Multifunctionality of the Iranian Agriculture Sector in a Partial Equilibrium Framework

Zahra Kiani-Feyzabad [1], Seyed-Ali Hosseini-Yekani [2], Seyed-Mojtaba Mojaverian [2]

[1.] MS Student, Department of Agricultural Economics, Sari Agricultural Sciences & Natural Resources University, Sari, Iran; [2.] Assistant Professor, Department of Agricultural Economics, Sari Agricultural Sciences & Natural Resources University, Sari, Iran. s.a.hosseiniyekani@gmail.com

Abstract: One of the magnificent issues related to the trade liberalization and globalization is to consider this point that whether the governmental support, such as paying agricultural subsidy are definitely of deviated effects on the trade or these paying are necessarily categorized out of the alluded policies in the green-box.in this case-study, taking a multifunctional role for the Iranian agriculture sector in the realm of the partial equilibrium model in mind, this issue that the supporting such as granting subsidy to the agricultural sector can not at all be categorized among the policies of the green-box is evaluated, besides, without taking these roles, the positive effects at supporting such as granting subsidy to the agriculture sector, justify the utility. On the basis of the results of this research, it is possible to simulate the consequences of joining to the world trade organization quantitatively.
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1. Introduction

Globalization means the merger of the national economy with the global economy that causes the increase in the amount of the international trade, the globalization of the production and direct investment (Saffari, 2004). One of the ways to globalization is joining the World Trade Organization (WTO). The countries that import agricultural products and the ones exporting them try to support their agriculture sectors putting customs tariffs and paying the subsidy of the export of the agricultural products, respectively. Following the different countries efforts to liberalize the trade of the agricultural products, WTO decreed that the related to tariff and non-tariff obstacles of the trade be reduced and the subsidy of the export of the agricultural products be limited. The economic activities results in the increase in production, rivalry and efficiency (Mohammadi and Naghshinehfard, 2005). Edward (1991) believes that trade liberalization should results in the establishment of a trade system in which all the deviations market like the import tariff and the export subsidy are deleted. In the studies conducted by WTO, the internal supports are categorized into two classes: a) trade-deviator supports (yellow-box supports), which every country whose amount, for every product or the whole agriculture sector, should be determined and then gradually be decreased, and b) development supports (Green-box supports) that are allowed supports with the purpose of supporting the rural expansion, agriculture and landscape preservation (Bakhshi et al., 2009). Agricultural income results in becoming motivated in producing goods and creating jobs and it insures the landscape preservation and food security. Natural landscapes, food security, rural employment, etc. are considered the marginal effects of the agricultural production. Many researchers have said that these effects are of two types: positive marginal effects like natural landscapes and negative marginal effects like soil corrosion. Recognizing the positive marginal effects has been known as the multifunctionality of agriculture (Pfeiffer, 2002). Many of high-cost counties, European Union countries, that are of a long-term background in conducting cost supports in the field of agricultural products higher than the global level, have utilized the multifunctionality as a means of insuring the positive marginal effects of the agricultural sector and justifying supporting their agriculture sectors (Brunstad et al., 2005). Supporting the agricultural sector in the field of the Green-Box policies i.e. the policies that do not result in the trade-deviation are acceptable. But are these supports, taking the multifunctional role of the agriculture and the production of the common goods the agricultural products, justifiable?

Brunstad et al. (1995), utilizing a numerical model in the form of partial equilibrium, established the level of the necessary support for the Norwegian agricultural sector assuming this issue that the only goal is to provide the food security. The results of this study, in comparison to the real activities in the Norwegian agriculture sector, indicated a 50 percent decrease in the employment and the optimal use of the land.

Brunstad et al. (1999) studied the landscape preservation as one of the common goods of the

agriculture sector utilizing the combinative information method in Norway. The researchers in this study calculated the optimized level of the products, employment and also supports in the situation that landscape preservation is considered the goal. On the basis of the different simulated experiments, the results of this study indicated that only a minor part of the broad conducted supports has been necessary.

Brunstad et al. (2005) determined the optimized level of supports, employment and production in Norway, and they considered the two objectives food security and landscape preservation in the objective function of the model. The results of theirs study proved this reality that only a minor part of the present supports considering common goods (food security and landscape preservation) has been necessary.

Prestegard (2004) using the partial equilibrium model showed that multifuntionality could hardy justify the supporting packages out of the Green-Box (supporting the market), whereas it might justify the governments support in the field of the production of the public goods.

Gelebe and Lohomann (2007) utilizes the function of the mercantile partial equilibrium model for analyzing the trade and environmental policies of the multifunctionality of agriculture. Although the issue of the multifunctionality might result in succoring the conduction of supporting the agriculture sector for criticizing the trade liberalization, it is not valid and cogent a reason when the trade liberalization paves the way for the initiation of the environmental policy.

