

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics



BACHELOR THESIS

**Analysis of Selected Grain Commodity with the Focus  
on Ukrainian Market**

Author: Olga Galka

Supervisor: Ing. Petr Procházka, MSc, Ph. D.

© 2015 CULS Prague

# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## BACHELOR THESIS ASSIGNMENT

Olga Galka

Economics and Management

Thesis title

Analysis of selected grain commodity with the focus on Ukrainian market

---

### Objectives of thesis

The aim of bachelor thesis is research of theoretical and practical reasoning of the main trends and factors of grain commodity markets with focus on the Ukrainian market. Evaluate current situation and prospects for main grain commodities and existing markets including the research of top trading exchange markets. Evaluate how the reduction in production in Ukraine may influence world trade of grain commodities.

### Methodology

With the help of methods of fundamental and technical analysis conduct the evaluation of grain commodity market with focus on Ukrainian market and determine the level of the advisability of investing the funds in it. By using comparative analysis and methods of deduction and induction and implementation of quantitative and qualitative research methods analyze the grain commodities markets.

**The proposed extent of the thesis**

The extent of thesis is 30-40 pages

**Keywords**

grain commodity, analysis, grain market, market trend, grain futures, grain production

---

**Recommended information sources**

OXLEY, Lawrence J. Extreme Weather and The Financial Markets: Opportunities in Commodities and Futures. Hoboken, New Jersey: John Wiley & Sons, Inc., 2011. ISBN: 978-1-118-20447-4

SPURGA, Roland C. Commodity Fundamentals: How To Trade the Precious Metals, Energy, Grain, and Tropical Commodity Markets. Hoboken, New Jersey: John Wiley & Sons, Inc., 2006. ISBN: 978-0-471-78851-5

ZHOU, Zhang-Yue. Effects of grain marketing systems on grain production: a comparative study of China and India. Binghamton, NY: The Haworth Press, Inc., 1997. ISBN:1-56022-862-8

---

**Expected date of thesis defence**

2015/16 WS – FEM

**The Bachelor Thesis Supervisor**

Ing. Petr Procházka, Ph.D., MSc

**Supervising department**

Department of Economics

Electronic approval: 18. 11. 2015

prof. Ing. Miroslav Svatoš, CSc.

Head of department

Electronic approval: 18. 11. 2015

Ing. Martin Pelikán, Ph.D.

Dean

Prague on 29. 11. 2015

---

## **Declaration**

I declare that I have worked on the bachelor thesis “Analysis of Selected Grain Commodity with the Focus on Ukrainian Market” by myself and the sources that I used in my work are listed in the references.

In Prague on

.....

Olga Galka

## **Acknowledgements**

I would like to dedicate my work to my family. I express my sincere gratitude to my mother and father, for their unlimited love and faith in me, to my grandmother, for supporting me all the way. I would like to thank my uncle Valeriy Bezverkhniy and to his family for giving me such opportunity and making this possible.

Thanks to my friends for inspiring me. Thanks to the God for giving me strength to do it.

I also would like to express gratitude to my supervisor Ing. Petr Procházka, MSc, Ph. D. for his patience, valuable and helpful advices.

## Analysis of Selected Grain Commodity with the Focus on Ukrainian Market

---

### Analýza vybraných komodit obilí se zaměřením na ukrajinský trh.

#### Summary:

The main aim of this bachelor thesis is to describe the current trends and evaluate main factors which may influence the grain commodity market, mainly concentrates the attention on the wheat commodity.

This bachelor thesis work consists of theoretical and analytical part. The first part presents the general overview of the grain commodity, describes current trends on wheat commodity market and explains basics of futures wheat trade. Then the following theoretical part which focuses on the situation in the Ukrainian grain market, describes the structure of grain production and export trends. The second part presents the results of conducted fundamental analysis of Ukrainian wheat market, and results from technical analysis of global trade.

#### Souhrn:

Hlavním cílem této bakalářské práce je popsat současné trendy a zhodnotit hlavní faktory, které mohou ovlivnit komoditní trh se zrním. Pozornost této práce se soustřeďuje hlavně na komoditu pšenice.

Tato bakalářská diplomová práce se skládá z teoretické a analytické části. První část představuje celkový přehled komodit obilí, popisuje současné trendy na komoditním trhu s pšenicí a vysvětluje základy budoucího obchodování s pšenicí. Následující teoretická část se zaměřuje na situaci na ukrajinském trhu s obilím, popisuje strukturu produkce obilí a trendů v oblasti exportu. Druhá část prezentuje výsledky provedené fundamentální analýzy ukrajinského trhu s pšenicí, a výsledky technické analýzy světového obchodu.

**Key words:** grain commodity, analysis, grain market, market trend, grain futures, grain production

**Klíčová slova:** komodity obilí, analýza, obilí na trhu, vývoj na trhu, obilí futures, produkce obilovin

## Contents

<b>List of Abbreviations and Acronyms</b> .....	8
<b>List of Tables</b> .....	10
<b>List of Figures</b> .....	11
<b>1 Introduction</b> .....	12
<b>2 Thesis Objectives and Methodology</b> .....	13
2.1 Objectives .....	13
2.2 Methodology.....	13
<b>3 Theoretical Part</b> .....	14
3.1 General Overview of Commodity.....	14
3.1.1 Classification of Commodity.....	16
3.1.2 Grain Commodity Market .....	18
3.2 Wheat Commodity Market.....	21
3.2.1 Export and Import .....	26
3.2.2 Main Exchanges.....	30
3.3 The Trade of Wheat: Commodity Futures.....	32
3.4 Grain Market In Ukraine.....	37
3.4.1 Situation on Ukrainian Grain Market.....	37
3.4.2 Structure of Grain Production.....	42
3.4.3 Export.....	44
3.4.4 Import.....	47
<b>4 Analytical Part</b> .....	48
4.1 Fundamental Analysis of Ukrainian Wheat Market.....	48
4.2 Technical Analysis of US Wheat Technical Analysis of US Wheat.....	53
4.2.1 The Simple Moving Average.....	53
4.2.2 The Relative Strength Index.....	55
4.2.3 The Exponential Moving Average.....	56
4.2.4 The Moving Average Convergence Divergence.....	57
4.2.5 The Bollinger Bands.....	59
<b>5 Conclusions</b> .....	61
<b>6 References</b> .....	62

## List of Abbreviations and Acronyms

BB	Bollinger Bands
CBOT	Chicago Board of Trade
CFD	Contract For Difference
CIS	Commonwealth of Independent States
CME	Chicago Mercantile Exchange
COMEX	Commodity Exchange
CPT	Carriage Paid To
EMA	Exponential Moving Average
ESA	European Space Agency
est.	et cetera, and so on
EU	European Union
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FAS USDA	Foreign Agriculture Service of United States Department of Agriculture
F&O	Futures and Options
FOB	Free On Board
FSI	Food, Seed and Industrial
GDP	Gross Domestic Product
ha	Hectares
ICE	Intercontinental Exchange
IGC	Interantional Grains Council
i.e.	id est., that is
JSE	Johannesburg Stock Exchange
KCBT	Kansas City Board of Trade
Kg per ha	Kilograms Per Hectare
LIFFE	London International Financial Futures and Options Exchange
MA	Moving Average
MACD	Moving Average Convergence/Divergence
MGEX	Minneapolis Grain Exchange
M ha	Million Hectare



MMT	Million Metric Tons
M t	Million Tons
MY	Marketing Year
NYMEX	New York Mercantile Exchange
NYSE	New York Stock Exchange
OECD	Organization for Economic Co-operation and Development
RSI	Relative Strength Index
SAFEX	South African Futures Exchange
SMA	Simple Moving Average
Sq. km	Square Kilometer
\$/MT	United States Dollar per Metric Ton
\$/t	United States Dollar per Ton
TMT	Thousand Metric Tons
t/ha	Tons Per Hectare
TY	Trade Year
US	United States
USA	United States of America
US\$ M	United States Dollars in Millions
USDA	United States Department of Agriculture
WCE	Winnipeg Commodities Exchange
ZCE	Zhengzhou Commodity Exchange
ZW	United States Wheat Futures

## **List of Tables**

Table 1 Sector components of soft and hard commodities	17
Table 2 World`s production of grain commodities, tons	19
Table 3 Wheat Production by Country in 1000 MT	22
Table 4 World Production, Trade and Consumption of Wheat, Mt	23
Table 5 Top 15 Importers of Wheat for 2014	26
Table 6 Top 15 Importers of Wheat for 2014	28
Table 7: Main agricultural indicators for Ukraine, 2012-2013	37
Table 8 Grain balance (including products of grain processing counted as grain), thousands tons	40
Table 9 Wheat main indicators, 2013- 2014	43
Table 10 Wheat Exports from Ukraine by Selected Destination, MY, 1000 MT	46
Table 11 The Effect of Changes in Supply and Demand on Price	48
Table 12 Ukraine Wheat Balance, 1000 MT	49

## List of Figures

Figure 1 Selected Wheat Consuming Regions, thousand metric tons, 2014/2015	24
Figure 2 Top 15 Exporters by percentage of global wheat export	27
Figure 3 Top 15 Importers by dollar value of wheat import, US\$ Mill	29
Figure 4 Variability of grain production and export, 1991-2021	45
Figure 5 Import of Wheat 1992-2012, tons	47
Figure 6 Ukraine Domestic and Black Sea Port Wheat Prices (\$/MT)	51
Figure 7 Export Prices for Milling Wheat from 2010 – 2015, \$/t	52
Figure 8 Supply and Demand of World Wheat, 2013- 2014, \$/t	52
Figure 9 US Wheat Moving Average, (15, 50, 200 days)	54
Figure 10 US Wheat Relative Strength Index, (14 days)	55
Figure 11 Exponential Moving Average of US Wheat (6, 14, 26 days)	57
Figure 12 Moving Average Convergence Divergence of US Wheat	58
Figure 13 Bollinger Bands of US Wheat	60

# 1 Introduction

The world raw materials are commodities. The commodities are being used as natural resources for production process of all goods that are manufactured. That fact is putting them at the heart of an economic cycle of any country and in particular the world itself. Commodity are around us and they are vital part of nowadays lives, the bread you put on your wooden table and cut with your knife it's a bright example of commodity in your life. This bread is made of a grain commodity.

The presented work is mostly concentrated on the grain commodity and the grain market of Ukraine, due to the fact that one of the most important sectors of the Ukrainian economy has historically been agriculture. Being a part of former Soviet Union, Ukraine has shown itself as a key actor on diverse international markets for agricultural commodities by being a significant consumer and producer of agricultural products.

The grain commodity market has powerful potential to contribute to the economic growth and development of Ukraine. The agriculture sector has all what is needed such as weather conditions, quality of soil and water, strategic location to increase the net export of grain. It will enable Ukraine to provide its own production and national economic development, but also will help to make a significant contribution to a global food security, it will also help to lead the country out of the crises and pay out the debts.

In the thesis the attention will be devoted mainly to the wheat as one of the main grain commodities of Ukraine. While conducting the research it was noticed the grain market has existed since the dawn of time, but the situation that was observed in Ukraine before and during crises, says that it is not perfect. Deficient in the sense that it is not debugged system of pricing, agricultural producers cannot receive the deserved money. With sufficient funds the production of wheat as one of main grain crops of Ukraine will be increasing covering the demand also on global market.

## **2 Thesis Objectives and Methodology**

### **2.1 Objectives**

The first research objective of the thesis is to explain basis of theoretical and practical reasoning of the main trends and factors which influence on grain commodity. The grain commodity and its trade such as futures will be clarified. The following aim is to understand Ukrainian grain market by analyzing current situation, evaluate how the reduction in production in Ukraine may influence world trade of grain commodity such as wheat.

### **2.2 Methodology**

In this bachelor's thesis work was implemented qualitative and quantitative analysis as a research method. Fundamental and technical analysis has been used. The elements of exchange trade, the grain futures trade system and current situation of Ukraine according to the grain market were reviewed with the help of articles and balance sheets of grain. The numerical data represented in thesis is assembled from the official websites, publications and magazines. The information base for the study served official annual grain reports, professional literature, materials of scientific conferences and periodicals, statistical data, data of marketing and analytical agencies.

### **3 Theoretical Part**

#### **3.1 General Overview of Commodity**

What is a commodity? How should we define it? Geman (2005, p. 15) suggested following “an economist would say that it is a consumption asset whose scarcity, whether in the form of exhausting underground reserves or depleted stocks, has a major impact on the world and country-specific economic development. A banker would observe that it is not a financial security, giving rise to a stream of cash flows and priced by net present value arguments. An ecologist would suggest that it is a natural good whose original integrity should be preserved. An academic would argue that, given the current volatility of all currencies, including the most established ones, a commodity is an exemplary numéraire with respect to which portfolio values should be measured”.

According to Bouchentouf (2011, p. 13) “just what, exactly, are commodities? Put simply, commodities are the raw materials humans use to create a livable world. Humans have been exploiting earth’s natural resources since the beginning of time. They use agricultural products to feed themselves, metals to build weapons and tools, and energy to sustain themselves. Energy, metals, and agricultural products are the three classes of commodities, and they are the essential building blocks of the global economy”.

Everything what is possible to eat, touch, see or feel is a commodity. Being in Texas one can see oil wells, a commodity such as oil is being pumped. Driving through kilometers of long wheat fields, one is passing fields of agricultural commodity: wheat. Drinking a cup of coffee or a glass of orange juice, one is drinking a commodity. And if someone has visited a jewelry store and has chosen a gold ring someone did choose a traded commodity: gold. Commodities are everywhere, but not all commodities are traded.

