AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Saffron Supply Response: A Panel Data Approach

M.A. Falahi
Ferdowsi University of Mashhad, Mashhad, Iran
Phone: +98-511-8811240
Email: falahi@um.ac.ir

S. Saghaian
University of Kentucky, Lexington, KY 40546
Phone: 859-256-2356
Email: ssaghaian@uky.edu

M. Reed
University of Kentucky, Lexington, KY 40546
Phone: 859-256-7259
Email: mrreed@uky.edu

Poster prepared for presentation at the Agricultural & Applied Economics Association 2010 AAEA,CAES, & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010

Copyright 2010 by [authors]. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

Saffron Supply Response : A Panel Data Approach

M.A. Falahi[1], S. Saghaian[2] & M. Reed[2]

[1]Ferdowsi University of Mashhad, Mashad. Iran. [2]University of Kentucky, Lexington, KY.

Prepared for the AAEA, CAFS & WAEA Annual Meeting, Denver, USA, July 25-27, 2010

INTRODUCTION

Saffron is a strategic agricultural product which Iran due to appropriate land and whether conditions with low wages has comparative advantage in its production. Over the last two decades, the cultivation area and production of saffron have increased dramatically and thereby have a crucial role in increasing income of farmers and employment. Although the Khorasan province is now the biggest producer of saffron as before, but saffron cultivation has expanded in other provinces (see figures 1 and 2).

Panel data increase the number of observations, variability and degrees of freedom and at the same time, decrease collinearity among explanatory variables allowing researcher to get more efficient and reliable statistical test. In addition, panel data models control for individual heterogeneity and able to study the dynamics of adjustment.

OBJECTIVE and HYPOTHESIS

The main objective of this study is to identify the main economic factors which affect the supply response of saffron in Iran using panel data econometrics approach. Estimating saffron supply response, especially price response, helps us for planning and policy making with the objective of stimulating the supply.

Two important hypotheses can be considered as bellow:

- Expected output price has a significant positive effect on cultivation of saffron.
- Liberalization of the official exchange rate in 1996 has positive effect on the cultivation.

DATA and MODEL

- **Data**

The data set is unbalanced panel using annual data for 16 Iran provinces over the period 1990-2006.

- **Key to notation**

cul = cultivation area of saffron (hectare)
pri = price of saffron (Rials)
D(1996) = dummy variable for liberalization of official exchange rate
l = natural logarithm

- **Model**

Using unbalanced panel data approach, based on theoretical and framework, four categories of explanatory variables are hypothesized to determine supply response as follows:

Supply = f {lagged supply, lagged output price, government policies, time trend}

It must be noted that saffron has not a close substitute, therefore its nominal price is considered here. The lagged value of price is a proxy for expected price. The lagged of cultivation area is added based on Nerlove partial adjustment method of agricultural production. Time trend is also a proxy for technology.

