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Effects of Development of Agricultural Products in Mercantile Exchange on Development of Iranian Agriculture Sector

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Capital market, as one of the financial markets, through its financial tools and institutions is able to collect the stagnant saving resources and to offer them to capital applicants through efficient financial mechanisms. With this explanation, the capital market, as the supply market, could be defined as one of the most important factors for capital production (and what is defined as the engine of economic growth). In this study the relation between Iran mercantile exchange and agriculture sector growth is surveyed. In this study by the use of seasonal data from the 2nd season of 1997 to the 2nd season of 2014, and by the use of HEGY seasonal unit root the effects of value and volume of transactions (turnover) are surveyed; and also Laspeyres (price) index is surveyed as one of the indices of agriculture mercantile exchange on valued added of agriculture sector. Also for surveying the relation between the indices and value added of agriculture sector, the vector error correction model (VECM) and vector auto-regressive model are used. Research results show that in long term there is a positive and significant relation between value added of agriculture sector, value and volume of transactions of mercantile exchange; but in short term only the value of transactions has positive and significant effects on value added of agriculture sector. Also, Laspeyres index of Iran mercantile exchange does not have tremendous effects on growth rate of value added of agriculture sector. It seems that unlike the petrochemical and metal industries, the mercantile exchange has not reached its true position in the agriculture sector and efforts must be made toward introducing farmers to this financial market in order to develop this sector.

Key words: Agriculture Mercantile Exchange, Seasonal Unit Root, Vector Error Correction, Variance Analysis.

Nowadays development of different types of economic activities depends on their access to financial services and this sector is another part of the modern economies and one of the large and growing parts in all economies around the world including developed and developing countries. Generally, this sector includes two markets (money and capital) from the four main markets existing in economy (including mercantile, labor, money and capital markets); and due to playing a mediatory role in allocating resources to all sectors of economy such as the real sector (including labor and mercantile markets) it decreases the costs of financing and also encourages savings and efficient use of them, and it has the main share in long term economic growth (Rasti, 2009).

Capital market, as one of the financial markets through its financial tools and institutions is able to collect the stagnant saving resources and to offer them to capital applicants through efficient financial mechanisms. With this explanation, the capital market, as the supply market, could be defined as one of the most important factors for capital production (and what

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is defined as the engine of economic growth). Global ideas and experiences indicate that there is a close relation between development of financial sector and economic growth. Based on conducted studies, a group of experts believe that economic growth and its consequent increase of demand result in development of financial sector; and another group consider the development of financial sector as a channel for directing capitals and economic growth (Falahati et al., 2009). Thus, regarding the importance of financial sector and communications between this sector and other sectors such as real sector, during the recent years the relation between financial development and economic functions such as economic growth and free trade have caught the attention of researchers. Meanwhile, many studies have discussed the role of exchange in economic growth. Growth literature shows that growth of exchanges in a country results in increased mobility in economic growth. Greenwood & Smith (1997) state that existence of stock exchange results in decreased costs of investment mobility and it creates investment facilities in sectors having technologies with high efficiency. Bencivenga et al. (1996) and Levine (1991) stated that liquidity of stock market (rapid and easy transactions) is necessary for growth. Kyle (1984) and Holmstrom & Tirole (1998) discuss the relation between these two variables: existence of a dynamic financial market with high liquidity causes the businesses to have equal and easy access to financial resources; and on the other hand, investors refer to financial markets and obtain information about business and make investments; and this ultimately results in cooperation between the producer, investor and the government. Obstfeld (1994) discuss the risk and states that in financial markets risks are divided in the whole market and resource allocation takes place in its best way so that this reduced risk belongs to both the producer and the investor.

Theoretical Concepts

Several different and even paradoxical theories have been stated regarding the relation between financial development and economic growth. Some scholars agree upon this theory that the effects of financial development on economic sectors, under stable economic conditions are positive; but there is not much agree upon this theory that financial development is one of the reasons for economic growth. Some economists state that development of monetary systems does not have a role in long term economic growth; and development of financial intermediaries is caused by increased economic growth. For instance, John Robinson believes that financial development is a result of economic growth and the direction of causality is from economic growth to financial development; in other words, by the increase of economic growth, the supply of intermediaries and financial services increases (Fetras et al., 2010).