Such commodities as corn, copper, gold, sugar, coffee, wheat, lumber, crude oil, natural gas, heating oil are the commodities that present in peoples everyday life. Perhaps people do not look at them in such way.

Whenever a kilogram of coffee is bought, the price which was paid was based on the commodity price established for a kilogram of coffee beans. However odd it may appear the future price of coffee is being traded right now and that price can volatile today, tomorrow and for months to follow and it will influence on price of coffee you will pay at a shop or café. The price you pay for a gas at a gas pump is a reflection of how gasoline is traded as a commodity. Consequently, as oil is traded, prices fluctuate, and they can do so on daily basis. These prices eventually translate to a change in the price of a traded gallon of gas, which will ultimately be filtered into what you pay at the pump (Fontanills, 2007, p. 2).

Commodities are generally traded on a commodity exchanges, as well as various derivatives are traded. As referred to a classic commodity it is usually a bulk product, which generally is unified by volume, standardized in quality, which has well-defined, easily concretized stable properties.

Exchange commodities generally refer to the beginning of the technological cycle of production and, therefore, they are largely determining the price for the products produced from it.

According to Gryaznova, Korneeva and Galanov (1995, p. 31) the basic requirements for the exchange of goods are follows:

- should be massive, that is produced in fairly large volume by many manufacturers and intended to be purchased by a large number of customers;
- exchange commodity can only be primary products - mining sectors, i.e. raw materials or semi-finished;
- exchange goods should have clear standard characteristics, that have regulated the conditions of quality, storage requirements, measurement and transportation;
- should be mutually interchangeable, that is commodity of one enlarged group should be identical in composition, properties, appearance and quality of the packaging, labeling, size of party, weight (particularly in the US wheat differentiated into three types: "soft red", "solid red", "dark north." In turn, each grade measured at three (1, 2, 3) classes, each of them has various baking properties. At the grain exchange the traded wheat price is for a

standard second class of wheat. If the exchange will feature wheat of first or third class, premium or discount on the price will be generated);

- pricing mechanism to exchange goods should be regulated on the basis of incorporation of the conjuncture forming factors - fixed and variable;

- should have clear boundaries that characterize its size, offered for sale, the unit should be governed by a carrying capacity or by a volume of vehicles typically rail cars, or the volume and weight of the product. So the actual amount offered for bidding of products – the unit shall be a multiple of exchange unit. For example, the Mercantile Exchange "Chicago Board Of Trade" (USA), a unit of exchange for wheat is 5 thousand bushels (about 100 tons), in cattle - 34 bulls head (40 thousand pounds or 18 tons). At the London Metal Exchange unit of copper, zinc, approved by the rules of the Exchange and is 25 tones, of tin – 5 tones, silver - 311 kilograms).

### **3.1.1 Clasification of Commodity**

In accordance with the established rules, based on the concept of commodities, each exchange entitled to establish the composition of products that will be subject to exchange trading. However, those requirements that apply to the exchange of goods by practice of exchange trading are taken into account. Nowadays about 70 types of goods are objects of trading.

A common way to classify them is to distinguish between soft and hard commodities. Hard commodities are products from the energy, precious metals, and industrial metals sectors. Soft commodities are usually weather-dependent, perishable commodities for consumption from the agricultural sector, such as grains, soybeans, or livestock, such as cattle or hogs (Fabozzi, Füss and Kaiser, 2008, p. 7).

The following Table 1 shows the classification of soft commodities and hard commodities which were suggested by Fabozzi, Füss and Kaiser (2008, p.8).



**Table 1 Sector components of soft and hard commodities**

<b>Soft Commodities</b>		
<i>Livestock</i>	<i>Agriculture</i>	
<ul style="list-style-type: none"> <li>• Feeder Cattle</li> <li>• Live Cattle</li> <li>• Live Hogs</li> <li>• Pork Bellies</li> </ul>	<i>Soft</i>	<i>Grains &amp; Seeds</i>
	<ul style="list-style-type: none"> <li>• Coffee</li> <li>• Cocoa</li> <li>• Cotton</li> <li>• Orange Juice</li> <li>• Rubber</li> <li>• Sugar</li> <li>• Silk</li> <li>• Timber</li> <li>• Wool</li> </ul>	<ul style="list-style-type: none"> <li>• Azuki Beans</li> <li>• Barley</li> <li>• Canola</li> <li>• Corn</li> <li>• Millet</li> <li>• Oats</li> <li>• Oilseeds</li> <li>• Red Wheat</li> <li>• Rice</li> <li>• Rye</li> <li>• Sorghum</li> <li>• Soybeans</li> <li>• Soybean Meal</li> <li>• Wheat</li> </ul>
<b>Hard Commodities</b>		
<i>Energy</i>	<i>Metal</i>	
<ul style="list-style-type: none"> <li>• Brent Oil</li> <li>• Crude Oil</li> <li>• Coal</li> <li>• Gas Oil</li> <li>• Heating Oil</li> <li>• Natural Gas</li> <li>• Unleaded Gasoline</li> </ul>	<i>Industrial</i>	<i>Precious</i>
	<ul style="list-style-type: none"> <li>• Aluminum</li> <li>• Chrome</li> <li>• Copper</li> <li>• Lead</li> <li>• Mercury</li> <li>• Nickel</li> <li>• Selenium</li> <li>• Tin</li> <li>• Titanium</li> <li>• Zinc</li> </ul>	<ul style="list-style-type: none"> <li>• Gold</li> <li>• Iridium</li> <li>• Palladium</li> <li>• Rhodium</li> <li>• Ruthenium</li> <li>• Silver</li> </ul>

Source: Fabozzi, F., Füss, R., and Kaiser, D. (2008, p.8).

According to Fabozzi, Füss and Kaiser (2008, p. 7) state that “storability and availability (or renewability) are also important features of commodities. However, because storability plays a decisive role in pricing, we distinguish between storable and non-storable commodities. A commodity is said to have a high degree of storability if it is not perishable and the cost of storage remains low with respect to its total value”.

### **3.1.2 Grain Commodity Market**

It is expedient to give the definition of the grain market. The grain market is defined as a set of economic relations, manifested in the exchange of grain and grain products for other commodities with material or technical value or for money, and as a result of this exchange a demand, supply and a price of grain is formed.

According to The Law of Ukraine № 37-IV (2002) "On Grain and Grain Market in Ukraine" is clear that *“grain market is the system of commodity-money relations arising between the actors in the production, storage, marketing and use of grain on the principles of free competition, free choice of directions of grain and determination of prices, and state control over its quality and storage”*.

To the grain commodities normally referred: barley, corn, millet, oats, rice, rye, sorghum, wheat. According to FAOSTAT (2015) the world`s production of most traded grain commodities is shown in the Table 2.

**Table 2 World`s production of grain commodities, tons**

<i>Grain</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
<i>Barley</i>	151,784,422	123,685,501	132,947,408	133,012,940	143,959,778
<i>Corn</i>	820,202,618	851,257,025	887,664,933	877,924,227	1,018,111,958
<i>Millet</i>	26,073,631	32,607,751	27,283,377	26,628,546	29,864,147
<i>Oats</i>	23,344,913	19,722,987	22,316,322	21,314,053	23,880,997
<i>Rye</i>	18,293,688	11,960,960	13,009,934	14,538,094	16,686,795
<i>Rice, paddy</i>	686,928,072	701,974,998	722,718,631	734,906,260	740,902,532
<i>Sorghum</i>	56,937,346	60,063,554	57,039,245	56,476,951	62,295,137
<i>Wheat</i>	686,720,279	649,325,445	699,373,388	671,481,923	715,909,258

Source: FAOSTAT (2015)

In 2012 world production of main crops of wheat, corn, rice and 671 million tons (M t), 877 M t and 734 M t, respectively. Nevertheless, the biggest share of corn harvest is given for feeder and fuel proposes, whereas more than 93 percent of the rice normally is used for consumption in the country where it is produced.

Wheat is one of the most important food crops in the world, providing 20 percent of humanity`s dietary energy supply and serving as the main source of protein in developing nations. There was around 135 M t traded annually from 2006 to 2010 (Phillips and Norton, 2013).

The top 3 grain commodities such as corn, rice and wheat are the leaders of production volume according the data give by FAOSTAT (2015), and those 3 commodities are keeping the positions of leaders and they production volume will rise.

That might be explain in the way that the total world consumption of wheat for year 2013/2014 is 698,655 thousand metric tons, as for rice consumption and residuals in is 481,474 TMT, and for corn it is 953,477 TMT (FAS USDA, 2015).

While some commodity markets may be comparably separated, trade in wheat is the world business. The consumption and production of this commodity is spread around the world highly uneven, which creates powerful interdependency among various areas.

The cultivation of wheat was mainly for human consumption purposes, however the wheat which possess less quality and the byproducts from flour processing which are full of nutrients started to be used as food for animal and later as bio fuel. Various classes of wheat normally have lightly distinctive usages, and it is significant to be aware of when the trade in wheat futures contracts happens.

Classification of wheat type is done according the planting season, color of wheat and hardness of the seed itself. A winter wheat is the type of wheat which is planted in autumn, maturing during the spring season and harvested in early summer.

Spring wheat is planted in the beginning of April till May and it is harvested in August. Despite the fact that the yields of spring wheat are considerably lower, this wheat is still very high quality and worldwide used for the production of bakery products.

Soft and white wheat mills easier due to lower percentage of gluten, used in baking biscuits, varieties of French bread. Those types usually generate higher prices since there is no need to bleach them and they are milled easier.

According to Basta (2014) the 6 major types should be distinguish:

***Hard red spring wheat*** has the highest protein level, and is used for bread, hard baked goods, all-purpose flour, and flour blends.

***Hard red winter wheat*** is high protein wheat used mostly for breads and all-purpose flour, and as an adjunct in other flours to increase protein content.

***Durum wheat*** is spring wheat. It may be either white or red, and is the hardest of all wheat. It offers both high protein and high gluten content, and is used to make the semolina flour for premium pasta products and for some Mediterranean bread.

**Hard white wheat** is medium protein grain that is closely related to red wheat except for color and some milling and baking qualities. However, it offers a milder, sweeter flavor, and is used in yeast breads, hard rolls, bulgur, tortillas, oriental noodles, whole wheat and all-purpose flours, and also in brewing.

**Soft red winter wheat** has a low to medium protein content, and is used for breads and blending. It is used to make cookies, cakes, donuts, and other fine pastries as well as flat breads, and crackers.

**Soft white wheat** is low protein wheat, but offers high yields to growers. It provides a whiter product for high quality cakes, crackers, cookies, pastries, and Asian-style noodles, bakery products other than breads.

### **3.2 Wheat Commodity Market**

Wheat is grown on more than 216,000,000 hectares (530,000,000 acres). This is an area larger than for any other crop. This is because of the wheat plant's agronomic adaptability to grow from near arctic regions to the equator, from sea level to the plains of Tibet, approximately 4,000 m. (13,000 ft.) above sea level (Basta, 2014).

The participants on a market of wheat commodities are of the three different types and they are the same as on others markets of commodities:

*Profiteers of a large scale:* Investors groups who are joining their financial funds together in order to decrease risk and increase profit. For example in the stock market mutual funds, involving financial managers to perform the investment decision for investors in general.

*Profiteers of a small scale:* The commodities being trade by individual trader or by broker. The small scale speculator can trade on its own accounts.

*Commercial traders:* Its individuals as well as companies which are engaged in the production, processing, or merchandising goods. The wheat farmer and the Kraft's are the commercial traders. The lion's share of trading is done by commercial traders.

IndexMundi (2014) listed top 10 producers of wheat for 2014 in 1000 metric tons, which are shown in Table 3.

**Table 3 Wheat Production by Country in 1000 MT**

Rank	Country	Production in 1000 MT
1	EU-27	156,448.00
2	China	126,000.00
3	India	95,850.00
4	Russian Federation	59,080.00
5	United States	55,129.00
6	Canada	29,300.00
7	Pakistan	25,500.00
8	Ukraine	24,750.00
9	Australia	24,000.00
10	Turkey	15,250.00

Source: IndexMundi (2014)

The first rank in top ten is occupied by EU-27 first of all is needed to mention that it's an accumulative figure for 27 member states of European Union not including Croatia. The biggest share in EU production of wheat is made by France and Germany around which is 39.1 million tons and 27.5 million tons respectively.

Top second in the rank is China with its production 126 million metric tons is exceptional production is done on about 24 million hectares of land, which is territory of six

Netherlands. Also it is due to the fact that wheat in China matures earlier so the farmer can harvest twice each year.

According to the information from International Grains Council (2015) major exporters of wheat are Argentina, Australia, Canada, EU, Kazakhstan, Russia, Ukraine and United States. Table 4 shows world production, trade and consumption in million tons from 2012 till 2015 with forecast made on 27 of August of 2015 for the year 2016.

