Role of Electronic Warehouse Receipt System in Development of Commodity Exchanges: An Assessment for Turkey

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Abstract

Commodity exchange is a centralized platform where buyers and sellers reduce transaction costs by carrying out commodity transactions under a set of clearly defined rules. Institutional mechanisms which commodity exchanges offer to reduce the transaction costs are stated as central trading platform, central counterparty service, central clearing and settlement service and integration with licensed warehousing and electronic warehouse receipt (EWR) system within the framework of Transaction Cost Theory. Although the literature contains some studies coping with the analysis of commodity exchange system in Turkey, little attention has been paid to mentioned institutional mechanisms by a holistic approach. This article tries to fill this gap by revealing the development of commodity exchange system in Turkey and evaluating it especially with regards to integration with licensed warehousing and EWR system in the consideration of Transaction Cost Theory. In the light of the findings obtained, the establishment of Specialized Commodity Exchange is highlighted for the deepening of the commodity markets in Turkey.

Key words: Transaction Costs, Commodity Exchange, Licensed Warehousing, Warehouse Receipts

Emtia Borsalarının Gelişiminde Elektronik Ürün Senedi Sisteminin Rolü: Türkiye Açısından Bir Değerlendirme

Öz

Emtia borsaları çok sayıda alıcı ve satıcıyı bir araya getiren, kuralları önceden belirlenmiş olan ve emtia işlemlerinin yapılmasına olanak sağlayarak işlem maliyetlerinin düşürülmesine hizmet eden merkezi platformlardır. İşlem Maliyetleri Teorisi çerçevesinde, emtia borsacılığının işlem maliyetlerini düşürmek için sunduğu kurumsal mekanizmalar merkezi işlem platformu, merkezi karşı taraf hizmeti, merkezi takas hizmeti ile lisanslı depoculuk ve ürün senedi sistemi ile entegrasyon olarak belirtilmektedir. Literatürde Türkiye'de emtia borsacılığını inceleyen çalışmalar olsa da, bütüncül bir yaklaşım ile bahsedilen kurumsal mekanizmalar üzerinde çok durulmamıştır. Çalışma Türkiye'de emtia borsacılığının gelişimini ortaya koyarak ve sistemi özellikle lisanslı depoculuk ve elektronik ürün sistemi ile entegrasyon açısından İşlem Maliyetleri Teorisi ışığında inceleyerek bu boşluğu kapatmayı hedeflemektedir. Elde edilen bulgular çerçevesinde, emtia piyasalarında derinleşmenin sağlanması açısından Ürün İhtisas Borsası'nın önemi üzerinde durulmuştur.

Anahtar Kelimeler: İşlem Maliyetleri, Emtia Borsacılığı, Lisanslı Depoculuk, Ürün Senetleri

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The ideas presented in this paper are the author's own and can not be connected to, represented and evaluated as those of the Company she works for.

1. Introduction

Institutions are at the center of New Institutional Economics (NIE) which has recently gained importance in the economics literature. Institutions are defined as written and unwritten rules and norms to reduce transaction costs and uncertainty in the markets. (North, 1991) From this perspective, commodity exchange is defined as a central platform where multiple buyers and sellers make spot and derivative transactions in order to reduce transaction costs according to pre-determined rules and procedures.

NIE also indicates that each country and society have different traditions, customs and institutional structures. Even if developing countries imitate efficient economic and political formal institutions of developed countries, the same institutional performance may not be achieved because of the differences of informal institutions. Thus, in order to increase economic performance in developing countries, it is very important to provide effective incentives by economic and political formal institutions. (Dumludağ, 2014) To set an example, in United States of America (USA), commodity exchanges have emerged and developed in line with the needs of the market since 1800s. On the other hand, they started to appear in developing countries especially since 1980s as the role of state in economy has gradually decreased and economic liberalization policies have spread to the commodity sector. (UNCTAD, 2009a) In parallel with other developing countries, the commodity exchanges integrated with licensed warehousing system have also emerged in Turkey in this period.

The development impacts of commodity exchanges are investigated in consideration of transaction costs theory in NIE. (UNCTAD, 2009a) In this regard, commodity exchanges become prominent with their institutional mechanisms in commodity markets where there are high costs before and after the transaction. Within this context, institutional mechanisms which commodity exchanges offer to reduce the transaction costs are stated as central trading platform, central counterparty service, central clearing and settlement service and integration with licensed warehousing and electronic warehouse receipt (EWR) system. (UNCTAD, 2009a)

Although the literature contains some studies coping with the analysis of commodity exchange system in Turkey, little attention has been paid to mentioned institutional mechanisms offered within the commodity exchange system by a holistic approach. Also, harmony between formal and informal institutions in Turkish commodity markets has not been investigated from the perspective presented by NIE. The present study aims to fill this gap by investigating the relationship between transactions costs in commodity markets and institutional mechanisms offered by the commodity exchanges in order to reduce transaction costs and by evaluating the Turkey's experience with commodity exchange system especially with regards to integration with EWR system. Also, the policy initiatives introduced in order to increase the harmony between formal and informal institutions in commodity sector in Turkey will be analyzed.

To this end, practices in developing countries and in USA, which has the most advanced commodity exchange system in the world, current situation of licensed warehousing and EWR system in Turkey is evaluated as part of the development of commodity exchange system in the light of transaction cost theory. Lastly, it is suggested that creation of Specialized Commodity Exchange will serve the commodity market development in Turkey and commodity futures at Borsa Istanbul Derivatives Market will be used after the deepening of spot EWR transactions.

The rest of the article has four sections. In the next section, we introduce the literature review in the field of transaction cost theory and commodity exchanges. In third section, development of the commodity exchange system is summarized by

giving examples from developing countries and USA. The fourth chapter discusses the evaluation of the system in Turkey. A final section provides a conclusion.

2. Literature Review

North (1990) takes transaction costs as the cost of measuring the value of the asset subject to the purchase, protection of the rights, application and control of the purchase contract. According to North (1990), the reason behind the transaction costs is asymmetric information between the parties in a contractual relationship. In certain circumstances, institutions, which are created to reduce the transaction costs, can be the reason for transaction costs. There should be a congruence between formal and informal institutions in order to have an impact on reducing transaction costs. In an economic environment where there is no such congruence, institutions can increase transaction costs instead of reducing them. North (1990), Furubotn and Richter (2005) categorizes transaction costs as below.

