

Baisakova, Nurzat

Research Report

Trade policy impacts on net wheat importers in the CIS: Three essays

Studies on the Agricultural and Food Sector in Transition Economies, No. 87

Provided in Cooperation with:

Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale)

Suggested Citation: Baisakova, Nurzat (2017) : Trade policy impacts on net wheat importers in the CIS: Three essays, Studies on the Agricultural and Food Sector in Transition Economies, No. 87, ISBN 978-3-95992-041-4, Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale),
<https://nbn-resolving.de/urn:nbn:de:gbv:3:2-86084>

This Version is available at:

<https://hdl.handle.net/10419/172795>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

**Studies on the Agricultural and Food Sector
in Transition Economies**

Nurzat Baisakova

**Trade policy impacts on net wheat importers
in the CIS: Three essays**



Leibniz Institute of Agricultural Development
in Transition Economies

Trade policy impacts on net wheat importers in the CIS

Three essays

Studies on the Agricultural and Food Sector
in Transition Economies

Edited by
Leibniz Institute of Agricultural Development
in Transition Economies
IAMO

Volume 87

Trade policy impacts on net wheat importers in the CIS: Three essays

**by
Nurzat Baisakova**

IAMO
2017

Bibliografische Information Der Deutschen Bibliothek

Die Deutsche Bibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.ddb.de> abrufbar.

Bibliographic information published by Die Deutsche Bibliothek

Die Deutsche Bibliothek lists the publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the internet at: <http://dnb.ddb.de>.

This thesis was accepted as a doctoral dissertation in fulfillment of the requirements for the degree "doctor rerum politicarum" by the Faculty of Law and Economics at Martin Luther University Halle-Wittenberg on 19.10.2016.

Date of oral examination:

06.12.2016

Supervisor and Reviewer:

Prof. Dr. Thomas Herzfeld

Co-Reviewer:

Prof. Dr. Ingo Pies

Diese Veröffentlichung kann kostenfrei im Internet unter
<www.iamo.de/dok/sr_vol87pdf> heruntergeladen werden.

This publication can be downloaded free from the website
<www.iamo.de/dok/sr_vol87pdf>.

© 2017

Leibniz-Institut für Agrarentwicklung in Transformationsökonomien (IAMO)

Theodor-Lieser-Straße 2

06120 Halle (Saale)

Tel.: 49 (345) 2928-0

e-mail: iamo@iamo.de

<http://www.iamo.de>

ISSN 1436-221X

ISBN 978-3-95992-041-4

CONTENTS

List of tables.....	iii
List of tables in appendices	iii
List of figures	v
Abbreviations	vii
Introduction.....	1
State of the art.....	1
1 Essay	12
2 Essay	15
3 Essay	19
Own contribution to the academic debate	21
Limitations and suggestions for further research	22
1 Russia's wheat trade policy with its neighbors:	
The neorealism perspective	25
1.1 Introduction.....	25
1.2 Wheat trade and political economy in Eurasia	26
1.3 Theory.....	30
1.4 Analysis.....	34
1.4.1 Competitors and transport costs	34
1.4.2 Economic and military cooperation.....	42
1.5 Conclusions	46
2 Agribusiness in transition: Insights from structural change	
in grain processing in Central Asia.....	49
2.1 Introduction.....	49
2.2 Structural change in grain processing in market economies.....	53
2.3 Conceptual framework.....	55
2.3.1 Drivers of structural change within the firm.....	55

2.3.2 Drivers of structural change outside the firm.....	56
2.4 Data description.....	59
2.5 Comparative analysis and survey results	60
2.6 Conclusions	83
3 Quantitative analysis of heterogeneous effects of grain export policies on Kyrgyz wheat producers and consumers	89
3.1 Introduction.....	89
3.2 Theoretical framework.....	91
3.3 Empirical framework	93
3.3.1 Description of the data set	93
3.3.2 Empirical specification of market surplus functions	100
3.4 Results of the econometric analysis.....	101
3.5 Conclusions	103
References.....	105
Appendices	115
Declaration of authorship.....	129

LIST OF TABLES

Table 1:	Non-standard exports from Russia to Armenia	36
Table 2:	Non-standard exports from Russia to Kyrgyzstan	36
Table 3:	Non-standard wheat exports to Georgia.....	40
Table 4:	Memberships in organizations	43
Table 5:	Military bases in the CIS	45
Table 6:	Quantitative import tariffs in Kyrgyzstan	76
Table 7:	Ad valorem import tariffs in Uzbekistan	77
Table 8:	Descriptive statistics for commodity real prices in Som per kilogram	96
Table 9:	Descriptive statistics for annual real income in Som.....	96
Table 10:	Descriptive statistics of marketed surplus for net sellers in 2005-2006 in kilogram	98
Table 11:	Descriptive statistics of marketed surplus for net sellers in 2008-2012 in kilogram	98
Table 12:	Descriptive statistics of marketed surplus for net buyers in 2005-2006 in kilogram	99
Table 13:	Descriptive statistics of marketed surplus for net buyers in 2008-2012 in kilogram	99
Table 14:	Marketable surplus equation estimates in 2005-2006.....	102
Table 15:	Marketable surplus equation estimates in 2008-2012.....	102

LIST OF TABLES IN APPENDICES

Table 1:	Mill enterprise questionnaire	115
Table 2:	Econometric estimation results for the period before the export ban	122
Table 3:	Econometric estimation results for the period after the export ban	126

LIST OF FIGURES

Figure 1:	FAO food price index in nominal and real terms	1
Figure 2:	Factors contributing to higher commodity prices	2
Figure 3:	Wheat production in the Caucasus and Central Asia	7
Figure 4:	Wheat import in the Caucasus and Central Asia	7
Figure 5:	Producer price index for wheat for Kazakhstan, Russia, and Ukraine	8
Figure 6:	Producer price index for wheat for the Caucasus	8
Figure 7:	Producer price index for wheat for Central Asia	9
Figure 8:	Political map of the Caucasus and Central Asia	11
Figure 9:	Wheat import in Armenia	37
Figure 10:	Wheat import in Kyrgyzstan	37
Figure 11:	Wheat import in Tajikistan	38
Figure 12:	Wheat import in Azerbaijan	39
Figure 13:	Wheat import in Georgia	40
Figure 14:	Wheat import in Turkmenistan	41
Figure 15:	Wheat import in Uzbekistan	41
Figure 16:	Wheat production, and wheat and flour import in Kyrgyzstan as a share of consumption	50
Figure 17:	Wheat production, and wheat and flour import in Uzbekistan as a share of consumption	51
Figure 18:	Uzdonmahsulot: Plants and production	52
Figure 19:	Output produced by mills in Kyrgyzstan	61
Figure 20:	Processed wheat by big- and middle-sized mills in Kyrgyzstan during 2012-2014	62
Figure 21:	Processed wheat by small-sized mills in Kyrgyzstan during 2012-2014	62
Figure 22:	Finance of fixed assets of mills in Kyrgyzstan	63
Figure 23:	Finance of working capital of mills in Kyrgyzstan	64
Figure 24:	Purchased proportion of domestic and foreign wheat in Kyrgyzstan in 2014	65
Figure 25:	Purchased proportion of domestic and foreign wheat in Kyrgyzstan in 2012	65

Figure 26:	Sorts of wheat used in production of wheat flour by mills in Kyrgyzstan in 2014.....	66
Figure 27:	Sorts of wheat used in production of wheat flour by mills in Kyrgyzstan in 2012	66
Figure 28:	Wheat flour grades produced by mills in Kyrgyzstan in 2014.....	67
Figure 29:	Wheat flour grades produced by mills in Kyrgyzstan in 2012.....	67
Figure 30:	Proportion of commodities produced by mills in Kyrgyzstan in 2014	68
Figure 31:	Proportion of commodities produced by mills in Kyrgyzstan in 2012	68
Figure 32:	Number of individuals worked in mills in Uzbekistan during 2012-2014.....	69
Figure 33:	Processing capacity of mills in Uzbekistan during 2012-2014.....	69
Figure 34:	Storage capacity of mills in Uzbekistan.....	70
Figure 35:	Funding of fixed assets in mills in Uzbekistan	71
Figure 36:	Funding of working capital in mills in Uzbekistan	71
Figure 37:	Purchased proportion of wheat by mills in Uzbekistan in 2014.....	72
Figure 38:	Purchased proportion of wheat by mills in Uzbekistan in 2012	72
Figure 39:	Sorts of wheat used in production by mills in Uzbekistan in 2014.....	73
Figure 40:	Sorts of wheat used in production by mills in Uzbekistan in 2014.....	73
Figure 41:	Wheat flour grades produced by mills in Uzbekistan in 2014	74
Figure 42:	Wheat flour grades produced by mills in Uzbekistan in 2012	74
Figure 43:	Proportion of commodities produced by mills in Uzbekistan in 2014.....	75
Figure 44:	Proportion of commodities produced by mills in Uzbekistan in 2012.....	75
Figure 45:	Proportion of establishments' sales to different parties in Kyrgyzstan.....	79
Figure 46:	Proportion of establishments' sales to different parties in Uzbekistan.....	80
Figure 47:	Biggest obstacles faced by mills in Kyrgyzstan	82
Figure 48:	Biggest obstacles faced by mills in Uzbekistan	83

ABBREVIATIONS

CCA	Caucasus and Central Asia
CIS	Commonwealth of Independent States
CSTO	Collective Security Treaty Organization
CUSTA	Canada/US Free Trade Agreement
CU	Customs Union
EAEC	Eurasian Economic Community
EBRD	European Bank for Reconstruction and Development
EES	Eurasian Economic Space
EEU	Eurasian Economic Union
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Statistics Division of FAO
FGLS	Feasible Generalized Least Squares
GDP	Gross Domestic Product
IMF	International Monetary Fund
KAZ	Kazakhstan
KIHS	Kyrgyz Integrated Household Survey
KGZ	Kyrgyzstan
KRU	Kazakhstan, Russia, and Ukraine
LIFDC	Low-Income Food-Deficit Countries
NAFTA	North Atlantic Free Trade Agreement
NATO	North Atlantic Treaty Organization
NGO	Non-Governmental Organization
SURE	Seemingly Unrelated Regression Equations
TJK	Tajikistan
TKM	Turkmenistan

UN	United Nations
USA	United States of America
USD	US Dollar
UZB	Uzbekistan
VAT	Value-Added Tax
WFP	World Food Program
WTO	World Trade Organization

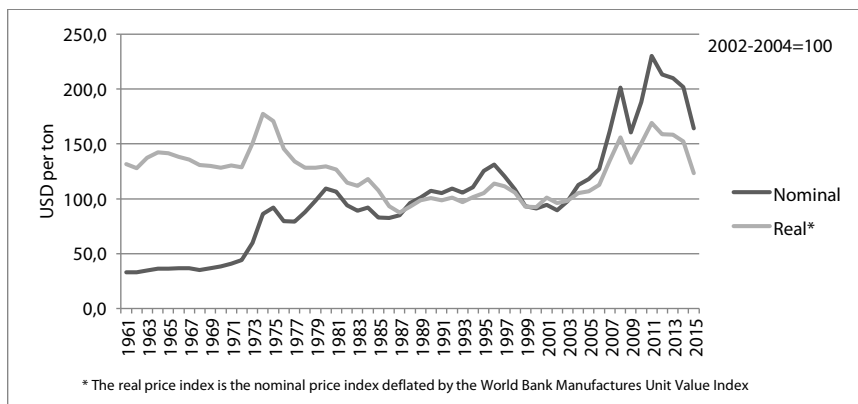
INTRODUCTION

State of the art

International debate on food price shocks

The price spikes¹ in years 2008 and 2011 (Figure 1) and the associated long-term increase in prices for food commodities have evoked massive concerns globally. In particular, the prices of the grains such as wheat and rice – both of which account for the largest share of grain consumption worldwide, corn – widely used as human as well as animal feed, and soybeans – used in vegetable oil production have increased tremendously in those years. This development in the international market for agricultural commodities has led to the so called "food crisis".

Figure 1: FAO food price index in nominal and real terms



Source: FAO, 2015a.

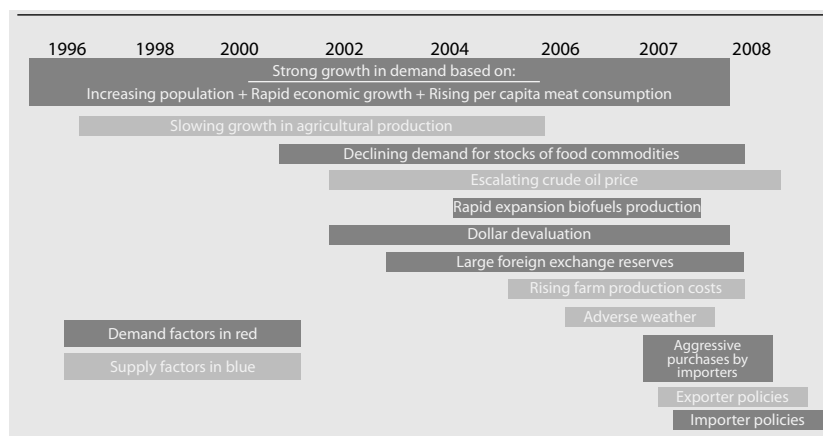
A large fraction of research around this issue was devoted to the causes of the tremendous food inflation. These papers put forward numerous supply and demand-driven factors at the macro- and microeconomic levels and it is agreed that a complex combination of short- and long-term multiple factors had influenced the price surge of primary agricultural commodities (ABBOTT, 2009; ABBOTT et al., 2011; BALTZER et al., 2008; CHAND, 2008; MITCHELL, 2008; PIESSE & THIRTLE, 2009; ROACHE, 2010; TROSTLE, 2008; VON BRAUN & TADESSE, 2012).

¹ There is a difference between price trends, price volatility, and price spikes. For more details see von BRAUN & TADESSE (2012).

At the macroeconomic level, there are numerous demand-driven causes that had imposed an upward pressure on food prices indicated. Among the ones indicated most: the economic growth of developing countries, and especially that of China and India, steady depreciation of the US Dollar (USD) for at least one decade against other currencies, and increasing biofuel production by some developed countries. In addition, stock market speculations are believed to have contributed to this development (GILBERT, 2010; ROACHE, 2010; ROBLES et al., 2009; WAHL, 2009). The claim, however, remains questionable with contradictory empirical evidence (IRWIN, 2011; PIES & PREHN et al., 2013; PIES & WILL et al., 2013; PREHN et al., 2013; TIMMER, 2009; WILL et al., 2013; B. WRIGHT, 2009).

On the supply side, this development was accompanied by decreased growth in global agricultural production, climate change, and decline in global grain stocks. WRIGHT (2009) believes the latter to be the primary cause for the price spikes – one of the reasons for downward sloping prices for cereals since the last price shock in the early 70s (B. WRIGHT, 2009). Trostle's table provides an overview of short- and long-term factors contributing to increasing commodity prices (TROSTLE, 2008). In the above-mentioned studies, all of the points in Trostle's table (Figure 2) are debated and supported by data and evidence. Nonetheless, the precise causes of the price shocks remain arguable with the impacts of exporter and importer policies, indicated in the table, remaining understudied.

Figure 2: Factors contributing to higher commodity prices



Source: TROSTLE, 2008.

There is a number of research on the consequences or impacts of soaring prices for agricultural commodities in various countries (BABIHUGA & GELOS, 2009; DE JANVRY & SADOULET, 2008, 2010; DEMEKE et al., 2009; DESSUS et al., 2008). Most of the countries analyzed in this context are developing countries, since the food crisis is

believed to have had the most severe effect on the countries, or segments of populations, where consumers give up the largest share of their incomes for food. The main aim of these studies was to investigate if and how the food inflation affected the consumers in the developing part of the globe. An increase in food prices can affect consumers such that during inflation they have to spend more money for the same basket of products than when prices are stable, holding real income constant. Naturally, if income is derived from sales of agricultural commodities, real income may increase keeping expenditures constant. This, however, depends on input prices, consumers being net buyers or net sellers of other food commodities, and many other country- and commodity-specific factors. A study by the European Bank for Reconstruction and Development (EBRD) and the World Bank reveals, nonetheless, that agricultural producers, in general, are net buyers of food themselves (AKSOY & HOEKMAN, 2010). Moreover, it is quite certain that low-income consumers lose more than consumers with higher incomes, as they have to change the composition of their caloric intake, which has a direct impact on health and in the long-term socio-economic implications. Such socio-economic implications include higher ratios of illness among populations and, therefore, lower ratios of labor force productivity.

The findings of IVANIC and MARTIN (2008) suggest adverse impacts of the food crisis on consumers in developing countries (IVANIC & MARTIN, 2008). In particular, the urban low-income consumers were affected most, as they are net buyers of food. HEADEY (2013), in turn, conducted research on the impacts of soaring prices based on self-assessed food security in India (HEADEY, 2013). DE JANVRY & SADOULET (2010) conducted a welfare analysis for Guatemala – a developing country with high urbanization rates and heavily dependent on food imports, where several cereals are the staple food (DE JANVRY & SADOULET, 2010). Their findings reveal that the rural low-income population was more affected by the food crisis than the urban segment of the population, which is conventionally expected by, for example, DESSUS et al. (2008). Further findings of the study show that the vast majority of households suffering from the rise in food prices were farm households. DESSUS et al. (2008) investigated developing countries in a sample of 73 countries on the change of the cost alleviating the urban poverty. They found that the change in the poverty deficit was mostly due to the negative real income effect of those households that were vulnerable to price surges before the food inflation (DESSUS et al., 2008).

According to the above-mentioned studies, the food crisis affected various segments of populations in developing countries to different degrees. This is understandable, considering the fact that the consequences of food inflation depend on the degree in which states are involved in international trade and transmission of prices from international to domestic markets. Moreover, such consequences

depend on the commodities in question and consumers' position as net buyers and net sellers, as already indicated. In general, the results of the studies indicate a negative impact of the soaring food prices on populations with comparatively lower incomes and who are initially vulnerable to such sudden price shocks.

Governments' reaction to the food crisis

The most noticeable development around the food crisis issue, however, was the way in which governments around the world reacted to it. Trade oriented *ad hoc* policies included different forms of export restrictions and reduction of import restrictions mostly in order to dampen domestic prices and to increase domestic production, respectively. Producer-oriented policies involved different forms of producer subsidies and consumer-oriented policies involved food subsidies and price controls. Such countries as China, Indonesia, Malaysia, the Philippines and Senegal, among many others, even declared the achievement of self-sufficiency in agricultural production as an important strategic policy measure from then on. Further, the food crisis brought a renewed emphasis on domestic food production in Latin American and the Caribbean countries. Thus, for instance, Colombia has started to support farmers by giving credits to produce corn and wheat, and Honduras has lowered interest rates for credits to buy agricultural inputs, technology, and seeds (DEMEKE et al., 2009).

Some authors argue that export restrictions by major cereal exporters have aggravated food inflation and have contributed to its further surge (HEADEY, 2011; MITRA & JOSLING, 2009; PIES & PREHN et al., 2013; PIES & WILL et al., 2013; TIMMER, 2009). It is argued that the price shocks would not have been that tragic if major net exporters of raw agricultural commodities had not imposed export restrictions and net importers of the agricultural commodities in question had not bought them out aggressively.

HEADEY (2011) conducted a study on how the trade restrictions affected the prices for agricultural commodities. In the study he argues that there has been a chain of reactions since Ukraine began to restrict grain exports in 2006. As a result, Ukraine's major trading partners have switched to other major grain exporters such as, for example, the United States of America (USA), Australia, Argentina, Russia and Kazakhstan. Increased demand in these countries has further pushed up prices domestically as well as internationally. Such development has then created panic among the net grain exporters as well as the net grain importers. As a result, exporters have started banning exports periodically and repeatedly with some differences in time between several months and more than a year (HEADEY, 2011)

Recent research provides a track record of governments' trade policies and producer- and consumer-oriented measures undertaken during the food crisis.

Demeke's table depicts governments' reactions in 2008 globally. In total 81 countries around the world among which 26 countries in Asia, 33 in Africa, and 22 in Latin America and the Caribbean have turned to trade policy and domestic market measures. Trade policy measures comprised such measures as reduction of tariffs and custom fees on imports (23 countries) and restriction or banning of exports (25 countries – among which Argentina, Cambodia, China, Egypt, India, Kazakhstan, Pakistan, Russia, Ukraine, and Vietnam). Domestic market-based measures included such measures as releasing of stocks (public or imported) at a subsidized price (such countries as India, Ethiopia, Senegal, Cameroon, China, and Pakistan), suspension or reduction of value-added taxes (VAT) and other taxes (such countries as Bangladesh, Egypt, India, Indonesia, Mali, Mexico, Morocco, Pakistan, Peru, the Philippines, Senegal, Turkey, Brazil, Mongolia, Congo, Madagascar, Kenya, and Ethiopia) but also other administrative price controls (21 countries – among which Sri Lanka, Senegal, Malawi, Côte d'Ivoire, Malaysia, India, Pakistan, the Philippines, and Thailand) as well as the restriction of private trade. Such countries as the Philippines, Saudi Arabia, Japan, and China even increased imports of respective commodities during the food crisis significantly (DEMEKE et al., 2009).

Many developing countries have decided to turn to price and trade regulation measures due to the unsuccessful outcomes of their agriculture after liberalizing trade. As a result, many of them have become net importers of food and depend significantly on external food supplies. Such outcomes of the trade liberalization are supposed to have occurred due to higher competition faced by domestic agriculture, but also due to the depreciation of the USD against national currencies (ABBOTT, 2011). As outlined above, many countries have undertaken such measures not only as a short-term response to the food crisis, but also as a long-term strategic policy measure to help their agriculture to recover and to provide sufficient domestic supply of food commodities in the future.

When it comes to exporting, ten countries supply about 90 per cent of total wheat, maize, and rice exports worldwide (FAO, 2015). The problem with the surging food prices was exacerbated when the leading net wheat exporting countries such as Argentina, Brazil, Kazakhstan, Russia, Ukraine and the European Union (EU) started to tax or ban exports. The same is true of trade policies of the major exporters of rice such as Cambodia, China, India, Pakistan, and Vietnam (ABBOTT, 2011). As a result, numerous riots took place worldwide due to the soaring food prices (MARC F. BELLEMARE, 2011; PIES & PREHN et al., 2013). Accordingly, such evidence speaks for an unignorable share of governments' contribution to further increase of the food prices.

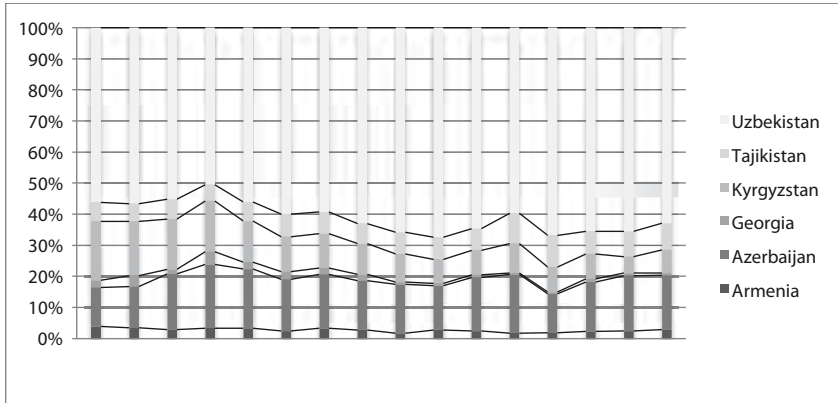
Trade arrangements are of great significance for pricing both domestically and internationally and may impose diverse welfare and structure related implications.

Moreover, government policies, although originally intended for good, can have adverse effects on pricing and welfare of low-income net food buyers. A study by DJURIC et al. (2015) shows that the domestic prices for cereals in Serbia remained high even after the export embargo imposed by the Serbian government (DJURIC et al., 2015). This simply implies that protective policy measures are not always effective.

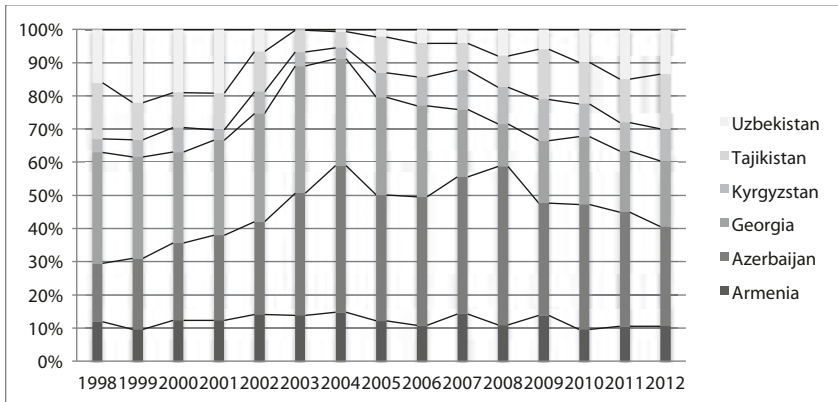
Implications of global grain price development in the CIS

Kazakhstan, Russia, and Ukraine (KRU) are the world's major grain exporters. During the food crisis, and even afterwards to the present day, these countries have been levying different forms of export restrictions for grains such as export taxes, export quotas, export bans (GOETZ et al., 2013). These policies were applied mainly to commodity wheat. In most of the Commonwealth of Independent States (CIS) wheat is the staple food, just like rice in Asia, and teff and sorghum in Africa. Combined, KRU account for around 20 per cent of the total global wheat export and their share is likely to increase in the future (FAO, 2015). Empirical evidence suggests a positive relationship between the international wheat prices and the export volumes from KRU (KEMÉNY et al., 2012). Further research findings in this area demonstrate that the grain export volumes from KRU have a high impact on pricing in the global markets and the global food security (FELLMANN et al., 2014). They have even higher impact for pricing and food security in the Eurasian market, where the majority of KRU's wheat export share is utilized. Secondary statistics on production as well as export-import volumes among the CIS countries prove that wheat exports from KRU have been increasing along with imports by countries of the Caucasus and Central Asia (CCA) coupled with decreasing production trends in most of these countries. The food crisis, interestingly, coincided with the lowest levels of wheat production in some of the net wheat importing countries of the CIS² (Figure 3 and Figure 4).

² There is lack of data for Turkmenistan and for Uzbekistan.

Figure 3: Wheat production in the Caucasus and Central Asia

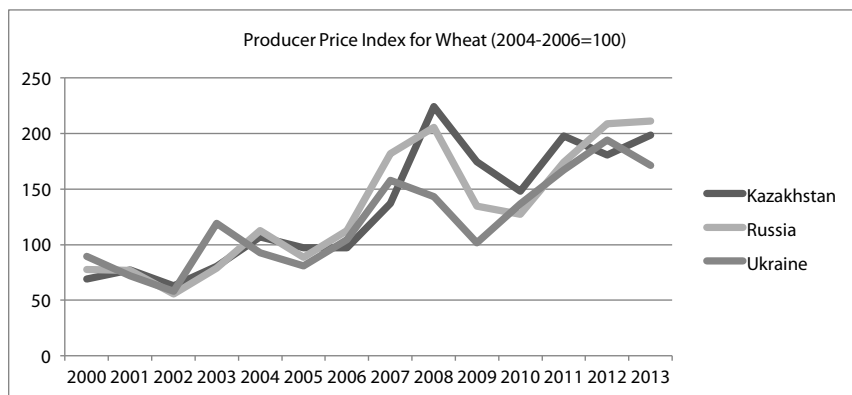
Source: FAOSTAT, 2015b.

Figure 4: Wheat import in the Caucasus and Central Asia

Source: FAOSTAT, 2015c.

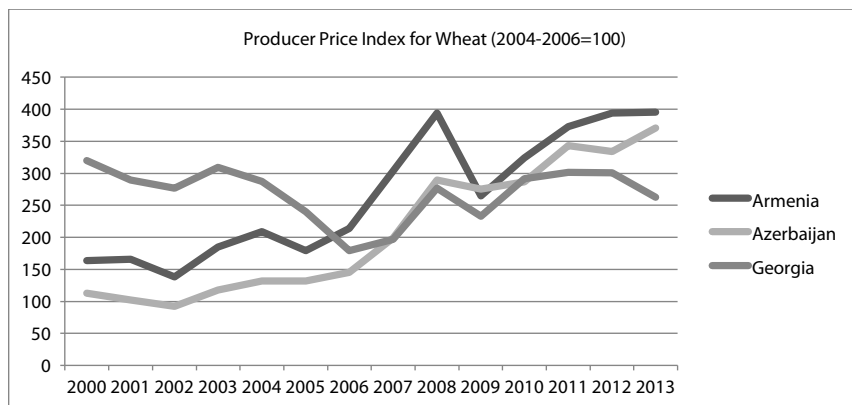
Producer price index for commodity wheat provides evidence that the wheat prices in the CIS have also been on a rollercoaster ride since the end of 2006 (Figures 5-7).

Figure 5: Producer price index for wheat for Kazakhstan, Russia, and Ukraine

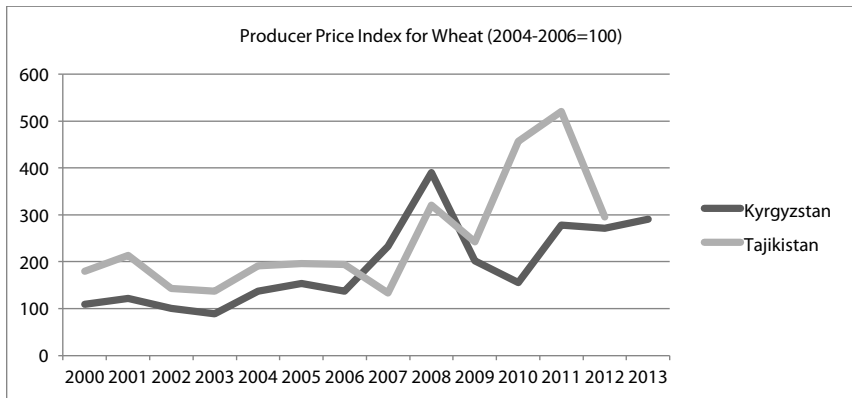


Source: FAOSTAT, 2015d.

Figure 6: Producer price index for wheat for the Caucasus



Source: FAOSTAT, 2015e.

Figure 7: Producer price index for wheat for Central Asia

Source: FAOSTAT, 2015f.

Kazakhstan's and Russia's³ wheat export embargos, in 2008 and 2010, respectively, and increase in global prices for grains must have had considerable impact on their neighboring countries that are heavily dependent on wheat imports and where some grains are the staple food. Kazakhstan introduced an export ban in 2008. Russia introduced an export ban on wheat in 2010/2011, export taxes in 2007/2008 and export taxes again in 2014/2015. Ukraine introduced export licensing in 2006, export quotas with some short breaks during 2006-2008, export quotas again in 2010/2011, export taxes and export duties in 2011 (KULYK et al., 2014). Undoubtedly, such measures have consequences not only for their own domestic markets, but also for the countries dependent on the wheat coming from KRU. FELLMANN et al. (2014) simulated three scenarios with an export ban, export quota, and export tariff, if such were applied by KRU. If an export ban is applied, global wheat trade would decrease by 6 per cent and the price for wheat would increase to 11 per cent compared to the benchmark scenario. If countries would impose an export quota by 3.3 million tons, the total export of wheat would decrease by 4 per cent and the world wheat price increases to 7 per cent. If KRU would introduce a 9 per cent export tariff, countries would still export significant amounts of the commodity, whereby the export would decrease by only 1 per cent and the price for wheat would increase to only 1 per cent (FELLMANN et al., 2014).

All countries of the Caucasus and Central Asia (except for Kazakhstan) fall under the Food and Agriculture Organization of the United Nations' (FAO) classification "Low-Income Food-Deficit Countries" (LIFDC). Moreover, the World Food Program (WFP) of the United Nations (UN) supports Armenia, Azerbaijan,

³ Kazakhstan joined WTO on 30.11.2015; Russia – on 22.08.2012; Ukraine – on 16.05.2008.

Georgia, Kyrgyzstan, and Tajikistan. To my knowledge, the latest research on the consequences of the soaring food prices in the Caucasus and Central Asia is limited to some food security reports by such organizations as FAO, EBRD, International Monetary Fund (IMF), World Bank, and different non-governmental organizations (NGO). The results of their analyses suggest that the CCA countries, being overwhelmingly low-income countries and heavily dependent on grain imports, have significantly been affected by the increase in food prices and their volatility since 2008. The impact might have been inevitable considering most of the observed countries don't have strategic grain reserves at their disposal (ROBINSON, 2008). The research after the food crisis in the early 70's indicated though that stockpiling is costly and difficult to manage. Therefore, this point seldom appears in policy recommendations (ABBOTT, 2009). Nevertheless, countries with sufficient reserves could react more quickly and with lower fiscal pressure than those without reserves (DEMEKE et al., 2009).

The necessity to study the net wheat importing countries of the CIS is explained by the fact that the problem of wheat insufficiency seems to be one of the most pressing problems in these countries. Insufficiency of such staple foods has implications for consumers in these countries. Moreover, increasing demand for wheat in the net grain importing countries coupled with significantly declining production of this commodity might have serious implications for the international wheat market. Most importantly, increasing export restrictions of major grain exporters in the region on the one hand and increasing dependency on imports of grain-commodities by import-dependent countries in the region on the other hand emphasizes the importance of this situation. The problem might become exacerbated considering how diverse trade and economic policies of the CIS countries have become ranging from extremely isolated to extremely open. Thus, this study aims to shed some light on the wheat sectors of the CIS in general and trade policy impacts on net wheat importers in particular. Countries under this study are limited to two major grain exporters Russia and Kazakhstan and net grain importers in the Caucasus and Central Asia (Figure 8).

Figure 8: Political map of the Caucasus and Central Asia

Source: PERRY-CASTAÑEDA, 2015.

Objectives of the study

The general question emphasized in this work is how the global food crisis during 2008–2011 and frequent grain export restrictions by the major exporters of this commodity affected the net wheat importing countries of Central Asia (Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) and the Caucasus (Armenia, Azerbaijan, and Georgia).

The aim of this dissertation is to study the impacts of such trade policies on the net grain importing countries of the CIS by focusing on three selected issues of this research problem. Each essay⁴ represents a separate work with its own research question, theories, methodology, and data. These research questions are, however, related to the general research question above and represent an analysis of the involved parties at three levels: international – the analysis of grain trade among several states, national – the analysis of the intermediate flour suppliers, and the micro-level – the analysis of households.

⁴ Words "essay" and "paper" will be used interchangeably. Further, I intend to submit the essays to scientific journals according to their research foci.

1 ESSAY

Russia's wheat trade policy with its neighbors: The Neorealism perspective

In what follows, each essay will be introduced with a presentation of the state of the literature, theories, methods, as well as major results. Each description will be closed with a discussion of policy implications.

The first essay is conducted at the international level and it analyzes the grain trade among the CIS countries⁵. In particular, Russia's wheat trade policy towards its grain import-dependent neighbors is studied. As introduced above, Russia has become a major net wheat exporter in the world exporting approximately 20 million tons of wheat annually (FAO, 2013). At the same time, Russia has been introducing export restrictions, with three of them introduced only in the course of the last several years (2007/08, 2010/11, and 2014/15). Nonetheless, as of about the same time as the food crisis started and during its frequent grain export restrictions, Russia has been increasing wheat and wheat flour exports in a non-standard form, i.e. in the form of presents, commodity for installments, and development of seed programs to some of the countries in the Caucasus and Central Asia, but not to all of them (UKHOVA, 2013).

The food crisis developed along with the changing political reality on the Eurasian continent: Russia's establishment as the major exporter of grains and its reviving position as the key political player (MANKOFF, 2009). This position is reflected in Russia's leading role in regional organizations⁶, the work of which has been intensifying during the last years. By now it is clear which of the CCA countries participate in those organizations and which have already withdrawn their memberships (NYGREN, 2008). However, the degree of reliance of the CCA countries on grain and flour supplies during the food crisis seems to have been determined by the degree to which the CCA countries are willing or not willing to participate in regional organizations. Therefore, it seems that political relations between Russia and the CCA intertwine with economic relations in such a way that developments in the sphere of politics influence developments in the sphere of trade and economic cooperation. Without any doubt it is important to understand the rationale behind such trade policy, since it has direct implications on the countries that trade with Russia. Therefore, in the first essay of the dissertation, the following research question will be addressed: what determines Russia's wheat trade policy towards the countries of the Caucasus and Central Asia? To answer this

⁵ CIS includes post-Soviet countries, although not all of them by now are members of the organization. Despite this, the term "CIS" is broadly used according to its political meaning, which considers all of the post-Soviet countries except for the Baltic States.

⁶ Regional organizations in this context are international organizations established on the post-Soviet space and members of which are mostly the post-Soviet countries.

question, the wheat trade between Russia and its neighbors will be analyzed, combined with the current geopolitical situation in the region.

There are numerous works conducted on Russia's grain trade from various perspectives as, for example, price transmission and market power (GAFAROVA et al., 2015; GOETZ et al., 2013; KEMÉNY et al., 2012). These studies assessed Russia's grain trade from a purely economic perspective. With regard to Russia's trade policy and the policy of integration in regional organizations, some research has also been done. However, it has been written either within the framework of trade integrational processes or pure political science (POMFRET, 2005; RAKHIMOV, 2010). There is a research gap though on the rationale behind the double-barreled trade policy, when some countries receive help and others are restricted on trade. This essay aims at closing this research gap.

This is a qualitative and interdisciplinary study. The chosen method is the qualitative analysis, because the inquiry is based on the analysis of the given data and the facts relevant to the research question. Materials of the analysis are mostly secondary statistical data, relevant articles, as well as news reports. The main theoretical foundation of the essay is the theory neorealism. Further relevant economic theories such as theories of transport costs, international trade, and competition theories will also be taken into account. This study encompasses a comparative aspect, since several countries (Russia's neighbors in the Caucasus and Central Asia) will be compared with one another based on political and economic factors that are obtained from the theories described above. At the end of the analysis conclusions will be drawn and policy implications will be discussed.

The results of the analysis indicate that the overall geopolitical situation on the continent influences trade amongst the countries. Intensively developing political events on the one hand and the food crisis on the other hand influenced access to grains for some of the net grain importing countries of the CIS during those years. Some, however, could receive wheat and wheat flour in a non-standard form. For many of the countries studied it turned out to be difficult to achieve self-sufficiency in wheat production following their independence despite the implementation of a variety of policies such as subsidization of production, development of seed programs, and import substitution. Structural factors such as soil, climate, quality, and land insufficiency (not to mention other manageable constraints such as agricultural and economic policies) make it impossible, at least in the short-run, to increase the production of wheat in those countries substantially. On the contrary, many of the grain import-dependent countries of the CCA show increasing trends in wheat and wheat flour imports over the years. This clearly makes them vulnerable to external shocks as was the case of the worldwide reduction in grain supplies and the drastic long-term increase of food prices. The geopolitical situation, on the other hand, which involves the

struggle among the bigger political actors over the level of influence on the continent, impacts significantly the trade patterns among the countries and trade development in general. It is found that cooperation or non-cooperation of the import-dependent CCA countries in different spheres, especially in the military, determines the accessibility of grains from a key political power.