**Table 4 World Production, Trade and Consumption of Wheat, Mt**

	12/13	13/14	14/15 est.	15/16 forecast
Production	655	714	720	720
Trade	142	156	158	148
Consumption	677	696	707	716
Carryover stocks	171	188	202	206
Year/ year change	-21	18	14	4
Major Exporters: Argentina, Australia, Canada, EU, Kazakhstan, Russia, Ukraine, United States	51	55	65	68

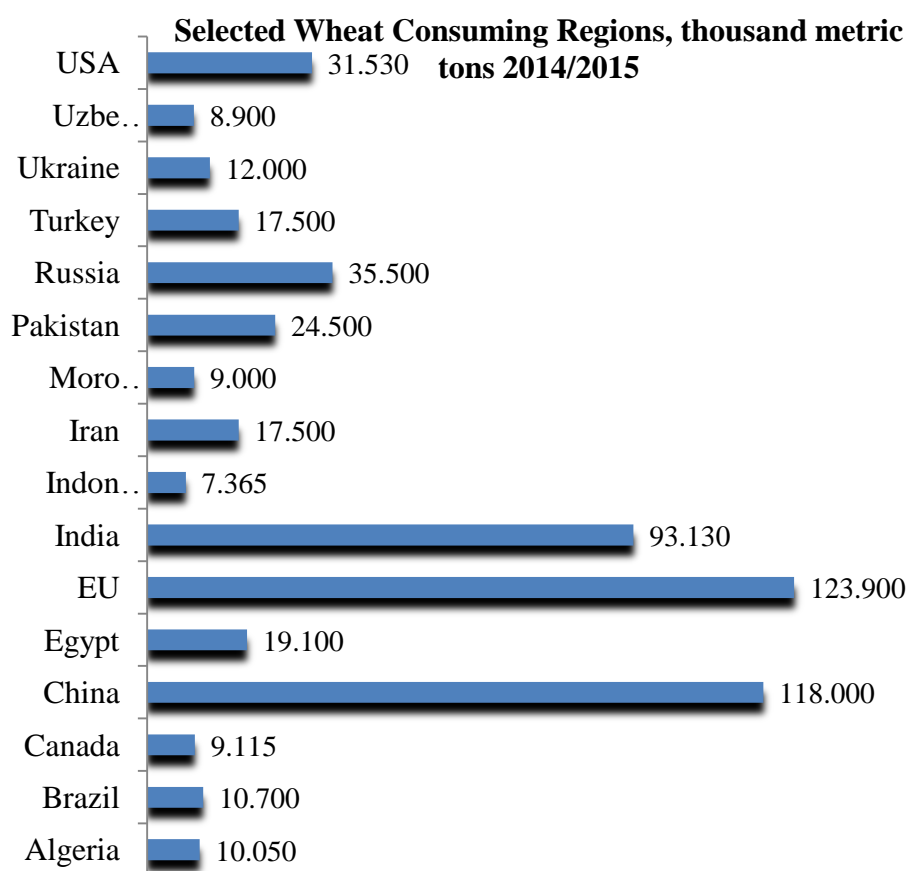
Source: International Grains Council (2015)

The world production is rising due to contribution of China, followed by Russia, Ukraine and United States. The trade is dropped from 158 to 148 because the import needs of Near East Asia and North Africa decreased and because of major part of produced wheat of China is consumed inside the country, that also explain the rise of global consumption. One more factor influenced on boost of consumption is boost of feed use.

Carryover stocks of global wheat at the end of 2015/16 are now seen at 206 m t, that mean that the harvest will be successful and the farmers will have enough of grains to seed next planting period.

As world consumption is predicted to raise it is expedient to take a look on the major consumers of wheat which are shown in the Figure 1, the values were taken for the period of 2014/2015 and the values are in thousand metric tons(FAS USDA,2015) .

**Figure 1 Selected Wheat Consuming Regions, thousand metric tons, 2014/2015**



Source: FAS USDA (2015)

According to the information given by FAS USDA (2015) on the wheat worl consumption there are top 16 consumers countries of wheat, the data analysed for the period of 2014/2015. The biggest consumer is China. Rural China has improved its food security significantly, which corresponds with an increase in living standards. The annual income



per capita of rural residents in 2011 increased in ten times than the one in 1978. The increase in real income caused significant changes in consumption patterns of the country.

On the second place of top consumers is a European Union with more than 123 thousand metric tons. This level is maintained due to establish historically consumption patterns and that big share of domestic consumption is by the feed sector.

Top three in the rank is India with the consumption more than 93 thousand metric tons. Wheat is the main food for the majority of Indians, mainly consumed in the form of homemade bread. Economic growth and the middle class expanding largely leading to the diversification of consumption patterns. The consumption of processed food is getting popular and in large amount of processed products the wheat is gaining the lead.

### 3.2.1 Export and Import

In 2014, wheat exports by country totaled US\$47.6 billion up by an overall 45% for all wheat shippers over the five-year period starting in 2010. However, the value of global wheat exports dipped 2.7% from 2013 to 2014 (Workman, 2015).

**Table 5 Top 15 Exporters of Wheat, US \$**

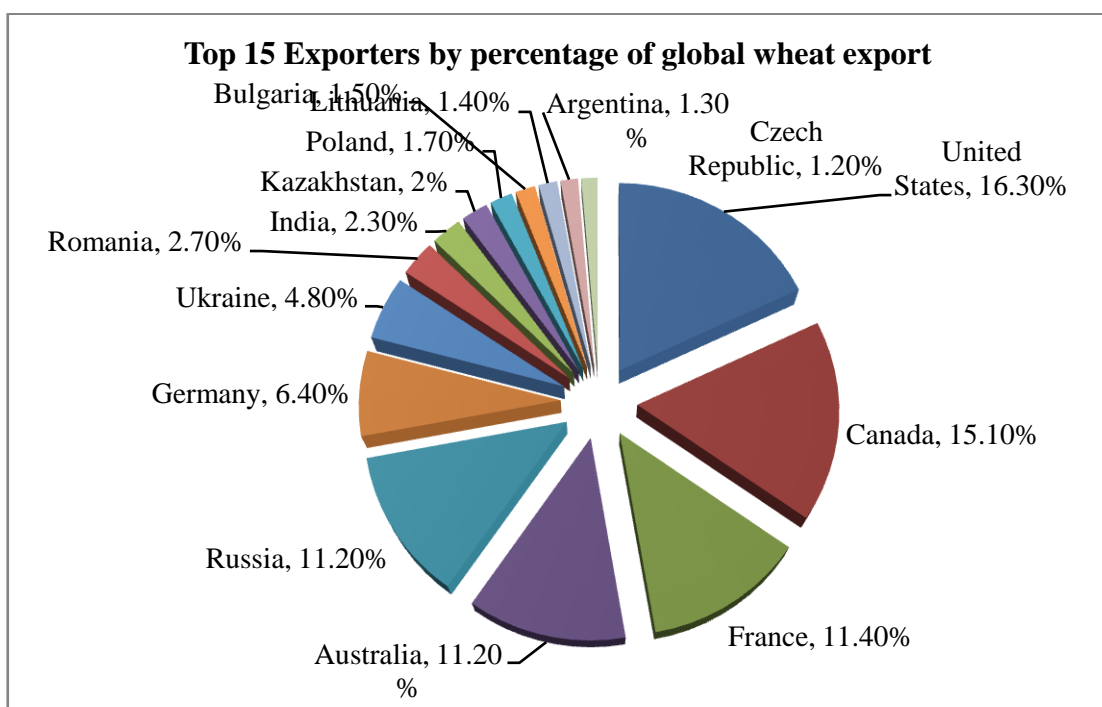
<i>Rank</i>	<i>Country - Exporter</i>	<i>2014 Wheat Exports, US \$</i>
<i>1</i>	United States	7.8 billion
<i>2</i>	Canada	7.2 billion
<i>3</i>	France	5.4 billion
<i>4</i>	Australia	5.3 billion
<i>5</i>	Russia	5.3 billion
<i>6</i>	Germany	3.1 billion
<i>7</i>	Ukraine	2.3 billion
<i>8</i>	Romania	1.3 billion
<i>9</i>	India	1.1 billion
<i>10</i>	Kazakhstan	960 million
<i>11</i>	Poland	806.9 million
<i>12</i>	Bulgaria	691.3 million
<i>13</i>	Lithuania	646 million
<i>14</i>	Argentina	603.6 million
<i>15</i>	Czech Republic	580.8 million

Source: Workman, 2015

The leading top 3 are United States, Canada and France. Indeed for the period of 2014/2015 the shipments of French wheat were not only within the European Union. Moreover, among the year to year leaders, the rapid growth in exports volumes was shown by India and Bulgaria, Russia, Romania and Ukraine. The shipments from Argentina declined on almost 35 percent which put the country on 14<sup>th</sup> position in list.

The Figure 2 it is an interpretation of the results of the Table 5 in the percentage form of global wheat export of top 15 countries- exporters in 2014.

**Figure 2 Top 15 Exporters by percentage of global wheat export**



Source: Own interpretation of data given in Table 5

Furthermore, the top 15 countries from the list manage to export about 90 % of total wheat exports in the year 2014. The companies which are considered to be multinational suppliers of wheat are: Soyko International (United States), Agritalia (Italy), Rivara S A (Argentina).

Population growth in different parts of the developing world, coupled with significant growth of economic lead to rise of demand for food as well as for feed grains. Such countries as Egypt, Sudan, Morocco, Pakistan, Algeria, and Indonesia experience the

growth in population while being exposed to low incomes. The demand for wheat should be met in order to provide staple food. Moreover the adverse weather condition can lower country supplies of wheat so the import of wheat is also needed to cover the loss.

There are several countries that stand out as importers, the top 15 list of importers for the year 2014 with quantity and dollar value is shown in the Table 6 (COMTRADE United Nations, 2014).

**Table 6 Top 15 Importers of Wheat for 2014**

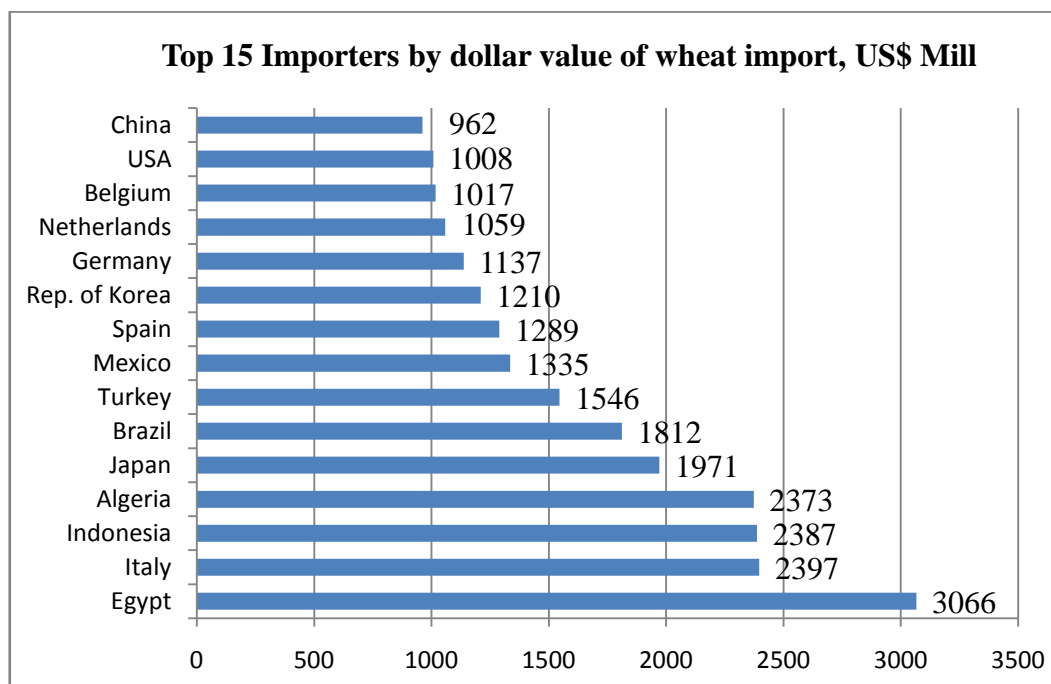
<i>Rank</i>	<i>Importer</i>	<i>Quantity, MT</i>	<i>2014 Wheat Imports, US \$ Million</i>
<i>1</i>	Egypt	12,51,525.00	3,066.00
<i>2</i>	Italy	75,25,982.00	2,397.00
<i>3</i>	Indonesia	74,32,598.00	2,387.00
<i>4</i>	Algeria	74,17,000.00	2,373.00
<i>5</i>	Japan	57,59,450.00	1,971.00
<i>6</i>	Brazil	57,83,030.00	1,812.00
<i>7</i>	Turkey	52,86,243.00	1,546.00
<i>8</i>	Mexico	45,03,452.00	1,335.00
<i>9</i>	Spain	48,23,181.00	1,289.00
<i>10</i>	Rep. of Korea	37,51,221.00	1,210.00
<i>11</i>	Germany	42,64,903.00	1,137.00
<i>12</i>	Netherlands	45,32,713.00	1,059.00
<i>13</i>	Belgium	37,47,490.00	1,017.00
<i>14</i>	USA	35,28,264.00	1,008.00
<i>15</i>	China	29,71,249.00	962.00

Source: COMTRADE United Nations (2014)

It is essential to mention that the ranking was composed from the dollar value even if some importers were having bigger amounts the dollar value of import was more important. As for example the top first place is occupied by Egypt the amount of import in 2014 was more than 1 million metric tons which is less than amount Italy imported but according to the value of imported wheat Egypt occupying first position. From the table 6 understandable that most of imported wheat is going to the countries which possess limited production potential. Such countries as Egypt, Brazil, Algeria, Indonesia, Mexico and few more developing countries which experience the growth in their population will form the base or foundation for development and rise in wheat trade around the world.

The Figure 3 presents the pie chart of top 15 importers according to dollar value of imported wheat for 2014.

**Figure 3 Top 15 Importers by dollar value of wheat import, US\$ Mill**



Source: Own interpretation of data given in Table 6

Brazil is occupying dropped to the 6 position in rank top 15 due to lower consumption and currency weakness. The position of Italy being on 2 place is mainly due to boost of demand for pasta and pasta products export which cause demand in import of wheat.

### 3.2.2. Main Exchanges

The export and import of wheat is normally the result of wheat trade which occur on the floors or platforms of exchange markets.