Economists who consider that development of financial intermediaries is effective on economic growth argue that financial system has the main role in allocating resources to projects with higher efficiency; for instance, Goldsmith (1962), Mckinan (1973) and Shaw (1973) believe that financial markets have a key role in economic growth and the difference in quality and quantity of provided services by the financial institutions could explain an important part of the difference of growth rate between countries (Fetras et al., 2010).

Theoretical discussion of effects of financial development on growth is based on this matter that if the financial system manages to do its main tasks regarding the reduction of costs of information, facilitating transactions and careful examination of costs, it will result in economic growth. The effect of financial development on economic growth depends on the role of financial intermediaries in evaluation and estimation of power of economic institutions that take innovative measures. Equipping resources, creating risk management and decreasing it, diversifying assets and increasing the savings rate are some of the important factors in providing the bases for economic growth by the financial system (Tayebi et al., 2009).

Increasing growth of exchanges in different parts of the world has formed this belief that financial resources and markets are the inseparable parts of the economic growth of each country. There is special focus on development of stock exchange and its relation with economic growth of countries. Theoretical discussion about the relation between financial markets and economic growth dates back to the 20th century (Schumpeter, 1911). This matter has been discussed among economists for years and many discussions have been formed about this matter. Firstly these

discussions were about two main questions: firstly, is there a relation between development of financial sector and economic growth; and secondly, if there is such relation, how is the direction of this relation. The possibility of a relation between financial development and agriculture sector growth was stated by Patrick (1966) stating the theories of supply leading and demand following. Supply leading states that Granger Causality is from financial development toward the economic growth. This hypothesis states that by creating financial development and growth of financial sector, the financial market is developed and financial services are provided and this results in economic growth; on the other hand, regarding the hypothesis of demand following, by the increase of economic growth rate, demand for financial tools and services increases and this results in increased demand for financial services (Tachiwou, 2009). Now this study is going to introduce exchange in Iran for further introduction to the discussion and further explanation of this matter.

Research Background

Ansari and Hosseyni Yekani (20140 surveyed the effect of development of financial market on growth of Iranian agriculture sector during the time period of 1967-2007 by the use of Beck-Levine model (2003) and auto-regressive model with wide lags. Two variables of bank credits paid to agriculture sector (as the money market representative) and volume of transactions of mercantile exchange (as the capital market representative) were used for studying development of financial market. Study findings showed that the short term and long term effect of all variables in model is coordinated. Capital market has a negative effect on growth of agriculture sector, whereas, the effect of money market on growth of this sector is positive. Estimated error correction coefficient had the expected sign for the study and in terms of amount it also indicated the relatively high speed of the process of adjustment of applied shocks in short term.

Mohammadi and Fakari (2013) surveyed the factors affecting the wheat prices in mercantile exchange. The researchers' aim in this study was surveying and comparing the price volatilities of wheat in Iran mercantile exchange with wheat price in Iranian free market, and Chicago Mercantile Exchange. Their study results showed that price volatilities of wheat in Iran mercantile exchange are higher than the price volatilities in Iranian free market. Additionally, the shocks applied on wheat price in Iranian free market, CME, and oil price are rapidly transferred to wheat price in Iran mercantile exchange (IME).

Shahnoushi et al (2012) surveyed the role and performance of IME for determining the price of agriculture products by the use of analytical network process (ANP). In this regard, the information achieved from filling out the questionnaire from IME brokerage in 2012 was used for surveying the factors affecting the price discovered in IME. Results showed that imports are the main factor affecting the price in IME in agriculture sector. Thus paying attention to imports and also creating regional exchange helps promote IME in agriculture sector.

Radetzki (2014) surveyed the relation between the primary commodity prices and commodity exchanges. In this study the importance of primary commodities is stated and it states that the trading of these commodities in commodity exchanges has an effect on reducing their prices. Radetzki states that commodity exchanges could have a role in decreasing the primary commodity prices by the use of ease of trade and the possibility of marketing in a wider range.