Abler (2004) considered this problem that whether the supporting policies like income and cost supports could result in the increase in the functions of the agriculture sector or are the policies that directly target the functions of agriculture more effective than those targeting the cost and income of farmers? The answer to the first question was negative, and second one, too, depended on the policies targeting the land.

Donnellan and Hanrahan (2006) in a study evaluated the influence of the trade liberalization in the agriculture sector on the decrease of one of the negative external effects, greenhouse gases, utilizing the partial equilibrium model. The results indicated that for alleviating the effects of the greenhouse gases, there is needed a set of basis reforms in some parts that are under the agreement of the WTO.

In this study, for evaluating the effect of the liberalization of agriculture on the functions of this sector, Brustad's partial equilibrium model (1995) has been utilized. In this study, it has been tried to assess the relationship between the multifunctionality of the Iranian agriculture sector and the tariff and subsidy supports conducted in this sector. To do this, two functions, food security and the preservation of the family farms, as two the public goods produced in this sector, have been considered.

In order to evaluating the elimination of the supports provided by the government, such as tariff and the subsidies, considering two important functions of the agriculture sector i.e. food security and the preservation of the family farms, we test the following hypotheses:

H1: Not only elimination of each of the supports threatens the other functions of the agriculture sector, but also these functions are strengthened if the supports are decreased.

H2: The elimination of each of these supports will not end in the decrease in the labor force in the rural areas under the critical level and both functions of food security and family farms preservation will not be damaged at all.

2. Material and Methods

In this research, the relations between the major economic variables of the agriculture sector containing two sub-divisions, farming and gardening, and also animal-husbandry in the form of a partial equilibrium model whose initial structure has been proposed by Brunstad et al (1995), have been simulated. This model, according to two viewpoints, is considered a partial equilibrium one:

1- In a partial equilibrium model, the variables of income and cost are exogenous. Hence, it is different with the common equilibrium models such as Walras model (Burnieaux et al., 1990).

2- In a partial equilibrium model, the prices of imports and exports of the products are considered exogenous. Taking the global price of the imports fixed has been adopted from the hypothesis of the small country.

Therefore, this model is different from those of the multi-market goods such as MTM (Huff and Moreddu, 1990) and GLS (Tyser and Anderson, 1987) models. The model utilized in this research is the same type as the programming models that have been introduced and designed McCarl and Spreen (1990). As it has been assumed in the long-term models, the assumption of the complete dynamism of labor-force and the capital is taken in mind. So the surplus of the labor-force and the capital, completely without friction, is absorbed by the other industries. In this model, the economic surplus (The consumer surplus and the producer surplus) of the agriculture sector has been maximized. This maximization has been done provided that there are relationships between the demand and supply of the sector. In this part, the considered relations and equations are

introduced. Relation 1 shows the production of each one of the sectors, agriculture and gardening and animal-husbandry in the form of Cobb-Douglas function. This is a function of the factor, for the generation of labor and capital.

(1) $$y_j = ad_j \prod_{f \in F} v_{fj}^{\alpha_{fj}} \qquad j \in J$$

In this function, the index j represents the products, y_j represents the production amount in every sub-division, ad_j is the parameter of the efficiency of the production function, the index f represents the production factors(labor and capital), α_{ff} is the elasticity of the production factor f in the production field j, and v is values of the production factors. On basis of relation 2, the amount of the family expenses is calculated deducting the family expenses in relation to other families, government (banks) and the external field from the total income of the family.

(2) $$c_h = (1 - mps_h - ty_h).yh_h - tr_{h',h} - tr_{gov,h} - tr_{row,h}.exr$$

In this relation, h represents the families, mps_h represents the income of the family h for saving after paying the family tax, ty_h shows the direct tax rate for the family h, exr shows the rate of the exchange (Rials), yh_h shows the total income, $tr_{h,h}$represents the family expenses, $tr_{gov,h}$shows the government expenses, and $tr_{row,h}$ shows the expenses related to the external world. The demand for consumption of every income quintile in each one of the products of the following sub-divisions is calculated according to relation 3. In this relation β_{jh} is relation of the total family expanses that the consumer consumes for the goods j, and p_j is the average price of the goods j that is set by the producer.

(3) $$c_{jh} = \frac{\beta_{jh}.[c_h]}{p_j} \quad j \in J, h \in H$$

Relation 4, contains the scarcity restrictions of the production factor in terms of their present values. In this relation, $\bar{v}_f$ is the maximum amount of the production.

(4) $$\sum_j v_{fj} \le \overline{v_f} \qquad f \in F$$

The export rate is the rate that is calculated by the native producers when they sell their products in the global markets.

(5) $$px_j = pwe_j \cdot exr \qquad j \in J$$

As it was shown in relation 5, the export rate of each of the products is calculated by the multiplication of the exchange rate in terms of the national country by the universal export cost of that product. px_j is the export cost (Rials), and pwe_j is the universal export cost (foreign exchange). The import price of every product is the price that consumers pay for the imported products in terms of the currency of their country. Because the consumers pay for the goods after the consumer tariff has been devised, the import price of every product is calculated according to relation 6.