The biggest exchanges where wheat trade occurs are The Chicago Mercantile Exchange (CME), The Kansas City Board of Trade (KCBT), and The Minneapolis Grain Exchange (MGEX), the platform of a group of New York Stock Exchange (NYSE), London International Financial Futures and Options Exchange (LIFFE).

*The Chicago Mercantile Exchange (CME)*, an American futures exchange founded in 1898 in Chicago, Illinois as a non-profit corporation under the name the Chicago Butter and Egg Board and functioning as agricultural commodities exchange until 1919 (Wikinvest.com, 2012).

In 2008 the merger with Chicago Mercantile Exchange (CME), Chicago Board of Trade (CBOT), Commodity Exchange, Inc (COMEX) and New York Mercantile Exchange (NYMEX) nowadays they operate under name of the CME Group. The trade is held by means of traditional open outcry (traders on floor) and introduced in 1992 first global electronic trading platform called CME Globex, which generate around 85 percent of exchange trades (Wikipedia.org, CME Group, 2015).

According the wheat trade its standard wheat contract is for Soft Red Winter Wheat, which is nowadays the most traded. The trade may be done with mini-sized wheat contract.

*The Kansas City Board of Trade (KCBT)* is commodity futures and option exchange, the specialization is the hard red winter wheat nowadays is a part of the CME Group and situated in Kansas City, Missouri. The exchange was open in 1856 and was working as a chamber of commerce. Prices which are found at KCBT are the reference point for world prices for wheat. They are used for determination of futures strategies for obtaining an acceptable supply of this vital commodity. The Wheat futures contract of KCBT ensures a tool for a risk management for millers, grain elevators, exporters and manufacturers while they using the exchange as a protection instrument of their cash positions. Investors benefit

from the wheat future contracts as from tools for investment (Howtotradecomodities.com, 2015).

***The Minneapolis Grain Exchange (MGEX)*** ,(mgex.com, 2011), is commodity futures and option exchange that started its work in 1881 in Minneapolis, Minnesota first as a marketplace for traders, millers and producers to trade wheat in cash. It was major market for Hard Red Spring Wheat. Later after 1883 when the futures and options contracts were introduced it started specialize not only in hard red spring wheat but also agricultural index commodities. In 2008 the operations of the open outcry was stopped and nowadays trade of futures done by the CME Globex electronic platform, and trade of options is side-by-side.

***The New York Stock Exchange (NYSE)*** was founded in 1792 in New York City, is the largest stock exchange in the world by market capitalization. This exchange started its operations as a private organization but in 2005 after a row of acquisitions became a public entity. NYSE Euronext is a parent company of the NYSE as a result of a merge with European exchange in 2007. Under the umbrella of NYSE Euronext works NYSE LIFFE which is the global derivatives market place with venues in Amsterdam, Brussels, London, Lisbon and Paris. Intercontinental Exchange made an acquisition of NYSE Euronext and NYSE LIFFE in 2013. All the operations are done with the help of electronic platform LIFFE Connect. To the NYSE LIFFE belongs several contracts in particular the London Feed Wheat and the Paris Milling Wheat. The trader or investor can use them as a help of gaining exposure to European Grain Prices (Wikipedia.org, NYSE, 2015).

***London International Financial Futures and Options Exchange (LIFFE)*** is a futures exchange founded in 1982, in London (Wikipedia.org, LIFFE, 2015). LIFFE is operating as a part of Intercontinental Exchange. Specialized on trade of mill wheat and feed wheat.

### 3.3 The Trade Of Wheat: Commodity Futures

According to Fontanills (2007, p.16) “grain as a commodity can be traded by farmers without any a prearranged contract with a mill or factory but farmer must compete with other farmers simultaneously offering their product in the *cash*, or *spot market*. When supplies are ample, millers and factory purchasers are likely to offer only low prices. In a year where a hard winter or spring flooding diminishes yields, however, farmer can command higher per-bushel prices for his crop in the spot market. This market is immediate and uncertain and this uncertainty may bring the farmer to trade by means of forward contracts”.

A forward contract is a private negotiation developed to establish the price of a commodity to be delivered at a specific date in the future. Such an agreement locks in the price for both the buyer and the seller of the commodity and, therefore, eliminates the risk of price fluctuation that both sides of the contract face without the benefit of a forward contract. Along with a centralized grain trade, the forward contract was another big step toward price stability, but there was a problem. Forward contracts reduce price risk only if both parties to the arrangement live up to their end of the agreement. In other words, there is no protection against default (Garner, 2013, p. 23).

Exchange-traded forward contracts were extremely helpful in reducing the price risk that farmers and merchants normally were exposed to. Additionally, with the advent of exchange-traded forward contracts along with good-faith deposits much of the default risk was eliminated. However, because forward contracts were negotiations between two individuals, it was a challenge to bring together buyers and sellers who shared the same needs in terms of quantity, timing, and so on. The exchanges’ answer to problems arising from forward contracts was the standardized futures contract (Garner, 2013, p. 24).

According to the Chicago Board of Trade (CBOT, 2011): “a futures contract is a commitment to make or take delivery of a specific quantity and quality of a given commodity at a specific delivery location and time in the future. All terms of the contract are standardized except for the price, which is discovered via the supply (offers) and the demand (bids). This price discovery process occurs through an exchange’s electronic



trading system. All contracts are ultimately settled either through liquidation by an offsetting transaction (a purchase after an initial sale or a sale after an initial purchase) or by delivery of the actual physical commodity. An offsetting transaction is the more frequently used method to settle a futures contract. Delivery usually occurs in less than 2 percent of all agricultural contracts traded”.

Thanks to the standardization of each contract, the subsequent ease of buying or selling contracts, and a lack of default risk, a future trading has attracted price speculation. Participation is no longer limited to those who own, or would like to own, the underlying commodity. Instead, unrelated third parties can easily involve themselves in the markets in hopes of accurately predicting—and, therefore, profiting from—price fluctuations (Garner, 2013, p. 25).

World over, farmers do not directly participate in the futures market. They take advantage of the price signals emanating from a futures market. Price-signals given by long-duration new-season futures contract can help farmers to take decision about cropping pattern and the investment intensity of cultivation. Direct participation of farmers in futures market to manage price risk –either as members of an Exchange or as non-member clients of some member - can be cumbersome as it involves meeting various membership criteria and payment of daily margins etc. Options in goods would be relatively more farmer-friendly, as and when they are legally permitted (Karvy Commodities Broking, 2003, p. 21).

Fabozzi, Füss and Kaiser (2008, p. 5) suggested that the Futures market participants are normally classified into hedgers, speculators (traders), and arbitrageurs. Commodity producers pass on the price risk that results from highly volatile and difficult to forecast commodity futures markets to speculators, and therefore pay a premium. Commodity producers have a distinct interest in hedging the price of their product in advance (a short hedge). For example, consider the situation in the classic agricultural market. Farmers face a weather-dependent, volatile supply that is met by a relatively stable demand.

There are certain benefits from grain commodity forward or futures trading. Those two types of trading execute vital actions such as managing the risk of price of certain commodity as well as price detection. This is bringing advantage to all sectors of economy.

Additionally, it provides the customer with the opportunity to obtain an idea of the price at which the goods will be presented in future. Will enable customer to correct estimate the costs and by forward contracts cover purchases. As to the exporter he benefits too, it ensure early establishment of prices which is most probably will dominate so the exporter have an idea how to quote reasonable price and guarantee export contract in a nowadays market situation. It helps balancing the supply and demand during a year and creates unified price structure in the country. Moreover bringing benefits by being a price indicator for exporters, consumers, farmers, state and others who might have interest, helping to stimulate competition and reduce risks connecting with indeterminacy of prices.

In other words, each participant gets their advantages in dealing in commodity futures. According to Karvy Commodities Broking (2003, p. 19) the following list present who benefits from dealing in commodity futures and how:

For investor, commodities futures represent a good form of investment because of the following reasons.

- **Diversification** - The returns from commodities market are free from the direct influence of the equity and debt market, which means that they are capable of being used as effective hedging instruments providing better diversification.
- **Less Manipulations** - Commodities markets, as they are governed by international price movements are less prone to rigging or price manipulations by individuals
- **High Leverage** - The margins in the commodity futures market are less than the F&O section of the equity market.

For an importer or an exporter, commodities futures can help in the following ways:

- **Hedge against price fluctuations** - Wide fluctuations in the prices of import or export products can directly affect his bottom-line as the price at which he import/export is fixed before-hand. Commodity futures help to procure or sell the commodities at a price decided months before the actual transaction, thereby ironing out any fluctuation in prices that happen subsequently.

For a producer of a commodity, futures can help as follows:

- **Lock-in the price for produce** - For a farmer, there is every chance that the price of his produce may come down drastically at the time of harvest. By taking positions in commodity futures he can effectively lock-in the price at which he wish to sell his produce
- **Assured demand** - Any glut in the market can make him wait unendingly for a buyer. Selling commodity futures contract can give assured demand at the time of harvest.
- **Increase in holding power** - Enable to store the underlying commodity in exchange approved warehouse and sell in the futures to realize the future value of the commodity.

For a large scale consumer of a product, here is how this market can help:

- **Control cost** - For an industrialist, the raw material cost dictates the final price of output. Any sudden rise in the price of raw materials can compel to pass on the hike to customers and make products unattractive in the market. By buying commodity futures, he can fix the price of his raw material.
- **Ensure continuous supply** - Any shortfall in the supply of raw materials can stall production and make him default on his sale obligations. Enable to avoid this risk by buying a commodity futures contract by which he assured of supply of a fixed quantity of materials at a pre-decided price at the appointed time.

Exist of a lot of aspects which typically may be affecting the market pricing of grain commodity; mainly it is weather and weather changes. Enormous flooding and droughts of the ground are impacting negatively on an ability to supply wheat; therefore the increasing of the wheat prices happens.

According to the article “Wheat Commodity Trading” (Howtotradecommodities.com, 2014) “it is reasonable to conclude that wheat futures charts will generally always show an upward curve for demand, but sometimes factors such as a change in government policy concerning import can affect wheat trading, and therefore wheat commodity prices. New

agricultural technologies can also affect the price of wheat, as production costs will vary depending on the method of harvest, and this can also sometimes create a temporary surplus of the crop, which could decrease spot prices for a time. It is also worth considering the conditions affecting competitor commodities such as corn and rough rice, as changes in demand or price for these can affect the wheat price”.

The market where wheat is traded can be extremely mutable market that may propose a lot of opportunities for various styles of trading. In general, though traders usually look for the key trends that impact on market before sowing begins and later continue to monitor the continuation or reversal, which may occur until the harvest is completed. Some of the major components to observe are:

***Moisture of the soil:*** During a harvest moisture of the soil can be to some extent decreased. Amount of precipitations are crucial in the period between last harvest and fresh sowing, in particular, for the growth of winter wheat due to the environment. Sufficient soil moisture which plant is getting from the boot stage until flowering stage will boost wheat yield and test weight. For example the United States Department of Agriculture (USDA) and traders in generally use the information given from European Space Agency (ESA) according soil moisture.

***Grain carryover stocks:*** The volume of wheat supplies which left over from the last harvest impact on the decision of farmers about the amount of grain to plant. Moreover that is a factor that influences the pricing and is being monitored by buyers. High volume carryover will weaken the influence of unfavorable weather conditions but low volume of carryover will escalate the market sensitivity.

***Weather conditions:*** The weather condition and ability to forecast them is crucial in agriculture not only according grain crops. The condition as droughts and floods or severe temperature changes can influence on yield. In cases of the predictability of weather is going out of control the grain complex including the market suffers from instability and unpredictability.

***Geopolitical situation, trade regulations and policies:*** Regulations of international trade, policies according export and import influence on wheat market situation. The manipulation on the wheat market can cause country food instability, rise prices on local

and international market; this should be strictly monitored and regulated by country government.

### 3.4 Grain Market In Ukraine

#### 3.4.1 Situation on Ukrainian Grain Market

Agriculture playing essential role by being one of the most crucial sectors of the Ukrainian economy, especially, considering the favorable climate and availability of the land with its high quality and fertility being suitable for growing grain crops, specifically, wheat.

After 1990 the process of transition from planned to market based economy followed the independence of country bringing with it macroeconomic problems such as decline in production, boost of shadow economy, hyperinflation, poor trade condition. This transition process did not remain unnoticed and has made its negative imprint on the agricultural sector.

**Table 7: Main agricultural indicators for Ukraine, 2012-2013**

<i>Indicator</i>	<i>2012</i>	<i>2013</i>
Land area (sq. km)	579,320.0	579,320.0
Agricultural land (M ha)	41.2	41.2
Arable land (% of land area)	56.1	56.1
Share of agricultural land in total area (%)	71.2 %	71.2 %
Land under cereal production (ha)	14,361,300.0	15,549,500.0
Cereal yield (kg per ha)	3,185	4,064
Population total	45,593,300	45,489,600
Employment in agriculture (% of total employment)	17	17
Rural population (% of total population)	31	31

Agriculture, value added (% of GDP)	9.1	10.2
Fertilizer consumption (kg per ha of arable land)	41.3	45.8
GDP per capita, current US\$	3,082.5	4,163.00
Gross Agricultural production value (million USD)	28294.60	18756.0

Source: FAOSTAT (2015)

Being second large country in Europe, after Russia, with the territory more than 50 M. ha, which is accounts for 5.7 % of Europe`s total land area. The so called agriculture land is around 69% or 41.2 M. ha of total land area in Ukraine. The land of 32.5 million hectares classified as arable land in accordance to total land area it is more than 56.1 % of land (FAO, 2013, p.2), which makes Ukraine the largest arable area in Europe. The advantage of Ukraine is fertile soils called chernozem; it is 25 percent of all rich black earth soil in the world. And country certainly benefits from it by being one of the top 15 leading grain producers, the largest producer and exporter of corn, barley and wheat. Wheat is the most important crop according to arable land, using around 20 % of total area land. Significant contribution by agro sector is done in means of creating working places and employing around 17 % of total employment of country, generating more than 9% of the GDP.