Jayne et al (2014) surveyed the effects of agricultural commodity exchanges and the development of grain markets and trade in Africa. Commodity exchange results in improvement and facilitation of financial operations between buyers and sellers. Contracts held in commodity exchange are totally guaranteed; commodity exchange reduces the transaction costs; interactions between buyers and sellers and their competition results in reduced prices. There is risk reduction mechanism with diversity of contracts and manipulating market and monopoly in exchange is reduced. Regarding the above mentioned standards, researchers think that participation in agricultural commodity exchange in Africa has an effect on development of economy.

Marques et al (2013) used evidences of change of economic structure in Portugal for surveying the effect of stock market on economic growth of this country. VAR model, Granger

causality, variance analysis and immediate reaction function are used in this article. The current research results have shown that there is no continuous relation between development of financial markets and economic growth.

Methodology

Ansari & Yekani (2014) used trade volume index for surveying the expansion of trade volume. In this study, since the aim was surveying the effects of financial development on value added of agriculture sector, three indices of trading value, trading volume and Laspeyres index of commodity exchange were used as indices for surveying development of agricultural commodity exchange. To this aim, daily statistics of agricultural commodity exchange forum were obtained from the Statistical Center of Iran's agricultural mercantile exchange. Since the statistics of value added of agriculture sector is seasonal, thus indices of trading volume and trading value were used seasonally. To this purpose, the trading volume and trading value were seasonally collected; the beginning of the season to its end was considered as a seasonal data by collecting the amount of volume and value of trades. The same procedure was used for the whole study period from the second season of 1999 to the second season of 2014. It must be noted that the beginning of activity of IME was from the second season of 2008 and the base of study for choosing was the same. Also in this study the seasonal value added of agriculture sector was used; because it is the most detailed information about the value added of each country. Thus the information of trading volume and value must also be collected seasonally. Information about the value added was achieved from the Central Bank and information related to trading value and volume of IME was obtained from the Statistical Center of Iran's mercantile exchange. Value added was the dependent variable and trading volume and trading value of agricultural mercantile exchange were the independent variables in this study. Also, Laspeyres index was used for using primary commodities for determining the trading volume and value. In this method the current value of goods is multiplied by the volume of traded goods, divided by basic price of goods multiplied by volume of traded goods and then multiplied by 100. At this state the price changes compared to the base year is surveyed (Rahmani, 2008); which means:

$$L_t = \frac{p^t{}_1 . Q^0{}_1 + P^t{}_2 . Q^0{}_2 + \cdots + p^t{}_n . Q^0{}_n}{p^0{}_1 . Q^0{}_1 + P^0{}_2 . Q^0{}_2 + \cdots + p^0{}_n . Q^0{}_n}$$

In the above relation, L_t represents the price index in t year; P and Q represent the amount and price of goods; lower indices show the type of goods and upper indices show the time period; for instance, $p^0{}_1$ indicates the price of first commodity in base year (0); and n indicates total number of goods used in calculating Laspeyres index. In this calculation, the base year is the first season of 2011. This season was chosen to be the study mid-observation. VAR model and seasonal unit root were used for surveying the relation between IME index and value added of agriculture sector.

Seasonal Unit Root Test

In time series with seasonal models, the behavior of series is different. Since the seasonal behavior of a time series could be definite or random, different models could be used for modelling. If the behavior of a monthly or seasonal time series is definite, the changes of a monthly time series by the use of virtual variables could be stated as follows (Ghysels & Osborn, 2001):

$$X_t = a_0 + \sum_{s=1}^{4} \delta_s D_{st} + \varepsilon_t \qquad ...(2)$$

In which the seasonal dummy variables are error terms and model parameters; showing the seasonal changes for s th season. In other words, this model is used when there is a definite and clear seasonal trend in information compared to other seasons.

But empirical studies show that usually the seasonal trends in time series are not definite and clear and they follow a random non-stable state (Beaulieu & Miron, 1993). Firstly it was assumed that using 12-month differences for providing durability of these time series was an appropriate method. To this aim, seasonal autoregressive integrated moving average (SARIMA models) were used. This model consists of two seasonal and non-seasonal parts. The seasonal part enters the model as autoregressive parameters or moving average from seasonal lags (in seasonal data from 4 lag), respectively from P and Q terms and non-

seasonal part enters the model as autoregressive parameters or moving average from non-seasonal lags from P and Q terms.