(6) $$pm_j = (1 + tm_j) \cdot exr \cdot pwm_j \qquad j \in J$$

pm_j is the import cost (Rials), tm_j is the import tariff rate, and pwm_j is the global cost of the imports (foreign exchange). Domestic consumers of every product use domestic and exterior goods (composite goods). The absorption price indicates the domestic cost according to the demanded price. Relation 7 shows the price of the composite goods that is a combination of the price the interior sold products and the price of the imported goods. The weights of the equation are the amount of the sold interior products and the amount of the imports. The absorption equation contains all the products that are sold in the country. In other words, contains all imported products or the products produced inside the country that are sold interiorly and it does not include the products that are completely exported.

(7) $$pq_j = \frac{(pd_j.yd_j + pm_j.m_j)}{yq_j}(1 - sq_j) \qquad j \in J$$

pq_j is the price of the composite goods, pd_j is the domestic price of the goods produced in the country, m_j is the amount of the imports, and sq_j is the subsidy rate per every product unit j. In addition, domestic producers either sell their products in their own country, or export them. Therefore, for every product that has been produced inside the country, the market production value (producer price) is calculated on the basis of relation 8 that shows the weight average of the goods produced in the country and export price of the products.

(8) $$p_j = \frac{(pd_j.yd_j + px_j.x_j)}{y_j} \qquad j \in J$$

$yd_j$is the amount of the products sold in the country, and x_j shows the exports.

On the basis of relation 9, the composite products are consumed by the domestic demanders. The imperfect substitution between the imported goods and the domestic products that are consumed in the country are indicated by the constant elasticity

of substitution general function (CES). In this function, the supplied products are a composition of the goods produced in the country and the goods imported. In this function, the imported products and the ones produced in the country are used as "input". From economic viewpoint, it means that the demanders' preferences from amongst the imported and produced in the country products are expressed in the form of a CES function that is called Armington function. Constraints as $(-1 < \rho_j^q < \infty)$ in which ρ_j^q is the power $(-1 < \rho_j^q < \infty)$, the composite offer function (Armington), supply the assumption of the convexity of the above-mentioned function in proportion to the y-intercept. This characteristic equals the rate of technical descending substitution.

(9) $$yq_j = aq_j \cdot \left(\delta_j^q \cdot m_j^{-\rho_j^q} + \left(1 - \delta_j^q\right) \cdot y_j^{-\rho_j^q} \right)^{\frac{-1}{\rho_j^q}} \quad j \in J$$

aq_j is the parameter of the translation of the composite supply function (Armington), and δ_j^q is the parameter of the ration of composite offer function(Armington). Also goods and services produced inside the country, either are sold in the country, or are exported whose specification is calculated by a constant elasticity of transformation (CET) function. CET function, according to relation 10, is used for the exported products. This function is like CES. The only difference between them is the existence of negative substitution elasticity. The isoquant curve related to the above equation, according to the constraints, is $(1 < \rho_j^t < \infty)$ per ρ^t in proportion to the concave origin of coordinates in which ρ_j^t is the power of $(1 < \rho_j^t < \infty)$, the product transformation function (CET). If it is demanded that the difference between Armington function and CET be presented via economic terms, it can be said that in CET, the variables of the relation are the production factors, whereas in the Armington function, the variables are the products.

(10) $$yt_j = at_j \cdot \left(\delta_j^t \cdot x_j^{\rho_j^t} + \left(1 - \delta_j^t\right) \cdot y_j^{\rho_j^t} \right)^{\frac{1}{\rho_j^t}} \quad j \in J$$

at_j is the translation parameter of the production transformation function (CET), and δ_j^t is the ration parameter of the production transformation function(CET). On the other hand, the demand function for each of the products is equal to relation 11.

(11) $$p_j = a_j - b_j c_j$$

The objective function in the model is the sum of economic surplus of the sector that has been defined as the sum of the surplus of the producers, the consumers and the importers. The producers benefit through selling the goods results from the domestic sales and the exports. Relation 12 shows the gained benefit from the domestic sales.

(12) $$\sum_j p_j (y_j - x_j)$$

Relation 13 shows the gained benefit from the exports.

