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Research article

Islamic finance and food commodity trading: is there a chance to hedge against price volatility and enhance food security?

Madina Kalimullina [a,*], Mikhail (Shamil) Orlov [b]

[a] HSE-Skolkovo Institute for Law and Development, National Research University Higher School of Economics, Russia
[b] AGROFINMOST, HSE-Skolkovo Institute for Law and Development, National Research University Higher School of Economics, Russian-Egyptian Business Council, Russia

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ABSTRACT

This paper evaluates current food commodity trading from the Shariah point of view, which is particularly relevant for the MENA region. It focuses on futures contracts as the main instrument for grain trading and analyzes the traders' activities. Through a qualitative and multifaceted approach, the paper accumulates and evaluates the suggestions for 15 Shariah-based alternatives to futures by contemporary researchers. Sukuk, commodity funds and takaful programs are among potential structures that could be developed and broadly implemented. The research compares the current criticism of futures markets with the opinions of Islamic scholars and researchers, as well as Shariah standards. The paper also evaluates several recent suggestions by researchers to raise the efficiency of the international commodity trading market for the sake of food security. The results show that there is space for cooperation taking into account Islamic financial principles and conventional commodity exchange regulations, in combining existing best practices of the latter and the rulings of the former in engineering a sounder system of grain trading for the benefit of market players and the end consumers. This would require a joint effort and support from exchanges, standard-setting bodies, and regulators. Among the areas of cooperation are the approach towards corners (ihtikar), squeezes, speculation (gharar, maysir, and najash), and defining the border between reasonable and excess speculation; financial architecture using new technologies in developing a commodity trading contract conforming to the Shariah regulations and the exchange requirements. There is a need to develop the ideas for global food contracts and grain reserve systems, and to test the contracts based on existing exchanges.

1. Introduction

Food commodities, especially cereals, are a staple in any community. Throughout history trade has been the driving factor for business in Islamic states. The main trade asset was food commodities. Such food items as grain, dates, and salt are mentioned in the early Islamic texts and have been the subject matter of many *hadeeths*[1]. Particularly, the texts of Al Bukhari contain mention of dates, wheat, barley, millet and other types of grain, salt, gourd, fruit, and dairy products. The Quran mentions wheat, grain, lentil, fruit, meat and other types of food commodities in numerous verses.

Food commodities often performed the role of money. History shows that grain, olive oil, cacao beans, tobacco, sugar, and salt etc. were used as a medium of exchange (Usanov, 2020, p. 34). Salt was such a popular money alternative that even the word 'salary' originates from this root. In ancient times, the first deposits were made in the form of grain (Iqbal, 2012, p. 69), and temples performed the role of banks. In Islam, transactions with these types of food commodities, which can be measured by weight or volume, known as *ribawi* goods[2], are regulated by special rules to avoid usury. The most known *hadeeth* about *ribawi* goods talks about dates, salt, wheat, and barley. One of the versions of this *hadeeth* says:

> *Narrated by Ibn 'Umar: The Prophet said, "The selling of wheat for wheat is Riba (usury) except if it is handed from hand to hand and equal in amount.*

* Corresponding author.
E-mail addresses: mkalimullina@hse.ru, muslimeco@gmail.com (M. Kalimullina).

[1] *Hadeeth* is an Arabic word meaning a story reflecting prophet Muhammad's life, his sayings or actions, narrated by one or several of his companions and written down in one of the books devoted to *hadeeths*.

[2] Goods with a high risk of usury inherent in trading them.

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Similarly the selling of barley for barley, is Riba except if it is from hand to hand and equal in amount, and dates for dates is usury except if it is from hand to hand and equal in amount.[3]

Kahf (2011) commented on the food commodities mentioned in the *hadeeth* as the products which had been actively circulated within Medina city, the center of the first Muslim state, which was relatively remotely distanced from other cities. Hence, these were the most liquid goods at the time.

A broad variety of food types and the manner of their cultivation is described in the earliest books on agriculture by Islamic authors, such as *Al Filaha Al-Nabatiya* by Ibn Washuyah and *Diwan Al Falaha* by Ibn Bassal in the 11th century (Bassal, 1955). At that period, Islamic countries were centers for agricultural science and trade, with the richest text collections on agriculture coming from Andalusia and Yemen. Even the sultans wrote texts on agriculture, and the best known are the books by Yemeni Rasulid sultans (Fitzwilliam-Hall, 2010). The Islamic civilizations have contributed significantly to international trade and investment development. There is evidence of the forward trading and issuance of commercial papers back to 7th century. Particularly, under the reign of Umayyads, commodity certificates (*sukuk al-badai'*) were issued to military personnel and civil servants and were traded at the market (Kamali, 2007). There are also indications (Abdullah, 2016) that the Islamic-based value of money (based on gold dinar and silver dirham) and money-market regulation, which prevailed between the 7th and 16th centuries, are more stable than the modern monetary systems concerning price fluctuations and inflation. Therefore, its implementation by modern regulators could lead to a higher level of market stability and social wellbeing.

Presently, international grain trading markets are driven by Western countries. Some contracts and market players' behavior, prevailing on the market, are inconsistent with the Shariah principles. This is true not only for the banking sector but also for commodity markets. Initially, futures contracts had been invented as a hedging instrument against unfavorable and excessive violations in the markets which could severely hit the producers. The morality of such contracts was defendable. Afterwards the traders started trading not the commodity, but the futures contract itself. The grain was not a commodity any more, but the futures. There had been much scholarly discussion over the status of futures till the beginning of the 21th century. Despite some arguments for the permissibility of futures by Shariah, many Muslim scholars tend to consider futures contracts as prohibited and this is affirmed by the International Islamic Fiqh Academy and, later, by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI, 2004a)[4].

Basically, all Islamic finance contracts can be divided into two groups: the contracts mentioned in the classic *fiqh* books, so-called named contracts (*'uqud musamma*), and contracts developed later on, which can be considered derived (*'uqud muwallida*). Such classification is for example suggested by Kahf (2011) [5]. All Islamic financial derived contracts are the result of Islamic finance architecture. In addition to the historically known Islamic contracts used in agriculture, such as *mugarasa*, *muzara'a*, *musaka*, *salam*, the modern Islamic finance architecture provides other forms of Islamic finance contracts, which could be the basis for a solution to the market volatility, at least for the countries of the Islamic world (See Section 3.2). The types of modern Islamic finance architecture are well described by Al-Suwailem (2006).

Nowadays, the problem of hunger and food security is again on the rise. According to the US Department of Agriculture, in 2017, there were 646 million food-insecure people (USDA, 2019). This number could be even higher given that the governments are not always able to organize food supplies in a sustainable manner. This is particularly relevant for low income countries. Staple food price spikes in net importing countries often result in social unrest (Bellemare, 2015).

Any successful measures and mechanisms aimed at increasing accessibility and stability on the food commodity market are of high importance. Sarris (2013, p. 213) maintains that major risks facing global food security are not only related to price volatility, but also trade finance and 'import contract enforcement'.

The current paper concentrates on the contracts and practices of wheat trading on the international market. Wheat, which is called 'the king of grains', accounts for about 12 % of all calories consumed by humankind (Gonzalez-Esteban, 2017). The main wheat importing region is the MENA region, where Islam is the predominant religion. Its annual per capita import amounts to 140 kg, twice more than the world average (Araujo-Enciso and Fellmann, 2020, p. 495). Wheat is three times more important for the Arab countries than maize and four times more important than rice. This is accompanied by a high rate of population growth and increasing food shortages. It is reported that by 2025 the food gap for wheat and flour in the Arab world would amount to 551 million tons (Elbogghi et al., 2016).

International food commodity trading has an impact on prices for both exporting and importing countries. For the exporting countries, a presence on international markets often resulted in higher and more sustained local prices and more production incentives. But, finally, this would result in increased food insecurity of the poor. USDA data shows that, for wheat, global import to consumption rate increased from 17 % in 1995/96 to 24 % in 2018/19 (Figures 1 and 2). This implies the increasing role of international trade in the global wheat market.

The current study was inspired by four main factors. First, wheat and other food commodities get increased importance nowadays in the face of the food security issue. This is specifically relevant for the Muslim countries, among which there is less food secured and heavy dependency on imports. Second, food commodity trading is a sphere which has not received relevant attention from the contemporary Muslim scholars and Shariah standard-setting bodies. Except for one standard by AAOIFI devoted to trading on exchanges, the whole food commodity market got little attention compared to banking and insurance sectors, while it comprises staple food for any community and Muslim countries specifically. Third, the traders' activities often result in price manipulation and unfair distribution of profit among market players. While there is plenty of research examining this issue from the regulative and ethical perspective, Shariah-based analysis of the traders' activities hasn't been performed in depth. Fourth, there is a need to investigate the current suggestions and develop and implement a practical contract for food commodity trading with deferred delivery which could be an alternative to futures which are non-Shariah compliant.

While there is substantial attention to the examination of futures and derivatives markets from the *fiqh* point of view, none of the works specifically focused on food commodity markets, except for providing examples of certain market failures or developments. The current study provides examination of a certain wheat futures contract and focuses specifically on current wheat commodity trading and market practices. Another distinguishing feature of the current paper is a review and evaluation of the main suggestions for potential alternatives to futures (Table 1). Additionally, the authors review the papers by secular authors examining the futures market failures. The authors make an attempt to combine both approaches, Shariah and conventional, and develop recommendations for the market with prospects of practical implementation.

[3] Al-Bukhari. Sahih. Vol. 3. Book 34. Hadeeth No. 379.

[4] AAOIFI (Accounting and Auditing Organization for Islamic Financial Institutions), established in Bahrain in 1990, being a reputable international organization, issuing Shariah standards for the sphere of Islamic finance, is regarded by the market as an important reference point, not to mention the obligatory status of its standards in over 12 countries.

[5] This is not the only classification of Islamic finance contracts, but most relevant to our research, to explain what is implied by the modern Islamic finance architecture.

Table 1. Potential instruments for Shariah-compliant food commodity futures trading.[15]

#	Instrument	Explanation	The supporting author/organization	Restrictions & Critics	Authors' evaluation
1	*Salam* and parallel *salam*	Advance payment agreement	Azzam, 1985 Kamali, 2007 Kahf, 2011 Malkawi, 2014 Hisham and Jaffar, 2016	Contract trading is forbidden (except for a parallel *salam* deal). Contract securitization is subject to a minimum of 30% of tangible assets. The contract is not designed to be a hedging instrument; it would be too costly (Al-Saati (1999). Advance payment may "wipe out benefits" (Al-Suwailem, 2006)	A sound contract, or combination of contracts, but its application is limited due to price volatility risks and other factors
2	*Quasi-salam futures* or *al-bay' 'ala al-sifa* (*Kahf, 2011*)	Futures could be Shariah-compliant based on certain prohibitions being relaxed: 1) *the sale of a non-existing and not owned item,* given that it is generally available in the market and the seller is capable to deliver *2) a deferred payment ban*	Malaysian Securities Commission, Kamali, 2007, Musa, 1954, Qadir, 1982, Qaradawi, 1987, Kunhibana and Shanmugam, 2010, with reference to Zahra and Mahmor, 2002 Ong and Jeong, 2012	The contract is not approved by IIFA and AAOIFI The transaction should be allowed only for qualified traders (Ong et al.)	Could be a potential solution if I approved by the Shariah standard-setting bodies
3	Value-based *salam*	The goods to be delivered are stipulated not by quantity, but by value	Al-Suwailem, 2006	AAOIFI rules that the sold commodity should be stipulated by quantity The price in *salam* cannot be linked to the market price (Misri, 2015, p. 157)	Such a suggestion should be regarded apart from a *salam* contract, as it contradicts its basic requirements, and requires Shariah assessment
4	*Bay' bi-thaman ajil* A sale with a deferred payment (including *murabaha*)	Mainly used as a trade finance instrument	AAOIFI, 2004a Khan, 1988 Al-Suwailem, 2006 Kamali, 2007	A ban for a sale back to the initial seller. Contract securitization is subject to a minimum of 30% of tangible assets	A 'working' solution, but with limited scope of application
5	*Bay' bi-thaman ajil* with asset-based payment	Al-Suwailem suggests to constitute payment by assets	Al-Suwailem, 2006	The commodities (payment) should be of different type than the sold commodity, to avoid *riba* (usury). Some sellers would be not interested in receiving assets as payment, instead of currency	Needs broader practical implementation
6	*Istisna'*	Construction finance agreement	Malkawi, 2014	Is not applicable to commodity trading (IIFA, AAOIFI) The contract is not designed to be a hedging instrument, it would be too costly (Al-Saati (1999)	As such, cannot be applied to food commodity trading
7	*Taureed*	Sourcing agreement, a means to save resources related to storage and minimize risks for perishable commodities	Misri, 2015, referring to Ibn Al-Qayim, 1982	Deferred payment is not allowed in commodity trading (IIFA)	One of the sound alternatives in case Islamic finance architecture develops a new type of product within the *taureed* group of contracts with further approval from IIFA/AAOIFI
8	Commodity funds	A hedging instrument as alternative to conventional index funds	Usmani, 2016	Certain amount of tangible assets should be always available in order to secure the fund tradability	A solution which could contribute to Islamic finance infrastructure and requires broader practical implementation
9	*Wa'd* (a binding promise from one party)	Suggested by AAOIFI as an alternative to options	AAOIFI, 2004a Kahf, 2011	Certain practical implementation as alternatives to swaps is questionable from the Shariah point of view (Sakti et al., 2016)	There is a risk that in practice it would be converted to a binding contract rather than a promise.
10	A combination of *wa'd* and *murabaha*		Kok et al., 2014	The model requires Shariah assessment	Questionable from the Shariah point of view
11	*Sukuk* (particularly, *sukuk salam*)	Asset-based investment certificates	Al-Suwailem, 2006	*Sukuk* cannot be tradable unless the tangible assets[16] constitute at least 30% of its value (AAOIFI, 2003; 2014a)	A 'working' solution, if implemented in a combination of other structures of *sukuk (hybrid sukuk* structures*)*

(*continued on next page*)

Table 1 (*continued*)

#	Instrument	Explanation	The supporting author/organization	Restrictions & Critics	Authors' evaluation
12	*Takaful* fund	Market participants form mutual commodity/cash funds to hedge potential risks	Khan, 1988	Not a trading but rather a hedging instrument. However, hedging is one of the futures' main aims	Could be practiced alongside financing agreements
13	Third-party guarantee	The investor in a company sells a part of his share to an insurance company on a deferred payment basis	Al-Suwailem, 2006 Kahf, 2011 Malkawi, 2014	Not a trading but rather a hedging instrument. However, hedging is one of the futures' main aims	Could be practiced alongside with financing agreements
14	*'arbun* (often combined with # 15 as an alternative to options)	Earnest money	AAOIFI, 2004a Malkawi, 2014	Is subsumed to the group "reverse engineering" (Iqbal), imitating conventional products (Al-Suwailem, 2006)	Could be practiced within financing agreements
15	*Khiyar al-shart*	A contract clause allowing to annul the agreement within a stipulated period of time based on false information or fraud	AAOIFI, 2004a Khan, 1988 Malkawi, 2014	Not a trading but rather a hedging instrument. However, hedging is one of the futures' main aims	Could be practiced within financing agreements

Source: made by the authors based on the studied research papers.

