STUDY THE EFFECT OF WHEAT MARKET LIBERALIZATION ON RURAL WELFARE IN IRAN

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ABSTRACT

This study aims to study the effect of elimination of government intervention and liberalization in wheat market in rural area in Iran on consumer welfare with time series data for 1981-2007. An alternative partial equilibrium model was developed to examine the welfare effect of wheat trade liberalization. Result show that on producer side, government budget (subsidy on production), and producer welfare are decrease but foreign exchange is increase, on consumer side, government budget (subsidy expenditure), foreign exchange and consumer welfare are decrease under open access(without considering consumer in urban area).

Keywords: Welfare, Trade liberalization, Partial equilibrium, wheat, rural area, Iran.
Introduction:

In order to achieve and maintain national self-sufficiency in basic agriculture products, the post-revolutionary government of Iran in the 1980s adopted a variety of programs such as price support and input subsidies, as well as some food programs and border controls. Since 1990, within a national strategy of economic liberalization and the development of a more competitive and market-oriented farming sector, policy has been redirected toward abolishing subsidies. However, there are still markets such as those in wheat, cotton, meat and rice in which government intervenes, apparently to protect both producers and consumers. Moreover, the government is still the largest economic agent in the country, controlling directly or indirectly nearly three-quarters of all economic activities, including international trade (Bkhashoodeh and Thompson, 2006).

The Iranian government intervenes in the wheat market by controlling the import to support consumers and prevent the increasing of price. According to available information, the consumer price of wheat is lower than producer’s price and the world price (evaluated with the exchange rate in the black market) is higher than domestic price at 1981 to 2000; but at the rest of period (2001-2007) producer’s price is higher than the world price.

After revolution in 1979, the government had total control over the wheat market. Self-sufficiency was the goal and government intervention was justified on the basic of economic factors such as foreign exchange saving, increasing in production, and political reasons such as heavy dependence on imports which could create problems at home in case of external shocks such as a large increase in prices, etc.

On the consumption side, government intervention started in the 1980s with a consumption subsidy and quota system to avoid the effects of increases in world prices. It means that temporary to reduce domestic price inflation and maintain nutritional status of low-income groups during the war (1980-1988). This policy lasted until 2000, expanding consumption faster than production, and preventing Iran from reaching self-sufficiency.

This conflict between self-sufficiency and subsidizing started to change during the 1990s, due to escalating budget cost caused by these policies, which forced the government to cut expenditures by gradually reducing the consumer subsidy and quota.

Such policy reforms create both costs and benefits to different segments of society and certainly producers’ and consumers’ welfare would be affected by change in production, consumption, trade flows and prices (Monterio da silva and Grennes, 1999).

The development of an analytical framework for wheat trade policy analysis in the presence of complex is important. Furthermore, the recently introduced general equilibrium model for analyzing trade liberalization is developed (Monterio da silva and Grennes, 1999 & Hannesson, 2000). The development of an analytical framework for trade liberalization in products originated from producers with regulated open access and regulated restricted access is important, since such management exists in several and probably most worldwide producers. The partial equilibrium approach of the present paper links together basic results from trade theory with long runs comparative static of both producers and consumers economics (Nielsen, 2009).

We aim to develop a framework for wheat trade policy analysis under trade liberalization, and by considering the theoretical basis for empirical welfare analysis of wheat trade. A partial equilibrium approach is developed and circumstances under which trade liberalization cause welfare gains and losses are identified theoretically. Not only is trade liberalization modeled as removal of a tariff, but also applies to analysis of reductions in other trade measures that open up or increase trade between countries (Nielsen, 2009).

Four plans are under consideration by WTO in order to liberalize global agricultural trade. These plans were submitted to the WTO ministerial meeting in Hong Kong, in 2005 but the members refuse to accept them. All the formulas include a reduction in border tariff, domestic farm support and export subsidy (Chang, 2007).

The purpose of this paper is to evaluate the possible consumers’ welfare affected by wheat trade liberalization in rural area in Iran. In addition, it was assumed that society of rural area can gain from abolition of the government trade control. Such an assessment should be useful for policymakers in Iran who intend to move toward a market oriented agricultural sector.

