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Identification and Measurement of the Standards for Trading in Future Markets in Agricultural Crops

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ABSTRACT

The purpose of this research was to identify and measure the required standards for trading in future markets in agricultural crops. To this end, 17 experts were selected and interviewed using the Grounded Theory and semi-structured interviews of experts. The data were analyzed after identifying the standards for 18 agricultural crops that were not listed on the Commodity Exchange and Futures Markets. The required data for calculating the standards were extracted from databases in 2008-2017. Initially, the data from previous research and interviews with experts were analyzed using the coding method. These data, which were extracted from in-depth interviews with 17 people, were analyzed in three steps of open coding, axial coding and selective coding and 40 extracted keywords were placed after changes (deletion and integration), which finally decided to select all standards on 6 standards. The required standards for acceptance in futures markets include crop revenue risk, cash market size, fluidity cost, degree of homogeneity, commerciality ratio, and perishability. According to each obtained standard, the required values for each product were calculated.

KEYWORDS: Future Market, Agricultural Crops, Standard Identification, Grounded Theory

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1. Introduction

Farmers face a variety of natural and unnatural hazards in agricultural activities. As a result, their revenue from agricultural production is associated with instability. Every year, farmers worry about paying off loans, living expenses, and so on because of an uncertain revenue. A wide range of risks affect revenue from agricultural production. Some of these risks include production risk, price or market risk, financial risk, and human risk. One of the critical risks that always afflict farmers is the risk of price fluctuations in agricultural crops (Ghazali et al., 2016). The importance of price risk for farmers is due to the fact that price changes cause changes in producer profits (Jordaan and Grove, 2007). The instability of the price of agricultural crops increases the inherent uncertainty in this sector by creating revenue uncertainty for the producers of these products (Helmberger and Chavez, 1996). Numerous tools are available for marketing and risk management for agricultural producers in the face of significant price risks (Penning et al., 2008).

Today, the development of agricultural futures markets for crops is recognized as a common structural policy in correcting the traditional market problems of these products worldwide in the form of a wide range of agricultural commodity exchanges. This wide range of value use different types of derivatives instruments to cover market risk while having the necessary organization and managerial focus, as well as learning different groups active in this market. The history of the use of such markets dates back to the early 1860s (Do, 2004; Purcell and Conte, 2003).

Accepting the formation of future markets for agricultural crops is one of the most successful structural policies to solve the problems of the agricultural sector. Considering the formation of the future market of agricultural crops and the direct enjoyment of this sector and consequently the whole economy from the benefits of creating such a market, the most important effects and benefits of the successful formation of the future market of agricultural crops can be expressed in the following cases:

- Modifying the traditional market structure
- Reducing the price and transaction risk
- Improving the quality of agricultural crops by standardizing them
- Modifying and changing the cultivation pattern in a way that creates information transparency
- Help to develop the agricultural sector

The above set of effects in the presence of a thriving and efficient future market of agricultural crops can contribute to the development process in this sector. Increasing the efficiency of the agricultural market, reducing marketing margins and improving the network of warehousing, packaging and distribution of crops, along with the development of investment in the agricultural sector are a set of factors that can accelerate the growth and development of the agricultural sector.

A futures contract and consequently futures markets are some of the price risk reducer instruments. Thus, the futures contract is a standard for purchase traded on stock markets such as the World Trade Organization. A futures contract is an agreement to exchange a good for a certain price at a given time and at a specific place for delivery. Therefore, the present research project identifies the necessary standards to create a future market and calculates these standards for agricultural crops to enter the future market.

2. Research Literature and theoretical foundations

Various types of futures contracts have been so far introduced and used in different markets of the world.. Planings and Linhold (2015) expressed 140 new derivative instruments, which were introduced across the world between 1994 and 1998. According to the same reference, London International Financial Futures & Options Exchange (LIFFE) and CME have the largest number of launched derivative instruments, with 15 and 14 derivative instruments respectively from 1994 to 1998. It seems that the increase in the number of new derivatives over time can only follow the growth and development of new future markets and thus

increase the number of products and tradable assets in these markets as well as the emergence of new types of derivative instruments.

Further studies show that in addition to the above two reasons, another important factor has an effect in this regard. Previous studies suggest that many new futures contracts fail (Brorsen & Fofana, 2015). Some quantitative studies have also shown that, the implementation of less than half (about 42%) of futures contracts is practically successful on average (Silver, 1981). Garcia and Littlehold (2004) also cited only about one-third of the successful derivative instruments out of 250 futures contracts and 90 new option contracts (options) entered into in the United States between 1975 and the early 1990s. In particular, the risk of failure of commodity derivative instruments, including agricultural derivatives, is potentially high (Carlton, 1984).

