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Full Length Research Paper

The effects of market factors and government policies on maize marketing in Iran

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Maize plays a unique role in the agricultural economic of world. It is a key stable crop which is used in a wide range of food industries and as a customary livestock feed in Iran. Also, it is one of the most widely traded commodities in terms of absolute import value and the ratio of its amount to the total production value. Most of the traded maize in Iran is used for feed and smaller amounts are for industrial and food uses. Agriculture policy reforms in Iran have generated higher disposable incomes and increase livestock production that worked to expand maize domestic consumption faster than domestic production. In order to investigate the effect of government agriculture policies on maize market and trade restriction in Iran during 1989 to 2006 period, in this paper the advanced simultaneously econometric model is used in order to study the acreage planted, domestic demand and production, import demand and marketing margin functions. The results showed that government policies were ineffective. Therefore price support policy was not efficient for the maize market regulation. Furthermore, since government intervention in the market did not result stabilization and regulation of the maize market in practice, so the support from private sector and less restriction on trade are suggested.

Key words: Marketing margin, market structure, agriculture policies, maize, Iran.

INTRODUCTION

Maize has been the largest component of global course-grain trade during the recent years by trading the almost 75% of its total production volume. Most of the traded maize is used for feed and smaller amounts are traded for industrial and food uses (Domestic Animal Support Company and Relief of Ministry of Jihad-e Agriculture). Maize plays a unique role in the agricultural economic world. It is a key stable crop which is used in a wide range of food industries and as a customary livestock feed in Iran. It is also one of the most widely traded commodities in terms of absolute import value and the ratio of its amount to the total production value. Although many countries are involved in the maize market, a few of them contributes in the most of the world's production, consumption and trade. The United States, China and Brazil have been the largest maize producers during 2005 - 2007. The average maize production of the United States was about 245 million metric tones (MMT) in the period of 1995 - 2005 which was the 40% of the world maize production. While the share of China and Iran from the total maize production in this period was 20 and 0.21%, respectively. During the mentioned period of time, Iran produced an average of more than 1.1 MMT each year. Iran's maize production has also in-creased substantially in recent years, from 509 thousand tons to 1.9 MMT in 2005 (www.fao.org; Zabihi, 2004).

The major maize planted areas in the world during 1995 - 2000 are the United States, China and Brazil with the average areas of 27.8, 27.7 and 12 million hectares respectively. But during the same period Iran planted area on average is 200 thousand hectares. Then, the average yield of maize during last ten years in Iran is 7.5 kilogram per hectares. Also, the United States, Argentina and China respectively with the average export amounts of 54.4, 12 and 7.5 MMT which were the 56, 11 and 8% of the total amount of maize exports in the world during the period of 1997 - 2005, have been the world's largest maize exporters (www.world bank.org). The world's major maize importers include Japan with an average of 17.5

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MMT or 20% of world import, the South Korea with 8.8 MMT or 10% of world import and Iran with an average of 1.7 MMT or 2% of world import. Iran's maize imports fluctuated widely from 400 thousand tons in 1988 to 2.1 MMT in 2005; therefore Iran's maize imports have increased substantially in recent years (Iranian Islamic Republic Custom).

Agricultural commodity prices respond rapidly to actual and expected supply and demand changes. Because demand and supply of farm products, particularly maize, are relatively price inelastic (that is quantities demanded and supplied change proportionally less than prices) and because farm policies can produce large fluctuations in farm production, potentially large swings in farm prices and incomes have long been characteristics of the sector and a farm policy concern in Iran. Existence of huge price fluctuations of agricultural products in Iran, particularly maize, followed by inelasticity of demand and supply of these commodities and instability of environmental and weather conditions makes the agricultural incomes uncertain and the concept of agricultural policies considerable. Farm policy reforms in Iran have generated higher disposable incomes and have increased livestock production which caused to expand maize domestic consumption faster than domestic production (Key and et al, 2000). Domestic programs such as guaranteed prices are customarily used by Iranian government together with import restrictions such as tariff and non-tariff barriers in order to influence domestic production and imported markets. According to the Maize Marketing Act of 1989 in Iran, governments implement guaranteed price and trade restrictions for supporting producers' incomes and creating incentives for higher maize productions. Average annual growth of maize price support has been 17.3% during 1989 to 2006 period. In order to stabilize the market price, governments purchased about 47% of domestic production in harvest time in 1991 and gradually decreased it to 2% of domestic production in 1996 and increased it again to 21% in 1997 (Komeijani et al., 2001).