The paper is organized as follows. Section 2 provides a literature review on the related topics and describes research methodology. Section 3 is divided into three parts. The first includes the analyses of the Black Sea Wheat Futures contract and discusses the Islamic scholars' objectives to derivatives. The second part provides analysis of the current suggestions for Shariah-compliant alternatives for food commodity trading. Section 3.3 discusses the traders' activities providing evaluation from both Islamic and conventional points of views. Section 4 concludes with results and discussion.

2. Literature review and research methodology

A historic analysis of the first derivatives prototypes and early futures trading was done in numerous articles (Santos, 2013, 2014; Al-Suwailem, 2006; Malkawi, 2014), mostly referring to the documents published by exchanges. There are suppositions that the first analogues of forward and option contracts were executed in ancient times. Forward markets existed in China 2000) BCE, where farmers sold rice to traders before it was planted. Options prototypes were practiced in Ancient Greece. The evidence is documented in Aristotle's book on the astronomer Thales, who became a monopolist supplier of olive presses due to his capability of forecasting the market for olive presses.

Al-Suwailem (2006) claims that tradeable forward contracts (in the form of *salam* contracts) were practiced in the Islamic state in the 8th century. He provides examples of the derivatives perception by the common law and courts as unenforceable and void because of 'mere wagers'. Claims still exist that derivatives, even being standardized, are pure gambling. Malkawi (2014) states that history shows a negative perception of options, which often came amid disrepute and defamation.

Researchers are generally unanimous in their assessment of the contribution of the US to forming modern futures contracts; the Chicago Board of Trade (CBOT) being the first comer. Contract standardization contributed to its wide circulation (Malkawi, 2014).

A detailed historical analysis of speculation from a regulatory perspective has been done by Baines (2017). The researcher investigates regulations shifts towards bone fide hedgers and speculators starting from the end of the 19th century till 2017, also reviewing main US bills and international trade agreements.

Gonzalez-Esteban (2017) analyses the impact of globalization on wheat trading throughout history. There is evidence that wheat had become more important since the mid 19th century, displacing other grain types. More than that, wheat had been introduced to the poor countries' food basket by the USDA through postwar food aid policies and market promotion campaigns in the mid-20th century. And in the end of the 20th century, there had been a "dietary shift towards wheat-based products" (Gonzalez-Esteban, 2017, p. 148).

Bekkerman and Tejeda (2017) study the factors influencing the demand for futures contracts. The researchers outline the following criteria: underlying cash market, industry structure, hedging opportunities, and market data availability.

The interconnection between food commodity trade mechanisms and the level of food security in poor and developing countries as well as food adequacy for the end consumers has been outlined in many research papers (Sarris, 2013; D'Odorico et al., 2014; Clapp, 2017; Araujo-Enciso and Fellmann, 2020; Larson et al., 2014; Webb, 2010). Sarris (2013) divides countries into groups depending on the wealth level and the impact of price shocks on imports and economic stability, making an accent on the necessity to create certain mechanisms to support food security in net food-importing countries. The researcher points out challenges encountered by the food import managing agencies in the related countries. Among them are the lack of the following: effective production and consumption volumes estimates, future demand non-fulfillment risk minimization tools, overall cost minimization mechanisms, storage costs optimization and securing trade financing. Apart from those challenges, FAO defined counterparty performance risk. Trading activities and storage are named the two main mechanisms for

managing price volatility shocks. Larson et al. (2014) outline that interventions and food subsidies are the most often used strategies in the MENA region. Based on World Bank and FAO data, they estimated that the wheat reserves in the region amounted to around 6 months' consumption period, and there were plans in some countries to increase the stocks "to meet the consumption needs for 13–17 months" (Larson et al., 2014, p. 53). These plans, however, were not put into practice. In many Muslim countries, the wheat is less than 6 months' consumption period. For example, in October 2019, the Egyptian Ministry of Supply announced that the wheat stock was enough to cover the county's needs for less than 5 months.[6]

Price volatility in food commodity markets can lead to adverse effects not only for consumers but also for political regimes, through an increase in food insecurity. After the 2008–2009 food crisis, there was a surge in research studying the reasons for commodity price volatilities. Speculators were regarded as the main responsible party. The legal outcome was the introduction of trading limits by commodity exchanges. Recent research (Araujo-Enciso and Fellmann, 2020) points out the vulnerable position of the world wheat trade due to instability of supplies from Russia, Ukraine and Kazakhstan, which would most likely lead to higher prices and threatens food security in the MENA region.

Froot et al. (2019) examine transaction prices on main food commodities, including wheat, on the Dutch and British markets and come to the conclusion that the level of volatility of the market throughout 700 years had not decreased despite cost minimization, regulation policies other factors. The authors maintain that arbitrage in the food commodity market is still not efficient enough.

The majority of research on the impact of speculation on organized markets is unanimous in the negative impact of speculation on the commodity markets (Adammer and Bohl, 2015; Ghosh, 2010; Baines, 2017; Alamad, 2017, and others). Some authors, however, claim the opposite (Haase and Huss, 2018; Koziol and Treuter, 2019; Lehecka, 2015; Boyd et al., 2018; Andreasson et al., 2016; Etienne et al., 2017).

Haase and Huss (2018) argue that the market benefits from "a certain level of excess speculation". The authors give two main arguments for the positive impact of speculation on volatility: minimizing trading costs for hedgers and intensifying information efficiency. Haase and Huss argue that huge public pressure prevented the authorities from conducting a proper investigation into who caused the global financial crisis. The researchers claim further that excess speculation can have a certain positive impact and "reduce shock" at a time of high volatility. It is argued that any regulatory limits to speculators' activities are adverse and unproductive. Examples are MiFID-II and the Dodd-Frank Act. The authors do not study the volatility of the Black Sea wheat futures, which is relevant to our research. However, the latter was only introduced in 2012, in a period that does not include the food crisis, a study point of most papers on the topic. Koziol and Treuter (2019) question the negative effects of speculation. They argue that forward prices drive the producers in their decisions on production volumes. Kamali also questions the adverse effect of speculation on futures. He claims that even in the wheat futures market speculators bear the risks that would not be borne by any other party; moreover, such activities often stabilize the price. He argues that the present sophisticated commodity futures markets regulation minimized the chances for fraud through speculation and manipulation; the largest speculators do not own more than 5% of a certain market (Kamali, 2007, p. 332–334). Lehecka (2015) opines that speculation and hedging activities have a low impact on price volatility. Boyd et al. (2018) in their recent literature review on speculation and financialization on commodity markets find little evidence supporting the destabilizing effects.

Revoredo-Giha and Zuppiroli (2013) claim that futures markets continue to play an important role in the commodity markets and would contribute to food security issues. Netz (1995) affirms that the development of wheat futures led to a decrease in spot price volatility and an increase in stock sensitivity.

An analysis of corners and squeezes was performed in a game-theoretic model by Cooper and Donaldson (1998). Pirrong (2017) provides examples of market-power manipulation through cornering and squeezing cases.

A more critical approach to speculative activities of traders and their impact on the commodity markets and beyond is inherent to research on commodity markets' financialization. Seddon (2019) analyses the transformation of the exchange's role in the era of financialization. He argues that commodity exchanges are designed in a greater degree to cater to the needs of the bankers and speculators rather than producers and traders. The researcher analyses the case of the London Metal Exchange and argues, based on the membership policy, deregulation of physical delivery clauses and other factors of disconnection from the physical market, that the financialization process is more about politics rather than economics and fintech. Baines (2017) distinguishes the adverse effects of speculation and financialization on two main groups of commodity market participants. According to the researcher, while small scale farmers and traders suffered from volatile prices and subsequent food crisis, large-scale farmers and traders earned extra income. As a logical outcome, each of the two groups insisted on opposite definitions of speculation: the big firms claimed the necessity to narrow the definition, and the small market participants insisted on the "far reaching definition". Among other researchers of the financialization of the commodity markets are Bernard et al. (2012) and Ordu et al. (2018). The large grain traders' market impact is not the only case where researchers stand for the necessity for stricter regulation. For example, Rahdari et al. (2020) call for stricter government regulation of the global retailers.

The Shariah approaches to derivatives have been a study point, mainly in Arabic, since the 1970s. There are also papers in English addressing the modern commodity trading contracts from the Shariah perspective (Malkawi, 2014; Alamad, 2017; Kafou and Chakir, 2015). Derivatives from Islamic perspective were studied by Khan (1988), Bacha (1999 and 2012), Al-Suwailem (2006), Kamali (2007), Jobst (2013), Jobst (2014), Mohamad (2013), Muhammad et al. (2015), Muhammad and Ahmed (2016), Ong and Jeong (2012), Smolarski et al. (2006), and others, who stressed the general necessity for Islamic derivatives for hedging purposes. Al-Suwailem and Hassan (2011) studied the issue of financial engineering in Islam. However, thus far Shariah-compliant food commodity trading contracts in the framework of food security has not been addressed by the researchers.

Al-Suwailem (2006) analyzed hedging options from the Islamic finance perspective. He studied the derivatives market, describing it as a "financial instrument for trading risk", and provides an overview for a list of potential alternatives. He describes derivatives from Shariah point of view as illegal and accumulates critical judgment on derivatives by the western economists and businessmen, who regard the derivative market as pure speculation, casinos (Allais, 1993), bubbles (Keynes, 1936) and 'time bombs' (Buffet, 2002, p. 15).

Kamali (2007), ascertaining the importance of futures for the market, accumulates religious scholars' critical remarks about derivatives. He states that modern futures instruments, being standardized, monitored and regulated, provide significant benefits for the producers and traders and the creation of Shariah-based alternatives should not be ignored by Muslims.

Kunhibava and Shanmugam (2010) compare conventional and Shariah approaches to derivatives. The authors outline similarities, among which are the negative attitude towards the 'gambling nature' of derivatives. They further conclude that Shariah objections to derivatives are more diverse and include such negative elements as uncertainty (*gharar*) and ignorance (*jahala*). The researchers provide evidence, with links to other Islamic scholars (Delorenzo, 1983; Chapra, 1985; Khan,

[6] See, for example, Reuters: Egypt says strategic wheat reserves enough to cover its needs until February. October 18, 2019/Reuters. URL: https://www.reuters.com/article/egypt-wheat/egypt-says-strategic-wheat-reserves-enough-to-cover-its-needs-until-february-idUSC6N24U01S. Access date: March, 30, 2020.

1988; Usmani, 1996; and others), of the overwhelmingly excess manipulation, corners, speculation on commodity markets, negative perception of futures and options in Islam.

Malkawi (2014) studies the essence of derivatives, their history, and the current challenges and suggests some Shariah-based alternatives. He argues that derivatives are often extensively misinterpreted by market players and the public. This statement is supported by the lack of a unified legal definition of derivatives. The researcher argues that Islamic finance provides sound alternatives, in the forms of *salam*, *istisna'*, '*arbun*, *third-party guarantee*, *khiyar al-shart* (Table 1).

Current challenges for the Islamic derivatives market were studied by Sakti et al. (2016), who interviewed five Shariah scholars working with Islamic financial institutions in Malaysia and Singapore. As a result, the authors question the legibility of certain alternatives contracts, particularly, Islamic profit rate swaps through *wa'd* (promise) contracts. Ebrahim and Rahman (2005) conducted a Pareto-optimal analysis of futures contracts over Islamic forward contracts.

Alamad (2017) stresses that futures contracts are among the current central topics of research in the framework of Islamic finance architecture. Like other researchers, he sees similarities between futures and *salam* deal but argues that the differences are predominant.

A deeper analysis of the Islamic concept of ownership (*milkiyya*) is performed by Razak and Saupi (2017). They claim that the derivatives market should be 'completely redesigned to achieve Shariah-compliance" (Razak and Saupi, 2017, p. 158). Atallah and Ghoul (2011) analyze the so-called "Islamic total return swaps", providing suggestions on alternative contracts.

Although food commodity trading has been partly addressed by many researchers analyzing the Shariah approach, few researchers have made attempts to examine deeper the food commodity trading market and techniques from the Shariah perspective, yet minor efforts were done to analyze from various angles, including the institutional aspect. The drawback of many papers on the Islamic approach to derivatives is that they lack practicability, and rarely integrate conventional papers suggestions, except for some criticism over futures contracts. Some potential alternatives related to the *sukuk* structures also need more attention and research. The present paper makes an attempt to fill this gap.

This article evaluates modern commodity trading contracts and practices from the perspective of Islamic commercial law (*fiqh muamalat al malia*)[7] with an institutional approach and investigates which Islamic finance contracts could be implemented and to what extent as alternatives to futures and options on the commodity markets.

The main hedging instruments on the food commodity markets are futures, options and swaps (Kang and Mahajan, 2006). This article focuses mainly on futures contracts and their implementation. Some comments are made concerning options and swaps.