Our paper extends the analysis through 2007, provides econometrics estimation of supply and demand parameters, and uses an alternative method for calculating the real exchange rate. The second section the methods and data in the analysis are presented. The results are discussed in the third section, and some conclusions are drawn in the last section.
Materials and Methods:

This section describes the partial equilibrium analysis approach in agricultural trade liberalization as well as its constraints. Based on the partial equilibrium model outline in a close economy, the welfare effects of international trade liberalization in a wheat market can be analyzed. Standard partial equilibrium and comparative static analysis is used Marshallian concept of economics surplus (Currie et al., 1971). The concepts of economic surplus are derived from Fig.2. In this study, the welfare effects of directing wheat toward a market-oriented system are evaluated by applying a partial equilibrium analysis to the 1981-2007 data. The synthetic part of the model consists of two equations for each product: (i) supply and (ii) demand. Net trade clears the disequilibrium between domestic supplies and demands (United Nations Conference for Trade and Development, 2005). As The supply function is:

\[
\ln Q^e_t = \alpha_1 \ln P_t + \alpha_2 P_{it-1} + \sum \alpha_3 \ln P_{it} + \alpha_4 \ln Q^e_{it-1} + \alpha_5 \ln Z_i + e_t
\]

Where, \(Q^e_t\) is the production of product \(i\), \(P_t\) is the corresponding price and \(P_j\) the prices of other products (substitutes and complements), and \(Z_i\) are other deterministic variables (Stoforos, 2003). Own price, cross price and income are the main explanatory variables in demand equation. The general form of the demand equations is follows:

\[
\ln Q^d_t = \beta_0 + \beta_1 \ln P_t + \beta_2 \ln P_{it-1} + \sum \beta_3 \ln P_{jt} + \sum \beta_4 \ln P_{jt-1} + \beta_3 \ln I_{it-1} + e_t
\]

Where, \(Q^d_t\) is the demand of product \(i\), \(P_t\) is the own price and \(P_j\) the prices of other products (substitutes and complements), \(I\) income (Stoforos, 2003).

\[
\Delta M_t = Q^d_t - Q^e_t + \Delta X_t
\]

\[
\sum_{n=1}^{N} (\Delta X_t - \Delta M_t) = 0
\]

To compute the total welfare change, in the general case, it is formally necessary to calculate the integral under supply curve (producer surplus change or change in production welfare) and demand curve (consumer surplus change or change in consumption welfare) and the change in government budget (Lagares Tavora, 2008). Demand is from demanders, which include live in rural areas while supply is constituted by all producers.

\[
\Delta CS = \int_{P_c}^{P^w} Q^d_i \, dp \quad \text{Or} \quad \Delta CS = \int_{P^w}^{P^s} Q^d_t \, dp \Delta PS = \int_{P_p}^{P^w} Q^e_t \, dp
\]

Where:

- \(\Delta CS\): Consumer surplus change
- \(\Delta PS\): Producer surplus change
- \(Q^d_i\): Demand in zone \(i\)
- \(Q^e_t\): Supply in zone \(i\)
- \(P_p\): Producer prices
- \(P_c\): Consumer prices
- \(P_w\): World prices

A border price represents the cost to the economy of producing a good and enables the analyst to determine if the country is an efficient producer of that commodity. According to the logic of the border paradigm, it is a waste of country’s resources to produce a good for which it has little or no cost advantage (Tsakok, 1990). Algebraically, the border price is defined as \(P_w = eP\) where \(e\) represents the exchange rate. The exchange rate reflects the opportunity cost of a unit of foreign currency to the domestic economy. The exchange rate is important especially where the official exchange rate is overvalued. The exchange rate employed to calculate the border price, should reflect the real economic cost of the domestic currency (Krueger, 1988).

As indicate above, we can calculate producer and consumer welfare, change in government budget by applying partial equilibrium analysis, also, Monterio da silva & Grennes[2] indicate that social cost, foreign exchange, domestic support expenditure (subsidy expenditure to support domestic price) on both side of the market, can be calculate.