The government establishes the import trade restrictions and maize guaranteed price every year. The Iranian government purchases domestic production during harvest time from producers at a support price based on average farm costs of production. Then the government purchased maize is sold gradually to livestock producers at another support price which is below the price of imported maize. During 1989 to 2006 the maize imports was controlled by quota tariff (Unname, 2004, 2006). Mashinini et al. (2006) in a survey with the title of welfare effects of the regulation of the maize market in Swaziland for six marketing seasons (1998/99 to 2003/04) with employing the standard partial equilibrium model studied the variations of consumer and producer surpluses and concluded that the current market policy structure is highly distorted in favor of producers while taxing consumers and recommended that a deregulated market will drive private sector-led trade, marketing and processing. Nyange and Wobst (2005) studied the effects of Strategic Grain Reserve, trade and regional production on maize price volatility in Tanzania (An ARCH Model Analysis) over the period of 1992 - 2000 in predominantly consumer, producer and border markets. The results indicated that trade exhibits a much stronger effect in reducing maize price volatility than Strategic Grain Reserve (SGR). Also, restrictions on cross-border maize trade were an irrelevant policy instrument for food security. Houck and Ryan (1972) studied the impact of changing government programs on maize supply in the United States. In their model, beside to the acreage they utilized government protective policy such as price support loan rates, direct support payments to growers and acreage diversion payments, market influences and all other supply determinants and random effects. The results indicated that more than 95% of the variations in U.S. maize acreage during the study period could be associated with the selected policy variables. Also trend of the world price and domestic wholesale (Figure 1) shows that both prices follow increasing trends and after 1997 the domestic wholesale price of maize in Iran has increased more rapid than world price. Of course, in 1998 the market of inputs has been released (Statistic Center of Iran and Ministry of Jihad-e Agriculture).

MATERIALS AND METHODS

In this paper the planted area, supply and domestic demand and import demand of maize in Iran have been studied in a framework of advanced simultaneity econometric model (Gujarati, 2003). Since maize is used as an input for broiler production, its demand considers as a derived demand. In general, there is no proper information about the maize carryover stock in Iran.

The prevalence of the biological lags in agriculture suggests the use of Nerlove econometric models as the most appropriate framework for considering simultaneity in supply-demand interaction to measure planted are. Therefore, a typical Nerlovian model which can be written as follows is utilized in this paper (Askari and Cummings, 1977).

$$A_t^D = c + \alpha_1 P_t^e + \alpha_2 Z_t + u_t \quad (1)$$

$$P_t^e = P_{t-1}^e + \beta(P_{t-1} - P_{t-1}^e) \quad (2)$$

$$A_t = A_{t-1} + y(A_t^D - A_{t-1}) \quad (3)$$

Where A_t = Actual planted area at time t A_t^D = Desired planted area at time t

P_t = Actual real producer price at time t P_t^e = Expected real producer price at time t

Z_t = Other exogenous factors affecting supply at time t

β, y = Expectations and adjustment coefficients, respectively

The above equations lead to the following:

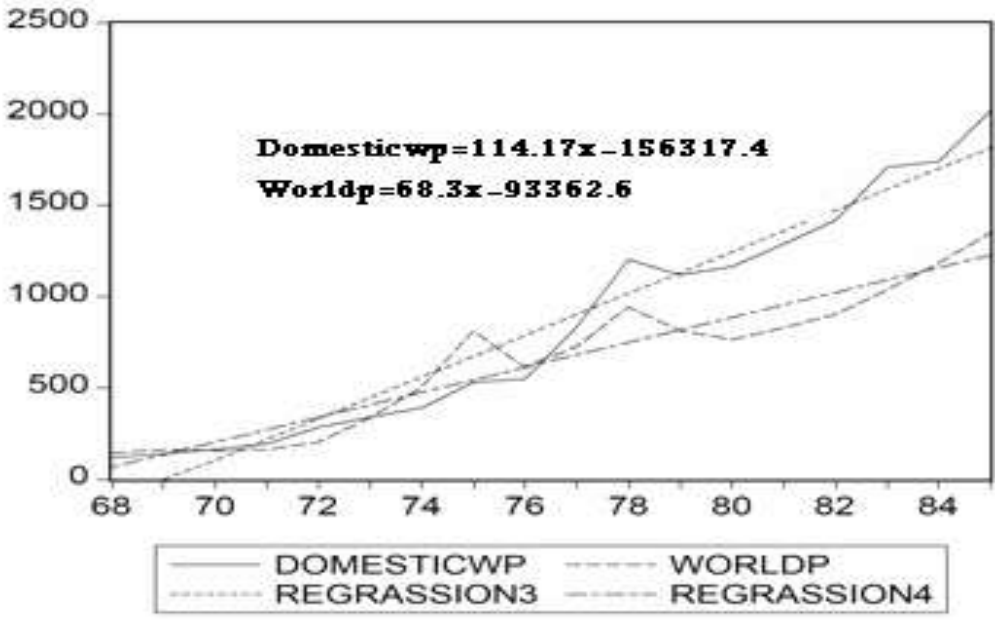

Figure 1. Trend of the world price and Iran's domestic wholesale price for maize during 1989 - 2006 periods (kilogram/rial).

$$A_t = c_0 + c_1 A_{t-1} + c_2(\frac{P_c}{P_d}) + c_3 Z_t + u_t \quad (4)$$

Where $(\frac{P_c}{P_d})$ is the real output price as P_c is the price of the crop and P_d is the given price deflator.

The basic supply function is derived following Henderson and Quandt (1980). In this approach, a competitive firm which uses multiple inputs to produce multiple outputs is assumed. The firm's implicit production function can be written as (Miller and et al, 2005)

$$F(y,x) = 0 \quad (5)$$

Where y is an n-dimensional vector of outputs and x is an m-dimensional vector of inputs. It is assumed that F is an increasing function of y and x and is twice continuously differentiable. The main objective of the firm is to maximize profit (π) which is defined as:

$$\pi = \sum_{i=1}^{n} p_i y_i - \sum_{j=1}^{m} w_j x_j \quad (6)$$

Where p and w are the prices of y and x, respectively. However, the profit function in equation (6) is maximized subject to the constraint imposed in equation (5). Using the Lagrange technique, the optimization problem can be formulated as:

$$L = \sum_{i=1}^{n} p_i y_i - \sum_{j=1}^{m} w_j x_j + \lambda F(y,x) \quad (7)$$

Taking the partial derivatives of equation (7), the results of the first order necessary conditions for local maximization will be:

$$L_i = p_i + \lambda F_i = 0 \qquad \text{for } i = 1,\ldots,n \quad (8)$$

$$L_j = -w_j + \lambda F_j = 0 \qquad \text{for } j = 1,\ldots,m \quad (9)$$

$$L_\lambda = F(y,x) = 0 \quad (10)$$

Solving the first order conditions simultaneously provides the input demand and output supply functions:

$$x_j^* = f_j(p,w) \qquad \text{for } j = 1,\ldots,m \quad (11)$$

$$y_i^* = f_i(p,w) \qquad \text{for } i = 1,\ldots,n \quad (12)$$

Equations (11) and (12) are both functions of input and output prices. These are static input demand and output supply functions, and the static formulation assumes that a farmer's adjustment to optimal level is instantaneous. In reality, however, adjustment to optimal level is achieved over time. Thus, a model must be developed to account these dynamics. One of the ways to incorporate dynamics is to adopt the Nerlovian partial adjustment model. In 1956 Nerlove's partial adjustment model begins with the hypothesis that producers slowly adjust output Y_t to the optimum level, Y_t^*.

$$Y_t - Y_{t-1} = \beta(Y_t^* - Y_{t-1}) \text{ where } \beta \in 0,1 \quad (13)$$