Policy implications

The latest developments around the price surge for food commodities prove that the net exporters of agricultural commodities can, in principle, easily ban exports despite the fact that it might hurt other participants of international trade that depend on the imports of respective commodities. Trade restrictions, surprisingly, have been imposed even after prices in the international markets started to decline. Moreover, this phenomenon calls for a renewed view of the international trade development at the national as well as supranational levels.

Commitments to the world's biggest trade organization appear to be limited to some maximum tariff bindings. The Doha Development Round of the World Trade Organization (WTO), which was launched in 2001 and aimed at lowering trade barriers and therefore fostering trade globally, couldn't, therefore, contribute to the elimination of trade restrictions during the food crisis. Moreover, the disagreements regarding agriculture and tariffs still remain up to date unresolved with negotiations having been stalled since 2008. Therefore, some new measures are necessary at the WTO-level that would restrain export bans, especially during such times when prices for agricultural food commodities in international markets start to surge.

One of the most important policy recommendations for large exporters of food commodities is to leave borders open even during food price inflations. The closing of borders by major exporters affects international prices and pushes them upward even more. International prices, in turn, can quickly be transmitted to domestic markets despite reverse expectations. Thus, in many cases of export restrictions, prices for respective commodities in domestic markets remain almost as high as prices in international markets. Because of this, it is crucial that major exporters of agricultural goods consider this matter and take into account the research works that reveal the inefficacy of such extreme measures as export bans. Researchers have been giving this recommendation for many years now. Only this way it is possible to preserve the balance between the international supply and the demand and, therefore, avoid distortions in the prices for food commodities, to provide smooth movement of goods along the supply chains, and to assure sustainable development of international trade relations. The net importers of the staples, in turn, should undertake long-term policy measures that would allow them to quickly and efficiently react to such sudden price shocks and, moreover, to ease the import-dependency from a single supplier. Therefore

it is recommended to diversify the import sources and to build consistent trade relationships with alternative suppliers aimed for a sustainable long-term co-operation in trade.

2 ESSAY

Agribusiness in transition: Insights from structural change in grain processing in Central Asia

The second essay is conducted at the national level and studies intermediary actors of the grain supply chain. Wheat flour processing industries of some of the observed countries have been undergoing significant structural changes as a result of increasing trends in wheat but mostly wheat flour imports coming from Russia and Kazakhstan. In particular, grain-processing firms in Armenia, Georgia, Kyrgyzstan, and Tajikistan have been either closing their enterprises for some uncertain time or leaving the business completely. Such phenomenon is not observed in all of the grain import-dependent countries of the CCA though. Governments' trade and competition policies play a decisive role in the developments occurring within the grain processing industry. In fact, the degree to which processing firms develop in a market or in a different type of economy depends significantly upon the respective governments' economic and trade policies. Moreover, intermediary flour suppliers are of importance, but their state of development remains understudied. The way they work is important for the price formation along the commodity supply chains, for the level of grain demand either domestic or foreign, and the way finished products are delivered to end consumers.

The focus of the second essay lies in the investigation of the drivers of such structural change. Study of this phenomenon requires the consideration of many factors from milling companies' business performance and strategy over quality issues of the commodity in question up to governments' trade and competition policies regarding the trade of both wheat as well as wheat flour. Since the grain import-dependent countries of the CCA provide examples of both with and without structural transformations of the grain supply chains, this study focuses on the most demonstrative examples of the country-cases of Kyrgyzstan and Uzbekistan. Whereas Kyrgyzstan, a net grain importer with a drastic structural change within the grain processing industry, serves as a sample for a market economy with open trade, Uzbekistan, also a net importer of wheat as well as wheat flour with no structural change to observe, serves as a restrictive economy with a strategic policy of import substitution. The countries can also serve as representative samples for other similar countries.

Designed as a comparative analysis of the country-cases Kyrgyzstan and Uzbekistan, this part of the dissertation investigates not only the phenomenon of

structural transformation within the grain processing industry, but explains indirectly how the demand for wheat and wheat flour by the grain import-dependent countries has been increasing and how it is related to the heterogeneous developments within the domestic grain processing industries. Particular attention will be paid to such drivers of the structural transformation outside the firm as governments' trade and competition policies and to commodity quality issues. The research question pursued within the second paper is: what drives the structural changes in the grain processing industry in Central Asia?

Most recent research on structural changes in the grain processing industry concerns the USA (C. S. KIM et al., 2001; C. S. KIM et al., 1991; OLLINGER et al., 2005; WILSON, 1995). The authors investigated this particular problem under the consideration of some main factors, which are strongly supportive in my orientation. Previous research studies on the outcomes of Central Asian reform strategies have focused primarily on agricultural production (LERMAN, 2008), structural change in the farming sector (LERMAN, 2009) and trade integration (KAMINSKI, 2012; RUTHENBERG, 2006). Moreover, the FAO Regional Office for Europe and Central Asia has consequently been publishing various reports and workshop-proceedings on value chains and their development over the years in the countries of Eastern Europe, the Caucasus, and Central Asia. Such reports have been dealing with supply chains of various commodities, however not with grain processing firms (TANIC, 2006, 2009, 2011, 2015). Furthermore, there is yet no in-depth study of the most recent developments around grain processing firms in Central Asia under the consideration of growing competition within the industry as a whole and governments' various trade policies. This study takes into consideration also the commodity quality issues. There are several studies regarding wheat quality issues in Central Asia (ABUGALIEVA & PENA, 2010; KIENZLER & IBRAGIMOV et al., 2011; KIENZLER & RUDENKO et al., 2011; PENA et al., 2002) and how markets value quality (MERCIER, 1993; URI et al., 1994). These papers, however, do not investigate structural changes in the grain processing industry by taking into account commodity quality issues. Considering all this, this essay aims at closing this research gap.

To study this particular research problem, a conceptual framework is constructed that involves drivers of the structural change within and outside of the firm. The theories generally stem from the sphere of economics of industrial organization and international trade. In particular, the theory of the firm will be used in order to analyze business units. Furthermore, import tariffs will be analyzed that serve as indicators of governments' trade and competition policies. Moreover, a survey of grain processing enterprises in both countries is conducted. The sample includes small-, middle-, as well as big-sized milling companies in different geographical regions of both countries. The questionnaire for the survey is designed specially for business enterprises in transition economies and is characterized

by the inclusion of factors specific for such economies. The questionnaire presupposes questions designed according to the theoretical framework. Therefore, it will be possible to compare and to find a reflection of survey questions in the theoretical part of the paper. The method chosen is the qualitative case study, since an in-depth analysis of two country-cases will be conducted. According to the method, both the survey data and the secondary statistical data will be analyzed. Further, data on import tariffs and national news reports, which normally are the first to capture the latest developments within the countries, will also be analyzed. Also here, as in other essays, policy implications will be discussed in detail after the conclusions.

The results of the analysis demonstrate that the milling enterprises in Kyrgyzstan, due to governments' unrestricted import policies of wheat flour and, therefore, growing industry competition, have been consolidating quickly, which means that ineffective business units have been squeezing out of the market while changing the market structure. The market, therefore, has been tending to take an oligopolistic form, where several big firms perform better competitiveness and can actually preserve their existence in the massive competition with the foreign industry. In particular, small- and even some of the middle-sized processing business units have been showing rather deteriorating developments in terms of economic parameters comprised in the survey, while big-sized mills have been improving their performance in almost all parameters. In sum, the structural change in Kyrgyzstan has been taking place mainly through two channels: the unrestricted import flows of wheat flour that circumvent the work of grain processing firms, and the growing preference of end consumers, but also intermediate consumers such as mills, for imported wheat, which is characterized by better quality.

The extreme case, in terms of restrictiveness of trade policy, is Uzbekistan, where there has been no actual change and, accordingly, no significant development to observe. The quality of wheat of domestic origin is similar to that of Kyrgyzstan and inferior to the wheat of, for instance, Kazakh origin. The government's strategic policy is set, however, to substitute imports. This it does not only by imposing comparatively high ad valorem import tariffs for wheat, wheat flour, and various flour commodities, but also by owning the largest shares in the grain-processing joint-stock companies and determining the volumes of the processed grain. The competition policy of the government is to eliminate competition. One of the examples for the latter is that wheat producers can sell their output only to milling companies, in which the government has the largest shares, herewith, restricting the access to wheat for private flour processing units in the country. As a result, the state-owned mills in Uzbekistan show no improvement in their business performance and, accordingly, there are hardly any developments within those mills to observe.

Policy implications

Liberal trade policy leads to accelerated competition among grain processing firms and grain producers. Higher competition among grain producers induces the average market price to reduce. This is of advantage for mills that use grains as inputs in production of flour and for end consumers, who normally consume the processed flour as well as flour products and not the raw grain. Increasing marginal profit per unit of output due to the reducing marginal production cost enables business enterprises to acquire more advanced technology. The latter, in turn, leads to economies of scale and diversification of product lines. Thus, the business can be extended and the market share of respective establishments can be increased. Increase in the market share of one business unit might inevitably decrease the market share of another less efficient unit. Eventually, such development may create an oligopolistic or a monopolistic market structure. In an extreme case, such development might even lead to industry dissolution. Such an outcome might have implications for limited supply within the domestic market and even higher dependency on imports of processed flour and flour commodities. Therefore, the governments under question might think of establishing institutions such as antitrust authorities to control for monopolistic competition on the one hand, and to create institutions that enable efficient marketing systems across the country, on the other hand.

Policies of import substitution and competition elimination might hurt consumers who, due to significantly high import tariffs, have to spend more money on imported commodities for which tariffs are applied, as well as intermediary producers as, for example, private milling companies, which express preference for commodities with certain quality characteristics. The restriction of such grains might have health implications, furthermore, since it is grains with high protein content that are restricted to import. Other policy instruments should be worked out, which wouldn't harm producers, such as, for instance, the development of better seeds and the provision or investment in better technologies. Moreover, mechanisms should be improved which rather control for efficiency of factors used in production than are oriented on pure quantity of the commodity produced. In the long-term these pay off for the sustainable production and general welfare for producers, intermediary suppliers, and, last but not least, end consumers.

General policy recommendation for all of the CIS countries is that more control mechanisms of trade flows are needed in order to be able to record smuggled volumes of staples. In some of the CIS (especially net cereal import-dependent ones) volumes of smuggled commodities are supposed to be so significant that they might even have structural implications for the real economy. The existence of smuggling, on the other hand, indicates to market imbalances. Therefore,

control of the flows of smuggled goods alone wouldn't solve the problem. That is why it would be more important to address and analyze the underlying reasons of the market disequilibrium, since this is an important issue for better economic assessment of the current trade situation among the trading parties.

3 ESSAY

Quantitative analysis of heterogeneous effects of grain export policies on Kyrgyz wheat producers and consumers

The third essay is conducted at the level of households – the last level within the grain supply chain and analyzes the impacts of the grain export embargo imposed by Kazakhstan in 2008 on agricultural households in Kyrgyzstan. It is believed that Kyrgyz consumers have suffered from the Kazakh grain export ban, since Kazakhstan is the major supplier of wheat to Kyrgyzstan.

The aim of this paper to find the price and income elasticities of marketed surplus⁷, which should give an assessment as to which degree households produce more and consume less when the prices of all observed commodities increase. In particular, price and income elasticities of the marketed surplus for two periods, before and after the grain export embargo, will be estimated.

Previous similar research stems from other countries. In particular, ULIMWENGU and RAMADAN (2009) investigated the food price increase and consumers' response to it. Their results predicted a 23 per cent decrease in food consumption for net sellers, compared with 44 per cent when using the consumption approach alone. These authors used the agricultural household models developed by SINGH et al. (1986) and conducted a quantitative demand analysis with food substitutes (ULIMWENGU & RAMADAN, 2009). There is, however, a research gap on how households in Central Asia were affected by the increase in the prices of the staples associated with the export ban.

This is a quantitative demand analysis for different cereal commodities and their substitutes. The particular interest lies in how the demand for cereals and their substitutes changed as a result of the grain export embargo. The theory and the methodology used allow the taking into account of the fact that the country is still to a significant degree agricultural and households can, in principle, produce commodities studied. This means as well that the production side will be taken into account to a certain degree, however not to the extent as to be considered a welfare analysis. The theory and the methodology used is that developed by BELLEMARE et al. (2013). In particular, these authors have combined both producer and consumer sides into one variable – the marketed surplus, and investigated

⁷ Marketed surplus equals production minus consumption.

supply as well as demand reactions of agricultural households to a food price inflation in Ethiopia.

The data set used is the representative panel data set "Kyrgyz Integrated Households Survey" (KIHS). The data set is distinguished by its uniqueness in comprising large number of welfare related indicators and is considered an integrated household panel data set. Also, there is no comparable data set in all Central Asia. Data has been collected annually since 2003 in a sample of around five thousand households with about one-fourth being replaced each year. The questionnaire is designed specially for a developing country with inquiries on different economic parameters of household livelihoods and with a special focus on food consumption and food expenditures.

The results came out to be surprising on the one hand, because, it was expected that when the prices of the observed commodities increase due to the reduced supply caused by the export ban, their marketed surpluses should increase too. The economic theory predicts that when prices increase consumers reduce consumption and producers increase production. In the results obtained, the marketed surpluses for almost all commodities were decreasing in both periods with the negative coefficients of the own-price elasticities being lower in the second period. The results weren't surprising on the other hand, because, by a thorough analysis of this case, a general decline in the production of almost all cereals could be observed. Further, the results of the econometric analysis indicate that even when there is no export ban and when prices for producible agricultural commodities increase, producers don't sell more and consumers don't consume less.

Policy implications

The agricultural sector of Kyrgyzstan is continuing to go through structural changes due to industrialization, market liberalization, and the associated increase in competition with agricultural commodities. Such transition is connected with heterogeneous developments within agricultural segments of the population. The demand for staples in such countries is, in general, relatively inelastic. In a situation of food crisis, demand for staples might increase even more. This might occur as a result of the substitution effect, since, normally, prices for other food commodities increase too. Such an incident might put even more pressure on the development of prices in domestic as well as in international markets. The significant share of the population in Kyrgyzstan still lives from agriculture. One might think that the increase in prices for food commodities is of advantage for agricultural households, since their incomes increase when prices for agricultural commodities increase. Such a way of thinking is unfortunately not always true. Some empirical evidence has been introduced above indicating that during the food inflation those households, which were affected the most, were the

semi-subsistent households as they are the net buyers of food themselves. Moreover, the results of the analysis of the third paper show that the export ban imposed by Kazakhstan and the associated increase in prices of cereal commodities had a significant impact on semi-subsistent households in Kyrgyzstan. National governments' effective work is crucial, therefore, especially in order to provide a painless transition from agriculture to industrialization, and for those farm households that stay in agriculture, to provide assistance for their sustainable development. Semi-subsistent households should be the primary targets for assistance at the governmental level and not only during crises. Long-term policy measures should be worked out for efficient use of lands suitable for agricultural production, access to credits for farmers and farm households at lower interest rates and better policy measures for small farm households for sustainable agricultural growth. In the short-term institutions are needed that can provide stabilization mechanisms and these need to be in place prior to such price shocks associated with the reduced supply of agricultural commodities.

Own contribution to the academic debate

As discussed above, the first essay brings innovation to the research in terms of using theories of political science to explain the current trade situation within the CIS. To the best of my knowledge, there are yet no studies that investigate grain trade in Eurasia from political science perspective. The novelty of this study is that in such an analysis the economic good wheat is introduced as a political instrument used by a powerful country in order to induce the counter-parties to act in a desired manner. The results emphasize the importance of the consideration of geopolitics in the future when studying the trading situation within the CIS.

Further, within the analysis of the grain processing industry, a theoretical concept to study the milling industry is developed, which is based on existing economic theories and which shows how one good moving along the entire supply chain gets to the end consumer differently in two different economic-policy situations. The novelty of the study is that primary data such as interviews of managers of milling enterprises in two Central Asian countries were collected in 2015. This is a significant contribution to the research, since grain processing industries in the CIS remain up to date understudied, even though their role is very important for the functioning of the supply chains. The results indicate that the major drivers outside the firm influencing the new trends within the milling industry in Kyrgyzstan have been governmental trade and competition policies as well as quality aspects.

The main contribution to the scientific debate around the food crisis within the final essay is a quantitative demand analysis for cereal commodities in Kyrgyzstan using a representative household panel data set. This, to my knowledge, is

the first such research for the entire Central Asia. The results indicate a significant impact of the food inflation associated with the Kazakh export ban on wheat on Kyrgyz semi-subsistent households.

Limitations and suggestions for further research

The time given for a dissertation is unfortunately limited. Thus, at some point, one needs to call it a day. Even though I was able, within the first essay, to capture the newest developments within the grain sectors and the grain trade among the countries of the CIS by showing general declining trends in grain production in most of the CCA and therefore ever increasing trends in wheat and wheat flour imports, there still is need for more research on the exact causes of such developments at the country-based level. Such causes can vary from country to country considering they each conduct different trade and economic policies. Such investigation requires taking into consideration the still on-going transformation processes. In order to understand the declining trends in grain production, more quantitative investigation of cereal producers is necessary. Such analysis would require primary data collection at the farm level, since the countries under consideration lack such data. One of the main limitations of the first paper is the time constraint. There is a great potential to study the research problem discussed in this paper within the framework of other comparable theories of political science that also take into account some distinct features of different states when conducting trade.

The structural changes within the grain processing industry are also observable in the countries of the Caucasus. Even though this research gives comparative understanding regarding this issue, more detailed analysis of the case for the countries of the Caucasus is needed. Especially the case of Georgia seems to be crucial. The country shows the ratio of the highest wheat import-dependence and the lowest wheat production levels compared to the other CCA countries. Such research requires detailed representative data that is not yet available and still needs to be collected. Differences in the developments within the countries indicate the necessity of case study research. One of the main limitations of the study concerns the difficulty of surveying milling companies that have already closed in order to inquire on the exact reasons of their withdrawal from the market. Because of the lack of data, it was impossible to track such companies. Therefore, the research is limited to the analysis of the firms that currently operate.

In the quantitative demand analysis of agricultural households the focus was only on several cereals and their substitutes. For a more comprehensive and detailed analysis of the exact impacts of trade policies one needs to conduct a general welfare analysis under the consideration of other commodities. To some degree this should be possible taking into account the availability of the household

panel data for Kyrgyzstan. The data set, however very unique and advanced, has some limitations, which are discussed in detail within the paper.

1 RUSSIA'S WHEAT TRADE POLICY WITH ITS NEIGHBORS: THE NEOREALISM PERSPECTIVE

Abstract

What determines Russia's wheat trade policy towards the countries in the Caucasus and Central Asia (CCA)? This essay studies Russia's wheat trade policy towards the CCA countries within the framework of political economy. In particular, the main mechanisms of standard and non-standard trade relationships will be analyzed. It is argued that Russia, while conducting trade with the countries of the CIS, does not pursue an economic advantage in the first place but rather political aims.

1.1 INTRODUCTION

Russia has become a major grain exporter within the past years and exports nowadays about 20 million tons of wheat annually. Moreover, Russia is the fifth major wheat exporter in the world, accountable for more than 10 per cent of the global wheat trade (FAO, 2013). However, Russia's establishment as the major net wheat exporter has been coupled with its significant restrictions of grain trade (WEGREN, 2013). Only during the last several years the country imposed export restrictions on wheat and other grains in the form of an export embargo during 15.08.2010-31.06.2011, export taxes during 01.11.2007-30.06.2008 (up to 40 per cent), and export taxes again during 01.02.2015-15.05.2015, although some evidence suggests that grain exports to some of the neighboring countries occurred even during the export ban (PROZERNO, 2011). Moreover, it appears that during the same period of restrictions, Russia supplied wheat and wheat flour in a non-standard form and in particular in the form of presents, humanitarian or free aid, commodity for installments, and development of seed programs to some of the countries of its near abroad⁸ examples of which are provided in the analysis part. Previous research regarding this subject, however, does not cover this issue. Interestingly, these countries seem to cooperate with Russia on important strategic policy and security issues and seem to show reliance on Russia as soon as there are domestic shortages of grains. Those countries strongly dependent on wheat imports from Russia, but not cooperating in the political sphere, must seek alternative suppliers.

Thorough research of this phenomenon discovers some interlinkages of such trade policy with the memberships of countries in question in regional organiza-

⁸ "Near-abroad" means post-Soviet countries that fall under the Russian sphere of influence.

tions, where Russia has a dominating position. In other words, political relations between Russia and the CCA might intertwine with their economic relations, where the cooperation (or non-cooperation) on key political issues influences countries' trade relationships. In such situations, wheat might stop being an economic good and become rather a political one.

This essay aims at identifying the causes of such policies and their implications for the observed countries using the commodity wheat as an example. The research question, therefore, is as follows: what determines Russia's wheat trade policy towards the countries in the Caucasus and Central Asia? This is an interdisciplinary qualitative study in which, first of all, the current situation of wheat trade in Eurasia and some examples of comparable policy mechanisms from the period prior to the Russian Empire's colonization of the CCA countries will be presented. Based on the information provided, hypotheses will be developed. Thereafter, neorealism theory will be introduced. Furthermore, a comparative analysis of the CCA countries will be demonstrated based on such factors as other competitors and transport costs, as well as economic and military cooperation between the countries. In the last part, conclusions will be drawn and policy implications will be discussed.

1.2 WHEAT TRADE AND POLITICAL ECONOMY IN EURASIA

After the dissolution of the Soviet Union, its ex member-countries found themselves in a situation resembling that of a necklace is torn where its beads, detached from the whole, can choose in which direction they roll. This means that the countries could determine their own political and economic orientation in an anarchic world (BRZEZINSKI, 1997). Moreover, in addition to the new economic challenges faced by the countries in terms of the transition to market economy, the countries faced security problems in form of religious extremism, terrorism⁹, and separatism¹⁰ (HEATHERSHAW & MONTGOMERY, 2014). The region became heterogeneous in terms of political orientation and economic development and even more volatile to various international and local conflicts (BLANK, 2012). The countries of the Caucasus and Central Asia have found themselves exactly where they were before the Russian colonization in the second half of the nineteenth century (BRZEZINSKI, 1997), only this time with the inheritance of the production systems established during the planned economy. Eurasia regained its economic

⁹ The Islamic Movement of Uzbekistan, the Hizb al-Tahrir, and the recent growing influence of the Islamic State of Iraq and the Levant (ISIS).

¹⁰ Chechen separatists.

and geopolitical importance once more since the time of the "Great Game"¹¹ (BLANK, 2012; ZABORTSEVA, 2012).

From Russia's side, there have been attempts to reintegrate the states under the roof of several integrational organizations such as, for example, the Commonwealth of Independent States. However, many of them weren't successful and existed only on paper (POMFRET, 2005). Big trade organizations didn't quite work for all the post-Soviet countries. They then intensified bilateral trade agreements. Such numerous trade agreements didn't work either and trade took place mainly on the de facto basis whereby great volumes of smuggled goods could be observed (ROBERTS & WEHRHEIM, 2001). Nevertheless, in recent years, the policy of reintegration in the spheres of economics, politics, security, education etc. seem to have been coordinately intensifying under the leading position of Russia (NYGREN, 2008).

In terms of potentials in wheat production, there still is a strong path dependency across all the post-Soviet countries, even though many of the CCA countries have been putting considerable efforts into implementing different policy measures at the governmental level towards becoming self-sufficient such as, for instance, Turkmenistan and Uzbekistan (POMFRET, 2005). Currently, Armenia, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, and Uzbekistan are net importers of wheat and wheat flour. During the planned economy wheat was fairly distributed among all the member-countries according to the plan and the comparative advantages of those countries didn't necessarily lie in wheat production. In other words, there was a fair access to grains and flour products for all the post-Soviet countries. Today, now that they are independent and conduct their own trade policy, they face the problem of wheat insufficiency and strong import-dependency, which have a direct implication for food security to different degrees (BABU & PINSTRUP-ANDERSEN, 2000; BABU & REIDHEAD, 2000; BABU & TASHMATOV, 1999).

The problem of wheat availability in the countries studied is becoming one of the most pressing ones, especially considering the developments around the wheat prices in the world during the last years. For the CCA countries wheat is a staple food and makes up on average the largest portion of the diet. Moreover, wheat is the only commodity among other agricultural commodities, which provides examples of frequent population demonstrations in different parts of the republics against the national governments as soon as they fail to provide stable market prices for it as it was in the cases of Kyrgyzstan (MAMYTOVA, 2007) and Tajikistan (ALEXANDER, R., 2011).

¹¹ Arthur Conolly was the first to coin the term "Great Game", by which he describes the struggle between the British and the Russian Empires over Central Asia.

The state of the current research suggests that the CIS countries can roughly be divided into three groups in terms of wheat sufficiency (TEUBER, 2014). Post-Soviet countries can be to a certain degree net wheat exporters: Kazakhstan, Russia, and Ukraine; net wheat importers: Armenia, Azerbaijan, Georgia, Kyrgyzstan, and Tajikistan; autarkic: Belarus and Turkmenistan. Russia mainly supplies the countries of the Caucasus, which are closer to the main Russian wheat production areas and the Black Sea. Ukraine's export volumes to the CCA are comparatively insignificant. Kazakhstan supplies Central Asia, although as Kazakhstan banned the export of wheat in 2008, Kyrgyzstan and Tajikistan could import more from Russia.

By now it is also possible to draw a line between three groups of countries, which collaborate, don't collaborate, and are autarkic in terms of cooperation in various spheres. Such cooperation refers to participation in economic, military, and political organizations despite the fact that very often Russia has the veto right (NYGREN, 2008). Armenia, Kazakhstan, Kyrgyzstan, and Tajikistan cooperate with Russia in many spheres. Azerbaijan, Uzbekistan, and Turkmenistan conduct a restrained policy towards Russia. As for Georgia, the country has been confronting Russia in terms of integration with the West and especially in terms of becoming a member of the North Atlantic Treaty Organization (NATO), which apparently resulted in the Russian-Georgian war in 2008 and a pause in their trade relationships. By today, bilateral trade relationships between Russia and Georgia have been insignificantly resumed. However, because of different political aims, it is yet difficult to predict if these two countries are going to reestablish the previous level of trade relationships in the nearest future.

Today's political and economic reality in Eurasia is very often associated with the one before the colonization of the CCA countries by the Russian Empire. Russia's expansion to the territories of the modern CCA countries started at about the same time as the trade between the East and the West began to intensify with Great Britain as the main acteur in the then new trade flows. Arthur Conolly, in his book "Journey to the North of India through Russia, Persia and Afghanistan", describes the strategic importance of Central Asia for both empires at the time of the Great Game (CONOLLY, 1834). Whereas the primary aim of the British Empire was not to let the Russian Empire come close to its colony India via Afghanistan, and therefore not to distort the flow of resources from India to Britain, the goal of the Russian Empire was to take over the dominance over the territories in order to gain control over the disposable resources and to control these trade flows. The latter would allow it at that time to influence the policies of its major opponents in the region such as China, Persia, Turkey, as well as the British Empire itself.

The importance of Central Asia and the Caucasus was subject to many discussions. Primarily, their importance is characterized by their *endowment with resources* and their *geographical location*. For Russia, which is located in the "heart" of Eurasia, the policies of the countries, which surround it, are even more important. Halford Mackinder in his "Heartland Theory" expressed the importance of the continent by stating: "Who rules East Europe commands the Heartland; who rules the Heartland commands the World-Island; who rules the World-Island commands the world" (MACKINDER, 1919, p. 194). Further, Mackinder called the modern Caucasus and Central Asia the "pivot areas" (MACKINDER, 1919). "Geopolitical pivots are the states whose importance is derived not from their power and motivation but rather from their sensitive location and from the consequences of their potentially vulnerable condition for the behavior of geostrategic players. Most often, geopolitical pivots are determined by their geography, which in some cases gives them a special role either in defining access to important areas or in denying resources to a significant player. In some cases, a geopolitical pivot may act as a defensive shield for a vital state or even a region" (BRZEZINSKI, 1997, p. 40-41).

With the acquirement of post-Soviet countries, Russia acquired a hegemonic position on the continent. With the dissolution of the Soviet Union, and therefore the establishment of the uni-polar world with the sole global hegemon – the USA, Russia lost its position as such. Current geopolitical developments, including Russia's strategic position in the grain sector and the grain trade, are directed to reestablish its strength¹². Moreover, in order to achieve such goals, post-Soviet countries need to participate in regional organizations, where Russia has the leading position. The reasons why their cooperation in those organizations is important can roughly be explained by the following:

- Russia's position in trade with its neighbors depends to some degree on cooperation of these countries in regional organizations. Such cooperation would increase Russia's position at the global level. Similarly, the same is supposed to be achieved by diminishing economic and especially military expansion of the US-dominated organizations on the territories of the post-Soviet countries. This can mainly be achieved through abandonment of memberships in various spheres and especially in that of trade and military. Russia's strong position in Eurasia would make its Western counterparts talkative in negotiations with regard to an unprecedented access to Western finances and technology. This especially concerns advanced military equipment, of which Russia is not yet competitive producer.

¹² Such a position is also reflected in many other spheres. This paper, however, intends to remain focused on the grain sector.

The next two aspirations are auxiliary to the one above and represent rather the means than the end. Nevertheless, they can be summarized as follows:

- Control of resources such as oil and gas, which Kazakhstan, Turkmenistan, Uzbekistan, and Azerbaijan export to Europe and other countries. Most of the current research studies tend to represent this position and sees it as an end, which is explained by the fact that Russia itself is an exporter of these resources and competes with these countries in the exporting markets (BAHGAT, 2007; BERMAN, 2010).
- Security reasons, whereby the CCA countries serve as a buffer zone from NATO and other military and ideologically different constructed organizations and institutions (MENON, 1995). Russia plays a key role in the resolution of international conflicts (e.g. Afghanistan, Syria, Iraq, and Iran) and it wouldn't want this position to be lost or diminished over time. This, however, is determined to a greater degree by the presence of NATO on the territories of the post-Soviet states. In other words, Russia perceives the expansion of NATO eastwards as a discrimination of its geopolitical interests and as a threat to diminish its role in the resolution of international conflicts.

1.3 THEORY

Within the framework of this paper it is argued that political relations between Russia and the rest of the CIS influence their economic relations and access to food. Economic theories alone are not always sufficient to explain political relations among the countries that significantly shape their trade relationships. Therefore, an interdisciplinary approach appears to be necessary with the application of theories stemming from the sphere of political science in general and international relations in particular, since the study focuses on the relation of one country to another.

There are three mainstream theoretical approaches (three major views of global politics) out of many used to explain modern international relations in the spectrum of which international trade also falls: neoliberalism, social constructivism, and neorealism (SNYDER, 2004). These theories have been interchangeably dominating throughout the twentieth century until now when explaining global politics. In what follows, it will be shortly outlined why neorealism has been chosen as a working theoretical framework for the first essay and, accordingly, a large fraction of this part will be devoted to it.

Neoliberalism stems from liberalism, the major founders of which were Adam Smith and Immanuel Kant. Neoliberalism, in general, requires the adherence of a subject to some common rules, which every subject perceives as some-

thing external and which do not allow the achievement of goals in a way which might harm other participants of the social action. Further, neoliberalism claims that supranational and international institutions can serve as a platform for the successful cooperation of states. Moravcsik, one of the well-known neoliberals, demonstrates this with the example of the European Union (MORAVCSIK, 1997, 2008). Trade liberalism is a branch of neoliberalism that implies that unrestricted trade relationships among countries promote cooperation and increase general welfare. Restricted trade, on the contrary, creates distortions and hurts participants of international trade. Recent developments in international trade with increasing trends in trade restrictions go against such notions of neoliberalism. This is true, considering that neoliberalism has always striven to show ways and possibilities to change the existing domination and power relationships within societies (SCHIEDER, 2010). Therefore, neoliberalism is of little help when studying the economic-political relations in the established state of the interstate affairs in Eurasia.

Social constructivism, which originally stems from idealism, is very close to neorealism in its approach to explain international politics, since both of them are structural theories. Social constructivism, while basically maintaining almost all of the major arguments and assumptions of neorealism, explains world politics from the point of view of societies taking into account their fundamental differences that have been established throughout their historical development (WENDT, 1999). The main difference of social constructivism from neorealism though lies in "shared knowledge". It means that states behave towards other states according to their perception of them as "foes", "rivals", or "friends". This theory is greatly applicable when studying countries with fundamental ideological or cultural differences. The USA, for instance, behaves differently towards Canada than it does towards Russia (WENDT, 1987). All countries observed within this essay have a common Soviet history, established comparatively similar autocratic regimes or power-based relationships and the difference in their attitudes to each other is not comparable to the one mentioned above. Therefore, the analysis is limited to neorealism.

Neorealism stems from realism. The roots of realism go back to Thucydides (The Peloponnesian War), Machiavelli (The Prince), Hobbes (Leviathan), and the East-West conflict. Morgenthau first conceptualized this theory and explained the foundation of realism as the natural striving of men, and therefore states, for power in order to ensure security in an anarchic world. According to realism, states are power maximizers and aspire for this position infinitely. Further, realists see *the primary goal of each state in the absolute security of its national borders*. In comparison to this goal, other goals may be considered as supplementary (MORGENTHAU, 2005).

This work addresses the continuator of realism in the face of neorealism. Kenneth Waltz, a neorealist, who structuralized realist theory by maintaining its fundamental principles described above. In neorealism, as in realism, interstate relationships are determined through absolute security and self-preservation. Since there is no government above governments, which sets standard rules and norms for all, the states feel constant insecurity about the intentions of other states and must, therefore, always be prepared for the worst scenario – war. With these assumptions neorealism is very close to classical realism but in terms of theorizing goes beyond it. The novelty of Waltz's approach to explain international relations lies in the fact that he structuralized this concept. His approach is characterized by analyzing international relations at the system level and then by explaining the behavior of states. This is why his theory is very often called "structural realism". Waltz applies a deductive approach in studying international relations much like economists do. The structure of the international system compels states to act according to the security- and power-based behavior. This, in turn, creates power constellations at the interstate level.

For Waltz, the international system basically consists of two elements: units – states, and the separate structure of the system – the environment where states have to co-exist. Waltz requires a separate analysis of both elements. The inner structures of separate states are, according to Waltz, negligible and therefore represent a "black box", which he leaves unopened. This is, of course, the main shortcoming of Waltz's theory. So, neorealism doesn't strive to explain the separate foreign policies of the countries, but rather concentrates on the so-called "systematic effects", which should be applicable for all countries.

There are three elements, which, according to Waltz, determine the structure of the international system:

- Ordering principle – relates to the anarchic structure of the international system. While a hierarchical international system would imply a higher authority over all governments, an anarchic international system indicates that there is no such government above all governments.
- Character of units – regards the anarchic structure of the international system, which forces states to care about their central preference – maintenance of own sovereignty and survival and while doing this not to rely on external help. Such a system can also be described as a self-help system. According to such a scheme, countries strive for self-sufficiency of everything in order to not be dependent on external supplies.
- Distribution of capabilities – characterizes the international system and can be understood as a power-relation of separate states to each other. Even though power is attributed to each state separately, Waltz under-

stands the power distribution in the international system as a characteristic of the structure of the system. Thus, the structure can be uni-, bi-, or multi-polar.

A uni-polar world means there is only one great power, as it was after the dissolution of the Soviet Union with the USA enjoying the role of sole superpower and its increasing involvement in the internal affairs of the CIS countries in order to democratize them¹³. This kind of structure is comparable to, for example, monopoly in economics. A bi-polar world means there are two great powers as it was during the Cold War with the USA and the Soviet Union being two superpowers. Such a system resembles oligopoly in economics. And finally, a multi-polar world means there are several (but at least more than two) great powers as is probably nowadays the case with China and some other countries (or groups of countries) developing very quickly and therefore increasing their role in global politics.

Further, neorealists mainly work with three core assumptions:

- Even though the concrete interests of states are put in the "black box", neorealists work under one general assumption – survival. This can be considered as an aspiration for state and geographic integrity.
- States are rational and behave accordingly. However, they are in a constant state of insecurity about the intentions of other states.
- While the first two assumptions work for all states, there is yet another assumption, based on which states can differ, namely their capabilities. It is not clarified though how these capabilities can be measured. Nonetheless, Waltz did point out the fact that the strength of a country is not determined only by the number of the arms and soldiers it possesses, but also by economic and social factors, which also play an important role in considering states' capabilities.

Now, how does the structure of the international system influence the actors, i.e. states under the anarchic construction of the system? The neorealist answer is as follows: states, which strive to survive in an anarchic environment, *are forced to employ all their capabilities to maximize their security*. They are secure then,

¹³ Zbigniew Brzezinski characterized the American incentive to promote social modernization and democratization in former Soviet Republics as one of the imperatives of the US foreign policy. The main principle of it should be seen in reconciling the social structures of national states in Eurasia with the domestic social structure of the USA in order to ensure the transmission of necessary impulses as well as to enforce the integrity of the system of international politics. In this vein, Russia, surrounded by modern democracies, would be more willing to deter itself from regaining its imperial appetites. Rather, this would prompt it to accelerate reforms leading to the modernization of its society (BRZEZINSKI, 1997).

when a balance of power in the international system exists. Shifts in power in favor of another state can in principle be compensated either through the extension of one's own equipment or through building an alliance. Soft balancing claims that a number of secondary states are capable of balancing a powerful state in the system through *forming of effective diplomatic coalitions* with one another (PAPE, 2005; PAUL, 2005). Furthermore, even though neorealism considers transnational and international organizations as not important in the system of international politics, it does apprehend the role of the "hegemonic induced cooperation". In this case, the major state *compels others (for example weaker states) to cooperate in order to increase the general welfare*. While doing this, the hegemon takes over the major part of the costs and the shelter function for the cooperating countries and with this gives them the motivation to be involved in the cooperation (SCHÖRING, 2010; WALTZ, 1979, 2008).

1.4 ANALYSIS

1.4.1 Competitors and transport costs

Within this part of the essay the country-based comparative analysis will be conducted. In particular, in the first part of this section, the wheat sectors of the countries of the Caucasus and Central Asia will be introduced and compared with one another. Moreover, such economic factors as Russia's competitors and transport costs of delivering grain to the CCA will shortly be discussed. In the second part of the analysis section the observed countries will be compared with each other based on such factors as economic and military cooperation.