The methodology of the paper is descriptive research through a qualitative and multifaceted approach. The multifaceted approach included the analysis of different types of sources, analyzing the study object both from conventional and Shariah approaches. Furthermore, the article provides examination of the futures contracts and the activities of the traders from the point of view of *fiqh muamalat* and from the point of an institutional approach (particularly, the impact of political and financial groups on the commodity markets, their regulation, and pricing). Additionally, the problem of Islamic alternatives to food commodity futures is discussed from the angle of food security, whereas the majority of the Muslim countries are among the least food secure.

[7] There are different classifications of *fiqh muamalat*. Some scholars refer *fiqh mumalat* to commercial transactions only (for example, in *Majalla al Ahkam al-Adliya*). Others subdivide fiqh muamalat to three or more sections, among them are *fiqh muamalat al maliya*. There is also a division of *fiqh muamalat* into two sections: *fiqh muamalat al maddia* (the law of things) and *fiqh muamalat al-adabiya* (the law of behavior) (see, for example, Ali Fikri. Al Muamalat al maddiya wa adabiya. Mesir: Mustafa al-Babi al-Halabi wa Auladah, 1938).

In evaluating the types of modern Islamic finance architecture, we follow Al-Suwailem's approach, who divided them into three groups: imitating conventional contracts, transformation and development of the existing Islamic contracts, and satisfying the market needs (Al-Suwailem, 2006) (See Section 3.2.2).

The authors chose a descriptive qualitative approach because there is not enough market data on Islamic commodity trading. Moreover, the market is still in its infant stages, and, therefore, the quantitative statistical approach would not have yielded the required, in-depth, and reliable analysis.

The data sources include AAOIFI Shariah standards and IIFA fatwas related to commodity trading contracts, exchanges documents (CTFC and CBOT), including a Black Sea futures contract sample, and the relevant regulations, as well as the research papers. The latter could be divided into two major groups. The first are the papers on food commodity markets, speculation, and financialization phenomena from the conventional market approach. The second are the papers analyzing futures and derivatives in general from the Islamic law perspective. Among other sources are reports on the Islamic financial market development and USDA reports on the global wheat market developments.

The data analysis process consisted of the following stages:

1. Selection and examination of the core research papers on Islamic alternatives to futures and derivatives in general. It appeared that whereas there has been substantial attention to the analysis of the Shariah compatibility of derivatives, there is not enough research on the current food commodity trading from the Shariah point of view (Section 2).
2. Examination of a sample futures contract for Black Sea Wheat Futures from the Shariah perspective (Section 3.1).
3. Based on the papers analysis, we derived the potential alternatives to a futures contract and summarized them in a table (Table 1). The main alternative contracts have been discussed in Section 3.2. We discussed deeper the sukuk salam as an alternative which had not received much attention in previous research.
4. The market players' activities were analyzed both from the point of view of conventional exchange regulations, based on recent research on speculation, manipulation, and financialization, and from the perspective of *fiqh muamalat* (Sections 3.1–3.3.).
5. Additionally, we studied some of the recent suggestions by researchers for the solution of the food security issue through the creation of a grain reserves system and international grain trading contracts (Section 3.4).
6. As a result, we outlined the most promising solutions that could be used to enhance food commodity trading following Shariah principles. We conclude on the aspects of potential cooperation between the Islamic financial principles and conventional exchange regulations in order to achieve the mutual aims for a secured and ethics-driven market (Section 4).

3. Analysis

The Islamic finance industry, since its inception in the modern form, has been developing in the context of the existing financial infrastructure and rules. Therefore, it is subject to the impact of financial path dependence (Kalimullina, 2010). This young market has to align itself with the existing cost of finance and income rates, credit ratings, collateral requirements and other factors, designed based on conventional finance principles. This leads to the fact that the Islamic finance industry, in practice, cannot fully achieve its certain goals, incorporated in Islamic jurisprudence, such as the matching between contract form and essence, and the avoidance of sham transactions. Unfortunately, the situation is relevant not only for the finance market, but also for international commodity trading, including food commodities.

3.1. Commodity trading contracts characteristics from the Shariah point of view

Deals concluded on commodity exchanges can result in one of the following four options: physical delivery, set-off, payment of the difference in futures and market price, and a reverse transaction. It is reported that real delivery is executed in about 2% of all cases (Kamali, 2007, p. 314). The UK Financial Services Authority characterizes derivatives as "contracts for differences" (Al-Suwailem, 2006, p. 28). This means that the contracts are mainly used for the sake of hedging or speculation. As a rule, a particular futures contract indicates whether it means delivery or not. Contracts with *sine qua non* physical delivery condition have higher chances to be applied for Shariah compliance, as there are fewer opportunities for speculation. Hernandez et al. (2014) indicate that the US grain market has a greater impact on the Asian market than the European concerning volatility spillovers and interdependence. Particular influence is from the part of the Chicago Commodity Exchange on wheat trading. Any regulation imposed on the Chicago exchange is certain to have a significant cross-border impact. The Black Sea Wheat Futures contract (BSW) is reviewed below as a sample for our research. The contract was registered with the Commodity Futures Trading Commission (CTFC) in 2012. In the related official letter by the Chicago Board of Trade the contract is referred to as a "Wheat Futures contract with physical delivery at selected ports on the Black Sea" (CBOT, 2012).

3.1.1. Black Sea Wheat Futures contract: a review

Shariah imposes strict conditions related to the contract subject, parties, traded asset, price, and time and place of delivery. In general, the BSW futures contract framework specifies in detail all the main contract elements. It provides a precise specification of the traded commodity, including its weight, composition, moisture, and insect damage. It also specifies the place of delivery, which is one of the Black Sea ports. The price increments are also stated, allowing 13.6 USD minimum fluctuations per contract. The parties are defined at the time of signing. However, an option to trade in futures contracts provides for the possibility of a change in the contract parties. Trading in receivables is forbidden by Shariah.

The contract sample also defines the limits to decrease the impact of speculation. It says that "there shall be no trading at a price more than $22 per metric ton above or below the previous day's settlement price" (CBOT, 2012. Appendix A), but this ruling does not include the last two trading days of each month. The contract limits the maximum positions to 1,000 contracts (except for bona fide traders).

The BSW sample contract also stipulates certain priority order in delivery to the same ports. If the delivery windows concur in time, priority is given to the Long Clearing firm with the 'largest requested quantity' and then the 'oldest trade date' and then the 'oldest entry time'. This regulation is important based on the fact that access to the ports in the region can be constrained.

The BSW futures limit the contract duration to a period between the 15th and the last calendar day of the contract month. The delivery date is defined in the contract by its nature, allowing a three-day 'delivery window'. This clause is not in conflict with Shariah, as a certain time window is necessary based on the normal workflow in ports, delivery schedules and other factors that could prevent delivery at a certain date. A three-day window delivery clause is not regarded by the Islamic law as an excessive level of uncertainty (*gharar kasir*) that nullifies a contract. The same is relevant for the payment clause. The latter is indicated by scholars of the *Maliki* Islamic legal school for advance payment in *salam*.

The contract has several references to the relevant regulations and internationally accepted sample documents, like GAFTA. The BSW contract allows for delivery offset. Loading tolerance up to 2 % from the contract quantity is admitted. This clause can be paralleled with the Shariah-based options for *husn al-qada*. The latter, however, is more ethical in its reasoning: the seller can supply goods of inferior quality with the buyer's consent (see AAOIFI, 2014a). The quantity of goods is determined by the number of contracts specified, along with other contract data, at the stage of delivery intention.

The contract includes certain clauses aimed at risk minimization. Among them are the payment and load out guarantees from the buyer's side. Payment is secured through the delivery margin clause. That is, each of the clearing firms should obtain a delivery margin in the form of cash or securities in the full value of the contract. In case of the Buyer's non-payment, the margins are to be liquidated and the Exchange would pay the Seller's Clearing Firm. For any delay in the loading out process, the Buyer is to cover storage expenses amounting to 0.20 USD per metric ton per day. The mentioned guarantee types are not in conflict with the Shariah standards (see, for example, AAOIFI, 2014b), although the actual storage cost can be much higher.

Arbitration is referred to as the dispute settlement option for the contract parties. In case of delivery failure, the respective clearing firm shall be liable to the other party for all losses. Such unconditional liability, however, may be questionable from the Shariah point of view, unless the clearing firm is regarded as a free-will guarantor. In this regard, it would be useful to study the relevant arbitration cases.

Some futures contracts have the clause for partial payment in advance. However, such a clause is not included in the BSW contract sample. The payment is made upon goods receipt following the specified order. The fact that both the delivery and payment are deferred is the main issue of futures contract non-conformance to the Shariah norms. This point will be discussed in the section below.

3.1.2. Shariah-based approach to futures, options, and swap contracts and other forms of commodity trading

Most Shariah prohibitions related to financial contracts are basically in line with the existing exchange regulations. For example, both Shariah law and other civil law regulations forbid cheating, exploitation, deliberate destruction and similar unlawful and unethical actions. As reported by Kunhibava and Shanmugam (2010) with reference to Wilson (2007), following harmonized ethical rules and regulations, Islamic-driven trade is more productive and socially beneficial.

Spot sale transactions, generally, have no conflict with Shariah rulings, as the uncertainty in such transactions is minimized. Any delay in payment or delivery, for technical issues, which do not exceed 1–3 days, are not subject to Shariah rulings related to deferred payment or delivery. However, certain conditions should be fulfilled related to the sold item. First, it should be *halal* (permissible). Secondly, the seller should have full ownership and possession of the sold item. Third, the sold item should be specified and concretized by, for example, labeling depending on the nature of goods (AAOIFI, 2004a). The latter condition is aimed at minimizing the risk of conflict if some disaster happens to the goods in the common storage of the seller or a third party (if the goods are stocked elsewhere).

Labeling would also help stipulate which particular goods have been spoilt and minimize the chance for conflicts. In common practice, it is not a rare situation when the real volume of the commodities sold at exchanges could be in reality much lower than expected by the market and stipulated in the contracts (see section 3.3.3). According to Shariah, once the goods are sold and the ownership is transferred to the buyer, even if the commodity is still being kept in the seller's warehouse, the risks are with the buyer. Therefore, in Islamic finance transactions, the common practice is that the sold goods should be labeled to identify the owner, or separated so that it would be easy to identify the owner. According to AAOIFI, "the sold item should be particularized so it could be identified from the bulk of other items" this could be done through identification based on registration marks or other similar ways (AAOIFI, 2004a, paragraph 3.1.2.).

Shariah rulings on futures, options, and swaps are provided in AAOIFI Shariah standard No. 20 issued in 2004. According to the standard, the existing forms of futures, options, and swaps are prohibited by Shariah. The main reasons for prohibition are the non-fulfilment of certain conditions related to the sold item, ownership and possession, price, and

time and place of delivery (AAOIFI, 2004a). Some of the researchers, however, claim the necessity to relax requirements related to certain above-mentioned elements. This will be discussed below.

The first ruling is that the sold item should not represent any of the prohibited (*haram*) items by Shariah. In food commodities, this could include any alcoholic drinks or substances used intentionally to produce alcohol, tobacco, cannabis and similar items, as well as animal meat, fat and skin taken from forbidden animals (pork, dogs etc.) or animals slaughtered in a non-*halal* manner. Any kind of grain is regarded as permissible in Shariah.

According to the second ruling, the sold item should be available at the time of the contract session. Any item which is not produced yet, cannot be sold, except for the *salam* (advance payment) and *istisna'* (construction) contracts. These two are the only cases when short selling is allowed based on certain conditions. Both situations are explained by the nature of the deals and the market necessity for a short sale. Kahf (2011, p. 146) combines both deals as *a sale based on description* (*al-bay' 'ala al-sifa*). The researcher explains that the main difference between lawful and prohibited sales of a not-owned or non-existing item is the way the item is identified: the item should not be particularized. This rule, however, does not make futures void. Kamali (2007) carries out a detailed analysis of the ruling on the sale of non-existing items, based on the hadeeth "*do not sell what is not with you*"[8]. The researcher provides three interpretations of the legal formula by Muslim lawyers. He concludes, based on the ideas of Musa (1954), Qadir (1982), and Qaradawi (1987), that this ruling should be applied based on its objective – the ability of the seller to secure the timely delivery of the sold item. Unlike Medina times, nowadays commodity markets are structured and regulated in a way that makes default almost impossible. Kunhibava and Shanmugam (2010) refer to Zahra and Mahmor (2002), who also maintained that non-existence of the goods does not always imply the sale prohibition, and to the decision of the Shariah Advisory Council of the Malaysian Securities Commission, which permitted futures contracts for palm oil, based on the opportunities to minimize contract uncertainty. This decision is reported to be based on the common commercial practice ('*urf tijari*), public interest (*maslaha*) and avoidance of impediments (Sakti et al., 2016).

As per the third ruling, any contract involving delay both in payment and in goods delivery simultaneously is prohibited by Shariah. This ruling is, however, questionable by some researchers. Alamad (2017, p. 132) maintains that "it does not make sense to pay the amount up-front". Kamali (2007, p. 313) subsumes futures contracts to the case described in Islamic books as the deal of two *simple* parties (*al kali bil-kali*), or a *sale of a debt for a debt*. And this is the case of all futures contracts. The only exception from this rule is manufacturing agreements (*istisna'*), where the condition is explained by its nature. *Istisna'* is mainly about construction or creating new items. Both advance payment and deferred payment are possible for such transactions. The *hadeeth* about the sale of a debt for a debt[9] is considered a weak one (Kamali, 2007, p. 328; Misri, 2015, p. 274), meaning that there is no strong evidence that these words were said by the Prophet Muhammad (peace be upon him), and this resulted in a debate over its meaning and practical implementation. Some scholars argue that this *hadeeth* is not relevant for transactions with deferred delivery and payment (Misri, 2015). Others (for example, Darir, 1967) maintain, however, that this ruling is related only to food and currency trading.

Some Muslim scholars regarded futures as a bilateral exchange of promises and allowed such transactions except for trading in currency. Such a position, particularly, was obtained by Hamoud (1985), and cited by Azzam (1985). The International Islamic Fiqh Academy issued a *fatwa* forbidding mutually binding promises on the ground that this would be analogue to a sales transaction over a non-existing asset, which is forbidden by Shariah (IIFA, 1988). This ruling was quoted by AAOIFI in its standards. For example, the standard over *murabaha* transactions, adopted in 2002 and amended in 2014 (AAOIFI, 2014c).