Equation (13) states that the change in output between the current and previous is only a proportion of the difference between the

optimum level and last year's output, and β is the adjustment coefficient which lies between zero and one. The static supply function in equation (12) can be rewritten in linear form as:

$$Y_t^* = \alpha_0 + \alpha_1 P_{yt} + \alpha_2 Z_t + \varepsilon_t \quad (14)$$

Where Z_t represents a vector of other factors such as government policies, and all other variables are as previously defined. Combining the static supply function in equation (14) with equation (13) which is the partial adjustment equation, yields equation (15):

$$Y_t = \alpha_0\beta + \alpha_1\beta P_{yt} + \alpha_2\beta Z_t + (1-\beta)Y_{t-1} + \beta\varepsilon_t \quad (15)$$

The above function is the Nerlove's dynamic supply response equation. The coefficient β measures the extent to which current output reflects desired rather than past levels of output. The restriction placed on the parameter, β in equation (13) is both intuitive, and theoretically sound. If $\beta = 1$, it implies that producers are able to fully adjust to supply and demand shocks in one period and $Y_t = Y_t^*$. If $\beta = 0$, it implies that there is no adjustment $Y_t = Y_{t-1}$. Equation (14) gives estimates of long-run elasticities, while equation (15) provides short-run elasticity estimates. The short-run elasticities are divided by the adjustment coefficient β to obtain the long-run elasticities. In estimation of maize demand function in this paper, the below general form of demand function for broiler industries is utilized.

$$X_t^d = h(Y_t, P_t, P_t^*, N_t) \quad (16)$$

Where X_t^d is the quantity of commodity consumption at time t, Y_t is the quantity of income per capita at time t, P_t is the price of commodity at time t, P_t^* is the price of another relevant commodity at time t and N_t is the population of whole country at time t.

The estimation of import demand functions for various commodities have paid a great deal of attention in the empirical literature of agricultural trade in recent years. The demand for traded goods is usually written as a linear or log-linear function of real income and the price of the traded goods relative to the price of domestic substitutes and other relevant factors. Depending upon whether the considered commodity is considered as an intermediated good or a finished product, such demand functions for imports can be derived from conventional production or utility theory (Sarker and Jaramillo-Villanueva, 2007). In this research, below theory is used to study the import demand function for maize by treating imports as inputs to the domestic production of a final product (Komeijani and et al., 2001).

$$IM = h\left(\frac{P_{im}}{P_d}, E, Y, P_s, Q, T_E\right) \quad (17)$$

Where IM is the quantity of crop import, $\frac{P_{im}}{P_d}$ is the ratio of imported price to domestic price ratio, Y is the national income, E is the exchange rate, Q is the domestic output, P_s is the price of proxy commodity and T_E is the import tariff rate.

Price asymmetric transmission

There are varieties of diagnosis tests of the price asymmetric transmission. Houck approach, error correction approach and threshold approach are three most customary diagnosis tests utilized in various studies (Meyer and Von Cramon -Taubadel, 2002). Houck approach is used in this research. Houck approach is defined as (Unname, 2006):

$$P_t^{out*} = \alpha t + \sum_{j=1}^{k}(\beta_j^+ \sum_{t=1}^{T} D^+ \Delta P_{t-j+1}^{in} + \sum_{j=1}^{L}(\beta_j^- \sum_{t=1}^{T} D^- \Delta P_{t-j+1}^{in}) + \varepsilon_t \quad (18)$$

Or

$$\Delta P_t^{out} = \alpha + \sum_{j=1}^{k}(\beta_j^+ D^+ \Delta P_{t-j+1}^{in} + \sum_{j=1}^{L}(\beta_j^- D^- \Delta P_{t-j+1}^{in}) + \gamma_t \quad (19)$$

Where (P_t^{out*}) is $(P_t^{out} - P_0^{out})$ and K and L are the number of lags.

RESULTS

The major objective of this paper is to investigate the effect of government policy on maize domestic market structure and clearly on Iran maize acreage planted, production and demand, import and marketing margin base on simultaneity econometric model during 1989 to 2006 period. The coefficient of determination (R^2), t-ratios, Durbin-Watson (D.W) and/or Durbin h-statistics overall, indicates that the structural performance of model is quite well. The stimulator variables in all equations explain over 85% of the variation in the response variables. All the policy variables introduced in the model are significant statistically at the 5 % level or lower and have signs consistent with economic theory.