In addition, the implementation and development of commodity derivative instruments, such as futures contracts, is a costly and time-consuming process, especially if it is to be used for the first time (Penningzo Littlehold, 2015). In the event of the failure of these contracts, the social costs resulting from the distrust of individuals in the community to the effectiveness of the implementation of such structural policies are also very important in addition to the heavy costs of implementation and development of future contracts for agricultural crops. The psychological effect of the first unsuccessful experience of launching futures markets, which is in any case a new phenomenon in the country's economy, in a word, allows to re-design it carefully. Therefore, the purpose of this research is to examine the required standards for agricultural crops in the futures market and crops that are eligible to join the futures market.

The following can be mentioned in the research literature:

Kazemnejad et al. (2020) examined the contractual agriculture based on the value chain of agricultural crops by library and field methods (based on a supplementary questionnaire by 32 experts and specialists of the Jihad Agricultural Organization of the provinces in 2019). Studies demonstrate that the problems of the agricultural sector in the value chain of agricultural crops are mainly the lack of coordination and inadequate link between different parts of the chain, lack of access of farmers, especially small farmers to the market, instability of employment and revenue, supply of agricultural inputs, high transaction costs and cost of production, price instability, lack of working capital liquidity, and lack of access to and identification of target markets. Hosseini Yakani and Zibaei (2007) and Zibaei and Hosseini Yakani (2008) examined the effects of changing the delivery period on future price behavior of agricultural crops to determine the best length of the average settlement period of futures contracts (as one of the most important features of futures contracts). In these two studies, the choice of the length of the delivery period of future contracts for this crop was considered due to the high volume of cash contracts for maize products on the Iranian Agricultural Commodity Exchange. In this study, cash settlement index was first introduced and determined to calculate future prices. In calculating this index, the published statistics of corn product transactions in the Iranian Commodity Exchange and the traditional market were used. A GARCH model (1,1) was used to estimate the conditional structure of future price fluctuations to determine the best delivery period in different scenarios. The results of these studies indicated that increasing the length of the delivery period of futures contracts reduces volatility and increases the level of future prices of maize. Therefore, the performance of the risk hedging mechanism can be strengthened by choosing longer delivery periods, and as a result, the incentive for maize producers and traders to enter future markets can be increased. If the future market of agricultural crops is launched in Iran, the entry of any product into this market is not appropriate and, to put it better, will not be successful. Hosseini Yakani, Zibaei, and Allen (2009a) considered the selection of the best crops to launch this market in Iran. In addition, Hosseini Yakani, and Zibaei (2009) and Hosseini Yakani, Zibaei, and Allen (2009b) determined the required deposit amount, allowable daily price fluctuations, delivery period, minimum unit price change and the size of future contracts of saffron, pistachio, and rice as potential futures contracts in Iran. Ghazali et al. (2016) identified the factors affecting the lack of prosperity in agricultural ring trading on the Iran Commodity Exchange. The research results indicate that the failure of agricultural

ring trading in the Commodity Exchange can be related to three main groups of macro government factors, factors related to the Commodity Exchange, and structural factors in the agricultural sector.

Chervanwang et al. (2018) compared the prediction power of implicit fluctuations calculated from the prices of option contracts on the Philadelphia Stock Exchange (PHLX), the Chicago Mercantile Exchange (CME), and the Over-the-counter market (OTC). The results showed that the implicit fluctuations calculated based on OTC prices also include the information contained in the implicit fluctuations calculated from PHLX and CME prices. Similar to the results of other studies (e.g. Christafersen and Mezata (2005)) as one of the most recent studies, this study also shows a stronger power of implicit fluctuation indicators in predicting future fluctuations (regardless of whether they are based on PHLX OTC or CME prices) than fluctuation indicators based on time series data.

In another large study conducted by Zakmari et al. (2015) using data from 35 futures markets including a large number of agricultural markets, researchers evaluated the ability of the above models to predict fluctuations in 70 working days. The results showed that the predicted fluctuations of agricultural crops using the biased-black model, include all the information observed in historical fluctuations. Manfredo et al. (2013) compared the power of time series methods, the Black Model, and the hybrid approach in predicting cash price fluctuations rather than their future price fluctuations. The results indicated a higher power of the combined method in prediction.