Between 1990 and 1999, output of the primary agricultural sector in Ukraine declined by 51%. In 1990, agriculture accounted for 18.6 % of GDP. By 1999, the share of agriculture in GDP had fallen to 13.6%. With the agricultural output recovering in 2000–2002, its share of GDP increased to 14.6% in 2002 (World Bank, 2004, pg. 2).

According to FAOSTAT (2015) the agricultural products export accounted for 17.8 million dollars in the year 2012.

The volatile market condition and economic instability was not helping to gain progressive growth of the grain market even the implementation of fragmentary expanding of free trade, the elimination of public procurement system and the setting of purchasing prices. Complication also comes with implementation of inconsistent reforms in the agriculture sector and considerable minimization of budgetary subsidizing to the sector. Such situation in country stimulated the adoption of Decree of President of Ukraine № 832/2000, a revolutionary governmental program in 2000 "On Urgent Measures to stimulate the production and development of the grain market" (Decree of President of Ukraine №

832/2000, 2000). Moreover the mechanism of depositary purchases of grain and low interest loans for grain producers were introduced, which made a beneficial impact on sector growth.

According to State Statistic Service of Ukraine (Vlasenko, 2014) the 1986 - 1991 grain production in the country averaged 47.4 million tons, and in 1991 - 1995 was only 38 million tons, and in 2000 – dropped to 24.5 million tons. And only in recent year's grain production growing rapidly: in 2010 - 39.3 million tons, in 2011 - 56.7 million tons.

In 2011 under grain crops were employed 15.7 million hectares (56.7 % of total cultivated area), which is 4.2 % more than in 2010. Share of winter crops in the grain wedge was 51.0% (8.0 million hectares), of which under wheat were employed 6.5 million hectares (81% of the area); spring crops - 49.0% (7.7 million hectares). In 2011 grains and legumes were grown by 36.5 thousand of agricultural enterprises. It should be noted that the performance of large traded enterprises is much higher than the average for this category of producers. Moreover, 2.3 thousand of manufacturers of grain and leguminous crops with a production volume of over 5.0 thousand tons received per hectare over 10.5 quintals of grain more than the average agricultural enterprises (State Statistics Service of Ukraine, 2015).

**Table 8 Grain balance (including products of grain processing counted as grain), thousands tons**

<i>Indicators</i>	<i>1995</i>	<i>2000</i>	<i>2005</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
Production	33930	24459	38016	39271	56747	46216	63051
Change of stocks at end of year	-757	1329	-314	-2054	12784	-10052	6933
Import	200	1010	226	175	273	228	242
Total resources	34887	24140	38556	41500	44236	56496	56360
Export	814	1330	12650	14239	14825	27798	27836
Expenditures of fodder	18527	11056	13817	14787	16334	16147	16183
Expenditures of sowing	4600	3597	3294	3222	3226	2953	2890
Losses and wastes	1220	309	375	794	1570	1491	1506
Processing for non-food purposes	876	100	670	1650	1551	1454	1367
Found of consumption	8850	7748	7750	6808	6730	6653	6578

Source: Vlasenko (2014)

The Table 8 above shows Grain balance which also includes products of grain processing counted as grain was calculated by State Statistic Service of Ukraine (Vlasenko, 2014) in year 2014 for the period from 1995 till 2013.

Between 2005- 2011, the export of grain and grain processed products increased by 2175 tones. Between 1995 and 2000 grain production in Ukraine decreased by about one-third (World Bank, 2004).



The reduction of fund of consumption can be explained by 2 factors: there was steady decrease in Ukrainian population: from 51.6 million in 1990 to 45.8 million in 2010, i.e. a 11% reduction over a decade; and changes in the basic diet, which significantly reduced consumption of bread products: from 141 kg per person a year in 1990 to 111.7 kg in 2009, i.e. a 21% reduction (Kobuta, Sikachyna and Zhygadlo, 2012).

The period from 2000 till 2005 was critical due to the economic crisis and the harsh winter which damage the crops, so in the result the import of grains in 2000 is rocketed to meet the market demand and the export decreasing in the year 2003/ 2004 which making its impact on lower export data from year 2005. And in the year 2004 export was mostly of feed quality wheat due to expectations of a low quality crop in 2003.

It should be noted that in 2011 was received a record harvest of grains and legumes since independence (in 2008 it was 53.3 million in 1990 -51.0 million) mainly due to the increase of their yields to the average level. This harvest crops is caused, primarily, by a significant increase in the production of grain - corn, its share reached 40% of total gross harvest of grain (with the average for the decade of 21%). The seeds of food crops was harvested of 23.7 million tons (42% of the total), 34% more than in 2010 (State Statistics Service of Ukraine, 2015).

As a result, the level of self-sufficiency of grain in Ukraine in 2011 (ratio of production to domestic use in Ukraine, %) amounted to 192.9 % (Vlasenko, 2014, p. 159).

This made Ukraine to become a powerful exporter of grain in the world market.

According to Maistro and Khiramahomedov (2012), in 2008 in the country were collected 53.3 million tones and sold in foreign markets a record of 26 million tons of grain, accounting for about 10% of world exports. Generally, in recent years the share of the country in the global grain trade increased from 1 to 10%. Ukraine is among the top ten exporters of wheat, ranks first in the world market export of barley. Now Ukraine exports its grain almost in all countries that import it: CIS, EU, Middle East, Pacific countries (importers of Ukrainian grain is 78 countries).

### **3.4.2 Structure of grain production**

The land available for agriculture is spread fairly evenly crosswise the Ukraine. Yet, in the Central and Eastern part, where the soil is highly productive, is the concentration of the main agricultural regions. The soil in Western and Northern parts of Ukraine is not that suitable for crop production that is why the livestock production is concentrated there.

The agro sector is represented by agricultural enterprises or large-scale corporate farms according to State Statistic Service of Ukraine (2015) in 2011 they produce around 45% of the total agricultural production. The biggest agro holdings or farm holdings in the transition process replaced the state owned collective farms. The corporate farms or commercial farms operate on a leased land and de jure they are either business companies or private companies. Private company assets are assets of one entrepreneur and the assets of agricultural business company are the shareholders money. Agro holdings include diversity of spheres such as agro production, processing of food, logistic and sales, and other activities which allows to agro holdings intensify profitable production of cash crops for export needs and production of raw materials for bio fuels.

Second type of farms which represents the sector is a significant amount of family farms or so-called peasant farms or households. They are playing the important role in the production of grain crops, in 1990 the output accounts only for 3 % comparing to 2013 already more than 20 % (State Statistic Service of Ukraine, 2015). The households or family farms mainly produce for internal consumption, and the agricultural enterprises specialized to cover the export needs of grain and wheat especially.

According to Prokopenko (2015) the production of grain and leguminous crops in 2014 by agricultural enterprises was 49902,6 thousand tons, and by households was and 13956,7 thousand tons respectively. The production of wheat in 2014 by agricultural enterprises was 18750,9 thousand tons and by the households was 5363,1 thousand tons, the data exclude temporarily occupied territory of the Autonomous Republic of Crimea and Sevastopol; also excluding the zone of the antiterrorist operation.

Wheat is the crop in production of which more than half of Ukrainian agricultural business is involved. The share of wheat production in the national crop output is between 40% and 50%. Both spring and winter wheat varieties are grown in Ukraine, but the winter wheat prevails in spite of the fact that the spring wheat has more potential quality. The share of winter wheat in the gross yield in the past five years is more than 95%. According to the quality of wheat production the main in the structure of production is forage class. In accordance with a new adopted standard (DSTU-P-3768:2009), forage wheat accounted for 67% in the total production in 2009-2010 (Kobuta, Sikachyna and Zhygadlo, 2012, p. 4).

The grain production potential of Ukraine depends on the two main factors: land area cultivated and yield.

**Table 9 Wheat main indicators, 2013- 2014**

Indicators	2013	2014
Area harvested (thousand ha)	6,566	6,500
Planted area (thousand ha)	7,250	7,200
Yield (t/ha)	3,47	3,23
Production (thousand tons)	22,793	24,750
Domestic use (thousand MT)	11500	12000

Source: Ukraine Crop Update (2014)

The domestic use of wheat and wheat product is changing due to the fact that consumers starting to shift from consumption of so called social bread to a private bakeries or even to making bread on their own. The production of grain started to growth with the start of operation of foreign private and local wheat traders. Such traders developing the base for the wheat trade by creating infrastructure, logistic, investing funds in developing and stable work of the elevators and other facilities, boosting port capacities. That allowed to the agro enterprises to increase their direct market potential.

One of the crucial factors to determine the grain market situation, specifically, situation on wheat market is export.

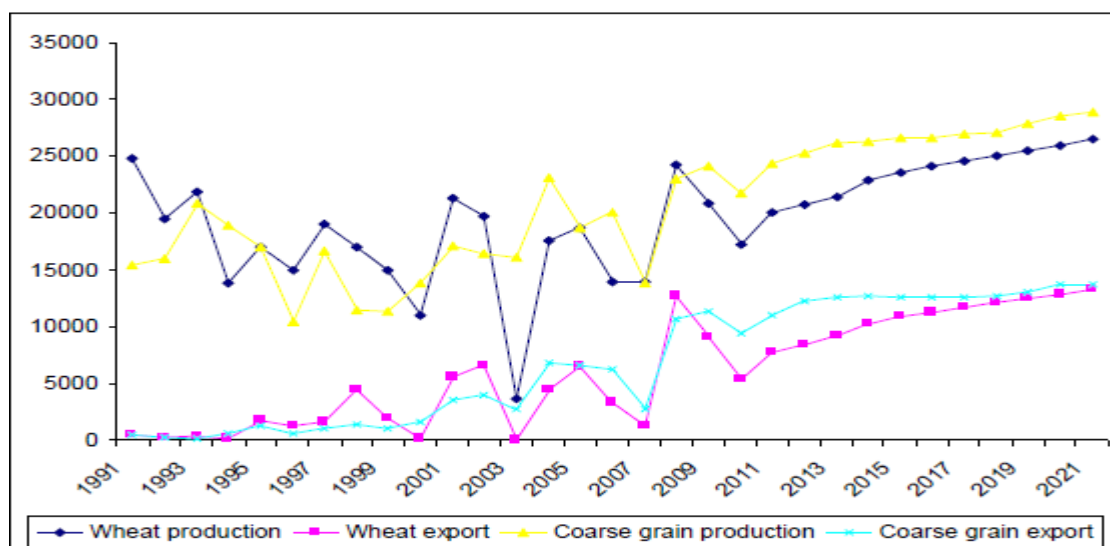
### **3.4.3 Export**

The level of self-sufficiency of wheat in Ukraine is quite high, it is maintained by high level of intensive production, allowing Ukraine to be among main exporters of wheat on global market by covering this external need of wheat. The surplus of produced wheat from the 1995 to the year 2010 was successfully covering the international demand and was important tool to regulate home market supply and demand.

According to Kobuta, Sikachyna and Zhygadlo, (2012, p. 5) “Ukraine is one of the largest suppliers of feed wheat to the world market. The low and medium quality wheat averaged about 50% in the total structure of Ukrainian wheat exports to the world markets over 1995 to 2010, reaching as high as 75-88% in some years. Traditionally, Near East, North African and European Union countries have been the main consumers of Ukrainian wheat. This is due to relative geographical vicinity of these regions to Ukraine, convenience of deliveries and steady requirement for this type of cereals. In this regard, Asian and African countries show demand for Ukrainian milling wheat, whereas European countries give preference to importing feed wheat from Ukraine”.

The following Figure 4 is demonstrates the variability of wheat export and production, also 1991-2021.

**Figure 4 Variability of grain production and export, 1991-2021**



Source: Acs, Borodina, Gomez y Paloma, Kharchenko (2013, p. 23)

Firstly, it must be noted that the higher variability exists in wheat export and production if we compare it to the production and export of coarse grain during the same analyzed period. Only the wheat export and production which are shown on the Figure above are needed to be clarify, the coarse grain production and export are shown just to compare the level of variability, which is 20 % production and 55% export variability in case of coarse grain and 33 % production and 72% export variability in wheat (Acs, Borodina, Gomez y Paloma, Kharchenko, 2013, p. 23).

The sharp fall of wheat production in 2003 occurred because of unfavorable weather conditions to be exact the December frost and ice crust and about half from total planted winter wheat area was killed, and as a result the drop in export.

The implementation of export restriction in the years 2006-2007 decreased wheat trade profitability, that explain a decline in wheat export in period from 2006 end of 2007.

Because of cancellation of export limitations and anticipated events in the world markets, producers have considerably increased the area under cultivation of wheat. The enlargement of sown area plus the favorable market conditions resulted in 2008 in harvest of around 26 million tons of wheat (Kobuta, Sikachyna and Zhygadlo, 2012, p. 44). The decline in production volume in year 2010 is explained by the severe droughts, the export

restrictions introduced again (the wheat export quotas), that made an input on the export and lead to reduction in export volumes.