- ***Market Transaction Costs:*** The costs of using market mechanism.
- ***Managerial Transaction Costs:*** The costs associated with setting up, maintaining and chancing organizational plan.
- ***Political Transaction Costs:*** The costs associated with setting up and maintaining of formal and informal political organization (Furubotn & Richter, 2005).According to NIE, institutions directly affect transaction costs. They determine the rules of the game and serve to reduce the risks related with transaction costs through their information, observation and enforcement functions. On the other hand, institutions have impact on economic performance through *"institutional change."* According to Williamson (2000), institutional change takes place in four stages:

- ***Informal Institutions:*** The first stage of the institutional change is informal institutions such as traditions, customs, rules and norms accepted by a society. These institutions have formed gradually over the course of many years. In this stage, transaction costs are quite high due to the uncertainty.
- ***Formal Institutions:*** Formal institutions are considered as political institutions, judiciary and bureaucracy. In this stage, property rights are guaranteed.
- ***Governance Institutions:*** The third stage of institutional change is governance institutions arising from contractual relationships. These institutions are formed to eliminate disputes that may arise during and after the establishment of a contractual relationship.
- ***Competitive Market:*** In the last stage of institutional change, competitive market mechanism is internalized via the governance institutions. In this stage, transaction costs are reduced, and stability is increased (Williamson, 2000).

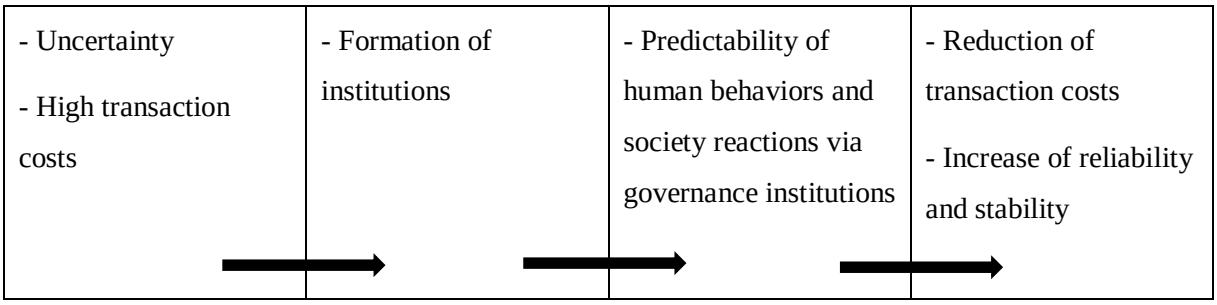

Figure 1. Stages of institutional change

Role of commodity exchanges in economic development is explained by "transaction cost theory" (UNCTAD, 2009a). According to Coase, most known representative of the theory, it is not a realistic assumption that there is no transaction cost in executing market transactions. In order to complete a market transaction, finding a counterparty for the transaction, bargaining process, application and control of the purchase contract are necessary operations and all these operations are highly costly (Coase, 1960).

From this point of view, commodity exchange as an institution serves to reduce uncertainty and transaction costs in commodity market transactions. In other words, commodity exchanges are formed to reduce *"market transaction costs"* introduced by Furubotn and Richter (Furubotn & Richter, 2005). In the stages of institutional change revealed by Williamson, commodity exchanges can be considered as *"governance institutions"* since they are created to reduce transaction costs arising from contractual relationship before and after the contract (Williamson, 2000).

On the other hand, Stiglitz (1986, 1989) also underlines that in case of lack of institutions especially in agricultural markets, asymmetric information leads to market failures through decision-making process of producers. Accordingly, in order to ensure market efficiency, institutions created to reduce the risks have great importance since they act as *"risk insurance mechanism"* in the market. Also, government intervention such as incentive policies is required to ensure market efficiency (Tahsin, 2014). From this perspective, agricultural institutions such as commodity exchanges can be taken as important insurance mechanism for reducing risks.

In addition, there are wide range of studies in the literature directly dealing with commodity exchange system. Black (1986) analyzed the commodity exchanges in developed countries and presented the criteria for the success of commodity exchange system. He found that in order to manage the price risks through derivatives commodity transactions, deep spot market volume is a must. Similarly, Bronsen & Fofana (2001) and Bollman (2003) put emphasize on the importance of the tight linkages between spot and derivatives commodity market over the success of the overall system. Also, United States Agency International Development (USAID), University of Illinois and Enabling Agricultural Trade (EAT) published a joint report regarding the pre-requisites for successful risk management through commodity exchanges in 2012. In the report, it is stated that the two main necessities are existence of deep spot market volume and supportive and market-friendly public policies.

Since commodity exchange system, which is integrated, with EWR system is a new issue for Turkey, there is no wide literature on the topic. However, there are some extensive researches even if the number of them is limited. Erbay (2003) investigated the organizational structure of commodity exchanges in developed countries and use of derivatives in Turkish commodity sector. In addition, Kaya (2017) made an extensive field research on licensed warehousing system in Turkey and shared the problems in producer side. He also offered policy recommendations in order to overcome these problems. Lastly, there are extensive reports published on the commodity exchange system and EWR system by Turkish Development Agencies (Ünal, 2011 & Doğu Akdeniz Development Agency, 2015).

3. Development of Commodity Exchanges

According to UNCTAD (2009b), transaction costs and institutional mechanisms offered by commodity exchanges to reduce or eliminate them are depicted in Table I. Matching the transaction costs in the commodity markets with the market risks, costs prior to the transaction include production, price, market, credit and institutional risks, while the counterparty risk is considered as the cost after the transaction. As aforementioned,

there are high transaction costs in a market where no infrastructural institution is available. From this point of view, commodity exchanges come to the forefront as an important infrastructure institution that serves to eliminate transaction costs. Therefore, they play an important role in economic development by increasing commodity trade and welfare in the commodity sector (UNCTAD, 2009b). Commodity exchanges minimize the cost of finding a counterparty and determining an acceptable price through the central trading platform and matching algorithms. Matching is realized based on the price and quantity information entered into the system by market participants. Matched orders are transformed into the positions. In this way, transactions are executed based on the supply and demand dynamics in the market conditions without the need for physical confrontation of buyer and seller (UNCTAD, 2009b). The other services offered in commodity exchange system are CCP and central clearing and settlement service.