The following constant elasticity supply and demand functions of wheat were estimated in this study:

\[
\ln Q^e_t = \alpha_0 + \alpha_1 \ln P_{w-1} + \alpha_2 \ln P_{ss} + \alpha_3 \ln P_{ss-1} + \alpha_4 \ln P_{sg} + \alpha_5 \ln P_{sg-1} + \alpha_6 \ln P_{sc-1} + \alpha_7 \ln Q^e_{t-1} + \alpha_8 \ln Q^w_{t-1} + e_t
\]

Domestic production was expressed as a function, which of producers’ price for wheat, producers’ price of soya beans, grain and canola as substitute commodities, lagged production, import of wheat are the variables in this function.
\[
\ln Q_t^d = \beta_0 + \beta_1 \ln P_{cw} + \beta_2 \ln P_{crp} + \beta_3 d \ln P_t + \beta_4 \ln I_t + \beta_5 Q_{t-1}^d + \beta_6 \ln Q_t^d + \beta_7 \ln I_t + \epsilon_t
\]

Consumption of rural areas was modeled as a function of consumers’ price in this area, the ratio price rice and tomato as substitute commodity, rural income, population growth of rural area, production (because people in rural area have consumption of their own production) and import of wheat variables. A lagged consumption and production variable was also used in the demand and supply equation to achieve any permanent change which could have occurred at the wheat market.

The welfare effects of the wheat trade regime can now be analyzed. Without state trading and at the black market exchange rate, the market would equilibrate at the world price \(P_w\), with domestic production at \(Q_s'\), consumption \(Q_d'\) and imports of \(Q_m = Q_d - Q_s\). With the regime, the domestic market price is higher than \(P_s\), with domestic production at \(Q_s\), consumption \(Q_d\), and state imports of \(Q_m = Q_d - Q_s\).

Thus, trade regime caused consumer lose economic welfare equivalent to area (that consumer price was lower than world price \(P_w\)), value given by the area \(-P_wBH\).

On the producer side, trade regime in period 1981-2000, that producer price was lower than world price \(P_w\), producers as a group gain economic welfare equivalent to area \(P_wADP_s\). However, in the period 2001-2007, that domestic price was higher than world price, producers loss equal to area \(-P_wADP_s\).

The area \(ABQ_s'Q_s\) represented the amount that the Iranian government gains by decrease of import (because of increased in production) on producer side.

On the demand side in period 1981-2000, Iranian government achieved benefit of trade regime, equal to area \(BFCQ_d'Q_d\). In contrast, in period 2001-2007, governments lose (area \(FCQ_d'Q_d\)) because of decreased consumer price of trade regime (without considering consumer in urban area).

Therefore, revenue of tariff on consumption side in period 2001-2007 equal to area \(BFDG\).

So, they may be summarized as follow:

**Figure 1. Price of wheat, Iran 1981-2007**

As Fig. 1 show the consumer price of wheat below the world price and producer price. In period 1981-2000 (Fig. 2), government intervention in the wheat market in rural area of Iran to support consumer and producer, so, set consumer and producer price lower than world price, in this condition, the functional representation of the conducted welfare analysis is:

Producer welfare: \(\int_{P_s}^{P_w} f(P_s, P_k, Q_{t-1}, I_m) dP_s \frac{Q_s}{1+\varepsilon} \left[\left(\frac{P_w}{P_s}\right)^\varepsilon P_w - P_s\right]\).
Consumer welfare:\((-P_wBH) = \int P_d f(P_d, P_r, Inc_t, P_t, Pr_t, Im_t, Q_{d-1})dP_d = \frac{Q_d}{1+\epsilon} \left[ (\frac{P_w}{P_d})^{\epsilon} P_w - P_d \right]\)

Social cost effect on production: \((P_w - P_d)Q_s' \frac{Q_s}{1+\epsilon} \left[ (\frac{P_w}{P_d})^{\epsilon} P_w - P_d \right]\)

Social cost effect on consumption: \(-(P_w - P_d)Q_d' \frac{Q_d}{1+\epsilon} \left[ (\frac{P_w}{P_d})^{\epsilon} P_w - P_d \right] \)

Foreign exchange effect on production=\(P_w(Q_s' - Q_s)\), and on consumption=\(P_w(Q_d' - Q_d)\)