(13) $$\sum_j px_j x_j$$

Relation 14 shows the producers surplus

(14) $$\sum_j (p_j - pm_j) m_j$$

Now if the cost T and relation 13 and 12 are deducted from each other, the sum of the surplus of the producer and the surplus of the importer will be as relation 15:

(15) $$\sum_j (p_j c_j + px_j x_j - pm_j m_j) - \sum_f r_f v_f - T + S$$

pm_j is the price of the product j,s is the governmental supports, and r_f the price of the inputs. On the basis of relation 16 the surplus of the consumer equals:

(16) $$\sum_k \sum_j b_{Kj} c_K c_j$$

According to the above relation and the relation number 11, the objective function of the model that contain the sum of the surplus of the consumer, producer and importer can be shown as follows:

(17) $$\Pi = \sum_j (a_j c_j - \frac{1}{2} \sum_k b_{Kj} c_K c_j + px_j x_j - pm_j m_j^r) - \sum_i r_i v_i - T + S$$

The above-mentioned matrix was solved utilizing the macroeconomic data and the expressed numbers in the input-output matrix of the years 1380 of the Iranian central bank using GAMS software. But as it was stated in the introduction, in this research, the two functions, preserving family farms and food security, are evaluated as marginal and often ignored functions of the agriculture sector. Preserving family farms via supporting the small farmers (who usually exploit domestic non-specialist labor force) is conducted in accordance to preserving their producing units. Concerning food security, it deserves mentioning that the ability to provide food in every condition is called food security. Food security is defined in three levels, global, national and personal (Ballenger, 1992).

2.1. Global food security

Pr[(world production+world stocks) ≥ world needs] ≥ π

Where π is minimum acceptable likelihood. This means that the sum of world production and stocks in every year must exceed the necessary consumption by a minimum acceptable likelihood.

2.2. National food security

Pr[(domestic production + domestic stocks +imports+ aid) ≥ domestic needs] ≥ π

National food security is less restrictive, as consumption could be satisfied based on imports and aid from other countries. Therefore, even if global food security is below reasonable limits, rich countries will normally have enough purchasing power in world markets to secure a sufficient share of world production. The same logic applies to individual food security, which can be secured if a person has enough income or purchasing power, even if the nation's food supply is insufficient. It follows that if global food security is fulfilled, then national and individual food security is a matter of distribution or poverty relief. A special case is a blockade in connection with war, which rules out distribution between countries (infinite import prices). it seems unwise to dismiss totally the need for a minimum of activity within the agricultural sector to diminish the negative effects of unknown crises in the future. Import tariffs and production subsidies are not only costly, but may also impair the purchasing power and food security in countries with comparative advantage in food production. In this study, the production rate in every level of the decrease of supports has been used as an index to show food security.

3. Results and discussions

In this section, the results gained from the effect of different scenarios of the alleviation and ultimately eliminating tariff and subsidy supports on food security and preserving rural farms as the unproductive functions of the agriculture sector are evaluated. In the basis of the gained results, one can express their ideas on the relationship between the unproductive functions of the agriculture sector are the supports provided. In this article, three scenarios were followed.

1- The evaluation of the effect of the reduction of tariff (20, 40, 60, 80 and100) on the unproductive functions of food security and the preservation of the rural farms.

2- The evaluation of the effects of the reduction the subsidies (20, 40, 60, 80 and 100) on the functions of food security and the preservation of the rural farms.

3- The evaluation of the effects of the reduction of the total supports provided on the agriculture sector (20, 40, 60, 80 and 100) on the two functions food security and the preservation of the rural farms.

3.1. The Elimination of Tariff

3.1.1. The effect of the elimination of tariff on the food security

The numerical results gained from solving the model on the basis of the reduction of the tariff rate indicate an increase in the level of production in the stock breeding sector, so that the percentage of the changes in production in the first scenario in proportion to real values includes a rate of increase in production at 0.06%. Concerning this issue that it is feasible to know the production rate as the index of food security, the increase in production can affirm this fact that not only has not tariff (as one the supports provided on the agriculture sector) provided any supports on food security ,but also by elimination it, the levels of production and even food security have increased; whereas, the level of production of the agriculture and gardening sector is of a slight gradual reduction, so that the percentage of the changes in production, in proportion to real values is 0.003%. This reduction is due to the bigger share of the agriculture and gardening sector in tariff. It is necessary to say that in the partial equilibrium models, every change in one sector will not affect the other sector; hence, the reduction in the level of production in the agriculture and gardening sector will not affect the stock breeding sector, and having a reduction in the level of production in the agriculture and gardening, food security will not be threatened. With the elimination of tariff, it seems logical that the imports increase, so that the results of this model prove this issue. The level of the exports in both sectors: agriculture and gardening, and stock breeding decreased, so that this reduction, with the complete elimination of tariff, reached at 2%. The increase in both sectors originates from the increase in consumption in both sectors. The highest level of the increase in consumption in the urban fourth quintile is 1.29%, and in the rural fifth quintile, it is 1.09% (Table2). The index of the price in the agriculture and gardening sector is of 1.14% increased, and in the stockbreeding sector, it is increased at 0.77%. The increase in price is due to the increase in consumption. This increase in agriculture and stockbreeding sector, because of the decrease in the production in the production in the agriculture and gardening sector, is more drastic (Table1).