Table 1. Transaction costs in commodity markets

Costs Prior to the Transaction	Applications of Commodity Exchange
Finding a buyer/seller	Central Trading Platform
Determining an acceptable price	
Reliability of counterparty	Central Counter Party (CCP) Service
Product quality	Integration with Licensed Warehousing System
Securing finance	
Delivery and payment terms	Central Clearing & Settlement Service
Costs After the Transaction	Applications of Commodity Exchange
Credit and cash flow	Central Clearing & Settlement & Licensed Warehousing System
Physical delivery	
Arbitrating disputes	Central Counterparty & Central Clearing and Settlement
Compensation for default	
Sanctioning defaulters	

Source: UNCTAD, 2009b

The cost of reliability of counterparty, delivery and payment terms, credit and cash flow, physical delivery, arbitrating disputes is eliminated by those services. In commodity exchanges where CCP service is offered, CCP enters between buyer and seller when an order is transformed into a transaction. CCP guarantees that transaction will be settled by means of efficient risk and collateral management. The rules of CCP are applied to every market participant objectively and it ensures that in case of the default, default will be covered from collaterals, guarantee fund and the amount allocated from CCP's capital (Takasbank, 2017).

With central clearing and settlement service, cash and security obligations arising from the transactions in commodity exchange are fulfilled to central clearing and settlement institution. Cash and security receivables are allocated via this centralized system instead of following up bilateral trade obligations (Akovalı, 2014).

Last institutional mechanism offered by a commodity exchange is integration with licensed warehousing system. Farmers put their commodities in a licensed warehouse after harvest time. EWR that indicates the ownership, quality and quantity of the commodity in licensed warehouse is issued. EWR's are accepted as collateral by banks and farmers can obtain loan from banks showing EWR as collateral. In this way, farmers can wait until the commodity prices reach to a satisfactory level instead of selling their commodities at low prices at harvest. All in all, EWR system reduces the costs of securing finance and measuring the quality of traded commodity. Also, physical delivery is made in the form of EWR (UNCTAD, 2009b).

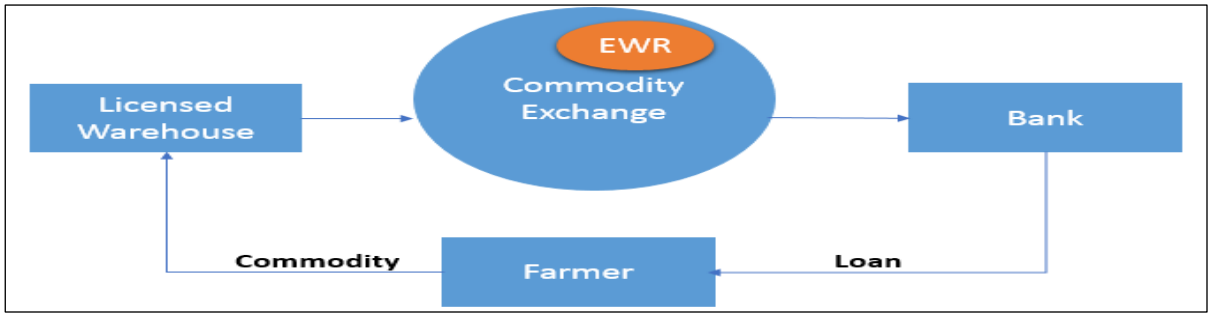

Figure I. Interaction between EWR system and commodity exchange
Source: Lacroix & Varangis, 1996.

As presented in the Figure III, there are six main stages of development of the commodity exchange system accepted in the literature. The first stage is the determination of a public policy and legal framework for the commodity exchange. In other words, in order to have a successful commodity exchange, it is a prerequisite for government to support market-based transactions and not to intervene in market mechanisms. The second stage is the development of infrastructure needed for a commodity exchange such as transportation and storage (Nordier, 2013).

The third and fourth stages are related with EWR system. Commodity standards are needed to facilitate the trades in commodity exchanges. For this reason, the quality of commodities should be determined by an impartial institution. In this way, quality production is encouraged within the EWR system. The other stage is the creation of warehouse receipt that states the standards of the commodity in the warehouse. As a result, these stages serve the facilitation of physical commodity trading (Nordier, 2013). The fifth stage is the deepening of spot market. In this stage, EWR, which indicates the ownership of the commodity, can be sold and purchased instantly according to the supply and demand conditions. Spot transactions pave the way for commodity futures market. Also, depth of spot market determines the depth and liquidity of the futures market. In other saying, the size of spot market provides insight into the effectiveness of the futures commodity transactions. The final stage is the futures market, which is the most advanced stage of a successful commodity exchange system. Commodity market participants minimize the price risks through the commodity derivatives. In commodity exchanges of developed countries, transactions are mostly carried out as futures (Nordier, 2013).

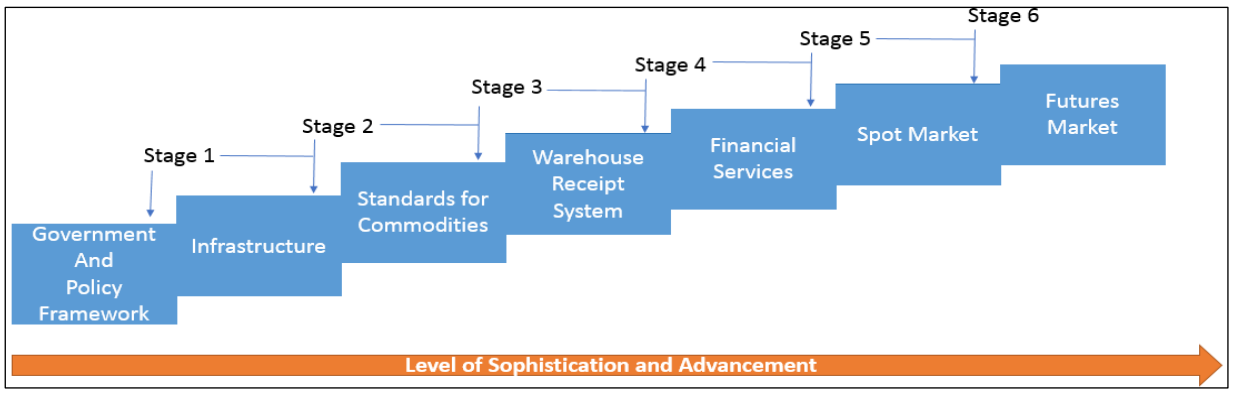

Figure 3. Stages of commodity exchange development
Source: Nordier, 2013.