ESTIMATED EQUATIONS BASE ON SIMULTANEITY ECONOMETRIC MODEL

Maize acreage planted function

Since in this section, the major objective is the survey of

farmers' act, is used acreage planted as dependent variable.

$$\ln A_t = -22.92 + 1.05\ln A_{t-1} + 0.02\ln NPRD_t + 3.4\ln Y_{t-1}$$
(-1.3) (8.2) (1.5) (1.25)

$$h_{D.W} = -1.67$$

Where $\ln A_t$ is the maize acreage, $NPRD_t = (1 - P_{IM}/P_D)$ is the nominal protection rate and $\ln Y_{t-1}$ is the last year maize yield. The farmer decision on maize acreage planted is depend on domestic price P_D, and imported price P_{IM}, therefore nominal protection rate NPRD. Also the amounts that have showed below the equation are t-ratios. The results indicate that about 86% of variations in logarithm of planted area of maize are determined by considered factors. The variables of last years acreage planted and yield have the most effect on the decision of farmer. The short-run elasticity of the nominal protection rate is very inelastic but is positive. Therefore the government price policy has positive but non-significant effect on maize planted area.

Maize production function

In agricultural economy, the study of reaction' production and supply of farmers have much importance in determination of suitable policy too.

$$\ln Q_t = 10.3 + 0.72P_{t-1} - 0.06SAM_t - 0.03BAZR_t \quad (16.2) \quad (7.2)$$
(-0.46) (-1.3)

$$D.W = 1.7$$

Where $\ln Q_t$ is the maize output, P_{t-1} is maize guaranteed price, SAM_t and $BAZR_t$ are the quantity of pesticides and seed used which have used in the cultivation of maize respectively. The results indicate that about 92% of variations in production of maize are determined by considered factors. The production response to guaranteed price elasticity's changes is positive and elastic. There-fore the government price policy has positive and significant effect on maize output. Also SAM and BAZR variables have negative and non-significant effect on maize output.

Maize broiler demand function

Since maize is used as an input for broiler feed, its demand considers as a derived demand.

$$\ln(x_t^d) = 7.11 + 1.32\ln(y_t) - 2.63\ln(p_t) + 1.84\ln(p_t^*) \quad (2.3)$$
(2.3) (-4.2) (4.1)

$$D.W = 1.96$$

Where $\ln(X_t^d)$ the total maize demand of broiler industries is, $\ln(Y_t)$ is income per capita, $\ln(P_t)$ is maize domestic price and $\ln(P_t^*)$ is wheat domestic price. The results indicate that about 99% of variations in demand of maize are determined by considered factors. Each coefficient has the expected sign, with negative sign for maize domestic price and positive signs for per capita income and wheat domestic price. Also, the results show that maize is a normal and elastic commodity.

Maize import function

Although the proportion of the domestic output of maize from the total amount of supply in Iran has increased in recent years, more than 50% of the supplied maize is imported from other countries. Also followed by various government market and trade policies, the role of private sector in the maize import has become stronger in the recent years (Unname, 2005). Utilizing the price elasticity of supply and demand, the elasticity of import demand could be defined as:

$$\varepsilon_D = \varepsilon_d\left(\frac{Q_d}{Q_m}\right) + \varepsilon_s\left(\frac{Q_s}{Q_m}\right)$$

Where ε_D is the elasticity of import demand, ε_d is price elasticity of the maize demand in Iran, ε_s is price elasticity of the maize supply in Iran, Q_d is the quantity of the maize demand in Iran, Q_s is the quantity of the maize supply in Iran and Q_m is the quantity of the maize import. The maize import demand is more elastic. In the other words, all of the factors that affect on the elasticity of domestic demand and supply, influence the import demand of maize. The findings show that the elasticity of import demand of maize follows an increasing trend (Table 1).

The maize import demand function was estimated as:

$$\ln IM_t = 16.29 - 0.1\ln(P_{IM}/P_D)_t - 0.005\ln T_E$$
(4.1) (-1.12) (-0.5)
$$+ 0.23\ln Y_t - 0.31\ln Q_t - 0.61Dum$$
(1.6) (-0.9) (-1.8)

$$D.W = 2.18$$

Table 1. Price elasticity of import demand for maize farm.

