The Impact of Producer Support Policies on Wheat Productivity in Iran

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Abstract — Iranian government has pursued producer support policies on wheat which is a staple food to increase production.

This paper aims to determine the effects of such producer support policies on wheat productivity. To achieve the objectives of the study, first, total factor productivity of wheat was estimated. Then, producer support equivalent (PSE) was determined. Due to lack of data on budget payment for wheat, it was calculated based on the share of product in total value of all products. Finally, factors affecting total factor productivity were estimated. Data used for the study obtained from Central Bank of Iran, Ministry of Agriculture and FAO for period of 1986-2010. Results of the study showed that producer support equivalent had positive effect in the short-run. But input price index had negative effect on wheat productivity. While capital labor ratio had no significant effect, the level of literacy had positive effect on wheat productivity both in the short and long run. Finally, some recommendations are made for reforms in existing wheat support policies to increase their effectiveness.

Keywords — Iran, Producer, Support Policies, Wheat.

I. INTRODUCTION

IRANIAN government has pursued producers support policies such as guaranteed prices and input subsidy to strengthen farmers' incentive to increase wheat production. This papers aims to determine the effects of producers support policies on wheat productivity. Salami and Eshrghi (2001) indicated that the government support polices for major agricultural products during 1977-97 period has not affected positively on farmers' incentive and only succeeded to decrease inflationary pressures on agricultural inputs. Study the effects of agricultural price policing on factor productivity in Argentina during 1913-84 showed that indirect taxing of agricultural sector through negative price policy had negative impact on productivity (Mandelak, et al., 1989). Study of relationship between supporting pieces and factor productivity for 18 developing countries for period of 1961-85 showed that in countries that negative price policy imposed on agriculture, the relation between supporting prices and factor productivity was negative while in countries which pursue positive price policy such relation is positive. The effect of agricultural supporting policies on productivity gap for rice in 33 major rice producing countries showed that high producer support for rice in developed countries showed that high producer support in developed countries and taxing producers in developing countries had caused productivity gap between rich and poor countries to increase (Manitra, 2010). The survey of literature indicates that the effects of producer supporting policies on productivity, to a large extent, depend on the nature and ways of implementation of such policies.

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Iran is a typical developing country in which agricultural sector has not received enough protection in various development plans. As a result, agriculture could not cope with growth of non-agriculture sector of the economy and the government in order to keep prices low for consumers has been resorted to huge import of agricultural products with emphasis on wheat which is a staple food in Iran. In this paper, first, the attempt has been made to estimate growth of total factor productivity of wheat and then, to determine the impact of producers supporting policies on wheat productivity.

II. METHODOLOGY

To estimate total factor productivity wheat production function is specified in cobb-Douglas form and can be written in general form as:

$$Y_t = F(X_t^1,...X_t^{\Re}, e_t^v) \qquad (1)$$

Where Y is output and X's are the amount of input, t is time period $\Re$ is K input types. The exponent of the residual v_t is index of the level of technology. Following Cermeno, Maddala and Trueblood (2003), the residual in a dynamic form could be written as $v_t = \lambda_t + \Phi v_{t-1} + \varepsilon_t$ for which ε_t iid $(0, \sigma_3^2)$ where the λ is time specific effect. The terns λ and ε are assumed to be uncorrelated.

Taking the logarithms of the production function led to the following:

$$(1-\phi L)y_t = (1-\phi L)\sum_{j=1}^{\Re-1} \alpha_j x_t^j + (1-\phi L)\varphi X_t^{\Re} + \lambda_t + \varepsilon_t \qquad (2)$$

In which y and x are logarithms of output and input per worker and L in the lag operation. The expression in (2) implies that constant returns to scale (CRS) technology only holds if $\phi = 0$.

Estimating factors, affecting total factor productivity Equation (3) used to estimate factors affecting total factor productivity.

$$TFP = F(PSE, HK, KL, W, F) \qquad (3)$$

In which TFP denotes for total factor productivity of wheat, PSE denotes for producer support estimate, HK denotes for human capital, KL capital labor ratio per hectare, W denotes for inputs price index, F denotes for inputs used per hectare. Data used for the study obtained from Central Bank of Iran, Ministry of Agriculture and FAO for period of 1986-2009.

III. RESULTS

In order to determine level and growth rate productivity of factors of production, first, per capita production function of wheat was estimated. The results are shown in Table 1.

As table 1 indicates among variables, only land per worker was significant in wheat production. Table results showed that the level of productivity has increased from 0.032 in 1986 to 0.0511 in 2009 mainly due to technological progress.

TABLE I
RESULTS OF PRODUCTION FUNCTION FOR WHEAT

Variable	Coefficient	Standard divination	t
Land per worker	1.31***	0.064	3.47
Capital per worker	0.13	0.322	0.43
Fertilizer per worker	0.061	0.203	0.303
Returns to scale	0.03	0.385	0.088

*** Significant at 1 present level

Table 2 shows factors affecting wheat productivity in the long-run. As table 2

TABLE II
FACTORS AFFECTING WHEAT PRODUCTIVITY IN THE LONG-RUN

Factors	Coefficient	Standard deviation	t
LF	0.087	0.174	0.504
PSE	0.007	0.004	1.64
LW	-0.00008	0.00005	-1.53
LHK	0.001***	0.0003	3.74
LKL	0.001	0.001	1.23
C	-0.66**	0.0204	-2.67

***, ** Significant at 1 and 5 percent level respectively.

Indicates level of literacy is the only variable which affects productivity in the long-run. Although, there was a positive relationship between wheat productivity and PSE, that was not significant.

Table 3 shows the relationship between wheat productivity and various factors in the short-run. As table 3 shows PSE in the short- run has positive and significant effect on productivity while price index of inputs had negative and significant effect on wheat productivity. Although the level of literacy had positive effect on productivity in the long run, it had no significant effect in the short-run. On the whole, producer support policies had greatest positive effect in the long-run.

TABLE III
FACTORS AFFECTING WHEAT PRODUCTIVITY IN THE SHORT-RUN

Factors	Coefficient	Standard deviation	t
DLF	0.062	0.123	0.502
DPSE	0.005*	0.002	1.8
DLW	0.0001**	0.00005	-2.88
DLHK	-0.001	0.0008	-1.33
DLKL	-0.0002	0.0006	-0.354
DC	-0.046***	0.015	-3.01
ECM(*1)	-0.7**	0.199	-3.53

***, **,* significant at 1, 5 and 10 percent level.

IV. CONCLUSIONS AND RECOMMENDATIONS

The objective of study was to estimate the effects of producers supporting policies on wheat productivity in Iran. Findings of the study showed that the effect of wheat supporting policies had positive effect on wheat productivity only in the short-run while human capital had greatest effect in the long-run. On the other hand, ratios of capital and fertilizer per worker had no significant effect on wheat productivity. This implies that government supporting policies should undergo major changes to make it more effective. Among these changes, priority should be given to revision of guaranteed price policy. The Iranian government has pursued a policy of purchasing wheat at guaranteed price for last four decades. The major problem with this policy which has been the source of complains among wheat producers, has been determining guaranteed prices below complete average costs. This policy should be changed to cover the full costs of production including opportunity cost of farmers' family labor. In addition, the present method of purchasing wheat should be changed to increase their effectiveness. On this basis, it is recommended to change the present approach to deficiency payment method.

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