The fourth ruling is the seller's full ownership and possession (*qabd*)[10] of the sold items. The ruling also leads to prohibition of trading in futures. Al-Suwailem (2006, p. 28) characterizes derivatives as not "real" deals because of the non-availability of ownership transfer. Again, *salam* transactions are an exception. On the commodity markets it is common practice to buy goods on the condition of deferred delivery, and immediately sell the same items without either receiving the goods physically or obtaining possession of the goods legally. This situation conflicts with Shariah rulings, as goods are not allowed to be sold until they are fully owned and possessed, to say nothing of their existence. A basis for this is the *hadeeth* saying: "Do not sell food until you have bought it and taken possession of it"[11]. According to Kamali (2007), some commentators on this ruling claim that it only applies to food items (for example, Imam Malik, Ibn Rushd. The same position was held by Shariah boards of Dalla al Baraka, Islamic Bank of Sudan, Kuwait Finance House), which is relevant to our research topic. Al-Zahiri (1988) claimed that the ruling is confined only to wheat. Some modern Shariah scholars support the position of Ibn Taimiyyah, who maintained that the ruling is relevant to the cases when there is no confidence that the goods would be in possession at the moment of delivery (for example, Al-Suwailem, 2006). Kamali (2007) continues that in modern markets even foodstuffs can be traded without physical delivery due to "no case of failure of a futures transaction". However, we should note here that this was said before the food crises of 2008 and 2010 (see section 3.3.3). Ong and Jeong (2012) claim that the Islamic approach should be reconsidered. However, only qualified parties should be admitted to futures trading with proper regulation in place due to high risks and uncertainty of the market. Razak and Saupi (2017) conclude than the concept of ownership risk is central to Islamic finance contracts and should be addressed and implemented by the interested regulators.

The fifth ruling is related to the contract price. The price should be stipulated once and should not be subject to any alterations, nor can it be dependent on any specific indicator, unknown at the time of the contract session. Some researchers outline that in many cases futures contracts allow for alterations not only in the agreed price, but also in the commodity grade and delivery time and place (Alamad, 2017). Although Shariah allows changing the grade of commodity and place of delivery, the price clause is stricter. If the contract is concluded with a condition of a deferred payment, then there could be no deferral in delivery. Shariah puts no limits to contract currency type. The price could be stipulated in any currency or even commodity (except for the same commodity as the sold one) (AAOIFI, 2014a, paragraph 3.1.1). The payment could be done in the local currency at the prevailing exchange rate at the day of payment. This could be a hedging point against currency volatility.

All these conditions, except the first, are based on the Shariah prohibition of the excess uncertainty (*gharar*) with regard to the contract's main clauses, which could lead to an unfair distribution of resources among the market players. Cases of *gharar* include uncertainty concerning the type of contract, the parties, the sold item (its presence, ownership and possession, and the volume), the price, the place and method of delivery. The AAOIFI Shariah standard on *gharar* mentions eight types of *gharar*, including three cases of a short sale. The latter include the selling of a lacking item, selling (or renting) of an existing item without ownership or possession, and selling of a non-existing item (AAOIFI, 2007). Malkawi (2014) defines *gharar* as

[8] Ibn Majah. Sunan. Vol. 3. Book 12. Hadeeth 2187.

[9] Bulugh al-Maram. Book 7. Hadeeth 849.

[10] Legal possession (in Arabic – *qabd hukumi*) is also allowed. Customs of taking possession is also considered by the Shariah. But in case there are high chances of sham transaction, many Islamic scholars put the condition that the buyer's representative secures physical possession (or at least personal inspection) whenever possible.

[11] An-Nasai. Sunan. Vol. 5. Book 44. Hadeeth 4605.

"uncertainty or speculation". Islamic law does not forbid trading with the aim of earning a profit, even if such transactions are characterized as speculative, but it imposes certain limits to prevent the harmful effects of excess speculation. Trading in commodities, or currencies, is allowed, even on a short-term basis, given that the necessary conditions, described above, are met.

Therefore, some arguments supporting speculators' activities are not in conflict with the Shariah rules. Koziol and Treuter claim that by increasing the forward price through speculators' long-term investment in futures, farmers tend to produce more, expecting higher prices, and this results in an increase in production and better access to food, thus decreasing food insecurity. Speculative trading keeps prices down, benefiting the consumers. This could have a negative impact on producers, who encounter income deficiency (Koziol and Treuter, 2019, p. 739).

Salam and *istisna'* contracts are only legitimate if uncertainty with regard to the short selling is minimized. In *salam*, only standardized goods can be sold. It is not allowed to stipulate a certain land or a piece of land where the crops should appear so that if there is an absence or a lack of crops from a certain piece of land, the seller could obtain it from other sources. AAOIFI suggests three alternatives to options. The first is a contract of sale with the payment of earnest money, stipulating the buyer's right to terminate the contract within a certain period. This contract is also referred to as an '*arbun* transaction (Malkawi, 2014). The second is a contract of sale with a condition providing both parties the right to annul the deal within a stipulated period. The third is a free of charge binding promise from one of the parties to buy or to sell the goods (AAOIFI, 2004a, paragraph 5.2.3). On the contrary, mutually provided binding promises over the same commodity are forbidden by Shariah.

Smolarski et al. (2006), based on critical analysis of earlier issued fatwas on options, claim that the Shariah approach to options should be reconsidered given that the contract is used for hedging purposes, based on real assets, and certain other conditions are met. An attempt to develop an Islamic risk-sharing option contract was made by Kok et al. (2014). The model combined *wa'd* (promise) and *murabaha* transaction principles. However, as the authors claimed, the model required Shariah assessment. In our opinion, the suggestion by the authors that the promise (*wa'd*) would be bought from a third party is non-admissible from the Shariah point of view, as a promise is not a fee-based action.

Swaps are prohibited by Shariah on the basis that no real delivery of any item is implied. The transaction is regarded as void or a sham transaction.

As a brief conclusion to Section 3.1, not all futures are the same. The closer to Shariah are futures with *sine qua non* physical delivery, fixed price and quantity, not allowing sales in a futures contract. A sample contract analysis reveals some questionable clauses from the Shariah point of view, such as storage expenses to be covered by the buyer being quoted in the contract providing a fixed amount, the undertaking of a clearing firm to cover the losses of the relevant party, and the opportunity to trade in a futures contract. Among other factors making futures non-Shariah compliant are the selling of the item until it is obtained (*qabd*). This can be settled through either of the two options: properly labelling the goods and selling only after the title transfer, or parallel sale deals (for example, a parallel *salam* deal). As for the subsequent deferred payment and delivery, some of the contemporary scholars claim that this rule should be relaxed similarly to an *istisna'* contract.

3.2. Shariah-based alternatives to futures and options

In the previous section we mentioned some potential Shariah-compliant alternatives to futures contracts. This section will look deeper into some of these.

3.2.1. Are alternatives needed?

The modern Islamic finance industry players and scholars have undertaken attempts to create Shariah-based alternatives to different financial instruments broadly used in financial markets. Among such instruments are liquidity management tools, futures and derivatives. Hedging, in Arabic *tahawwut*, is among the encouraged operations according to Shariah, along with other instruments of risk minimization and treaty enforcement. Despite some statements that Islamic law does not establish risk-mitigation tools, the essence of risk management is in line with the Shariah principles, as protecting property is among objectives imposed by Shariah (*maqasid al-shar'iyyah*). Therefore, any unreasonable capital loss is reprehensible. As confirmation, we can take a *hadeeth* invoking Muslims to invest the material possessions of orphans into trade to prevent it from depreciation[12]. Al-Saati (1999) supports the idea that the contract parties should hedge against any potential damage or loss. If not eliminated, this can be mitigated through proper risk management. Al-Suwailem (2006) features three hedging strategies: economic hedging, including diversification, which can be partly replaced by specialization or achieving a balance between assets and liabilities, and among various types of liabilities[13]; cooperative hedging, mainly through insurance schemes, including hedging against currency risks; and contractual hedging.

The need for modern Shariah-compliant forward contracts is well understood and rationalized by many scholars. Kamali (2007) particularly stresses the critical need for a well-functioning futures market in developing Muslim countries. He indicates that palm oil futures market creation in Kuala Lumpur, in 1983, allowed Malaysia, as the world's biggest producer, to attain its role as a major market player, unlike the situation prior to the 1980s. The researcher claims that similar projects are needed in the oil-exporting countries. He argues that the producing and exporting countries would benefit not only from spot trading, but from futures trading.

The futures market institution is regarded by some researchers as one of the most efficient and sophisticated decisions for the unstable markets of food commodities. It is, however, questioned, what is the best option to further develop the system of pricing to make it less volatile (Sarris, 2013). Major grain-producing and exporting countries could also gain from Islamic finance engineering, however, some researchers claim that the Islamic finance industry is slow in its innovation process (Kok et al., 2014).

Russia and other CIS countries (particularly Ukraine and Kazakhstan), being wheat exporting regions, in partnership with the MENA region, could establish a financial tool that would decrease the wheat market instability and minimize the development of speculative activities of traders from other countries. This idea, under the name Agrofinmost, was first presented in 2019 by the Moscow-based HSE-Skolkovo Institute for Law and Development and supported by Sheikh Mufti Muhammad Taqi Usmani.[14]

There is, however, no unanimity of opinion among the researchers over the potential Shariah-compliant alternatives to futures. Apparently, any Islamic alternative to commonly used derivatives is sure to be a separate kind of financial instrument. This idea is supported by Malkawi (2014). Kamali (2007, pp. 315–316) maintaining, however, that instead of prohibiting futures and inventing alternatives, it would be better to "recognize futures as a new contract". The researcher names three contracts usually quoted by Muslim scholars as the traditional alternatives – *salam* (advance payment), *bay' bi-thaman ajil* (a deferred payment sale) and *istisna'* (manufacturing contract) (See Table 1). He argues, based on

[12] The hadeeth is cited, for example, in Malik. Al-Muwatta. Book 17. Hadeeth 592.

[13] Al-Suwailem (2006, p. 114) also maintains, based on this strategy, that Islamic banks have much more 'symmetrical' balance sheets.

[14] For more details see: https://agrofinmost.com/en/. Access date: March 15, 2020.

the opinion of Al-Saati (1999), that these instruments cannot be implemented as direct alternatives to hedging: it would be too costly, as they "were not designed for hedging purposes". He criticizes Muslim scholars who prohibit futures based on their non-conformity to *salam* contract rules. He argues that the modern futures market is free from elements that can lead to contract failure, and the rights of the parties are well protected by the exchanges and regulation. There is no need "to worry about counterpart's creditworthiness", the payments and timely delivery are guaranteed. Since the protection of capital is one of Shariah's main objectives, the market rules and strict regulations, including registration and clearance procedures, are regarded by the researcher as sufficient to consider futures as a lawful instrument. He adds that eliminating *gharar* results in relaxed requirements towards possession (*qabd*). Kamali (2007) similarly to some other researchers (Qadir, 1982; Azzam, 1985; Khatib, 1976) reasons from the evaluation of the balance between the potential benefits and damage the transaction can lead to (the social needs), rather than the literal understanding of the religious texts. Among those who follow the literal treatment the researcher names Khan, Mahmassani, Sulayman, Basit and Taqi Usmani. He argues that the resolution of the Islamic Fiqh Academy was an "ambivalent view" towards the futures. The reasons for derivatives prohibition by the Academy include lack of ownership, absence of a real transaction, frequent cases of trading in contracts, and serving the interests of large traders at the expense of small producers and traders. The latter supported by Khan (1988, p. 40) who claims that "small investors hardly ever win". Ebrahim and Rahman (2005, p. 275) argue that futures contracts "constitute a quasi-equity" deal rather than a sale of debt as claimed by the prevailing number of researchers. This conclusion, in its regard, should "remove a major hurdle against futures" for the Islamic financial architectures. This suggestion, however, has not received any further attention in recent research except for the paper by Hisham et al. (2017), and Hisham and Jaffar (2016), who introduced a mathematical model of *salam* contract with credit risk as an alternative to conventional derivatives.

3.2.2. Principles of effective Islamic finance engineering

Apart from Shariah-concordance, the new Islamic finance instruments should meet other important requirements to be efficient. Kahf (2011) names administrative environments (the capability of the contracts to comply with statutory requirements), and theoretical and practical approbation. Al-Suwailem (2006, pp. 88–91) supports financial creativity and claims that efficient financial engineering is measured by the economic and social impact and the added value it brings. He cites Professor Drucker, who argued that financial engineering had not brought any true innovation for 30 years, except for "allegedly 'scientific' derivatives".

The scholar specifies four principles of Islamic financial engineering: a balance between individuals and society, interdependence and cooperation among industry stakeholders, acceptability by Shariah (excluding certain activities causing harm and damage), and consistency between form and substance including avoidance of any sham transactions. He argues that substance precedes form in terms of Shariah analysis. The researcher indicates three product development strategies. The first and the easiest one includes imitating conventional products, also called by Iqbal (1999) 'reverse engineering' (these include various cases of *tawarruq* deals, '*arbun* alternative to options etc.). This option has many drawbacks, in particular, it places the Islamic finance industry in a dependent position towards the conventional industry. The tendency to follow this strategy is also explained by the principle of 'financial path dependence' (Kalimullina, 2010). The second strategy, or transformation, implies the development of existing Islamic products. The third strategy aims at satisfying the existing market needs, thus avoiding a series of unnecessary intermediary transactions. The researcher suggests combining the second and third strategies as the best option for Islamic financial engineering. He adds that new technologies allow us to surpass many previous impediments in serving the real needs of the real economy.