In the modern sense, the commodity exchanges were emerged in Chicago, USA in the 19th century. Chicago has become a trade center because of its location where the roads are intersected and its closeness to big farms in North America. Farmers and industrialists came to Chicago to market their commodities. The problem of excess supply was emerged in time due to the lack of storage. In order to eliminate the storage problem, farmers and industrialists started to sell their commodities in advance. In these forward transactions, even if the price risk was transferred to buyers and speculators, counterparty risk and uncertainties in the delivery due to lack of standardization were always present (Yurtoğlu, 2015).

In 1848, Chicago Board of Trade (CBOT) was established as a response to all these risks. The aim of the establishment of CBOT was to ensure that transactions are executed in an organized platform in a standard manner. CBOT was merged with Chicago Mercantile Exchange (CME) in 2007. In 2008, they are merged with New York Mercantile Exchange (NYMEX) and New York Commodity Exchange (COMEX).

Today, as it is depicted in Figure IV, 70% of the total derivatives transactions are realized in the exchanges in North America and Asia Pacific. The major exchanges in North America are CME Group, Intercontinental Exchange Group and NASDAQ. Among those exchanges, CME is the largest futures market in the world with a contract volume of 4 billion in 2017 which equals to 50% of the total trading volume in North America.

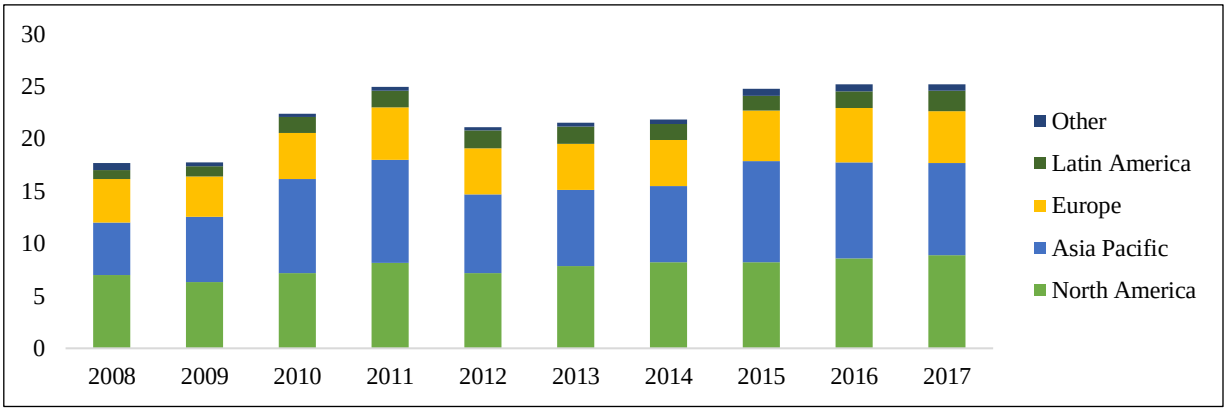

Figure 4. Regional distribution of global derivatives volume (Billion Unit)
Source: Futures Industry Association (FIA)

Returning to the development of commodity exchanges in USA, warehousing infrastructure has also developed in USA in 19th century. The first legislation for warehousing system came into force in 1916. The legislation obliged companies to obtain licenses from the state in order to establish a warehouse. Following the law, there was also increase in the use of warehouse receipts as collateral for financial needs. To give an example of finance against warehouse receipts, John D. Rockefeller, founder of Standard Oil Company, obtained the loan of $2000 giving warehouse receipt as collateral in 1859. Later, with the help of this loan, he bought his first oil refinery in the Cleveland area (Martin, 2016). Today, there are 863 licensed warehouses in federal level and 10,000 licensed warehouses in province level in USA. Licensed warehouses with 620 million tons of storage capacity are integrated with commodity exchanges throughout the country (TMO, 2017).

Considering the US agricultural production volume of 2.2 billion tons in 2016, the storage capacity is quite high.

Turning now to the development of commodity exchanges in developing countries, neo-liberal policies such as commercial and financial liberalization gained importance after 1980. Through the structural adjustment and stabilization programs, it has been suggested that governments should not intervene in prices in commodity sector and prices should be determined in market conditions (Tahsin, 2014).

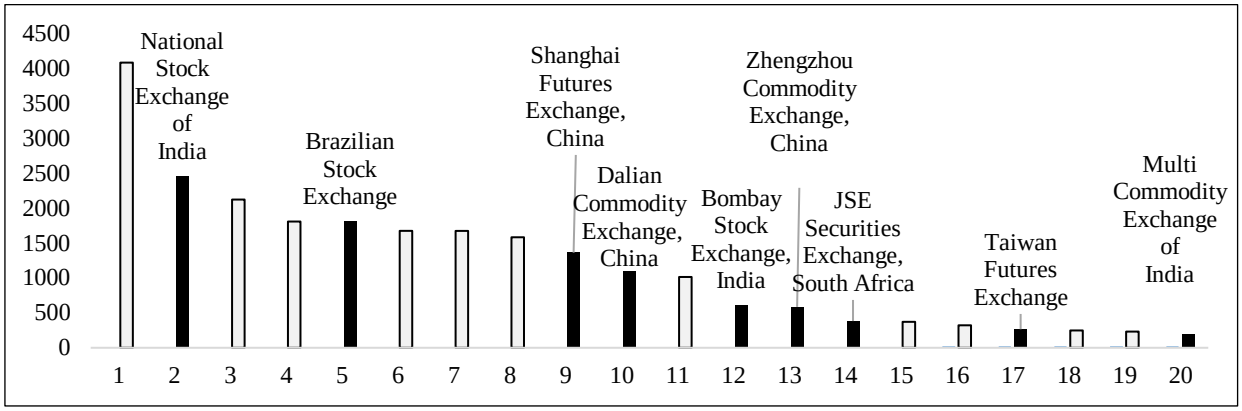

Figure 5. Leading commodity exchanges in developing countries
(The exchanges in developing countries are shown in black.) Source: FIA