Karali et al. (2009) also presented a new business method for the future prices of several futures contracts to examine the factors affecting volatility and future price fluctuations by changing the type of contract. The framework of the new introduced model can examine the relationship between future price fluctuations simultaneously with the amount of physical inventory of goods and the time of contract delivery. Fang and Xie (2000) studied the monthly data on futures exchanges to find little evidence of the effect of these exchanges on price fluctuations. Irwin and Holt (2016) also used CFTC daily statistics on large hedge fund exchanges in 13 different futures markets and concluded that there was little positive correlation between the volume of large hedge fund exchanges and market fluctuations. Tao and Song (2016) conducted an experimental study of the participation of small Hong Kong futures market participants in the price discovery process. The results of this study showed a 16.8% share of small traders in this market, which is an extremely high share compared to the low level of trades made by them. Therefore, the researchers concluded that small market participants play an important role in the process of discovering future market prices.

Kaber et al. (2019) examined whether futures markets determine the price trend in the electronic markets of foreign currencies. The results of this study showed that cash markets guide the process of price discovery of both currencies during the period under review. Chen and Ga (2018) examined the process of price discovery in Taiwanese markets. The results showed that reducing the minimum unit of price change reduces the gap between bids and ask prices and thus increases the role of futures markets in the price discovery process.

Edward and Martha (2020) studied the impact of a new type of futures contract on agricultural crops in which the producer buys inputs at a discount, but agrees to lower the price of the crop. The buyer pays the supplier to compensate for the discount. Huang and Lock (2017) examined the role of traders in the price discovery process. According to the results of this study, price direction by active market traders in both volatile and downtrend market is more significant, which can be due to the more valuable information in these conditions. This study showed that more active traders generally trade at the same times and in the same directions. Hall et al. (2016) examined the process of discovering the option price of futures contracts. The market for futures contracts related to them has been organized and regulated by the stock exchange, but there has been no change in the market for option contracts by the stock exchange.

3. Methodology

The present research is conducted using the mixed method, which is a qualitative-quantitative method because it will use a qualitative approach in the design phase of the conceptual model, and use a quantitative approach in the model explanation phase. This research is an inductive and exploratory-applied study because it seeks to identify and rank the entry of products into the futures market with a qualitative method. It should be noted that this research will be conducted in the following two general phases:

- Phase 1: identifying standards based on the qualitative methodology of grounded theory. The reason for using the grounded theory is the power of this method in presenting indigenous and realistic models in various fields (Zakai, 2010).

In this section, interview data with experts is analyzed using coding method. This data, which was extracted from in-depth interviews with 17 experts, will be analyzed in two stages (open coding, axial coding, and selective coding).

- Phase 2: Using theoretical foundations and previous studies to identify standards and also prioritize selected crops based on identified crops criteria to enter the futures market. The data of this research include the price of agricultural crops, crop performance from the statistics of the Ministry of Jihad for Agriculture, the price received by producers from the Statistics Center of Iran during 2006-2017 and the cost of agricultural crops from the Research Institute for Planning, Agricultural Economics, and rural development was the Ministry of Jihad Agriculture.

According to the studies of Black (1986) and Brotherson & Zana (2015), a successful futures contract is considered in this study as the contract with the largest volume of transactions. Therefore, determining the factors affecting the success of futures contracts for agricultural goods is equivalent to determining the factors affecting the volume of exchanges of these contracts. Different researchers have cited different criteria to explain the reasons for the success or failure of different futures markets. Measuring the importance of the above factors in the success of future markets for agricultural crops is important in order to use them in ranking and selecting the best and most suitable crops for trade in the form of futures contracts in Iran.

To this end, various statistics and information including various studies and interviews were conducted to identify factors and standards for acceptance in future markets and the degree of product homogeneity. Furthermore, the databases of the Ministry of Jihad Agriculture were collected from the Commodity Exchange to identify prices, production, yield, and area under cultivation, the amount of price fluctuations, and transactions, as well as to check the amount of exports and imports of products from the selected customs organization. The values of the introduced explanatory variable (standards affecting the success of futures contracts) and the only variable described in this study (the value of future transactions) can be estimated within the framework of estimation techniques using pooled data during the study period.