**Table 10 Wheat Exports from Ukraine by Selected Destination, MY, 1000 MT**

Destination	MY 2011/12		MY 2012/13		MY 2013/14		% Change MY 2013/14 to 2012/13
	Quantity	%Share	Quantity	%Share	Quantity	%Share	
World	5,254.2	100.00	6,886.1	100.00	9,410.2	100.00	36.66
Egypt	1,200.2	22.84	1,646.4	23.91	2,774.5	29.48	68.52
Kenya	35.5	0.68	306.0	4.44	522.8	5.56	70.85
South Africa	0.0	0.00	271.3	3.94	505.4	5.37	86.31
Jordan	153.6	2.92	351.1	5.10	431.8	4.59	22.98
Israel	713.5	13.58	350.7	5.09	406.5	4.32	15.89
Thailand	143.6	2.73	7.6	0.11	386.2	4.10	5001.70
Bangladesh	118.0	2.25	0.0	0.00	345.0	3.67	0.00
Italy	293.6	5.59	68.4	0.99	14.5	0.15	- 78.72
Spain	1,073.1	20.42	833.6	12.11	9.9	0.11	- 98.81
Saudi Arabia	265.7	5.06	0.0	0.00	0.0	0.00	0.00

Source: Sobolev (2015)

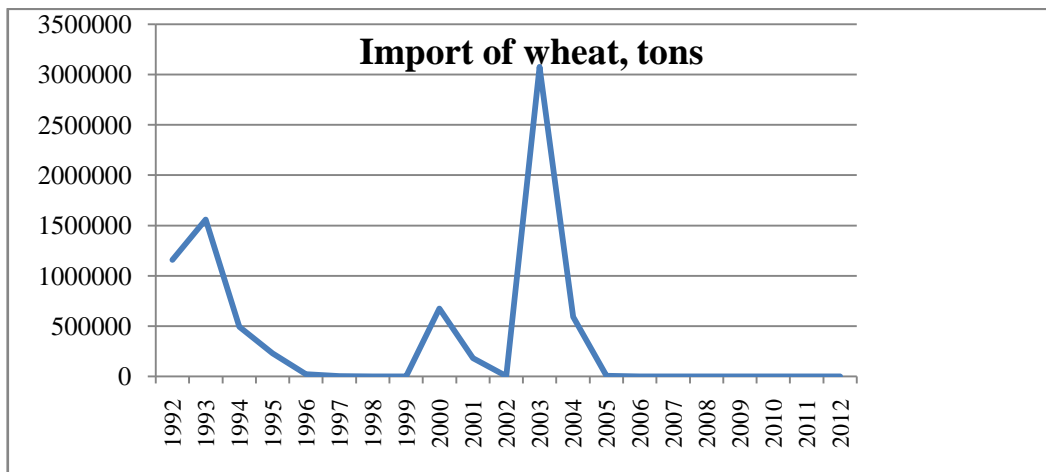
In the marketing year 2013/14 the top importer of Ukrainian wheat was Egypt same as in the two previous marketing years. In the beginning of analyzed period the biggest share of the total wheat export, to be exact the feed varieties of wheat were exported to Spain, Italy and to Middle East. The decrease in amount of import to Mediterranean region is due to the certain EU restrictions in amounts of imported wheat. But in the season of 2013/14 significant amount of exported wheat, milling wheat, was sent to Kenya, South Africa, Bangladesh and Thailand. The drastic fall from 265.7 thousand MT to zero in case of Saudi Arabia can be explained by swap from wheat import to the barley import from

Ukrainian producers. Also the uncertainties in political situation and tensions around Black Sea region affected the cost of freight and boosted the insurance premiums.

### 3.4.4 Import

With the intensively of production and ability to self-supply with wheat there was practically no need in importing wheat to the country.

**Figure 5 Import of Wheat 1992-2012, tons**



Source: FAOSTAT (2015)

There were several peaks on the Figure which are easy to explain, first peak in 1992 was due to need to cover high demand for spring wheat which wasn't planted at the previous two years. As a result of negligent management and delay privatization yields decreased until harvest in 2000 was not enough even in order to feed its own population. The highest peak was in 2003 was due to a decline in production because of unfavorable weather conditions which actually killed the harvest.

After that there were practically no wheat imports to the country. The only imports that do come in are either high protein wheat varieties for production of premium pasta products or seeds of some special wheat varieties for breeding purposes in Ukraine (Sobolev, 2015, p. 9).

## 4 Analytical Part

### 4.1 Fundamental analysis of Ukrainian Wheat Market

The ability to predict the future movements on the market is essential for producers, trader, buyers, and for all who is involved in wheat market.

One of the ways to identify the future movements are to identify or better said to predict the price. The expectations of price can be handled by two major methods. Those methods are fundamental analysis and technical analysis.

Allgood, Maynard, and Walters (2010, p. 5) suggested to use this definition given by Leuthold, Junkus, Cordier at the year 1989 “fundamental analysis is based on market economics. Fundamental analysis focuses on the cause of external events to the trading market that are likely to affect prices in the market. Fundamental forecasts are based on potential shifts in demand and supply and how those shifts will affect commodity prices. The most common external events that lead to changes in the market include weather, current inventory levels, government policies, economic indicators, and trade balances”.

Doing fundamental analysis one will work with information obtained from the supply-and-demand factors to predict the price shifts, will monitor production, use and ending stocks to predict the move of price. Such information for instance, can be found in the monthly reports from the USDA according supply and demand for certain commodity.

Fundamental approach it is analyze of components that influence on a supply and a demand. The table 11 will demonstrate how the change in demand or supply influence price of commodity in particular wheat.

**Table 11 The Effect of Changes in Supply and Demand on Price**

<i>Supply</i>	<i>Demand</i>	<i>Price</i>
Up	Down	Falls
Down	Same	Rises



Same	Up	Rises
Same	Down	Falls

Source: CME (2009, p. 70)

As it seen from table above the main indicators are supply and demand. Further analysis will be divided on two parts. First is an analysis of factors that form supply, which is factors of production (area harvested, yields), carryover stocks, political instability, and weather. Second part of analysis is to study factors which form demand: internal use/ consumption, possible export.

**Table 12 Ukraine Wheat Balance, 1000 MT**

	<i>15/16</i>	<i>Change</i>	<i>14/15</i>	<i>13/14</i>
Production	27,000	+2,250 (+9.09%)	24,750	22,278
Beginning Stocks	5,178	+1,508 (+41.08%)	3,670	2,579
TY Imports	0,05	+0,023 (+85.18%)	0,027	0,068
Total Supply	32,228	+3,781 (+13.29%)	28,447	24,925
TY Exports	15,000	+3,731 (+33.10%)	11,269	9,755
Domestic Consumption	12,700	+700 (+5.83%)	12,000	11,500
FSI Consumption	8,200	+200 (+2.50%)	8,000	8,100
Feed Dom. Consumption	4,500	+500 (+12.50%)	4,000	3,400
Ending Stocks	4,528	-650 (-12.55%)	5,178	3,670
Area Harvested	7,000	+700 (+11.11%)	6,300	6,566
Yield	4	0 (0.0%)	4	3

Source: AgroChart (2015)

The above table 12 is a balance sheet of wheat crop during 2013/14, 2014/15 and 2015/16 marketing year.

The balance sheet helps to understand if the supply and demand are in balance. The area harvested rose on 11.11% from 2014/15 but it does not change the yield. The farmers cannot increase yield due to droughts and warming temperatures, which are lowering the wheat yields all over the globe. Also the boost of the input costs making the producers to use low amounts or none of plant protective chemicals such as fertilizers, pesticides. Moreover the drop of the market prices for wheat reduced the profits of Ukrainian producers. With the reduction of profits the budgets for improving machinery and methods of harvesting are cut down. The push for such trends are the fluctuation of the exchange rates between US Dollar and Ukrainian Hryvna, the background to that is economic and political instability which in the end led to the devaluation of Hryvna. In the end of 2014 there was reported about total currency devaluation of the 100 percent. Even though such situation bringing a lot of problems related to trade, such situation also significantly boosted country export and disable import. One more example of the political influence is the new amendments to the taxation system of Ukraine The Law of Ukraine N 73-VIII (2014) “On Measures for Stabilization of Balance of Payments of Ukraine in Accordance with Article XII of General Agreement on Tariffs and Trade of Year 1994”, which may influence the cost of inputs (machinery, agrochemical products and seed) for farmers.

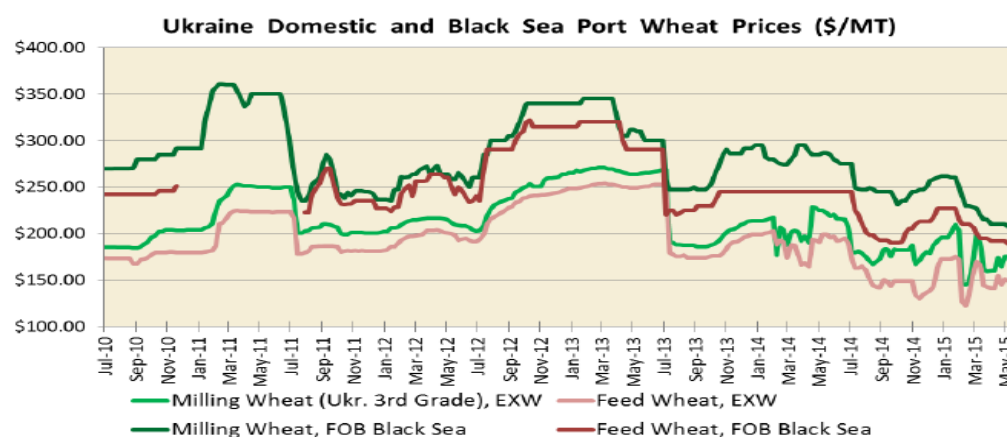
The carryover stocks it is ending stocks of one period that are beginning stocks of next period. Ending stocks of 2013/14 is a beginning stocks of the 2014/15. The ending stocks of 2015/16 are lower on 12, 55 % from previous season which means that the country need to produce more to cover the demand. Carryover stocks are decreasing or increasing accordingly with the forecasted demand and supply. The level of carryover stocks are the price indicator. Lack of supply rising prices, oversupply is leading to price reduction. Carryover stocks plus the production plus import are forming total supply of wheat and it is noticeable that the total supply rose in 2015/16 on 13, 29% in comparison to the year 2014/15.

The factors which are forming demand are total export and domestic consumption. Due to high production level of country export is rising from 2014/15 on 33.10 % in 2015/16. Moreover the non-restrictive regulation for export as well as currency fluctuation raising

the export level of country. The domestic consumption which include food, seed and industrial use of wheat and feed domestic consumption increased by 5, 83% from the 2014/15 which was due to higher level of production. There was a stable increase in milling wheat production which increased a flour production for country consumption. Current economic situation also increased the wheat consumption. People switching food habits to more social costs as usual on bread.

The following Figure shows the price fluctuation for domestic and Black Sea Port milling and feed wheat from July 2010 till May 2015.

**Figure 6 Ukraine Domestic and Black Sea Port Wheat Prices (\$/MT)**

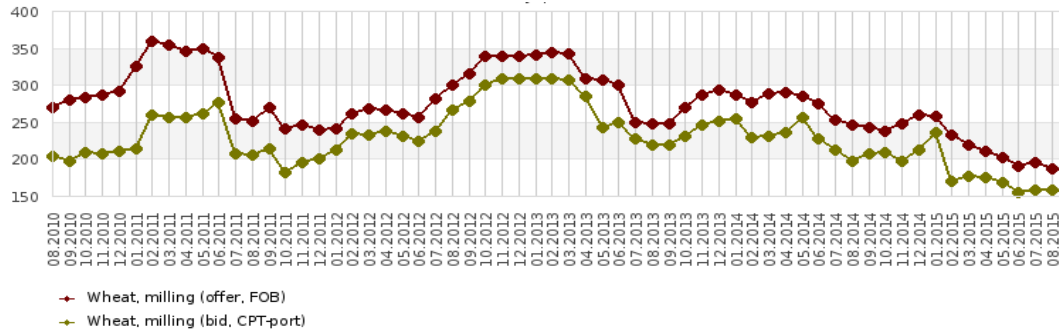


Source: Sobolev (2015, p. 9)

The price trends for milling and feed wheat for a five year period showing fluctuation of prices with clear downtrend. Such difference between the domestic and FOB prices is the result of the boost of delivery costs which are coming from the cost of insurance for railway and cargo due to changes in regulation. According Sobolev (2015, p. 8) the increase in tariffs for railway by more than 30 % in February of 2015 as the outcome of rising prices for energy, fuels. The brakes on the Figure indicate the no offers on market.

From the balance sheet is clearly visible that the total supply is higher than a total demand. According to the table 11 when the supply is increasing and the demand decreasing there should be a fall in the prices. And according the Figure 6 it is shown that the prices with the beginning of 2015 are going down. The following Figure 7 will demonstrate the export prices of milling wheat offer FOB and bid of CPT-port from the 2010 till 2015.