For modeling the time series behavior firstly the seasonal difference filter must be used. For instance, in seasonal data of tourists, the difference of amount of variable with its amount in the previous similar season ([1-L^S]) is used for creating stationary time series and then the time series behavior is modeled by the use of Box and Jenkins approach (1976) (Brendstrup et al., 2004). But this type of differencing does not mean accepting the existence of all seasonal and non-seasonal roots in surveyed information; whereas, it might be just one or a few roots in time series (Darne & Diebolt, 2002). Seasonal unit root test is used for preventing from differencing error. Hylleberg et al (HEGY) (1990) conducted the seasonal and non-seasonal unit root test on 3-month seasonal time series. Later this test was expanded by Beaulieu and Miron (1993) for monthly time series. This test could determine the root existing in time series that result in being non-stationary. Thus for the stationarity of model it is only needed to use the special filter for that root. Generally, if "$_s$ requires differencing filter for stationarity of time series, the time series must be a seasonal integration of s degree. The aim is considering an appropriate filter for detecting seasonal and non-seasonal roots of time series. To this aim it could be written down as: " $(1-L^s)_s$.

For determining the roots below equation must be solved:

$$(1-L^S)=0 \quad ...(3)$$

The general answer to above mentioned equation could be written down as {1,cos(2ðk/s)+isin(2kð/s)}. For k= 1,2,3, … the above mentioned equation has s solutions. The first root is the non-seasonal root and s-1 as the seasonal root (HEGY, 1990). HEGY used below test for determining the number of roots in 3-month data:

$$\Phi_{p-4}(L)y_{4,t} = \mu_t + \pi_1 y_{1,t-1} + \pi_2 y_{2,t-1} + \pi_3 y_{3,t-2} + \pi_4 y_{3,t-1} + \varepsilon_t \quad ...(4)$$

In which $\mu_t = \delta_0 + \sum_{s=1}^{3} \delta_s D_{s,t} + \beta t$..

Also in the above mentioned relation, the variables could be defined as follow (HEGY, 1990):

$$\begin{aligned} y_{1,t} &= y_t + y_{t-1} + y_{t-2} + y_{t-3} \\ y_{2,t} &= -y + y_{t-1} - y_{t-2} + y_{t-3} \\ y_{3,t} &= -y_t + y_{t-2} \\ y_{4,t} &= y_t - y_{t-4} \end{aligned} \quad ...(5)$$

For significance test of each of π_1 and π_2 coefficients, t-test is used and for significance of π_3 and π_4, F-test is used. Significance of each of coefficients means the insignificance of the root in time series.

Thus the time series could have any of the above mentioned roots or a set of them and the type of unit roots will determine that how the time series must become stationary; thus firstly the type of unit root must be detected. To this aim it is possible to use Beaulieu & Miron (BM) method (1993). Beaulieu & Miron (1993) used seasonal differencing unit root analysis approach and showed that it is possible to use below regression equations for testing the seasonal and non-seasonal unit roots:

$$(1-L^s)X_t = \alpha + \sum_{s=1}^{s} \delta_s D_{s,t} + \beta t + \sum_{i=1}^{s} \pi_i y_{i,t-1} + \sum_{j=1}^{p} \phi_j (1-L^s)X_{t-j} + \varepsilon_t \quad ...(6)$$

In this equation, p is the degree of generalization of the equation (6). For providing the characteristic of white noise of equation error terms of (ε_t) and $y_{i,t}$ according to Beaulieu & Miron definition 91993), linear transformations are

from amounts of X_t lags and in each one of them one of the unit roots is kept in the frequency and the rest of unit roots in other frequencies are eliminated. In practice, for using BM test, firstly the equation (6) must be estimated by the use of OLS and then the significance test of π_i parameters must be evaluated by t and F tests. In this test as well the significance of coefficients means lack of the root in time series. T-test is used for significance test of π_1 and π_2 and F-test and compound test are used for testing the significance of other coefficients.

RESULTS

Then the Laspeyres index of mercantile exchange is drawn.

Figure 2 shows seasonal diagram of value added of agriculture sector during the study period. As the diagram shows, value added of agriculture sector has a seasonal trend; thus in the study analyses, it is necessary to pay attention to the seasonality of variables.