Change in quantity produced=\(Q_s' - Q_s\), and in quantity consumed=\(Q_d' - Q_d\)

Net trade after market liberalization=\(Q_d' - Q_s'\)

In period 2001-2007 (Fig. 3), government support (subsidy expenditure) of producer wheat market was increased, so, set producer price higher than world price and however, because of support in consumer side by government, likewise before, set consumer price lower than world price, in this condition, the functional representation of the conducted welfare analysis is:

Producer welfare :\((-P_wADP_s) = \int P_s f(P_s, P_{sp}, Q_{t-1}, Im_t) dP_s = \frac{Q_t}{1+\epsilon} \left[ (\frac{P_s}{P_d})^{\epsilon} P_w - P_d \right]\)

Consumer welfare :\((P_wCH) = \int P_d f(P_d, P_{db}, Inc_t, P_t, Pr_t, Im_t, Q_{d-1}) dP_d = \frac{Q_d}{1+\epsilon} \left[ (\frac{P_w}{P_d})^{\epsilon} P_w - P_d \right]\)

Social cost effect on production: \((P_s - P_w)Q_s' \frac{Q_t}{1+\epsilon} \left[ (\frac{P_s}{P_w})^{\epsilon} P_w - P_d \right]\)

Social cost effect on consumption: \((P_w - P_d)Q_d' \frac{Q_s}{1+\epsilon} \left[ (\frac{P_w}{P_d})^{\epsilon} P_w - P_d \right] \)

Foreign exchange effect on production=\(P_w(Q_s' - Q_s)\), and on consumption=\(P_w(Q_d' - Q_d)\)

Change in quantity produced=\(Q_s' - Q_s\), and in quantity consumed=\(Q_d' - Q_d\)

Net trade after market liberalization=\(Q_d' - Q_s'\)

The data used in this study were gathered from Statistic Center of Iran, Agricultural Ministry of Iran and Central Bank of Iran. These include: consumption and consumer price, income and population of rural areas; production, domestic supply, import and producer price; GNP (Gross National Production).

The world prices of wheat are calculated based on the dollar rate in black market. The time-series of exchange rates of dollar against Rials (the Iranian Local Currency in the black market) were obtained from the central bank of Iran (CBI).

**Results and Discussion:**

The Augmented Dickey-Fuller (ADF) command in E-views 6.0 was applied to the data to test the stationary of the time series in this study. All variables are not stationary in same levels (Table 1).

As Engle-Granger (Engle and Granger, 1987) and Sargan and Bhargava (Sargan and Bhargava, 1983) indicate, we can be use variables that they are not in the same level of stationary, if the residuals are stationary and the variables have long run relationship (Noferesti, 1995). So, we analysis Engel-granger and co-integration regression Durbin-Watson tests on the residuals of the models that regress, results gave in Table 2. As results show residuals are stationary so, we can use them just as they are.

**Table 1. Unit root test statistics for wheat market model variables, Iran, 1981-2007**

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF test</th>
<th>Variable</th>
<th>ADF test</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Q_t^d)</td>
<td>-4.606059**</td>
<td>(Q_t^m)</td>
<td>-3.810541*</td>
</tr>
<tr>
<td>(P_d)</td>
<td>-3.050316</td>
<td>(P_s)</td>
<td>-4.587798**</td>
</tr>
<tr>
<td>(P_{dch})</td>
<td>-2.443528</td>
<td>(P_{sch})</td>
<td>-2.109716</td>
</tr>
<tr>
<td>(I_t)</td>
<td>-4.326092**</td>
<td>(St_t)</td>
<td>-4.098208**</td>
</tr>
<tr>
<td>(P_t)</td>
<td>-2.765360</td>
<td>(Q_t^s)</td>
<td>-1.961451</td>
</tr>
</tbody>
</table>

The null hypothesis has a unit root at 1% (***) and 5% (*).

**Source:** Calculated by the author
Table 2. Engle-Granger and CRDW test

<table>
<thead>
<tr>
<th>Function</th>
<th>Engle-Granger</th>
<th>CRDW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>-5.337872**</td>
<td>2.17**</td>
</tr>
<tr>
<td>Demand</td>
<td>-4.667279**</td>
<td>1.90**</td>
</tr>
</tbody>
</table>

The null hypothesis has a unit root at 1% (**) and 5% (*).

