The Impact of Liberalization on Agricultural Import in Iran

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Abstract: Liberalization is an undeniable trend these days which countries can not evade that. It will effect on all aspects of economics in the world. One of the most important parts of one economic which will be impressed by liberalization and WTO's rules is import. In liberalization process, tariffs reform and it may change the direction of trade between countries. All countries should think about WTO rules deeply, exactly about import and export and more over about their affects on GDP which is important to public welfare enhancement. In this study, for exploring the impacts of liberalization on import of Iran -one of the developing countries which are not the member of WTO- the import function of agricultural sector was estimated with regarding an important index which show how much an economic is open. This index is the Integration of International Trade (*IIT*). The span of our study is 1970-2006. At the end of article some suggestions and strategies have been presented.

Key words: Iran · liberalization · WTO · *LIT* index · *IIT* index · Import · Agriculture

INTRODUCTION

Liberalization is an undeniable trend these days which countries can not evade that. It will effect on all aspects of economics in the world. One of the most important parts of one economic which will be impressed by liberalization and WTO's rules is import. In liberalization process, tariffs reform and it may change the direction of trade between countries. All countries should think about WTO rules deeply, exactly about import and export and more over about their affects on GDP which is important to public welfare enhancement. One of the most important sectors in developing countries is agricultural sector that a lot of force labors are working on that. During trade liberalization, this sector will be impressed which should be predicted before accepting WTO rules because if global price are less than domestic price the import will increase more and more after liberalization and in this way employment will decrease. Because of all reasons which have been told, focusing on agricultural import function is one of the most important subjects which must be estimated by decision makers in every society. In this decade, a lot of researches have been done in developing countries on import function and liberalization as fallow:

Grethe and Nolte [1] identified various internal and external factors that can contribute to the emergence of agricultural import surges in developing countries and discusses their relevance. External factors play a rather minor role. Internal policies, whether carried out for purely domestic reasons or for whatever kind of international commitment, have a much stronger potential to cause import surges. International Support Group [2] investigated the impact of trade liberalization on some agricultural sub-sectors of Vietnam. They concluded, to improve the competitiveness and strengthen capacity of economic integration for reduce or remove all non-tariff barriers, particularly in administrative procedures so that marketing and trading cost can be decreased and price competitiveness can be enhanced. Liu *et al.* [3] used a national CGE model of China linking to GTAP model to track the changes of household income and expenditure patterns due to the impacts of WTO membership on China's agriculture. The tariff reduction leads to a decline in local import prices, inducing consumers to substitute cheaper imported agricultural products for their domestic counterparts. Similarly, the tariff reduction brings about cheaper intermediate inputs as it drives the domestic cost of production down, benefiting the outward-oriented-import-dependent industrial sector as output and exports increases. Agricultural output decline while industry and services output expand. It affects the income of rural households which engaged in agriculture production. According to the analysis of household income, real tariff cut could increase the income of most households. But it also brings about a little inequality in

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China. Brafu-Insaidoo and Obeng [4] investigated the effect of import liberalization on tariff revenue in Ghana. Import liberalization in Ghana may not be fiscally incompatible if the liberalization is coupled with other policy measures such as tax replacement, for example substituting sales taxes for tariffs, improves total tax revenue sufficiently. Thus the fiscal policy issue may be whether these suggested measures improve revenue sufficiently to compensate for tariff revenue loss due to import liberalization. Weeks [5] suggested that the failure of agriculture to respond positively to policy changes can be in part explained by an unfavorable trend in world prices of the region's major tradable commodities. Itharattana [6] investigated the effects of trade liberalization on agriculture in Thailand. Who concluded during liberalization Thailand has to reduce producer subsidies. This will affect major commodities which are subsidized, such as soybeans, palm oil, dairy products and sugar. Henriques and Patel [7] investigated Mexico's Agricultural Trade Liberalization on corn. They concluded the exact impact of trade liberalization on import-competing producers cannot be generalized without considering the heterogeneity among them.

In this study, the impact of liberalization on agricultural import has been explored. All equations have been estimated by Microfit 4.0 Software. All variables are changed to constant of 1997.