Kazakhstan, Russia, and Ukraine combined have increased their grain export share in Eurasia over the last decade. Moreover, they compete with each other in various markets. As already mentioned in the introduction, Russia mainly supplies the countries in the Caucasus and Kazakhstan the countries in Central Asia. The grain export share of Ukraine is smaller in comparison to these two countries in both regions. Each of these exporters has distinctive characteristics, which make them more or less competitive in comparison to each other. Kazakhstan's wheat, for example, is characterized by high quality because of the good soil, good climatic conditions, and lower prices because of comparatively lower production costs. However, the landlockedness of the country and poor infrastructure represent a substantial impediment for a greater export of the grains. Ukraine, on the other hand, has a more developed infrastructure in comparison to Kazakhstan and Russia and enjoys a short distance to the Black Sea where the major grain exporting ports are located. The country, however, has limited railway operations from there. As for Russia, the country has better transportation facilities to the former Soviet Republics, but poor grain facilities (IMAMVERDIYEV et al., 2014). For Russia, moreover, the transport costs of delivering grain to the countries in

the Caucasus are substantially smaller than those to Central Asia. The reason lies in the distance. In most of the trade literature distance is used as a proxy for transport costs (ANDERSON & VAN WINCOOP, 2003). Therefore, it is plausible to believe that the transport cost of delivering grain from Russia's main wheat production areas to the Caucasus is smaller than to Central Asian countries. Moreover, Kazakhstan, which is in Central Asia, is the main source of grain import for other Central Asian countries and represents, therefore, significant competition not only to Russia but also to other wheat exporters. Researchers working on this topic found that transport costs do not influence grain export volumes from KRU when importing to the countries in the Caucasus. In contrast, though, they do influence the grain export volumes coming from KRU to Central Asian countries. However, since the authors included in their estimations all three exporters combined, it is difficult to indicate the impact of transport costs to each of these countries separately (IMAMVERDIYEV et al., 2014).

Despite higher transportation costs, during the food crisis and even afterwards, Russia has been supplying wheat and wheat flour to some of the CCA countries, however not to all of them equally. According to Oxfam's research reports and national newspaper reports, Russia has increased humanitarian aid in the form of food and grains over the last decade. Major wheat and wheat flour receivers are Armenia, Kyrgyzstan, and Tajikistan. Whereas, for instance, in 2006 Russia's humanitarian aid was only in the form of capital, by 2013 almost 80 per cent of total humanitarian aid was in the form of agricultural commodities, i.e. some semi-finished foods, but especially wheat and wheat flour. Moreover, the countries of Central Asia and the Caucasus represent almost 60 per cent of the receivers of Russian humanitarian aid (UKHOVA, 2013).

Armenia, among the countries in the Caucasus, Kyrgyzstan and Tajikistan, among the countries in Central Asia, are the major receivers of Russian aid in the form of wheat and wheat flour. To Armenia and Kyrgyzstan, for instance, Russia started delivering significant help in terms of the supply of wheat and wheat flour (presumably from its own state reserves) as humanitarian aid since the end of 2009. This development has coincided with the fact that Russia introduced frequent export restrictions to the rest of the world. There is no evidence of such non-standard exports before 2009 and there is also no information on how the supplied commodities were distributed inside the countries.

Table 1: Non-standard exports from Russia to Armenia

08.2012	640 tons of elite wheat seeds (MIR, 2012)
02.2011	30 million US Dollars from the Eurasian Development Bank to buy 25 thousand tons of grain from the Russian state company "United Grain Company" (BNEWS, 2011)
08.2010	One thousand tons of elite wheat seed as a humanitarian aid (VESTNIK KAVKAZA, 2010)
09.2010	Five thousand tons of wheat as a humanitarian aid (KAVKAZ-UZEL, 2010)

Table 2: Non-standard exports from Russia to Kyrgyzstan

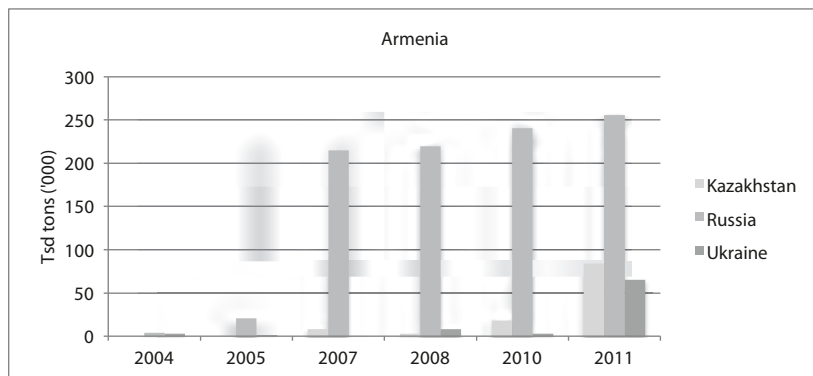
15.04.2015	40 thousand tons of wheat, 20 thousand tons of which as a free aid (KABARLAR, 2015)
03.12.2014	60 thousand tons of wheat, 20 thousand tons of which as a humanitarian aid and the rest on preferential conditions with low transportation costs (TAZABEK, 2014)
2012-2013	100 thousand tons of wheat of which 20 thousand tons as a humanitarian aid and 80 thousand tons as installments from the Russian "United Grain Company" (Zhogorku-Kenesh (Kyrgyz Parliament), 2013)
08.2012	Four thousand tons of wheat flour as a humanitarian aid (Zhogorku-Kenesh (Kyrgyz Parliament), 2013)
05.2011	28.8 millions of Russian Rubles to buy one thousand tons of barley (Zhogorku-Kenesh (Kyrgyz Parliament), 2013)
10.2010	1.5 thousand tons of wheat seed as a humanitarian aid (Zhogorku-Kenesh (Kyrgyz Parliament), 2013)
2009	6.5 thousand tons of wheat flour (worth one million USD) (Zhogorku-Kenesh (Kyrgyz Parliament), 2013)

Armenia's total wheat demand for domestic consumption is made up of about 60 per cent imported wheat, the major part of which comes from Russia¹⁴ (Figure 9). Since 2011 wheat production has been more fruitful mainly due to the improvement of seed quality through the seed development program, which has been conducted by the government with the help of Russia. The seeds were provided to farmers at a cost 50 per cent lower than the market price (URUTYAN et al., 2012). Furthermore, the wheat export taxes introduced by Russia in the period between 01.02.2014-15.05.2015 didn't apply to Armenia, as Armenia was then already a member of the Customs Union (CU) and the Eurasian Economic Union (EEU). In connection with this it is worth mentioning, however, that the free trade regime with Russia has been creating challenges for Armenia's domestic grain processing industry. The country's milling sector has been

¹⁴ Please note: Figures 9-15 present import volumes of wheat for respective countries from the most important sources of this commodity.

negatively affected by the increase in imports of cheap Russian wheat flour. This, in general, resembles the situation in Kyrgyzstan, Tajikistan, and Georgia.

Figure 9: Wheat import in Armenia

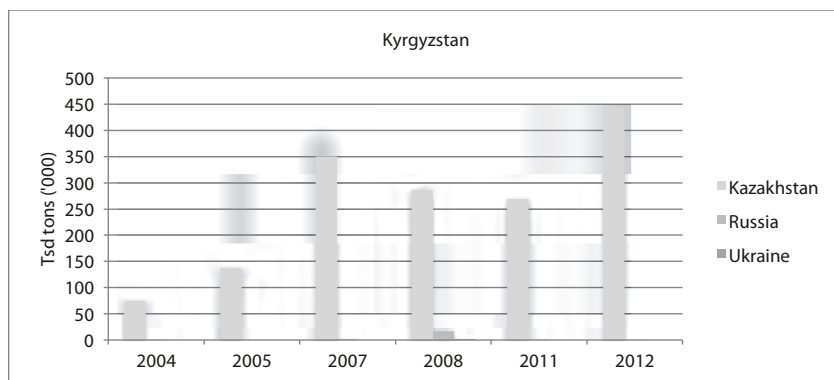


Source: FAOSTAT, 2015g.

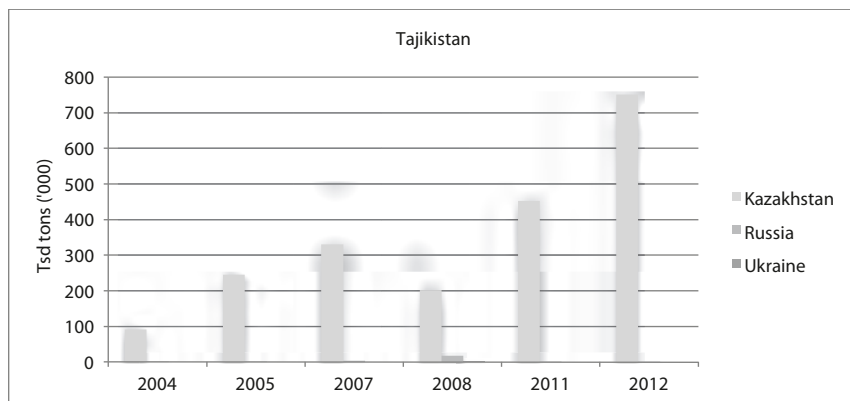
Kyrgyzstan and Tajikistan do not carry out supportive subsidization policies and permit the free flow of the import of Kazakh wheat, which comprises in both cases about 95 per cent of their total wheat imports (Figure 10 and Figure 11).

However, in comparison to the case of Kyrgyzstan, where there is no distinct grain policy to observe, the government of Tajikistan has started introducing policies to restrict imports of wheat flour significantly and instead loosen restrictions on imports of wheat (ASIA-PLUS, 2016). This policy is aimed at supporting the grain processing industry that has been challenged by the cheap and high quality wheat flour coming from Kazakhstan.

Figure 10: Wheat import in Kyrgyzstan



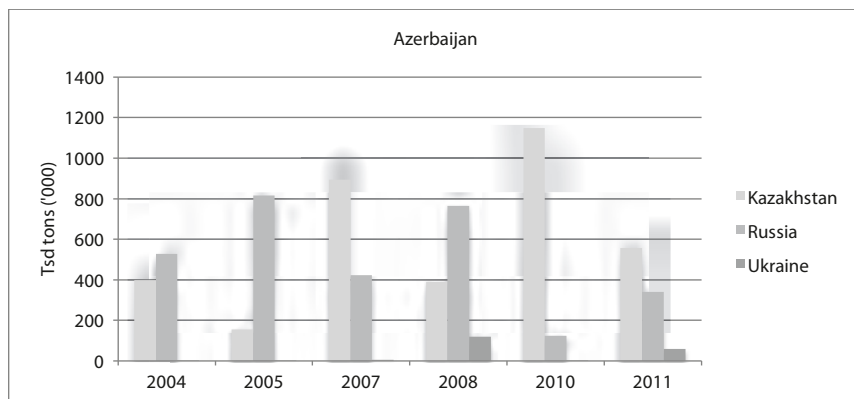
Source: FAOSTAT, 2015h.

Figure 11: Wheat import in Tajikistan

Source: FAOSTAT, 2015i.

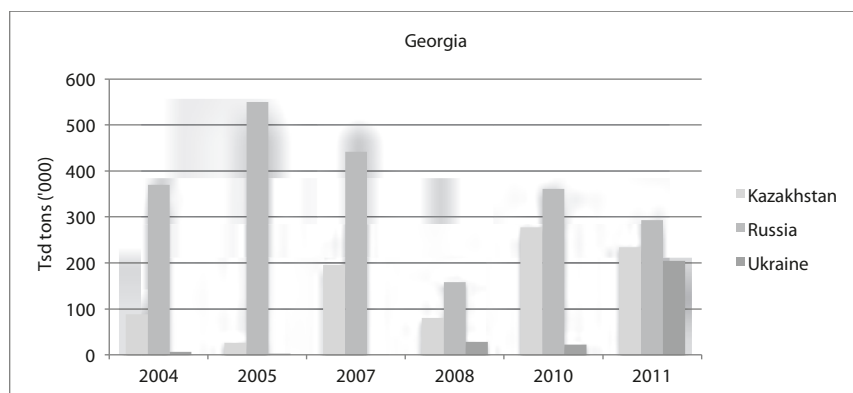
The situation in Azerbaijan, Georgia, Turkmenistan and Uzbekistan is different in terms of their domestic agricultural policies as well as their relationships with Russia.

Azerbaijan is a rare example among the CCA countries where the demand for wheat has been increasing along with the increase in production and imports of this commodity. The lowest production levels since the 2000s fell to the time of the food crisis. The government appears to take the problem of self-sufficiency seriously and has been undertaking different strategies to increase wheat production. Different programs have been tested as, for example, equipping farmers with knowledge on modern farming practices and showing them the results (FAO NEWS, 2015). The government has even been giving up some reserve lands belonging to the state for grain production and agricultural utilization. Further, several large farms have been established and access to finance has been made easier (ORUJOVA, 2014). As a result, the production has increased from about one million at the end of the 90s to almost two million tons of wheat today, but that still doesn't cover the total domestic wheat demand. On the other hand, the government has been controlling bread prices such that it has been maintaining the bread prices artificially low (ORUJOVA, 2015). Thus, the government has been supporting producers and consumers combined. Interestingly, during the last ten years, trends in imported volumes of wheat from Russia have been reducing and from Kazakhstan increasing (Figure 12). The government, most likely, wants to diversify the imports in order not to depend solely on the imports of the Russian wheat.

Figure 12: Wheat import in Azerbaijan

Source: FAOSTAT, 2015j.

Since the beginning of the 2000s the production of wheat in Georgia has been declining drastically. Russia has been the major wheat supplier until 2008 and has been delivering until then on average up to 400 thousand tons of wheat yearly (Figure 13). However, in the period after the conflict with Russia, their trade volumes decreased to the minimum (which coincided with the food crisis), wheat export almost stopped, and Georgia had to seek alternative suppliers, including the USA. Also Ukraine, Kazakhstan, and Lithuania provided support to Georgia during the food crisis (wheat deliveries presumably from state reserves) (Table 3). Since 2008 Georgia increased imports of wheat from Kazakhstan and Ukraine and today these import volumes have practically replaced the previous volumes of Russian wheat (Figure 13). Moreover, in 2010 Georgia announced its intension to stop imports of Russian wheat completely and to replace it with European and American wheat instead (AGRONEWS, 2010). It seems that Russian-Georgian political tensions haven't been exhausted yet completely, and one of the indications of this is that in December 2014, Russia introduced wheat export restrictions to Georgia among some other countries (GEORGIAONLINE, 2014).

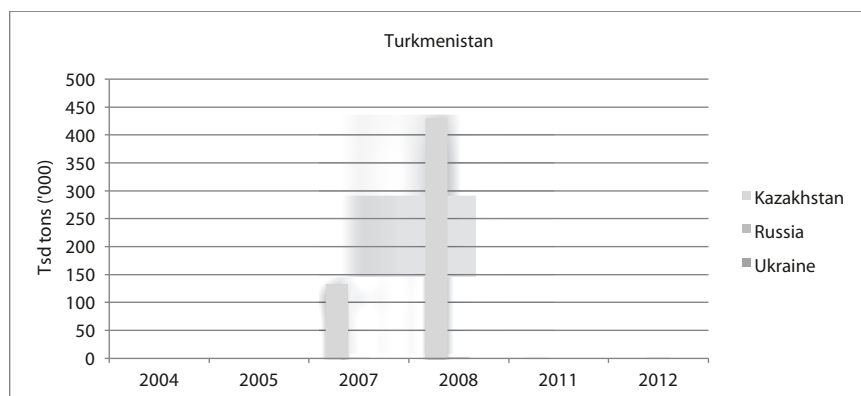
Figure 13: Wheat import in Georgia

Source: FAOSTAT, 2015k.

Table 3: Non-standard wheat exports to Georgia

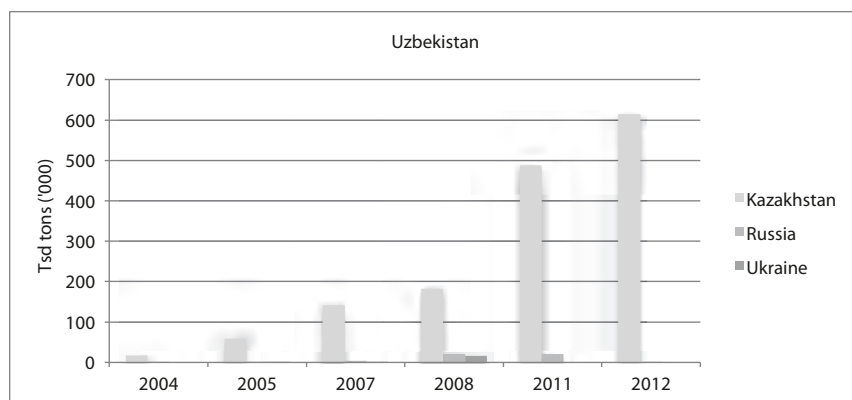
31.08.2010	Georgia asks Ukraine to help to buy 120 thousand tons of wheat (UNIAN, 2010)
03.08.2007	The USA included Georgia into a special program GSM, which gives credits to companies on preferential terms to buy agricultural products from the American market (IZVESTIA, 2007)

Turkmenistan represents a unique case among the Central Asian countries, as it conducts an isolated policy not only from Russia but also from the rest of the world. Among all other Central Asian countries only Uzbekistan can be compared to Turkmenistan in terms of its economic and agricultural policies, which are strongly oriented towards self-sufficiency and import substitution (POMFRET, 2005). In wheat production, Turkmenistan's policy is aimed at achieving self-sufficiency and there is as yet no evidence of the country's strong dependency on imports and challenges in having access to wheat. The grain sector is strongly controlled and supported by the government. The government subsidizes producers and provides access to credit on preferential terms (LERMAN et al., 2012). It seems that Turkmenistan imported wheat only during the food crisis (Figure 14).

Figure 14: Wheat import in Turkmenistan

Source: FAOSTAT, 2015I.

Uzbekistan is another case of a strong import-substitution oriented country after Turkmenistan. The overall volumes of domestically produced wheat in Uzbekistan are relatively sufficient to cover the total wheat demand. Despite this, there is an increasing trend in the imports of wheat from Kazakhstan. Moreover, shares of Russian and Ukrainian wheat in the total volumes of wheat import are insignificant (Figure 15).

Figure 15: Wheat import in Uzbekistan

Source: FAOSTAT, 2015m.

1.4.2 Economic and military cooperation

Armenia, Kyrgyzstan and Tajikistan participate in all Russia-dominated regional organizations (Table 4). These three countries aren't as attractive as, for example, Azerbaijan, Turkmenistan, and Uzbekistan in terms of their endowment with natural oil and gas resources. Therefore, their importance is explained in terms of geopolitics, which is of twofold nature: movement of commodities over their borders (especially from China) and security reasons. Kyrgyzstan and Tajikistan are located near Afghanistan – the main source of terrorism. Thus, they may as well serve as a buffer zone.

Armenia is important in terms of its geographical allocation, which is between Azerbaijan, Georgia and Turkey. Armenia, moreover, is the only country in the Caucasus out of three that has the closest political relations with Russia. To some degree, Armenia and Russia even serve towards mutual interests. Russia serves for Armenia as a backup in war with Azerbaijan over Nagorno-Karabakh and therefore provides security. The surprising turn-around from the Association Agreement with the EU in autumn 2014 wasn't surprising after all considering the mutual dependency between Russia and Armenia in many spheres and especially in that of security.

The political tensions between the USA and Russia in the region had led to the closure of the US air base "Gansi", based in Kyrgyzstan from December 2001 until June 2014, established originally as a military station after September 11th in 2001 when the US-war against terrorism began. From Russia's side, the military presence of the US military troops in the near abroad was comprehended as a direct threat to its regional policy (BOHR, 2010). Bakiev's (former president of the Kyrgyz Republic) government permitted the continuation of the allocation of NATO troops in 2010. The overthrow of Bakiev in 2010 coincided with the start of commodity deliveries and other aids from Russia to Kyrgyzstan. Atambayev's (current president) government, which came the same year, announced the closure of the military base at the end of the lease period in 2014 (KUCERA, 2013).

Table 4: Memberships in organizations

Organization	Member country	Joined	Left
CIS (Commonwealth of Independent States)	All post-Soviet countries except for the Baltic states. Turkmenistan and Ukraine are associate members.		
	Georgia	1993	2009
CSTO (Collective Security Treaty Organization)	Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia, Tajikistan	1992/1993	
	Azerbaijan, Georgia,	1992/1993	1999
	Uzbekistan	1992/2006	1999/2012
EAEC (Eurasian Economic Community Eliminated in 2014)	Belarus, Kazakhstan, Kyrgyzstan, Russia, Tajikistan. Armenia, Moldova, Ukraine were associated members	2001	
	Uzbekistan	2006	2008
CU (Customs Union)	Belarus, Kazakhstan, Russia	2010	
	Armenia, Kyrgyzstan	2014/2015	
EES (Eurasian Economic Space)	Belarus, Kazakhstan, Russia	2012	
	Armenia, Kyrgyzstan	2015	
EEU (Eurasian Economic Union)	Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia. Tajikistan is in the process of becoming a member	2015	

Source: Websites of the respective organizations.

Out of all the other Central Asian republics, Tajikistan experienced civil war in 1992 and Kyrgyzstan "color revolutions" in 2005 and 2010. Russia's support in resolving such conflicts has increased. There are further examples that once again confirm the mutual interdependency of both countries and Russia¹⁵. If the

¹⁵ Both countries have significant political tensions with Uzbekistan. The Uzbek government, which is claimed as having aspirations to become the regional leader, frequently stops gas supplies and closes borders, which interrupts trade flows across the countries. As a reaction to this, the "upstream countries", Kyrgyzstan and Tajikistan, block water supplies to Uzbekistan and, consequently, to Kazakhstan. Gas and energy questions are the biggest apple of discord among the Central Asian countries. Moreover, Kyrgyzstan and Tajikistan gave over the right to Russia to rebuild and enlarge some of their energy stations (Kambarata-1 in Kyrgyzstan and Sangtuda-1 in Tajikistan). Kyrgyzstan even sold 100 % of the shares of

cooperation of Russia with Kyrgyzstan and Tajikistan is to develop like these examples show, both countries may rely on aids from Russia during diverse crises.

Azerbaijan is an important geopolitical pivot first of all due to its role for the economies of the major regional oil exporters. In the interstate relations of Russia and Azerbaijan, the highest priority is given to their business relations in terms of oil trade. Azerbaijan, along with Georgia and Uzbekistan, has been showing reluctance to participate in the CSTO, which the country quit in 1999 (Table 4).

Russian-Georgian relations have become tense ever since Georgia showed a willingness to integrate into the EU and eventually become a member of NATO. Two out of four Russian military bases located on Georgian soil were closed in 2001 after Georgia withdrew from the CSTO in 1999 and the other two in 2007, which were then directly transferred from there to Armenia (Table 5). During the Russian-Georgian war in 2008, where Abkhazia and North Ossetia served as pivotal, the trade between them paused and Georgia abandoned its membership in the CIS. Moreover, Georgia, in contrast to Armenia, did sign the Association Agreement with the EU in 2014.

Turkmenistan does not represent a political contradiction to Russia in terms of political orientation, since it is oriented neither westward nor eastward¹⁶.

Russian-Uzbek relations have worsened since Uzbekistan started negotiations with the USA and NATO. The position of Uzbekistan is not to the advantage of Russia, therefore Russia is keeping a careful eye on what happens in Uzbekistan and the Uzbek government, in turn, is aware of that and therefore wants to reinforce itself by cooperating with NATO and the USA. The Uzbek government recognizes that in case of an uprising or civil war, with which the government will not be able to cope with, the government may be overthrown but also that a third party may interfere and end its territorial integrity. Therefore, the state tightly controls all spheres of the economy, politics and social life. The country also exited the CSTO and is currently de facto not participating in any of the regional economic organizations.

the "Kyrgyzgaz" for a symbolic \$1 to the "Gazprom" (Governments' various documents and reports).

¹⁶ The main issues in their interstate relationships deal with the question of gas exports where they compete in outside markets and where Turkmenistan depends on Russian pipelines through which it delivers gas to Europe, but I will not go into detail about the gas situation between Russia and Turkmenistan, since it is not the focus of this work.

Table 5: Military bases in the CIS

Active military bases	
Abkhazia	-The 7 th Russian military base with allocations in different regions and headquarter in Suhum (active since 2007)
Armenia	-The 102 nd military base in Gumri. Extended during 2006-2007 by transferring the headquarters of the Russian forces from Georgia (1995-2044)
Belarus	-Radar station "Volga" in Gancevichi (2003-2020) -The 43 rd communication node of the Russian navy in Vileika
Kazakhstan	-The 5 th test-cosmodrome "Baikonur" -Independent regiment for air force transport of the Russian Armed Forces in Kostanai -Independent radar node of the space forces in Priozersk -State proving ground in Sary-Shagan -The 20 th station for Russian strategic missiles in Novaya-Kazanka
Kyrgyzstan	-Air force base in Kant. -Testing facility for antisubmarine torpedoes in Karakol -The 338 th naval communications center in Marevo -Seismic station in Ichke-Suu
Tajikistan	-The 201 st Russian military base in Dushanbe, Kurgan-Tube, Kulyab (active since 2004) -Optoelectronic complex "Okno" in Nurek (active since 2002). In 2004 it became Russian property
South Ossetia	-The 4 th military base with headquarter in Chinval (since 2009)
Former military bases	
Azerbaijan	-Radar "Daryal" in Gabala, which was one of the most expensive ones in the disposition of Russia (closed in 2012)
Georgia	-The 137 th military base in Vaziani (closed in 2001) -The 50 th military base in Gudauta (closed in 2001) -The 62 nd military base in Ahalkalaki (closed in 2007) -The 12 th military base in Batumi (closed in 2007)
Uzbekistan	Since 2006 Russian troops could use the military base Karshi-Khanabad in Kashkadarya. Since 2012 Russia can't use the base, since Uzbekistan withdrew from CSTO
Ukraine	Most of the bases are located in Crimea. Locations of the Black Sea Fleet of the Russian Armed Forces: Sevastopol and Feodosiya Mainaerodroms are located in Gvardeiskoe and Kacha with one spare aerodrome in Sevastopol Communication nodes are in Kacha, Sudak and Yalta -The 219 th regiment of radio-electronic warfare Except for these, there are 30 battle ships parked in Sevastopol, the central communications center, the 1472 nd naval hospital, the 1096 th first anti-aircraft missile regiment, the 810 th separate regiment of marines, and the 17 th arsenal.

Source: KUTNABAEV, 2010; LUKIN, 2007; MIHAILOV, 2005.

1.5 CONCLUSIONS

The current geopolitical situation undoubtedly influences trade in Eurasia. Russia's policy to use wheat as an economic good for political purposes is due to the present shift in the power-constellation among the global powers in particular and the change in the structure of international politics in general. The change in the structure is due to the transition from a uni- to a multi-polar world with China and some other countries becoming major global political players. The food crisis coincided with such a development, therefore creating the necessity to study the grain markets of the CIS and the on-going food crisis against the background of global politics.

Russia, as a successor of the Soviet Union, has been attempting to reestablish its position in world politics. This coincided, presumably, with the time NATO started to extend its position on the continent by extending military bases across the post-Soviet countries, which had been perceived by Russia as a direct threat of its national borders. Preservation of national borders is the primary goal of states, according to neorealism. Moreover, all means are used by states to secure their national borders. This study went beyond neorealism, which leaves countries' internal structures in the "black box", and has touched upon some special characteristics of the countries studied while still considering the main notions of neorealism. For Russia, securing borders means reducing the presence of NATO. Reduction of the presence of NATO means increasing the role of Russia in resolving the international conflicts on the Eurasian continent. The latter increases the country's bargaining power with the West and strengthens the country's position in the region. One of the methods to achieve this is to bring other post-Soviet countries to cooperate in different organizations and especially the military, because some post-Soviet countries have been allowing the allocation of NATO on their soil and have been abandoning Russian military bases. Of course, one might argue that Russia, perhaps, just does not see the post-Soviet countries (except for the Baltic States) as being foreign, but as countries for which Russia feels responsible for and is, therefore, willing to bear costs. Such costs are associated with the building of institutions for cooperation as well as rendering different types of aids (financial help, grain supplies etc.). This may be true but only in relation to those post-Soviet countries that participate in organizations where Russia has a dominating position. Those countries, that do not, are treated differently. Induced hegemony, according to neorealism, is when stronger states induce weaker states to cooperate in different organizations in order to increase their position in global politics. Countries, that do cooperate, apparently, had no problems with access to resources like, for example, access to grains during the food crisis not to mention other help. On the contrary, countries that refused to cooperate had only limited access.

After the 2008 war in Georgia, Russia and Georgia have limited bilateral trade flows including grain trade. This situation struck Georgia, since it had to import from the USA and Ukraine. This came to be more expensive at least in terms of transportation costs. This is why some countries of the CCA, as, for instance, Turkmenistan and Uzbekistan, conduct an autarkic policy in order not to find themselves some day in an import-dependent position of such vital staples as grains. On the other hand, countries such as Armenia, Kyrgyzstan, and Tajikistan receive, especially during and around the on-going embargos, regular gifts of wheat and wheat flour, humanitarian aid, and commodity for installments. Such aid is, however, connected with their willingness to cooperate with Russia on key political issues. Such development in Eurasia poses an even more urgent situation of wheat availability for those countries dependent on grain imports, but wanting to conduct an independent foreign policy.

Even though weaker political players (these are as well the import-dependent ones) are not in a position to change the political reality, they can, nevertheless, decrease their import-dependency by improving their agricultural performance through the implementation of effective policy measures and building persistent trade relationships with other countries.

Policy implications

The first essay demonstrates that international trade can be significantly affected by the political state of affairs. Therefore, very often, trade restrictions can be reasoned not only economically, but also, to a significant degree, politically. The latest developments around the price surge for food commodities proved that the net exporters of agricultural commodities could, in principle, easily ban exports despite the fact that it might hurt other countries that depend on imports. The reason is that the geopolitical development compels states to use strategic commodity grain for political purposes and distribute it in the form of standard and non-standard exports. The existence of non-standard exports among the CIS countries indicates imperfections in their economic relations.

Policy implications arising out of this event can be found at the international and national levels and can differ depending on countries' trading positions, i.e. net exporters or net importers. For exporters as well as for importers it is crucial not to restrict trade too extremely. Existing research on the impacts of export trade restrictions shows that such measures don't help and in many cases can even exacerbate the situation in the domestic markets. Importers, on the other hand, should undertake long-term policy measures that would allow them to avoid such sudden price shocks and to ease the import-dependency from a single supplier. Therefore, it is necessary for the net grain importers to diversify the import sources and to build consistent trade relationships with alternative suppliers because in case of a foreign policy crisis, there might be serious impediments

in having an access to important food commodities. As discussed above, the case of Georgia proves this statement. Such measures might be connected with higher transportation and other administrative costs. Better infrastructure and enhanced marketing systems, however, facilitate smooth movement of goods from one market to another and accelerate trade flows among the countries.

At the research level, more country and commodity specific case studies are encouraged and seem to be necessary in order to be able to give policy advice to the net grain import-dependent countries as to how to improve their agricultural production performance by taking into consideration all the constraints the countries face as well as their potentials for agricultural production the countries have.

2 AGRIBUSINESS IN TRANSITION: INSIGHTS FROM STRUCTURAL CHANGE IN GRAIN PROCESSING IN CENTRAL ASIA

Abstract

This essay analyzes the on-going structural change in the grain processing industry in Kyrgyzstan. According to the Ministry of Economics of the Kyrgyz Republic, the number of milling companies across the country has been declining very rapidly over the last decade. This paper aims at identifying the drivers for this structural change. The study is designed as a comparative study, as the case of Kyrgyzstan will be compared to the case of another Central Asian country Uzbekistan, where no such structural change is to observe. Against this background this essay reviews the drivers of structural change in agribusiness and applies them in comparing the Kyrgyz and Uzbek cases. The results of manager interviews indicate that the major drivers outside the firm influencing the new trends within the milling industry in Kyrgyzstan have been governmental trade and competition policies as well as quality aspects.

2.1 INTRODUCTION

The important aspects of the economic transition from a centrally planned economy to a market economy involve opening up to foreign trade, liberalization of prices, and privatization of state enterprises (KORNAI, 1995). Since the break-up of the Soviet Union, the Central Asian countries chose different reform strategies. Measured by the Transition Index 2012 of the European Bank for Reconstruction and Development, which aims at quantifying macroeconomic and structural reform efforts, the five Central Asian countries received marks of 1.8 (TKM), 2.3 (UZB), 2.9 (TJK), 3.1 (KAZ), 3.4 (KGZ) on a scale between 1 (planned economy) and 4 (market economy) (EBRD, 2012).

Kyrgyzstan was the first Central Asian country that entered the World Trade Organization in 1998 and implemented the most liberal economic and agricultural reforms. Kazakhstan, since recently, has been called a "regulated capitalism" among researchers and is distinguished by the tremendous increase in its wheat flour exports from 171 thousand tons in 2001 to 1.8 million tons in 2008 (PRIKHODKO & RYBCHYNSKY, 2009). As regards Turkmenistan, Tajikistan, and Uzbekistan, it is yet difficult to say whether they are developing towards a market economy or not.

This case study focuses on Kyrgyzstan and Uzbekistan as extreme cases in terms of their openness to international trade and regulation of domestic market for agricultural commodities.

Previous research studies on the outcomes of Central Asian reform strategies have focused primarily on agricultural production (LERMAN, 2008), structural change in the farming sector (LERMAN, 2009), and trade integration (KAMINSKI, 2012; RUTHENBERG, 2006). However, there is no sufficient information on how economic reforms and trade policies have affected the processing industries. Further, in the case of Kyrgyzstan, there seems to be insufficient monitoring of the grain-processing sector. Various sources indicate different numbers of mills throughout the years emphasizing their withdrawal from the market. Therefore, it is hard to ascertain the exact number of existing mills. Nonetheless, for example, according to the UN data assessment, there were 54 big- and medium-sized mills across the country in 2012. According to an official report by the Ministry of Economics of the Kyrgyz Republic, the number of the milling companies across the country has been declining very rapidly in the last several years (MINEKONOMKR, 2013). The grain expertise center of the Kyrgyz Republic indicated 21 big-sized (80-250 tons per day), 9 medium-sized (30-80 tons per day), and around three thousand small (mini) milling firms in 2013¹⁷.

Kyrgyzstan, with a population of almost 6 million, needs on average 1.2-1.3 million tons of wheat annually to cover its total domestic wheat demand. During the 90s, the country was self-sufficient in wheat production. However, since the 2000s the production of wheat has been declining and the import of wheat as well as wheat flour has been rising (Figure 16).

Figure 16: Wheat production, and wheat and flour import in Kyrgyzstan as a share of consumption

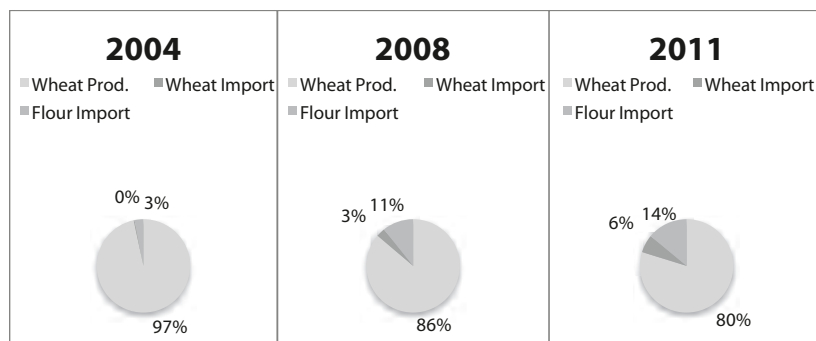


Source: KYRGYZSTAT, 2015.

¹⁷ Processing capacity of a grain milling firm is determined by how many tons of grain a day the company can process.

Uzbekistan, with a population of more than 30 million, needs on average about 7-8 million tons of wheat yearly to cover its total domestic wheat demand. Uzbekistan wasn't initially self-sufficient in wheat production following the end of the Soviet Union and almost all wheat had to be imported. After the independence, however, the Uzbek government set the achievement of self-sufficiency in wheat production as a strategic economic policy. According to the secondary statistical data, it seems that the aim was finally achieved and, today, Uzbekistan covers its wheat demand to about 80 per cent. Despite this achievement, there are rising imports of wheat and even more of wheat flour since the early 2000s (Figure 17). In addition to official records of imported wheat flour, there are supposed to be significant levels of smuggling of these commodities from the neighboring Kazakhstan, according to various local reports and newspapers.

Figure 17: Wheat production, and wheat and flour import in Uzbekistan as a share of consumption

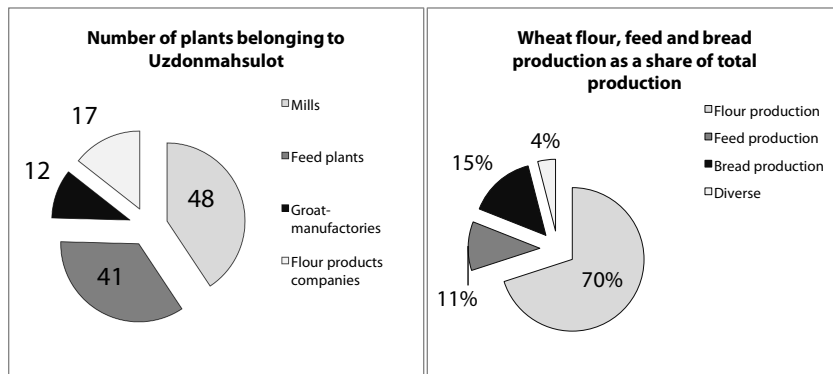


Source: UzSTAT, 2015.

Uzbekistan's grain processing industry represents to a significant degree a monopolized joint-stock company, the controlling stakes of which belong to the government. "Uzdonmahsulot" procures, processes, stores, and allocates for governmental needs. Only member-companies of "Uzdonmahsulot" are allowed to purchase grain seeds from local farmers and store them as a state reserve. Since 2003 the grain processing and feed production industries are allowed to use only domestically produced grains. The distribution of shares within "Uzdonmahsulot" corresponds to the "Concept of the state property management of the Republic of Uzbekistan", which states that the preservation of companies' shares remains in the property of the government, since they have a strategic meaning for country's economy. According to the information provided on the website of the company, there are currently 48 big milling companies operating across the country and 17 companies that focus on production of flour products. The total number of the plants, however, is supposed to be

significantly higher, since each of them has its own branches across the country. "Uzdonmahsulot" has also 12 groat-manufactories and 41 feed plants. The share of the flour production within the joint-stock company corresponds to 70 per cent of their total output. The feed and bread production shares are 11 and 15 per cent, respectively (Figure 18).

Figure 18: Uzdonmahsulot: Plants and production



Source: UZDONMAHSULOT, 2015.

The motivation to study this particular problem is explained by the following: the grain processing industry is an important element of the supply chain. Accelerated structural change, however, might, in extreme cases, lead to industry dissolution. Therefore, it is necessary to investigate this problem in order for relevant stakeholders and governments to know what exactly has been driving such structural changes. These actors, in turn, might be able to consult such analysis for the purpose of necessary policy implementations.

To study this phenomenon, a conceptual framework comprising the main drivers of the structural change will be developed. The drivers have been identified from the previous research. The theoretical framework includes internal influencing factors, such as firms' strategies, behavior, and technology, as well as external influencing factors, such as market environment, new trends in demand, product quality issues, industry and firm competition, and governments' trade policies. Also, the comparative analysis of the two case studies relies on such primary data as manager interviews of milling companies.

The organization of the paper is as follows: after the literature overview of recent studies, a conceptual framework encompassing the drivers of the structural change and the mechanisms of their influence on business units in a grain processing industry will be introduced with a number of working hypotheses following thereafter. Further, the hypotheses will be confronted with the data obtained

from the survey. In the last part of the paper, conclusions will be drawn and policy implications will be discussed.