Source: Calculated by the author

All coefficients presented, have the expected signs. Autocorrelation was detected in two of the equations estimated. As Gujarati (Gujarati, 1995) indicates equations with lagged-dependent variable, autocorrelation was tested using the Durbin-h statistic. So, results of test shows no problems were detected (Table. 3, 4). In the supply equations, the coefficient for supply elasticity is significant when lagged price of wheat are used. The coefficient of lagged production and producer price of chicken are positive and significant. The coefficient of lagged import is positive as expected and significant. Also coefficient of lagged wheat stock is negative, however not expressive.

The demand equation shows that the coefficient for wheat price (demand elasticity) is significant and negative. Also, the coefficients of lagged price of wheat and people growth are significant and positive. The coefficient of chicken price and income are positive but not significant. As mentioned before, people in rural area have consumption of their own production, so, the coefficient of this variable is positive but not significant. The coefficient of import is positive but not expressive.

In order to get elasticity’s of demand and supply for wheat in Iran, during the period of analysis, different specifications for an aggregate domestic supply and a derived demand were estimated. Knowing that the relationship between quantities of demand, supply and the respective prices are bidirectional and simultaneous, but Hausman test (Hausman, 1976) showed that the system is not simultaneous (Seddighi et al, 2000). So, each equation estimates separately in non-linear form. The equations were estimated in logarithm form. Results obtained are presented in Table 3, 4.

Table 3. Estimated coefficient of wheat demand function, rural area of Iran, 1981-2007

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_{cw}$</td>
<td>-0.66708</td>
<td>0.15441</td>
<td>-4.3202</td>
</tr>
<tr>
<td>$P_{crp}$</td>
<td>0.29983</td>
<td>0.40793E-01</td>
<td>7.3502</td>
</tr>
<tr>
<td>$I_t$</td>
<td>0.95011E-01</td>
<td>0.68714E-01</td>
<td>1.3827</td>
</tr>
<tr>
<td>$P_t$</td>
<td>1.7358</td>
<td>0.36991</td>
<td>4.6924</td>
</tr>
<tr>
<td>$Q_{t-1}^P$</td>
<td>0.46357</td>
<td>0.16695</td>
<td>2.7767</td>
</tr>
<tr>
<td>$Q_t^S$</td>
<td>0.43884</td>
<td>0.29358</td>
<td>1.4948</td>
</tr>
<tr>
<td>$Im_t^w$</td>
<td>0.10214E-01</td>
<td>0.78874E-01</td>
<td>0.12949</td>
</tr>
<tr>
<td>Constant</td>
<td>1.4721</td>
<td>2.1841</td>
<td>0.67401</td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>1.90</td>
<td>Durbin H Statistic</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Source: Calculated by the author

Table 4. Estimated coefficient of wheat supply function, rural area of Iran, 1981-2007

<table>
<thead>
<tr>
<th>Regressor</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_{sw-1}$</td>
<td>0.62713</td>
<td>0.21848</td>
<td>2.8704</td>
</tr>
<tr>
<td>$P_s$</td>
<td>0.018367</td>
<td>0.1106</td>
<td>0.16567</td>
</tr>
<tr>
<td>$P_{ss-1}$</td>
<td>0.000044883</td>
<td>0.000092263</td>
<td>0.48646</td>
</tr>
<tr>
<td>$P_{sg}$</td>
<td>-0.33728</td>
<td>0.13645</td>
<td>-2.4719</td>
</tr>
<tr>
<td>$P_{sg-1}$</td>
<td>-0.27936</td>
<td>0.17337</td>
<td>-1.6113</td>
</tr>
<tr>
<td>$P_{sc-1}$</td>
<td>-0.00000064328</td>
<td>0.00000085669</td>
<td>0.75088</td>
</tr>
<tr>
<td>$Q_{t-1}^P$</td>
<td>-0.00055347</td>
<td>0.027523</td>
<td>-0.020109</td>
</tr>
<tr>
<td>$Q_t^{P-1}$</td>
<td>0.59064</td>
<td>0.13829</td>
<td>42.711</td>
</tr>
<tr>
<td>Constant</td>
<td>3.5123</td>
<td>0.43205</td>
<td>8.1293</td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>2.17</td>
<td>Durbin H Statistic</td>
<td>-0.49</td>
</tr>
</tbody>
</table>

