Effects of rice price change on welfare: Evidence from households in Fars Province, Iran

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Abstract

This study attempts to analysis the welfare effects of rice market liberalization in Fars province in Iran. In this context, proportion of net seller households was determined first calculating net benefit ratio (NBR) criterion. NBR is defined as the value of net sales of a commodity as proportion of income. Furthermore, the compensated variation method was used to determine the effect of price changes on households' welfare. The data were collected from the Iranian Statistical Center and the Ministry of Agriculture. Results indicated that only 36 percent of the households are net seller of rice. Whilst, 23 percent of the sample households' income attained from rice production, 16 percent of their income is devoted to rice purchasing. The econometric analysis indicated that households welfare may reduce by 0.67 percent in short-run as result of a 10 percent increased in rice price. But, their welfare may increase by 0.24 percent in the long-run. Increase in rice cost would hurt urban households and vulnerable groups with monthly income of less than 750 thousand Rials. However, rice producers can gain from price increase. Since rice market liberalization is expected to reduce rice price, therefore, despite the policy can improve welfare of vulnerable households, in general, it does not significantly affect the welfare level of households.

Keywords: liberalization, welfare, NBR, rice market, Iran

Introduction

The world market of rice seems to be unstable and suffering from price fluctuation. Irregular climates, existence of disease, economic conditions of importer and exporter countries as well as irrelevant growth between production and consumption of rice may be regarded as the main reasons behind such instability. The level of vulnerability of the countries from these factors depends to the importance of rice in their foods. Since the households budget share of rice in Iran is almost high (20% on average), changes in rice price and lack of supply can deeply affect people in the country. As stated by Najafi (1999) and Bakhshoodeh (2001), the inconvenient policy

of the Iranian government in some years has widened the gap in the rice market. Evidences show that with high fluctuation the imports of rice have grown more rapidly than its production. Among the factors affecting the increasing gap between production and consumption of rice, both the direct and indirect policies of government intervention are important. These policies include farm input subsidies and credit programs, guaranteed prices, food coupon distribution, and importing rice using foreign exchange evaluated at a special rate restricted for food purchases. Najafi (1999) has suggested that most of these programs have been inefficient, and have in fact widened the supply-demand gap.

The welfare levels of producers and consumers of rice change as result of change in the price of rice that is of policy makers' interest. In this context, the compensated variation index is applied to a cross sectional data of 1400 households in Fars province, Iran, to investigate the effects of rice price change in social welfares. Based on the previous studies (e.g. Bakhshoodeh, 2002), an almost 10 percent increase in the price of rice is expected to occur after liberalizing the rice market in Iran. Therefore, the main objective of this study is to reveal the effects of such price change on welfares.

The rest of this paper is organized as: first, the economic features of rice in Fars province are shortly reviewed. This is followed by the model and discussions on main findings. Then, some policy implications are discussed at the end.

Fars province with a total area of 132 thousand square meters (around % of the whole country surface) is known as one of the key agricultural poles in Iran. The agricultural lands are around 12 percent of the province area where a notable portion of wheat, barley, rice, parcels, sugar beet, tomatoes, forages, corns and summer crops are produced annually. Although the rice area in the province is about 7 percent, more than 23 percent of the households' incomes are attained from rice production.

Shapouri and Trueblood (2002) have showed that global trade liberalization has so far led to only a slight improvement in the food security of low-income food-deficit countries. Also, although agricultural market liberalization and privatization may seem justified in terms of social welfare and treasury costs (e.g. Bakhshoodeh and

Akbari, 2002), the policy is not fully desirable when its side-effects on poverty are taken to account. For instance, Bernabe (2002) states that "it is clear that in a world made more precarious by uncertainties in food supply and unpredictable movements in foreign exchange valuations, the only safeguard available to developing countries like the Philippines against food insecurity is to develop our nation's capacity to feed itself. And this can only be done if we reinvest in the rice industry and secure our local farmers from full-scale rice liberalization."

Data

A sample of 1400 households was interviewed in Shiraz (a city in South Iran) in 2001/02. The distribution of the sample is given in Table 1. As shown, almost 55 percent of the total households live in the rural areas. These households are categorized as rice producers.

