Investigating the Cause of Reducing Iran Country Share in Global Cotton Production Using of Parametric Method

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ABSTRACT: Cotton is one of the important industrial plants and supplies good part of oil and fiber needed. In this study, using data collected in time period 2001-2011 using, Systemic method of ordinary least squares estimator (OLS), to estimate the supply equation and investigate the causes of the decline share Iran Country in global cotton production, in the form of a single equation regression models were discussed . The results of the estimation of the supply function shown the cotton price variables \( P_C = +2.58 \), the price of synthetic fibers \( P_y = +0.11 \), per capital income \( IN = +1.47 \), per capita demand of cotton a year ago \( X_{t-1} = +0.14 \) on cotton production in the years has a positive effect. Based on the results of the main reasons for the decline in value of the variable of cotton imports this year \( IM_t = -0.15 \) and the cost of producing cotton \( CP_t = -0.45 \), Which has a negative impact on cotton production in the country. Variable amounts of cotton imports years ago \( IM_{t-1} = -0.15 \) and the cost of producing cotton \( CP_{t-1} = -0.45 \), has a negative impact on cotton production in the country. In general, the reduction of tariffs on cotton and entry More than need this product to country and increase the cost of production from the major causes of failure of cotton production in the country is the most important reason to reduce the incentive for manufacturers of produce cotton.

Keywords: Ordinary Least Squares, Cotton Price, Demand coefficient, Imports coefficient, Production Cost coefficient

INTRODUCTION

Development economists have assigned different duties to agriculture part in describing different economic parts function in economic development and on this base, they have emphasized on well-timed development, agriculture and industry part (Tudaru, 1999). Along this policy, agriculture part is required to increase agriculture crops production in order to play it’s role better in the country development and account to needs to nutriment. This affair is caused that quantitative an analysis of production and increasing agriculture crops production are placed in the head of policies of this port (Rafati, 2010).

In Iran there are many talents in relation to agricultural and gardening crops production. One of these crops is cotton. This crop has been used in parts of industry, nutrition and animal husbandry and in addition to supply raw material of weaving industry and oil extraction play an important role in occupation of agriculture, industry and commerce parts (Sabooohi and mojarrad, 2009). Among agriculture crops, about having relative advantage, cotton is included worthy crops that has unique place globally. Iran with cultivated level about 90000 hectare is one of the
most Important cotton producers from quality and quantity point of view in 1390 year. (Agricultural crops statistic, 2011).

Reviews Cultivated area and cotton production in the period 2001-2011 show that trend cultivated area is declining and also Production was descending during this period and has been about 345 tons of seed cotton in 2001 to 180 tons in 2011 that this subject is disturbing.

**Research Objective**
1. Estimation supply function of Cotton production using time series data on Iran country
2. Investigate the factors affecting of cotton production in the Iran country.
3. Investigate the factors reducing the Iran country’s share in global cotton production.

**Literature Review**

On the field of subject to cotton productions and cotton supply and systematic estimator method of leas general squares, much research has been done globally and Iran that is referred to some of them the following: Guisan and Exoposit (2004), considered to investigation of agriculture supply and demand in Spain, France, Japan and America. There results show that supply has been increased more than demand. Also agriculture productions have an important role in economy growth of these countries because decreasing imports and increasing exports of (agriculture) have contributed important in non Agriculture production and ultimately economic growth.

Karbasi, (2010) have considered to investigation of changes and growth convergence of cotton production productivity in the country provinces. The results have been showed that in period 2007-2008, productivity growth has been negative and about –0.008 for the whole country and fluctuations of productivity growth is related more to technology changes. There fore productivity can be in proved with investment and transferring technology to agriculture part. Iran relation to productivity growth convergence didn’t support but it has been convergence since agricultural year of 81- 82 on.