Future exchange volume (FTV) information for each of the goods examined in different years was needed to estimate the coefficients of the standards. According to Black (1998) and Brorson & Fofana (2015), a successful futures contract is considered as a contract in this study that allocates the largest volume of exchanges. Determining the factors affecting the success of futures contracts for agricultural goods is equivalent to determining the factors affecting the volume of exchanges of these contracts. Different researchers have cited different criteria to explain the reasons for the success or failure of different futures markets. Cash market size is one of the important factors whose impact on the volume of futures exchanges is evaluated in this study. The total supply value of each crop in each year is considered as a criterion for measuring the cash market size of that product in the year in question.

According to previous studies, the value of future exchanges is a direct function of the size of the product cash market associated with the futures contract. Equation 1-4 is used to calculate the value of future exchanges (Black, 1998; Borsen, 2015; Hosseini et al., 2010).

$$FTV_i = CMS_i . HR_i . VLCT_i \quad (1)$$

In which, FTV_i is the futures trading value, CMS_i is the cash market size, HR_i is the hedge ratio, and $VLCT_i$ is the velocity. Exchange velocity indicates the number of times that commodity i is traded in the futures market. It is very unlikely to have successful and thriving secondary market without a strong and inclusive primary market. The larger the cash market, the greater the volume of futures exchanges as more risk-takers and traders are attracted to the futures market.

The main purpose is to measure the importance of the above factors in the success of future markets of agricultural crops to use them in the ranking and select the best and most suitable crops for trade in the form of futures contracts in Iran. For this purpose, ten-year statistics and information collected from the databases of the Commodity Exchange, the Ministry of Jihad for Agriculture and the Statistics Center have been used.

In the first step, the above six factors are calculated for the selected goods and markets that will be introduced in the results and discussion section. Statistics on the value of annual exchanges of futures contracts for all selected goods and markets were also obtained from the Agricultural Commodity Exchange database in addition to the statistics and information needed to calculate the above six factors. Equation 2 is estimated using the pooled data after calculating the values of the six explanatory variables (six factors affecting the success of futures contracts) and the only explanatory variable studied in this study (the value of future exchanges) during the ten-year period under study.

$$FTV_{i,t} = f\ (OP_{i,t}, SPF_{i,t}, FS_{i,t}, LC_{i,t}, H_{i,t}, CR_{i,t})$$

It is necessary to determine the most suitable products for launching the future market in Iran by applying the estimated coefficients of the above equation on them after estimating the coefficients of each of the factors examined, which shows the average importance of each of them in influencing the success of future contracts on agricultural crops. In this study, 12 crops including rapeseed, forage maize, wheat, seed maize, lentils, chickpeas, barley, soybeans, and garden crops of dates, pistachios, raisins and tea were selected as the most important agricultural crops of Iran.

4. Findings

As explained in the Materials and Methods section, this research uses two phases:

- Phase 1: identifying standards for acceptance in future markets: Experts are interviewed and the data obtained from interviews with experts are analyzed using the coding method.
- Phase 2: Quantitative phase: In the quantitative section, each of the identified standards is first calculated. Then, the readiness of the product to enter the future market is examined from the information obtained from the calculations of the standards.

Qualitative phase: classification of standards for acceptance in future markets

In this section, standards are extracted from the theoretical foundations and research literature in the future markets of agricultural crops. The results of these studies are shown in Table (1):

Table 1. Extraction of standards based on research literature

No.	Researcher	Year	Standards
1	Chizari	2003	There should a full awareness about price, supply, and demand for the product, as well as storage capability.

2	Hosseini	2009	The values of relative basis risk (RBR) variables, spot price fluctuations (SPF), cash market size (CMS), fluidity cost (LC), degree of homogeneity (H) and commerciality ratio (CR) are the most important standards for successful contracts.
3	Mojaverian	2015	Adherence to standards, crop homogeneity, and grading of most agricultural crops
4	Kermani and Hassani	2003	Goods must be standardized, classified, and have complete specifications.
5	Golriz	2015	The successful exchange of any commodity on the stock exchange depends on the three characteristics of standard, sufficient life, and the limited fluctuation of the cash price of that commodity.
6	Golriz	1995	The seller must have complete information about the specifications of that crop. Agricultural and industrial goods must be raw and unprocessed. Perishable goods must have a long life so that they will not be difficult to deliver in the future. Also, these goods must be reproducible. The cash price of a commodity should not fluctuate enough to cause uncertainty.
7	Soltani et al.	2009	The reason for the lack of success of the agricultural ring in the commodity exchange is due to the traditional structure of Iranian agriculture, which makes the volume of transactions in the agricultural ring less prosperous and small in case of merger and independent activity of the exchanges.