MATERIALS AND METHODS

MODEL and DATA
Data: In this study we focus on agricultural import and liberalization in Iran. For this aim Iran center bank data of 1968-2006 have been used. Variables are the growth rate of agricultural exports (X), the growth rate of (GDP), the growth rate of net factor income remittances from abroad (NFI), the growth rate of real investment (INV), the growth rate of agricultural imports (M_a), the growth rate of nominal exchange rate (e) and $D59$ is a dummy variable which is related to a year (1980) when Iranian people suffered from a big war. This event changed the investment and economic direction sharply. All equations have been estimated by Eviews Software. All variables are changed to constant of 1997.

Method
Unit Root Test: Of particular interest to us is the Augmented Dickey-Fuller (ADF) test that has been developed to test univariate time series for the presence of unit roots or non-stationary. The extended maintained regression used in the ADF test can be expressed in its most general form as:

$$\Delta T_t = \mu + \gamma Y_{t-1} + \sum_{j=1}^{p} \alpha_j \Delta Y_{t-j} + \beta t + \omega_t$$

where; μ is the drift term, t denotes the time trend and p is the largest lag length used. Test statistics and hypotheses are as fallow:

$$H_0 : \gamma = 0$$
$$H_1 : \gamma = 0$$

If H_0 could be rejected, there is non stationary for tested variable.

Model: Our aim in this study is determination the linkage of agricultural imports and liberalization in Iran. In order to achieve our goals 2SLS model for estimating the agricultural imports and GDP growth equations was used.

The advantages of using 2SLS over the more conventional maximum likelihood (ML) method include:

- It does not require any distributional assumptions for RHS independent variables; they can be non-normal, binary, etc.
- It is computationally simple and does not require the use of numerical optimization algorithms.
- It easily caters for non-linear and interactions effects [8].
- It permits the routine use of often ignored diagnostic testing procedures for problems such as heteroscedasticity and specification error [9].
- Simulation evidence from econometrics suggests that 2SLS may perform better in small samples than ML [10].

SLS Estimation Basics
Consider a Simple Regression Model:

$$Y = \alpha + \beta X + u \qquad (1)$$

where; y is the dependent variable, x is the independent variable α and β are estimable parameters, u is the error term. If x and u are correlated then this violates an assumption of the regression framework.

Applying standard ordinary least squares (OLS) to equation (1) under these circumstances results in inconsistent estimates, that is, even as the sample size approaches infinity the estimates of the parameters on

average will not equal the population estimates. To remedy this problem one can apply 2SLS, also called the instrumental variables (IV) procedure. To implement 2SLS we need to identify one or more instruments for x.

These instruments (call them z) must satisfy two conditions:

- z must be uncorrelated with u.
- z must be correlated with x.

In choosing the number of instruments to employ in 2SLS asymptotically, the larger number of instruments the better in terms of efficiency. However, the small sample bias of the estimator may get worse as the number of instruments increases. Further as more instruments are employed degrees of freedom are lost and this will weaken the power of statistical tests [11].

Estimating with Two New Parameters: Liberalization is an undeniable trend these days which countries can not evade that. When a country accepts liberalization, this trend will effect on all aspects of its economy. Imports and exports are the most important parts of one economic which will be impressed by liberalization and WTO's (World Trade Organization) rules. Iran is one of the developing countries which are not the member of WTO but it should be prepare for accepting this organization rules. There are some indexes that show the degree of liberalization and the readiness of a country for accepting globalization. We try to use two important of them in this article. The export and import functions were estimated with regarding to these indexes which show how much an economic is open. These two indexes are the Level of International Trade (*LIT*) and Integration of International Trade (*IIT*).

Level of International Trade (*LIT*) Index: This index reveals the extension of connection for a sector and defined as fallow:

$$LIT_i = \frac{(X_i + M_i)}{(Y_i + M_i - X_i)}$$

In this equation X_i, M_i and Y_i are export, import and production of case study sector (i). Small LIT_i shows the case study sector has less partnership in trade regarding to its production. However this index is very suitable, it shows first order condition for measuring globalization, not second order condition for that.

Integration of International Trade (*IIT*) Index: This is Grubel and Loyd [12] index that measure international integration for a sector. It is like as fallow:

$$IIT_i = 1 - \frac{|M_i - X_i|}{X_i + M_i}$$

IIT_i is always between 0 and 1. 0 shows there is no any trade in that industry and 1 shows there is complete trade in that industry or sector. Economics believe IIT_i is a good index for finding the degree of globalization for an industry because it is related to a lot of factors which are effective on globalization and it shows the impact of liberalization more than the other indexes.