Biglari, (2010) considered estimating supply and demand function of printing and writing paper in Iran with employing systematic estimator method of minimum general squares by use of time series data of the ears 2001- 2006 in a study. The results obtained from this estimation show that in demand function that is intercept elevation variables. Paper price as substitute goods, Education rate , rate of product out put have positive effect on use rate of printing and writing paper and variable price of printing and writing paper has marginal and negative effect on use rate of ranting and writing paper. Also the result sublimed from estimation of supply function show that actual price variables of printing and writing paper , actual price of paper, demand value for printing and writing have positive effect on supply rate of printing and writing and in intercept elevation variables , imports value of printing and writing paper and production cost of printing and writing paper have negative effect.
Rafati, (2011) considered investigating technical, all locative and economic efficiency of people who plant cotton of Tehran province in Varamin provinces by using random marginal production function. Based on the results, variables of cultivated cotton level, machinery, lab our force, use rate of seed and number of irrigation cycle had significant and positive effect on cotton production in Varmint provinces statistically. Also variables of farmer age and participation in promotion and education classes showed reversed relation ship with technical deficiency of exploiters. But number of plots had positive and significant effect on technical deficiency of people who plant cotton. Calculated results of efficiency types showed that average technical, all locative and economic efficiency of sample exploiters is %93, %80,%74 respectively.

Akbari Nodehi (2011) has considered investigating different water values impact on function, efficiency of water consumption and determining production function of cotton in Mazandaran province in a study. This affair has been performed based on random complete block design in 4 frequency over coast cotton and for 2 years in agriculture researches station of Bayekal in Mazandaran. According to the results of this study. It's not necessary to complete irrigation in cotton agriculture and be sufficient 75% watery need.

Rafati, (2011) have considered investigating technical, all locative and economic efficiency of people who plant cotton of Golestan province by use of parametric method in Gorgan provinces in a study. In this investigation, random marginal production function has been used the results of estimating random marginal production function of people who plant cotton in Gorgan provinces express positive and significant effect of cultivated cotton level variables, machinery, Labor force rate of fertilizer consumption and number of irrigation cycle on cotton production. Also in technical deficiency function of cotton producers, education level variables and participation in promotion and education classes showed negative effect. But variable number of plots has positive and significant effect on technical deficiency people who plant cotton.

Calculated results of kinds of efficiency has been show that average technical, all locative and economic efficiency of sample exploiters is 85, go and 77 percent. Respectively, Based upon statistics of food stuff and agriculture organization (FAO), there are 20 main countries of cotton producer in the world that china and India and America are the first three countries. In total they had 70% global cotton production under control and Iran is placed in 20th class in cotton seed production. Cotton is cultivated in 17 province of Iran (Iran – Farm Home website 2010).

Iran share and been equalled %14 from the view point of cotton production in 2009 year, but in the last years, this value has ruined to 0.1% (statistical and strategic studies book of weaving industry, 2011). Iran share from cotton production in the world is very little and this is pitying for our country that has historical background on the field of cotton production. Improvement of this condition seeks special notice responsible persons of the country cotton to be removed present crisis on the field of cotton and this important product , regain it 's old place among other agriculture products . In general, regarding that Iran is one of the most important and the most major countries of cotton producer in the world. It's necessary to be considered issue of effective factors on supply better of this product in internal and increasing Iran share in global cotton production more carefully.

There for total purpose (or whole purpose) of this study with emphasizing on cotton crop production in Iran. Consider investing of effective factors on supply of this product and estimating function related, with help of systematic estimate or method of least general squares and ultimately show determining the most important factors that has caused of decreasing Iran share in global cotton production by use of software program EVIEWS.

**MATERIALS AND METHODS**

**Determination and Stipulation of the Model**

In present investigation estimating supply equation was considered in foramen work of regressive single equation models by use of time series data related to 2001 to 2011 years that have been collected from different references and with emptying systematic estimator method of least general squares (OLS) the cause of this method, giving classic model of linear regression , means that among hear estimators, least squares estimators are with out in flat ion and contains least variance namely BLIE.

Kind of function that is considered of supply equation cotton production in Iran, is linear function of logarithm logarithmic. The cause of selecting such a model access to efficient that estimate stretch directly and is in dependently of unit. Generally, cotton supply depends on factors such as cotton products cost, artificial fiber price (substitution goods) Pure imports, demand value of cotton product (consumption value), in flatiron rate and crops production costs. There supply function of cotton production in Iran can be written logarithmic from follow:

\[ \ln(X^d_t) = C_1 + C_2 \cdot \ln(PC_t) + C_3 \cdot \ln(PY_t) + C_4 \cdot \ln(X_{t-1}^d) - C_5 \cdot \ln(CP_{t-1}) + C_6 \cdot \ln(N_{t-1}) - C_7 \cdot \ln(IM_{t-1}) \]  

In where:
$X_t^5$: Supply rate in period 1 according to ton

$PC_t$: Actual price of each kilogram artificial cotton in period to according to Rial.