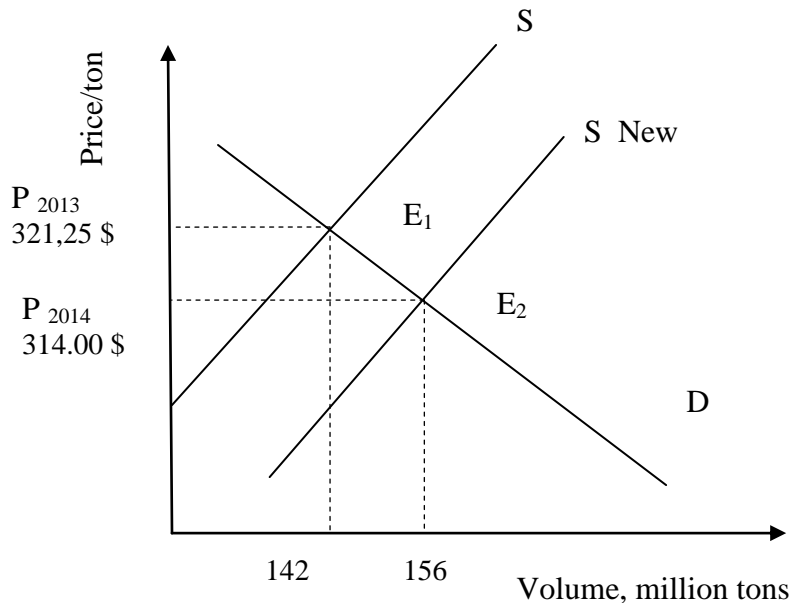
**Figure 7 Export Prices for Milling Wheat from 2010 – 2015, \$/t**



Source: APK Inform (2015)

The following Figure 8 will demonstrate the world wheat price and volume of trade in 2013 and 2014, which are the supply and demand curves.

**Figure 8 Supply and Demand of World Wheat, 2013- 2014, \$/t**



Source: Own Figure

The prices for the Figure 8 are taken from Foodsecurityportal.org (2015) and the volume is taken from International Grains Council (2015, p. 1). The Figure 8 shows how the supply shifts when the new lower price is established on the market. With the change of price the volumes of trade grow. The prices are taking in the June of 2013 and June 2014. The volumes of trade are 142 million tons in 2013 and 156 million tons in 2014. This Figure proving that the wheat world supply is higher than a demand.

## 4.2 Technical analysis of US Wheat

According to Mattos (2014) “technical analysis can provide more help in analyzing price movements in the short run. This approach is based on the analysis of historical prices to identify patterns, which then may be used to anticipate future price movements. An issue with technical analysis is that there are plenty of techniques and indicators, and they rely on certain parameters that have to be chosen by the analyst”.

Doing technical analysis one will work with information obtained from tables, Figures and charts, also wheat price forecast can be done with the help of technical indicators. In this analytical part attention is given to indicators such as Simple Moving Average (SMA), Relative Strength Index (RSI), Exponential Moving Average (EMA), Moving Average Convergence/Divergence (MACD), and Bollinger Bands (BB).

### 4.2.1 Simple Moving Average

*Simple Moving Average (SMA)* is a trend following indicator which is easy to construct and one of the most widely used mechanical trend following systems used. A moving average, as the name suggests, represents an average of a certain body of data that moves through time (Keystone Marketing Service, 2015).

According to Achelis (2013) A simple, or arithmetic, moving average is calculated by adding the closing price of the security for a number of time periods (e.g., 12 days) and then dividing this total by the number of time periods. The result is the average price of the security over the time period. Simple moving averages give equal weight to each daily price:

$$\frac{\sum_{i=1}^n \text{closing price}}{n}$$

$n$  = The number of time periods in the moving average

By placing moving average in a price action of a stock chart of the US wheat the records of average closing price for a pass number of periods such as 15 days period, 50 days period and 200 days period are shown on a chart.

The following Figure 9 represents such pricing chart with 3 moving average periods.

**Figure 9 US Wheat Moving Average, (15, 50, 200 days)**



Source: Investing.com (2015)

The symbol ZW on top of the Figure represents a US Wheat commodity from CBOT. First MA is 15 days and it is 501.9667 dollars, 50 days MA is a bit higher it is 503.2025 dollars and the last MA on the Figure is MA 200 which is higher than two previous and stands on the level of 508.8263 dollars. This is CFD trading which means contract for difference, trade which based on the fluctuation of current prices on the market of a commodity, without having this commodity. We can see that we have downturn on the Figure, and the fact that the prices are dropping below the moving average in the November on the point 16 is saying about bearish situation that the price will be dropping and on the Figure the closing price is 492.88 dollars. The indicator signals to sell.

## 4.2.2 Relative Strength Index

**Relative Strength Index (RSI)** according to Achelis (2013) “the RSI is a price-following oscillator that ranges between 0 and 100. A popular method of analyzing the RSI is to look for a divergence in which the security is making a new high, but the RSI is failing to surpass its previous high. This divergence is an indication of an impending reversal. When the RSI then turns down and falls below its most recent trough, it is said to have completed a "failure swing." The failure swing is considered a confirmation of the impending reversal”.

Keystone Marketing Service (2015) offers to use such simple formula of calculation of RSI:

$$RSI = \frac{100}{1+RS}$$

$$\text{Where } RS = \frac{\text{Average of 14 Day's Up Closes}}{\text{Average of 14 Day's Down Closes}}$$

The following Figure 10 demonstrates the RSI indicator on the US Wheat chart.

**Figure 10 US Wheat Relative Strength Index, (14 days)**



Source: Investing.com (2015)

The standard setting for RSI is 14 and it starts from zero and the high reading is 100, it has three horizontal lines one indicates level of 30, below that level is consider being oversold. Second line is in the middle and it is level of 50 indicates the crossovers, which goes up or down. Third line is level of 70, everything what is on or above this level is consider to be overbought and there may be a correction coming soon. After the hitting the 70 the market started go down touched the 50 and went below 50 here it is considered bearish and it will go near 30 where it will be oversold again and it was expected to bounce again. It went above 50 again dropped low bounced back and drop low again. This Figure does not have any divergences because the RSI is tracking well the price action. Most likely the trend will go below the 50 level, which will tell about bearish market situation with call to sell.

### 4.2.3. The Exponential Moving Average

*The Exponential Moving Average (EMA)* is a better trend indicator than a simple moving average as it puts greater weight to most recent data more than older data (Mak, 2003).

According to Achelis (2013) an exponentia (or exponentially weighted) moving average is calculated by applying a percentage of today's closing price to yesterday's moving average value. Exponential moving averages place more weight on recent prices:

$$\{Today's\ Close * 0.09\} + \{Yesterday's\ Moving\ Average * 0.91\}$$

To calculate the EMA of 9% it is needed to take the closing price of today and multiply by 9%. Next it is needed to multiply by 91% the yesterday MA. Finally the sum of to operations will show the EMA of 9%.

To interpret the EMA percentages to the time period possible by using such formula (Achelis, 2013):

$$Time\ Periods = \left( \frac{2}{Percentage} \right) - 1$$

The formula for converting time periods to exponential percentages is (Achelis, 2013):



$$\text{Exponential Percentage} = \frac{2}{\text{Time Periods} + 1}$$

**Figure 11 Exponential Moving Average of US Wheat (6, 14, 26 days)**



Source: Investing.com (2015)

EMA has faster reaction on the market situation than Simple Moving Average. The 26 period EMA is more static line, when this line is below the 6 and 14 EMA its mean the market is upward trend. The 6 EMA line is more sensitive and react much faster, so it helped to senses the reversal to come and when two lines go under the 26 line market end up in downtrend. Prices trying to bounce back to the 26 line, the 6 period EMA rebound and move above the longer term EMA that gave two slight signals to buy. And in the end of Figure shorter terms lines went below the longer 26 period line that gave the bearish signal to market.

### 4.2.3 The Moving Average Convergence Divergence

*The Moving Average Convergence Divergence (MACD)* explained in Investopedia.com (2015) as a trend-following momentum indicator that shows the relationship between two moving averages of prices. The MACD is calculated by subtracting the 26-day exponential moving average (EMA) from the 12-day EMA. A nine-day EMA of the MACD, called the

"signal line", is then plotted on top of the MACD, functioning as a trigger for buy and sell signals.

The MACD indicator is calculated as the difference between the fast and slow moving averages(Increiblecharts.com ,2015):

$$\text{MACD} = 12 \text{ Day exponential moving average} - 26 \text{ Day exponential moving average}$$

The signal line is calculated as a 9 day exponential moving average of MACD.

**Figure 12 Moving Average Convergence Divergence of US Wheat**



Source: Investing.com (2015)

Standard setting is difference between 12 and 26 EMA so they are on the Figure as well as the MACD with 12, 26 for EMAs and signal line is set on the 9 period. It is combination of three parts the black line is MACD, the red line is a signal line and the blue histogram. The stock had a huge run from about 470 up higher than 600, and it was really steep so the pull back is going to come. And it is visible that MACD is above the signal line and cross down through it and it falls that telling that the run has lost momentum. But right before that the MACD was above the signal line and cross up through it and it was a bullish signal and the histogram was below the central line and also cross up through it and went up. At the end of the Figure there is a bearish signal where the MACD is going below the signal line and crosses the central line at the same time the EMA 12 is going below the 26 EMA giving the signal to sell.

## 4.2.4 The Bollinger Bands

**Bollinger Bands® (BB)** according to Stockcharts.com (2015) are volatility bands placed above and below a moving average. Volatility is based on the standard deviation, which changes as volatility increases and decreases. The bands automatically widen when volatility increases and narrow when volatility decreases. This dynamic nature of Bollinger Bands also means they can be used on different securities with the standard settings. For signals, Bollinger Bands can be used to identify M-Tops and W-Bottoms or to determine the strength of the trend.

According Achelis (2013) Bollinger Bands are displayed as three bands. The middle band is a normal moving average. In the following formula, "n" is the number of time periods in the moving average (e.g., 20 days).

$$\text{Middle Band} = \frac{\sum_{j=1}^n \text{Close}_j}{n}$$

The upper band is the same as the middle band, but it is shifted up by the number of standard deviations (e.g., two deviations). In this next formula, "D" is the number of standard deviations (Achelis, 2013).

$$\text{Upper Band} = \text{Middle Band} + \left[ D + \sqrt{\frac{\sum_{j=1}^n (\text{Close}_j - \text{Middle Band})^2}{n}} \right]$$

The lower band is the moving average shifted down by the same number of standard deviations (i.e., "D").

$$\text{Lower Band} = \text{Middle Band} - \left[ D + \sqrt{\frac{\sum_{j=1}^n (\text{Close}_j - \text{Middle Band})^2}{n}} \right]$$

Mr. Bollinger recommends using "20" for the number of periods in the moving average, calculating the moving average using the "simple" method (as shown in the formula for the middle band), and using 2 standard deviations (Achelis, 2013).

**Figure 13 Bollinger Bands of US Wheat**



Source: Investing.com (2015)

The Figure above consists of upper line, middle line and lower line. Middle line is based on 20 MA, upper line is two deviation plus and lower BB is two deviation minus. The prices at the upper BB are high or overbought and at the lower BB are low or oversold. As soon as they are above the upper BB we expecting a pull back as it happened on the Figure. The trader were buying when it was oversold at the lower BB, than it made through the middle BB giving a bullish sing after it went up to upper BB and dropped down giving the bearish sing.

In the technical analysis was used all five indicators mentioned above and those indicators showed only one result – the bearish situation on market. This basically means that the prices for wheat commodity are falling.

To sum up the rising production on Ukrainian wheat market and rising export are pushing the global prices down by oversupplying the global wheat commodity market. In case there will be a decrease in production levels, Ukraine will supply less to the global wheat trade which will lead to insufficient supply and higher demand which in its turn will rise the global wheat prices.

## 5 Conclusion

Ukraine is a country where agriculture plays an important role in the economy, where a favorable weather conditions and fertile chernozemy extremely suitable for growing grains, especially a wheat. The country which by it's an advantageous geographical position is an important partner in the international trade of wheat and a grain in general, which can act as a transit area and as a center of a wheat trade.

The potential for a wheat trade is enormous; nowadays the share of country in the global grain trade is around 10 percent. Ukraine is in the top ten producers and exporters of a wheat commodity. For example the wheat production in 2014 was registered as 24, 750 thousand metric tons, and the dollar value of the export in this year is 2.3 billion. Also country is one of the largest suppliers of the feed wheat to the world market.

In the analytical part with the help of the fundamental analysis was established the factors which influence the wheat price therefore influence on the global wheat trade. The findings shows that the most common factors are weather, current levels of carryover stocks, government policies, trade balance and production. Also it is noticeable that the level of production in Ukraine is rising, the current economical situation boosting countries export and that's all leads to the price reduction on the internal and the external markets. The technical analysis with the implementation of five indicators such as simple moving average, relative strength index, exponential moving average, moving average convergence divergence and Bollinger bands showed that there is a downtrend in the prices of wheat on global market.

Summarizing the results of findings of the entire thesis work, it is needed to mention that the growth of the wheat production in the country and increase in the export of Ukrainian wheat are leading to oversupply of the global wheat commodity market. This fact is pushing the global prices down. In case there will be a decrease in production levels, Ukraine will lower its share in the global wheat trade which will lead to insufficient supply and higher demand which in its turn will rise the global wheat prices. The findings of this bachelor thesis can be used as recommendation for the investors.

## 6. References

### *Literature:*

BOUCHENTOUF, Amine. *Commodities for dummies*. 2nd ed. Hoboken, NJ: Wiley Pub., c.2011, xviii, 358 p. ISBN 1118016874.

FONTANILLS, George. *Getting started in commodities*. Hoboken, N.J.: John Wiley & Sons, Inc., c2007, xx, 507 p. Getting started in. ISBN 0470089490.

GEMAN, Hélyette. *Commodities and commodity derivatives: modeling and pricing for agricultural, metals, and energy*. West Sussex: John Wiley & Sons, c2005, xvii, 396 p. ISBN 04-700-1218-8.