Malkawi (2014) ascertains the objective necessity of derivatives and indicates five options that could serve as alternatives for the modern futures contracts, characterizing them as "important religiously acceptable Islamic financial contracts, which could be partial proxies for some of the derivative securities now commonly used in conventional financial markets". Among them are *salam*, *istisna'*, *'arbun*, *third-party guarantee*, *khiyar al-shart*. Only two of these alternatives are contracts as such; *Salam*, which is an advance payment contract, and *istisna'*, which is a custom manufacture agreement. The rest are elements that could be practiced alongside trade contracts. Al-Suwailem (2006) subsumes '*arbun*-based hedging to imitation strategy which is undesirable. The third-party guarantee is described by him as an option that 'allows all parties to gain'. In this deal the investor in a company sells a part of his share to an insurance company on a deferred payment basis.

The list of alternatives for current futures contracts is provided in Table 1, and in sections below some of the options are discussed.

3.2.3. Salam contract and its variations as alternatives to futures

In *salam*, selling a crop before it is grown is a means of attracting investment into the seeding process itself. In *salam*, the main rulings are that the goods should be of generic nature (not an exclusive item), the sold item could not be a specific existing item, and there should not be any delay in payment (see the rulings in Section 3.1.2). Thus, the *salam* contract is only allowed based on advance payment provided in full during the contract session. There is evidence in Islamic history of the prohibition of deals when food is sold on a delayed basis and payment is made by promise papers (*sakk*), which would be later traded in the market. (Adam and Thomas, 2005).

It is prohibited to settle the *salam* contract by payment of the difference between the contract price and the market price for the commodity. Instead, in the case of the seller's failure to supply the sold commodity, the following options are possible based on the buyer's consent: the goods could be substituted by another type of good of a similar nature (in a volume to provide the same total market price of the delivered items); the contract can be annulled by mutual consent, followed the return of the payment; or partially canceled, by delivery of part of the sold item and securing only the respective part of the payment. In the case of the seller's failure to deliver the goods, the buyer can provide him with additional time to fulfill his obligations, without any extra payment (AAOIFI, 2014a). In *salam*, the buyer cannot be forced to collect the goods ahead of schedule as this may lead to extra expenses related to storage and additional risk exposure. Delivery in installments is possible, subject to the contract conditions. The price in *salam* cannot be linked to the market price (Misri, 2015, p. 157). The option of goods substitution by other grades of the commodity is also allowed in conventional futures contracts. It is argued though (Khan, 1988), that in many cases the buyers have been forced to accept goods of other quality. This, however, was solved through authorization to resell the contract without delivery (Alamad, 2017, p. 130).

Reasoning the price in *salam*, Malkawi indicates two grounds for a lower price compared to spot prices: the credit risk of the buyer and the 'cheapest-to-deliver' choice.

Malkawi claims that *salam* is the "closest Islamic approximation" to forward contracts practiced in western markets (Malkawi, 2014). Azzam (1985) qualifies futures as *quasi-salam*, stating that the deferred payment in futures makes it a void contract that cannot conform to *salam* requirements (Kamali, 2007, p. 316). According to Al-Suwailem (2006, pp. 131–132), the core issue is the cash price for the commodity at the time of the contract maturity, claiming that 'the gap might wipe out the benefits of the advanced payment". As a way out, he suggests so-called '*value-based salam*'. This means that in a *salam* sales contract the goods to be delivered are stipulated not by quantity, but by value. For example, a wheat sales contract could include an advance payment of 1,000 USD for the wheat to be delivered in the amount equaling the value of 1,100 USD at the time of delivery. This form of *salam* sales, however, is questionable from the Shariah point of view. AAOIFI rules that the sold

commodity should be stipulated by quantity (AAOIFI, 2014a, paragraph 3.2.8). Al-Suwailem (2006, pp.133–134), admitting the objections, provides certain pro arguments to value-based *salam*. In particular, he claims that the transaction secures the nature of the *salam* contract, does not involve the sale of money for money, and provides hedging options for the parties. From our point of view, value-based *salam* is a questionable alternative to futures.

Hisham et al. (2017), and Hisham and Jaffar (2016) introduced a new model of *salam* contract with credit risk, including a storage cost variable, as an alternative to futures contracts. The two papers examine the practical implications of *salam* transactions through a quantitative analysis. They review the papers studying *salam* implications by Islamic finance institutions in Malaysia and Indonesia. The researchers argue that the advance payment condition in the *commodity salam* contract would eradicate speculation and provide the needed finance to the producers (sellers), along with eliminating the non-payment risk on the buyer's part. On the contrary, this condition highlights the credit default risk on the seller's behalf.

In the 8th century, Islamic scholars allowed the trading of *salam* contracts on a secondary market, except when the traded items included basic foods, such as wheat, barley, dates, and salt, mentioned in the earlier cited *hadeeth* (Section 3.2.1, ruling four). However, there were certain clauses, closing the door for speculation, differentiating the contracts from the present futures (Al-Suwailem, 2006).

Trading in futures contracts could be substituted by *parallel salam* deals, so that the execution of any of the contracts would not be linked to another. A parallel sales transaction may be concluded on advance payment terms, without any linkage to the first transaction. This is called by Islamic scholars a parallel *salam* deal (AAOIFI, 2014a). Alamad (2017, p. 132) maintains that in order to 'resell' a futures contract based on the permissibility of *parallel salam*, it is necessary to make sure that there is 'enough distinguishing characteristics between each contract, which is rarely the case'. Overall, despite some limited arguments, the cases of trading in futures contracts is not in line with Shariah. Alamad (2017) claims that the largest profits are made by speculators through trading in futures, rather than executing the contracts. Khan (1988) argues that all the futures market benefits are wiped out through speculation.

3.2.4. A sale with a deferred payment (bay' bi-thaman ajil)

Another alternative is a sales transaction with deferred payment (*bay' bi-thaman ajil,* or *bay' ajil*). According to Al-Suwailem (2006), the transaction contains three types of risks: credit risk, liquidity risk, and rate of return risk, all of which can be managed in the framework of the Shariah rulings. Moreover, to minimize the risk of deferred payment, he suggests diversifying the payment by constituting it not only with cash, but with various types of commodities or equities. One important advantage of deferred payment in material assets is the opportunity to securitize it in the form of *sukuk*. According to AAOIFI, the *sukuk* tradability is subject to a minimum of 30% of underlying assets being tangible. However, the *sukuk* can only be traded after the assets are received, similar to the *sukuk istisna'*, which cannot be traded before the manufacturing completion of a real asset (AAOIFI, 2003). Deferred price diversification, therefore, is a sound option that can be diversified through a combination with other less volatile commodity types and in conjunction with potential *sukuk* issuances. As an option, a portfolio of commodities and assets could be worked out to play the role of a stabilizing and diversification basket. A popular Islamic finance transaction, *murabaha*, is also a type of a sale with deferred payment.

AAOIFI allows the transactions for obtaining commodities on a spot basis and selling them to the market on a deferred payment basis. This could be practiced directly or through specialized market participants (acting as agents or managers) on the condition that the goods cannot be sold back to the initial seller (including selling to his official representative, agent or any related party), the goods should be duly obtained into ownership and possession, and all bought and sold items should be duly specified and *particularized* (AAOIFI, 2004a). The prohibition of sale back to the initial seller is based on the grounds that it is regarded as a *trick* to provide interest-based credit, where the difference in price between two contracts is considered the amount of interest.

3.2.5. Istisna' – a sound option, but not for food commodities

Technically, an *istisna'* contract is closer to a futures contract than, for example, a *salam* contract. Being a form of sourcing contract (Kahf, 2011; Misri, 2015), *istisna'* allows for the deference of payment and delivery, deliveries can be scheduled in parts, or the payment could be linked to certain delivery lots. *Istisna'* contracts are compared by Malkawi (2014, p. 50) with a forward contract "modified for a progress payment". This contract, however, is allowed strictly for manufacturing purposes and cannot be applied to food trading (IIFA, 2000).

3.2.6. Taureed, or sourcing agreement

Taureed, or sourcing agreement, is among potential Shariah-compliant contracts to finance agricultural trade. Misri (2015) devoted a chapter of his book to this agreement. Providing different opinions, he does not give an explicit opinion on its Shariah status. He defines *taureed* as a contract under which a party obliges within a stipulated period to perform regular supplies of goods or services, against agreed consideration. The sourcing agreement is mentioned in AAOIFI standards (for example, AAOIFI, 2014d, paragraph 2.3). The purpose of *taureed* contracts is providing oneself with supplies of the required goods. The contract is a means to save resources related to storage and minimize risks for perishable commodities. For the seller, the contract is a guarantee of distribution and planned profit (Misri, 2015, pp. 272–273). Misri observes similarities between *taureed* contracts and *salam* and *istisna'*. The scholar maintains that *taureed* contracts cannot be categorized as a forbidden *sale of missing items,* referring to Al Qayim (1982), who considered this prohibition relevant only in the case of non-professional traders (Misri, 2015, pp. 274). The inapplicability of the agreement to food commodity trading would, therefore, depend on scholarly discussion over the *hadeeth* on the trade of a debt for a debt, mentioned in Section 3.1.2. In 2000, the International Fiqh Academy issued a fatwa on *taureed* agreements, according to which such agreements could be made in either of the two forms: *istisna'*, or *salam*. The *istisna'* option should compulsively involve manufacturing. Any delay in payment in such contracts is regarded by the Academy as impermissible (IIFA, 2000).

Therefore, the underlying rulings of *taureed* contracts could be potentially used to develop alternative sourcing contracts, apart from *salam* and *istisna'*, should Islamic finance architecture move in this direction, reflecting the current needs of the market for the benefit of society.

3.2.7. Sukuk structures and their applicability to commodity trading

One of the examples of effective cases of Islamic finance architecture is *sukuk*, which are the certificates of equal value representing equal shares of common ownership for property, or rights for a usufruct, services, or assets under certain projects or investment activity (AAOIFI, 2003). In 2019, the total size of the international issuances exceeded 38 billion USD, while global issuances amounted to 145.7 bln USD (IIFM, 2020). As a standardized Shariah-compliant financial instrument, *sukuk* have certain advantages. It could be combined with different agreement structures, including *salam* and *istisna'*. Al-Suwailem (2006, pp. 130) compares *sukuk* based on commodities to commodity bonds, which appeared in the Western market in the 19th century.

However, there are certain impediments for the *sukuk* market that need to be addressed. First of all, from the infrastructure side, there is low level of standardization and high transaction costs compared to conventional bonds. This results in the fact that *sukuk* issuance requires more steps and takes more time and more resources. Particularly, the additional steps are related to identifying the underlying asset and structuring, 'adjustment of legal environment', Shariah examination and approval and document finalization (S&P, 2020, pp. 10). Moreover, *sukuk salam* has not received wide acceptance for two reasons. First, such

Table 2. Baines's Hedging – speculation spectrum and the Shariah approach.

	Pure hedging	Anticipatory hedging	Cross hedging	Options	Portfolio management	Pure speculation
Description	Matching between physical and futures positions	Covers anticipated rather than a physical transaction, including price bets	Applies to different commodity types; including cross-commodity price spread bets	'betting' on both price directions	Controversial positions sets in a portfolio	Purchase of a 'naked' position, engagement in price bets
Regulation approach: year of admitting as bona fide hedging		1956 (USDA)	1977	1982	1991 (risk management exemptions)	
The Shariah-based approach	No contradiction, given that the futures position is maintained through Shariah-compliant contracts	Price bets are forbidden	Price bets are forbidden	Forbidden	Forbidden, unless the portfolio consists of Shariah-approved assets	Forbidden (as pure gambling and excess speculation)

Source: Baines (2017, p. 11) The Hedging-Speculation Continuum and the authors' elaboration

securities cannot be tradable (AAOIFI, 2003; AAOIFI, 2014a). Second, *salam* is mainly a short-term agreement (3–6 months), whereas *sukuk* issuers are targeting long-term investment, except for short-term liquidity management *sukuk*. The only option is to combine *salam* structure with other agreements and secure a minimum of 30% (some scholars say 50%) of assets in irreducible stock, or designing another asset-based business to be securitized through sukuk. Among potential structures are *sukuk wakala/salam, sukuk musharaka and sukuk mudaraba*. This means that a *salam* agreement would be a part of the total project or business which would be managed based on an agency agreement (*wakala*) or investment agreement (*mudaraba*). *Sukuk salam* certificates, however, also could be practiced on the market should they be introduced by exchanges followed by certain regulation. Currently commodity markets do not provide such an option.

Sukuk salam are mainly practiced by sovereign issuers for a short-time period. Examples are domestic issuance by the Central Bank of Gambia (SBG) in the amount of 220 million GMD; Government of Bahrain short and long term *sukuk salam* for residue gas commodity (totally there were more than 213 issuances) (IIFM, 2019, p. 133). Both state institutions interact with the investors through auction procedures. However, the CBG *salam*-based *sukuk* is questionable from the Shariah point of view. It is stated on the CBG website that *sukuk salam* are "securities issued at a discount, redeemed at their face value at maturity and have maturities of not more than one year" (Central Bank of Gambia, 2018). No information is provided on the underlying asset, whereas, according to AAOIFI, it is forbidden to settle the *salam* contract with cash (AAOIFI, 2014a, paragraphs 3.2.4 and 4.2).

By 2019, *sukuk salam* structure accounted for only 3% of the global short term *sukuk* issuances, the market top structures were *sukuk murabaha* (68%), *sukuk wakala* (12%) and *sukuk ijarah* (7%). In 2018, the share of *sukuk salam* decreased to 1% (IIFM, 2019, pp. 31–32). Among sovereign issuances, till 2019, the share of *sukuk salam* by value was 2.68% amounting to 2 billion USD on the international market and 9.4 billion USD (1.77%) on local markets. In 2018, there were sovereign issuances of *sukuk salam* only in the domestic markets (1.4 billion USD, or 2.38% of all domestic sovereign issuances). In the corporate sector *sukuk salam* is even less popular: there were only 1 million USD issuances between 2001 and 2018 (IIFM, 2019). No Islamic financial institution issued *sukuk salam* till 2019.