2.2 STRUCTURAL CHANGE IN GRAIN PROCESSING IN MARKET ECONOMIES

Most recent research on structural changes in the grain processing industry concerns the United States of America. According to the researchers, the structural changes in the US milling industry occurred due to such drivers as technological change, economies of scale, shift in demand, increasing disposable income, and countries' engagement in free trade organizations (C. S. KIM et al., 2001; C. S. KIM et al., 1991; OLLINGER et al., 2005; WILSON, 1995). These factors strongly support the direction of this study.

The dynamic evolution of the US grain processing industry took place during 1970-1990. The structural change had continued until the 2000s, although more sluggish than in the previous period. In particular, the number of grain-processing firms had reduced while at the same time their processing capacity had increased. During the entire period, the number of small mills with a daily capacity of under 1000 hundredweight (cwt) declined from 125 to 34, while that of large mills with a daily capacity of over 10 000 cwt increased from 24 to 61 (C. S. KIM et al., 2001). Economists connect these developments in the grain-milling sector with a large number of reasons. The main drivers of the structural change, however, have been factors outside the firm, which have as well given an impulse for milling companies to change their internal strategies, such as mergers among smaller business units as a response to growing competition within the industry and improving their technological endowment in order to create economies of scale, but also to be able to respond to the growing demand for high quality flour and flour products in increasing volumes.

WILSON (1995) claims that the change in the structure of the grain milling industry in America resulted in adjustments to new strategies after the USA and Canada (both net grain exporters) had entered into the liberalization of their trade relations. He emphasizes that the USA's and Canada's engagement in the Canada/US Free Trade Agreement (CUSTA, 1988) and the North American Free Trade Agreement (NAFTA, 1994) had in the first place changed the firms' strategies in terms of adjusting to the new environment such as the growing competition within the industry. It is stated, further, that at that time even the USA, which is a net wheat exporter itself, increased imports of wheat from Canada. The reason was simply that the quality of the Canadian wheat is superior to that of the American (URI & BEACH, 1997). Furthermore, the increasing per capita consumption trends in American and Canadian diets have impacted the change in the demand for wheat flour and wheat flour products. Such new trends in the diet were generally linked to social and economic changes during that time. It was

especially caused by the growing disposable income and by the vast change of consumers' preference from buying-flour-and-baking-home towards buying finished flour products. Such trend, in turn, has driven the grain processing companies, first, to increase their production volumes at lower costs, and, second, to improve their technological endowment in order to accomplish the first and to diversify their product lines (for example, not only to process grain but also to produce various flour products). In addition to this, consumers' preferences have changed towards high quality flour and flour products that depended mainly on the origin of the grain and to some degree on the quality of the technological processing. Also some large chains of fast food restaurants have increased their demand for processed high quality flour and flour products. Furthermore, as a consequence of the free trade agreements among the above-mentioned countries, the circulation of exports and imports among the member-countries has accelerated. As a result, the use of the capacity in mills increased to higher rates and the competition grew significantly not only among mills in the member-countries, but also within the industry as a whole. This made the industry concentrated where predominantly large-sized mills could survive. Moreover, it became difficult for new entrants to enter the business. Eventually, this brought an oligopolistic market structure in America. Further, the results of empirical studies demonstrate that US milling companies have reduced in number, but have grown in capacity. Also, the number of plants belonging to milling firms has grown significantly. Further, the results also indicate that geographic boundaries among firms have become vague, although some firms could gain dominance in particular regions. In particular, mills have moved their locations closer to customer centers, and not to production areas as was initially the case, since transportation costs for transporting flour have become higher than transporting wheat due to the requirement of certain technical equipment (WILSON, 1995).

KIM et al. (1991) also investigated the drivers of the structural change in the grain processing industry. In particular, they investigated the causes of the structural change in terms of the number and the size of the companies in the US grain-milling industry. They included in their assessments change in technology and increase in consumption due to the change in demand and income. Their results indicate that a rising disposable income and declining wheat prices have been the primary reasons for changes in the size distribution of larger grain milling companies, while automation in production and higher disposable income have been important factors for smaller business units (C. S. KIM et al., 1991).

2.3 CONCEPTUAL FRAMEWORK

2.3.1 Drivers of structural change within the firm

In this section the theories and mechanisms of drivers of structural changes in grain processing industry will be introduced on the basis of the previous research, whereby drivers within and outside the firm will be distinguished. It is important to consider them separately in order, firstly, to show the mechanisms of how each of these factors influences the work of processing business enterprises. Secondly, such differentiation contributes to the understanding of which factors firms can and which they cannot change. While doing this, nonetheless, no causal relationship between the drivers within and outside the firm will be established.

Firms' internal strategies, as changes in technology, production strategies, strategies in terms of which inputs to use, as well as plant location fall under the category of the drivers of the structural change within the firm. Market structure, change in demand, product characteristics, as well as governments' trade and competition policies fall under the drivers outside the firm. The theoretical framework is based mainly on classical economic theories from the sphere of firms' behavior, economics of industrial organization, and economics of international trade.

In a market economy there is a good deal of conditions that determine whether firms stay in business or quit. Microeconomic theories state that condition marginal cost equals marginal revenue or total average cost equals market price conditions firms' work if they are profit maximizers. Total average costs include fixed as well as variable costs such as renting a plant, buying technology, inputs for production, salaries for employees, interest rates (if firms are at the disposition of credits), and other administrative expenses.

Technology allows average costs to decline along with increasing output, which, in turn, allows marginal costs to be less than average costs. The "transfer mechanism" introduced by Downie suggests that firms with lower average costs have higher profits and can, therefore, spend more on new equipment, which, in turn, lowers firms' costs, raises firms' capacity and, eventually, drives the market price down. Downie's "innovation mechanism" implies that high costs induce firms to seek techniques, which allow average costs to reduce. This leads to the outweighing of the transfer mechanism over the innovation mechanism. In such cases, the average costs of firms, with initially lower costs, decline faster over time than those of firms with higher costs. As a result, the weighted average cost of the industry declines and so the industry price (per price equation). Decline in price leads to leaving the industry by less efficient units and, accordingly, to diminishing of the number of firms staying in the business. This, in turn, increases

the market shares of firms that stay in the industry (DOWNIE, 1958). Further, technological change, which results in larger optimal sizes, increases the optimal regional circle, which may bring about to the emergence of new competitive situations. Nowadays, technologically advanced grain milling companies not only process wheat into flour, but also produce flour commodities and retail them on spot or transport to customers. In other words, modern processing units with advanced technological equipment can get integrated backwards and forwards and can execute several functions such as processing, production of flour commodities, baking, and retailing.

In a heterogeneous goods market the rate of substitution between domestic or imported wheat in producing wheat flour depends on their market prices and the elasticity of demand for certain types of wheat flour (VARIAN, 2009). The rate of substitution between different origins of wheat flour in the production of flour products depends on the prices of imported wheat flour, domestically produced wheat flour from imported wheat, and wheat flour produced from domestically grown wheat. If imported and domestic wheat and wheat flour are sold under the same price conditions (i.e. to the market price) domestic business units will work according to the condition average costs smaller or equal to the market price, whatever inputs or input combinations are used (BOEHLJE, 1999). Moreover, milling firms, which produce heterogeneous goods (i.e. not only process grain but also produce flour products) face higher competition within the heterogeneous goods market (N. R. WRIGHT, 1978).

2.3.2 Drivers of structural change outside the firm

Market conduct of competitors is a driver outside the firm and with it is a given constraint for firms operating in the market. Higher competition within the domestic flour milling industry might as well drive firms to undergo structural changes but not as quickly as when firms in addition to the already given competition with domestic firms have to compete with foreign ones (ESPOSITO & ESPOSITO, 1971; WHITE, 1974).

A monopolist can have policies other than just profit maximization. In any case, a monopolist as well as a monopsonist has the power to set the price (BAIN, 1949). What if the monopolist in the output market is the monopsonist in the factor market? Then, most likely, it gets the possible maximum profit from the transaction and will have the power of distribution (LERNER, 1934). Consumers and producers would have to bear losses under such circumstances though. Producers, mainly because they would have to accept the price set by the monopsonist; consumers, because they also would have to accept the fixed price set by the monopolist and bear the violation of their price and quality preferences for those goods. This question comes to be of the highest importance if those commodities represent *the* most important foodstuff in the country.

Governments can set policies that vary from food security and food standards to setting of marketing mechanisms and protection of the domestic production sector and the domestic processing industry. Governments are also in the position to impose tariff and non-tariff measures in order to protect the domestic industry. These differ across countries and across commodities or groups of commodities. It is possible in such situations, however, that the share of informal trade and markets might increase. This is if control mechanisms are weak or mis-sing. If this occurs, additional competition occurs.

The competition policy of the government in a non-competitive environment (KORNAL, 1998) might be to protect and support the industry by creating regulations that would trip up new entrants in case they create competition to the domestic industry. Such regulations might include restriction of wheat import, flour, and flour products to eliminate the import competition. Further, the government can prohibit or ban producers from selling their output to private business processing units. Another regulation of the kind could be the setting of production quotas for producers and allowing them to sell the crop to alternative buyers only and only after they have filled out a quota set by the government. However, this type of restrictive trade policy might lead to the increase of smuggling and the emergence of some informal market segments.

Governments can as well conduct an open trade and put no restrictions on imports at all (HITIRIS, 1978). This case might bring about the acceleration of the structural change to higher degrees squeezing inefficient business units out of the market. Unrestricted import of wheat might still not be as challenging for domestic mills as unrestricted import of wheat flour. The latter does not pass through mills. If imported flows of wheat and wheat flour are significant (and there are no distortions in exchange rates), the world price becomes leading in the domestic market, especially if the exporting country has a significant share of exports in the world market (KRUGMAN & OBSTFELD, 2008). Empirical studies found that influences of tariffs and concentration on prices and costs are inter-dependent. This means that prices and costs tend to be high when both tariffs and concentration are high. However, there was no evidence for the contrary. Namely, when tariffs, concentration, or both are low. Furthermore, concentration has an independent upward influence on profit per unit, but tariffs have no influence on profit per unit (BLOCH, 1974). If quantity tariffs are imposed, the degree of their effect on the actors of wheat and flour supply chains depends on the ultimate market price including them and the elasticity of demand.

Commodity quality issues

If countries' natural conditions do not allow them to produce certain types of wheat, they normally import them. It is preferable though to import wheat in order to process it domestically rather than to import already processed wheat

flour and flour products (REYNOLD, 1993). The economic rationale behind this is that the direct access of the imported wheat flour to end consumers circumvents the grain-processing sector. Obviously, this causes distortions in the supply chain and domestic actors of that supply chain are in the end worse off. The opportunity costs of losing or having distortions in the domestic supply chain are, for instance, the bygone employment opportunities for the population and the certain share of the Gross Domestic Product (GDP). However, such free trade policy is of significant advantage for grain processing companies, which use imported wheat in the production of wheat flour and flour products, especially if its market price is lower than that of the domestically produced wheat. Additionally, if the qualitative characteristics of the domestic wheat and wheat flour are inferior to that of the imported wheat, they might as well prefer imported grains.

The economic value of commodity quality is becoming increasingly important for intermediate actors (such as milling companies) as well as end consumers. Nowadays, in international markets, not only the price but also the quality plays an important role to about the same degree when purchasing or importing wheat and wheat flour (URI et al., 1994; WILSON & GALLAGHER, 1990). The quality of either wheat or wheat flour is an important indicator of its suitability in the production of different types of flour and flour products, respectively. Mills have to cope with the changing demand towards higher quality wheat flour and flour products, not only if the price differences of end products made from either domestically produced or imported wheat are not significant in the national market, but also if consumers' marginal rate of substitution depends on maximizing their utility from the quality of the product rather than its price.

The quality of wheat is characterized by its protein content. The content but also the quality of the protein is decisive for dough's ability to leaven and, therefore, extremely important in producing final flour products. For example, white bread is produced from high quality wheat flour. The lower the protein quality, the more difficult it is for the dough to leaven. This causes, in general, the final baked pome to be harder and its color darker. The protein's quality, in other words its gliadin and glutenin ratio, heavily depends on the soil as well as growing and climatic conditions. In order for the protein's quality to be good, the gliadin and the glutenin need to be of a particular ratio (LOOKHART et al., 2004). Researchers found that high temperatures (e.g. over +35°C) over a long period of time can impact the gliadin to glutenin ratio, and, consequently, impact the total protein quality (BLUMENTHAL et al., 1993). This is one of the reasons why modern wheat producers use fertilizers. The fertilizers cannot, however, totally improve the quality (ENTZ & FOWLER, 1989; FOWLER, 2003; KIENZLER & IBRAGIMOV et al., 2011; KIENZLER & RUDENKO et al., 2011).

Hypotheses:

1. Based on the information provided in the introduction and considering the established market structure in Kyrgyzstan, milling firms are able to improve their technological endowment, which, in turn, allows them to improve their business-performance. Because of the restrictive trade policy of the Uzbek government, no technological advance within the industry is possible. Therefore, the consolidation among the firms might be slower. Moreover, such a policy might induce higher levels of smuggled goods.
2. Because of the country's liberal trade policy, and therefore higher competition, the structural change in the grain-processing industry of Kyrgyzstan is progressing faster while the restricted trade policy and the policy of competition elimination in Uzbekistan, on the contrary, slow down the industry consolidation.
3. Because Uzbekistan as well as Kyrgyzstan does not have a comparative advantage in producing wheat of higher quality due to specific environmental conditions, both countries depend on imports of such wheat. Excessive imports of wheat may affect wheat producers but not necessarily grain milling companies. In contrast, import of flour and flour products can.

2.4 DATA DESCRIPTION

The analysis is based on the survey data of grain processing firms in Kyrgyzstan and Uzbekistan collected by myself in 2015. The analysis of this essay required data on firms' business performance in order to assess the drivers of the structural change within the firm. Such data, unfortunately, was available neither from public sources nor from previous surveys on a similar subject. Therefore, it was necessary to conduct own survey. Data on import tariffs and other relevant issues related to the drivers of the structural change outside the firm have been collected from various sources such as governments' official laws and import tariff regulations.

In total, 52 milling firms of different sizes have been interviewed in 2015: 30 in Kyrgyzstan and 22 in Uzbekistan. The data for Kyrgyzstan has been collected from mills in and around the capital Bishkek and in Osh (the second biggest city after the capital). Mills in Uzbekistan have been interviewed in and around the capital Tashkent and in Samarkand (the second biggest city after the capital). Capitals and big cities have been chosen because the most progressive developments take place in big cities.

The questionnaire is designed similar to the one constructed and used by the World Bank when surveying business enterprises in developing countries (WORLD BANK, 2015). The questions aimed at identifying such parameters as firms' performance in terms of capacity and staff development at the time of the

survey and three years ago in order to observe trend, technology and innovation, finance, inputs, quality, and policy issues (Table 1 in Appendices).

Out of 30 milling firms interviewed in Kyrgyzstan four are of large size, five are of middle size, and the rest are small mills. The size of the mills is determined through their processing capacity outlined in the introduction. All milling companies in Kyrgyzstan have been operating since the 90s and only one, which is also the only one that stores grain stocks from the State Fund of Food Reserves, has been operating since the 60s. All of them process grain and sell flour and three of them even produce flour commodities for human consumption (involving the use of additional technology) such as bread, pastry, and noodles. The latter three mills are located in and around the capital Bishkek. The ownership structure of the milling firms is very diverse: twelve are limited liability companies, eight are individual entrepreneurship, six are joint-stock companies, and four are joint-venture companies where more than 50 per cent of the shares are foreign shares.

In Uzbekistan twelve large-sized, five middle-sized and five small-sized mills have been surveyed. Most of the mills have been operating since the Soviet Union. These mills are also large in terms of their processing capacity, and joint-stock companies in terms of their ownership structure, where, presumably, the state owns the largest shares. Such structure is most likely due to the fact that most of the large mills, which had been established during the Soviet Union, haven't been given up for privatization like in Kyrgyzstan. On the contrary, all milling companies that have been operating since the break-up of the Soviet Union are small in terms of their processing capacity and private in terms of their ownership structure. All mills process grain and sell flour, but none of them produce flour products.

2.5 COMPARATIVE ANALYSIS AND SURVEY RESULTS

Drivers of the structural change within the firm

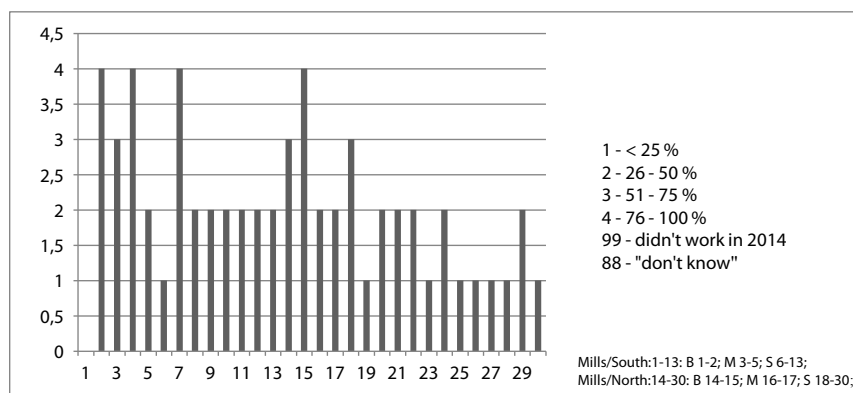
The business performance of mills in Kyrgyzstan

In the subsection "firm's strategy" a broad range of questions have been asked regarding firms' capacity utilization, the change in the number of employees over the last three years, storage capacity, financial situation, technological endowment, and inputs used in production. The results reveal differences not only between the two countries, but also within the countries. In what follows, detailed results of the survey will be presented first for Kyrgyzstan and then for Uzbekistan.

In Kyrgyzstan, when assessing the development in terms of the processing capacity and the staff, in general, big- and middle-sized mills in both regions¹⁸ have indicated rather positive development and small-sized mills have assessed their development with regard to these two parameters as rather negative. There is a noticeable difference though between the assessments of the mills in the north and in the south. Namely, middle- and small-sized firms in the north have indicated less successful business performance than have the mills of the same sizes in the south. With regard to the number of permanent full-time individuals¹⁹ working at the end of 2012, more people worked in small mills in the south than in small firms in the north. More people were employed, however, in big mills in the north than in the mills of the same size in the south. Middle-sized mills have indicated about the same amount of employees in both regions.

The response rate on the output produced, as a proportion of the maximum output possible if using all the resources available, varies among mills. Nonetheless, on average, the outputs of mills of all sizes in both regions in 2014 were between 25-50 per cent only (Figure 19).

Figure 19: Output produced by mills in Kyrgyzstan



Source: Own survey.

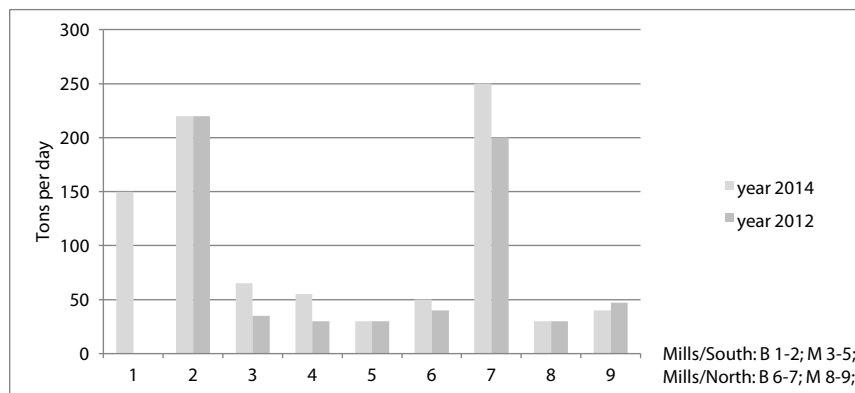
Accordingly, the production of wheat flour by big-sized mills in the south didn't quite change during 2012-2014 and that of middle-sized mills increased. In the north, however, big-sized mills increased the production of wheat flour, while middle-sized milling companies decreased the output during 2012-2014.

¹⁸ Whereby Bishkek represents the North and Osh the South.

¹⁹ Permanent full-time employees (including all managers and employees) are defined as all paid employees that are contracted for a term of one or more fiscal years and have a guaranteed renewal of their employment contract.

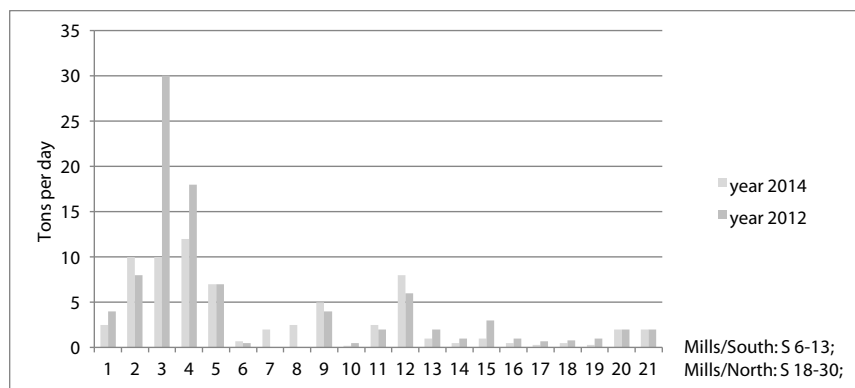
Small-sized milling firms in both regions, on average, decreased their output during the same period (Figure 20 and Figure 21).

Figure 20: Processed wheat by big- and middle-sized mills in Kyrgyzstan during 2012-2014



Source: Own survey.

Figure 21: Processed wheat by small-sized mills in Kyrgyzstan during 2012-2014



Source: Own survey.

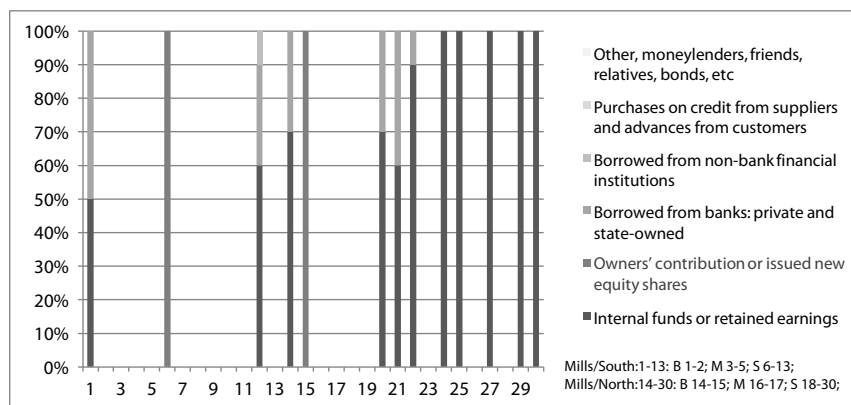
In terms of technological innovation, inquiries have been made on the number, age, and the country of origin of the equipment. Almost all mills had at least one piece of milling-equipment at their disposal at the time of the survey, but only big- and middle-sized mills had other equipment at their disposal such as grain and flour elevators as well as packing machines and lorries for transportation. Further, most of the establishments were in possession of Chinese and Turkish technology except for a couple of small mills in the south, which had still been

using Soviet technology. Furthermore, only big-sized mills in the north were able to acquire new technology within the last three years, but around 20 per cent of all mills were able to introduce new production lines within the same period.

The inquiries with regard to storage capacity reveal that big- and middle-sized mills in Kyrgyzstan can store, on average, up to ten thousand tons of grain, whereas small-sized mills have almost no storage capacity at all. Moreover, not many mills have storage capacity for wheat flour. This is most likely due to the fact that the flour doesn't last long and should ideally be marketed right after the processing. Grain, on the contrary, can be stored for a relatively longer time.

At the time of the survey, almost a half of all surveyed firms had lines of credits or loans from financial institutions. Over the fiscal year 2014, the estimated proportion of the establishments' total purchase of fixed assets was mostly financed from internal funds or retained earnings. This was especially true for the processing business units located in the north, since many processing firms in the south didn't quite finance their fixed assets from any of the sources given in the questionnaire. Big-sized enterprises in both regions in 2014 financed up to almost half of their fixed assets from loans borrowed from banks (Figure 22).

Figure 22: Finance of fixed assets of mills in Kyrgyzstan

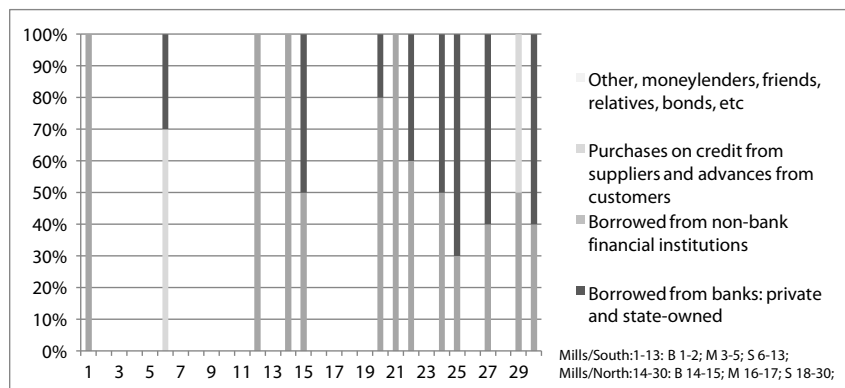


Source: Own survey.

Approximately half of the estimated proportion of the establishments' working capital was financed by smaller firms in the north from their own internal funds or retained earnings and the other half from loans borrowed from banks. Mills in the south didn't quite give an answer to this question. Furthermore, about one-third of all milling firms applied for loans or credits in 2014. The majority of the mills that did apply for loans or credits were small-sized mills in the north. Milling companies that did not apply for loans or credits were asked to point out the reasons for not having done so. The reasons indicated are very diverse, although

the most frequently mentioned ones are: "sufficient capital", "interest rates weren't favorable", "didn't think this would be approved", and "have already credits" (Figure 23).

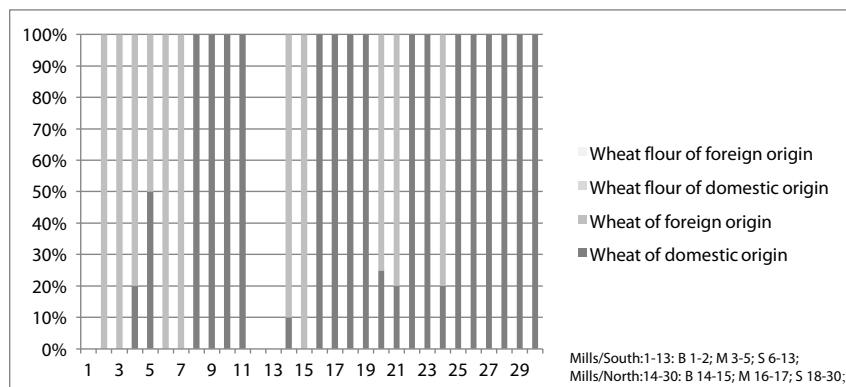
Figure 23: Finance of working capital of mills in Kyrgyzstan



Source: Own survey.

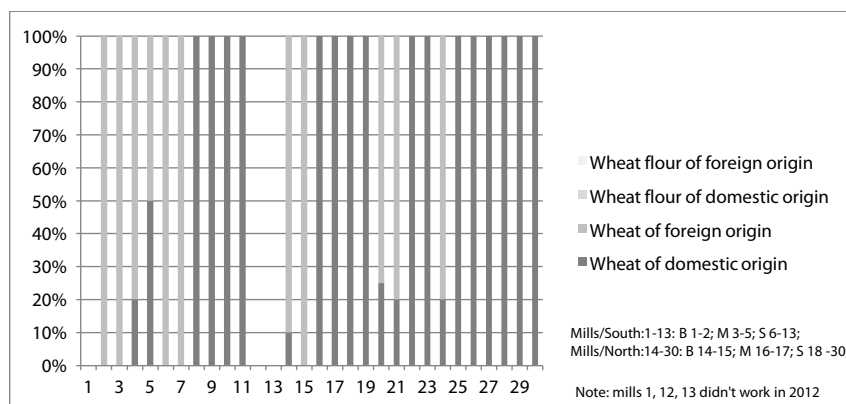
In the subsection about the inputs used in production, the aim was to find out in which proportion milling companies used wheat and wheat flour of domestic and foreign origins in the production of flour and flour products in 2012 and 2014, respectively. Since most of the mills concentrate mainly on the production of flour, there was no indication of using foreign wheat flour as input in the production. 100 per cent of total wheat used in the production of wheat flour by big mills in the south during 2012-2014 was wheat of foreign origin. Middle-sized firms in the same region used both wheat of domestic and wheat of foreign origins in about the same proportion. In contrast to these, all small mills in the south used wheat of domestic origin. In the north, big-sized milling companies used predominantly wheat of foreign origin. Middle-sized mills used wheat of domestic origin. The majority of small mills, however, used only domestic wheat. Furthermore, there was no significant difference between the two periods in terms of the change in the proportion of the use of wheat of domestic and foreign origins (Figure 24 and Figure 25).

Figure 24: Purchased proportion of domestic and foreign wheat in Kyrgyzstan in 2014



Source: Own survey.

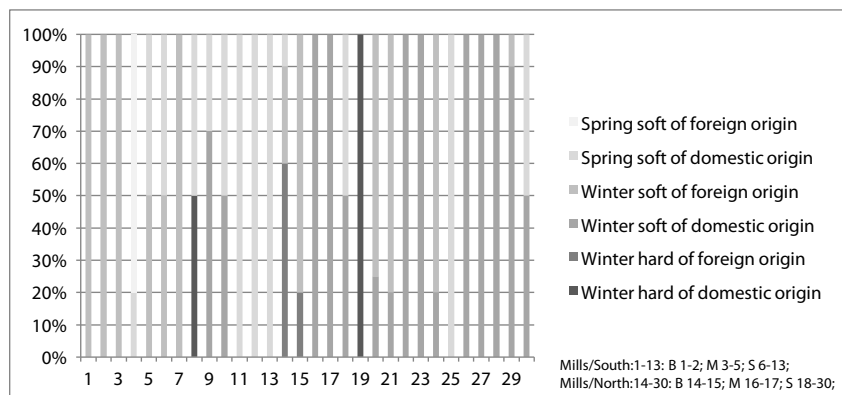
Figure 25: Purchased proportion of domestic and foreign wheat in Kyrgyzstan in 2012



Source: Own survey.

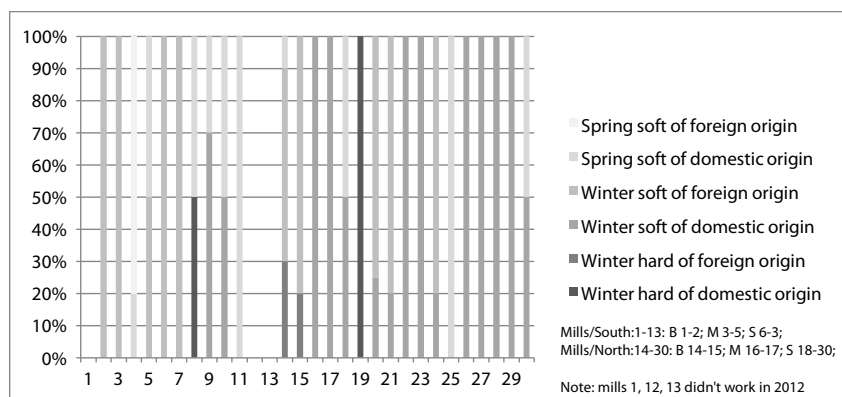
During the observed three years, the milling enterprises in Kyrgyzstan used mostly winter soft of domestic and foreign origins as well as spring soft of domestic origin in the production of wheat flour. Interestingly, big-sized firms in both regions used mostly winter soft of foreign origin, while smaller firms, especially those in the north, used winter soft of domestic origin in the production of wheat flour (Figure 26 and Figure 27).

Figure 26: Sorts of wheat used in production of wheat flour by mills in Kyrgyzstan in 2014



Source: Own survey.

Figure 27: Sorts of wheat used in production of wheat flour by mills in Kyrgyzstan in 2012

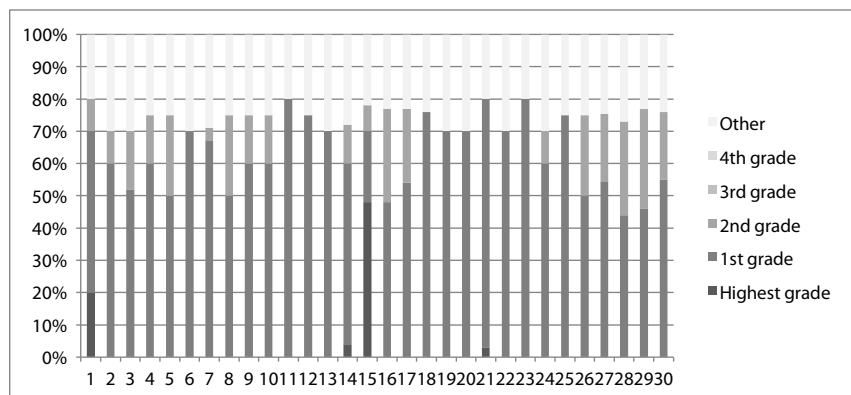


Source: Own survey.

The inquiries on the grades of wheat flour produced by the establishments reveal that mills in Kyrgyzstan produce mostly wheat flour of the first and the second grades. During 2012-2014 only one big processing company in the north produced wheat flour of the highest grade. One big processing company in the south in 2014 was also able to produce wheat flour of the best quality. These firms mostly use wheat of foreign origin in their production of wheat flour. On average, 60 per cent of the total flour production is wheat flour of the first grade, 20 per cent is wheat flour of the second grade, and the rest is wheat bran or other commodities. Nonetheless, the proportion of wheat flour of the second grade

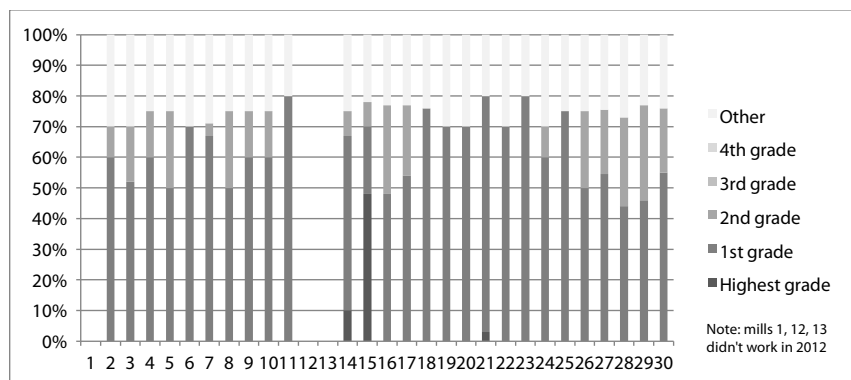
in big mills in both regions doesn't exceed 10 per cent of their total wheat flour production, while, for example, that of middle- and small-sized firms is about 30 per cent. Small mills in the north produce more wheat flour of the second grade than the mills of the same size in the south do. None of the milling companies produce wheat flour of third and fourth grades (Figure 28 and Figure 29).

Figure 28: Wheat flour grades produced by mills in Kyrgyzstan in 2014



Source: Own survey.

Figure 29: Wheat flour grades produced by mills in Kyrgyzstan in 2012

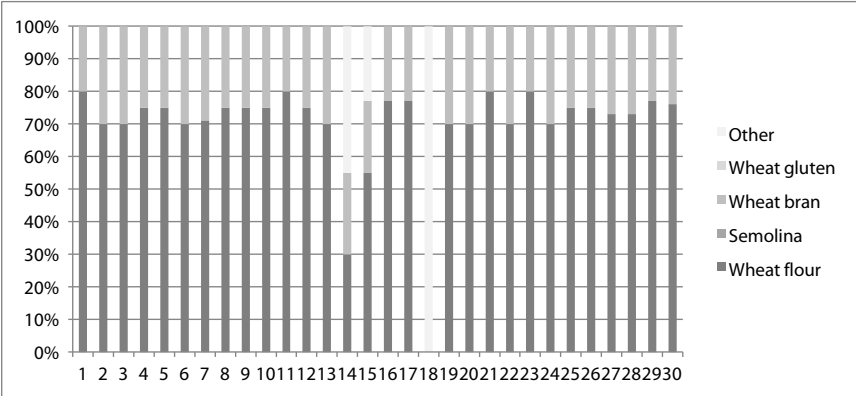


Source: Own survey.

Big-sized processing units in the north also produce other products. None of the mills use additional flour to assemble their products. In terms of the proportion of production of different commodities, there was no significant difference between 2012 and 2014, except for big processing companies in the north, which have reduced wheat flour production and instead have increased production of other wheat flour commodities. Nevertheless, the proportion of their wheat

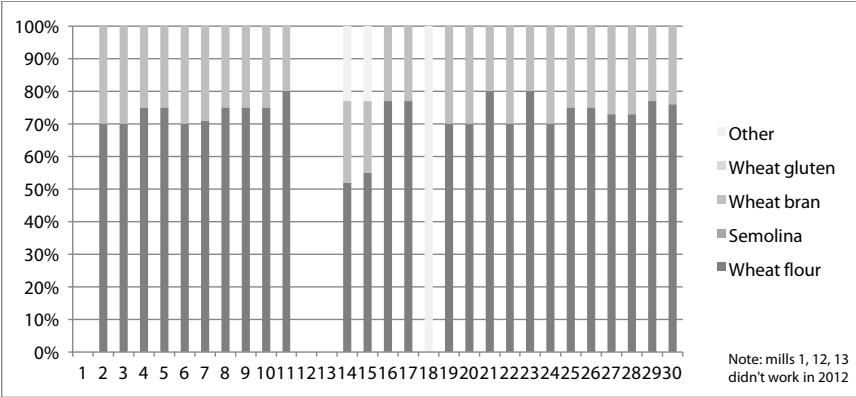
flour production represents more than a half of their total production (Figure 30 and Figure 31).

Figure 30: Proportion of commodities produced by mills in Kyrgyzstan in 2014



Source: Own survey.

Figure 31: Proportion of commodities produced by mills in Kyrgyzstan in 2012

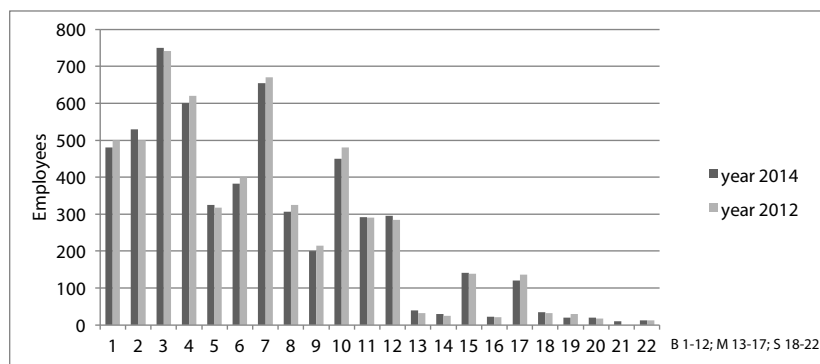


Source: Own survey.