Table 1. Distribution of sample households, Fars, Iran

	Rural areas		Urban areas	
	No of households	%	No of households	%
Rice cultivating areas	430	56	377	60
Other regions	335	44	258	40
Total	765	100	635	100

The collected data include monthly income, the consumption of rice, food expenditure and other expenditures.

Methodology

The direct welfare effect of high food prices on a household depends on its net sales position, as noted by Mellor (1978). Contrary with the net buyers, such as urban consumers and landless rural households, the households who are net sellers, such as commercial farmers, gain from higher prices.

Following Deaton (1989), the net benefit ratio (NBR) was used to determine net sales positions of the sample household. The NBR is defined as the value of net sales of a commodity as a proportion of income. Minot and Goletti (2000) stated that "the NBR

for a commodity can be interpreted as the "before-response" or "impact" elasticity of real income with respect to the price of that commodity. The NBR is a very short term measure which assumes no response from households as producer or as consumer. Further more, it assumes no changes in labor market or non farmer income that might result from the price change". NBR is defined as:

NBR = PR – CR

Where PR is the value of rice production as percentage of income and CR is the value of rice consumption as percentage of income. If NBR is positive (negative), the household is to be a net seller (net buyer).

After examination of the net sales position of household, it is easy to determine that which groups of household would lose and which would gain from an increase in rice price. The data were used to estimate the impact of a uniform 10 percent increase in rice price on real income and welfare.

As stated by Minot and Goletti (2000), the before response welfare effect of changes in rice prices refers to the effect in very short term and is given by:

$$\frac{\Delta w^1}{x_0} = PR_r \frac{\Delta p^p_r}{p^p_0} - CR_r \frac{\Delta p^c_r}{p^c_o}$$

Where Δw^1 : the first order approximation of the change in i^{th} household welfare due to a change in rice price.

x_0 : original income (consumption expenditure) of household

P_0^p : the original value of the price used to value rice production

and PR_r and CR_r are defined as before.

The after response income effect refers to the effect of the households' response to the new prices and is calculated as:

$$\frac{\Delta w^2}{x_0} = PR_r \frac{\Delta p_r^p}{p_{0r}} + \frac{1}{2} e_{rr}^s PR_r (\frac{\Delta p_r^p}{p_{0r}})^2 - CR_r \frac{\Delta p_r^c}{p_{or}} - \frac{1}{2} e_{rr}^h CR_r (\frac{\Delta p_r^c}{p_{0r}})^2$$

Where Δw_i^2: the second order approximation of the change in the ith household

welfare due to a change in rice price.

e_{rr}^s : The own-price elasticity of rice supply.

e_{rr}^h : The own-price Hicksian elasticity of rice demand.

The own-price elasticity of supply is taken from the study conducted by Bakhshoodeh and Akbari (2002) through which the own-price elasticity of demand was calculated using Hicks-Slutsky equation $E_{rr} = e_{rr}^h - CR_r h_r$ in which E_{rr} and h_r are elasticity of ordinary demand (-0.036) and income demand (0.266) respectively.

Results

Table 2 shows net sales position of the sample households. On average, rice production is equivalent to 23 percentage of household income, while the mean budget share of rice is 16 percent. The NBR is 7 percent (23 less 16). Thus, a 10 percent increase in rice price would raise real income by 0.7 percent (10 percent increase in price times NBR) on average.

The urban households were recognized to be net buyer and the rural households were net seller of rice as expected. Therefore, the real income of urban households may decrease by 1.6 percent while that of those in the rural areas may increase by 0.08 percent for given price increase.

Turning to regional patterns, the importance of rice in households' income is the highest in Mamasani (59 percent) and Sepidan (52 percent) and the lowest in Kazeroon (10 percent) and Shiraz (19 percent). This pattern reflects that Northern regions tend to be better off. Table 1 also reveals that budget share of rice falls from 20 percent for the poorest quartile to 5 percent for the richest.