$PY_t$: actual price of each kilogram artificial fiber (substitution goods) in period to according to Rial.

$X_{t-1}^d$: Demand rate with an interval year (period $t-1$) according to ton.

$CP_{t-1}$: production cost of each hectare cotton with on interval year (period $t-1$) according to Rial.

$IN_{t-1}$: average the country income with on in travel year (period $t-1$) according to billion.

$IM_{t-1}$: cotton imports rate with an in travel (period $t-1$) according to ton.

Regarding above model, variable coefficient signs are expected to be as follow:

$C7 < 0$, $C6 > 0$, $C5 < 0$, $C4 > 0$, $C3 < 0$, $C2 > 0$, $C1 > 0$

Statistic community in this investigation is the whole people who cultivate cotton of Iran country. Information is form of library and document that has been collected from different sites world wide and the country and offices and organization related in Iran. Statistics and information of this research are related to 2001 to 2011 years. Statistics related to internal production rate of cotton from agriculture products statistics and cotton production cost and artificial fiber price from external commercial statistics annual of Iran and customs library of Islamic republication of Iran, cotton crops production cost statistics from agriculture crops production cost and, ministry of agriculture, consumption statistics of cotton product in Iran factories from cotton general office, inflation rate from central bank of Islamic republication of Iran, cotton product imports to inside the country from site FAO have been collected.

**RESULTS AND DISCUSSION**

Supply equation of cotton production in Iran was estimated with also method that it is results have been presented in table 1.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. α=0.5 |
| ln($X_t^5$) | 0.144538 | 0.710717 | 2.20983 | 0.0472 |
| ln($PC_t$) | 0.117492 | 1.794057 | 2.062592 | 0.0554 |
| ln($PY_t$) | 2.584771 | 1.546282 | 3.671603 | 0.001932 |
| ln($IM_{t-1}$) | -0.152382 | 0.378529 | -2.402563 | 0.03142 |
| ln($IN_{t-1}$) | 1.476176 | 1.089825 | 4.354755 | 0.02685 |
| ln($CP_{t-1}$) | -0.459646 | 1.691411 | -3.271673 | 0.05035 |
| $C$ | 11.33081 | 16.0568 | 9.705594 | 0.005313 |

R-squared(R$^2$) 0.955108  Mean dependent var 12.00666
Adjusted R-squared 0.865324 S.D. dependent var 0.581474
S.E. of regression 0.213391 Akaike info criterion -0.055356
Sum squared resid 0.136607 Schwarz criterion 0.156454
Log likelihood 7.276779 Hannan-Quinn criter. -0.28771
F-statistic 10.63783 Durbin-Watson stat 2.202365
Prob (F-statistic) 0.039408

Source: Research Findings

Results obtained from estimating supply function showed that intercept elevation value (mean effect of the whole variable omitted from the model on dependent variable of supply) has been estimated equaled 11.33081 that regarding statistics values and it's probability is significant 5% statistically.

$\ln X_t^5 = 11.33081 + 2.58 \ln PC_t + 0.11 \ln PY_t + 0.14 \ln X_{t-1}^d - 0.45 \ln CP_{t-1} + 1.47 \ln IN_{t-1} - 0.15 \ln IM_{t-1}$

Coefficient of cotton actual price has been estimated 2.58 that shows (that) whenever cotton price is increased 1% (percent) it’s supply rate by productive units due to accessing to sale and consequently profit is increased 2.58%.

This coefficient shows that cotton supply is increased to rate 0.11% (percent) instead of 1% Beige positive sing of this coefficient corresponds to expectancy and conforms with supply regulation that describes (that) there is a
Direct relationship between goods price and supply value. Stretch coefficient of artificial fiber actual price has been estimated equaled 0.11 as substitution goods of cotton. This coefficient shows that cotton supply is increased to rate 0.11% instead of 1% increase in artificial fiber price. Being positive sign of this coefficient corresponds to expectancy, in that within crease of artificial fiber as substitution goods. Demand value should decrease for it and consequently demand value should for cotton. Increase in demand causes of increase in production rate by productive cotton units due to more do motion over market.