The business performance of mills in Uzbekistan

The results of the survey with regard to firms' business performance reveal that the overwhelming majority of all interviewed mills in Uzbekistan have assessed their development in terms of processing capacity and the development of staff as "almost constant" (Figure 32).

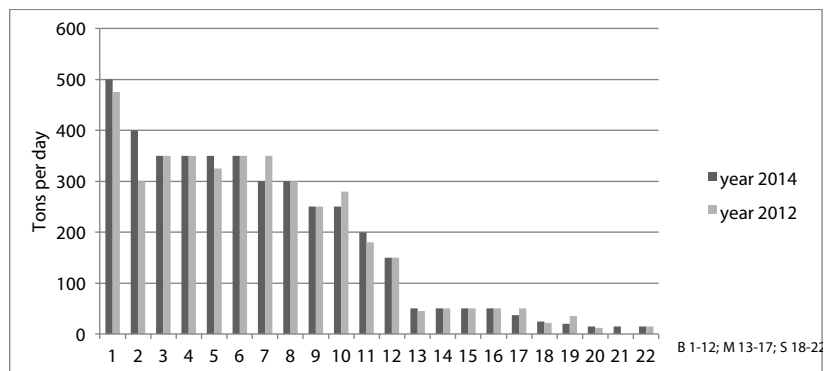
Figure 32: Number of individuals worked in mills in Uzbekistan during 2012-2014



Source: Own survey.

In the fiscal year 2014, establishments' output produced as a proportion of the maximum output possible, providing all available resources are used, seems impressive, as all companies have indicated to more than 100 per cent. Big mills in Uzbekistan can on average process 150-350 tons of wheat per day. Middle-sized mills' capacity lies at 50 tons and small mills are able to process on average up to 10 tons of grain per day (Figure 33).

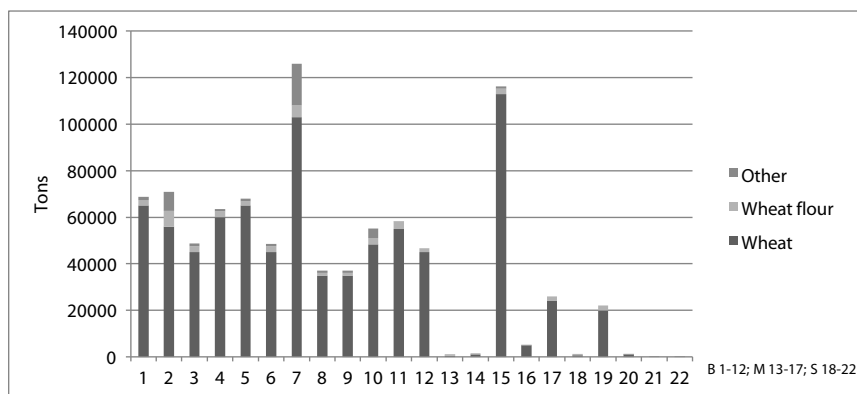
Figure 33: Processing capacity of mills in Uzbekistan during 2012-2014



Source: Own survey.

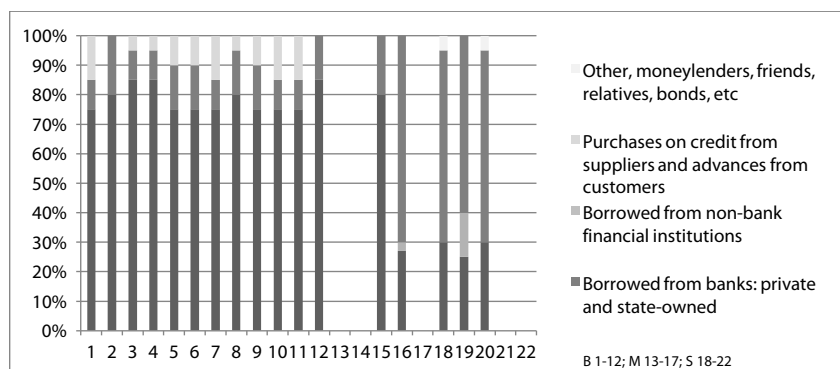
In comparison with the processing firms in Kyrgyzstan, the technological endowment of the milling firms in Uzbekistan is quite obsolete. Firstly, the majority of the firms have indicated having used their technological equipment for more than 25 years. In other words, they are still using Soviet technology. Secondly, within the last three years none of the firms introduced new equipment nor started new product lines. Regarding the storage capacity, big-sized mills can store on average up to 60 thousand tons of grain, whereas most of the middle- and small-sized mills have almost no storage capacity at all (Figure 34).

Figure 34: Storage capacity of mills in Uzbekistan



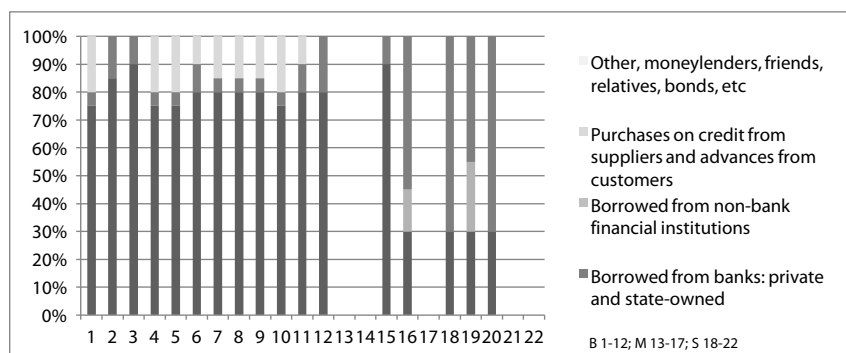
Source: Own survey.

With regard to the financial situation, the majority of the processing establishments had credits at the time of the survey. The response rate on the estimated proportion of establishments' total purchase of fixed assets and working capital over the fiscal year 2014 is noticeably diverse within the different size distributions. Namely, most of the big- and middle-sized milling companies have financed about 80 per cent of their fixed assets from their internal funds or retained earnings, and about 10 per cent from credits from banks, purchases on credits from suppliers, and advances from customers (Figure 35). The latter option, for instance, never came up among mills in the neighboring Kyrgyzstan.

Figure 35: Funding of fixed assets in mills in Uzbekistan

Source: Own survey.

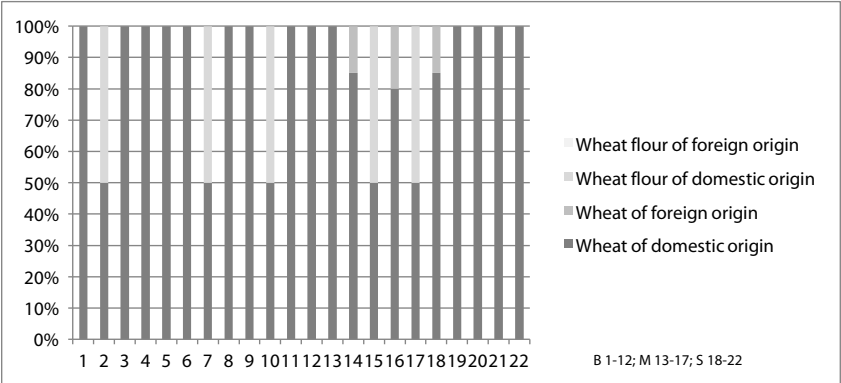
With regard to the funding of the working capital the results for big- and middle-sized mills are the same, although the share of the funding of the working capital with purchases on credits from suppliers and advances from customers is higher than it is in the case with the funding of the fixed assets. Many small mills (that are also private firms) didn't quite give an answer to these questions, but those which did, interestingly, have financed about 30 per cent of their fixed assets as well as their working capital from only internal funds or retained earnings and about 60 per cent from borrowings from banks, and the rest from other money-lenders such as friends, relatives, bonds etc. Furthermore, two-thirds of all mills did apply for loans and credits in 2014. The main problems for mills that did not apply were basically the disposition of sufficient capital and high collateral requirements (Figure 36).

Figure 36: Funding of working capital in mills in Uzbekistan

Source: Own survey.

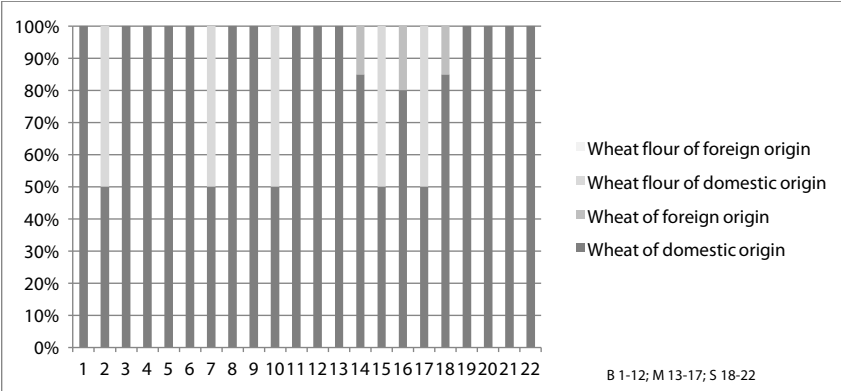
During 2012-2014, most of the processing firms used predominantly wheat of domestic origin. Only private and small milling firms used, to a certain degree, wheat of foreign origin (Figure 37 and Figure 38).

Figure 37: Purchased proportion of wheat by mills in Uzbekistan in 2014



Source: Own survey.

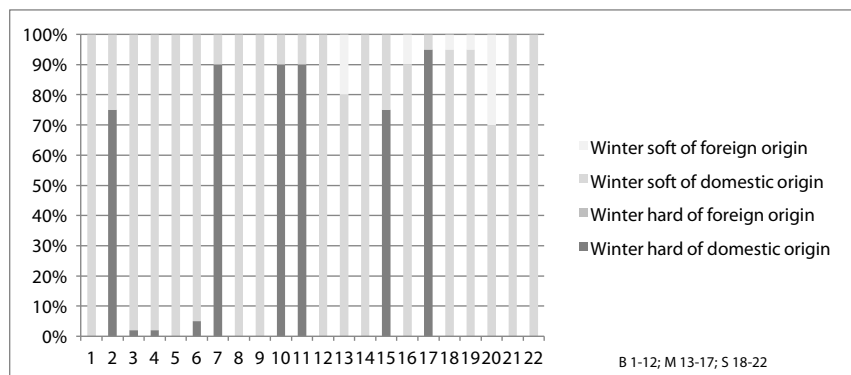
Figure 38: Purchased proportion of wheat by mills in Uzbekistan in 2012



Source: Own survey.

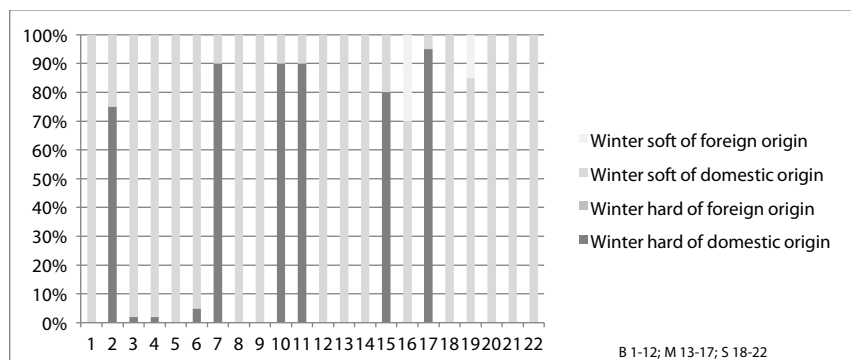
Furthermore, they used exclusively winter hard and winter soft of domestic origin. Only private mills used winter soft of foreign origin and there are more mills in 2014 than in 2012 that used wheat of foreign origin (Figure 39 and Figure 40).

Figure 39: Sorts of wheat used in production by mills in Uzbekistan in 2014



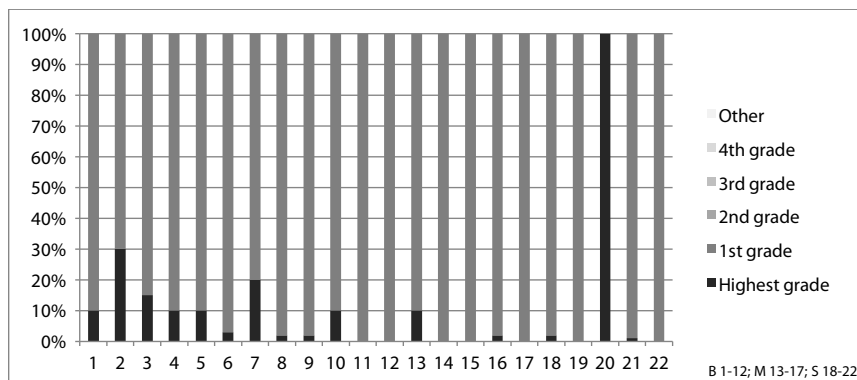
Source: Own survey.

Figure 40: Sorts of wheat used in production by mills in Uzbekistan in 2014

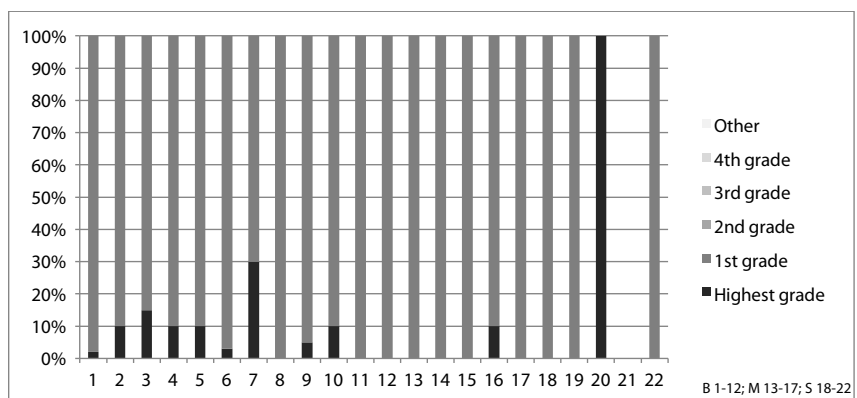


Source: Own survey.

All processing firms in Uzbekistan produce exclusively wheat flour of the first grade, although some firms have claimed to also produce wheat flour of the highest grade representing about 10 per cent of total wheat flour production (Figure 41 and Figure 42).

Figure 41: Wheat flour grades produced by mills in Uzbekistan in 2014

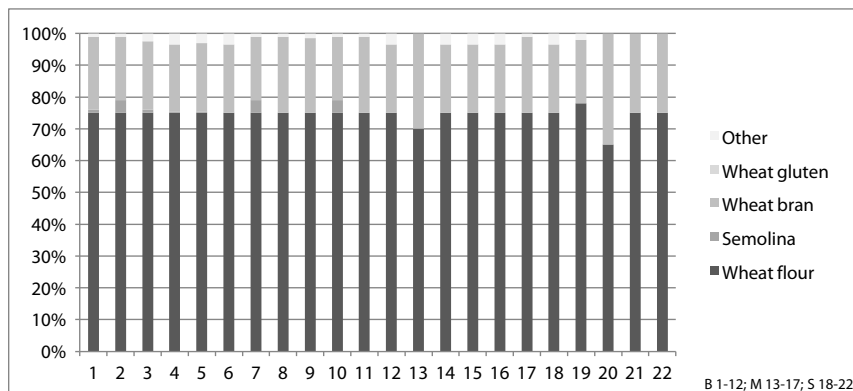
Source: Own survey.

Figure 42: Wheat flour grades produced by mills in Uzbekistan in 2012

Source: Own survey.

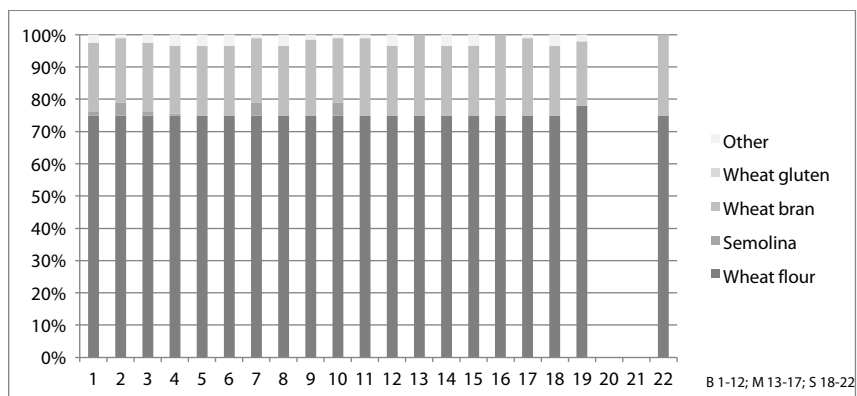
The proportion of commodities produced in mills in Uzbekistan is split at about 80 per cent wheat flour and 20 per cent wheat bran. None of the firms indicated the production of flour products like some mills in Kyrgyzstan. Most likely, among the joint-stock firms, this is due to the fact that the flour production and the production of flour commodities run separately, and among the private processing companies, this is due to the absence of appropriate technology (Figure 43 and Figure 44).

Figure 43: Proportion of commodities produced by mills in Uzbekistan in 2014



Source: Own survey.

Figure 44: Proportion of commodities produced by mills in Uzbekistan in 2012



Source: Own survey.

Drivers of the structural change outside the firm

Governmental trade policy in Kyrgyzstan

The government of Kyrgyzstan doesn't normally restrict imports of wheat or wheat flour. However, the government sometimes imposes tariffs for the imports of wheat flour in order to protect the domestic grain processing industry.

In practice, however, they don't last long and are relatively insignificant with regard to the average price of wheat flour²⁰ (Table 6).

Table 6: Quantitative import tariffs in Kyrgyzstan

Period	Commodity	Tariff
01.06.2009-01.11.2009	For wheat flour	3 Som
01.04.2012-01.10.2012	For wheat flour for 6 months initially-	3 Som
01.04.2012-01.08.2012	-abolished after 4 months already	3 Som
01.08.2013-01.12.2013	For wheat flour for 4 months initially-	3 Som
01.12.2013-01.03.2014	-prolonged for further 3 months	3 Som

Source: Government's tariff regulations (EurAsEC codes 1101 00 110 0 and 1101 00 150 0).

In the subsection "government's trade policy", inquiries were made regarding the waiting time for obtaining an import license for wheat. On average, mills answered 10 days. To the same question, but with regard to wheat flour and technical equipment, mills didn't know the answer. It is understandable considering none of the surveyed mills uses imported wheat flour in the production of flour commodities.

In order to know the opinion of mills and their attitude with regard to the trade and import policies of their government, they were asked to describe the national wheat and wheat flour import policies on a scale between 0 (no obstacle) and 4 (very severe obstacle). The findings are very interesting. Almost all milling companies in the south described the government's import policies as being no obstacle for their business, whereas the majority of the milling companies in the north described them as a major obstacle. Further, mills were asked to rate the situation for an average business unit in their business with regard to different aspects of running a business in the country on a scale between 1 (very easy) and 4 (impossible). Two-thirds of mills evaluated the beginning of the milling operation as "difficult". These were mostly small mills in the north. Among the rest, most of the business units in the south assessed this particular issue as "quite easy". Extending a part of operation significantly (e.g. acquiring new facilities) was for one half "difficult" and for the other half "very difficult". Dismissal of staff and the extension of business were for the overwhelming majority "difficult". To the question "what percentage of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose", the majority of the mills that operate in the south answered "zero". The mills in the north, in contrast, assessed such payments as up to 5 per cent of the total annual sales.

²⁰ For instance in 2014, the consumer price of wheat flour of the first grade was 32 Soms and that of the highest grade 40 Soms per 1 kilogram (Statistical Committee of the Kyrgyz Republic).

Governmental trade policy in Uzbekistan

Uzbekistan is significantly restrictive in terms of trade policy and sets for imports of wheat, wheat flour, and diverse flour products with ad valorem import tariffs far above the international average. The tariffs vary from 15 to 30 per cent, depending on the product type. It seems that there is a tariff escalation, where the ad valorem import tariffs for wheat and flour products are on average twice as high as they are for wheat flour (on average 30 per cent and 15 per cent, respectively) (Table 7).

Table 7: Ad valorem import tariffs in Uzbekistan

Date of entry into force	Commodity	Tariff
01.11.2005	Wheat	30 %
01.07.2010	Wheat flour (was changed)	10 %
01.04.2011	Wheat flour (was changed)	15 %
01.11.2011	Bread, bakery, and flour products (sweet)	30 %
01.04.2012	Wheat flour (was changed)	15 %
01.05.2013	Macaroni products	20 %-30 %
01.08.2013	Wheat flour (current)	15 %-11 %

Source: Official government laws and regulations.

With regard to the question on the approximate number of days to obtain an import license for wheat, two-thirds of the respondents answered "don't know", and the rest gave it an average of 23 days, with answers ranging from 7 to 45 days. Small private mills gave more days than big joint-stock companies did. To the same question, but with regard to wheat flour and other milling products, all mills unanimously answered "don't know". With regard to the number of days to receive an import license for technical equipment, the majority gave an average of 17 days, with answers ranging from 5 to 45 days. Interestingly, small mills indicated a much higher number of days than big mills.

The beginning of the milling operation was "difficult" for the majority. Extending part of the operation significantly was for one half of the respondents "quite easy" whereas for another half "difficult". Dismissal of staff was "difficult" for the majority. Exiting business was for big joint-stock companies more difficult than for small private mills. To the question on the government's import policies in terms of import taxes, none of the mills gave an answer. With regard to corruption most of them were reluctant to answer. Three mills, nonetheless, gave 0.2-0.7 per cent of their total annual value.

Market conduct of competitors in Kyrgyzstan

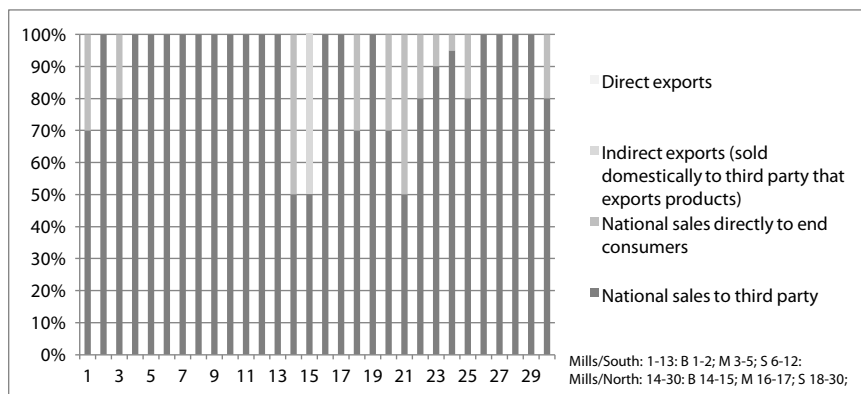
In the subsection "competition", the aim was to find out mills' perception of the level of competition with respect to the purchase of wheat as well as the sale of wheat flour and other flour commodities. In Kyrgyzstan, with respect to the

purchase of wheat on a scale between 0 (no competition) and 4 (very severe competition), mills perceived "moderate" and "major competition" in about the same proportion. Remarkably, bigger business units indicated more to the absence of competition whereas the overwhelming majority of small firms in both regions indicated "major competition". The same question, but with respect to the sale of flour, demonstrates 30 per cent of opinions inclining from "zero" to "moderate competition", and 70 per cent from "major" to "severe competition". Further, mills were asked to indicate (intuitively) the number of mills in the area of their operation. The main finding reveals that big- and middle-sized firms in both regions indicated a smaller number of operating firms in the area. Exceptions are the middle-sized mills in the north that indicated a higher number of competitors. Small mills in both regions indicated a higher number of competitors. Moreover, to the additional question on how many of them are big, middle, and small, the response rate is digressional. Namely, the highest number of the mills in both regions indicated big- and then middle-sized business units, whereas almost none of them indicated small firms in the area.

Assuming the existence of unregistered or informal firms, mills were asked about the level of competition with such firms. About 80 per cent of all mills indicated a rate from "zero" to "moderate competition" and 20 per cent from "major" to "very severe competition". With the same aim inquiries were made on firms' competition with smuggled products. In total, almost 50 per cent of all companies indicated "zero competition" and the other half "major" and "very severe competition". An interesting finding in this case reveals that most of the mills, which indicated "zero competition", were the mills in the south while most of the mills, which indicated "major" and "very severe competition", were the mills in the north.

Further, inquiries were made on the proportion of the establishments' sales to different parties. It seems that all firms sell the major part of their output to third parties and some of them also engage in selling their output directly to end consumers. Again, some noticeable differences between different unit-sizes in different regions were found. In the south of the country, for example, only big mills engage in direct selling to end consumers, whereas small firms sell 100 per cent of their output to a third party. The firms in the north sell 80 per cent of their total output to a third party and small-sized mills engage in national sales directly to end consumers more than in the south (Figure 45).

Figure 45: Proportion of establishments' sales to different parties in Kyrgyzstan



Source: Own survey.

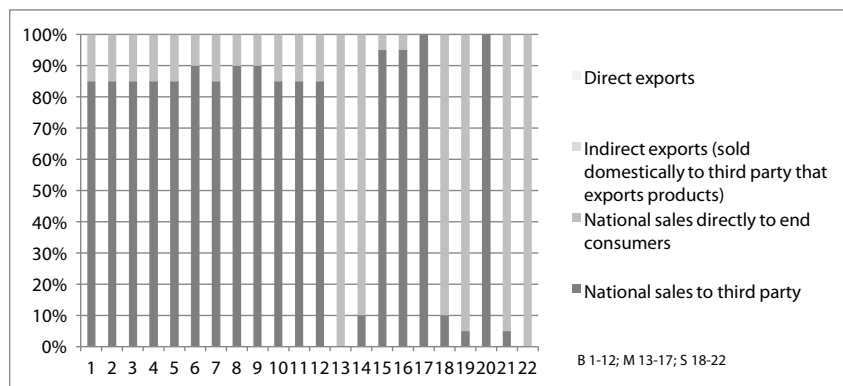
Market conduct of competitors in Uzbekistan

In Uzbekistan, the level of competition among the milling companies in the area with respect to the purchase of wheat was perceived by the joint-stock companies as "zero". The private processing units, in contrast, perceived the level of competition with respect to the purchase of wheat from "minor" to "major competition". This can be rationalized given the fact that only state-owned enterprises can mill domestic wheat. Grain producers, in turn, can sell their output only to state-owned firms, at least until the quota is filled²¹.

The majority of the mills perceived the level of competition with regard to the sale of wheat flour as "major competition". This is most likely due to the presence of Kazakh wheat flour (including smuggled goods) in the market. The perception of mills about the number of milling companies located nearby is increasing among small mills. To the question as to whether the establishment competes with informal firms, all mills answered unanimously with "don't know" or "doesn't apply", and "zero competition". The same concerns the question about the competition with smuggled products. Regarding the proportion of establishments' sales to different parties, most of the big-sized mills sell on average up to 85 per cent of their total output to a third party. Almost all of the small-sized private mills, in contrast, sell on average up to 95 per cent of their total output directly to end consumers. Moreover, none of the mills engage in direct or indirect exports (Figure 46).

²¹ The government sets quotas to sell certain amount of grains to the state-owned processing mills. Only after the quota is filled, producers are permitted to sell the rest of the output (if something left over) to whatever parties they wish to sell.

Figure 46: Proportion of establishments' sales to different parties in Uzbekistan



Source: Own survey.

Commodity quality issues

The quality of the domestic grain in Kyrgyzstan as well as in Uzbekistan is inferior to the quality of the Kazakh grain and can in general be assessed as relatively bad. The questionnaire included a separate subsection on the quality of the domestic wheat and wheat flour as well as that of the foreign wheat and wheat flour. In Kyrgyzstan, on a scale between 0 (very bad) and 4 (excellent), one half of respondents evaluated the quality of the domestic wheat as "bad" and another as "good". The quality of wheat of foreign origin was evaluated as "good" and "very good". When evaluating the quality of the domestic wheat flour, about 50 per cent of the respondents described it as "good" and about 20 per cent as "bad". Further, about 10 per cent of all respondents described the quality of the domestic wheat flour as "very good". Those are exclusively answers of the big-sized mills in the north that produce wheat flour of the highest quality themselves and use exclusively wheat of foreign origin in the production of wheat flour. Regarding the quality of the foreign wheat flour, the majority described it as "good" and "very good".

In Uzbekistan, with regard to the quality of the domestic wheat, the majority described it as "good" and with regard to the quality of the foreign wheat more than half of the respondents described it as "very good" and about one-third as "good". The quality of the domestic wheat flour was evaluated by 70 per cent of the respondents as "good" and by 30 per cent as "very good". The quality of the foreign wheat flour was evaluated by 50 per cent as "very good", 14 per cent as "excellent", 14 per cent as "good" and 22 per cent of respondents answered "don't know". This is, of course, a personal view of quality.

Most recent studies on wheat quality in Uzbekistan argue that the local wheat is of very poor quality. KIENZLER et al. (2011) conducted a survey in large, medium, and small mills as well as in large, medium, and small bakeries and among households in order to understand the tandyr bread quality criteria and the grain quality requirements in producing the tandyr bread²². Their findings reveal that the wheat grown in most of the Central Asian countries is considered as inferior, in terms of the quality and the protein content, to the wheat grown in Kazakhstan. Further, farmers in Uzbekistan sell wheat to the state-owned grain processing industry according to certain production quotas at the monopolistic prices determined by the state. The rest can either be processed by local households for home consumption or can be sold at local markets that offer higher but also fluctuating prices compared to the state-owned milling companies (KIENZLER & IBRAGIMOV et al., 2011; KIENZLER & RUDENKO et al., 2011).

PENA et al. (2002) found that the government receives grain and stores it in large silos according to the gluten content, and then distributes the grain lots among the large mills. It provides certificates for quality attributes (including test weight, gluten content, moisture etc.). The government regulates the rate of flour extraction, which constitutes 78 to 82 per cent depending on the region. There are four grades of wheat flour: the highest, the first, the second, and the "Uzbek grade". The wheat flour of the highest grade is used mainly for cookies and pastry breads; the wheat flour of the first grade is used for tandyr bread and white bread, and the wheat flour of the second and the Uzbek grades (0.8-0.9 per cent ash) are used in production of cheap, dark, and dense bread called "diabetic bread". The largest bread producing plants still use the very old sponge and dough method involving a liquid fermenting process to produce a low quality, high ash, and dense pan-type bread. However, the milling and baking industry recognizes that currently cultivated wheat varieties possess low gluten content and weak gluten character and are unsuitable in the production of the tandyr bread, especially considering that the consumption of the tandyr bread has been increasing significantly, particularly in city suburbs and rural villages (PENA et al., 2002).

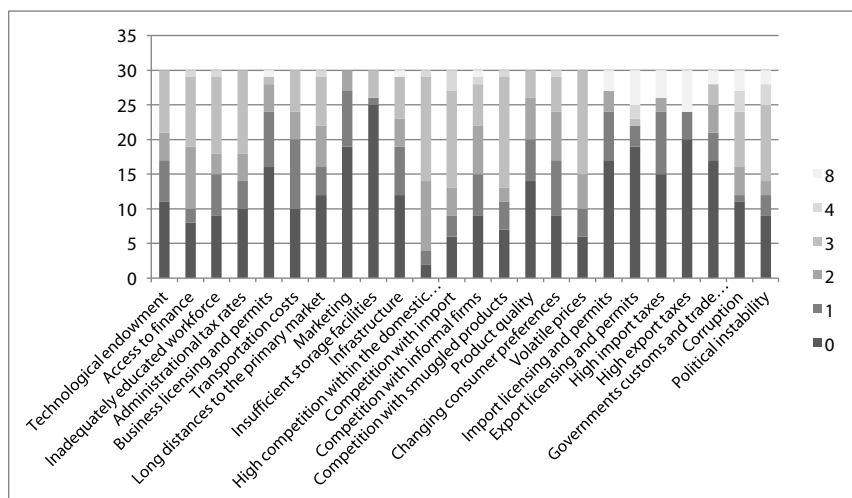
In the last part of the questionnaire the respondents were asked to evaluate the different elements of the business environment included in the list, if any, which at the time of the survey represented the biggest obstacle faced by the establishments on a scale between 0 (no obstacle) and 4 (very severe obstacle). Answers are illustrated in Figure 47 and Figure 48.

The most noticeable difference between the two countries, in terms of the obstacles faced by the establishments, is the fact that on almost all of the elements listed below, the dominating colors in the case of Uzbekistan are blue (no obstacle)

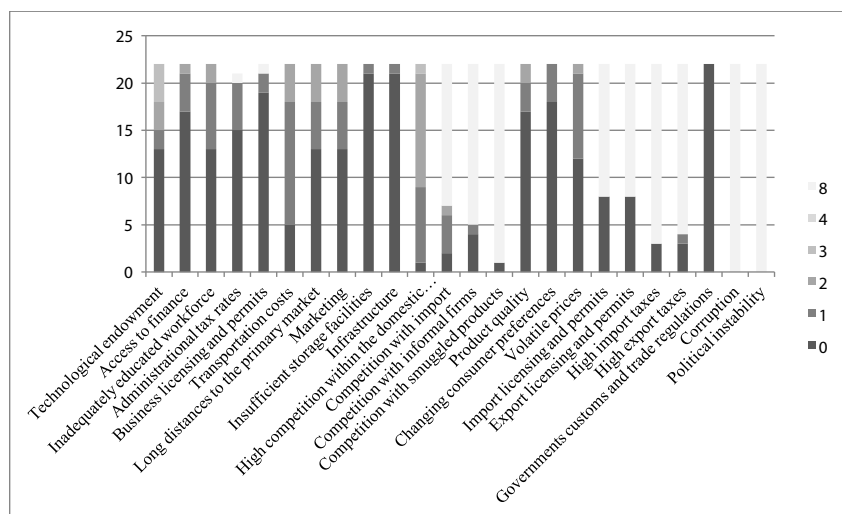
²² Tandyr bread is the most popular type of bread consumed in Central Asian countries.

and orange (don't know), and in the case of Kyrgyzstan blue (no obstacle) and violet (major obstacle). The majority of Kyrgyz mills identified such elements of the business environment as competition within the domestic industry, competition with import, competition with smuggled products, and volatile prices as "major obstacles" – basically all elements that have something to do with competition. It was exactly these elements, on the contrary, that Uzbek mills didn't want to evaluate. Also they didn't evaluate such elements as import-export licensing and permits, high import-export taxes, corruption, and political instability – basically all questions about politics. Even though mills in Uzbekistan evaluated most of the elements as "no obstacle" and "minor obstacle", there is still one pillar that entails violet (major obstacle), and that is the technological endowment.

Figure 47: Biggest obstacles faced by mills in Kyrgyzstan



Source: Own survey.

Figure 48: Biggest obstacles faced by mills in Uzbekistan

Source: Own survey.

Notes: 0 – no obstacle; 1 – minor obstacle; 2 – moderate obstacle; 3 – major obstacle; 4 – very severe obstacle; 8 – "don't know".

2.6 CONCLUSIONS

The overall results of the analysis allow the hypotheses introduced above to be confirmed. The differences in governments' trade and competition policies in both countries have far reaching consequences for developments within their grain processing industries. The on-going structural changes within the grain processing industry in Kyrgyzstan are occurring primarily due to the government's unrestricted trade policies and therefore due to the significant competition faced by the domestic grain processing firms with the wheat flour of Kazakh origin. As the results of the survey demonstrate, most of the small-sized grain-processing firms have been deteriorating in their business performance as an outcome of the competition acceleration within the industry as a whole. Such development, on the one hand, squeezes out inefficient units from the market, but, on the other hand, may serve for the significant change of the market structure in favor of the big-sized processing companies. The unavailability of higher quality domestic wheat coupled with the increasing preference for such wheat certainly compounds the situation. It seems that only mills that use wheat of higher quality in the production of wheat flour have been able to withstand the significant competition with the foreign industry. As the results of the survey reveal, their better business performance is reflected in such economic parameters as their ability to enhance their technological endowment or buy new

technology that resulted in the increase of their processing capacity and the extension of product lines. The results of the survey indicate, further, the differences in developments of milling enterprises within the country. More dynamic changes occurring among the milling companies located in the north of the country indicate the comparative advancement of the north over the south. Moreover, such significant differences in the development of mills located in different parts of one country indicate the heterogeneity of the markets and the lopsided developments of business enterprises within one country.

The protective trade and competition policies of Uzbekistan have been restricting any positive development within the domestic grain processing industry. The results of the survey reveal that hardly any changes could be observed among the mills regarding the same economic parameters outlined above. Only private processing units indicated some deterioration of their business. Clearly, these developments have been caused by government's trade and competition policies. In addition to the fact that the ad valorem import tariffs for wheat are comparatively high, domestic grain producers are restricted from selling grain to private mills, at least until they have filled the quota and have sold enough grain to the state-owned joint-stock companies. Such a position as well as high import tariffs represents a significant constraint for private enterprises in Uzbekistan that want to conduct business.

The comparison between the two countries demonstrates that mills in Uzbekistan haven't been able to introduce new production lines and improve their technological endowment. Further, milling firms in Uzbekistan still use Soviet technology, whereas milling firms in Kyrgyzstan use newer technology originating from China and Turkey. The number of employees in mills in Uzbekistan didn't quite change during the last three years, whereas the grain processing firms in Kyrgyzstan have experienced rather dynamic changes with regard to this issue. Furthermore, more mills operating in Kyrgyzstan have indicated a lack of qualified staff than mills in Uzbekistan²³. Mills in both countries assessed the wheat and wheat flour quality of foreign origin as superior to that of the domestic wheat and wheat flour. With regard to competition, this point was a crucial issue for both countries. In Uzbekistan, the private small mills have been facing significant competition with regard to the purchase of wheat. In Kyrgyzstan, the competition with regard to the sale of flour was assessed as "major" and "very severe competition". Especially small mills perceived it this way. Moreover, milling enterprises in Kyrgyzstan have indicated the presence of informal firms and smuggled goods, the competition with which, according to them, is supposed to be significant. In the case of Uzbekistan, many mills didn't quite answer the question on smuggled goods and informal firms. The crucial difference in the answers

²³ The advanced technology requires certain skills.

regarding the governments' trade and competition policies could be found in the reluctance of mills in Uzbekistan to talk about politics and how comparatively open mills in Kyrgyzstan were with regard to the same questions. Concerning the policy of the government, the major concerns for firms in Kyrgyzstan are competition, volatile prices, corruption, and political instability, while for firms in Uzbekistan, on average, nothing represented an obstacle and regarding corruption, smuggled goods, government's customs and trade regulations, and political instability mills were reluctant to answer. Most likely, they were afraid to mention critical aspects regarding questions on government's policies. This aspect implies necessity of suitable methods when interviewing on issues related to similar inquiries.

Policy implications

The research within the second essay shows that there are some significant constraints regarding the sustainable supply of flour and flour commodities in the observed countries. There are factors, which constrain sufficient supply within the domestic market due to some natural factors. Such natural factors are the soil and the climate in the observed countries, which significantly influence the quality of the grains. Yet there are manageable constraints such as governments' trade policies. Either in the case of protection measures or in the case of liberal trade measures, there are crucial issues that need serious considerations at the governmental level.