In this context, especially in 1990s, various projects and programs in relation to the establishment of commodity exchanges in developing countries have been initiated by the institutions such as World Bank (WB) and UNCTAD. With the efforts of those institutions, local commodity exchanges have been established in many countries but not all have been successful. For example, many commodity exchanges in African countries except from South Africa have failed because of lack of a strong and transparent regulatory framework and public intervention in commodity sector. However, some developing countries have achieved to have a successful commodity exchange. In terms of number of contracts traded in 2017, 9 of the 20 commodity exchanges with the highest transaction volume are located in developing countries as depicted in Figure V.

3. Development of Licensed Warehousing and EWR System in Turkey

Commodity exchange system in developed countries has a history of more than 150 years. In these countries, commodity exchanges have developed together with the licensed warehousing system. The licensed warehousing systems in the former Eastern bloc countries such as Poland, Bulgaria and Hungary were established and developed during the years 1980-1990. On the other hand, in Turkey, commodity exchange and licensed warehousing system have started to develop together with African countries such as Zambia and Ethiopia especially in 2000s (Memiş & Keskin, 2015).

In Turkey, *"Agricultural Product Development Project"* with the support of WB and UNCTAD was initiated in 1996 in order to ensure healthy price formation in commodity exchanges and to reduce the government intervention in agricultural markets. In addition to that project, *"Licensed Warehousing Development Project"* was initiated in 2004. As a result of these projects, Agricultural Products Licensed Warehousing Law no. 5300 was accepted and came into force on February 10, 2005. With the enforcement of the Law, Turkey's central securities depository Merkezi Kayıt Kuruluşu (MKK) was appointed as Electronic Registry Agency for safekeeping of EWRs.

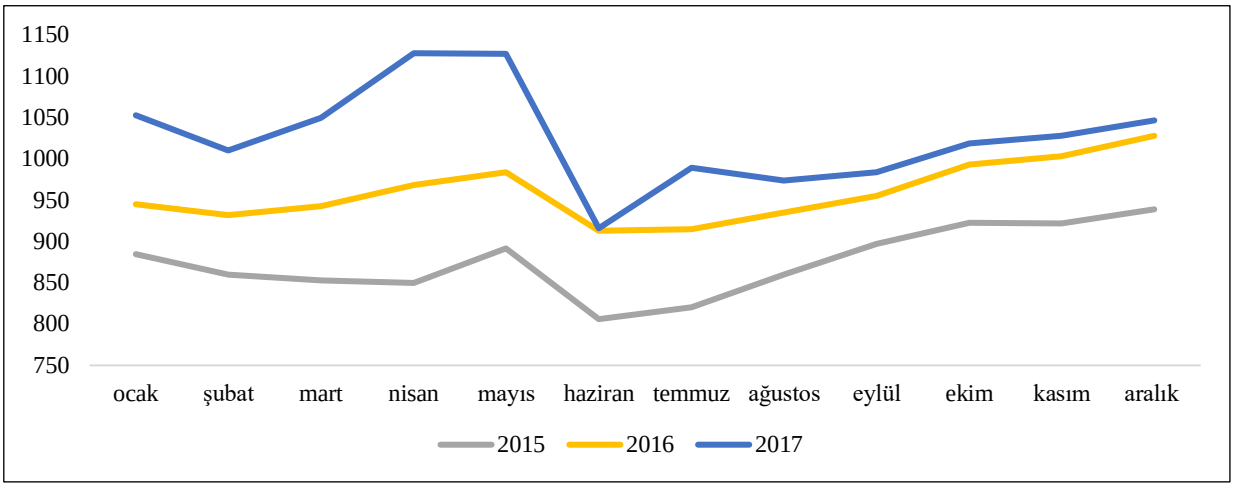

Figure 6. Wheat prices in Turkey (2015 – 2016 – 2017)
Source: TMO

Licensed warehousing system facilitates the trading of storable and standardized agricultural commodities and enables storage of commodities under modern and healthy conditions (Yurtoğlu, 2015: 52). Licensed warehousing system has benefits for the market, producers, industrialists and merchants. Major benefits of the system towards the market are price stability, efficient price formation and decrease in informal economy, need for government intervention and burden on taxpayers.

As it is well known, after the harvest, the commodity supply is based on whether the commodity can be stored or not. If the commodity is not stored, in case of high demand and high price in the market, the farmers should wait for the next production period in order to increase the supply due to the lack of supply elasticity. On the other side, if it is possible to store the commodity, supply can be increased thanks to the supply elasticity arising from the stored amount of the commodity. Licensed warehousing system increases supply elasticity and serves the price stability in the market. Also, since the commodities stored are recorded, contribution to fight against the informal economy is made by the system. The other advantage of the system is decrease in the need for government intervention because price instability, which is one of the major reasons for government intervention, can be eliminated into the system. Lastly, the burden on taxpayer is decreased because of the decrease in the need of government intervention (Kaya, 2017).

The first advantage for the producers is use of EWR as collateral in securing finance. Producers can handle their financial needs within the licensed warehousing system. The other advantage obtained by the producers is revenue growth because they can put their commodities into a warehouse, and they can sell their commodities at a satisfactory level instead of selling them at a low price after the harvest. The finance facilities offered to producers are also valid for industrialist and merchants. In addition to that, by licensed warehousing system, industrialists and merchants get rid of the cost of building a warehouse for their commodities (Kaya, 2017).