### *Online Sources:*

ACHELIS, Steven. *Technical Analysis from A to Z*, [online], McGraw-Hill Professional, 2013 [Accessed 2015-11-12]. ISBN-13: 978-0071826297 Available at:  
<http://www.metastock.com/Customer/Resources/TAAZ/Default.aspx?p=74&js=0>

ACS, Szvetlana, Oleksandra BORODINA, Sergio GOMEZ Y PALOMA and Andriy KHARCHENKO. *Ukraine's agriculture:: potential for expanding grain supply. Economic and institutional challenges*. In: *JRC Scientific and Policy Reports* [online]. Luxembourg: Publications Office of the European Union, 2013, 2013, s. 88 [Accessed 2015-10-29]. DOI: 10.2791/22957. ISBN 978-92-79-33205-0. ISSN 1831-9424. Available at:  
<http://ftp.jrc.es/EURdoc/JRC84652.pdf>

Agrochart.com (2015) Total Supply: Wheat Ukraine. [online] Available at:  
<http://www.agrochart.com/en/usda/section/13/grains/country/243/ukraine/commodity/107/wheat/attribute/7/total-supply/> [Accessed 2015-10-21].

ALLGOOD, Collin, Leigh MAYNARD a Cory WALTERS. *Introduction to Futures: Hedging for Grain Producers*. In: *UKAg Extension: AEC-96* [online]. Kentucky Cooperative Extension. 2010, s. 12 [Accessed 2015-10-30]. Available at: <http://www2.ca.uky.edu/agc/pubs/aec/aec96/aec96.pdf>

Apk-inform.com (2015) *Prices*. [online]. [Accessed 2015-10-11]. Available at: <http://www.apk-inform.com/en/prices>

BASTA, Charles. *Commodity Focus: Wheat, back to the basics*. Redcape [online]. 2014 [Accessed 2015-09-29]. Available at: <http://www.redcape.us/trading-investing-education-blog/2014/9/21/commodity-focus-wheat-back-to-the-basics>

CBOT (2011) Chicago Board Of Trade –*Self-Study Guide to Hedging with Grain and Oilseed Future Option* [online]. [Accessed 2015-10-21]. Available at: [http://www.cmegroup.com/trading/agricultural/files/AC-216\\_HedgersGuideNewBoilerplate.pdf](http://www.cmegroup.com/trading/agricultural/files/AC-216_HedgersGuideNewBoilerplate.pdf)

CME, *An Introduction to Futures and Options* [online]. 2009, p. 132 [Accessed 2015-10-30]. Available at: [http://www.cmegroup.com/files/intro\\_fut\\_opt.pdf](http://www.cmegroup.com/files/intro_fut_opt.pdf)

COMTRADE, *United Nations: Major Importing Countries of Wheat* [online].

COMTRADE, United Nations, 2014 [Accessed 2015-10-19]. Available at:

[http://agriexchange.apeda.gov.in/product\\_profile/Major\\_Importing\\_Countries.aspx?categorycode=0603#](http://agriexchange.apeda.gov.in/product_profile/Major_Importing_Countries.aspx?categorycode=0603#)

Decree of President of Ukraine, № 832/2000 [on-line]. [Accessed 2015-10-21]. Available at: <http://zakon5.rada.gov.ua/laws/show/832/2000?test=4/UMfPEGznhhr2h.Ziw.fRV.HI4.oss80msh8Ie6>

FABOZZI, Frank J, Roland FÜSS a Dieter G KAISER. *The handbook of commodity investing* [online]. John Wiley & Sons. Hoboken, N.J.: Wiley, c2008, xxii, 986 p.

[Accessed 2015-09-10]. Frank J. Fabozzi series. ISBN 9780470117644. Available at:  
[http://samples.sainsburysebooks.co.uk/9780470293201\\_sample\\_384971.pdf](http://samples.sainsburysebooks.co.uk/9780470293201_sample_384971.pdf)

FAO, *Agricultural and Trade Background Policy Note: Ukraine* [on-line]. FAO 2013  
[Accessed 2015-10-18]. Available at:  
[http://www.fao.org/fileadmin/templates/est/meetings/wto\\_comm/Trade\\_Policy\\_Brief\\_Ukraine\\_final.pdf](http://www.fao.org/fileadmin/templates/est/meetings/wto_comm/Trade_Policy_Brief_Ukraine_final.pdf)

FAOSTAT [online]. *FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS Statistics Division*, 2015 [Accessed 2015-09-20]. Available at:  
<http://faostat3.fao.org/home/E>

Foodsecurityportal.com (2015) *World Wheat Price* [online] Available at:  
[http://www.foodsecurityportal.org/api/countries/world-wheat-price?order=mar\\_13&sort=asc](http://www.foodsecurityportal.org/api/countries/world-wheat-price?order=mar_13&sort=asc) [Accessed 2015-10-29].

*Foreign Agricultural Service's Production, Supply and Distribution (PSD) online database: Production, Supply and Distribution Online* [online]. FAS USDA, 2015  
[Accessed 2015-09-24]. Available at: <http://apps.fas.usda.gov/psdonline/>

*Foreign Agricultural Service/USDA: Grain: World Markets and Trade* [online]. Office of Global Analysis, 2015 [Accessed 2015-11-10]. Available at:  
<https://apps.fas.usda.gov/psdonline/circulars/grain.pdf>

GARNER, Carley. *A trader's first book on commodities: an introduction to the world's fastest growing market* [online]. 2nd ed. Upper Saddle River, N.J.: FT Press, c2013, xiv, 271 p. [Accessed 2015-11-17]. ISBN 01-332-4783-X. Available at:  
<http://ptgmedia.pearsoncmg.com/images/9780133247831/samplepages/013324783X.pdf>

GRYAZNOVA, A, R KORNEEVA a V GALANOV. *Birzhevaia deiatelnost: [uchebnik]* [online]. Moskva: "Finansy i statistika", 1995, 238 p. [Accessed 2015-09-12]. ISBN 52-790-1208-4. Available at: [http://polbu.ru/gryaznova\\_exchange/ch00\\_i.html](http://polbu.ru/gryaznova_exchange/ch00_i.html)



Howtotradecommodities.com (2014) Wheat Commodity Trading. [online] Available at: <http://howtotradecommodities.com/wheat.html> [Accessed 2015-10-21].

Howtotradecommodities.com (2014) *The Kansas City Board of Trade (KCBT)*. [online] Available at: <http://howtotradecommodities.com/kansascityboardoftrade.html> [Accessed 2015-10-01].

Incrediblecharts.com (2015) MACD Formula [online] [Accessed 2015-10-30] Available at: <https://www.incrediblecharts.com/indicators/macd.php>

*IndexMundi: Wheat Production by Country in 1000 MT* [online]. USDA, 2014 [Accessed 2015-09-30]. Available at: <http://www.indexmundi.com/agriculture/?commodity=wheat>

International Grains Council: Grain Market Report [on-line]. IGC 2015 [Accessed 2015-09-30] Available at: <http://www.igc.int/en/downloads/gmrsummary/gmrsumme.pdf>

*International Grains Council: WHEAT* [online]. 2015 [Accessed 2015-10-01]. Available at: <http://www.igc.int/en/grainsupdate/sd.aspx?crop=Wheat>

Investing.com (2015) US Wheat Streaming Chart [online] [Accessed 2015-10-21]. Available at: <http://www.investing.com/commodities/us-wheat-streaming-chart>

Karvy Commodities Broking : *A Beginner`s Guide to Commodity Market ( Spot and Futures)* [online]. Karvycommodities.com .2003 [Accessed 2015-10-19]. Available at: <http://www.karvycomtrade.com/faqbookletenglish.pdf>

*Keystone Marketing Services: Technical Indicators and Commodities* [online]. Keystone Marketing Ltd .2015 [Accessed 2015-11-04]. Available at: [http://futures.tradingcharts.com/learning/technical\\_indicators.html](http://futures.tradingcharts.com/learning/technical_indicators.html)

KOBUTA, Iryna, Oleksandr SIKACHYNA a Vitaly ZHYGADLO. *Policy Studies on Rural Transition No. 2012-4: Wheat Export Economy in Ukraine* [online]. FAO Regional

Office for Europe and Central Asia. 2012, 2012 [Accessed 2015-10-09]. Available at: <http://www.fao.org/docrep/017/aq344e/aq344e.pdf>

MAISTRO, S. a M. KHIRAMAHOMEDOV. Grain market in Ukraine:: current status and state regulation directions. *State building* [online]. Kharkiv: Kharkiv Regional Institute of Public Administration, 2012, 2012(2): 10 [Accessed 2015-10-11]. ISSN 1992-2337. Available at: <http://kbuapa.kharkov.ua/e-book/db/2012-2/doc/2/01.pdf>

MAK, Don K. *The science of financial market trading* [online]. River Edge, NJ: World Scientific, c2003, xiv, 245 p. [Accessed 2015-11-30]. ISBN 9812382526. Available at: <http://www.worldscientific.com/worldscibooks/10.1142/5178>

MATTOS, Fabio. *Commodity Market Analysis: Combining Fundamentals and Technicals*. Cornhusker Economics [online]. University of Nebraska – Lincoln Extension, 2014, 2014, : 4 [Accessed 2015-11-03]. Available at: <http://agecon.unl.edu/cornhusker-economics-november-12-2014>

Mgex.com (2011) *The Minneapolis Grain Exchange (MGEX)* [online] [Accessed 2015-10-01]. Available at: <http://www.mgex.com/history.html>

PHILLIPS, Steve and Rob NORTON. *Global wheat production and fertilizer use: Fertilizer use in all agriculture has risen to keep up with growing food demand*. [online]. 2013 [Accessed 2015-09-22]. Available at: <http://www.agannex.com/field-crops/global-wheat-production-and-fertilizer-use>

PROKOPENKO, O. (ed.). *The Statistical Yearbook: Crop Production of Ukraine 2014* [online]. State Statistics Service of Ukraine. Kyiv, 2015 [Accessed 2015-10-19]. Available at: [https://ukrstat.org/uk/druk/publicat/kat\\_u/publ7\\_u.htm](https://ukrstat.org/uk/druk/publicat/kat_u/publ7_u.htm)

SOBOLEV, Denys. Ukraine: Grain and Feed Annual Report. In: *GAIN Report: UP1522* [online]. 2015, 2015, s. 31 [Accessed 2015-10-20]. Available at:

[http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual\\_Kiev\\_Ukraine\\_6-10-2015.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_Kiev_Ukraine_6-10-2015.pdf)

State Statistic Service of Ukraine (2015). [online] [Accessed 2015-10-22]. Available at: <http://www.ukrstat.gov.ua/>

Stockcharts.com (2015) Technical Indicators and Overlays. Bollinger Bands. [online] ChartSchool 2015. [Accessed 2015-10-29]. Available at: [http://stockcharts.com/school/doku.php?id=chart\\_school:technical\\_indicators:bollinger\\_bands](http://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:bollinger_bands)

The Law of Ukraine N 73-VIII [online]. [Accessed 2015-10-30]. Accessible at: [https://www.urm.lt/uploads/default/documents/Ekonomija%20diplo%20matija/Aktuali/Law73\\_VIII\\_ENG\\_28December14ed.pdf](https://www.urm.lt/uploads/default/documents/Ekonomija%20diplo%20matija/Aktuali/Law73_VIII_ENG_28December14ed.pdf)

Ukraine Crop Update. *Informa Economics* [online]. Informa Economics, Inc, 2014, 2014(CROP-UKR14-01): 8 [Accessed 2015-10-19]. Available at: <http://www.informaecon.com/samplereports/UkraineSampleReport.pdf>

VLASENKO, N. (ed.). *The Statistical Yearbook: Agriculture of Ukraine 2011* [online]. State Statistics Service of Ukraine. Kyiv, 2012 [Accessed 2015-10-15]. Available at: <http://www.zerno.org.ua/download/file/72-silske-hospodarstvo-ukrainy-za-2011-rik-statystychnyi-zbirnyk>

VLASENKO, N. (ed.). *The Statistical Yearbook: Agriculture of Ukraine 2013* [online]. State Statistics Service of Ukraine. Kyiv, 2014 [Accessed 2015-10-05]. Available at: <http://www.zerno.org.ua/download/category/16-vidannya-derzhkomstatu-ukrajini>

Wikinvest.com, (2012). *Chicago Mercantile Exchange (CME)*. [online] Available at: [http://www.wikinvest.com/wiki/Chicago\\_Mercantile\\_Exchange\\_%28CME%29](http://www.wikinvest.com/wiki/Chicago_Mercantile_Exchange_%28CME%29) [Accessed 2015-10-01].

Wikipedia.org (2015) *CME Group* [online] [Accessed 2015-10-01]. Available at: [https://en.wikipedia.org/wiki/CME\\_Group](https://en.wikipedia.org/wiki/CME_Group)

Wikipedia.org (2015) *London International Financial Futures and Options Exchange (LIFFE)* [online] [Accessed 2015-10-01]. Available at: [https://en.wikipedia.org/wiki/London\\_International\\_Financial\\_Futures\\_and\\_Options\\_Exchange](https://en.wikipedia.org/wiki/London_International_Financial_Futures_and_Options_Exchange)

Wikipedia.org (2015) *The New York Stock Exchange (NYSE)* [online] [Accessed 2015-10-01]. Available at: [https://en.wikipedia.org/wiki/New\\_York\\_Stock\\_Exchange](https://en.wikipedia.org/wiki/New_York_Stock_Exchange)

WORKMAN, Daniel. *World's Top Exports: Wheat Exports by Country* [online]. 2015 [Accessed 2015-10-23]. Available at: <http://www.worldstopexports.com/wheat-exports-country/3386>

World Bank. (2004). *Achieving Ukraine's Agricultural Potential : Stimulating Agricultural Growth and Improving Rural Life*. Washington, DC. © World Bank, OECD. [online] Available at: <http://www.oecd.org/tad/agricultural-policies/34031855.pdf> [Accessed 2015-10-20].