Source: Calculated by the author
The price elasticity of demand and supply to be used in calculating the welfare effects are -0.66708 for demand and 0.026455 for supply, coefficients imply that wheat is an inelastic product on demand and supply side of the domestic market; however, producers are expected to respond to any change in the wheat price more than consumers do. The small elasticity of supply obtained, indicated that, any policy on production and consequently on welfare has small effect. The greater the elasticity of demand has high effects of policies on consumption and so on consumer’s welfare.

Based on these estimated coefficients, various aspects of wheat market liberalization in rural area of Iran are now discussed. The annual estimated quantities of supply and demand (Qs and Qd) at current market prices and those estimated after abolition of government intervention (Q's and Q'd) are shown in Fig.2,3.

**Figure 2.** The welfare effects of wheat liberalization in rural area in Iran, 1981-2000

**Figure 3.** The welfare effects of wheat liberalization in rural area in Iran, 2001-2007

Applying the algebra in previous section, the estimated changes in demand quantities decreased in period 1981-2007, but supply quantities in period 1981-2000 increased and decreased in time 2001-2007 (because of decline of domestic price to world price) from wheat market liberalization in rural area of Iran. So, prices were used to estimate the welfare effects on three periods for producer: before accepted liberalization law (1981-1988), period that producer prices is lower than world price (1989-2000) and period that producer prices of wheat are higher than world price (2001-2007), on consumer side, welfare effects estimated in period (1981-2007), that consumer prices are lower than world price. Tables 5, 6 and 7 Shows the effects of Iranian wheat policy on consumers in rural area and producer welfare, social cost, subsidy expenditure and foreign exchange saving.

The producer welfare effects of the production policy are shown in Table 5. Producers were subsidized until 2007. The loss in producer’ welfare from 2001 until 2007 was due to a reduction in production, because of reduction of price to world price. Prices to producers which were lower than import prices until 2000 become higher than import prices. Because of inelastic supply, social cost of the production policy was much smaller than those of...
consumption policy. However, the foreign exchange was large and negative for 1981-2000 periods, declining producer prices during this period decreased production and increased imports, and had a negative effect on foreign exchange.

Table 6 shows the Iranian wheat policy on producer welfare, subsidy expenditure, social costs and foreign exchange. Consumers were subsidized from 1981-2007. The gains in consumer welfare from 1981-2007 correspond to 25% of the total cost (aggregate of change in welfare and social cost). The foreign exchange was negative during the period 1981-2007.

### Table 5. Effect of the Iranian wheat production policy (Thousand tons and Million Dollars)

<table>
<thead>
<tr>
<th>Exchange rate</th>
<th>Subsidy expenditure</th>
<th>Change in Welfare</th>
<th>Social cost</th>
<th>Foreign exchange effect</th>
<th>Change in production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-1988</td>
<td>260800.0 (90636.7)</td>
<td>377058.4 (135235.8)</td>
<td>-116258.3 (52631.7)</td>
<td>-180932.1 (63116.4)</td>
<td>2026.4 (361.5)</td>
</tr>
<tr>
<td>1989-1994</td>
<td>864223.2 (402791.4)</td>
<td>1191413.5 (662882.9)</td>
<td>-327190.3 (280522.8)</td>
<td>-591759.2 (287948.1)</td>
<td>2278.9 (836.0)</td>
</tr>
<tr>
<td>1995-1999</td>
<td>3804668.9 (288271.7)</td>
<td>5568436.3 (1619699.7)</td>
<td>-1763767.4 (1649976.3)</td>
<td>-2645785.6 (287948.1)</td>
<td>2853.1 (851.6)</td>
</tr>
<tr>
<td>2000-2004</td>
<td>-2168546.4 (2741749.2)</td>
<td>-2443297.9 (3159089.2)</td>
<td>274751.4 (191316.4)</td>
<td>1283962.4 (1694245.5)</td>
<td>-1075.6 (1377.2)</td>
</tr>
<tr>
<td>2005-2007</td>
<td>-6092213.1 (875048.7)</td>
<td>-7021750.4 (1191697.2)</td>
<td>929537.3 (325794.3)</td>
<td>3652114.9 (494496.6)</td>
<td>-2296.3 (435.2)</td>
</tr>
</tbody>
</table>

Parenthesis indicate standard deviation.
The period 1989 until 2007 mentioned development programs.