For the purpose of hedging on grain markets, the buyers, including the government agencies and huge distributors and retailers, could buy *sukuk* certificates which would guarantee them the delivery of required commodities and food by the stipulated time. Particularly, *sukuk salam* could be issued by a trader and *sukuk istisna'* could be issued by a processor of products manufactured from grains. In the case of *sukuk salam*, the payment should be made in advance (at the time of contract signing) and the delivery be postponed till the execution date. The holders of the certificates are not allowed to resell it into the market, but they can, in their turn, issue *salam* or *istisna'* certificates for a similar amount of goods for other delivery dates (parallel transactions). It could be questionable, however, to issue *sukuk*, which is a costly procedure compared to direct *salam* contracts. The practicability of such *sukuk* would be for the cases of high-level volumes of commodities and/or investment required. In projects related to food security on a state level, *sukuk* certificates could play an important role. For example, if an agency in the UAE is planning to obtain grain from Russia and to produce flour to be sold to Egypt, and an agency in Turkey is planning to obtain wheat from Russia to produce pasta to be sold to Saudi Arabia. A Russian-based SPV, which has its own storage capacities and necessary stocks, could issue *sukuk salam* for wheat deliveries every four months within a period of 2 years. UAE-based and Turkey-based agencies could buy such certificates to ensure that the necessary amount of wheat is available. In their turn, these agencies could issue *istisna'* certificates for the delivery of food products at the desired place of destination. Egypt, Saudi Arabia, and other countries, interested in food stocks in the required amount, could buy those

certificates. The funds obtained via *sukuk* could be invested in proper infrastructure, and this should be stated in the *sukuk* document.

3.2.8. Commodity funds

Since real assets should underline any financial deal according to Islamic finance principles, in food commodity trading the creation of commodity funds is a core necessity. Usmani (2016) considers commodity funds a viable alternative to conventional index funds. He maintains that any transaction of the fund should be based on Islamic financial contracts, the transfer of ownership should be real and any price should be stipulated in advance. The shares of the commodity fund could be tradable based on the condition that a certain portion of the fund portfolio commodities is always available. As mentioned above, the portion requirements vary according to various scholars, from 30 to 50%.

Developing well-accepted 'Islamic futures' instruments would be another sound destination for Islamic investments for those aiming to diversify through buying commodities, bearing in mind all consequences related to such contracts and, more importantly, its non-tradability. This could be the point of cooperation of investment funds with the food security agencies. Currently, Islamic investment funds are the fastest-growing Islamic finance segment, compared to *sukuk*, Islamic insurance, and Islamic banks. The growth rates are respectively 16%, 9%, 6%, and 5% (Thomson Reuters, 2018, p. 14). Shariah stock screening methodology is a well-developed and constantly updated discussion point. New commodity-based financial instruments could be a well-capitalized complement to shares and *sukuk*. Potential alternatives to wheat futures, including *sukuk*, as a means to increase food security in MENA were discussed at a special event within the framework of AAOIFI-World Bank conference, in 2019.[17]

Such a commodity fund, acting as an authorized institution with a minimum-required balance of grain, could be a potential *sukuk* issuer for grain deliveries. Otherwise, it could issue *sukuk musharaka* or *sukuk mudaraba* certificates to attract potential investors interested to participated in the fund's activities and/or profit.

The above-described cases did not include commodity trading contracts over existing stocks. Once the stock exists, for example, in the commodity fund, the sales contract could be signed with the advance or deferred payment terms. The goods could be stocked with the seller or the third party till the delivery date, but the goods title should be transferred immediately to the buyer. In this case, however, some storage cost issues will arise.

3.2.9. Cooperative insurance (takaful) schemes

Another alternative deriving from the basic aim of futures to protect market players from losses is insurance. History provides evidence from the 16th century of investors' betting on several trade expeditions to the East, realizing the high risks of the journeys (Pines, 2019). This is an early form of risk diversification. Early forms of mutual insurance in Islam were the foretypes of the modern *takaful* industry: when traders set out on a journey, they used to form a mutual reserve which was non-repayable (*tabarru'*). Khan (1988, p. 42) suggests to create farmers' cooperatives to insure against market volatility and minimize risks for its individual members. The researcher presumes that such cooperatives could serve as a balance to the power of large traders. However, as mentioned in Section 3.3.1, Baines (2017) provided proof of farmers' associations decreasing power.

As a brief summary of Section 3.2., there is a necessity to develop alternatives to futures. Among the most cited potential solutions are the classical Islamic contracts *salam* and *bay' bi-thaman ajil*, and modifications to these contracts, some of which are considered reasonable. Surprisingly, *sukuk* structures, particularly, *sukuk salam*, have not been suggested as an alternative to futures, nevertheless, this structure has huge potential, given proper arrangement. In any case, at least, the alternative should embrace the positive developments of the futures market, but not copy its drawbacks. Support from the market practitioners, involved regulators, and interested exchanges would be a good incentive in this regard.

3.3. Food commodity market players' activities from a Shariah point of view

In previous sections we have studied the futures contract clauses from the Shariah point of view and examined some alternatives. In this section we analyze commodity market players' activities questionable both from the Islamic and conventional approaches.

3.3.1. Speculation and financialization: is regulation effective?

Current researchers of commodity markets outline various factors directly or indirectly influencing the real asset prices. Among them are international trade and factors related to trade distortion (export bans, tariffs, and other barriers; Rutten et al., 2013; Smith and Glauber, 2020), currency volatility (Buberkoku, 2017), oil prices (Taghizadeh-Hesary et al., 2019; Zmami and Ben Salha, 2019), and speculators' activities, including heavy investment in futures, which result in grain market financialization (Seddon, 2019; Aït-Youcef, 2019). Other factors of the food commodity market dichotomy are the mismatch between exchange storage and commercial storage rates (Garcia et al., 2015; van Huellen, 2018).

The situation in the global wheat market could be a good illustration of the influence of the traders and speculators on the commodity markets. Wheat, as one of the main food commodities, is among the top priorities for many countries to secure food sufficiency. Global wheat production between 2000–2018 ranged between 560 (2003) and 760 (2017) million tons (Figure 1). World wheat consumption is almost the same level, with a few years of an increase over production (2012 and 2018), resulting in cutting the world stocks of wheat. In 2018–2019, based on USDA data, the volume of wheat produced was 731.5 million tons, the world wheat consumption was 733.4 million tons, with ending stocks equaling 238.1 million tons (Figure 2). From 1972, after going off the gold standard, the price of wheat went up dramatically and hardly ever went below 2 USD per bushel (this, however, does not include inflation-adjustment). A significant rise in prices is spotted in other types of commodities as well. The lack of convergence between real assets and food commodity futures, specifically at the time of the rise of trade volumes, has been a focus for researchers, particularly, since 2008 (Irwin et al., 2011; Garcia et al., 2015; van Huellen, 2018). Such a dichotomy is distinctly outlined in the US grain market, including wheat (Adjemian et al., 2013). The peaks on non-convergence came at the time of the world food crises, in 2007–2008 and 2010–2011. Some papers suggest that the reason was the predominance of index investment over arbitrage deals (Gilbert, 2010; Garcia et al., 2015).

Gilbert (2010) contradicts the claims that commodity price spikes were the results of supply shocks: the decrease in production in certain countries is usually neutralized by higher production levels in other regions. The researcher also indicates that the main price fluctuations are relevant to those commodity types which are more characterized by active futures markets. According to Gutierrez (2013), the wheat market was the first to react to speculators' activities through a bubble spotted in August 2007, and its burst in April 2008. It is also reported that more developed financial markets tend to have less physical trade flows compared to futures trading. In the Russian grain market, on the contrary, physical trade flows predominate (Svanidze and Gotz, 2019).

Gilbert (2010) compares the highly volatile wheat and maize markets to more stable cocoa and sugar markets. Furthermore, he outlines the link between *informed* and *uninformed speculation*, claiming that uninformed speculators tend to follow the trend set up by the first group, thus pushing the price upwards resulting in bubbles. This classification is close to the "skilled" and "unskilled" groups of speculators, outlined by Haase and

[17] For the event resolution please visit: https://ild.hse.ru/data/2019/11/21/1519711672/Resolution.pdf.

Huss (2018), the latter having a negative impact and spurring market volatility. Gilbert explains that upward price trends result in an increase of commodity stocks, in anticipation of further higher prices and returns. According to Soros, commodity-based derivatives investment, specifically through indices, became 'the elephant in the room' (Gilbert, 2010). According to Gilbert (2011), international commodity agreements related to food commodity markets did not have a significant effect in reducing the price volatility in the market.

Price fluctuations are quite natural given the seasonal character of the grain and wheat markets. Speculators, and to some extend traders, take advantage of this natural market volatility by using certain techniques (Ghosh, 2010). First of all, information asymmetry and goods retention. Ghosh argues that the negative outcomes from the speculators' activities are mainly due to the financial deregulation of the commodity derivatives markets.

Garcia et al. (2015) studied non-convergence between the futures price at the time of contract expiration and cash price. The authors maintain that convergence failure in grain futures markets is more common since actual delivery is relatively rare compared to other commodity futures. This led to futures prices up to 35% higher compared to spot prices at the expiry date. Therefore, the futures market, in this case, failed to perform its price discovery function. According to the authors, the main reason for convergence failure is the difference between the real grain storage rate and storage rates on delivery instruments.

According to van Huellen (2018), there were numerous attempts to establish the link between the level of investment in the financial derivatives and the distortion of the futures market from the real market. The issue was studied by the US Senate, but the phenomenon has not been officially recognized, although the Dodd-Frank Act was passed in 2010, permitting the Commodity Futures Trading Commission to introduce futures trading limits. Such an arrangement was made in U.S. Code § 6a on excessive speculation, whereas excessive speculation is defined as a trading activity performing or affecting "a significant price discovery function with respect to registered entities causing sudden or unreasonable fluctuations or unwarranted changes in the price of such a commodity", and such speculation is regarded as an "undue and unnecessary burden on interstate commerce in such a commodity" (7 USC 6a, 2010). Starting from 2010, the introduction of any new futures contract under CFTC included the trade limits for traders and speculators. For example, submitting the CBOT Black Sea Wheat Futures, the Chicago Board of Trade indicated its plans to introduce a "month position limit" which is set "at a conservative level" (below 25% of the monthly deliveries) calculated based on the actual supply data, percentage of milling wheat, port loading capabilities, and other observations (CBOT, 2012). Other papers question the efficiency of CTFC as a market regulator given its failure to effectively oversee the self-regulatory organizations (for example, Fischer, 2015).

Kamali (2007) suggests that imposing quantitative limits is one of the effective instruments against undesired speculation. According to van Huellen (2018), the measure of specifying trading limits would not be efficient without introducing "a policy that carefully monitors and balances the composition of traders in the market", but the author himself has doubts of the applicability of the suggestion in light of US political developments.

All these factors, specifically related to investment in futures, result in the impracticability of real arbitrage in food commodity markets. This means that the real purpose of the exchanges and the true aim of derivatives to serve as instruments to hedge the producers' and traders' risks are not fulfilled. From the Shariah point of view, this disruption is the result of practicing prohibited activities, which pursue neither the aim of real asset movement nor hedging.

A certain group of researchers does not support the idea of the speculators' negative impact on price and some even claim the opposite. For example, Ghosh (2010) claims that any excuse for speculation should be taken aback after the food crisis of 2008. The researcher insists on the necessity for restriction or even a ban on speculators operating in commodity markets.

Such a dichotomy in approaches towards speculation is well explained by Baines (2017). He analyzed the evolution of regulatory approaches towards the definition of bona fide hedging and demonstrates a gradual approach to the lobbying points of agrifood giants and financial groups. Therefore, the activities that were formerly treated as 'pure gambling' appeared to be bona fide hedging (Baines, 2017). We have taken Baines's hedging – speculation spectrum and made an attempt to provide a *fiqh* position, which is in all cases negative, except for pure hedging (Table 2). We should add here that futures, options, and swaps, are regarded by AAOIFI as gambling (AAOIFI, 2004b). There are Muslim scholars supporting certain levels of speculation. The regulation shifts with the adoption of certain speculative practices as bona fide hedging opened doors to increased speculative activities, along with derivatives and CIF deregulation at the beginning of the 21st century. Therefore, the approach towards speculation regulation and defining the affordable types of speculation is one of the spheres where Islamic and conventional jurists and regulators could cooperate[18] to work out a solution acceptable to both conventional and Islamic markets.

The two main groups of stakeholders in food commodity markets, represented by small-scale farmers and large-scale traders, are unequal in their opportunities to protect and lobby their interests. Newcomers in the market are hardly likely to win (Khan, 1988). Clapp (2019) continues by outlining the trend for the further concentration of an already oligopolistic market of agrifood traders. Moreover, the wheat market is characterized by the highest level of financialization compared to other grains (Baines, 2017). This phenomenon was described in a number of recent papers. For example, Ouyang and Zhang (2020) registered a positive linkage between food commodities and stock market prices, and this correlation has become even stronger in recent years. Baines claims that certain involvement from the regulatory side is mainly confined to financial and commodity markets crises. Once the market is more or less stabilized and the price volatility moves down, regulators tend to 'succumb' to the market power of large traders by 'loosening the hedging definition' and providing the speculators other exemptions. This is supported by an analysis of the US grain market lobbying network and its transformation between 2010 and 2016 in favor of market giants. The researcher compared the comment letters from various stakeholder groups throughout this period: there are fewer initiatives from small-scale producers every year (Baines, 2017). He analyzes the income dynamics of the largest wheat traders and concludes that in the time of the biggest price fluctuations when producers are hit hardest, the biggest traders reported a significant income increase. With reference to Murphy et al. (2012) and Salerno (2016), Baines maintains that agricultural commodity traders are among the main winners from financialization, unlike small farmers and livestock producers, who are generally hit most by crises. This is due to their unique market power, access to information, storage capacity, and influence on regulators (Baines, 2017).

This gives us grounds to conclude that modern food commodity futures regulation is, in fact, ineffective in defining and eradicating destructive, unfair, or excess speculation. Therefore, the arguments of the opponents of speculation should be considered within the framework of the increasing financialization of commodity markets, and the speculation hazard outlined by Islamic jurisprudence which exists even in highly regulated and standardized markets. Hence, Khan's claims that speculation in the futures market can hardly be minimized is still relevant. He

[18] The idea of Islamic and conventional market cooperation, as reflected in the article, is relevant only given the context of cooperation being in the field and scope of fulfilling the basic ethical principles of both approaches. That is, there could be a sound combination of the Shariah ethical principles and standards and the existing conventional regulation and approaches of the commodity exchanges (whenever it proved to be efficient) pertaining to securing the rights of the market players.

argued that the Shariah requirements toward physical transfer of commodity and other rulings are a sound solution to market instability (Khan, 1988).