Demand coefficient for cotton has been estimated 0.14 last year. This coefficient shows that supply rate of cotton is increased 0.14% (percent) next year in stead of 1% increase in demand rate last year. Being positive sing of this coefficient corresponds to expectancy and describes that with in crease of cotton consumption rate last year. Producers of this product increase their production rate supposing increase of demand rate current year and accessing to sale rate and consequently more profit.

Stretch coefficient of cotton production costs last year has been estimated equaled(-0.45) that shows (that) cotton production value is creased 0.45 next year instead of 1% increase in production costs of this product last year. Being negative of this coefficient corresponds to expectancy. The cause of this affair can be described in this manner that determinant factor of each product cost is it's production cost.

Consequently by increasing production costs of a product , it's price in creased in marked too and demand is decreased for it and naturally production rate is decreased by productive units due to preventing more loss – making .stretch coefficient of cotton imports last year.

Income elasticity coefficient for cotton in revenue last year, equal to 1.47 is estimated. This coefficient shows that cotton supply rate is increased 1.47% by productive units of the country next year instead of 1% increase in cotton imports rate last year. Being positive symptom is consistent with the expected and stated that increased Income countries to last year, the amount of subsidies granted to production inputs and is more Grant finance of producers and As a result, to obtain more profit in the next year will increase your productivity.

Has been tempted equaled (-0.15) that has been significant in level 5% statistically. This coefficient shows that cotton supply rate is decreased 0.15% by productive units of the country next year instead of 1% increase in cotton imports rate last year. Being negative sing of this coefficient corresponds to expectancy. The cause of this affair can be described in this manner that determinant factor of each product cost is it's production cost.

In estimated supply function, statistics value $R^2$ (determination coefficient) has been estimated equally 0.95 and shows that respected variables (independent variables) in model %95 explain dependent variable changes (of supply) that is indicative of goodness of the model suitability value calculated equals 10.63 that regarding it's Statistical is significant in level 5% Significant and is indicative of the whole statistical reliability of regression.

**Conclusion**

Cotton has been one of the most important productive and exported items in our country since a long time a go and cotton share from non- oil exports of the country has been more than %23 and it has b even counted the most important exchange goods of the country after oil. Being positive supply coefficient in proportion to price (+2.58) corresponds to supply regulation and shows that cotton is counted a normal goods.

Being positive stretch coefficient of supply in proportion to artificial fiber price (+0.11) shows that above artificial fiber is substituted for cotton. Negative effect of cotton imports in last year on production rate next year shows that decreasing cotton tariff and entrance more than need of this product to Iran is named the most major causes of its eternal production fall, also, when cotton production fall, also when cotton production costs are in creased last year, productive units decrease their production value supposing product cost in reuse in next year and consequently sale rate decrease.

There for non- justifiable in crease of productive actors price leads to decreasing sale rate and consequently cotton production value. Being positive in cone coefficient (+1.47) is indicative of increasing cotton supply with creasing the country income because it causes of increasing rewards of a little in tersest loans to cotton producers (that is) cotton producers Are supported.

In the world wide in 1350 to 1356 year , cotton has been the most important productive and exported non – oil goods of the country with average annual production about 181000 ton and average exports 100000 ton to the value of more than 120 million $. presently, Iran share has been come o %0.1 in cotton production. One of the most important causes of decreasing this value is being high internal costs for cotton production, because , cotton producers are supported very little (that is) increasing internal costs of cotton production in proportion to producers considered in the world . causes of decreasing Iran share in global production . In tense decrease of cotton production in the country in the last years describes this fact that supported policies of this parterre not suitable, as
far as if fund am entail measures are not made for rescue of this product, no doubt, destroying complete of this product will not contrary to expectation not far years.

**Suggestions**

1. Strategies that are presentable for exiting cotton condition from crisis canoe referred to subsidy supports of the government of cotton production.
2. Paying a little interest facilities for supplying cultivation and keeping costs at the first of cultivation set son.
3. Transaction at suitable price of paying it timely to the farmer without expectancy of profitability.

Guarantee of productive transaction from relevant organs and providing needed machine made possibilities for performing complete. Mechanization of cultivation, keeping and harvest operations.

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