Resource: Summary of research studies

The second qualitative part: analysis of interviews by coding method

In this section, the data obtained from interviews with experts are analyzed using the coding method. This data, which was extracted from in-depth interviews with 17 people, will be analyzed in two stages (open coding, axial coding, and selective coding). In this study, 17 managers, officials, and experts of the Agricultural Commodity Exchange, professors, and traders in the agricultural sector were selected as the statistical population for the interview. All of them had at least a high school diploma. The important point in this organization is that the scope of activities is very large due to the type of management activity, and there are significant differences between different departments. It was possible for the person being invited for the interview to express his/her point of view governing the interview space and to present the information from his/her own point of view. To this end, researchers have tried to select their research sample in the following sections to obtain different opinions and views.

Interviews were used to collect the data of this research in the qualitative part. All interviews have been recorded and the audio file has been fully implemented. In the last interviews, theoretical saturation was obtained, but the interviews were conducted to ensure the adequacy of the data. The purpose of the research and the interview process are explained to the interviewee in each interview. Both closed-ended and open-ended questions were used throughout the interview process. The questions asked of the experts were behavior-oriented in order to identify the standards. In this part, the interviews were reviewed several times and sentences including keywords were extracted. Extraction of standards from interviews along with coding analysis is presented in the following table:

Table 2. Level one coding (speech) to set standards

Marker	Keywords	Standards
PA1	Having high productivity in production	High efficiency
PA2	Having relative productivity in production	Relative advantage in production
PA3	Cultivating based on schedule	Capability of scheduling
PA4	Not being rot quickly	Lack of corruption
PA5	Being able to store	Ability to store
PA6	Having low price fluctuations	Lack of fluctuations in price
PA7	Complete information on cultivation and area under cultivation and demand should be available	Complete product information

PA8	Demand for the crop should be available.	Existence of a buyer
PA9	The price should be reasonable.	Reasonable price
PA10	There must be a possibility of stable supply.	Stability in supply
PA11	It should be easy to send.	Possibility of transportation
PA12	Goods should not be subject to supply restrictions.	No supply restrictions
PA13	The supply of goods by the applicant must be legal.	Possibility of enforcing regulations
PA14	The possibility of fair price discovery should be provided in the stock market.	Proper pricing
PA15	The amount of quality products should not decrease much.	No decline in product quality
PA16	Revenue must be stable and predictable.	Revenue stability
PA17	Production and distribution time must be controllable.	Production and distribution time control
PA18	Packaging must have the required standard.	Standard packaging
PA19	Product quality must be very much considered.	good quality
PA20	Must be transparent about price and future revenue.	Revenue forecast
PA21	The product must be customer friendly and marketable.	Commercialization capability
PA22	Determining the future trend of product prices	price transparency Product
PA23	The seller must have complete information about the specifications of that product.	Complete product information
PA24	Agricultural and industrial goods must be primary, raw, and unprocessed.	Converted mode
PA25	Perishable goods must have a long life so that they will not be difficult to deliver in the future.	Adequate life and longer shelf life
PA26	These goods must also be reproducible.	Production capability in the country
PA27	The cash price of a commodity should not fluctuate enough to cause uncertainty.	Low volatile cash prices
PA28	Product homogeneity and grading should be possible.	Product homogeneity
PA29	It must have a low price risk and be able to be stable.	Low price risk
PA30	Full knowledge of the price, supply, and demand for the product must be well done.	Transparency of goods
PA31	The product must be well standardized.	The ability of being Standardized
PA32	Must be capable of storage.	Storage capability
PA33	It should have a good global marketability.	Marketability
PA34	The cost should be reasonable.	Low cost of production
PA35	It must have mass production.	Mass production
PA36	It must be able to compete globally and quantitatively.	Ability to compete
PA37	Must have a high profit margin.	High profit margin
PA38	Distribution between time and storage of goods should not reduce seasonal supply fluctuations to some extent.	No fluctuations in supply
PA39	Goods must be reproducible.	Reproductive capability
PA40	It should have a comparative export advantage compared to other agricultural products.	Comparative advantage of exports

Resource: Research Findings

Once specific phenomena can be identified in the data, then concepts can be grouped accordingly. The selection of keywords from the 40 concepts extracted is based on the principles of repetition, emphasis, and importance (theoretical basis or researcher's understanding), which of course were selected qualitatively. In other words, the concepts mentioned by several interviewees (repetition) or subject to special emphasis of one person and the importance of that concept has been determined by the research literature or the researcher's diagnosis have been selected for the final model of the interview. Some concepts in the refining process were merged due to differences in their level of abstraction or the

possibility of combining them for summarization, which was done continuously in the theme analysis process. The concepts mentioned in the literature and interviews were re-examined comparatively after applying the mentioned changes (deletion and integration). In the end, it was decided to select all concepts based on 6 standards. The results of the classification are given in Table (3):