Surveying the stationarity of research variables

In time series studies, surveying the stationarity is one of the basic principles of the study. In this study also the stationarity of

variables must be surveyed. Since the variables of trading volume and value in mercantile exchange did not have seasonal trend and had several changes during the study period, extended Dicky-Fuller test was used for surveying the unit root; but seasonal unit root test was used for surveying the unit root of valued added of agriculture sector.

According to table 1 it is clear that indices of trading value and trading volume do not have unit root and it is possible to use these variable at the level. But Laspeyres index has unit root and with one time of differencing it becomes stationary. Agricultural growth rate is also stationary.

Table 2 results show that value added of agriculture sector had seasonal unit root and it became stationary with seasonal difference; thus next for surveying the short term and long term relations this study uses the index level of trading value and trading volume and seasonal difference of value added in agriculture sector.

Long term and short term relations modeling of trading volume and value indices

At this part of the study, VECM is used for extracting long term and short term coefficients.

Table 1. Dicky-Fuller test results of research variables

Variable	Notrend/ trend	Amount of calculated t-statistics	Amount of t-statistics at level 5%	Result
Trading value index	No trend	-3.08	-2.99	Stationary
Trading total volume index	No trend	-4.11	-2.99	Stationary
Laspeyres index	No trend	2.14	-2.99	Non-stationary
Agricultural economic growth rate	No trend	-4.09	-2.99	Stationary

Source: research findings

Table 2. Seasonal unit root test results of value added of agriculture sector.

Seasonal variable	$t_1(\pi_1)$	$t_2(\pi_2)$	$F_{3,4}$ $(\pi_3=\pi_4)$
Test at level	-1.48	-2.088	0.65
Test at seasonal difference	-3.19	-3.04	10.07

*critical values at sig. level 1% equal to -3.66 and at sig. level 5% equal to -2.96; critical value of F-test at level 1% equals to 4.78 and at level 5% equals to 3.04 (Francis & Hebaigen, 1997 and Taylor, 1998)

Table 3. Determining the optimal lag of VECM

StandardLag	AIC	SC	HQ
0	58.99	59.58	59.05
1	58.33*	58.48*	58.35*
2	58.77	59.8	58.87

Source: research findings

At this part of the study the indices of trading volume and trading value of mercantile exchange and valued added of agriculture sector are used. For estimating the model, firstly the number of optimal lags must be determined.

Thus according to table 3 results, one lag is used for estimating the VECM. In the above mentioned table a lag is determined that has the

Table 4. No. of co-integration vectors in Johansen-Juselius test

Trend Statistics	No trend and y-intercept	No trend with y-intercept	No linear trend with y-intercept	Linear trend and y-intercept	Exponential trend and y-intercept
Effect amount λTrace	1	1	1	1	0
Max Eig	1	1	1	0	0

Source: research findings

Table 5. Descriptive statistics of top products in mercantile exchange.

Product name	Rice	Barley for animal feed	Corn	Soybean press cake	Canola press cake	Wheat
Average price of the product (Rials)	7000	3200	2650	4960	3915	7850
Total trading volume (Ton)	53315	267562	219497	55360	8726	232720
Total trading value (billion Rials)	692.4	692.2	969.6	369.7	60.2	1968
Average trading volume (Ton)	400	100	75	35	40	500
Average trading value (billion Rials)	3.5	0.32	0.23	0.019	0.18	2.27
Relative volume (%)*	6.4	31.2	26.2	6.61	1.04	27.8
Relative value (%)	14.6	14.6	20.4	7.78	1.27	41.4
Type of trading	Cash	Cash, credit, pre-buy	Cash, credit, pre-buy	Cash, credit, pre-buy	Cash, pre-buy	Cash

Source: research findings*Relative value and volume: ratio of trading value and volume of each product to the total trading volume and value of 6 products.