**Source:** Calculated by the author

### Table 6. Effect of the Iranian wheat consumption policy (Thousand tons and Million Dollars)

<table>
<thead>
<tr>
<th>Exchange rate</th>
<th>Subsidy expenditure</th>
<th>Change in Welfare</th>
<th>Social cost</th>
<th>Foreign exchange effect</th>
<th>Change in consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-1988</td>
<td>-363508.5 (172880.9)</td>
<td>-35726.6 (173155.5)</td>
<td>22218.1 (22220.1)</td>
<td>-279004.7 (147685.9)</td>
<td>-2979.6 (1031.9)</td>
</tr>
<tr>
<td>1989-1994</td>
<td>-788163.8 (139742.5)</td>
<td>-628181.6 (164781.5)</td>
<td>-159982.2 (60247.2)</td>
<td>-955967.5 (157213.1)</td>
<td>-3995.9 (1297.5)</td>
</tr>
<tr>
<td>1995-1999</td>
<td>-2117079.6 (976489.7)</td>
<td>-1136441.1 (331111.7)</td>
<td>-980638.6 (645207.1)</td>
<td>-4567121.3 (3152389.0)</td>
<td>-4819.3 (1134.9)</td>
</tr>
<tr>
<td>2000-2004</td>
<td>-2853195.9 (663212.0)</td>
<td>-1552825.9 (2398189)</td>
<td>-1300370.1 (658052.0)</td>
<td>-5215829.8 (1499221.6)</td>
<td>-4891.9 (1010.8)</td>
</tr>
<tr>
<td>2005-2007</td>
<td>-2797689.6 (223291.6)</td>
<td>-1422531.4 (110245.2)</td>
<td>-1375158.2 (135440.4)</td>
<td>-6316559.3 (673657.4)</td>
<td>-3967.0 (317.6)</td>
</tr>
</tbody>
</table>

Parenthesis indicate standard deviation.
The period 1989 until 2007 mentioned development programs.

**Source:** Calculated by the author

### Table 7. Annual effects of wheat market liberalization, rural area of Iran.1981-2007

<table>
<thead>
<tr>
<th>Thousand Tons</th>
<th>Mean</th>
<th>SD</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in quantity supplied (1981-2000)</td>
<td>2268.8</td>
<td>745.9</td>
<td>3641.9</td>
<td>1226.9</td>
</tr>
<tr>
<td>Decrease in quantity supplied (2001-2007)</td>
<td>-1927.7</td>
<td>584.7</td>
<td>-941.4</td>
<td>-2603.1</td>
</tr>
<tr>
<td>Decrease in quantity demand</td>
<td>-3935.9</td>
<td>1175.8</td>
<td>-1349.9</td>
<td>-6607.5</td>
</tr>
<tr>
<td>Change on trade after liberalization (1981-1988)</td>
<td>-4993.6</td>
<td>12367.9</td>
<td>-3091.6</td>
<td>-6815.7</td>
</tr>
<tr>
<td>Change on trade after liberalization (1989-2007)</td>
<td>-5168.6</td>
<td>2551.7</td>
<td>-7.1014</td>
<td>-9977.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Million Dollars</th>
<th>Mean</th>
<th>SD</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
</table>