Table 3. Classification of standards and implementation of components from previous research and interviews

No.	Standards	Research	Interviews
1	Product revenue risk	●	●
2	Cash price fluctuations	●	●
3	Fluidity cost	●	●
4	Degree of homogeneity	●	●
5	Commercial ratio	●	●
6	Perishability	●	●

Necessary standards for acceptance in futures markets are product revenue risk, cash market size, fluidity cost, degree of homogeneity, commerciality ratio, and perishability.

Phase 2 (quantitative): Calculating the values of standards and identifying crops to enter the futures market

In this section, the results of calculating the values of the standards and determining the most appropriate crops and ranking them for entering the futures market are presented.

It should be noted that only saffron is traded in futures contracts in Iran. Crops such as rapeseed, forage maize, wheat, seed maize, lentils, chickpeas, barley, soybeans, and garden crops of dates, pistachios, raisins and tea were listed on the Agricultural Commodity Exchange, but they are not traded in futures contracts. Therefore, agricultural crop are examined and feasibility, which are available in the commodity exchange but are not traded in futures contracts. Livestock products were not studied because their entry into future markets is not possible in the early stages of setting up such markets due to their initial prerequisites.

Accordingly, the values of product revenue risk, cash market size, fluidity cost, degree of homogeneity, commerciality ratio, and perishability should be calculated as the most important necessary standards on the success rate of futures contracts based on previous studies and interviews, for the mentioned goods and standards from 2008 to 2017. The results of calculating each of these factors are presented below.

Product revenue risk

Since the income of each crop in the agricultural sector consists of the performance and price of each crop, the obtained risk factor can well represent the production risk and price and the total income of each crop.

According to Sharp (1959), the parameter resulting from the linear regression of an investment (trading) revenue (TR_i) on the return of the market portfolio gives the systematic risk factor of the investment. In this section, Sharp theory is used to measure income risk and the values of the coefficients are compared with one:

Table 4. Revenue risk of agricultural crops

Crop	Risk factor
Rapeseed	0.94
forage maize	0.91
wheat	0.87
seed maize	0.84
lentils	0.82
chickpeas	0.81
barley	0.79
soybeans	0.44
dates	1.11
pistachios	1.11
raisins	0.94
tea	0.50

This coefficient have five different values for different investments. The first case, beta equal to one, changes in the return on such investments are fully consistent with market changes. In other words, the return on investment also changes by one unit for every unit of change in market return (portfolio). In fact, the investment risk in question is the same as the portfolio risk. Second case (beta greater than one): includes date and pistachio. In this case, changes in return on investment are greater than changes in market returns. In other words, a unit of change in market returns causes the return on this type of investment to change by more than one unit. This type of investment is known as aggressive investment and carries a lot of risk for the investor. Therefore, in this case, the fluctuations in the return on investment are greater than the fluctuations in the portfolio, so the investment is more risky. For example, if the revenue of a pistachio crop has a beta greater than one compared to the portfolio of a region, it follows that the risk of production is higher than the risk of the portfolio of the region. In this case, the producer expects the revenue to be higher than the revenue from the regional portfolio. Third case (beta less than one), includes rapeseed, forage maize, wheat, seed maize, lentils, chickpeas, barley, soybeans, and tea. In this case, changes in return on investment are less than changes in market returns. This type of investment is known as defensive investment whose risk is much lower than the risk of the measured portfolio. Fourth mode (beta less than zero); In this case, the return on investment is inversely related to market returns. Fifth mode (beta equals zero); In this case, the return on investment is not related to market returns.

Cash price fluctuations

In this study, cash market price variance was simply used to calculate the rate of cash price fluctuations. Given that different crops have different values in the same weight units, the variance of cash price indicators calculated in 2006 was considered as cash price fluctuations. The coefficient of variation of cash prices can also be a good criterion for measuring these fluctuations. However, manufacturers will be more inclined to use futures contracts to reduce market risk in a market with high levels of price volatility. Therefore, there is a positive relationship between cash price fluctuations and the volume of future transactions in the expected results.