3.3.2. Information asymmetry, cornering and squeezing practices in food commodity markets

The transactions performed based on information asymmetry, including sales based on the counter-party's limited knowledge of the market situation are disapproved by Shariah, and are called *jahala*-based deals, or deals based on the lack of information (ignorance). First of all, this includes a lack of knowledge related to the real price for the sold item. It is based on the condition that Islam forbids speculators and traders snatching up at bargain-basement prices goods from the farmers on their approaches to the city (*talaqqi rukban*), which enables the traders to earn several times more than the producers. Secondly, any sales transaction based on the counterparty's ignorance of the real market price (*najash* and *ghabn*) authorizes the latter to cancel the transaction based on that ignorance (*khiyar al-ghabn*) (AAOIFI, 2015). Khan (1988) claims that speculators are highly engaged in cooperation with market insiders who tend to use any information flow in their interest.

Goods retention practices with the aim to create a market deficit that would push the prices up are called in Islamic *fiqh* as *ihtikar*, which is also prohibited. Islamic legal schools (*mazhab*) gave the following definitions for *ihtikar* (Misri, 2015, p. 132*)*: the acquisition of food and other items with the aim of their further retention till prices increase (*Hanafi*[19]); markets surveillance in anticipation of rising prices (*Maliki*); food buyout at the moment of a price rise and further retention for selling at a higher price with the aim of squeezing (*Shafii*); the acquisition of food and its retention anticipating a price hike (*Hanbali*). As explained by Misri (2015) the reason for prohibition of *ihtikar* is the prevention of harm to the society, and any monopolist at the time of acute public need of the commodity should be forced to sell it. *Ihtikar* can be the result of the purchase of large quantities of goods or retention after production. The first case refers to traders, the second can be applied to farmers and producers. Monopolies and oligopolies are cases of *ihtikar*.

Ihtikar in the terminology of the commodity market is the analogue of *corners*. The Cambridge Dictionary defines cornering as "controlling the available supply of a type of product or the ability to sell it" (Cambridge Dictionary, 2020). The first case stands for physical possession of commodities and the second one implies the possession of futures contracts. Another definition indicates that cornering stands for obtaining a significant market share of a certain market without becoming a monopolist. Easterbrook (1986) defines cornering as the "exercise of monopoly power in an expiring futures contract" (Pirrong, 2017, p. 6). The advantage which traders usually have is linked to the fact that they own storage and logistics infrastructure, which facilitates cornering practices.

The past two centuries have provided several clear examples of cornering practices in various commodity markets. At the end of the 19th century, commercial corners over various commodities from rice to copper were exercised in Latin America; and attempts were made to corner the coffee market in New York.

Cornering, price manipulation, and speculation are, actually, all interconnected. In a way, one of them implies the others. In Islamic law, speculation is often associated with gambling, or *maysir* in Arabic, which is among the prohibited activities. It can have many forms in modern practice, but the main feature of it is the gambling nature of the transaction. In essence, the parties or a party of the contract do not follow the aim of using the commodity or even obtaining it. The main target is to 'win' the income margin through a series of transactions.

It is due to the presence of *maysir* that several popular finance instruments, commonly used in the general market, are prohibited by Shariah. Among them are futures, options, swaps, and trading in market indexes. Index, according to Shariah, is a sound indicator of market development. But investment in the index itself cannot be regarded as a real deal, as there is no underlying asset (Kahf, 2011). Futures and options contracts are regarded in Shariah as "zero-sum contracts" (Al-Suwailem, 2006; Kahf, 2011), in that "gains result from corresponding losses" and no value is produced (Delorenzo, 1983), which means from the Shariah approach that no fair exchange of values is implied.

Gambling is also a part of trading in futures. According to AAOIFI (2004b, art. Shariah bases), "the majority of futures contracts end in payment of the difference between the market price and futures price, and this is apparently gambling, if it was initially a contract condition. If it were not stipulated in the contract, the futures are kind of gambling by nature. Moreover, transactions pursue the aim of obtaining goods and money, but in a futures contract parties do not have such an objective". Similarly, gambling is a part of options trading (AAOIFI, 2004b). Gambling elements are also present in swaps, as "the purpose of the parties in such transaction is settlement payments based on the difference in the average shares' profitability, and not obtaining the traded items" and "definitely, only one of the parties will win whereas the other will lose" (AAOIFI, 2004b). The AAOIFI Shariah standard # 27 says: "The Reason for the prohibition of trade in market indexes is because this transaction is, in essence, obtaining or handling money as a result of randomly getting a number or a figure, which is a form of gambling (*maysir*)" (AAOIFI, 2006).

Some researchers (for example, Khan, 1988) maintain the position that speculation per se is not prohibited in Shariah. However, Islamic law leaves little space for speculatory activities.

Gharar (uncertainty), described in section 3.1.2. as an element inherent in different futures contract parts is by far the most serious issue from a Shariah point of view. As described by Garcia et al. (2015), physical delivery in case of grain futures is not often performed, whereas warehouse receipts and shipping certificates under futures contracts are negotiable, transferable, and have no expiration dates. Holders of such certificates can "redeem them by selling in the secondary market, exchanging them for grain, or re-deliver them by taking a short futures position and holding to the next expiration" (Garcia et al., 2015, p. 44). Therefore, such documents can live forever, thus increasing price distortions and bubble effects. It is the risk of non-performance of delivery that Shariah aims to minimize by introducing an anti-*gharar* clause. The uncertainty related to lack of *qabd* (possession) is increased by the consolidation of the actual delivery capability being confined to large grain traders; the exchanges support this kind of consolidation of the companies eligible to issue such delivery certificates. This means that any third company wishing to perform physical delivery under a futures contract must acquire such a delivery instrument from a 'regular firm' approved by the exchange. This is done by commodity platforms to reduce non-delivery risks. The long-time stipulation of storage price inside futures contracts leads to the situation of an increasing gap between real storage rates and futures rates. The situation resulted in some amendments introduced to the rates starting from 2010 (Garcia et al., 2015). Everything which increases the discrepancy with the real market is disapproved by Shariah as excess uncertainty.

Pirrong (2017) conducted a detailed survey on manipulation practices and its regulation. He defined price manipulation as "international conduct that causes market prices to diverge from their competitive level" (Pirrong, 2017, p. 3). He claims that manipulation is inherent to futures markets since their inception. With a reference to Allen and Gale (1992) he outlined three types of manipulation, all of which are relevant to commodity markets: action-based manipulation, information-based manipulation and trade-based manipulation. The first type, more often referred to as market-power manipulation and includes cornering and squeezing practices, has the strongest effect. The researcher provides examples of market-power manipulation, described in Section 3.3.3 below.

[19] The opinions of four most widespread and accepted Muslim legal schools are given.

3.3.3. Food trading market failures and fraud

The US commodity exchange history witnesses many cases of fraud, among which are early 'bucket shops' (end of the 19th and the beginning of the 20th century) (see also Johnson, 2010), American International Trading Company fraud scheme (the 1970s), unauthorized trading by the Silverman, Haltmier, Winchester-Hardin-Oppenheimer Trading Company, Williams etc. (McGregor, 2020). It should be noted that the early stage of futures market development in the US witnessed a lot of fraud and manipulation cases reported, including the promotion of "price guarantees", and false representations (Duvel and Hide, 1930). Proper report and investigation resulted in the adoption of the futures act.

Modern grain commodity markets often come across situations of stock vanishing caused by fraud, negligence or other factors, such as force majeure cases. While the first two issues are usually settled through guarantees and contract enforcement clauses, the force majeure risks could be minimized through insurance schemes, which could be based on the creation of a mutual fund (*takaful*), which can have various forms based on the system of management.

Wheat stocks are the potential underlying assets of numerous wheat futures deals conducted at exchanges. It is reasonable that the number of futures deals for a particular year should not exceed the amount of stock plus the average annual production level. Otherwise, certain parts of the deals would not be executed (if we speak about futures with physical delivery). Baines (2017, pp. 4–5) provides data that, between 2011 and 2014, on the US commodity markets the volume of grain underlying futures contracts exceeded 33 times the production volume in the US. This means that the multiplication effect in the derivatives market can be even higher than in banking, and the market is less regulated. Cases of stock disappearance from storage facilities exacerbate the statistic. The modern commodity derivatives markets are based on the assumption that certain parts of the deals will never live till execution. It is a kind of analogue for the banking multiplication effect. But what will happen if trust in the system is undermined? It would lead to massive withdrawal and crisis. That is why the modern financial system is characterized by large-scale crises, which are rare, but very destructive.

A commodity exchange bears responsibility for the execution of the contracts concluded through its platform. Therefore, the case of stock disappearance leads to the material losses of the exchange, if it fails to prove the other party's fault. In 2019, the Moscow Exchange reported higher risks for elevator storage of grain and initiated several criminal cases, after a shortfall of grain on elevators was detected. The grain was used as storage security for swap operations amounting to 5.5 million tons throughout 2018 and the 1st quarter of 2019. The losses of 2.4 billion rubles (37 million USD) led to a suspension of all swap operations in the grain market and to the introduction of more stringent requirements to elevators. As a result, the Exchange's 1st quarter profit in 2019 dropped by 28% compared to the same period of 2018.[20] Cases of fraud amounting to 10–100 thousand tons of grain repeatedly take place in Russia and Ukraine. On a larger scale, the distortion between the reported stocks and real stocks is also a reality. Gilbert (2011) questions the reliability of China's historical stock data.

In 2019, the 4-year-long wheat futures manipulation legal case against Kraft Food Group and Mondelez International was settled. The US Commodity Futures Trading Commission accused the companies of execution of "a manipulative strategy" pushing the market to sell wheat at lower prices and "earning profit on speculative futures positions" (CTFC, 2015a). CTFC reported other cases related to wheat futures price manipulation, faked sales and violation of other rules. Among the recently reported violators are Eric Moncada, BES Capital LLC, Serdika LLC (CTFC, 2012); Bank de Binary (CTFC, 2013); Cargill de Mexico (CTFC, 2015b); Adam Flavin, Peter Grady (CTFC, 2018b); Lansing Trade Group LLC (CTFC, 2018a); Elephas Investment Management (CTFC, 2019).

Earlier centuries provide not fewer cases of manipulation. Some cases of wheat manipulation have inspired novels and films. A famous example is the Leiter wheat corner, 1898. Harvard-educated Joseph Leiter from Chicago came into history as the man who attempted to hold the largest quantity of existing wheat stocks, but did not succeed due to his competitors' actions. The Leiter case is a vivid example of the market power of the agri giants, like Armour, who owned the biggest amount of elevators at the time, and who had a long and established position in the market. Leiter's intervention, not being supported by information and 'market-power', despite buying huge amounts of wheat, led him to huge losses, including huge costs for wheat storage which he had to pay to Armour from whom he had bought bulks of wheat (Benzkofer, 2012). In 1963, Cargill was accused of wheat futures manipulation to the amount of 8 million bushels. Although this figure exceed the trading limit for speculators of 2 million bushels, the deal has been reported to be a bona fide deal.[21]

The above cases describe violations of the official commodity exchange regulations and reinforcement of the relevant acts have been given many attempts through history, up to present day. It is also often claimed that cases of manipulation are very hard and often impossible to prosecute (Pirrong, 2017). Not less important are probably contract execution failures. In contemporary food commodity trading, which is executed beyond the scope of exchanges, reneging on a delivery contract is possible due to price spikes and non-secured delivery (Sarris, 2013). If the price is determined in a contract in advance, no price spike will hit the buyer. On the contrary, for the seller it could be a challenge to supply the goods. Some suggestions in this regard are discussed in the following section.

3.3.4. General recommendations for increased efficiency in the global wheat trade

Wheat futures market failures frequently result from global financial crises, on a large scale, and market fraud on a smaller scale. The main failure cases are related to the impossibility of the physical delivery of the sold items. This has negative social impacts on the buyers as market players and the importing countries, in general.

As a solution to market instability, it was suggested to create "buffer stocks" by governments (Khan, 1988, p. 42). One of the solutions aimed at decreasing market instability and securing physical supplies could be the creation of an international certified wheat storage system. The deliveries could be guaranteed through the system of international independent certification and identification. The identification system would work on the basis of the earlier mentioned system of labeling, so that the sellers' ownership for the grain would be not only be supported by the bulk stocks, but confirmed by particularized goods in given storage. If necessary, the system would allow substituting one piece of stock for another, stored in a warehouse in a particular country of delivery, closer to the buyer, through a contract of exchange (barter, or offset transaction), followed by proper labeling. A similar system, along with other sound recommendations, was described by Sarris (2013), who analyzed various suggestions aimed at the improvement of the international grain trading system. The researcher suggests creating a system that would minimize the non-delivery risks for the importers in developing

[20] Московская биржа потребовала возбудить уголовные дела из-за недостачи зерна (The Moscow Exchange claimed filing criminal cases due to the grain shortage). April 29, 2020. https://www.interfax.ru/russia/659767; Mikheeva, A. Национальный расчетный депозитарий и Россельхозбанк выпустят зерновые токены (National Settlement Depositary and Rosselkhozbank will issue grain tokens). October 15, 2019./National Settlement Depositary. URL: https://www.nsd.ru/publications/my-v-smi/blokcheyn-budet-okhranyat-zerno-dlya-mosbirzhi-2019-10-15_170100/; Sarycheva, M. БиржА расплатилась за украденное зерно (The Exchange paid for the stolen grain). May 20, 2020./ Kommersant. URL: https://www.kommersant.ru/doc/3974785. Access date: March 05, 2020.

[21] For more detail on the case see Cargill, Incorporated v. Hardin. URL: https://casetext.com/case/cargill-incorporated-v-hardin

countries. Sarris maintains that the present international grain trading system lacks a well-developed international grain contract (with a link to Berg, 2011), an international grain reserve system, and an International Grain Clearing Arrangement.