Year	The price elasticity of import demand	Year	The price elasticity of import demand
1989	-2.83	1998	-5.42
1990	-3.51	1999	-5.37
1991	-2.96	2000	-4.81
1992	-3.37	2001	-3.66
1993	-4.07	2002	-4.31
1994	-4.39	2003	-3.08
1995	-4.18	2004	-5.54
1996	-3.68	2005	-5.91
1997	-4.04	2006	-4.77

Source: The findings of research.

Where $\ln(IM_t)$ is the quantity import of maize, $\ln(P_{IM}/P_D)_t$ is the imported price to domestic price ratio for maize, $\ln(T_E)$ is the quantity of tariff for maize, $\ln(Y_t)$ is income of exports, $\ln(Q_t)$ is the quantity of maize output and Dum is dummy variable for showing the effects of non-tariff barriers and exchange rate policy (The best representation of policies is a dummy variables taking on a value of one from 1989 to 2002 and a value of zero from 2002 to 2006). After 2002 the system of exchange rate varied and authorizations of import only were given to the commerce ministry. The results indicate that about 77% of variations in import of maize are determined by considered factors.

Estimation of the import function shows that the variables of domestic output, policy of exchange rate and the import authorizations affect on the maize imports more than others so we can say that the domestic output is an appropriate proxy for imported maize. Also with regard to estimated coefficients, the variable of non-tariff barriers affects on the maize imports more than the variable of tariff.

Maize marketing margins function

Iran's maize marketing system was characterized by a few channel marketing systems. Marketing margin is defined as "difference between the price which consumer pays and the farmer receives."

The most customary models of marketing margins are price excess model, relative margins model, marketing cost model and rational expectation model (Kazemnejad and Najafi, 2004). In the current study, the relative margins model has been utilized.

$$\ln MM_t = 1.11 - 0.66\ln MC_t + 1.6\ln P_t + 0.13\ln IM_t - 0.4\ln Q_t$$
$$(0.16)\ (-0.73)\qquad (3.2)\qquad (0.3)\qquad (-1.44)$$

D.W=2.4

Where $\ln MM_t$ is the maize marketing margins (wholesale margins), $\ln MC_t$ is the maize marketing cost, $\ln P_t$ is the maize domestic wholesale price, $\ln IM_t$ is the maize import and $\ln Q_t$ is the maize output.

The results indicate that about 95% of variations in import of maize are determined by considered factors. Also 10% increase in the maize domestic wholesale price will increase the maize marketing margins about 16% so the maize domestic wholesale price is the most important effective factors on the maize marketing margins.

MAIZE MARKET STRUCTURE

Afterwards maize market structure model was estimated base on non-simultaneity model. Regarding the stationary of time series, we used Houck approach for examining of price transmission. The maize price transmission model is:

$$\Delta P_t^{out} = 37.62 + 0.87 D_t^{+}\Delta P_t^{in} + 5.93 D_t^{-}\Delta P_t^{in}$$

Where $\Delta P_t^{out} = P_t^{out} - P_{t-1}^{out}$ (on the basis of wholesale price), $\Delta P_t^{in} = P_t^{in} - P_{t-1}^{in}$ (on the basis of farm-gate price), D_t^{+} and D_t^{-} are the dummy variables that are:

$$D_t^{+} = 1 \text{ if } P_t^{in} \geq P_{t-1}^{in} \text{ and } D_t^{+} = 0 \text{ otherwise}$$
$$D_t^{-} = 1 \text{ if } P_t^{in} < P_{t-1}^{in} \text{ and } D_t^{-} = 0 \text{ otherwise}$$

Actually, the price variables were separated in two groups, increased and decreased.