Liberal trade policy leads to higher industry competition. Higher industry competition induces the average market price to reduce. This is of advantage for mills, which use grains as inputs in the production of wheat flour and for end consumers, who, normally, consume the processed flour as well as flour products and not the raw grain. Increasing marginal profit per unit of output due to reducing marginal production costs enables business enterprises to acquire newer technology. The latter, in turn, allows for the creation of economies of scale and diversification of products. Thus, the business can be extended and the market share of respective establishments can be increased. Increase in the market share of one business unit might inevitably decrease the market share of another less efficient unit. Eventually, such development may create an oligopolistic or a monopolistic market structure. In an extreme case, such development might even lead to industry dissolution. Such an outcome might have implications for limited supply within the domestic market and even more increased dependency on imports of processed flour as well as flour commodities. Therefore, the governments that don't impose any significant import restrictions, and, therefore, conduct less control of trade flows, might be advised to think of improving policies. Because of the excessive competition, smaller business units might, in an extreme case, disappear completely. Such an outcome might have implications

for limited supply in the future especially in peripheral areas where smaller mills are usually allocated. Acceleration of consolidation among business enterprises might inevitably change the market structure. Eventually, such development might lead about to an oligopolistic market structure where several big firms will function and will presumably be allocated near bigger cities and customer centers, as the previous experience in the USA shows. This situation might create challenges first of all for consumers as well as for producers in the peripheral areas. Consumers will be affected because they will depend on flour deliveries from afar. These, in turn, might be more costly due transportation costs and markups depending on what kind of third party will supply. Producers will also be affected because they would have to transport their output to bigger cities, which again is linked to additional transportation costs and might be time consuming. Because of this they wouldn't be able to market the output right away, which could affect the price and the welfare of producers in general. Therefore, governments under question should think of establishing institutions such as antitrust authorities to control for monopolistic competition and efficient marketing systems across the country. The challenge for the domestic grain processing industry in Kyrgyzstan will, most likely, increase considering Kyrgyzstan's accession into the Eurasian Economic Union in 2015. Further, it appears that unknown third party traders are present and in fact by now it is difficult to say if they operate on an official basis or are just smugglers. Their situation is not entirely clear, because there is no official data regarding them. It is very important that more systematic tracking and research of such third party traders is conducted. Information of such traders is necessary for better assessment of the market and for the role they play in lags in price adjustments and therefore the degree to which prices are formed along the supply chains.

The overall implication for the grain processing industry in Uzbekistan remains in the bygone opportunity costs and the general decline in welfare. Uzbekistan's trade and competition policies do, maybe, to some degree protect domestic producers and intermediary flour suppliers from foreign competition, but this constricts the development within the domestic industry and within milling firms. In such a policy environment no technological advance and therefore no growth in the processing capacity or reduction in average production costs are to be expected. Restrictive trade policy might hurt consumers and even intermediary producers that express preference for certain types of quality of commodities, which, due to some country-specific natural conditions are not producible domestically. The restriction of some grains with certain quality characteristics might have health implications, furthermore, since it is grains with a high protein content that are restricted to import or costly to import because of the import tariffs. Consumers have to eat less-protein flour products, or have to over-pay in order to be able to buy flour products that contain sufficient protein. Other

policy instruments should be worked out that wouldn't hurt either producers or consumers, such as, for example, the development of better seeds and provision, or investment in better technologies. Moreover, mechanisms should be improved that control for efficiency of factors used in production rather than pure quantity. In the long-term these will pay off for sustainable production and general welfare for producers, intermediary suppliers as well as end consumers. Import restrictions, further, might increase the activity of informal markets and smugglers. Smuggled commodities, however, aren't necessarily cheaper when they reach the end consumer and will certainly include all the costs connected with the costs of crossing the border and transportation.

A general policy recommendation for all of the CIS countries is that more control mechanisms of trade flows are needed in order to be able to record smuggled volumes of staples. This is an important issue for a better economic assessment of the current trade situation among the trading parties. In some of the CIS (especially net cereal import-dependent ones) volumes of smuggled commodities are supposed to be so high that they significantly influence the competition in selling flour products and might even have structural implications for the real economy.

3 QUANTITATIVE ANALYSIS OF HETEROGENEOUS EFFECTS OF GRAIN EXPORT POLICIES ON KYRGYZ WHEAT PRODUCERS AND CONSUMERS

Abstract

How did Kazakhstan's export ban on wheat in 2008 and the associated increase in prices for cereals affect producers and consumers of respective commodities in Kyrgyzstan? In this essay a quantitative analysis of demand reactions for cereals and their substitutes is conducted. The analysis is based on the marketed surplus as a function of prices and incomes. Panel data set "Kyrgyz Integrated Household Survey" was used for the analysis. The sample comprises five thousand households per year during eight years. The method is the econometric method of supply-demand functions. The results of the econometric analysis indicate that the wheat export embargo policies as well as the doubling of the real mean prices of cereals and their substitutes had a noticeable heterogeneous effect on agricultural households in the Kyrgyz Republic. In particular, the results indicate for one per cent increase in the prices of the commodities studied an increase in consumption and a decline in production for households that can produce cereal commodities.

3.1 INTRODUCTION

Kyrgyzstan is a small country with an open economy. Since Kazakhstan is the major supplier of grains to Kyrgyzstan, restriction of export of these commodities can influence the food security and general welfare of Kyrgyz consumers. Therefore, the export restriction policies of major net grain exporting countries during the food crisis have raised the question of the effects of such policies on net grain importing countries. Following the food crisis, a number of research studies have been done on different aspects of this issue, however not for Central Asia. Out of five Central Asian countries, Kazakhstan is the only net wheat exporter and is the main supplier of this commodity to its neighbors. The problem with increasing prices for the staples for net grain importers such as Kyrgyzstan has exacerbated when in 2008 Kazakhstan levied an export ban on wheat for the period between 15.04.2008-01.09.2008. Moreover, the mean real prices for wheat and other substitutes, once having been increased, remained stably high over the following years and have never been stabilized at the previous level. Up to date there still is no research on the net impacts of such policies and the associated development of the prices of cereals on producers and consumers in the regional

net grain importing countries. Therefore, this paper aims to close this research gap by conducting a quantitative supply and demand analysis on households, and making an effort in finding the answer to the question: how did Kazakhstan's export embargo on wheat in 2008 and the associated increase in prices for cereals affect producers and consumers of such commodities in Kyrgyzstan?

In this essay the focus lies on Kyrgyzstan, as it is the most open and reform-oriented country out of all other net grain importing countries in the region and the only country that provides representative household panel data. The empirical analysis is based on the "Kyrgyz Integrated Households Survey" (KIHS). This is a panel data set, which is specially designed to study households in a developing country context with detailed inquiries on consumption, expenditures, production, and income. Furthermore, aside from the fact that there is yet no empirical evidence on the effects of Kazakhstan's export embargo on wheat and the associated increase in the prices for cereals and their substitutes in Kyrgyzstan, the motivation to study this problem is justified by the following. Firstly, Kyrgyzstan covers only about two-thirds of its domestic demand for wheat and strongly depends on the imports of wheat and wheat flour, with more than 95 per cent of total imports of wheat coming from Kazakhstan. Secondly, Kyrgyzstan is a developing country where more than 60 per cent of the population lives in rural areas and their livelihood depends mostly on agriculture, which means that households can also produce the commodities studied (FAO, 2016). Thirdly, the prices for cereals in Kyrgyzstan have remained high even after the release of the Kazakh export ban up until 2012, which has implications for lasting welfare effects.

When studying an agricultural country, both demand and supply sides should be taken into account. More importantly, it wouldn't be sufficient to investigate both sides separately based on consumer and producer surpluses like many researchers traditionally do, using the Marshallian or the Hicksian demand functions. A more appropriate analysis would be based on surpluses of respective commodities that might be marketed after households produce and consume them. Coefficients of price and income elasticities of the marketed surplus would give a more accurate response on the net effects of the food inflation on semi-subsistent households that produce agricultural commodities themselves. Clearly, households can change their positions over time from being pure consumers to becoming net producers and vice versa, and change the levels of production and consumption among different commodities. Certainly, the consideration of these factors requires an appropriate methodology.

The outline of the paper is as following. Firstly, the theoretical framework based on agricultural household models will be introduced. This will then be followed by the description of the panel data and the descriptive statistics. Then, after the description of the empirical approach and the econometric analysis, the results of

the analysis will be introduced. In the last part conclusions and policy implications will be discussed.

3.2 THEORETICAL FRAMEWORK

The theories this work refers to are basically agricultural household models. The methodology is heavily drawn from the one developed by BELLEMARE et al. (2013), who combined the theories developed by TURNOVSKY et al. (1980) and SCHMITZ et al. (1981) as well as the empirical framework developed by FINKELSHTAIN & CHALFANT (1991) and BARRETT (1996) (BARRETT, 1996; MARC F. BELLEMARE et al., 2013; FINKELSHTAIN & CHALFANT, 1991; SCHMITZ et al., 1981; TURNOVSKY et al., 1980). More precisely, BELLEMARE et al. (2013) have developed an advanced methodology, which measures heterogeneous welfare effects based on coefficients of risk aversion by automatically assuming that agricultural producers are risk averse, which they obtain from coefficients of price and income elasticities of marketed surplus in a multiple equation system. These authors have devoted their attention mainly to the impacts of price volatility of agricultural commodities on consumers and producers combined. Particularly, their main research problem was if and how agricultural households gain or lose from price stabilization policies. In order to conduct an appropriate welfare analysis they have deviated from the conventional consumer and producer surplus theories and have used the concept of risk aversion, which is based on the cardinal utility functions. The latter is supposed to provide more precise welfare impacts of price stabilization policies. As Kyrgyzstan did not implement any price stabilization measures, this research focuses on the implications of the reduced supply of wheat as a result of the export ban and the associated increase in prices for cereals and their substitutes. Therefore, only a part of the methodology discussed above will be used, most particularly the one where the authors derive coefficients of price and income elasticities of marketed surplus for multiple commodities in a multiple commodity equation model.

If a country-exporter bans the export of a certain commodity, the price for that commodity in the importing country must rise, assuming this is the only source of import for the importing side and holding the production constant. Further, the demand for that commodity in the importing country must fall, assuming it is a normal good. It is, furthermore, expected that the demand for substitutes of that good will increase and therefore their prices. If the exporting country trades at world prices, the importing country imports at world prices too. Such a situation has implications for both producers as well as consumers in both countries. Within the framework of this essay the interest lies in the economic outcomes for the importing side. It is theoretically expected that domestic producers produce more or sell more due to the price effect, holding the prices on the factor markets and the demand elasticity constant, and domestic consumers ought to consume less of that commodity and buy more of other foodstuffs.

In reality, however, it is not always the case. For example, in the 1990s the selling prices for maize in Zambia increased through trade liberalization and it was expected that the output would increase too. However, the input prices rose even more and the maize production fell (WINTER, 2002).

The agricultural household model developed by SINGH et al. (1986) takes into consideration the fact that agricultural households differ from pure consumers in such a way that they can produce different commodities and can decide how much of them to produce and to consume over different periods of time. Moreover, they can switch positions over time from being net sellers, net buyers, or autarkic in regard to respective commodities. This fact allows one to summarize the demand and the supply factors in one single variable – the marketed surplus. Such surplus is what is left after households produced commodities and consumed them. The final behavioral equation of the theoretical model represents the indirect utility obtained by households from the marketed surplus that is defined over income and vector of prices of respective commodities.

For more details about the theory this paper leans on see the corresponding appendix supplementary to the article by BELLEMARE et al. (2013). In short, the theoretical model implies that a representative agricultural household can be a consumer, a producer, or both at the same time and can switch position over time. Households' preferences, further, are determined by the von Neumann-Morgenstern utility function and are defined through consumption and production of a vector of commodities. Households are endowed by land and labor and constrained by time and income. Considering all endowments and constraints, households eventually maximize their utility function subject to their budget constraint. The theory predicts that when prices for agricultural commodities increase, households produce more and consume less of those commodities in order to be able to sell the surplus that is left at the market.

When confronting the established theories with real situations some special characteristics of certain cases must be taken into account. One of the special features of Kyrgyzstan's wheat sector is captured in the constant decline of the production and increase of the imports of this commodity. Regarding the theoretical implications of the production side, it is important not to leave out of sight the following issues. Primarily, the supply elasticity of wheat depends on the marginal profit and the price. In the optimum, it is predicted that producers supply more whenever the marginal profit increases. When the price for wheat increases, and is not necessarily volatile, it should give producers an additional incentive to produce more and sell more. If the marginal profit obtained in the period before the inflation is the same during the inflation, there is no guarantee that producers will produce more. In the least possible case they will remain at the same production level. If they foresee that output prices will increase and so the input prices,

however they have left some buffer stock from the previous harvest and therefore had foregone the possible profit, they might act strictly rationally and produce and sell more in the future period (RENKOW, 1990).

In terms of consumption it is pretty straightforward. Namely, all of the commodities observed in this study represent the most important foodstuff in the diet of the population in Kyrgyzstan, which leads one to believe that the demand for those commodities is relatively inelastic. Moreover, the income of the population has been increasing significantly due to remittances (RATHA et al., 2015). SINGH et al. (1986) indicate wealth effects on consumption resulting from the impact of price changes on farm profits. Their theoretical work demonstrates that under certain circumstances these wealth effects might be large enough to induce positive own-price demand response and negative marketed surplus response (SINGH et al., 1986). "Consumption and labor-supply depend on both prices and income, and, although prices are fixed by assumption, income is determined, at least to some extent, by the household's profits from its farming activities. Thus, production decisions determine farm profits, which are a component of household income, which in turn influences consumption and labor supply decisions. This one-way relation between production on the one hand and consumption and labor supply on the other hand is known as the profit effect" (SINGH et al., 1986, p. 7).

3.3 EMPIRICAL FRAMEWORK

3.3.1 Description of the data set

The analysis is based on the KIHS – an integrated²⁴ panel data set, which has been conducted since 2003 with a slightly different methodology used since 2005. There is no comparable data set in all Central Asia. The uniqueness of the data set lies in the fact that it focuses on the most important indicators of households' welfare within the developing country context.

Around five thousand households have been surveyed annually on such economic parameters as food- and non-food expenditures, agricultural and livestock production, income, employment etc. Since it is a rotating panel data set, about one-fourth of all households have been replaced each year. The sample is divided into 16 strata and entails urban as well as rural populations of the seven oblasts (regions) as well as the capital Bishkek and the city Osh.

In the subsection on food expenditures every household fills in a diary on food expenditures where they indicate the amount of each commodity bought and the amount of money spent covering more than 350 products for two weeks on a quarterly basis. The number of commodities has been reducing over the

²⁴ "Integrated" means that survey combines households, budget, and labor force.

years along with an improvement in the methodology and experience based on the frequencies of commodities mentioned by households. In the year 2012 about 250 commodities were given for choice in the questionnaire. On the agricultural production side households fill in diaries quarterly on how much of which commodity was produced and consumed. There are around 60-70 commodities in the production module of the data set. Since the inquiry has been designed mainly for consumption and expenditure parameters, there is no information on, for example, inputs used in production.

The panel data set is in general reliable, however not perfect. For example, the so called "basic and general information" on the place of living, the age, and the number of household members and their education, firstly, has been collected separately from other modules of the data set, secondly, not for each year, and, thirdly, observations match only partly with the modules of the KIHS within the same year. This way of collecting the data limits the possibility for the research to conduct an integrated analysis that requires matching the above-mentioned parameters with other modules of the KIHS. Further, the data set is heavily oriented on studying households in developing countries with a focus on expenditures and consumption. A large share of populations in such countries is, however, agricultural. Despite this, the data set does not comprise any information whatsoever on the inputs used in agricultural production. In fact, households indicate only the amount of commodities produced. This fact represents significant limitation for the study of agricultural production-related questions. Further, the income in the year 2007 was collected differently than in all other years. Namely, whereas in all other years households fill in the amount of the income per household earned on a quarterly basis, in 2007 households filled in the total income earned per household in that year. This fact limits the possibility of studying households involving income in 2007 on a quarterly basis. Another important limitation regards the way commodities in the data set have been numbered. It is very time consuming to find the same commodities (on average 300) across different years while their numbers vary from year to year.

The prices have been attained by dividing the amount of money paid (all in the national currency Som) by the amount bought (all in kilograms) by each household in each period of time²⁵. The following commodities are included in the analysis: wheat, wheat flour, rice, barley groats, and potatoes. Further, in the descriptive statistics, different breads and noodles are included, which can't be produced by agricultural households, but do represent substitutes in terms of consumption.

²⁵ Prices are based on consumption expenditures.

The mean real prices for commodities have increased after 2008 and remained at about the same level at least until 2012. Moreover, the prices have been highly volatile. The standard deviation for wheat, for instance, was during 2005-2007 around 3 per cent, and during 2008-2012 around 14 per cent. The real mean prices for wheat, wheat flour, rice, and all types of breads and macaroni products have doubled between the two periods (Table 8). Furthermore, the prices varied significantly within the different regions. One of the explanations could be the differences in quality and hence prices. The data set, however, doesn't provide any information on quality issues making it impossible to assess the hedonic prices for the observed commodities. Another explanation for such differences could lie in the poor integration of the markets within the country. Aside from the strong confidence regarding the domination of the world prices for agricultural commodities in the country based on the fact that the country is to a significant degree involved in international trade, there is also the possibility of the existence of markets that are highly isolated from big cities where households supply local markets with their own production prior to having had any contact to outside markets. Furthermore, very often, agricultural producers sell their output in bulk at a determined aggregated price (not always the market price). This is mostly the case for relatives, friends, and neighbors. This argumentation would explain the existence of comparatively low prices even during the food price inflation. For example, GRAFE et al. (2008) investigated the intra-regional trade in Central Asia based on the regional disaggregated consumption price indices for food- and non-food goods and the price survey data. They found that the price variations across regions within one country are just as large as variations across the countries (GRAFE et al., 2008).

Table 8: Descriptive statistics for commodity real prices in Som per kilogram

Commodity	2005-2007			2008-2012		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
Wheat flour	7,837	10.88	2.26	18,500	20.26	4.73
Wheat	322	18.27	3.21	925	35.99	14.11
Wheat groats	106	17.17	4.09	157	32.87	16.47
Buckwheat	3,701	29.82	4.32	10,638	51.28	25.33
Barley groats	593	15.19	7.07	913	25.77	7.95
Semolina	979	22.51	7.84	2,570	41.64	14.82
Rice	9,079	28.95	4.62	22,517	55.09	16.49
Potatoes	7,240	9.66	3.62	17,844	13.82	4.43
Rye bread	838	17.70	3.96	1,500	45.72	17.82
White bread	4,351	14.55	2.42	9,578	30.87	7.32
Flatbread	3,476	16.77	2.61	5,474	33.91	8.63
Macaroni	5,521	16.94	3.94	13,479	34.99	9.15
Vermicelli	4,375	16.41	3.75	9,730	33.87	8.848
Noodles	5,179	17.95	4.13	11,409	37.20	9.95
Pasta	5,799	16.11	3.04	12,956	33.57	8.86

Source: KIHS, 2012.

The income is available on a quarterly basis with indication to different sources (Table 9). The income is given on a per household basis and not on a per capita basis. It means that a household indicates the total amount of income earned by all members of the household combined on a quarterly basis. In total, there are about 40-45 income sources from the on- and off-farm work, social benefits, in-kind income, income from work outside the country, and financial help from relatives and friends (just to name the most frequently indicated ones). Incomes varied significantly among the households. The households that indicated significantly high incomes explained it by the sale of houses or other expensive estates. Certainly, the prices and the income are adjusted to the consumer price index given in the Statistical Committee of the Kyrgyz Republic.

Table 9: Descriptive statistics for annual real income in Som

Year	Obs.	Mean	Std. Dev.	Min.	Max.
2005	5,003	33856.69	29664.31	145.7335	876632.8
2006	5,000	37872.21	37309.25	75.09882	965774.7
2008	4,998	59917.31	47697.74	154.233	443728.4
2009	5,006	81983.52	61842.86	445.7478	861722.4
2010	5,009	89393.05	64862.79	512.0773	887225.1
2011	5,007	100060.6	69474.37	343.778	1078231
2012	5,012	128447.2	84873.83	259.8985	784113.7

Source: KIHS, 2012.

The tables depicting descriptive statistics include all net sellers as well as net buyers of the cereal commodities. However, only households that could produce and consume observed commodities were included in the econometric estimations. On the production side there were only five (wheat, barley groats, wheat flour, rice, potatoes) commodities that match with the commodities given on the consumption side and included in the econometric estimations. On the consumption side alone there were sixteen (wheat flour, wheat, rice, potatoes, wheat groats, barley groats, buckwheat, semolina, rye bread, white bread, flatbread, macaroni, vermicelli, noodles, pasta, lagman) commodities, which are included in the descriptive statistics.

The Tables 10-13 present descriptive statistics of the marketed surpluses of all observed commodities for the net sellers in 2005-2006 and 2008-2012, respectively, which were obtained by extracting the total consumption from the total production for each household in each period of time. There are two samples: the first sample includes observations before the export ban, and the second sample includes observations after the export ban. In addition to this, it is worth mentioning that the analysis represents an investigation of potentially new market equilibrium in the period after the export ban. Moreover, the first sample encompasses two panel observations and there are five panel observations in the second sample. A positive mean marketed surplus indicates that an average household is a net seller of the observed commodity, and a negative mean marketed surplus indicates that an average household is a net buyer of the observed commodity.

The mean marketed surpluses of wheat, wheat flour, and rice demonstrate a clear decline in the second period compared to the first period. On the contrary, the mean marketed surpluses of barley groats and potatoes increased in the second period. The descriptive statistics of the marketed surpluses for net buyers show that the consumption of wheat flour, potatoes, and wheat groats increased in the second period and that of white bread decreased. The mean marketed surpluses of different breads and pasta products don't seem to have changed much between the two periods, constituting on average about five kilograms of different breads per household for two weeks a month and about two kilograms of different pasta products per household for the same period of time. Other cereals like wheat groats, barley groats, semolina, and buckwheat are less consumed ones, but still do represent direct substitutes for other cereals (the reason why they were included in the descriptive statistics).

In contrast to all other observed commodities, potatoes are widely produced by households in Kyrgyzstan. This is due to the fact that it is less complicated to grow potatoes than, for example, wheat. Moreover, the price of this commodity is the cheapest among its substitutes and in Kyrgyzstan it is very common that

potatoes are used in almost every food and very often even together with flour products. The production of wheat and wheat flour has generally been declining. Therefore, the statistics of the marketed surpluses for net sellers just verify this phenomenon. Rice represents, in general, an imported commodity and is produced in insignificant amounts and mostly only in the southern part of the country, where the climate is warmer. However, rice represents a very important food-stuff which is a substitute for other cereals and the demand for which is almost inelastic. In terms of consumption, one of the reasons for the increase in the demand for wheat flour and decrease in the demand for white bread (according to the descriptive statistics of marketed surpluses of respective commodities for net buyers), might lie in the higher substitution effect between wheat flour and white bread, which is also made from wheat flour and is the most widely consumed bread. This can be explained by people buying more of wheat flour and less of white bread and baking at home, since buying white bread is on average more costly than buying wheat flour.

Table 10: Descriptive statistics of marketed surplus for net sellers in 2005-2006 in kilogram

Commodity	Obs.	Mean	Std. Dev.	Min.	Max.
Wheat	1,223	2654.474	3580.666	20.01	40000
Wheat flour	783	179.4922	544.1765	.0299988	13900
Rice	55	829.8655	2691.448	9.990005	19740
Barley groats	16	89.03125	98.43246	30	450
Potatoes	3,380	1255.776	2426.575	.0099983	26960.01

Source: KIHS, 2012.

Table 11: Descriptive statistics of marketed surplus for net sellers in 2008-2012 in kilogram

Commodity	Obs.	Mean	Std. Dev.	Min.	Max.
Wheat	2,041	2340.617	2332.093	14.01	30000
Wheat flour	1,209	154.63	170.7993	.0300293	1451.01
Rice	167	407.5032	522.7929	2.49	4530
Barley groats	23	180.6591	431.9815	10.02	1980
Potatoes	8,218	1625.912	3341.481	.0000153	52780

Source: KIHS, 2012.

Table 12: Descriptive statistics of marketed surplus for net buyers in 2005-2006 in kilogram

Commodity	Obs.	Mean	Std. Dev.	Min.	Max.
Wheat flour	7,837	-76.54647	65.82123	-900	-.5
Wheat	322	-1.575621	1.393332	-13	-.5
Rice	9,079	-6.676613	6.733221	-205	-.33
Potatoes	7,240	-23.89487	33.52593	-1010	-.5
Wheat groats	106	-1.463208	1.351706	-10	-.3
Barley groats	593	-1.468752	1.147669	-10	-.05
Buckwheat	3,701	-2.02539	1.466196	-23	-.4
Semolina	979	-1.141297	.7514967	-6.3	-.2
Rye bread	838	-3.649469	4.587431	-63.6	-.25
White bread	4,351	-17.71624	17.80627	-168	-.2
Flatbread	3,476	-9.790711	14.98589	-203.75	-.1
Macaroni	5,521	-5.842529	5.011229	-45	-.4
Vermicelli	4,375	-3.119463	2.762615	-60	-.3
Noodles	5,179	-2.953962	2.957673	-41	-.2
Pasta	5,799	-4.582023	3.884548	-55	-.4
Lagman	230	-1.149565	.5737145	-4	-.1

Source: KIHS, 2012.

Table 13: Descriptive statistics of marketed surplus for net buyers in 2008-2012 in kilogram

Commodity	Obs.	Mean	Std. Dev.	Min.	Max.
Wheat flour	18,500	-95.24648	71.17223	-815	-.4
Wheat	925	-1.579514	1.874858	-27	-.3
Rice	22,517	-6.947741	6.786665	-145	-.2
Potatoes	17,844	-24.40982	31.22389	-625	-.5
Wheat groats	157	-3.063567	10.22959	-100	-.3
Barley groats	913	-1.561555	1.644125	-25	-.3
Buckwheat	10,638	-2.320346	1.767473	-25	-.1
Semolina	2,570	-1.124535	.879265	-12	-.15
Rye bread	1,500	-3.279917	4.131307	-50	-.2
White bread	9,578	-15.76623	14.7547	-300	-.2
Flatbread	5,474	-9.342255	12.1042	-137	-.2
Macaroni	13,479	-5.569342	4.509999	-52	-.25
Vermicelli	9,730	-3.413777	3.01969	-56	-.2
Noodles	11,409	-3.125308	3.062124	-45.5	-.14
Pasta	12,956	-4.845553	4.008305	-47	-.3
Lagman	1,243	-1.461118	1.057723	-12	-.3

Source: KIHS, 2012.

3.3.2 Empirical specification of market surplus functions

In this section the empirical approach will be introduced briefly. Price as well as income elasticities of marketed surpluses of various cereal commodities will be estimated. For each household the marketed surpluses of the observed commodities can be positive, zero, or negative, depending on whether the households are net buyers, net sellers, or autarkic. For each observed commodity a reduced form regression of the marketed surplus of that commodity as a function of the output prices of all observed commodities and household's income will be estimated. The following function for commodities will be estimated, where the dependent variable is the marketed surplus of each commodity:

$$M_{iklt}^* = \alpha_i + \varepsilon_{ij} \sum_{j=1}^n p_{kjlt}^* + \eta_i y_{klt}^* + v_{iklt}$$

where variables with an asterisk (*) were transformed to the inverse hyperbolic sine transformation – a logarithmic transformation, which keeps negative as well as zero-valued observations and which can be interpreted as coefficients of elasticities (BURBIDGE et al., 1988; MACKINNON & MAGEE, 1990; MOSS & SHONKWILER, 1993; PENCE, 2006). In the function i is for certain commodity, k is the household, l is the region (oblast), and t is the round; y is the household income; p_j is a vector of prices of all (observed) commodities (including i); and v is a mean zero, iid error term. All cereal commodities (by households producible) given in the data set for both periods are estimated by the "Seemingly Unrelated Regression Equations" (SURE). The SURE is a generalization of a linear regression model, where dependent variables are regressed by the same regressors. The "Feasible Generalized Least Squares" (FGLS) of the SURE, which have a specific form of variance-covariance matrix and which are widely used in the empirical analysis of firms and households²⁶, provide efficiency by error terms being correlated across the equations.

The model should comprise at least two periods where households make their production and consumption decisions in the subsequent period while having knowledge of the prices from the previous period. Since the prices for cereals increased after 2008 and remained at about the same level at least until 2012, there will be two periods: 2005-2006 and 2008-2012. Of course, the decision based on the information from the previous period is independent of the export embargo, since each year farmers decide how much to plant based on last year's prices. The substitution on the consumption side, however, is supposed to be easier than on the production side (at least after the planting season).

²⁶ Feasible Generalized Least Squares provide more efficiency for large samples, which is the case here, rather than the Ordinary Least Squares.

3.4 RESULTS OF THE ECONOMETRIC ANALYSIS

Table 14 and Table 15 present matrices of coefficients of price and income elasticities for the marketed surpluses of all observed commodities, which were obtained with the random effects estimator. The sample includes all households in all years that could produce and consume the observed commodities. The on-diagonal coefficients introduce the own-price elasticities of the respective commodities, whereas the off-diagonal coefficients indicate the cross-price elasticities.

The coefficients of price and income elasticities are to be interpreted the following way: for example, for a 1 per cent increase in the price of wheat, the marketed surplus of this commodity in the first period decreased to -.456 per cent. The results of the econometric analysis indicate two very important issues. First, the own-price elasticities of all commodities in both periods, except for barley groats²⁷, are negative. This means, for a 1 per cent increase in the prices of almost all commodities included in the econometric analysis, their marketed surpluses decreased in both periods independent of export ban. This goes against the conventional wisdom that the marketed surplus should increase if the price of the commodity increases due to "consume less – sell more". Assuming a threshold of 5 per cent, the estimated coefficient of barley groats in both periods and that of rice in the second period is positive, although not statistically different from zero.

Regarding the coefficients of income elasticities of the marketed surpluses, all of the commodities have positive signs. In other words, for a 1 per cent increase in income, the marketed surpluses of almost all of the producible commodities increased. It means that when the income increases, producers sell more and consumers consume less. Consumers, because of higher income they can diversify their diet by buying more of other high-value products and, therefore, reduce the consumption of the staples. This result satisfies expectations and is also theoretically justified.

The second important aspect is encompassed in the result that demonstrates lower own-price elasticities of the marketed surpluses of wheat, wheat flour, and potatoes in the second period. For wheat flour it is almost two times low: -.318 per cent in the first period and -.185 per cent in the second period. Such a result implies that there has been a significant effect on agricultural households. Regarding the income elasticity of the marketed surplus, the commodity wheat shows a noticeable difference between the two periods. It is positive .469 per cent in the first period and .182 per cent in the second period. It means that in the first

²⁷ The production of barley has an increasing trend (Statistical Committee of the Kyrgyz Republic).

period, for a 1 per cent increase in the income of agricultural households, the marketed surplus of wheat increased more than it did in the second period.

Table 14: Marketable surplus equation estimates in 2005-2006
Dependent variables: Marketable surplus of each commodity
(n = 3560)

Price	Wheat	Barleyg	Wheat flour	Rice	Potatoes
Wheat	-.456*** (0.010)	.003 (0.050)	-.013 (0.016)	-.011 (0.071)	-.170* (0.076)
Barleyg	-.133*** (0.007)	.002 (0.035)	-.175*** (0.012)	-.015 (0.051)	.042 (0.055)
Wheat flour	-.733*** (0.003)	-.005 (0.017)	-.318*** (0.006)	-.006 (0.024)	.288*** (0.027)
Rice	.057*** (0.003)	-.001 (0.016)	.068*** (0.005)	-.007 (0.023)	-.035 (0.025)
Potatoes	.088*** (0.003)	-.003 (0.017)	-.060*** (0.006)	.026 (0.025)	-.674*** (0.028)
Income	.469*** (0.001)	.002 (0.008)	.186*** (0.003)	.006 (0.011)	.668*** (0.013)

Notes: * p<.05; ** p<.01; *** p<.001. Own price elasticities are in bold. Standard errors are in parentheses.

Table 15: Marketable surplus equation estimates in 2008-2012
Dependent variables: Marketable surplus of each commodity
(n = 8815)

Price	Wheat	Barleyg	Wheat flour	Rice	Potatoes
Wheat	-.347*** (0.025)	.001 (0.002)	-.047** (0.017)	.000 (0.006)	-.013 (0.028)
Barleyg	-.034 (0.021)	.002 (0.002)	-.030* (0.015)	-.002 (0.005)	.300*** (0.024)
Wheat flour	-.507*** (0.012)	.001 (0.001)	-.185*** (0.008)	.003 (0.003)	.139*** (0.013)
Rice	.258*** (0.011)	.000 (0.001)	.062*** (0.008)	.000 (0.003)	.082*** (0.013)
Potatoes	.227*** (0.012)	.001 (0.001)	.044*** (0.008)	.015*** (0.003)	-.412*** (0.014)
Income	.182*** (0.007)	.000 (0.000)	.057*** (0.004)	-.001 (0.001)	.485*** (0.007)

Notes: * p<.05; ** p<.01; *** p<.001. Own price elasticities are in bold. Standard errors are in parentheses.

3.5 CONCLUSIONS

This work contributes to the academic debate around the food crisis by conducting a quantitative analysis of the impacts of Kazakhstan's wheat export restriction policies and the long-term increase in the prices for the staple foods in the following years on Kyrgyz agricultural households. In particular, price and income elasticities as a function of marketed surpluses for diverse cereal commodities were estimated. The results obtained contradict some theoretical expectations, but also prove some general developments occurring in transition economies. Namely, to begin with the theoretical assumption, when the price of a certain commodity increases, the marketed surplus of that commodity must also increase due to a "consume less – produce more". This wasn't exactly the case for Kyrgyzstan. In particular, the results of the econometric analysis reveal that almost all observed commodities have negative coefficients of the price elasticity of their marketed surpluses not only after the export ban but also before that. I am inclined to believe that there are effects on the production as well as on the consumption sides.

Firstly, the production of almost all of those commodities has been declining except that of barley groats²⁸. The production of barley has been increasing and the price elasticity of the marketed surplus of barley groats is positive in both periods, although not significantly different from zero. Secondly, since the country has an open economy, the prices for inputs must have been increasing along with other food prices with no risk for the endogeneity of prices. As already mentioned in the theoretical part, the decision to produce or not to produce depends not only on the prices. The production decision mostly depends on the marginal profit and producers can normally adjust to new prices on a seasonal basis. If the marginal profit doesn't change or diminishes with the increase in the prices for those commodities, it is not guaranteed that producers will produce more. Quite to the contrary, it is possible that less output will be produced. Thirdly, the increase in the income within the country is significant. It is most likely due to migrants' remittances. Accordingly, there might have been a wealth effect: when incomes of agricultural producers increase they might produce less. Finally, and most importantly, at the macroeconomic level such results imply that the country is still in the process of transition with the on-going processes of declining agriculture and increasing urbanization.

Effects on the consumption side can be as follows. For example, when the prices for food commodities increase, they increase normally for many commodities at a time. Since cereals were studied, it is possible, and also theoretically expected,

²⁸ Please see the statistical data provided by the National Statistical Committee of the Kyrgyz Republic.

that the consumption of commodities other than the staples might be reduced and that of the staples increased. The income elasticities of the marketed surpluses of the observed commodities represent positive signs for all commodities in both periods. This means, when the income increases, producers sell more and consume less, which is theoretically expected and justified.

The results reveal that the export embargo on wheat and the long-term increase in the prices for cereals have affected agricultural households in the net grain importing country to different degrees. Producers, because they clearly don't produce and sell more even if the prices go up, and, consumers, because they might even consume more of these commodities, since these are the staples. In order to assess the welfare impact, one would have to extend this research and consider all other food commodities given in the data set, since theoretically it is expected that the demand for other foods must fall with the increase in the consumption of the staples, but this is left for future research.

Policy implications

The transition process is connected with heterogeneous developments within agricultural segments of populations in such economies and provides therefore diverse reactions to the sudden increase in the prices for food commodities.

The demand for staples in developing countries is, in general, relatively inelastic. In a situation of food crisis the demand for staples might increase even more as a result of the substitution effect, since, normally, prices for other food commodities increase too. Such an incident might put even more pressure on the development of prices in domestic as well as international markets. It is crucial, therefore, for national governments to provide a painless transition from agriculture to industrialization, and to provide assistance for the sustainability of those farm households that stay in agriculture. Semi-subsistent households should be the primary targets for assistance at the governmental level and not only during crises, since this is the segment of the population that is on the verge of the transition. Agricultural households in developing countries cannot respond by producing, as is normally expected, due to diverse reasons discussed in the conclusion and they might even respond with an increased consumption of the staples during significant food inflations. Therefore, long-term policy measures should be worked out to ensure efficient use of lands suitable for agricultural production, access to credits for farmers and farm households at lower interest rates and better policy measures for small farm households for sustainable and effective agricultural growth. In the short-term, institutions are needed that can provide stabilization mechanisms and are in place prior to such price shocks associated with the reduced supply of agricultural food commodities.

REFERENCES

- ABBOTT, P. C. (2009): Development dimensions of high food prices. *OECD Food, Agriculture and Fisheries Working Papers, Working Paper No. 18*.
- ABBOTT, P. C. (2011): Export restrictions as stabilization responses to food crisis. *American Journal of Agricultural Economics*, 94 (2): 428-434.
- ABBOTT, P. C., HURT, C., TYNER, W. E. (2011): What's driving food prices in 2011? *Farm Foundation Issue Report, Working Paper No. 112927*.
- ABUGALIEVA, A., PENA, R. J. (2010): Grain quality of spring and winter wheat of Kazakhstan. *The Asian and Australasian Journal of Plant Science and Biotechnology*, 4 (1): 87-90.
- AKSOY, A. M., HOEKMAN, B. (2010): Food prices and rural poverty. *Working Paper No. 66677*.
- ANDERSON, J. E., VAN WINCOOP, E. (2003): Gravity with Gravitas: A Solution to the Border Puzzle. *The American Economic Review*, 93 (1): 170-192.
- BABIHUGA, R., GELOS, G. (2009): Commodity prices: Their impact on inflation in Uruguay. *Selected Issues. IMF Staff Country Report 2008, Working Paper No. 09/103*.
- BABU, S., PINSTRUP-ANDERSEN, P. (2000): Achieving food security in Central Asia – Current challenges and policy research needs. *Food Policy*, 25 (6): 629-635.
- BABU, S., REIDHEAD, W. (2000): Poverty, food security, and nutrition in Central Asia: A case study of the Kyrgyz Republic. *Food Policy*, 25 (6): 647-660.
- BABU, S., TASHMATOV, A. (1999): Attaining food security in Central Asia – Emerging issues and challenges for policy research. *Food Policy*, 24 (4): 357-362.
- BAHGAT, G. (2007): Central Asia and energy security. *Asian Affairs*, 37 (1): 1-16.
- BAIN, J. S. (1949): A note on pricing in monopoly and oligopoly. *The American Economic Review*, 39 (2): 448-464.
- BALTZER, K., HANSEN, H., LIND, K. M. (2008): A note on the causes and consequences of the rapidly increasing international food prices. Research Report of the Institute of Food and Resource Economics of the University of Copenhagen.
- BARRETT, C. B. (1996): On price risk and the inverse farm size – Productivity relationship. *Journal of Development Economics*, 51 (2): 193-215.
- BELLEMARE, M. F. (2011): Rising food prices, food price volatility, and political unrest. *MPRA Paper, Working Paper No. 31888*.
- BELLEMARE, M. F., BARRETT, C. B., JUST, D. R. (2013): The welfare impacts of commodity price volatility: Evidence from rural Ethiopia. *American Journal of Agricultural Economics*, 95 (4): 877-899.
- BERMAN, I. (2010): The new battleground: Central Asia and the Caucasus. *The Washington Quarterly*, 28 (1): 59-69.