The other advantage is that quality agricultural production is encouraged throughout the country since the commodities are analyzed before storage. The producers who would like to use the system should comply with the quality standards. Finally, the system contributes to commodity market development by facilitating physical commodity transactions.

Returning to the development of the system in Turkey, wheat and cotton were selected as pilot commodities in 2011. After 2011, various incentives are introduced and there has been a sharp increase in the number of licensed warehouses throughout the country. For example, total storage capacity authorized by the Ministry was increase from 615 thousand tons in 2015 to 4.5 million tons in 2016. As of 2018, 58 licensed warehouses operate in Turkey and total storage capacity is 2.8 million tons. While Turkish Grain Board (TMO) has approximately 1.8 million tons of the total capacity, private sector has a capacity of 1 million tons (TMO, 2017). Comparative data with USA, the world leader in commodity exchange system integrated with licensed warehousing, is shared in Table II. Based on the data presented, it is evaluated that licensed warehousing capacity should be improved and authorized capacities should start to operate in the coming years in Turkey.

Table 2. Licensed warehousing system in Turkey and in USA

	USA	Turkey
Number of licensed warehouses	10000	58
Licensed warehousing capacity (million ton)	620	3
Grain production in 2016 (million ton)	879	49
Licensed warehousing capacity / total grain production (%)	70	6

Source: FAO, TMO, USDA

3.1. Issuance of EWRs

The actors in issuance of EWR are MKK as Electronic Registry Agency, İstanbul Settlement & Custody Bank (Takasbank) as a national numbering agency, licensed warehouses and authorized classifiers. Producer delivers the commodity to the licensed warehouse at first and part of the commodity is sent to the authorized classifier for determination of quality standard. Then, commodity and quality information are sent to MKK and after the Takasbank appoints International Securities Identification Code (ISIN), creation of EWR is completed. Issued EWRs are safe kept at the depository accounts at MKK.

Based on the data provided by MKK, types of commodities subject to issuance of EWR are increased from 8 to 10 in 2017 and current commodity types are cotton, wheat, barley, corn, rice, olive, soybeans, sunflower, lentil, and hazelnut. The total balance of EWRs safe kept at MKK reached 1 089 533 tons at the end of 2017 and 1 480 998 tons of EWRs were issued in 2017 (MKK, 2017).

Table 3. Issued EWRs volume and total production in 2016 & 2017

	2017			2016		
Type of Commodity	Issuance of EWR (ton)	Total Production (ton)	Issued EWR / Total Production (%)	Issuance of EWR (ton)	Total Production (ton)	Issued EWR / Total Production (%)
Wheat	844335	21500000	3.93	214340	20600000	1.04
Corn	503703	5900000	8.54	311034	6400000	4.86
Barley	65914	7100000	0.90	40209	6700000	0.60
Cotton	15704	2400000	0.60	10597	2100000	0.50
Total	1429656	36900000	3.87	576180	35800000	1.61

Source: MKK, 2016, 2017; TMO, 2017

Considering the EWRs issued in 2017 together with the total licensed storage capacity of 2.8 million tons, it can be said that approximately 52% of the existing capacity is used. On the other hand, EWRs based on wheat, barley, corn and cotton constitute 96.5% of total volume of issued EWRs and EWRs volume of those commodities corresponds to only 3.9 % of total production of these commodities in 2017 (MKK & TMO, 2017). However, considering that this ratio is 1.6 % in 2016, it is clear that licensed warehousing system is getting widespread year by year in Turkey (MKK, 2016 & TMO, 2017).

3.2. EWRs Trading Transactions

In commodity exchanges, trading transactions can be performed as spot or futures. In Turkey, all the commodity types issued as EWR are subject to spot trading in commodity exchanges, but futures transactions can be carried out only for cotton and wheat. After the introduction of EWR system, the first physically delivered futures contracts based on agricultural commodities have introduced. Wheat (in 2016) and cotton (in 2017) contracts began to be traded on Borsa Istanbul Derivatives Market (VIOP). These contracts are subject to physical delivery in the form of EWR.

Previously, cash settled commodity futures are traded at Turkish Derivatives Exchange in İzmir but trading volume was extremely low. It was evaluated that these contracts have not been used since the contracts were not subject to physical delivery. For this reason, it is an important development for Turkish agricultural markets to have physically delivered futures contract at VIOP. However, contrary to the expectations, no agricultural futures transaction has been realized so far (Erbay, 2002).

In order agricultural futures transactions to be widespread, spot trading transactions should be done within the EWR system at first. As it is well known, a vibrant spot market is one of the major prerequisites for a successful derivative market. Therefore, following the development of spot EWR transactions, market participants will naturally start to use agricultural futures in order to manage the price risk.

Turning now to the spot EWR transactions in Turkey, as of 2018, there are 113 commerce exchanges in 61 cities across the country and only ten of them provides spot EWR trading platform. The list of commodity exchanges which offer spot trading, clearing and settlement platform integrated with licensed warehousing and EWR system is presented in table IV. In spot transactions, each licensed warehouse can only work with one commodity exchange. Takasbank is responsible for settlement transactions of EWRs. Market participants enter their buy or sell orders to the electronic EWR trading platform of the commodity exchange. When the trading session ends, matched orders are sent to Takasbank for settlement transactions. Cash settlement is realized at Takasbank accounts while settlement of EWR is done at MKK which is the safekeeping agency of EWRs.

Table 4. Authorized commodity exchanges for spot EWR trading

1	Polatlı Commerce Exchange
2	Ankara Commerce Exchange
3	Bandırma Commerce Exchange
4	Lüleburgaz Commerce Exchange
5	Çorum Commerce Exchange
6	Düzce Commerce Exchange
7	İzmir Commerce Exchange
8	Konya Commerce Exchange
9	Gaziantep Commerce Exchange
10	Adana Commerce Exchange

Source: Republic of Turkey Ministry of Trade

In relation with the clearing and settlement practices in EWR transactions, CCP service is a central clearing practice where a clearing house assures to complete clearing and settlement by acting as buyer against seller and seller against buyer. The most important benefits provided by CCP service are the management of systemic risk and the reduction of counterparty risk. In addition,

it serves to reduce liquidity and operational risk, to manage asymmetric information, to reduce intermediary costs and to increase financial reliability and stability. CCP service has two pillars: central clearing and counterparty practice. Central clearing, defined as "Central Nervous System of Financial Markets" by Moscow (2006), refers to the execution of clearing & settlement transactions through a single clearing house. The counterparty practice means the transfer of counterparty risk from buyer/seller to the clearing house. CCP service is only offered for futures EWR transactions by Takasbank.