To examine the hypothesis of price symmetric transmission, we must test null hypothesis $\beta^{+} = \beta^{-}$ by

using F-distribution. Since F-distribution is 11.7, so the null hypothesis is rejected and the maize market structure is uncompetitive. Abdulai (2000) concluded that price transmission asymmetries did exist in the Ghanaian maize market, and local markets showed greater response to rising prices than to falling prices in the central market. Moreover, we examined the effect of maize world price transmission to domestic price in Iran utilizing the Houck approach during the study period. The maize world price transmission model is:

$$\Delta P_t^{iran} = 132.7 - 0.72 D_t^{+} \Delta P_{t-2}^{world} + 0.5 D_t^{-} \Delta P_{t-3}^{world} - 0.41 D_t^{+} \Delta P_{t-4}^{world} + 0.7 D_t^{-} \Delta P_{t-5}^{world}$$

Where $\Delta P_t^{iran} = P_t^{iran} - P_{t-1}^{iran}$ (on the basis of wholesale price for maize in Iran), $\Delta P_t^{world} = P_t^{world} - P_{t-1}^{world}$ (on the basis of world price for maize), D_t^{+} and D_t^{-} are the dummy variables that are:

$$D_t^{+} = 1 \text{ if } P_t^{world} \geq P_{t-1}^{world} \text{ and } D_t^{+} = 0 \text{ otherwise}$$
$$D_t^{-} = 1 \text{ if } P_t^{world} < P_{t-1}^{world} \text{ and } D_t^{-} = 0 \text{ otherwise}$$

Since F-distribution is 9, so the null hypothesis is rejected. In the other words, world price transmission of the fluctuations of doesn't affect the wholesale maize price in Iran rapidly and completely. In other words, price transmission asymmetry do exist in the Iranian maize market, and falling world prices show greater response in the domestic market than rising world prices

DISCUSSION

The short-run elasticity of the nominal protection rate (inelastic but positive) shows that the government price policy has positive effect on maize planted area but according to the small amount of coefficient of variation, the changes of this policy have not significant effect during the study period. In the other words, the effect of government policy on acreage is dubitable. The elastic response of production to government guaranteed price has a strong effect on output. Price policy is the most important governmental policies which had effect on maize acreage planted and production, Per capital consumer income and maize price elasticity's had significant effects on demand of broiler industries.

Regarding the findings of the import function, a) the domestic output is an appropriate proxy for imported maize b) non-tariff barriers more significantly lead to trade and instability of the domestic price. So reforming in tariff system beside to the tariffication can affect the competive maize market. Also the tariff and tariff equivalent of non-tariff barriers during the study period show that the trade protections of maize are not logical but at the end of the study period, the trade policies are logical. On the other hand since regulating the maize imports can help to have a stable domestic market (also an unregulated import plan leads to more fluctuation in the prices) and in the recent years, market interventions of government did not lead to stabilization and regulation of the maize domestic market so executing new policies in order to make the role of private sector stronger in the import of maize is very important. The results shows that price policy of the market regulation as like as guaranteed price policy is the most important governmental policies that affect on the maize market margins and therefore it is necessary to try to make precious decisions about it in order to have stable marketing margins (MM) and to prevent from the fluctuations of price and marketing margins. Stimulating and motivating market participation such as the farmers, importers, wholesalers and brokers for trading in agricultural commodity exchange via establishing new cooperatives can drastically decrease the marketing margins. Uncompetitive maize market in Iran cause inefficient market, the effects of policies in the maize market regulation will not be as our expectations and price policy are inefficient or affect indirectly. Then for determining the guaranteed prices, it needs to consider the inflation rate and the prices of substitution crops.

Therefore it is recommended that support of private sector and less restricted of trade is the most efficient for exogenous from disorder of this crop market, also executing a plan of investing for the increase of production and consequently decrease of the imports could be decrease economic dependence with emphasis on self-sufficiency of this agricultural strategic crop that for gaining to this target is suggested that governments consider the direct or indirect market policies such as subsidy for transportation of commodity from farm to maize drier factories, subsidy for insurance of crops and for decreasing the production cost.

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Appendix 1. Tariff and tariff equivalent of non-tariff barriers of maize from 1989 to 2006.

Year	Maize tariff (%)	Tariff equivalent of non-tariff barriers
1989	10	-73.9
1990	10	-68.1
1991	10	-44.3
1992	10	-43
1993	0	-16.5
1994	5	-28.1
1995	5	-43
1996	0	-40
1997	0	-34.62
1998	0	-20.16
1999	0	-1.87
2000	0	19.95
2001	0	23.75
2002	10	24.18
2003	4	0
2004	4.4	0
2005	4.1	0
2006	4.1	0

Sources: 1. Provisions of export and import; 2. Agricultural Planning and Economic Research Institute.