- BLANK, S. (2012): Whither the new great game in Central Asia: New geopolitics, old regional order. *International Affairs*, 80 (3): 485-502.
- BLOCH, H. (1974): Prices, costs, and profits in Canadian Manufacturing: The influence of tariffs and concentration. *Canadian Journal of Economics*, 7 (4): 594-610.
- BLUMENTHAL, C. S., BARLOW, E. W., WRIGLEY, C. W. (1993): Growth environment and wheat quality: The effect of heat stress on dough properties and gluten proteins. *Journal of Cereal Science*, 18 (1): 3-21.
- BOEHLJE, M. (1999): Structural changes in the agricultural industries: How do we measure, analyze and understand them? *American Journal of Agricultural Economics*, 81 (5): 1028-1041.
- BOHR, A. (2010): Regionalism in Central Asia: New geopolitics, old regional order. *International Affairs*, 80 (3): 485-502.
- BRZEZINSKI, Z. (1997): The grand chessboard: American primacy and its geostrategic imperatives (1 ed.). New York, USA: Basic Books.
- BURBIDGE, J. B., MAGEE, L., ROBB, L. A. (1988): Alternative transformations to handle extreme values of the dependent variable. *Journal of the American Statistical Association*, 83 (401): 123-127.
- CHAND, R. (2008): The global food crisis: Causes, severity and outlook. *Economic and Political Weekly*, 43 (26/27): 115-122.
- CONOLLY, A. (1834): Journey to the North of India through Russia, Persia and Afghanistan (Vol. 1 & 2). New Delhi, India: Reprint: Laurier Books Ltd.
- DE JANVRY, A., SADOULET, E. (2008): The global food crisis: Identification of the vulnerable and policy responses. *Agriculture and Resource Economics Update*, 12 (2): 18-21.
- DE JANVRY, A., SADOULET, E. (2010): The global food crisis and Guatemala: What crisis and for whom? *World Development*, 38 (9): 1328-1339.
- DEMEKE, M., PANGRAZIO, G., MAETZ, M. (2009): Country responses to the food security crisis: Nature and preliminary implications of the policies pursued. FAO Initiative on Soaring Food Prices.
- DESSUS, S., HERRERA, S., DE HOYOS, R. (2008): The impact of food inflation on urban poverty and its monetary cost: Some back-of-the-envelope calculations. *Agricultural Economics*, 39 (s1): 417-429.
- DJURIC, I., GOETZ, L., GLAUBEN, T. (2015): Are export restrictions an effective instrument to insulate domestic prices against skyrocketing world market prices? The wheat export ban in Serbia. *Agribusiness*, 31 (2): 215-228.
- DOWNIE, J. (1958): The competitive process. London, UK: Duckworth.
- EBRD. (2012): Transition report 2012. Integration across borders. Retrieved from <http://passthrough.fw-notify.net/static/953750/downloader.html>.
- ENTZ, M. H., FOWLER, D. B. (1989): Response of winter wheat to N and water: Growth, water use, yield and grain protein. *Canadian Journal of Plant Sciences*, 69 (4): 1135-1147.
- ESPOSITO, L., ESPOSITO, F. F. (1971): Foreign competition and domestic industry profitability. *The Review of Economics and Statistics*, 53 (4): 343-353.
- FAO (2013): Agriculture and trade policy background note: Russia. *Trade Policy Brief*.

- FAO (2015): Biannual report on global food markets. FAO Food Outlook.
- FAO (2015a): FAO food price index. Retrieved from <http://faostat3.fao.org>.
- FAO (2016): FAO country profile Kyrgyzstan. Retrieved from <http://www.fao.org/countryprofiles/index/en/?iso3=kgz>.
- FAOSTAT (2015b): FAOSTAT/Production/Crops. Retrieved from <http://faostat3.fao.org>.
- FAOSTAT (2015c): FAOSTAT/Trade/Crops and livestock products. Retrieved from <http://faostat3.fao.org>.
- FAOSTAT (2015d): FAOSTAT/Prices/Exporters. Retrieved from <http://faostat3.fao.org>.
- FAOSTAT (2015e): FAOSTAT/Prices/Caucasus. Retrieved from <http://faostat3.fao.org>.
- FAOSTAT (2015f): FAOSTAT/Prices/Central Asia. Retrieved from <http://faostat3.fao.org>.
- FAOSTAT (2015g): FAOSTAT/Trade/Crops and livestock products/Armenia. Retrieved from <http://faostat.fao.org/>.
- FAOSTAT (2015h): FAOSTAT/Trade/Crops and livestock products/Kyrgyzstan. Retrieved from <http://faostat.fao.org/>.
- FAOSTAT (2015i): FAOSTAT/Trade/Crops and livestock products/Tajikistan. Retrieved from <http://faostat.fao.org/>.
- FAOSTAT (2015j): FAOSTAT/Trade/Crops and livestock products/Azerbaijan. Retrieved from <http://faostat.fao.org/>.
- FAOSTAT (2015k): FAOSTAT/Trade/Crops and livestock products/Georgia. Retrieved from <http://faostat.fao.org/>.
- FAOSTAT (2015l): FAOSTAT/Trade/Crops and livestock products/Turkmenistan. Retrieved from <http://faostat.fao.org/>.
- FAOSTAT (2015m): FAOSTAT/Trade/Crops and livestock products/Uzbekistan. Retrieved from <http://faostat.fao.org/>.
- FELLMANN, T., HELAINE, S., NEKHAY, O. (2014): Harvest failures, temporary export restrictions and global food security: The example of limited grain exports from Russia, Ukraine and Kazakhstan. *Food Security*, 6 (5): 727-742.
- FINKELSHTAIN, I., CHALFANT, J. A. (1991): Marketed surplus under risk: Do peasants agree with Sandmo? *American Journal of Agricultural Economics*, 73 (3): 557-567.
- FOWLER, D. B. (2003): Crop nitrogen demand and grain protein concentration of spring and winter wheat. *Agronomy Journal*, 95 (2): 260-265.
- GAFAROVA, G., PEREKHOZHUK, O., GLAUBEN, T. (2015): Price discrimination and pricing-to-market behavior of Black Sea region wheat exporters. *Journal of Agricultural and Applied Economics*, 47 (3): 287-316.
- GILBERT, C. L. (2010): How to understand high food prices. *Journal of Agricultural Economics*, 61 (2): 398-425.
- GOETZ, L., GLAUBEN, T., BRÜMMER, B. (2013): Wheat export restrictions and domestic market effects in Russia and Ukraine during the food crisis. *Food Policy*, 38 (1): 214-226.

- GRAFE, C., RAISER, M., SAKATSUME, T. (2008): Beyond borders – Reconsidering regional trade in Central Asia. *Journal of Comparative Economics*, 36 (3): 453-466.
- HEADEY, D. (2011): Rethinking the global food crisis: The role of trade shocks. *Food Policy*, 36 (2): 136-146.
- HEADEY, D. (2013): The impact of the global food crisis on self-assessed food security *World Bank Policy Research Working Paper, Working Paper No. 6329*.
- HEATHERSHAW, J., MONTGOMERY, D. W. (2014): The myth of Post-Soviet Muslim radicalization in the Central Asian Republics. *Russia and Eurasia Programme Research Paper*.
- HITIRIS, T. (1978): Effective protection and economic performance in UK manufacturing industry. *The Economic Journal*, 88 (349): 107-120.
- IMAMVERDIYEV, N., GLAUBEN, T., PEREKHOZHUK, O., PREHN, S. (2014): Competitive structure of Kazakhstan, Russia and Ukraine in world wheat market: Gravity Model approach. Paper presented at the EAAE 2014 Congress Agri-Food and Rural Innovations for Healthier Societies, Ljubljana/Slovenia.
- IRWIN, S. (2011): Index funds, financialization, and commodity futures markets. *Applied Economic Perspectives and Policy*, 33 (1): 1-31.
- IVANIC, M., MARTIN, W. (2008): Implications of higher global food prices for poverty in low-income countries. *Agricultural Economics*, 39 (s1): 405-416.
- KAMINSKI, B., MITRA, S. (2012): Borderless Bazaars and regional integration in Central Asia: Emerging patterns of trade and cross-border cooperation.
- KEMÉNY, G., FOGARASI, J., VARGA, T., TÓTH, O., TÓTH, K. (2012): International wheat price volatility and the increasing export of Russia, Kazakhstan and Ukraine. Paper presented at the 123rd EAAE Seminar: Price Volatility and Farm Income Stabilisation Modelling Outcomes and Assessing Market and Policy Based Responses, Dublin, Ireland.
- KIENZLER, K. M., IBRAGIMOV, N., LAMERS, J. P. A. (2011): Food security: Quantity and quality matters for eating good bread in Uzbekistan. in: MADRAMOOTOO, C., DUKHOVNY, V. (ed.): *Water and Food Security in Central Asia* (pp. 313-142). Dordrecht/The Netherlands: Springer Science+Business Media B.V.
- KIENZLER, K. M., RUDENKO, I., RUZIMOV, J., IBRAGIMOV, N., LAMERS, J. P. A. (2011): Winter wheat quantity or quality? Assessing food security in Uzbekistan. *Food Security*, 3 (1): 53-64.
- KIHS (2012): Kyrgyz Integrated Household Survey [Panel data set].
- KIM, C. S., HALLAHAN, C., SCHAIBE, G., SCHLUTER, G. S. (2001): Economic analysis of the changing structure of the US flour milling industry. *Agribusiness*, 17 (1): 161-171.
- KIM, C. S., LIN, W. W., LEATH, M. N. (1991): The changing structure of the US flour milling industry. *The Journal of Agricultural Economics Research*, 43 (3): 18-24.
- KORNAI, J. (1995): *Highway and byways: Studies on reform and post-communist transition*. Cambridge/USA: The Massachusetts Institute of Technology Press.
- KORNAI, J. (1998): *From Socialism to capitalism: What is meant by the "change of system"?* London/UK: Watkiss Studios.
- KRUGMAN, P. R., OBSTFELD, M. (2008): *International economics: Theory and policy* (8 ed.). Boston/USA: Pearson Education Inc.

- KULYK, I., HERZFELD, T., NIVIEVSKYI, O. (2014): Comparative assessment of Ukrainian grain export policies. *Agriculture Policy Report, Working Paper No. APD/APR/01/2014*.
- KUTNAEVA, N. (2010): Foreign military bases on the territory of the post-Soviet Central Asia (Inostrannye voennye bazy na territorii postsovetsoi Central'noi Azii) *Central Asia and Caucasus (Central'naya Aziya i Kavkaz)*, 2 (13): 82-93.
- KYRGYZSTAT (2015): Statistical Committee of the Kyrgyz Republic. Retrieved from <http://www.stat.kg/en/>.
- LERMAN, Z. (2008): Agricultural recovery in the former Soviet Union: An overview of 15 years of land reform and farm restructuring. *Post Communist Economies*, 20 (4): 391-412.
- LERMAN, Z. (2009): Land reform, farm structure, and agricultural performance in CIS countries. *China Economic Review*, 20 (2): 316-326.
- LERMAN, Z., PRIKHODKO, D., PUNDA, I., SEDIK, D., SEROVA, E., SWINNEN, J. (2012): Turkmenistan: Agricultural sector review. *FAO & EBRD Country Highlights, Working Paper No. 7*.
- LERNER, A. P. (1934): The concept of monopoly and the measurement of monopoly power. *The Review of Economic Studies*, 1 (3): 157-175.
- LOOKHART, G. L., BEAN, S. R., CULBERTSON, C. (2004): Wheat quality and wheat varietal identification. Paper presented at the 12th International ICC Cereal and Bread Congress, Harrogate, UK.
- MACKINDER, H. (1919): Democratic ideals and reality: A study in the politics of reconstruction. London/UK: Constable and Company Ltd.
- MACKINNON, J. G., MAGEE, L. (1990): Transforming the dependent variable in regression models. *International Economic Review*, 31 (2): 315-339.
- MANKOFF, J. (2009): Russian foreign policy: The return of Great Power Politics. USA: Rowman & Littlefield Publishers Inc.
- MENON, R. (1995): In the shadow of the bear: Security in post-Soviet Central Asia. *International Security*, 20 (1): 149-181.
- MERCIER, S. (1993): The role of quality in wheat import decisionmaking. *USDA Agricultural Economic Report, Working Paper No. 670*.
- MINEKONOMKR (2013): The results of the proceedings to establish the existence of increased imports of wheat flour (code TN VED 1101 00 110 0 and 1101 00 150 0) on the territory of the Kyrgyz Republic and the resulting serious damage to the national economy (Rezultaty razbiratel'stva, v celyah ustanovleniya nalichiya vozrosshego importa muki pshenichnoi (kod TN VED 1101 00 110 0 i 1101 00 150 0) na tamojennuyu territoriyu Kyrgyzskoi Respubliki i obuslovlennogo etim ser'eznogo usherba otrasli nacional'noi ekonomiki). Retrieved from <http://www.mineconom.gov.kg/Docs/torgovlya/140214.docx>.
- MITCHELL, D. (2008): A note on rising food prices. *World Bank Policy Research Working Paper, Working Paper No. 4682*.
- MITRA, S., JOSLING, T. (2009): Agricultural export restrictions: Welfare implications and trade disciplines. *IPC Position Paper Agricultural and Rural Development Policy Series*.
- MORAVCSIK, A. (1997): Taking preferences seriously: A liberal theory of international politics *International Organization*, 51 (4): 513-553.

- MORAVCSIK, A. (2008): The New Liberalism. in: REUS-SMIT, C., SNIDAL, D. (eds.): The Oxford Handbook of International Relations. London/UK: Oxford University Press.
- MORGENTHAU, H. (2005): Politics among nations: The struggle for power and peace (7 ed.). New York, USA: McGraw-Hill Education.
- MOSS, C. B., SHONKWILER, J. S. (1993): Estimating yield distributions with a stochastic trend and nonnormal errors. *American Journal of Agricultural Economics*, 75 (4): 1056-1062.
- NYGREN, B. (2008): The rebuilding of Greater Russia: Putin's foreign policy towards the CIS countries. USA and Canada: Routledge Taylor & Francis Group.
- OLLINGER, M., NGUYEN, S. V., BLAYNEY, D., CHAMBERS, B., NELSON, K. (2005): Structural change in the meat, poultry, dairy, and grain processing industries. *USDA Economic Research Service, Working Paper No. 3*.
- PAPE, R. (2005): Soft balancing against the United States *International Security*, 30 (1): 7-45.
- PAUL, T. V. (2005): Soft balancing in the age of U.S. primacy. *International Security*, 30 (1): 46-71.
- PENA, R. J., MENG, E. C. H., ABUGALIEVA, A., ATLI, A., MASSALIMOV, A., MORGOUNOV, A. (2002): Milling, baking, and grain factors influencing the quality of tandyr bread (Nan) in Central Asia. *CIMMYT Wheat Special Report, Working Paper No. 50*.
- PENCE, K. M. (2006): The role of wealth transformations: An application to estimating the effect of tax incentives on savings. *Journal of Economic Analysis and Policy Contributions*, 5 (1): 1-20.
- PERRY-CASTAÑEDA (Cartographer) (2015): Political map of Caucasus and Central Asia. Retrieved from http://www.lib.utexas.edu/maps/commonwealth/caucasus_cntrl_asia_pol_2003.jpg.
- PIES, I., PREHN, S., GLAUBEN, T., WILL, M. G. (2013): Nahrungssicherheit und Agrarspekulation: Was ist politisch zu tun? *Wirtschaftsdienst*, 93 (2): 103-107.
- PIES, I., WILL, M. G., GLAUBEN, T., PREHN, S. (2013): Hungermakers? – Why futures market activities by index funds are promoting the common good. *Swiss Derivatives Review*, 53: 12-16.
- PIESSE, J., THIRTLE, C. (2009): Three bubbles and a panic: An explanatory review of recent food commodity price events. *Food Policy*, 34 (2): 119-129.
- POMFRET, R. (2005): Trade policies in Central Asia after EU enlargement and before Russian WTO accession: Regionalism and integration into the world economy. *Economic Systems*, 29 (1): 32-58.
- PREHN, S., GLAUBEN, T., PIES, I., WILL, M. G., LOY, J.-P. (2013): Betreiben Indexfonds Agrarspekulationen? Erläuterungen zum Geschäftsmodell und zum weiteren Forschungsbedarf. *IAMO Discussion Paper, Working Paper No. 138*.
- PRIKHODKO, D., RYBCHYNSKY, R. (2009): Wheat flour. FAO Agribusiness Handbook.
- PROZERNO (2011): Trade news (Vneshnetorgovy vesti). *ProZerno Review Export-Import Vesti*, 82 (2).
- RAKHIMOV, M. (2010): Internal and external dynamics of regional cooperation in Central Asia. *Journal of Eurasian Studies*, 1 (2): 95-101.
- RATHA, D., DE, S., DERVISEVIC, E., PLAZA, S., SCHUETTLER, K., SHAW, W., . . . YOUSEFI, S. R. (2015): Migration and remittances: Recent developments and outlook. Special topic: Financing for development. *World Bank migration and development brief, Working Paper No. 24*.

- RENKOW, M. (1990): Household inventories and marketed surplus in semisubsistence agriculture. *American Journal of Agricultural Economics*, 72 (3): 664-675.
- REYNOLD, P. D. (1993): New growth in flour milling. *Minnesota Agricultural Economist*, p. 8.
- ROACHE, S. K. (2010): What explains the rise in food price volatility? *IMF Working Paper, Working Paper No. 10/129*.
- ROBERTS, M., WEHRHEIM, P. (2001): Regional trade agreements and WTO accession of CIS countries. *Intereconomics*, 36 (6): 315-323.
- ROBINSON, I. (2008): Food markets and food insecurity in Armenia, Azerbaijan, Chechnya, Georgia, Ingushetia. WFP Regional market survey for the Caucasus Sub Region.
- ROBLES, M., TORERO, M., VON BRAUN, J. (2009): When speculation matters. *IFPRI Issue Brief Working Paper No. 57*.
- RUTHENBERG, A. (2006): Central Asia: Increasing gains from trade through regional cooperation in trade policy, transport, and customs transit. *Working Paper No. 030106*.
- SCHIEDER, S. (2010): *Neuer Liberalismus*. Germany: Verlag Barbara Budrich, Opladen & Farmington Hills.
- SCHMITZ, A., SHALIT, H., TURNOVSKY, S. J. (1981): Producer welfare and the preference for price stability. *American Journal of Agricultural Economics*, 63 (1): 157-160.
- SCHÖRING, N. (2010): Neorealismus. in: SCHIEDER, S., SPINDLER, M. (eds.): *Theorien der Internationalen Beziehungen* (Vol. 3). Germany: Opladen & Farmington Hills.
- SINGH, I., SQUIRE, L., STRAUSS, J. (1986): *Agricultural household models*. Baltimore, USA: Johns Hopkins University Press.
- SNYDER, J. (2004): One world, rival theories. *Foreign Policy*, 145: 53-62.
- TANIC, S. (2006): Enabling environments for Agribusiness and Agro-Industry development in Eastern Europe and Central Asia. Paper presented at the Enabling environments for Agribusiness and Agro-Industry development in Eastern Europe and Central Asia, Budapest/Hungary.
- TANIC, S. (2009): Agribusiness and Agro-Industries Development in Central and Eastern Europe. Paper presented at the International Food and Agribusiness Management Association – 19th Annual World Forum and Symposium, Budapest/Hungary.
- TANIC, S. (2011): FAO Agribusiness Roundtable: Small and medium Agri-Processing enterprises competitiveness challenges in Central and Eastern Europe. Paper presented at the FAO Agribusiness Roundtable: Small and medium Agri-Processing enterprises competitiveness challenges in Central and Eastern Europe, Budapest/Hungary.
- TANIC, S. (2015): Enhancing efficiency and inclusiveness of Agri-Food chains in Eastern Europe and Central Asia. Paper presented at the AGRIMBA Network Congress "Smart Agribusiness for the society of tomorrow", Porec/Croatia.
- TEUBER, R. (2014): Overview of the MATRACC project and outlook on future research directions. Paper presented at the ReCCA Workshop, Halle (Saale).
- TIMMER, P. C. (2009): Did speculation affect world rice prices? *ESA Working Paper, Working Paper No. 09-07*.

- TROSTLE, D. (2008): Global agricultural supply and demand: Factors contributing to the recent increase in food commodity prices. *USDA Report from the Economic Research Service, Working Paper No. 0801*.
- TURNOVSKY, S. J., SHALIT, H., SCHMITZ, A. (1980): Consumer's surplus, price instability, and consumer welfare. *Econometrica*, 48 (1): 135-152.
- UKHOVA, D. (2013): Russia as a humanitarian donor (Rossiya kak gumanitarnyi donor). *Oxfam Report*.
- ULIMWENGU, J., RAMADAN, R. (2009): How does food price increase affect Ugandan households? An augmented multimarket approach. *IFPRI Discussion Paper, Working Paper No. 00884*.
- URI, N. D., BEACH, D. E. (1997): A note on quality differences and United States/Canadian wheat trade. *Food Policy*, 22 (4): 359-367.
- URI, N. D., HYBERG, B., MERCIER, S., LYFORD, C. (1994): A note on the market valuation of grain quality characteristics. *Journal of International Food & Agribusiness Marketing*, 64 (4): 17-42.
- URUTYAN, V., MNATSAKANYAN, L., VARDANYAN, N. (2012): ICARE Assessment of the wheat, barley, and emmer wheat value chains in Armenia.
- UZDONMAHSULOT (2015): Retrieved from <http://uzdon.uz/en/>.
- UZSTAT (2015): State Committee of the Republic of Uzbekistan on Statistics. Retrieved from <http://www.stat.uz/en/>.
- VARIAN, H. R. (2009): Intermediate Microeconomics (8 ed.). USA: W. W. Norton & Company.
- VON BRAUN, J., TADESSE, G. (2012): Global food price volatility and spikes: An overview of costs, causes, and solutions. *ZEF-Discussion Papers on Development Policy, Working Paper No. 161*.
- WAHL, P. (2009): Food speculation: The main factor of the price bubble in 2008. *WEED Briefing Paper*.
- WALTZ, K. (1979): Theory of international politics. New York, USA: Addison-Wesley Pub. Co.
- WALTZ, K. (2008): Realism and international politics (1 ed.). United Kingdom: Routledge.
- WEGREN, S. K. (2013): Russian agrarian policy under Putin. *Post-Soviet Geography and Economics*, 43 (1), 26-40.
- WENDT, A. (1987): The agent-structure problem in International Relations theory. *International Organization*, 41 (3): 335-370.
- WENDT, A. (1999): Social theories of international politics. Cambridge, UK: Cambridge University Press.
- WHITE, L. J. (1974): Industrial organization and international trade: Some theoretical considerations. *The American Economic Review*, 64 (6): 1013-1020.
- WILL, M. G., PREHN, S., PIES, I., GLAUBEN, T. (2013): Schadet oder nützt die Finanzspekulation mit Agrarrohstoffen? – Ein Literaturüberblick zum aktuellen Stand der empirischen Forschung. *List Forum für Wirtschafts- und Finanzpolitik*, 39 (1): 16-45.
- WILSON, W. W. (1995): Structural change and strategies in the North American flour milling industry. *Agribusiness*, 11 (5): 431-439.
- WILSON, W. W., GALLAGHER, P. (1990): Quality differences and price responsiveness of wheat class demands. *Western Journal of Agricultural Economics*, 15 (2): 254-264.

- WINTER, A. L. (2002): Trade liberalisation and poverty: What are the links? *The World Economy*, 25 (9): 1339-1367.
- WORLD BANK (2015): Enterprise Surveys. Retrieved from <http://data.worldbank.org/data-catalog/enterprise-surveys>.
- WRIGHT, B. (2009): International grain reserves and other instruments to address volatility in grain markets. *World Bank Policy Research Working Paper, Working Paper No. 5028*.
- WRIGHT, N. R. (1978): Product differentiation, concentration, and changes in concentration. *The Review of Economics and Statistics*, 60 (4): 628-631.
- ZABORTSEVA, Y. (2012): From the "forgotten region" to the "Great Game" region: On the development of geopolitics in Central Asia. *Journal of Eurasian Studies*, 3 (2): 168-176.

MEDIA SOURCES


- AGRONEWS.RU (04.08.2010): *Georgia intends to abandon Russian wheat (Gruziya namerena otkazat'sya ot Rossiiskoi pshenicy)*. Retrieved from <http://www.agronews.ru/news/detail/68305/>.
- ALEXANDER, R. (12.03.2011): *Tajikistan: Symptoms of a revolution. Demonstrations swept the country (Tajikistan: Simptomy revoliucii. Strana ob'yata mitingami)*. Retrieved from <http://newsland.com/news/detail/id/653334/>.
- ASIA-PLUS (25.04.2016): *Tajikistan reduced the import of flour to 25 per cent and instead increased the import of wheat to 18 per cent (Tajikistan, sokrativ import muki na 25 procentov, uvelichil vvoz pshenicy na 18 procentov)*. Retrieved from <http://news.tj/ru/news/tadzhikistan-sokrativ-import-muki-na-25-uvelichil-vvoz-pshenitsy-na-18>.
- BNEWS (18.02.2011): *The Eurasian Development Bank has provided Armenia the first tranche of the loan to import grain (Evraziiskii bank razvitiya predostavil pervyi tranch kredita dlya importa zerna v Armeniyu)*. Retrieved from <http://bnews.kz/ru/news/post/45005/>.
- FAO NEWS (14.01.2015): *Azerbaijan aims to grow more grain – Sustainably*. Retrieved from <http://www.fao.org/europe/news/detail-news/en/c/275265/>.
- GEORGIAONLINE (29.12.2014): *Russia has reduced the supply of wheat to Georgia (Rossiya ogranichila postavki pshenicy v Gruziyu)*. Retrieved from <http://www.apsny.ge/2014/eco/1419893524.php>.
- IZVESTIA (03.08.2007): *Georgia intends to switch from Russian to American wheat (Gruziya namerena promenyat' rossiiskuyu pshenicu na amerikanskuyu)*. Retrieved from <http://izvestia.ru/news/405559>.
- KABARLAR (15.04.2015): *Russia will supply Kyrgyzstan with 40 thousand tons of wheat (Rossiya postavit v Kyrgyzstan 40 tysyach tonn pshenicy)*. Retrieved from <http://kabarlar.org/?newsid=46787>.

- KAVKAZ-UZEL (25.09.2010): *Russia has provided humanitarian aid to Armenia: Wheat and sunflower oil* (Rossiya predostavila Armenii gumanitarnuyu pomosh': Pshenicu i podsolnechnoe maslo). Retrieved from <http://www.kavkaz-uzel.ru/articles/174712/>.
- KUCERA, J. (04.11.2013): U.S. checked in Central Asia. Retrieved from http://www.nytimes.com/2013/11/05/opinion/us-checked-in-central-asia.html?ref=collection%2Ftimestopic%2FTransit%20Center%20at%20Manas&action=click&contentCollection=timestopics®ion=stream&module=stream_unit&version=latest&contentPlacement=6&pgtype=collection&r=1.
- LUKIN, M. (21.05.2007): All Russian military bases (Vse Rossiiskie bazy). Retrieved from <http://www.kommersant.ru/doc/766827>.
- MAMYTOVA, J. (21.09.2007): *Sooronbai Jeenbekov: There won't be any more of price spikes in Kyrgyzstan* (Sooronbai Jeenbekov: Eshe odnogo skachka cen v Kyrgyzstane ne budet). Retrieved from <http://arch.24.kg/economics/24569-2007/09/21/62787.html>.
- MIHAILOV, M. (19.10.2005): *Last garrisons of the empire* (Poslednie garnizony imperii). Retrieved from <http://grani.ru/War/m.96882.html>.
- MIR (10.08.2012): *About 640 tons Russian elite wheat seeds to be delivered to Armenia by the 15th of August* (Okolo 640 tonn semyan rossiiskoi pshenicy elitnyh sortov budet dostavleno v Armeniyu do 15go avgusta). Retrieved from <http://am.mir24.tv/news/4098>.
- ORUJOVA, N. (28.07.2014): More grain to gain for Azerbaijan. Retrieved from <http://www.azernews.az/business/69123.html>.
- ORUJOVA, N. (02.03.2015): Bread prices will not change. Retrieved from <http://www.azernews.az/business/78448.html>.
- TAZABEK (03.12.2014): *Kyrgyzstan and Russia have reached an agreement on the supply of 40 thousand tons of wheat with low transportation costs to Kyrgyzstan* (Kyrgyzskaya Respublika i Rossiiskaya Federaciya dogovorilis' prarabotat' vopros postavok 40 tysh tonn zerna prodovol'stvennoi pshenicy s usloviem l'gotnoi transportirovki). Retrieved from <http://www.tazabek.kg/news:383092>.
- UNIAN (31.08.2010): *Georgia asks Ukraine to help to buy 120 thousand tons of wheat* (Gruziya prosit Ukrainu pomoch' kupit' 120 tysyach ton pshenicy). Retrieved from <http://www.unian.net/politics/395660-gruziya-prosit-ukrainu-pomoch-kupit-120-tyis-tonn-pshenitsyi.html>.
- VESTNIK KAVKAZA (10.09.2010): *Russia will supply Armenia with one thousand tons of wheat seed as a humanitarian aid* (Rossiya postavit v Armeniyu 1 tysyachu ton semyan pshenicy v kachestve gumanitarnoi pomoshi). Retrieved from <http://www.vestnikavkaza.ru/news/25189.html>.
- ZHOGORKU-KENESH (Kyrgyz Parliament) (22.01.2013): *Monitoring of mass media in the sphere of international relations. Kyrgyzstan – Russia: Profits of cooperation* (Monitoring SMI v sfere mejdunarodnyh itnoshenii. Kirgiziya – Rossiya: Vygody sotrudnichestva). Retrieved from http://kenesh.kg/RU/Articles/15124-Monitoring_SMI_v_sfere_mezhdunarodnyx_otnoshenij_na_22_yanvary_2013_goda.aspx.
- All media sources were last accessed on 01.06.2016.

APPENDICES

Table 1: Mill enterprise questionnaire

Confidential



Leibniz Institute of Agricultural Development in Transition Economies (IAMO)
Business conditions of mills in Kyrgyz Republic

Questionnaire Code

Mill Enterprise Questionnaire

Control information of enterprise

Oblast Code

City/Village Code

Respondent Name _____

Position of respondent _____

Age _____

Date of interview _____

Company address: _____

Telephone: _____

1. GENERAL CHARACTERISTICS OF THE FIRM

M101	Year of establishment	_____
M102	What is the main revenue generating activity of your firm:	Milling cereals and selling flour 1
		Production of flour products (involving additional processes) for human consumption 2
		Production of flour products (involving additional processes) for animal feeding 3
		Other activity 1 (Specify) 4
		Other activity 2 (Specify) 5
M103	Which other activities does your firm engage in:	Milling cereals 1
		Production of flour products for human consumption 2
		Production of flour products for animal feeding 3
		Other activity (Specify) 88
		No other activity 99
M104	Ownership:	Joint-stock company 1
		Subsidiary of foreign firm (100%) 2
		Joint venture (< 50% foreign share) 3
		Joint venture (> 50% foreign share) 4
		Limited liability company 5
		Individual entrepreneur 6
		Other private ownership- Please specify 7

2. PERFORMANCE

M201	How do you assess the firm's development since 2005 in terms of capacity	significant growth	1
		slight growth	2
		almost constant	3
		slight decline	4
		sharp decline	5
M202	How do you assess the firm's development since 2005 in terms of staff	significant growth	1
		slight growth	2
		almost constant	3
		slight decline	4
		sharp decline	5
M203	At the end of 2014, how many permanent, full-time individuals worked in this establishment?	less than 10 persons	1
		from 11 to 20 persons	2
		from 21 to 30 persons	3
		from 31 to 40 persons	4
		from 41 to 50 persons	5
		from 51 to 75 persons	6
		from 76 to 100 persons	7
		more than 100 persons	8
Please include all employees and managers. (Permanent, full-time employees are defined as all paid employees that are contracted for a term of one or more fiscal years and/or have a guaranteed renewal of their employment contract and that work a full shift).			
M204	In fiscal year 2014, what was this establishment's output produced as a proportion of the maximum output possible if using all the resources available?	less than 25 percent	1
		from 26 to 50 percent	2
		from 51 to 75 percent	3
		from 76 to 100 percent	4
		enterprise didn't work in 2014	99
Do not know		88	
Capacity utilization based on comparison of the current output with the maximum output possible using the current inputs.			
M205	How many tons of wheat did your plant process at the end of 2014 ? (tons per day)	Processing of wheat to wheat flour	
		Processing of other grain to flour (Specify type of cereal 1)	
		Processing of other grain to flour (Specify type of cereal 2)	
M206	Three fiscal years ago [2012] what was the processing capacity of the firm? (tons per day)	Processing of wheat to wheat flour	
		Processing of other grain to flour (Specify type of cereal 1)	
		Processing of other grain to flour (Specify type of cereal 2)	

3. TECHNOLOGY & INNOVATION

No		M301 Amount, units	M302	M303	M304	M305 Storage capacity, ton	M306 Country of origin of equipment	M307 Within the last three years, did your firm introduce any new equipment (1- Yes, 2-No)
			Age of equipment, building, machinery					
			More than 25 years	Between 25 and 10 years	Younger than 10 years			
1	Grain elevator							
2	Flour elevator							
3	Other products warehouse							
4	Grain cleaning equipment							
5	Milling equipment							
6	Packing equipment							
7	Transport (lorries)							
8	Other equipment 1 (specify)							
9	Other equipment 2 (specify)							
10	Other equipment 3 (specify)							
11	Other equipment 4 (specify)							

M308	Within the three years, did your firm start new product lines	Yes	1
		No	2
M308a	If "Yes", then please provide a short description		
		Wheat	1
		Wheat flour	2
		Other output 1 (specify)	3
		Other output 2 (specify)	4
		Other output 3 (specify)	5
		Other output 4 (specify)	6
		Other output 5 (specify)	7
M309	What is the storage capacity of the firm at the place of operation?		