Table 1: Effect of the elimination of tariff on production, imports, exports, prices and capital

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Production (billion rials)	Agriculture and gardening	76471	76470.4	76469.8	76469.2	76468.6	76467.99
	Stock breeding	54479	54515.6	54552.66	54590.2	54628.24	54666.79
Import (billion rials)	Agriculture and gardening	10689	10854.48	11025.59	11202.65	11385.98	11575.94
	Stock breeding	95	96.45	97.96	99.51	101.12	102.79
Export (billion rials)	Agriculture and gardening	6774	6744.07	6713.89	6683.45	6652.73	6621.74
	Stock breeding	680	678.41	676.8	675.17	673.52	671.85
Price (billion rials)	Agriculture and gardening	1	1	1	1.01	1.01	1.01
	Stock breeding	1	1	1	1	1.01	1.01
Capital (billion rials)	Agriculture and gardening	262	262.67	263.35	264.05	264.75	265.47
	Stock breeding	411	412.05	413.12	414.21	415.32	416.44

Source: research findings

Table 2: The effect of the elimination of tariff on consumption

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Agriculture and gardening	Consumption of the first urban quintile	2490	2491.86	2493.75	2495.67	2497.62	2499.6
	Consumption of the second urban quintile	3984	3987.18	3990.41	3993.69	3997.02	4000.41
	Consumption of the third urban quintile	4980	4984.67	4989.4	4994.21	4999.1	5004.07
	Consumption of the fourth urban quintile	5976	5989.08	6002.37	6015.86	6029.56	6043.49
	Consumption of the fifth urban quintile	7470	7444.45	7418.52	7392.17	7365.41	7338.22
	Consumption of the first rural quintile	1546	1546.55	1547.11	1547.68	1548.26	1548.84
	Consumption of the second rural quintile	2249	2250.12	2251.27	2252.42	2253.6	2254.8
	Consumption of the third rural quintile	2530	2532.03	2534.08	2536.17	2538.3	2540.45
	Consumption of the fourth rural quintile	3232	3235.45	3238.96	3242.51	3246.13	3249.81
	Consumption of the fifth rural quintile	4497	4506.55	4516.25	4526.1	4536.11	4546.28
Stock breading	Consumption of the first urban quintile	122	122.09	122.18	122.28	122.37	122.47
	Consumption of the second urban quintile	195	195.16	195.31	195.47	195.64	195.8
	Consumption of the third urban quintile	244	244.23	244.46	244.7	244.94	245.18
	Consumption of the fourth urban quintile	293	293.64	294.29	294.95	295.63	296.31
	Consumption of the fifth urban quintile	366	364.75	363.48	362.19	360.88	359.54
	Consumption of the third rural quintile	1851	1852.48	1853.99	1855.52	1857.07	1858.65
	Consumption of the fourth rural quintile	2365	2367.53	2370.09	2372.69	2375.34	2378.03
	Consumption of the fifth rural quintile	3290	3296.99	3304.08	3311.29	3318.61	3326.05

Source: research findings

3.1.2. The effect of the elimination of tariff on the preservation of the family farms

By completely elimination the tariff, employment, in all sectors, shows an increasing rate, so that the highest levels of the increase in employment in the fields of the rural skilled labor force and rural state unskilled labor force are 1011% and 0.55% respectively. Because the rural unskilled labor force work at the family farms, and, by eliminating the tariff, the job demand of the rural labor force has not decreased, and can insure the survival of the rural family farms.

In general, by eliminating the tariff, and of the supporting packages in the government`s policy to back the agriculture sector, not only are not the other functions of the agriculture sector, such as food security and the presentation of the rural farms, threatened, but also it is possible to justify the elimination of the supporting packages such as tariff, that results in the economic deviation (Table 3).

3.2. The Elimination of All the Subsidies

3.2.1. The effect of the reduction of the subsidies on security

In the scenario of the elimination of the subsidies, the level of production in the agriculture sector is of a slight decrease, where as that of the stockbreeding sector has decreased. The reduction in the production of the agriculture sector, according to the increase in the production cost, is reasonable. According to the sectional nature of the model, the transfer of the reduction in the agriculture and

gardening sector concerning the increase in the stock breeding sector indicates this fact that not only is not the function of food security threatened, but also it is an emphasis on keeping food security and the inefficiency of the supports provided on the agriculture sector. The imports, in the agriculture and stockbreeding sectors, have decreased at 0.3% and 3.34%, respectively. The decrease in the imports in the agriculture sector is due to the reduction in the production and consumption. The exports in the agriculture sector, because of the elimination of subsidies, have decreased at 1.5%, and those in the stockbreeding sector have increased at 13.6% (Table4). The increase in the production in the stockbreeding sector along with the decrease in the demand for the surplus of the production of this sector has resulted a 13% growth in the exports. Also, the prices in the gardening sector, because of the decrease in the supply, have raised; because the decrease in the consumption has been compensated for with the decrease in the production and imports; and in the stockbreeding sector, due to the surplus of the supply, the price has decreased (Table5).