Table 6. Granger causality test results

H_0	F-statistics value	Prob.
Laspeyres index is not the Granger causality of growth rate of agricultural value added.	0.17	0.68
Growth rate of agricultural value added is not the Granger causality of Laspeyres index	58.48*	0.08***

Source: research findings

Table 7. Determining the optimal lag of VECM

StandardLag	AIC	SC	HQ
0	16.06	16.46	16.15
1	15.86*	16.06*	15.9*
2	15.99	16.6	16.13

Source: research findings

lowest value in terms of standards. Another pillar of VECM is determining the number of Co-integration vectors. To this aim Johansen & Juselius test is used.

Table 4 results show that there is a minimum co-integration vector between variables of value added of agriculture sector, agricultural trading value and trading volume in IME. After achieving the required prerequisites, the estimation of VECM, short term and long term coefficients is surveyed. (in this study, *, **, *** shows significance at level 1%, 5%, and 10%, respectively.

According to relation (2), the short term seasonal model of value added of agriculture sector (GDPagri) was estimated by seasonal total trading volume of IME (VOL_{IME}) and seasonal trading value of IME ($VALUE_{IME}$). According to the estimation results, total trading volume of IME has positive and insignificant (in terms of amount) relation (0.0029) with value added of agriculture sector. In short term this relation is statistically insignificant. Short term relation of trading value of IME and value added of agriculture sector is positive and this relation is statistically significant at level 1%. The amount of this coefficient (0.036) shows that generally in short term the agricultural forum of IME does not have significant effects of value added of agriculture sector. Also the estimated vector error correction coefficient shows that in terms of a shock in short term balance, the short term balance after a lag (season) gets close to long term balance with amount of 0.23 units; thus after 5 seasons the applied shock is moderated.

$$GDPagri = -1414^{**} + 0/0013\ VOL_{IME}{}^{**} + 0/11\ VALUE_{IME}{}^{**} + \varepsilon t \quad ...(3)$$

Relation (3) indicates the long term relation between value added of agriculture sector (GDPagri), trading value of agricultural forum of IME ($VALUE_{IME}$) and trading volume of agricultural forum of IME (VOL_{IME}). According to results it is determined that trading value has positive and significant effects on value added of agriculture

sector and the coefficient amount shows that if one unit (billion Rials) is added to the agricultural trading value of IME, then 0.11 units (billion Rials) will be added to value added of agriculture sector. This coefficient shows the importance of trading value against trading volume of agricultural mercantile exchange. Trading volume of agricultural mercantile exchange also has a positive and significant effect on value added of agriculture sector. With each unit of increase in trading volume (Ton) 0.0013 units (billion Rials) is added to valued added of agriculture sector. Trading volume of mercantile exchange against the total trading volume of agricultural mercantile is insignificant; thus it has less effects on value added of agriculture sector. Then impulse response function is used for surveying the effects of market shocks. Impulse response functions show the reaction of the target variable to the effect of applied shock from another variable.

Figure 3 indicates the impulse response function of value added of agriculture sector compared to shocks applied from the trading value and volume of IME. According to the figure, it is clear that value added of agriculture sector is more affected by the shocks of trading volume of agricultural mercantile exchange than the trading value of mercantile exchange. Also it is clear that

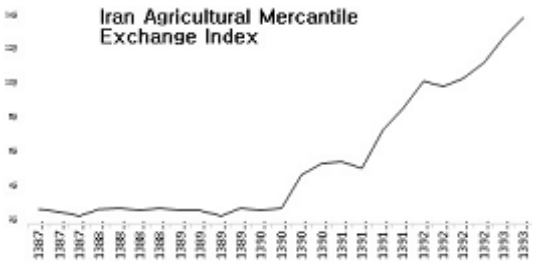

Fig. 1. Laspeyres index of IM

Fig. 2. Value added of agriculture sector (source: www.amar.org.ir)