For our purposes, we defined equations which were required as fallow: (estimations were not significant and desirable by using *IIT*).

Agricultural Imports Equation:

$$M_{at} = \alpha_0 + \alpha_1 GNP_t + \alpha_2 e_t + \alpha_3 Pm_t + \alpha_4 LIT_t + \alpha_5 D59 + \varepsilon_{1t}$$

GNP Equation:

$$GNP_t = \alpha_8 + \alpha_9 X_t + \alpha_{10} M_{at} + \alpha_{11} INV_t + \alpha_{12} NFI_t + \alpha_{13} D59 + \varepsilon_{2t}$$

CONCLUSION

Stationary: Augmented Dickey - Fuller test (ADF) was used for stationary test of variables. Variables were non-stationary in level but their differences were stationary. Table (1) shows the test results.

After that co-integration between variables in equations (1) and (2) were explored. If existence of co-integration between variables in each equation isn't true, there wouldn't be the long run relation between variables in equations. So, Engle-Granger method for co-integration was used. The residuals of each equation were stationary. Therefore there are long run relations between variables in each equation. Table (2) shows these results.

Table (2) shows that results of each equations are stationary in at least 10% level. Therefore there is a long run relationship between variables in each equation.

Estimation: Table (3) shows the 2SLS estimation results. Because all variables are growth rate, the coefficients of them indicate elasticity.

Table 3 shows results in two parts, in first equation GDP has positive effect on agricultural imports also this effect is significant which means by increasing GDP, agricultural will increase too. Another variable that was

Table 1: Result of Adf Test

Variable	DF	CV	Variable	DF	CV
M_a	-3.21	-2.94	----	-----	----
GDP	-2.53	-2.942	ΔGNP	-4.33*	-2.947
e	-4.38	-2.942	----	-----	----
P_m	-3.66	-2.94	----	-----	-----
LIT	-2.80	-2.94	ΔLIT	-6.44*	-2.947
X	-2.162	-2.942	ΔX	-4.347*	-2.947
INV	-4.002	-2.942	----	-----	----
NFI	-4.33	-2.942	----	-----	-----

*at 5% significance level

Table 2: Result of Co-integration Test for Each Equation in First Scenario

Residual	ADF
Equation(1)	-3.78*
Equation(2)	-4.20*

*at 1% significance level

Table 3: Result of Estimation

Equation	Variable	Coefficient	t statistic
1	C_1	-10.56103	-0.916719
	GDP	2.344266	2.794398*
	e	-0.149824	-1.544834
	P_m	-0.094306	-0.311299
	LIT	23.97368	1.700913*
	D59	8.270362	0.957448
R^2		0.4	
DW		1.99	
2	C_2	6.749156	5.220746*
	X	0.016157	2.062748*
	M_a	-0.012412	-0.128043
	INV	0.274336	3.067396*
	NFI	0.003633	1.600126**
	D_{59}	-5.175902	-3.257601*
R^2		0.74	
DW		2.006	

*at 1% Significance level

** at 5% Significance level

significant and positive effect on agricultural imports is *LIT*. It means by openness, agricultural imports will increase. By 1% increase in *LIT* index -which shows openness- agricultural imports will increases 23%. *D59* shows Iranian war increased agricultural imports but it is not significant. Agricultural goods price index and nominal exchange rate have negative effect on agricultural imports. R^2 is 0.4 and shows 40% of agricultural imports variations explain by dependent variables.

In second equation, growth rate of GDP is explained. Growth of exports, investment and net factor income remittances from abroad have positive and significant effect on growth rate of GDP. Moreover M_a and D_{59} have negative effects on growth rate of GDP, but M_a is not significant. It shows Iranian war has negative and significant effect on growth rate of GDP. R^2 is 0.74 and shows 74% of growth rate of GDP variations explain by dependent variables.

It has been proved by many studies, Iran has advantage in producing most of agricultural goods, but this study results show trade liberalization will increase the import of agricultural goods to Iran. It might be because of that cost of Iran's agricultural productions are high. Before accepting liberalization condition, decision makers should try to propagate some methods in order to decrease costs and increasing quality more and more. It is a necessary action to face the of liberalization impacts.

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