Table 3: The effect of the elimination of tariff on labor force

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Agriculture and gardening	Urban self-employed skilled labor force	84	84.06	84.12	84.19	84.25	84.32
	Urban state skilled labor force	16	16.01	16.02	16.03	16.05	16.06
	Urban self-employed unskilled labor force	5	5	5	5.01	5.01	5.01
	Urban state unskilled labor force	1143	1143.89	1144.79	1145.71	1146.64	1147.58
	Rural self-employed skilled labor force	105	105.23	105.46	105.69	105.93	106.17
	Rural state skilled labor force	80	80.11	80.21	80.32	80.44	80.55
	Rural self-employed unskilled labor force	7	7.01	7.02	7.03	7.04	7.05
	Rural state unskilled labor force	56912	56972.96	57034.86	57097.73	57161.62	57226.54
Stock breading	Urban self-employed skilled labor force	131	131.1	131.19	131.29	131.39	131.5
	Urban state skilled labor force	25	25.02	25.04	25.05	25.07	25.09
	Urban self-employed unskilled labor force	8	8	8.01	8.01	8.01	8.02
	Urban state unskilled labor force	1791	1792.39	1793.81	1795.24	1796.7	1798.18
	Rural self-employed skilled labor force	164	164.35	164.71	165.08	165.45	165.83
	Rural state skilled labor force	125	125.17	125.33	125.51	125.68	125.86
	Rural self-employed unskilled labor force	11	11.01	11.03	11.04	11.06	11.07

Table 4: The effect of the elimination of the subsidies on production , export, price and capital

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Production (billion rials)	Agriculture and gardening	76471	76364.29	76253.62	76138.91	76020.05	75896.94
	Stock breeding	54479	54566.59	54662.27	54766.07	54878	54998.11
Import (billion rials)	Agriculture and gardening	10689	10681.03	10673.17	10665.39	10657.7	10650.07
	Stock breeding	95	94.34	93.69	93.04	92.41	91.77
Export (billion rials)	Agriculture and gardening	6774	6755.39	6735.58	6714.57	6692.34	6668.89
	Stock breeding	680	697.01	714.75	733.26	752.58	772.75
Price (billion rials)	Agriculture and gardening	1	1	1	1	1	1
	Stock breeding	1	0.99	0.98	0.97	0.95	0.94
Capital (billion rials)	Agriculture and gardening	262	256.81	251.63	246.47	241.31	236.17
	Stock breeding	411	402.86	394.74	386.63	378.55	370.48

Source: research findings

Table 5: The effect of the elimination of the subsidies on consumption

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Agriculture and gardening	Consumption of the first urban quintile	2490	2475.68	2461.39	2447.14	2432.92	2418.73
	Consumption of the second urban quintile	3984	3959.52	3935.1	3910.74	3886.44	3862.18
	Consumption of the third urban quintile	4980	4944.09	4908.27	4872.54	4836.88	4801.3
	Consumption of the fourth urban quintile	5976	5875.3	5774.86	5674.65	5574.68	5474.9
	Consumption of the fifth urban quintile	7470	7666.63	7862.76	8058.41	8253.63	8448.45
	Consumption of the first rural quintile	1546	1541.84	1537.68	1533.54	1529.41	1525.29
	Consumption of the second rural quintile	2249	2240.51	2232.05	2223.61	2215.18	2206.78
	Consumption of the third rural quintile	2530	2514.7	2499.45	2484.23	2469.05	2453.9
	Consumption of the fourth rural quintile	3232	3205.94	3179.95	3154.03	3128.17	3102.36
	Consumption of the fifth rural quintile	4497	4424.88	4352.96	4281.22	4209.65	4138.23
Stock breading	Consumption of the first urban quintile	122	121.3	120.6	119.9	119.2	118.51
	Consumption of the second urban quintile	195	193.8	192.61	191.41	190.22	189.04
	Consumption of the third urban quintile	244	242.24	240.49	238.73	236.99	235.24
	Consumption of the fourth urban quintile	293	288.06	283.14	278.23	273.32	268.43
	Consumption of the fifth urban quintile	366	375.63	385.24	394.83	404.39	413.94
	Consumption of the first rural quintile	1131	1127.95	1124.92	1121.89	1118.86	1115.85
	Consumption of the second rural quintile	1645	1638.79	1632.6	1626.43	1620.26	1614.12
	Consumption of the third rural quintile	1851	1839.81	1828.65	1817.51	1806.41	1795.32
	Consumption of the fourth rural quintile	2365	2345.93	2326.92	2307.95	2289.02	2270.14
	Consumption of the fifth rural quintile	3290	3237.24	3184.62	3132.14	3079.77	3027.52

Source: research findings

3.2.2. The effect of the reduction of the subsidies on the preservation of the family farms

The numerical results of doing the model in the decrease of the subsidies indicates a falling trend in employment, so that the highest level of the reduction in the rural skilled labor force is 7%, that cannot be serious threat to the immigration of the labor force. On the other hand, the index of the function of the preservation of the family farms is the rural unskilled labor force, and this index shows a negligible number. In general, the elimination the subsidies does not endanger the unproductive function of this sector (Table 6).