**Source:** Calculated by the author
Increase in producers’ welfare(1981-2000) | 2024498.2 | 5851267.8 | 11287856.5 | 195322.2
Decrease in producers’ welfare (2001-2007) | -5109224.9 | 2295989.2 | -1531555.8 | -8188585.3
Decrease in consumers’ welfare | -905959.8 | 508815.6 | -168483.3 | -1987750.7
Foreign exchange effect on production(1981-2000) | -981041.4 | 1285344.4 | -99077.3 | -4944260.7
Foreign exchange effect on production (2001-2007) | 2681435.1 | 1151373.6 | 4165574.2 | 842681.5
Foreign exchange effect on consumption | -2808906.1 | 2794449.7 | -76486.4 | -9695471.2
Subsidy expenditure on production (1981-2000) | 1420797.2 | 1824390.5 | 6920871.7 | 145276.9
Subsidy expenditure on production (2001-2007) | -4462890.2 | 1938338.8 | -1383145.5 | -6986766.8
Subsidy expenditure on consumption | -133667.4 | -3698147.1 | -1483612.5 | 1126366.9

Parenthesis indicate standard deviation

Source: Calculated by the author

On average over period of the study, wheat market liberalization causes decrease domestic wheat consumption by 3935.9 thousand tons per annum, foreign exchange caused falling effect on consumption about 2808906.1 million dollars per annum, while the foreign exchange caused falling effect on production side about 981041.4 million dollars per annum. in period 1981-2000 that producer price was lower than world price, however, in period 2001-2007 that domestic price was higher than world price, the foreign exchange effect increase by 2681435.1 million dollars per annum. Totally, the foreign exchange effects on consumption decrease 31510.5 million dollars per annum (without considering urban consumption). Demand quantity decreased 3935.9 thousand tons per annum, because of domestic price increased in period 1981-2007.

Thus, change on trade after liberalization in period 1981-2007, because of decreasing in rural consumption and increasing in production, decrease an average of 10762.2 thousand tons per annum, (without considering urban consumption).

Besides indicating the effects of liberalization on agricultural export and import, the four proposed WTO tariff reduction scenarios also assess the impacts on producer and consumer’s welfare as well as on government tariff revenue. In most developing countries, the agricultural sector is one of the largest employers in the economy while many household also spend a disproportionate share their income on food. Iranian consumers’ welfare in 1981-2007 lost 905959.8 million. On average from market liberalized and producers’ welfare gained 2024498.2 million Rials in 1981-2000 and lost 5109224.9 million Rials in 2001-2007 if trade regime had been accrued.

Also when trade liberalization regime had been accepted, government expenditure on consumption decreased by 1483612.5 million Rials, because difference between consumer price and world price had been decreased, while expenditure on production side during 1981-2000 increase by 1420797.2 million Rials and decrease 4462890.2 million Rials in 2001-2007 per annum.

Therefore, if wheat market liberalized, rural consumer and producer welfare increased and decreased in foreign exchange in both side, also in this situation, government budget decreased.

Although, this study results proved that wheat market liberalization decreased welfare in both side, and we should notice all points of liberalization include unsupported low-income rural consumer by government.

Conclusions:

In this study, the recent changes in the Iranian wheat policies were analyzed through measures of government intervention on nominal rates of production and on the welfare of producers and consumers. Elasticity of demand and supply of wheat in rural area in Iran were estimated and used as a measure to examine the changes on producers and consumers’ welfares.

The price elasticity of supply and demand which calculated, indicate that the Iranian producers are more sensitive to price changes than consumers. However, consumption is more respond to changes in production. Increase in production cause an increase in demand for wheat product.

Annual data for the period 1981-2007 were used to calculate a simple supply/demand relationship. Given the big changes in wheat policies in that period, which affected directly production and consumption, it is necessary to develop models which could calculate such shock, and improve the estimates of the elasticity.

The wheat market liberalization in Iran result in rise of average domestic market price and generally decrease rural area consumers’ welfare; also, demising in producers’ price cause an decrease in producers’ welfare. Foreign exchange cost on the production side would increase due to decreased of wheat import. It shows that produce of
wheat is more economical than wheat import. On consumers’ side, foreign exchange cost have decreased from 1981 until 2007, because of increasing in consumers’ price and decline in demand of wheat. If the market had been liberalized the government budget would have been decreased on consumer and producer side.

In order to improve the wheat market situation in Iran, the following recommendation may be functional: Considering the low level of government activities, the role of the government in the wheat market should be reduced. In the meanwhile, the government should buy and import amount of wheat as stock in order to supply them in time to decrease the market shortage.

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References:


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