Settlement of spot and futures EWR transactions are executed by Takasbank. In this way, transaction costs related with determination of delivery and payment terms and follow-up of physical delivery are reduced. The settlement of spot transactions is executed bilaterally through the delivery versus payment (DvP) model. In this settlement method, transfer of cash and EWR can only be realized simultaneously. In other words, the transfer of EWR to the buyer can only be possible when buyer fulfills cash obligations arising from EWR trading transactions. Otherwise, settlement cannot be finalized. In this case, Takasbank informs related commodity exchange on the cancellation of the settlement transaction. Contrarily, in futures transactions, Takasbank guarantees that settlement will be finalized. In futures transactions, risk and collateral management are applied through CCP service while in spot transactions, there is no risk, collateral and default management applied.

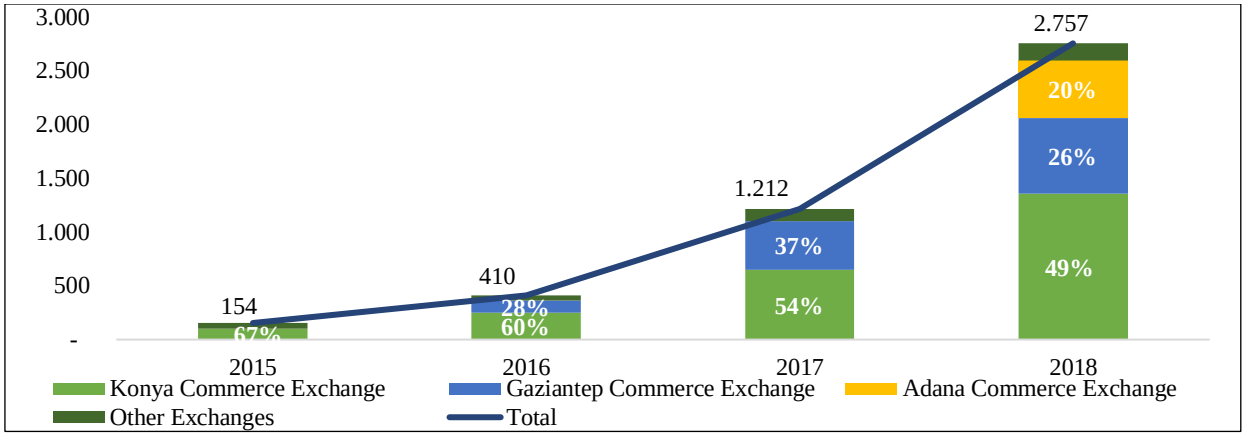

Figure 7. Spot EWR trading volume (Million TL)
Source: Takasbank

Returning to spot EWR trading transactions, based on the volume data of last 4 years provided by Takasbank, it is seen that the number of spot EWR transactions and trade volume are continuously increasing year by year. As it is seen in figure VII, since 2015, the trading volume has increased by 16 times. Even though there are ten authorized commodity exchanges for spot EWR trading, 91 % of total trading was realized in Konya and Gaziantep Commerce Exchanges in 2017. Trade volume of Konya Commerce Exchange in 2017 was increased by 162% compared to the previous year. On the other side, the spot EWR trading was started in Gaziantep Commerce Exchange in 2016. Gaziantep Commerce Exchange increased its trading volume by 289% in 2017 compared to the previous year. In 2018, spot EWR trading in Adana Commerce Exchange started and 20% of total trading in this year has been realized in Adana Commerce Exchange. 95% of total trading volume was executed in Konya, Gaziantep and Adana Commerce Exchange in this year. Besides, total trading volume in 2018 is increased by 127% compared to the previous year.

Table 5. Spot EWR trading volume and total production in 2016 & 2017

	2017			2016		
Type of Commodity	EWR trading (ton)	Total Production (ton)	EWR Trading/ Total Production (%)	EWR Trading (ton)	Total Production (ton)	EWR Trading/ Total Production (%)
Wheat	564003	21500000	2.62	195912	20600000	0.95
Corn	739500	5900000	12.53	306065	6400000	4.78
Barley	32544	7100000	0.50	32740	6700000	0.49
Total	1336047	34500000	3.87	534717	33700000	1.59

Source: MKK & TMO

As aforementioned, various commodities are stored in licensed warehouses and they can be sold and bought as EWR at commodity exchanges. The commodity range is constantly being expanded. In the current system, commodities such as wheat, barley, corn, cotton, hazelnut, olive, and sunflower can be traded. However, trading transactions are concentrated on wheat, corn and barley. In 2017, approximately 99% of spot EWRs transactions were carried out in wheat, barley and corn. Even if Table V shows that there has been a sharp increase in spot EWR trading volume since 2016, ratio of spot EWRs trading to total production is still at a very low level of 3.87%. It means that only 3.87% of produced wheat, corn and barley is traded within EWR system in 2017.

3.3. EWR-Based Finance Transactions

By virtue of collateral functions of EWRs, they contribute to meet financial needs in agricultural sector, and they serve to reduce the cost of securing finance. When farmers apply for loan to banks, banks demand collateral to guarantee the repayability of the loan. In accordance with the Article 27 of Regulation on Agricultural Commodities Licensed Warehousing, EWRs can be accepted as collateral by banks and when the problem occurs in repayment of the loan, liquidity can be provided by selling the collateral EWR at the commodity exchange. Based on the data provided by MKK, 5 of 10 types of commodities were used as collateral for securing finance in 2017 (MKK, 2017).