Table 6: The effect of the elimination of the subsidies on labor force

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Agriculture and gardening	Urban self-employed skilled labor force	84	83.58	83.16	82.74	82.32	81.91
	Urban state skilled labor force	16	15.92	15.85	15.77	15.7	15.62
	Urban self-employed unskilled labor force	5	4.99	4.97	4.96	4.95	4.94
	Urban state unskilled labor force	1143	1136.95	1130.91	1124.9	1118.9	1112.92
	Rural self-employed skilled labor force	105	103.45	101.91	100.38	98.84	97.32
	Rural state skilled labor force	80	79.27	78.55	77.83	77.11	76.39
	Rural self-employed unskilled labor force	7	6.94	6.88	6.82	6.75	6.69
	Rural state unskilled labor force	56912	56495.83	56081.12	55667.74	55255.56	54844.44
Stock breading	Urban self-employed skilled labor force	131	130.34	129.69	129.04	128.39	127.74
	Urban state skilled labor force	25	24.88	24.76	24.64	24.53	24.41
	Urban self-employed unskilled labor force	8	7.98	7.96	7.94	7.92	7.9
	Urban state unskilled labor force	1791	1781.51	1772.06	1762.64	1753.24	1743.87
	Rural self-employed skilled labor force	164	161.58	159.18	156.78	154.38	152
	Rural state skilled labor force	125	123.86	122.73	121.61	120.48	119.36
	Rural self-employed unskilled labor force	11	10.9	10.81	10.71	10.61	10.52
	Urban self-employed skilled labor force	21326	21170.05	21014.65	20859.75	20705.3	20551.25

Source: research findings

3.3. The Elimination of Tariff and the Subsidies

3.3.1. The effect of the elimination of the tariff and the subsidies on food security

By eliminating all the provided supports on the agriculture sector, the level of production in the agriculture and gardening sector has transferred to the level of production in the stack breeding sector at %0.7. The level of import in the agriculture and stock breeding sectors shows %7.9 and %4.5 increases, respectively (Table 7). The percentage of the changes in export in the agriculture sector, in the scenario of the complete elimination of tariff is -3%, whereas it, in the stock breeding sector, because of the surplus of the supply, has increased. Because of the rise of the price in the agriculture sector, and the stability of the price in the stockbreeding sector in different scenarios, not only has not the level of consumption in creased, but also it has decreased. The level of consumption in all quintiles has been of a falling rake of 7%, as well, whereas in the urban fourth quintile, it has been of an 11% growth, so that this level of growth is compensated for by an increase in imports, and there is no surplus stuff for exports in the gardening sector (Table 8).

Table 7: The effect of the elimination of tariff ,and the subsidies on production , export, price and capital

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Production (billion rials)	Agriculture and gardening	76471	76363.57	76251.95	76136.06	76015.8	75891.08
	Stock breeding	54479	54603.66	54737.82	54881.51	55034.74	55197.55
Import (billion rials)	Agriculture and gardening	10689	10846.38	11009.23	11177.84	11352.52	11533.59
	Stock breeding	95	95.78	96.61	97.47	98.37	99.32
Export (billion rials)	Agriculture and gardening	6774	6725.5	6675.65	6624.43	6571.85	6517.92
	Stock breeding	680	695.39	711.43	728.15	745.59	763.79
Price (billion rials)	Agriculture and gardening	1	1	1.01	1.01	1.01	1.02
	Stock breeding	1	0.99	0.98	0.97	0.96	0.95
Capital (billion rials)	Agriculture and gardening	262	257.47	252.94	248.41	243.88	239.35
	Stock breeding	411	403.89	396.79	389.68	382.58	375.47

Table 8: The effect of the elimination of tariff ,and the subsidies on consumption