Table 2. Production, consumption and net benefit ratio of rice, household in Fars, Iran

	The value of rice production as percentage of income (PR)	The value of rice consumption as percentage of income (CR)	Net benefit ratio (NBR)
Fars:	23	16	7
Urban	0.1	16	-15.9
Rural	21	20.2	0.8
Rice cultivating areas:			
Jahrom	38	27.3	10.7
Sepidan	52	28.5	13.5
Shiraz	19	18.5	0.5
Firozabad	38	14.5	23.5
Kazeron	10	6.1	4
Marvdasht	41	18	23
Mamasani	59	21	38
Other regions	0.01	23	23
Income groups (monthly income, Rials):			
Less than 750000	20.1	23.2	-3
750000-1250000	38.2	13.2	25
1250000-1750000	28.1	10	18
1750000 or more	5.5	1.6	4

Out of 765 households in the rural areas, 75 percent (576 households) and only 0.4 percent (25 out of 635 households) that is nearly 42 percent of the total sample were recognized to be net seller. However, the total gain by these households is found to be higher than decreases in the real income of the net buyers. In short, the results of this table indicate that although rice price increase tends to improve the income of producer households, it has not significant effect on consumer household's expenditure.

The effect of rice price change on households' welfare

The impact of a 10 percent increase in rice price on welfare of sample households is shown in Table 3. The first column of this table shows the before-response effect and the second column indicates the after-response effect on Fars households. As indicated, although rice price increase tends to improve welfare in long term, it decreases welfare in short term.

Table 3. Change in real income and welfare change in Fars province household for 10 percent increase in rice price

	Change in real income (%)	Short-term welfare changes (%)	Long-term welfare change (%)
Fars:	0.7	-0.67	0.2
Urban	-1.6	-1.7	-1.7
Rural	0.8	-1.5	0.3
Rice cultivating areas:			
Jahrom	1.1	1.9	1.9
Sepidan	1.3	2.7	2.7
Shiraz	0.05	0.6	0.2
Firozabad	2.3	2.2	2.4
Kazeron	0.04	0.2	0.2
Marvdasht	2.3	1.9	1.9
Mamasani	3.8	3.3	3.3
Other regions	-2.3	-4	-0.4
Income groups (monthly income, Rials):			
Less than 750000	-0.3	-0.3	-0.3
750000-1250000	2.5	2.5	2.5
1250000-1750000	2.2	2.2	2.2
1750000 or more	0.39	5.4	5.4

In urban areas as well as the category of other region, where rice is not a dominant product, the welfare tends to decrease respectively by 1.7 and 4 percent in short term, and 1.75 and 0.41 percent in long-term. Although price increase tends to decrease 1.5 percent in short-term, it increases welfare in long-term by 0.3 percent in the rural areas. Due to the relatively inelastic demand and supply, however, the differences between short-term and long-term effects are small. Not surprisingly, the most effect of price change on welfare is observed in Mamasani and Sepidan where NBR is high. Regarding income groups, the policy causes a decrease in the welfare level of the poorest but an increase on that of the other groups.

Summary and conclusions

Since the effect of price changes on households depends to their position of net sales, the NBR was calculated in this study for a sample of 1400 households in Fars, Iran. The short-run and long-run effects of rice price change due to its market liberalization were then calculated and discussed. Based on the previous studies in Iran, the rice market liberalization is expected to increase the price of rice. This may be regarded as a policy that declines the welfare level of the poor. Considering the advantages of the policy and its economic beneficiary, this group should be supported by appropriate policy such as targeting subsides at least in the short-run.

The finding revealed that although around 45 percent of sample households, whose real income may decrease by 1.6 percent, the whole sample household can gain from liberalization. This is because of the fact that the real income of the rest 55 percent of households may increase by 0.8 percent for given price increase. Moreover, the total gain by these households is found to be higher than decreases in the real income of the net buyers.

An increase in the amount of the rice import can improve income welfare in the regions without rice production and also among the poor in Fars province.

As a whole, Iranian taste consist with domestic rice, so imported rice can not substitute with domestic rice perfectly. Therefore, it is expected that with a fall in imported rice price, domestic rice price would not change significantly.

In order to investigate the effect of changing imported rice price on demand for domestic rice, one should note on its cross elasticity and it can be noticed in future studies.

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