Table 6. EWR-Based finance transactions in 2016 & 2017

	2017			2016		
Type Of Commodity	Issuance of EWR (ton)	Finance Transactions (ton)	Issued EWR/ Finance Transactions (%)	Issuance of EWR (ton)	Finance Transactions (ton)	Issued EWR/ Finance Transactions (%)
Wheat	844335	170759	20.2	214340	56311	26.3
Corn	503703	84110	16.7	311034	21743	7.0
Barley	65914	7013	10.6	40209	8259	20.5
Cotton	15704	11647	74.2	10597	11244	106.1
Rice	21910	25026	114.2	12729	13433	105.5
Total	1451566	298555	20.57	588909	110990	18.8

Source: MKK, 2017

As it is depicted in Table VI, approximately 20% of the issued EWRs were used as collateral to secure finance in agricultural sector in 2017. Especially two commodities come to the forefront in EWR-based finance transactions: cotton and rice. 74.2% of issued cotton EWRs and 114.2% of issued rice EWRs are used as collateral in 2017. Considering the low trading volume in cotton and rice, it can be easily stated that the main aim of farmers who put their cotton and rice in the licensed warehouses is to secure finance by showing them as collateral. In 2017, 25% of the

loan interest arising from EWRs based finance transactions was covered by TMO in order to support the EWR system.

3.4. Incentive Mechanisms for EWR System in Turkey

There are several incentive mechanisms introduced regarding EWR system to encourage it throughout the country. One of the most important incentive is intervention purchases of TMO through the EWR system. In 2017, 240 000 tons of wheat and 95 000 tons of corn were purchased by TMO using EWR system. (TMO, 2017) In addition, the tax regulations that promote the EWR system have been put into effect with the Law on the Amendment of the Income Tax Law no. 5904 published in the Official Gazette no. 27277. According to the law;

The gains arising from EWR trading are exempted from income tax and corporate tax until 31/12/2014. This period has been extended to 31/12/2018 and then to 31/12/2023.

Value added tax exemption is applied to EWR trading.

Contracts between the licensed warehouse and farmers and the EWRs are exempted from stamp tax (Sezal, 2017).

Also, in 2014, rental fee support was introduced in order to increase the capacity of licensed warehouses in Turkey. According to the Council of Ministers Decree no. 6849 published in the Official Gazette no.27147, for the commodities stored in licensed warehouses, there will be rental fee support for the next 5 years. Within this framework, 50% of rent fees are paid to the warehouses within the limits of specified amount. Besides, discount is applied to the interest rate of EWR-based loans and the banks provide loans up to 10,000,000 TL at discounted interest rate to the investments of licensed warehouses (Sezal, 2017).

In addition to those incentives, in recent years, within the scope of the development of commodity exchange system, establishment of Specialized Commodity Exchange has been decided. In this way, decentralized small exchanges will be merged into one central exchange and EWR transactions will be executed in a single electronic platform. It is expected that establishment of Specialized Commodity Exchange will serve to deepening of spot EWR market. A deep spot market will directly contribute to the widespread use of futures contracts based on EWRs at VIOP. As of April 6, 2017, Specialized Commodity Exchange with the status of joint-stock company has been established with the decision of Council of Ministers but it has not yet been put into operation. The partners of the Exchange are TOBB, TMO, Borsa Istanbul, Takasbank, MKK, Ziraat Bank, Vakıflar Bank, Halk Bank and 33 commodity exchanges.

Within the scope of the development of licensed warehousing and EWR system in agricultural markets, the establishment of the Specialized Commodity Exchange is an action item in Istanbul International Finance Center Program Action Plan which is the part of 10th Development Plan for 2014-2018. The item for the integration of agricultural commodities into the financial markets and the establishment of Specialized Commodity Exchange was also included in the Presidency 100-Day Action Plan published on 03/08/2018.

4. Conclusion

According to NIE, each country and society have different traditions, customs and institutional structures. Even if efficient economic and political formal institutions of developed countries are imitated by developing countries, the same institutional performance may not be achieved because of the differences of informal institutions. (Dumludağ, 2014) At this point, North (1990) argues that there should be a congruence between formal and informal institutions in order to have an impact on reducing transaction costs. In an economic environment where there is no such

congruence, institutions can increase transaction costs instead of reducing them (North, 1990).

In the light of the data presented in the article, it is concluded that even though the institutional mechanisms for spot and futures EWRs trading are very similar with international best practices, market inclination and EWR-based trading volume is at a very low level in Turkey and there is no strong congruence between formal and informal institutions in commodity markets.

Although more than a decade has passed since the release date of the legislation on the licensed warehousing system, the system is not yet at the desired level in terms of both usage and capacity. Also, based on the data provided in the study, futures EWR trading transactions have not used so far and very small proportion of produced grain is subject to spot EWR trading. In developed countries, especially in USA, the transition from spot to futures transactions in commodity markets has been realized many years ago. However, in Turkey, this transition has not been realized yet and market inclination in commodity sector is at the beginning level. This case also sets an example for the problem of congruence between formal and informal institutions stated by NIE.

In such cases, NIE offers that in order to increase economic performance, it is very important to provide effective incentives by economic and political formal institutions. In this regard, various policy instruments and incentive mechanisms were introduced in Turkey to promote the use of spot and futures EWR contracts for the purpose of risk management in the commodity sector (Kaya, 2017). Substantive steps have been taken by government support and considerable increase in spot EWR transactions have been realized in recent years.

However, current decentralized commodity exchange system poses a problem for liquidity development in spot EWR transactions (Memiş & Keskin, 2015). It is foreseen that establishment of Specialized Commodity Exchange will have a positive impact on deepening of spot EWR market because of the liquidity provided by the merge of small commodity exchanges throughout the country. It is also evaluated that deep spot market will pave the way for the use of futures agricultural contracts by the market participants.

As a result, there are structural and institutional problems that need to be overcome in order to increase the use of EWR system in the commodity sector. It is also worth noting that as a result of public incentives, the capacity of the licensed warehousing is increasing and the use of EWR system in spot trading is getting widespread year by year. Considerable progress has been made so far but the proportion of EWR in total grain trade in Turkey is still very small. At that point, further studies can be executed in relation to the farmers' awareness and financial knowledge about the public incentives for EWR system within the context of behavioral economics especially nudge theory.

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