Figure 1: Cultivation of Saffron in Iranian Provinces Except Khorasan

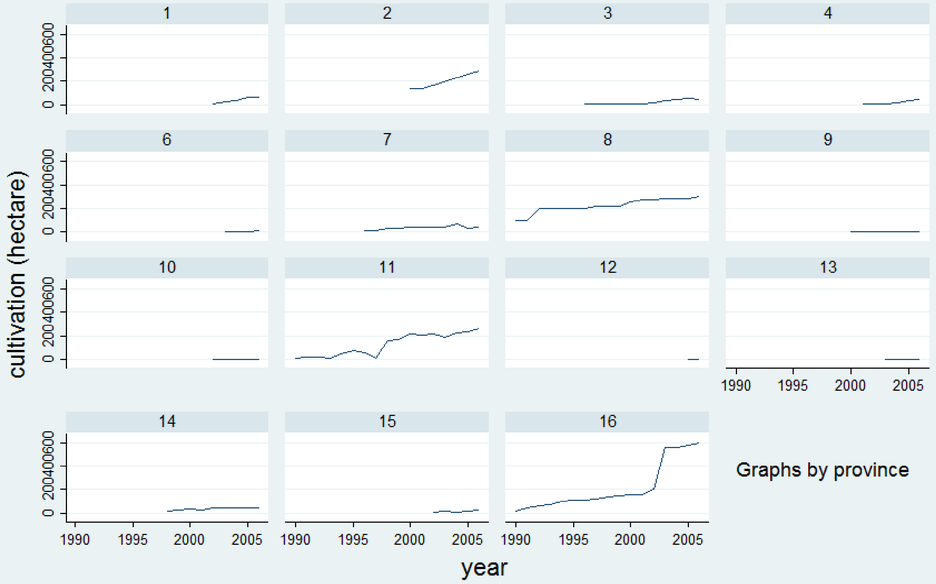
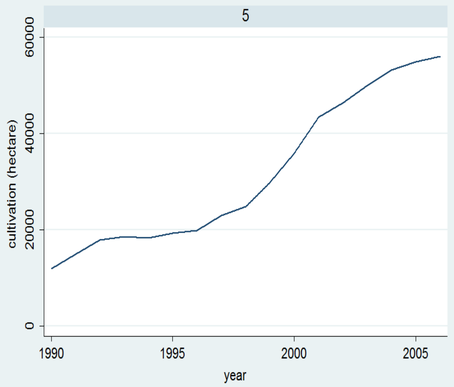


Figure 2: Cultivation of Saffron in Khorasan Province



EMPIRICAL RESULTS

The Hausman test was performed and it rejects the null hypothesis at the 1% significance level that the RE estimator is consistent and therefore the within estimator is preferable (Table below).

Table: Fixed Effects (WITHIN) Regression Results, Unbalanced Panel,1990-2006

Intercept	-1.421	(-1.02)
lcul(-1)	0.648	(10.46)***
lp[ri(-1)	0.226	(2.03)**
D(1996)	-0.111	(-0.57)

R – sq : within = 0.701
between = 0.994
overal = 0.969

F (3 , 103) = 80.50***

Note: t-statistics appear in parentheses. Significant levels: *** = 1% , ** = 5 %

CONCLUSION

This study analyses the factors that the supply response of saffron in Iran as a major producer of world saffron. Here agricultural commodity supply response is examined based on cultivation area. According to the results of the survey, the estimated supply price coefficient is positive at reasonable significant levels and smaller than unity which indicates producers respond to price incentives. The estimated coefficient of lagged supply is positive showing a degree of dynamic adjustment. Exchange rate liberalization as a policy change is not significant and correct sign but it needs careful attention. The saffron price is in nominal terms and there is high collinearity with D(1996) which has strong effect on the significance and sign of exchange rate liberalization coefficient. The supply response equation was estimated using a two-way error component model but the estimated coefficient were not significant. This shows that the time effect which sometimes is chosen as a proxy for technology is absent. Empirical facts of saffron cultivation in Iran during the period of study indicate no technology progress. As a policy recomendation, the own price of saffron has a crucial role on the supply but at the same time, export promotion policy and technological progress may have positive effects on the supply in the future.

REFERENCES

Albayark, N. (1998), "Wheat Supply Response: Some Evidence on Aggregation Issues, *Development Policy Review*," 16: 241-263.

Baltagi, Badi H. (2008) *Econometric Analysis of Panel Data*, 4th ed., John Wiley and Sons.

Gunawadana, P. J. and E. A. Oczkowski (1992), " Government policies and Agricultural Supply Response: Paddy in Srilanka, "*Journal of Agricultural Economics*, 43: 231-242.

Nerlove, M. (1956), "Estimates of Supply of Selected Agricultural Commodities," *Journal of Farm Economics*, 38: 496-509.

Nerlov, M. (1979), " The Dynamic of Supply: Retrospect and Prospect," *American Journal of Agricultural economics*, 61: 874-888.

Rao, M. (1989),"Agricultural Supply Response: A Survey," *Agricultural Economics*, 3: 1-22.

Schiff, M. and C. Montenegro (1997), " Aggregate Agricultural Supply Response in Developing Countries: A Survey of Selected Issues," *Economic Development and Cultural Change*, 45: 393-410.