Table 5. Cash price fluctuations

No.	Crop	Cash price indicators
1	Rapeseed	**62.1769**
2	forage maize	**12.1896**
3	wheat	**12564**
4	seed maize	**1749**
5	lentils	**3.15550**
6	chickpeas	**5.4103**

7	barley	**473.85**
8	soybeans	**8.1558**
9	dates	**12.2646**
10	pistachios	**118500**
11	raisins	**400.77**
12	tea	**26.2961**

Calculation of variance of cash price indicators is presented based on the base year 2006. As shown in the column for standard deviations of the price index, the lowest cash price fluctuations are related to the raisin and the highest amount of these fluctuations are related to the pistachio. It is expected that the producers of this crop in the country will actively trade contracts due to facing a high price risk in the cash market, as well as high price fluctuations.

Degree of homogeneity

In the Delphi method, the opinions of experts and specialists are taken from them in several stages. To this end, they were asked in the first step to assign a number between 1 and 10 to each of the crops. In this way, the proximity of the presented value to 10 indicators of higher homogeneity and its proximity to 1 indicates more heterogeneity of the studies crop. In the second stage, the results of the previous stage questionnaire were presented to the experts in the form of calculated values μ and $(\mu + \sigma)$ after collecting the first stage questionnaires and calculating the mean values (μ) and standard deviation (μ) of the values collected for each product. They were asked to re-evaluate the values stated in their previous step in relation to the degree of homogeneity of each product. If their revised value is in the distance $(\mu + \sigma)$ of each product, it declares that value and confirms the distance. Otherwise, they will announce their reasons for this disapproval along with presenting the new value. In a commodity futures market, the commodity must be easily scalable and unitary. In this study and other studies that have been done in the field of examining the factors affecting the success of futures contracts, degree of homogeneity is all considered as a factor in the selection of goods for exchange in future markets.

Table 6. Degree of crop homogeneity

No.	Crop	Degree of homogeneity
1	Rapeseed	**8.96**
2	forage maize	**8.88**
3	wheat	**8.15**
4	seed maize	**8.55**
5	lentils	**8.46**
6	chickpeas	**8.92**
7	barley	**7.69**
8	soybeans	**9.19**
9	dates	**8.8**
10	Pistachio	**7.84**
11	Raisins	**8.48**
12	Tea	**7.89**

The table above shows the values of μ and $(\mu + \sigma)$ of the last step of the Delphi method. According to the information in this table, soybean is the most homogeneous and barley is the most heterogeneous crop

among all tradable commodities in the futures markets of selected agricultural products. Homogeneous products are expected to be more prosperous and successful due to their high standardization and rating capabilities, which are essential for tradable products in future markets.

Fluidity cost

A comparative criterion was used to measure fluidity costs. More fluidity in the futures market of a particular commodity means higher costs in the futures market of other commodities. Because the degree of fluidity in a market depends on the size of that market, the size of the cash market (total supply value) of other markets was considered as a relative measure of the cost of fluidity in a particular market. The indirect relationship between the fluidity cost of each market and the number of futures exchanges in that market is quite logical and predictable.

Table 7. Fluidity cost of selected crops

No.	Crop	Fluidity cost (Rials per hectare)
1	Rapeseed	**10897467**
2	forage maize	**13638635**
3	wheat	**8328086**
4	seed maize	**13235142**
5	lentils	**11196296**
6	chickpeas	**723333**
7	barley	**9549813**
8	soybeans	**10321073**
9	dates	**12523142**
10	Pistachio	**12534215**
11	Raisins	**8532141**
12	Tea	**6232561**

The fluidity cost of a commodity exchange in a particular market is directly related to the fluidity ratio of other usable markets, and the fluidity ratio in each market also depends on the size of that market. In this study, the cash market size values of each commodity in each market were considered as an indicator of the fluidity cost of that market. Therefore, according to the information on the fluid cost column in Table (5), the lowest and highest fluid cost values are for tea and forage maize, respectively.

Perishability

The percentage of water in the product body was replaced to measure the perishability. The percentage of water content of each is given in the following table:

Table 8. Perishability rate of selected crops

No.	Crop	Perishability
1	Rapeseed	**24.32**
2	forage maize	**32.12**
3	wheat	**32.12**

4	seed maize	**18.3**
5	lentils	**12.5**
6	chickpeas	**12.2**
7	barley	**22.2**
8	soybeans	**26.13**
9	dates	**42.12**
10	Pistachio	**28.3**
11	Raisins	**31.2**
12	Tea	**22.2**

The results of the above table show that dates with 42% have the highest and chickpeas with 12.5% have the lowest perishability ratio.