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Agriculture and gardening	Consumption of the first urban quintile	2490	2477.51	2465.02	2452.52	2440.03	2427.53
	Consumption of the second urban quintile	3984	3962.65	3941.3	3919.95	3898.59	3877.23
	Consumption of the third urban quintile	4980	4948.68	4917.36	4886.04	4854.72	4823.38
	Consumption of the fourth urban quintile	5976	5888.17	5800.35	5712.53	5624.69	5536.82
	Consumption of the fifth urban quintile	7470	7641.51	7812.98	7984.46	8155.98	8327.56
	Consumption of the first rural quintile	1546	1542.38	1538.76	1535.14	1531.52	1527.9
	Consumption of the second rural quintile	2249	2241.62	2234.24	2226.86	2219.49	2212.11
	Consumption of the third rural quintile	2530	2516.7	2503.4	2490.1	2476.8	2463.5
	Consumption of the fourth rural quintile	3232	3209.34	3186.68	3164.03	3141.38	3118.73
	Consumption of the fifth rural quintile	4497	4434.28	4371.59	4308.9	4246.22	4183.52
Stock breading	Consumption of the first urban quintile	122	121.39	120.78	120.16	119.55	118.94
	Consumption of the second urban quintile	195	193.95	192.91	191.86	190.82	189.77
	Consumption of the third urban quintile	244	242.47	240.93	239.4	237.86	236.33
	Consumption of the fourth urban quintile	293	288.69	284.39	280.08	275.78	271.47
	Consumption of the fifth urban quintile	366	374.4	382.8	391.21	399.61	408.02
	Consumption of the first rural quintile	1131	1128.35	1125.7	1123.06	1120.41	1117.76
	Consumption of the second rural quintile	1645	1639.6	1634.2	1628.81	1623.41	1618.02
	Consumption of the third rural quintile	1851	1841.27	1831.54	1821.81	1812.08	1802.35
	Consumption of the fourth rural quintile	2365	2348.42	2331.84	2315.27	2298.69	2282.11
	Consumption of the fifth rural quintile	3290	3244.11	3198.25	3152.39	3106.53	3060.66

Source: research findings

3.3.2. The effect of the reduction of tariff and the subsidies on the preservation of the family farms

In different scenarios, employment, too, is of a falling rate, so that the highest level of reduction is at 6%, and in the field of the rural unskilled labor force it is at 3%, that is not considerable an amount with the critical level of these numbers. This reduction dose not result in the immigration of the rural labor force, and the function of the preservation of the family farms will not be threatened (Table 9).

Table 9: The effect of the elimination of tariff ,and the subsidies on labor force

Description		Actual values	First scenario	Second scenario	Third scenario	Fourth scenario	Fifth scenario
Agriculture and gardening	Urban self-employed skilled labor force	84	83.64	83.28	82.92	82.56	82.2
	Urban state skilled labor force	16	15.93	15.87	15.8	15.74	15.67
	Urban self-employed unskilled labor force	5	4.99	4.98	4.97	4.96	4.94
	Urban state unskilled labor force	1143	1137.82	1132.65	1127.49	1122.33	1117.17
	Rural self-employed skilled labor force	105	103.68	102.36	101.04	99.72	98.4
	Rural state skilled labor force	80	79.38	78.76	78.14	77.52	76.9
	Rural self-employed unskilled labor force	7	6.95	6.89	6.84	6.79	6.74
	Rural state unskilled labor force	56912	56555.9	56200.42	55845.4	55490.7	55136.19
Stock breading	Urban self-employed skilled labor force	131	130.44	129.88	129.32	128.76	128.2
	Urban state skilled labor force	25	24.9	24.8	24.69	24.59	24.49
	Urban self-employed unskilled labor force	8	7.98	7.96	7.95	7.93	7.91
	Urban state unskilled labor force	1791	1782.88	1774.78	1766.69	1758.61	1750.53
	Rural self-employed skilled labor force	164	161.93	159.87	157.81	155.75	153.69
	Rural state skilled labor force	125	124.03	123.06	122.09	121.12	120.15
	Rural self-employed unskilled labor force	11	10.92	10.83	10.75	10.67	10.59
	Urban self-employed skilled labor force	21326	21192.56	21059.36	20926.32	20793.41	20660.57

Source: research findings

4. Summary and Concluding Remarks

In the negotiations of the WTO on the trade liberalization, the elimination of the supports provided by government that result in trade deviation in the agriculture sector is crucial. The elimination of many of these supporting packages without considering the functions of the agriculture sector seems completely unreasonable. In this study, it has been tried that, taking two important functions of the agriculture sector i.e. Food security and the preservation of the family farms, in to consideration, the elimination of the supports provided by the government, such as tariff and the subsidies be evaluated. The result of the model indicated that not only dose not the elimination of each of the supports threaten the other functions of the agriculture sector, but also these functions are strengthened if the supports are decreased. The elimination of each of these supports will not end in the decrease in the labor force in the rural areas under critical level and both functions of food security and family farms preservation will not be damaged at all. Considering the other functions of the agriculture sector such as the preservation of the landscapes, keeping population in faraway areas, rural development, etc., it is possible to justify the complete elimination of the governments backing policies.

Corresponding Author:
Dr. Seyed-Ali Hosseini-Yekani
Department of Agricultural Economics
Sari Agricultural Sciences & Natural Resources University, Sari, Iran
E-mail: s.a.hosseiniyekani@gmail.com

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