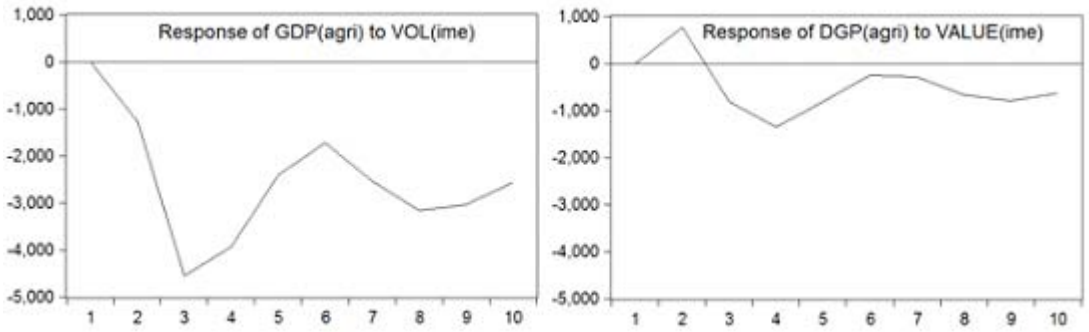

Fig. 3. Impulse response functions of value added of agriculture sector compared to trading value and volume of mercantile exchange

the response of value added of agriculture sector to applied shocks is negative and it does not moderate in long term; but the response of agricultural value added to trading value decreases during time and it gets close to long term balance. Then this study surveys the variance analysis.

Figure 4 shows the variance analysis of value added of agriculture sector. According to the diagram it is clear that the value added had the effects of error terms until the second lag. By the increase of lag, the trading volume participates in error terms of agricultural value added. Trading value does not have a significant role in variance analysis of value added of agriculture sector. Then by the use of VECM the short term and long term coefficients of Laspeyres index are extracted. Some products are chosen for calculating the Laspeyres mercantile exchange index; the base for choosing products is more trading volume, and also continuous trading in ME. Thus products such as imported rice, barley for animal feed, corn, soybean press cake, canola press cake and wheat were

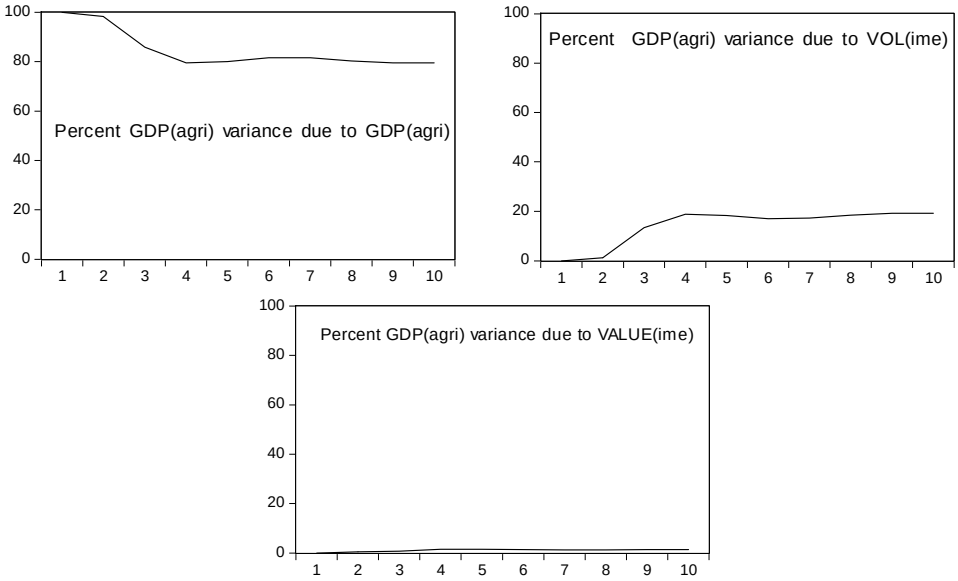

Fig. 4. Variance analysis of value added of agriculture sector.

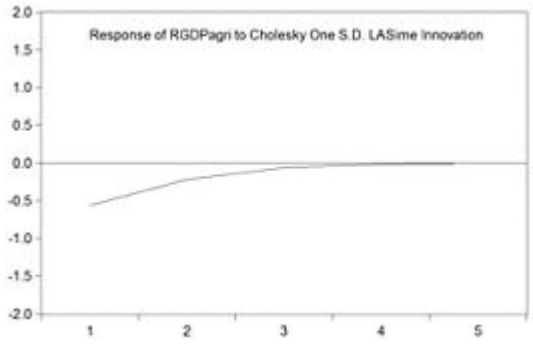

Fig. 5. Impulse response function of growth rate of value added of agriculture sector compared to Laspeyres index of mercantile exchange

chosen. These 6 products reserve relatively the whole transactions in mercantile exchange.