- Commerciality ratio

The commerciality ratio index is calculated from the total import and export of goods on the total production for each product.

Table 9. The commerciality ratio of the selected crops

No.	Crop	Commerciality ratio
1	Rapeseed	**4.32**
2	Forage maize	**42.12**
3	wheat	**5.39**
4	seed maize	**4.32**
5	lentils	**1.5**
6	chickpeas	**12.2**
7	barley	**3.6**
8	soybeans	**32.6**
9	dates	**8.32**
10	Pistachio	**28.3**
11	Raisins	**31.2**
12	Tea	**22.2**

The above table shows that forage maize has the highest and lentils have the lowest commerciality ratio.

5. Conclusions

In this research, the data from previous research and interviews with experts were first initially using the coding method. These data, which were extracted from in-depth interviews with 17 people, were analyzed in two steps (open coding, axial coding, and selective coding). In this part, the interviews were reviewed several times and sentences including keywords were extracted. Standards were extracted from interviews along with coding analysis. Finally, the selection of keywords from the 40 extracted concepts is based on the principles of repetition, emphasis, and importance (theoretical basis or understanding of the researcher), which of course were selected qualitatively. Some concepts in the refining process were merged due to differences in their level of abstraction or the possibility of combining them for summarization, which was done continuously in the theme analysis process. The concepts mentioned in

the literature and interviews were re-examined comparatively after applying the mentioned changes (deletion and integration). In the end, it was decided to select all concepts based on 6 standards.

The results of classification and grouping of standards are presented. The required standards for acceptance in futures markets include crop revenue risk, cash market size, fluidity cost, degree of homogeneity, commerciality ratio, and Perishability. The market of agricultural products in Iran has a very important and fundamental place in the overall structure of the country's economy. This market follows a traditional market due to the type of structure of agricultural products, and such markets have created problems for producers, consumers, policy makers, and planners in the agricultural sector. Producers of the agricultural sector of Iran, who are considered as one of the important factors in the market structure, face many problems, some of the most important of which are:

A. Seasonal fluctuations in the price of agricultural crops and its instability.
B. Lack of transparency in the price of agricultural crops.
C. Fluctuation in the supply of agricultural crops.
D. Inadequate information in the main markets.
E. Extensive and significant presence of brokers and intermediaries in the market.
F. Lack and inadequacy of financial credits required by producers at different times.
G. Lack of comprehensive and integrated competitive market in all stages of trading.
H. Inefficiency of marketing network and marketing services.

Such problems arise mainly in the absence of an appropriate market in the form of agricultural exchange. Since the stock market is an alternative to the current market of products, these problems will be solved in the long run by launching the stock market of agricultural products and using special levers and functions. One of the important tools in solving the problems of the agricultural products market is the creation of a commodity exchange market. In other words, the Agricultural Commodity Exchange is a place where cash-futures contracts are traded for agricultural commodities. In other words, this organized and cohesive market has a large number of suppliers or producers of agricultural goods or traders (predecessors, workers, rural cooperatives, etc.), who offer their goods to that market, until their cash-futures contracts to be traded on the stock exchange after Expert reviews and pricing by market brokers. However, a futures market is formed for some crops that affects the price of produce, and one of the criteria is the amount of risk from farmers' earnings.

1. The results show that the standards of product revenue risk, cash market size, fluidity cost, degree of homogeneity, commerciality ratio, and perishability are the most important indicators and standards for entering the futures market that should be considered by policy makers.
2. The revenue risk identified that pistachio and date have a high revenue risk and tea and soybeans have a low revenue risk, which should be considered when deciding on the type of risk.
3. Regarding the acceptance of products in the futures market, it should be considered that the lowest fluctuations in cash prices are related to raisins and chickpeas and the highest amount of these fluctuations are related to pistachio. Therefore, it is expected that the producers of this crop in the country will actively trade contracts due to facing a high price risk in the cash market, as well as high price fluctuations.
4. Agricultural policymakers need to consider that soybeans, rapeseed, chickpeas, forage and seed maize, barley, pistachios, and tea are the most heterogeneous among all tradable commodities in the futures markets of selected agricultural crops. Homogeneous products are expected to be more prosperous and successful due to their high standardization and rating capabilities, which are essential for tradable products in future markets.
5. Regarding the examination of fluidity cost, it should be considered that the lowest and highest values of fluidity are related to forage maize, pistachios, and dates, respectively. Therefore, products that cost less fluidity have better conditions, such as chickpeas and tea.

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