A Global Financial Food Reserve for basic food commodities, according to Sarris, should be made as a fund and operate as a "market based global safety net" for the "weakest members" of the global food consumer community (Sarris, 2013, p. 224). The researcher suggests that the fund should be created by the G8+5 countries as well as the major grain exporters and other donors, through holding a series of long positions in futures contracts that would be rolled over at the time of expiration. The fund should operate to secure the best options for grain consumers, avoiding buying grain at the moments of price spikes. The amount of the Fund should be approximately 400 million USD, taken as 10% of the global grain imports increase by the least developed countries between 2006 and 2008 (Sarris, 2013, p. 225).

It is suggested that it is more efficient to develop a food reserve system rather than to provide a production system for the MENA countries (Wright and Cafiero, 2011). A possible solution could be a 'dynamic competitive storage model for wheat' for the MENA region, developed by Larson et al. (2014). They argue that the region size is sufficient to be able to influence international wheat prices, or at least decrease its influence by region. They estimated storage cost in the MENA region, in 2011, varying from 1.5 to 3.5 USD per metric ton. Combined with port and inland logistics and management, the expenses per metric ton equaled about 42 USD, which amounted to about 12.5% of the wheat price. The authors suggest that a certain share of state investment in storage capacities could be redirected into logistic infrastructure, or "trade corridors" (Larson et al., 2014, pp. 53, 55).

The International Grain Clearing Arrangement described by Sarris (2013) is aimed at guaranteeing the physical delivery of grain under futures contracts. Sarris explains that, presently, contract enforcement is only in place for the parties registered with exchanges and spread upon registered warehouses, which, as a rule, are located nearby a certain Exchange. It is most probably that the importer, wishing to minimize risks, would be interested in obtaining the goods from the warehouse closer to his location, which most probably would be not secured by the Exchange rules. According to the concept of a global grain contract (Berg, 2011), the system would choose a warehouse with the cheapest delivery cost to the buyer's destination. It is suggested that transportation costs between the relevant warehouses would influence the cost of grain in the buyer's desired destination. Sarris (2013) provides examples of such a global contract from the sugar market (global sugar futures contracts). The researcher further suggests transforming a certain portion of the financial margin of the given clearing house into the physical grain storage. This suggestion is very close to achieving the Shariah goals related to bridging the gap between the financial and physical markets. Sarris suggests securing only part of the financial reserves in physical stocks, claiming that "reserve stock would be used only to make the market work" as "there is no physical liquidity mechanism internationally (Sarris, 2013, p. 230). We assume that to make the system Shariah-compliant, it is necessary to secure at least 33% of the stocks in total financial reserves (this is not speaking about the futures contracts themselves, rather a Shariah-compliant alternative should be put into practice). But this also opens the question of storage infrastructure, which needs to be developed.

As a conclusion to Section 3.3., there are plenty of theories and approaches towards explaining the price volatility. Physical deliveries are predominant in the developing countries, while in the developed one futures trading prevails. The latter explains convergence failures. Therefore, one of the problems of the futures market is its connection disruption with the real market: storage prices is one of the indicators, which we also observed when analyzing a sample of BSW futures.

Effective market regulation related to minimizing the adverse effect of speculation is still being examined by the researchers. The frequent cases of fraud, stock vanishing, and price manipulations confirm this. In our opinion, the policy over price manipulation and speculation would not be efficient without taking in to account non-economic factors. It seems that this issue is always subject to pressure from various stakeholders. Introducing the Shariah-based strict approach towards speculative activities and the requirements towards transfer of ownership reflecting real physical movement of the sold items would most likely result in a win-win situation. Thus, suggestions of Sarris (2013) and Berg (2011), combined with the Shariah requirements to title transfer, labelling and parallel contracts instead of trading in contracts, could be a sound system to eliminate fraud and minimize risks in the global wheat market, securing quicker deliveries at a cheaper cost through international exchanges cooperation.

Adequate market mechanisms and structures implying real transactions and fair profit distribution, in most cases, most probably would be Shariah-compliant, as the target for all is ethics, sustainability, fairness and transparency. Once Islamic scholars and international standard-setting organizations succeed in developing Shariah-compliant food commodity trading structures, they could call upon the related organizations involved in grain import, to enforce implementation of such contracts, and to develop an international system of grain storage and exchange, to be placed in the main markets with high levels of political and economic stability, to minimize any chance of export bans.

4. Summary & conclusion

Shariah rulings for food commodity trading are similar to trade requirements for other commodities. Although there is evidence that, in certain rulings, trading in food (and wheat in particular) requires a stricter approach and cannot be subject to rule relaxation, it is claimed that strict exchange regulations could minimize the uncertainly and market manipulation risks. Therefore, there are reasonable grounds for deeper Shariah studies of the rules pertaining to food commodity trading given the widespread availability of the selling item, contract parties' rights protection, and security being in place.

Three elements of the futures contracts, considered prohibited by many fatwas and contemporary Shariah standards, are less strictly addressed by some contemporary scholars. This is relevant to the non-existence of goods and lack of ownership, as well as deferred payment. It is claimed that the uncertainty in this regard (which is the core reason for the sales prohibition) can be minimized subject to a commodity's general presence and ease of accessibility to the market, unlike it was during the first Muslim state in Medina. Consequently, a general significant stock decrease for any given commodity would mean a stricter approach to the mentioned *fiqh* rulings.

In a conventional market, some criticism of food commodity trading mechanisms is based on factors deriving from activities and elements which are prohibited or highly reprehensible according to Islamic law. Those elements include both contract clauses and market behavior.

A terminology non-concordance exists between the research based on the Shariah approach and other papers. On the behavior level, the Shariah-prohibited and reprehensible activities are gambling (*maysir*), which is in some literature called speculation; ignorance (*jahala),* as well and goods retention (*ihtikar*), which can also be referred to as manipulation *(najash and ghabn),* along with cornering (*ihtikar*) and squeezing practices, and more generally – monopolization. These elements are, in some cases, forbidden by civil law regulations. There have been many lawsuits against companies who were engaged in such practices. There is a mixture, however, in the definition of each. These activities are interrelated and complementary to each other. Manipulation, and to some extent, speculation, has a more flexible approach, which was demonstrated by Baines (2017), Clapp (2019) and Pirrong (2017). Similarly, there is a non-judgmental approach to certain speculation activities from Shariah scholars (see, for example, Khan, 1988).

As we can see from the recent market history, the futures and options-based trade system operates relatively well, but is likely to result in a huge collapse during economic instability. Shariah rules and regulations

are aimed at the non-admission of similar situations, which result not only in huge losses and food insecurity, but also in huge gains for the market giants.

Analyzing the food commodity markets, we cannot constrain ourselves to merely economic factors. Food security is also of social and political importance, and we are taking into account various institutional aspects of food commodity trading and regulation mechanisms. Therefore, when approaching the issue merely from a legal and economic perspective, one can easily conclude that the existing regulatory system is sound and the market highly stable through contract standardization and enforcement systems. However, an institutional approach and the analysis of power-distributional perspective (Baines, 2017), and detailed attention to the financialization phenomenon, draws a different picture.

Initially, futures were introduced to eliminate uncertainty. They were designed as a hedging instrument to decrease the risks for market participants. And to some extent it succeeded in reaching this aim through putting bounds on uncertainty via strict regulation procedures, transparency, and an advanced level of standardization. It worked until the moment when futures themselves had become a commodity. The creators of futures have left unregulated and unstipulated certain elements that potentially lead to convergence failures and financial bubbles. These factors are outlined both by analysts from the conventional side and the scholars evaluating the commodity market from a Shariah perspective.

Strict commodity exchange regulations and requirements for registered traders result in a situation where the market has a high concentration within a limited range of traders. The derivatives market in its present state leads and increases the gap between the real asset market and the futures market, which has been proved by numerous research, outlining various factors driving the excessive premium or discounts of futures prices over the spot (cash) prices. These problems, although addressed by authorities, exchanges and researchers, remain unsolved, although there are claims for the necessity of changes in the food commodity market regulation, specifically for the US exchanges.

The results also show that the relatively less developed futures market in a certain country may imply less price volatility. However, other factors may have a strong influence on price, including non-economic factors.

As long as East and West continue interaction through trade, particularly, commodity trading, these issues are likely to be mutually addressed by traders, and ethical standards endorsed by Islamic scholars can prove as adequate drivers for the improvement of the global trading system overall.

Developing a sound system of international wheat trading, not contradicting Shariah principles, requires a multifaceted approach, combining contract engineering, creating certain financial infrastructure, and implementing macroeconomic measures. As suggested by Al-Suwailem (2006), it is important to address the current societal needs, particularly in terms of food commodity consumers. Creating an international system of certified warehouses, Shariah-approved global wheat trading contracts and an international clearing system is an acute necessity for the present international wheat market, which provides benefit for all the countries involved: the US as a developed financial market and sound regulation system through its role in the market; emerging exporters such as Russia, as an underdeveloped but promising market, whose participants are eager to become active players in the international market; and Islamic countries, through the system of Shariah-approved contracts, a secure clearing and labeling system and a reduction in delivery costs with the certified warehouses.

There are several potential alternatives for the current futures and options contract that could be practiced by religion- and ethics-driven market players. in the current paper we studied 15 potential alternatives (Table 1), out of which nine can be already implemented as contracts or hedging instruments with relevant scopes of application, and three require Shariah assessment and decision of the standard-setting bodies. For example, if Islamic scholars admit *taureed* contract principles to apply to grain trading or develop another contract reflecting the society's needs, this could enhance Shariah-compliant food commodity trading.

Among potential sound alternatives are *sukuk salam*, or the investment certificates confirming the buyers' rights to a certain quantity of goods based on advance payment terms. To develop the market for such Islamic securities, certain infrastructure should be developed and rules should be established on commodity exchanges. The untradability of such certificates is an obstacle that could be managed through combined structures of *sukuk*, for example, agency-based agreements with a required minimum of stocks, which could be managed as commodity funds with separate rules and regulations.

The contribution of the paper with respect to previous works includes: a summary of suggestions for alternatives to futures, comparative analysis of approaches towards speculation regulation to protect the rights and interest of the producers and consumers, and *sukuk salam* and their hybrid structures as alternatives.

Based on the results of this paper, further research can dwell on developing a detailed practical model for *sukuk salam* (and hybrid structures whenever necessary) application as an alternative to futures, combined with other forms of hedging - such as commodity funds, *takaful*, promissory notes etc. Moreover, it is necessary to evaluate the wheat storage model suggested by Larson et al. from the perspective of *awqaf* developments in agriculture. Based on Sukmara (2020), agriculture is only studied in 5% papers on *awqaf*, published after 2010.

The findings can be referred to by the relevant regulators of the exchanges, both from exporting and importing economies, when developing a sounder system of futures trading. Additional research could focus on the actual implementation of a Shariah-based approach to commodity market regulation, specifically, exchanges. Particularly, it would be of interest to study the practices of commodity exchanges in OIC countries (for instance, Malaysia, UAE, Pakistan, Iran, Egypt), or other exchanges that follow any Shariah-based solutions, including storage costs and management systems. The prospects of exercising these solutions and practices in new markets, specifically the Black Sea Wheat market, could be on the agenda. Another issue is designing food trading mechanisms taking into account the numerous costs layered on top of production cost, which is often not taken into account by researchers. Additionally, dispute settlement in food commodity trading and an arbitration process conforming to the Shariah norms and taking into account existing regulation would be another study point.

Research framework

The paper has been composed as part of the AGROFINMOST project of the HSE-Skolkovo Institute for Law and Development aiming at introducing new mechanisms for the reinforcement of the food security of different countries and regions, many of which are Muslim countries, and within the scope of the HSE University Research and Development Program.

Declarations

Author contribution statement

M.E. Kalimullina: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

M.S. Orlov: Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data.

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The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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Appendices.

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Location	CropCdr	Beginning Stocks	Production	Imports	Exports	Domestic Consumption	Ending Stocks
1) Africa							
Morocco	Jul-Jun	5 133	7 340	3 706	75	10 700	5 404
Ethiopia	Jul-Jun	737	4 800	1 300		6 250	587
2) Asia/Oceania							
China	Jul-Jun	131 196	131 430	3 145	1 006	125 000	139 765
3) Central America							
Guatemala	Dec-Nov	105	1	675	42	625	114
4) Europe							
Euro Zone	Jan-Dec	13 885	136 863	5 762	23 310	123 200	10 000
Russia	Jul-Jun	12 026	71 685	446	35 838	40 500	7 819
5) Middle Eastern							
Iran	Apr-Mar	8 066	14 500	180	410	16 100	6 236
6) North America & Caribbean							
United States	Jun-May	29 907	51 306	3 674	25 477	30 024	29 386
7) South America							
Argentina	Dec-Nov	470	19 500	5	12 188	6 050	1 737
World	Jan-Dec	283 057	731 448	169 909	173 057	733 300	278 057

Source: USDA data, sourced via Bloomberg.

Figure 1. World wheat statistics 2018–2019, thousand tons. Source: USDA data, sourced via Bloomberg.

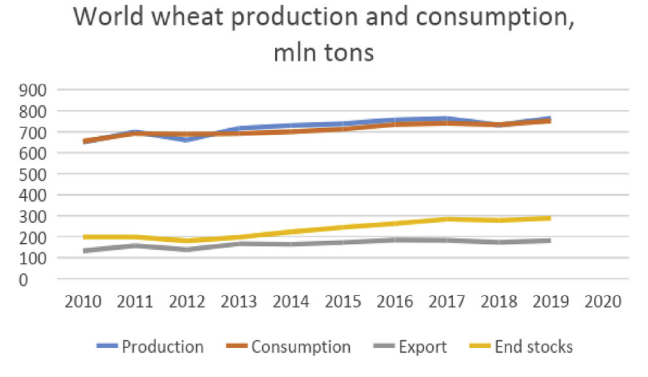

Figure 2. World wheat market dynamics. Source: made by the authors based on Bloomberg data.

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