Table 5 shows statistical features of 6 top products in mercantile exchange used in calculating Laspeyres index. These 6 products reserve more than 90% of trading value and volume of exchange. As table shows, wheat has the highest trading value (41.4%) among the 6 products; and in terms of trading volume, barley for animal feed with 31.2% is ahead of other products. As table 5 shows, in IME, only three types of cash, credit and pre-buy transactions take place. Then according to the research hypotheses the Granger causality between Laspeyres index of ME and economic growth rate of agriculture sector is surveyed.

According to table 6 results, it is clear that growth rate of value added of agriculture sector is the Granger causality of Laspeyres index; and there is a one-way causality from value added of agriculture sector toward the Laspeyres index. This matter shows that the more the agriculture sector promotes the more the trading in exchange will promote. Then the VECM of Laspeyres index and growth rate of agriculture sector are estimated.

Thus according to table 7 results, one lag must be used for estimating the VECM. In the above mentioned table a lag is determined that has the lowest value in terms of standards. Then the estimation results of vector autoregressive model are provided.

RGDPagri= 5/73*** + 0/13 RGDPagri (-1) *+ 0/019 LAS_{IME}(-1) ***+εt ...(4)

According to relation (32), growth rate of value added of agriculture sector (RGDPagri) with one lag has positive and significant effects (0.13) on growth rate of agricultural value added. Also, Laspeyres index of agricultural mercantile exchange (LAS_{IME}) with one lag has positive and significant effects (0.019) on growth rate of value added of agriculture sector; although the amount of this index is insignificant. Then impulse response function is used for surveying the effects of shocks of exchange index on the growth rate of value added of agriculture sector. Impulse response functions show the reaction of target variable under the

influence of applied shock from another variable.

Figure 5 indicates the impulse response function to growth rate of value added of agriculture sector compared to shocks applied from the Laspeyres index of IME. According to the diagram it is clear that applied shocks from Laspeyres index are insignificant and they are moderated after two lags.

CONCLUSION

Study results show that in short term, there is a significant relation between trading value of ME and value added of agriculture sector; but there is no significant relation between value added of agriculture sector and trading volume of agriculture forum of ME. Also Laspeyres index of mercantile exchange does not have tremendous effects on growth rate of value added of agriculture sector. The reason to this could be due to the amount of trading value of mercantile exchange compared to trading volume. It is true that trading value is a result of trading volume multiplied by the product price; but it must be noted that the product price is different and varied and this results in creation of a high difference between trading volume and trading value. However, since in long term the relation between value added of agriculture sector, trading volume and trading value in mercantile exchange is positive and significant, it could be claimed that in long term the mercantile exchange has positive and insignificant effects on value added of agriculture sector. The reason to the fact that agricultural mercantile exchange could not have the same effect on economy as mercantile exchange of other countries could be this matter that the role of mercantile exchange in this country is insignificant. In fact, mercantile exchange unlike the petrochemical and metal industries, has not reached its true place in the agriculture sector.

According to the research results, below suggestions are provided:

1. Increasing the number of suppliers and demanders; because it results in more competition and more realistic prices.
2. Increasing the supply and demand volume in a way that trading volume increases during one day.
3. Using future contracts and trading options (many studies have shown the effect of mentioned trading in decreasing the mercantile price volatilities). Decreased price volatilities results in encouraging real businessmen to the exchange market.
4. Making policies resulting in decreased exchange rate fluctuations; because decreasing the exchange rate fluctuations has a significant effect on price volatilities of commodities traded in exchange; and this result in increased transactions in mercantile exchange.
5. Since import is the determinant of price in IME, regarding the products that need to be imported, government should allow the import of agricultural commodities through exchange; or consider custom discounts for commodities imported and priced in mercantile exchange.
6. According to the tax rules, there must be tax relief for demanders and suppliers dealing in mercantile exchange.
7. Government should adopt encouraging policies to financial and regulatory support the farmers dealing in exchange.
8. IME should adopt long term plans; create advertising programs in the country to introduce farmers to trading and the benefits of trading in exchange.
9. IME should branch out in professional regional ME in order to expand ME and ease the farmers' access to ME.

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