4. FINANCE

M401	At this time, does this establishment have a line of credit or a loan from a financial institution?	Yes <input type="checkbox"/>	go to the questions M402 and M403	1
		No <input type="checkbox"/>	go to the question M404	2
M402	Over fiscal year 2014, please estimate the proportion of this establishment's total purchase of fixed assets that was financed from each of the following sources? INTERVIEWER: CHECK THAT TOTAL SUMS TO 100% (UNLESS RESPONDENT DOES NOT KNOW)	Internal funds or retained earnings		1
		Owners' contribution or issued new equity shares		2
		Borrowed from banks: private and state-owned		3
		Borrowed from non-bank financial institutions		4
		Purchases on credit from suppliers and advances from customers		5
		Other, moneylenders, friends, relatives, bonds, etc		6
M403	3 Over fiscal year 2014, please estimate the proportion of this establishment's working capital that was financed from each of the following sources? INTERVIEWER: CHECK THAT TOTAL SUMS TO 100% (UNLESS RESPONDENT DOES NOT KNOW)	Internal funds or retained earnings		1
		Owners' contribution or issued new equity shares		2
		Borrowed from banks: private and state-owned		3
		Borrowed from non-bank financial institutions which include microfinance institutions, credit cooperatives, credit unions, or finance companies		4
		Purchases on credit from suppliers and advances from customers		5
		Other, moneylenders, friends, relatives, etc.		6
M404	Referring again to the last fiscal year [2014], did this establishment apply for any loans or lines of credit?	Yes		1
		No		2
M405	What was the main reason why this establishment did not apply for any line of credit or loan?	No need for a loan - establishment had sufficient capital		1
		Application procedures were complex		2
		Interest rates were not favorable		3
		Collateral requirements were too high		4
		Size of loan and maturity were insufficient		5
		Did not think it would be approved		6
		Other		7

5. COMPETITION

	What do you think is the level of competition among the milling companies in the area?	No competition	Minor competition	Moderate competition	Major competition	Very severe competition	Do Not Know (spontaneous)	Does Not Apply (spontaneous)
		0	1	2	3	4	8	9
M5011	With respect to purchase of wheat							
M5012	With respect to sale of flour							
M5013	With respect to sale of other outputs							
M502	How many firms in the area of your establishment and what is their processing capacity?	Number _____						
M5021	How many of them are:	Big 1						
		Medium 2						
		Small 3						

	Does this establishment compete against unregistered or informal firms?	No competition	Minor competition	Moderate competition	Major competition	Very severe competition	Do Not Know (spontaneous)	Not applicable (spontaneous)
		0	1	2	3	4	8	9
M503	Competition against informal/unregistered firms							

	Does this establishment compete against smuggled products?	No competition	Minor competition	Moderate competition	Major competition	Very severe competition	Do Not Know (spontaneous)	Not applicable (spontaneous)
		0	1	2	3	4	8	9
M504	Competition against smuggled products							

6. INPUTS AND OTHER CHARACTERISTICS

		%	Do not know (spontaneous)																																																																	
M601	In fiscal year 2014, what percentage of this establishment's sales were: (INTERVIEWER: these must be asked in the order they appear on the table)	National sales to third party																																																																		
		National sales directly to end consumers																																																																		
		Indirect exports (sold domestically to third party that exports products)																																																																		
		Direct exports																																																																		
		INTERVIEWER: CHECK THAT TOTAL SUMS TO 100% (UNLESS RESPONDENT DOES NOT KNOW)	100%																																																																	
M602	Of all wheat purchased by your plant, which proportion belongs to the following categories:																																																																			
	<table border="1"> <thead> <tr> <th colspan="2">2014</th> <th colspan="3">Three years ago (2012)</th> </tr> <tr> <th>Percent</th> <th>Don't know (spontaneous)</th> <th>Percent</th> <th>Don't know (spontaneous)</th> <th>Plant wasn't established then</th> </tr> </thead> <tbody> <tr> <td>M6021</td> <td>Wheat of domestic origin</td> <td></td> <td></td> <td>Does not apply (spontaneous)</td> </tr> <tr> <td>M6022</td> <td>Wheat of foreign origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6023</td> <td>Wheat flour of domestic origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6024</td> <td>Wheat flour of foreign origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>100%</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			2014		Three years ago (2012)			Percent	Don't know (spontaneous)	Percent	Don't know (spontaneous)	Plant wasn't established then	M6021	Wheat of domestic origin			Does not apply (spontaneous)	M6022	Wheat of foreign origin				M6023	Wheat flour of domestic origin				M6024	Wheat flour of foreign origin					100%																																	
2014		Three years ago (2012)																																																																		
Percent	Don't know (spontaneous)	Percent	Don't know (spontaneous)	Plant wasn't established then																																																																
M6021	Wheat of domestic origin			Does not apply (spontaneous)																																																																
M6022	Wheat of foreign origin																																																																			
M6023	Wheat flour of domestic origin																																																																			
M6024	Wheat flour of foreign origin																																																																			
	100%																																																																			
	INTERVIEWER: CHECK THAT TOTAL SUMS TO 100% (UNLESS RESPONDENT DOES NOT KNOW)																																																																			
M603	Which sorts of wheat did your plant use for processing?																																																																			
	<table border="1"> <thead> <tr> <th colspan="2">2014</th> <th colspan="3">Three years ago (2012)</th> </tr> <tr> <th>Percent</th> <th>Don't know (spontaneous)</th> <th>Percent</th> <th>Don't know (spontaneous)</th> <th>Plant wasn't established then</th> </tr> </thead> <tbody> <tr> <td>M6031</td> <td>Winter hard of domestic origin</td> <td></td> <td></td> <td>Does not apply (spontaneous)</td> </tr> <tr> <td>M6032</td> <td>Winter hard of foreign origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6033</td> <td>Winter soft of domestic origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6034</td> <td>Winter soft of foreign origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6035</td> <td>Spring hard of domestic origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6036</td> <td>Spring hard of foreign origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6037</td> <td>Spring soft of domestic origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6038</td> <td>Spring soft of foreign origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M6039</td> <td>Other of domestic origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td>M60310</td> <td>Other of foreign origin</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>100%</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			2014		Three years ago (2012)			Percent	Don't know (spontaneous)	Percent	Don't know (spontaneous)	Plant wasn't established then	M6031	Winter hard of domestic origin			Does not apply (spontaneous)	M6032	Winter hard of foreign origin				M6033	Winter soft of domestic origin				M6034	Winter soft of foreign origin				M6035	Spring hard of domestic origin				M6036	Spring hard of foreign origin				M6037	Spring soft of domestic origin				M6038	Spring soft of foreign origin				M6039	Other of domestic origin				M60310	Other of foreign origin					100%			
2014		Three years ago (2012)																																																																		
Percent	Don't know (spontaneous)	Percent	Don't know (spontaneous)	Plant wasn't established then																																																																
M6031	Winter hard of domestic origin			Does not apply (spontaneous)																																																																
M6032	Winter hard of foreign origin																																																																			
M6033	Winter soft of domestic origin																																																																			
M6034	Winter soft of foreign origin																																																																			
M6035	Spring hard of domestic origin																																																																			
M6036	Spring hard of foreign origin																																																																			
M6037	Spring soft of domestic origin																																																																			
M6038	Spring soft of foreign origin																																																																			
M6039	Other of domestic origin																																																																			
M60310	Other of foreign origin																																																																			
	100%																																																																			
	INTERVIEWER: CHECK THAT TOTAL SUMS TO 100% (UNLESS RESPONDENT DOES NOT KNOW)																																																																			

M604 Which grades of wheat flour did your plant produce?							
Proportion of wheat flour grades processed as output by the establishment, unless the plant does not process		2014		Three years ago (2012)			
		Percent	Don't know (spontaneous)	Percent	Don't know (spontaneous)	Plant wasn't established then	Does not apply (spontaneous)
M6041	Highest grade						
M6042	1st grade						
M6043	2nd grade						
M6044	3rd grade						
M6045	4th grade						
M6046	Other						
		100%					
INTERVIEWER: CHECK THAT TOTAL SUMS TO 100% (UNLESS RESPONDENT DOES NOT KNOW)							
M605 In which proportion does your plant produce following commodities?							
Proportion of wheat flour grades processed as output by the establishment, unless the plant does not process		2014		Three years ago (2012)			
		Percent	Don't know (spontaneous)	Percent	Don't know (spontaneous)	Plant wasn't established then	Does not apply (spontaneous)
M6051	Wheat flour						
M6052	Semolina						
M6053	Wheat bran						
M6054	Wheat gluten						
M6055	PLEASE ADD ANY LOCALLY RELEVANT OUTPUT						
		100%					
INTERVIEWER: CHECK THAT TOTAL SUMS TO 100% (UNLESS RESPONDENT DOES NOT KNOW)							
M606 Do you use any additional flour to assemble your products?				Yes			1
				No			2
M607 If yes, in which proportion do you use externally bought wheat flour and for which purpose?							
Proportion of using domestically processed and imported wheat flour in the production of flour products and/or baking				Percent		Main Purpose	
M6071	Wheat flour obtained from domestic wheat						
M6072	Wheat flour of domestic origin bought in the national market						
M6073	Wheat flour obtained from wheat of foreign origin						
M6074	Wheat flour of foreign origin imported or bought in the national market						
				100%			

	How would you describe the wheat and wheat flour quality of domestic and foreign origins?	Very Bad	Bad	Good	Very good	Excellent	Don't know
		↓ 0	1	2	3	4	↓ 8
M6081	Domestic wheat						
M6082	Foreign wheat						
M6083	Domestic wheat flour						
M6084	Foreign wheat flour						

7. TRADE POLICY AND REGULATION

M701 Approximately, how many days does it take to obtain an import license?

	Average number of days from the day of the application to the day it was granted	Days	Don't know
M7011	Wheat		
M7012	Wheat flour		
M7013	Other milling products		
M7014	Technical equipment		

M702 Please rate the situation for an average enterprise in your business:

		Very easy	Quite easy	Difficult	Very difficult	Impossible	Don't know
		↓ 0	1	2	3	4	↓ 8
M7021	Starting milling operation						
M7022	Extending part of operation significantly (e.g. new facilities)						
M7023	Dismissal of staff						
M7024	Exiting business						

M703 How would you describe your governments import policies in terms of import taxes for your business

		No obstacle	Minor obstacle	Moderate obstacle	Major obstacle	Very severe obstacle	Don't know
		↓ 0	1	2	3	4	↓ 8
M7031	National trade and import policy for wheat/ grains						
M7032	National trade and import policy for flour and milling products						
M704	It is said that establishments are sometimes required to make gifts or informal payments to public officials to "get things done" with regard to customs, taxes, licenses, regulations, services etc. On average, what percentage of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?						%

M705	Can you tell me which of the elements of the business environment included in the list, if any, currently represents the biggest obstacle faced by this establishment	No obstacle ↓ 0	Minor obstacle 1	Moderate obstacle 2	Major obstacle 3	Very severe obstacle 4	Don't know ↓ 8
M7051	Technological endowment						
M7052	Access to finance						
M7053	Inadequately educated workforce						
M7054	Administrational tax rates						
M7055	Business licensing and permits						
M7056	Transportation costs						
M7057	Long distances to the primary market						
M7058	Marketing						
M7059	Insufficient storage facilities						

M705	Can you tell me which of the elements of the business environment included in the list, if any, currently represents the biggest obstacle faced by this establishment	No obstacle ↓ 0	Minor obstacle 1	Moderate obstacle 2	Major obstacle 3	Very severe obstacle 4	Don't know ↓ 8
M70510	Infrastructure						
M70511	High competition within the domestic industry						
M70512	Competition with import						
M70513	Competition with informal firms						
M70514	Competition with smuggled products						
M70515	Product quality						
M70516	Changing consumer preferences						
M70517	Volatile prices						
M70518	Import licensing and permits						
M70519	Export licensing and permits						
M70520	High import taxes						
M70521	High export taxes						
M70522	Governments customs and trade regulations						
M70523	Corruption						
M70524	Political instability						

Table 2: Econometric estimation results for the period before the export ban**2005-2006**

```
xtsur (ms_wheat price_wheat price_barleyg price_flour price_rice price_potatoes yin-
come_aggr) (ms_barleyg price_wheat price_barleyg price_flour price_rice
price_potatoes yincome_aggr) (ms_flour price_wheat price_barleyg price_flour
price_rice price_potatoes yincome_aggr) (ms_rice price_wheat price_barleyg
price_flour price_rice price_potatoes yincome_aggr) (ms_potatoes price_wheat
price_barleyg price_flour price_rice price_potatoes yincome_aggr)
```

(running multi-step estimates...)

Calculating multi-step estimates...

Iteration 1: relative difference = .14856249

Iteration 2: relative difference = 1.632e-10

Seemingly unrelated regression (SUR) in panel data set

One-way random effect estimation:

Number of Group variable: 2 Number of obs = 3560

Panel variable: hh_code Number of eqn = 5

Time variable: year Number of panels = 2

Random effects $u_i \sim \text{Gaussian}$

$\text{corr}(u_i, e_{it}) = 0$ (assumed)

Panel type : unbalanced

Coef. Std. Err. z P>z [95 % Conf. Interval]

ms_wheat

price_wheat -.4561531 .0103669 -44.00 0.000 -.4764718 -.4358344

price_barleyg -.1332911 .0072394 -18.41 0.000 -.1474801 -.1191022

price_flour -.7330337 .0033286 -220.23 0.000 -.7395576 -.7265099

price_rice .057379 .0033083 17.34 0.000 .0508948 .0638632

price_potatoes	.0885377	.003456	25.62	0.000	.081764	.0953114
income_aggr	.4690745	.0015858	295.79	0.000	.4659663	.4721827
ms_barleyg						
price_wheat	.0036132	.0501943	0.07	0.943	-.0947659	.1019922
price_barleyg	.0022167	.0355491	0.06	0.950	-.0674581	.0718916
price_flour	-.0054081	.0171037	-0.32	0.752	-.0389306	.0281145
price_rice	-.0019202	.0165106	-0.12	0.907	-.0342804	.0304401
price_potatoes	-.0034766	.0176658	-0.20	0.844	-.0381009	.0311477
income_aggr	.002257	.0084594	0.27	0.790	-.0143231	.0188372
ms_flour						
price_wheat	-.0130866	.0169344	-0.77	0.440	-.0462775	.0201042
price_barleyg	-.1752182	.0122371	-14.32	0.000	-.1992024	-.151234
price_flour	-.3187604	.0061317	-51.99	0.000	-.3307783	-.3067425
price_rice	.0684377	.0057923	11.82	0.000	.057085	.0797904
price_potatoes	-.0604512	.0063496	-9.52	0.000	-.0728962	-.0480063
income_aggr	.1869677	.0030265	61.78	0.000	.1810359	.1928996
ms_rice						
price_wheat	-.0113315	.0717022	-0.16	0.874	-.1518652	.1292022
price_barleyg	-.0158593	.0512046	-0.31	0.757	-.1162185	.0844999
price_flour	-.006915	.0248496	-0.28	0.781	-.0556193	.0417893
price_rice	-.0070542	.0239279	-0.29	0.768	-.0539521	.0398437
price_potatoes	.0262164	.0257619	1.02	0.309	-.0242759	.0767088
income_aggr	.0065305	.0119048	0.55	0.583	-.0168025	.0298636
ms_potatoes						
price_wheat	-.1705838	.0762285	-2.24	0.025	-.3199889	-.0211787
price_barleyg	.0427743	.0552102	0.77	0.438	-.0654357	.1509842

```

price_flour .2885388 .0277648 10.39 0.000 .2341207 .3429569
price_rice -.0351202 .025789 -1.36 0.173 -.0856657 .0154252
price_potatoes -.6748128 .0281896 -23.94 0.000 -.7300635 -.6195622
yincome_aggr .668837 .0137258 48.73 0.000 .641935 .6957391
sigma_u see e(sigma_u)
sigma_e see e(sigma_e)
Dependent variables: ms_wheat ms_barleyg ms_flour ms_rice
ms_potatoes
Independent variables: price_wheat price_barleyg price_flour
price_rice price_potatoes yincome_aggr
estimates table, star(.05 .01 .001)
Variable active
ms_wheat
price_w~t -.45615307***
price_b~g -.13329114***
price_f~r -.73303374***
price_r~e .05737899***
price~oes .0885377***
yincome_~r .4690745***
ms_barleyg
price_w~t .00361316
price_b~g .00221671
price_f~r -.00540807
price_r~e -.00192017
price~oes -.00347659
yincome_~r .00225703

```

ms_flour

price_w~t -.01308664

price_b~g -.17521819***

price_f~r -.31876043***

price_r~e .06843771***

price~oes -.06045122***

yincome_~r .18696773***

ms_rice

price_w~t -.0113315

price_b~g -.0158593

price_f~r -.006915

price_r~e -.0070542

price~oes .02621644

yincome_~r .00653054

ms_potat~s

price_w~t -.17058376*

price_b~g .04277425

price_f~r .28853881***

price_r~e -.03512021

price~oes -.67481284***

yincome_~r .66883704***

legend: * p<.05; ** p<.01; *** p<.001

Table 3: Econometric estimation results for the period after the export ban**2008-2012**

```
xtsur (ms_wheat price_wheat price_barleyg price_flour price_rice price_potatoes yin-
come_aggr) (ms_barleyg price_wheat price_barleyg price_flour price_rice
price_potatoes yincome_aggr) (ms_flour price_wheat price_barleyg price_flour
price_rice price_potatoes yincome_aggr) (ms_rice price_wheat price_barleyg
price_flour price_rice price_potatoes yincome_aggr) (ms_potatoes price_wheat
price_barleyg price_flour price_rice price_potatoes yincome_aggr)
```

(running multi-step estimates...)

Calculating multi-step estimates...

Iteration 1: relative difference = .19239896

Iteration 2: relative difference = 8.908e-07

Seemingly unrelated regression (SUR) in panel data set

One-way random effect estimation:

Number of Group variable: 5 Number of obs = 8815

Panel variable: hh_code Number of eqn = 5

Time variable: year Number of panels = 5

Random effects $u_i \sim \text{Gaussian}$

$\text{corr}(u_i, e_{it}) = 0$ (assumed)

Panel type : unbalanced

Coef. Std. Err. z P>z [95% Conf. Interval]

ms_wheat

price_wheat -.3476478 .0252185 -13.79 0.000 -.397075 -.2982205

price_barleyg -.034454 .0211824 -1.63 0.104 -.0759707 .0070628

price_flour -.5070536 .0120096 -42.22 0.000 -.530592 -.4835152

price_rice .258679 .0117991 21.92 0.000 .2355531 .2818049

price_potatoes .2270655 .0126897 17.89 0.000 .2021942 .2519368

yincome_aggr .1829281 .0071093 25.73 0.000 .1689941 .1968621

ms_barleyg

price_wheat .001941 .0026618 0.73 0.466 -.003276 .007158

price_barleyg .0024856 .0022707 1.09 0.274 -.0019649 .0069361

price_flour .0011747 .0011893 0.99 0.323 -.0011562 .0035056

price_rice -.0006326 .0012233 -0.52 0.605 -.0030301 .001765

```

price_potatoes -.0012326 .001222 -1.01 0.313 -.0036276 .0011624
yincome_aggr .0008682 .0006145 1.41 0.158 -.0003363 .0020726
ms_flour
price_wheat -.0472746 .017984 -2.63 0.009 -.0825226 -.0120266
price_barleyg -.0301307 .0152058 -1.98 0.048 -.0599334 -.000328
price_flour -.1856185 .0083323 -22.28 0.000 -.2019495 -.1692875
price_rice .0624629 .0083495 7.48 0.000 .0460982 .0788277
price_potatoes .0443011 .0086973 5.09 0.000 .0272548 .0613474
yincome_aggr .057512 .0045645 12.60 0.000 .0485658 .0664583
ms_rice
price_wheat .0004318 .0064935 0.07 0.947 -.0122952 .0131588
price_barleyg -.0025161 .0054661 -0.46 0.645 -.0132295 .0081973
price_flour .00337 .0030625 1.10 0.271 -.0026325 .0093724
price_rice .0006867 .0030299 0.23 0.821 -.0052517 .0066251
price_potatoes .0157186 .0032209 4.88 0.000 .0094058 .0220315
yincome_aggr -.0018585 .0017053 -1.09 0.276 -.0052008 .0014838
ms_potatoes
price_wheat -.0134891 .028986 -0.47 0.642 -.0703005 .0433224
price_barleyg .3001226 .0243804 12.31 0.000 .2523378 .3479074
price_flour .1394706 .0137188 10.17 0.000 .1125823 .1663589
price_rice .0827658 .0135381 6.11 0.000 .0562317 .1092999
price_potatoes -.4126352 .0144522 -28.55 0.000 -.440961 -.3843094
yincome_aggr .4853599 .007773 62.44 0.000 .4701251 .5005947
sigma_u see e(sigma_u)
sigma_e see e(sigma_e)
Dependent variables: ms_wheat ms_barleyg ms_flour ms_rice
ms_potatoes
Independent variables: price_wheat price_barleyg price_flour
price_rice price_potatoes yincome_aggr
estimates table, star(.05 .01 .001)
Variable active
ms_wheat
price_w~t -.34764776***
price_b~g -.03445396
price_f~r -.50705362***
price_r~e .25867904***

```

```

price~oes .22706552***
yincome_~r .18292809***
ms_barleyg
price_w~t .00194101
price_b~g .0024856
price_f~r .0011747
price_r~e -.00063256
price~oes -.00123258
yincome_~r .00086815
ms_flour
price_w~t -.04727461**
price_b~g -.03013068*
price_f~r -.18561852***
price_r~e .06246292***
price~oes .04430109***
yincome_~r .05751202***
ms_rice
price_w~t .00043183
price_b~g -.00251613
price_f~r .00336996
price_r~e .00068667
price~oes .01571861***
yincome_~r -.00185853
ms_potat~s
price_w~t -.01348905
price_b~g .30012258***
price_f~r .13947057***
price_r~e .08276578***
price~oes -.4126352***
yincome_~r .48535993***
legend: * p<.05; ** p<.01; *** p<.001

```

DECLARATION OF AUTHORSHIP

Hiermit erkläre ich, dass ich die vorliegende Dissertation selbständig verfasst und keine anderen als die angegebenen Hilfsmittel benutzt habe. Die Stellen der Doktorarbeit, die anderen Quellen im Wortlaut oder dem Sinn nach entnommen wurden, sind durch Angaben der Herkunft kenntlich gemacht. Dies gilt auch für Zeichnungen, Skizzen, bildliche Darstellungen sowie für Quellen aus dem Internet.

I hereby certify that this PhD-thesis has been composed by myself and is based on my own work, unless stated otherwise. No other person's work has been used without due acknowledgement. All references and verbatim extracts have been properly quoted, and all sources of information, including graphs and data sets, have been specifically acknowledged.

- Vol. 1 **The importance of institutions for the transition in Central and Eastern Europe with emphasis on agricultural and food industry**
ed. by Klaus Frohberg and Witold-Roger Poganietz
1998, 137 pages, ISBN 3-8175-0258-3
- Vol. 2 **The significance of politics and institutions for the design and formation of agricultural Policies**
ed. by Klaus Frohberg and Peter Weingarten
1999, 254 pages, ISBN 3-8175-0289-3
- Vol. 3 **Food processing and distribution in transition countries. Problems and perspectives**
ed. by Monika Hartmann and Jürgen Wandel
1999, 349 pages, ISBN 3-8175-0293-1
- Vol. 4 **Die private Nachfrage nach Nahrungsmitteln im Transformationsprozeß Tschechiens und Polens**
Stephan Brosig (PhD)
2000, 171 Seiten, ISBN 3-8175-0319-9
- Vol. 5 **Integrating Estonia into the EU: Quantitative analysis of the agricultural and food sector**
Achim Fock (PhD)
2000, 286 pages, ISBN 3-8175-0320-2
- Vol. 6 **Competitiveness of agricultural enterprises and farm activities in transition countries**
ed. by Peter Tillack and Frauke Pirscher
2000, 216 pages, ISBN 3-8175-0322-9
- Vol. 7 **Конкурентоспособность сельскохозяйственных предприятий и фермерской деятельности в странах переходного периода**
под редакцией Петера Тиллака и Фрауке Пиршер
2000, 253 страницы, ISBN 3-8175-0324-5

- Vol. 8 **Perspectives on agriculture in transition: Analytical issues, modelling approaches, and case study results**
ed. by Witold-Roger Pogonietz, Alberto Zezza, Klaus Froberg and Kostas G. Stamoulis
2000, 433 pages, ISBN 3-8175-0323-7
- Vol. 9 **Land ownership, land markets and their influence on the efficiency of agricultural production in Central and Eastern Europe**
ed. by Peter Tillack and Eberhard Schulze
2000, 485 pages, ISBN 3-8175-0325-3
- Vol. 10 **Landwirtschaft und Industrie in Russland – Der Transformationsprozeß in der Ernährungsindustrie**
Jürgen Wandel (PhD)
2000, 361 Seiten, ISBN 3-8175-0334-2
- Vol. 11 **Food consumption in Russia. An econometric analysis based on household data**
Karin Elsner (PhD)
2001, 256 pages, ISBN 3-8175-0335-0
- Vol. 12 **Alexander Wasiljewitsch Tschajanow – Die Tragödie eines großen Agrarökonomen**
hrsg. u. übers. von Eberhard Schulze
2001, 192 Seiten, ISBN 3-8175-0342-3
- Vol. 13 **Analysis of food consumption in Central and Eastern Europe: Relevance and empirical methods**
ed. by Stephan Brosig and Monika Hartmann
2001, 253 pages, ISBN 3-8175-0349-0
- Vol. 14 **Wettbewerbsprozesse und Firmenwachstum in der Transformation am Beispiel der polnischen Fleischindustrie**
Agata Pieniadz (PhD)
2002, 291 Seiten, ISBN 3-8175-0360-1
- Vol. 15 **Agricultural enterprises in transition: Parallels and divergences in Eastern Germany, Poland and Hungary**
ed. by Ludger Hinners-Tobrägel and Jürgen Heinrich
2002, 455 pages, ISBN 3-8175-0366-0
- Vol. 16 **Agricultural technology and economic development of Central and Eastern Europe. Results of the workshop in Halle, 2nd-3rd July 2001**
ed. by Peter Tillack and Ulrich Fiege
2002, 160 pages, ISBN 3-86037-199-1

- Vol. 17 **Региональные аспекты аграрных преобразований: Политика, реструктуризация, рыночная адаптация**
под редакцией Петера Тиллака и Виталия Зиновчука
2003, 236 страницы, ISBN 3-928466-55-0
- Vol. 18 **Alexander Vasilievich Chayanov – The tragedy of an outstanding agricultural economist**
ed. by Eberhard Schulze
2003, 188 pages, ISBN 3-86037-201-7
- Vol. 19 **Development of agricultural market and trade policies in the CEE Candidate Countries**
by the Network of Independent Agricultural Experts in the CEE Candidate Countries
2003, 72 pages, ISBN 3-86037-212-2
- Vol. 20 **Large farm management**
ed. by Alfons Balmann and Alexej Lissitsa
2003, 396 pages, ISBN 3-86037-213-0
- Vol. 21 **Success and failures of transition – The Russian agriculture between fall and resurrection**
ed. by Eberhard Schulze, Elke Knappe, Eugenia Serova, Peter Wehrheim
2003, 521 pages, ISBN 3-9809270-1-6
- Vol. 22 **Subsistence agriculture in Central and Eastern Europe: How to break the vicious circle?**
ed. by Steffen Abele and Klaus Froberg
2003, 233 pages, ISBN 3-9809270-2-4
- Vol. 23 **Pfadabhängigkeiten und Effizienz der Betriebsstrukturen in der ukrainischen Landwirtschaft – Eine theoretische und empirische Analyse**
Andriy Nedoborovsky (PhD)
2004, 197 Seiten, ISBN 3-86037-216-5
- Vol. 24 **Nichtmonetäre Transaktionen in der ukrainischen Landwirtschaft: Determinanten, Spezifika und Folgen**
Olena Dolud (PhD)
2004, 190 Seiten, ISBN 3-9809270-3-2
- Vol. 25 **The role of agriculture in Central and Eastern European rural development: Engine of change or social buffer?**
ed. by Martin Petrick and Peter Weingarten
2004, 426 pages, ISBN 3-9809270-4-0

- Vol. 26 **Credit rationing of Polish farm households – A theoretical and empirical analysis**
Martin Petrick (PhD)
2004, 254 pages, ISBN 3-9809270-6-7
- Vol. 27 **Drei Jahrhunderte Agrarwissenschaft in Russland: Von 1700 bis zur Gegenwart**
Alexander Alexandrowitsch Nikonow und Eberhard Schulze
2004, 232 Seiten, ISBN 3-9809270-8-3
- Vol. 28 **Russlands Weg vom Plan zum Markt: Sektorale Trends und regionale Spezifika**
Peter Voigt (PhD)
2004, 270 Seiten, ISBN 3-9809270-9-1
- Vol. 29 **Auswirkungen des Transformationsprozesses auf die sozio-ökonomischen Funktionen ukrainischer Landwirtschaftsunternehmen**
Helga Biesold (PhD)
2004 182 Seiten, ISBN 3-938584-00-9
- Vol. 30 **Agricultural policies and farm structures – Agent-based modelling and application to EU-policy reform**
Kathrin Happe (PhD)
2004, 291 pages, ISBN 3-938584-01-7
- Vol. 31 **How effective is the invisible hand? Agricultural and food markets in Central and Eastern Europe**
ed. by Stephan Brosig and Heinrich Hockmann
2005, 361 pages, ISBN 3-938584-03-3
- Vol. 32 **Erfolgsfaktoren von landwirtschaftlichen Unternehmen mit Marktfruchtanbau in Sachsen-Anhalt**
Kirsti Dautzenberg (PhD)
2005, 161 Seiten, ISBN 3-938584-06-8
- Vol. 33 **Agriculture in the face of changing markets, institutions and policies: Challenges and strategies**
ed. by Jarmila Curtiss, Alfons Balmann, Kirsti Dautzenberg, Kathrin Happe
2006, 544 pages, ISBN 3-938584-10-6

- Vol. 34 **Making rural households' livelihoods more resilient – The importance of social capital and the underlying social networks**
ed. by Gertrud Buchenrieder and Thomas Dufhues
2006, 106 pages, ISBN 3-938584-13-0
- Vol. 35 **Außerlandwirtschaftliche Diversifikation im Transformationsprozess. Diversifikationsentscheidungen und -strategien ländlicher Haushalte in Slowenien und Mazedonien**
Judith Möllers (PhD)
2006, 323 Seiten, ISBN 3-938584-14-9
- Vol. 36 **Accessing rural finance – The rural financial market in Northern Vietnam**
Thomas Dufhues (PhD)
2007, 166 Seiten, ISBN 3-938584-16-5
- Vol. 37 **Страхование посевов в Казахстане: Анализ возможностей эффективного управления рисками**
Раушан Бокушева, Олаф Хайдельбах, Талгат Кусайынов
2007, 82 Seiten, ISBN 3-938584-17-3
- Vol. 38 **Rethinking agricultural reform in Ukraine**
Zvi Lerman, David Sedik, Nikolai Pugachov, Aleksandr Goncharuk
2007, 167 Seiten, ISBN 3-938584-18-1
- Vol. 39 **Sustainable rural development: What is the role of the agri-food sector?**
ed. by Martin Petrick, Gertrud Buchenrieder
2007, 293 pages, ISBN 3-938584-22-X
- Vol. 40 **Efficiency of selected risk management instruments – An empirical analysis of risk reduction in Kazakhstani crop production**
Olaf Heidelberg (PhD)
2007, 223 Seiten, ISBN 3-938584-19-X
- Vol. 41 **Marktstruktur und Preisbildung auf dem ukrainischen Markt für Rohmilch**
Oleksandr Perekhozhuk (PhD)
2007, 274 Seiten, ISBN 978-3-938584-24-8
- Vol. 42 **Labor market behavior of Chinese rural households during transition**
Xiaobing Wang (PhD)
2007, 140 Seiten, ISBN 978-3-938584-25-5

- Vol. 43 **Continuity and change: Land and water use reforms in rural Uzbekistan. Socio-economic and legal analyses for the region Khorezm**
ed. by Peter Wehrheim, Anja Schoeller-Schletter, Christopher Martius
2008, 211 Seiten, ISBN 978-3-938584-27-9
- Vol. 44 **Agricultural economics and transition: What was expected, what we observed, the lessons learned (Vol I and II)**
ed. by Csaba Csáki, Csaba Forgács
2008, 634 Seiten, ISBN 978-3-938584-31-6
- Vol. 45 **Theoretical and methodological topics in the institutional economics of European agriculture. With applications to farm organisation and rural credit arrangement**
Martin Petrick
2008, 223 Seiten, ISBN 978-3-938584-31-6
- Vol. 46 **Agri-food business: Global challenges – Innovative solutions**
ed. by Thomas Glauben, Jon H. Hanf, Michael Kopsidis, Agata Pieniadz, Klaus Reinsberg
2008, 152 pages, ISBN 978-3-938584-33-0
- Vol. 47 **Eine Analyse der Transformationsberatung für die "kollektive Landwirtschaft" während der ersten Transformationsphase (1989-1991) am Beispiel Ostdeutschlands: Lehren für Korea**
Jeong Nam Choi (PhD)
2009, 225 Seiten, ISBN 978-3-938584-36-1
- Vol. 48 **Croatia's EU accession. Socio-economic assessment of farm households and policy recommendations**
Judith Möllers, Patrick Zier, Klaus Froberg, Gertrud Buchenrieder and Štefan Bojnec
2009, 196 Seiten, ISBN 978-3-938584-35-4
- Vol. 49 **Structural change in Europe's rural regions. Farm livelihoods between subsistence orientation, modernisation and non-farm diversification**
ed. by Gertrud Buchenrieder Judith Möllers
2009, 166 Seiten, ISBN 978-3-938584-39-2
- Vol. 50 **Motive beim Weinkonsum – Unterschiede zwischen deutschen und ukrainischen Konsumenten**
Astrid Lucie Rewerts (PhD)
2009, 267 Seiten, ISBN 978-3-938584-40-8

- Vol. 51 **Rural development as provision of local public goods: Theory and evidence from Poland**
Andreas Gramzow (PhD)
2009, 203 Seiten, ISBN 978-3-938584-41-5
- Vol. 52 **Multi-level Processes of Integration and Disintegration. Proceedings of the Third Green Week Scientific Conference**
ed. by Franziska Schaft, Alfons Balmann
2009, 216 Seiten, ISBN 978-3-938584-42-2
- Vol. 53 **Zur Bestimmung der Wettbewerbsfähigkeit des weißrussischen Milchsektors: Aussagefähigkeit von Wettbewerbsindikatoren und Entwicklung eines kohärenten Messungskonzepts**
Mikhail Ramanovich (PhD)
2010, 202 Seiten, ISBN 978-3-938584-44-6
- Vol. 54 **Die Internationalisierung landwirtschaftlicher Unternehmen. Das Beispiel deutscher, dänischer und niederländischer Direktinvestitionen in den ukrainischen Agrarsektor**
Henriette Stange (PhD)
2010, 296 Seiten, ISBN 978-3-938584-45-3
- Vol. 55 **Verhandlungsverhalten und Anpassungsanpassung im internationalen Verhandlungsprozess: Die WTO-Agrarverhandlungen zum Abbau exportwettbewerbsfördernder Maßnahmen**
Ildiko Lajtos (PhD)
2010, 195 Seiten, ISBN 978-3-938584-48-4
- Vol. 56 **Challenges of education and innovation. Proceedings of the Fourth Green Week Scientific Conference**
ed. by Kelly Labar, Martin Petrick, Gertrud Buchenrieder
2010, 155 Seiten, ISBN 978-3-938584-49-1
- Vol. 57 **Agriculture in the Western Balkan Countries**
ed. by Tina Volk
2010, 249 Seiten, ISBN 978-3-938584-51-4
- Vol. 58 **Perspectives on Institutional Change – Water Management in Europe**
ed. by Insa Theesfeld, Frauke Pirscher
2011, 127 Seiten, ISBN 978-3-938584-52-1

- Vol. 59 **Der ukrainische Außenhandel mit Produkten der Agrar- und Ernährungswirtschaft: Eine quantitative Analyse aus Sicht traditioneller und neuer Außenhandelstheorien**
Inna Levkovych (PhD)
2011, 232 Seiten, ISBN 978-3-938584-53-8
- Vol. 60 **Regional structural change in European agriculture: Effects of decoupling and EU accession**
Christoph Sahrbacher (PhD)
2011, 244 Seiten, ISBN 978-3-938584-58-3
- Vol. 61 **Structural Change in Agriculture and Rural Livelihoods: Policy Implications for the New Member States of the European Union**
ed. by Judith Möllers, Gertrud Buchenrieder, Csaba Csáki
2011, 247 Seiten, ISBN 978-3-938584-59-0
- Vol. 62 **Improving the functioning of the rural financial markets of Armenia**
Milada Kasarjyan (PhD)
2011, 121 Seiten, ISBN 978-3-938584-60-6
- Vol. 63 **Integrierte Strukturen im Agrar- und Ernährungssektor Russlands: Entstehungsgründe, Funktionsweise, Entwicklungsperspektiven und volkswirtschaftliche Auswirkungen**
Jürgen Wandel
2011, 758 Seiten, ISBN 978-3-938584-61-3
- Vol. 64 **Goal Achievement in Supply Chain Networks – A Study of the Ukrainian Agri-Food Business**
Taras Gagalyuk (PhD)
2012, 204 Seiten, ISBN 978-3-938584-63-7
- Vol. 65 **Impacts of CAP reforms on farm structures and performance disparities – An agent-based approach**
Amanda Sahrbacher (PhD)
2012, 284 Seiten, ISBN 978-3-938584-64-4
- Vol. 66 **Land fragmentation and off-farm labor supply in China**
Lili Jia (PhD)
2012, 143 Seiten, ISBN 978-3-938584-65-1
- Vol. 67 **Ausprägung interregionaler Disparitäten und Ansätze zur Entwicklung ländlicher Räume in Mittel- und Osteuropa**
Sabine Baum (PhD)
2012, 214 Seiten, ISBN 978-3-938584-68-2

- Vol. 68 **Patterns Behind Rural Success Stories in the European Union: Major Lessons of Former Enlargements**
ed. by Axel Wolz, Carmen Hubbard, Judith Möllers, Matthew Gorton,
Gertrud Buchenrieder
2012, 190 Seiten, ISBN 978-3-938584-69-9
- Vol. 69 **Motives for remitting from Germany to Kosovo**
Wiebke Meyer (PhD)
2012, 142 Seiten, ISBN 978-3-938584-70-5
- Vol. 70 **Effizienz russischer Geflügelfleischproduzenten: Entwicklung und Determinanten**
Elena Epelstejn (PhD)
2013, 272 Seiten, ISBN 978-3-938584-72-9
- Vol. 71 **Econometric impact assessment of the Common Agricultural Policy in East German agriculture**
Patrick Zier (PhD)
2013, 172 Seiten, ISBN 978-3-938584-73-6
- Vol. 72 **Determinants of non-farm entrepreneurial intentions in a transitional context: Evidence from rural Bulgaria**
Diana Traikova (PhD)
2013, 136 Seiten, ISBN 978-3-938584-75-0
- Vol. 73 **Human capital differences or labor market discrimination? The occupational outcomes of ethnic minorities in rural Guizhou (China)**
Bente Castro Campos (PhD)
2013, 266 Seiten, ISBN 978-3-938584-76-7
- Vol. 74 **Identifying and understanding the patterns and processes of forest cover change in Albania and Kosovo**
Kuenda Laze (PhD)
2014, 152 Seiten, ISBN 978-3-938584-78-1
- Vol. 75 **Flexibilität von Unternehmen. Eine theoretische und empirische Analyse**
Swetlana Renner (PhD)
2014, 194 Seiten, ISBN 978-3-938584-79-8
- Vol. 76 **Impact of policy measures on wheat-to-bread supply chain during the global commodity price peaks: The case of Serbia**
Ivan Djuric (PhD)
2014, 160 Seiten, ISBN 978-3-938584-80-4

- Vol. 77 **Marktwirtschaftliche Koordination: Möglichkeiten und Grenzen. Symposium anlässlich des 75. Geburtstages von Prof. Dr. Dr. h.c. mult. Ulrich Koester**
ed. by Jens-Peter Loy
2014, 94 Seiten, ISBN 978-3-938584-82-8
- Vol. 78 **Participatory governance in rural development: Evidence from Ukraine**
Vasyl Kvartiuk (PhD)
2015, 200 Seiten, ISBN 978-3-938584-84-2
- Vol. 79 **Agricultural transition in Post-Soviet Europe and Central Asia after 25 years. International workshop in honor of Professor Zvi Lerman**
ed. by Ayal Kimhi, Zvi Lerman
2015, 314 Seiten, ISBN 978-3-938584-95-8
- Vol. 80 **Three essays on the Russian wheat export**
Zsombor Pall (PhD)
2015, 150 Seiten, ISBN 978-3-938584-86-6
- Vol. 81 **Milchproduktion zwischen Pfadabhängigkeit und Pfadbrechung: Partizipative Analysen mit Hilfe des agentenbasierten Modells AgriPoliS**
Arlette Ostermeyer (PhD)
2015, 335 Seiten, ISBN 978-3-938584-88-0
- Vol. 82 **Competitiveness and performance of EU agri-food chains**
ed. by Heinz Hockmann, Inna Levkovych, Aaron Grau
2016, ISBN 978-3-95992-006-3
- Vol. 83 **Market uncertainty, project specificity and policy effects on bioenergy investments. A real options approach**
Lioudmila Chatalova (PhD)
2016, 202 Seiten, ISBN 978-3-95992-017-9
- Vol. 84 **Too much but not enough: Issues of water management in Albania in light of climate change**
Klodjan Rama (PhD)
2016, 222 Seiten, ISBN 978-3-95992-034-6
- Vol. 85 **Business groups in agriculture. Impact of ownership structures on performance: The case of Russia's agroholdings**
Andriy Matyukha (PhD)
2017, 128 Seiten, ISBN 978-3-95992-039-1

Vol. 86 Russian demand for dietary quality: Nutrition transition, diet quality measurement, and health investment theory

Christine Burggraf (PhD)

2017, 225 Seiten, ISBN 978-3-95992-040-7

Vol. 87 Trade policy impacts on net wheat importers in the CIS: Three essays

Nurzat Baisakova (PhD)

2017, 154 Seiten, ISBN 978-3-95992-041-4

In der Schriftenreihe *Studies on the Agricultural and Food Sector in Transition Economies* werden durch das IAMO Monographien und Tagungsberichte herausgegeben, die sich mit agrarökonomischen Fragestellungen zu Mittel- und Osteuropa beschäftigen. Wissenschaftlern, die in diesem Bereich forschen, steht die Schriftenreihe als Diskussionsforum offen.

In its series *Studies on the Agricultural and Food Sector in Transition Economies* IAMO publishes monographs and proceedings focusing on agricultural economic issues specific to Central and Eastern Europe. This series offers a forum to researchers studying this area.

ISSN 1436-221X
ISBN 978-3-95992-041-4