Analyzing the Effects of Globalization Neoliberalism on the Earning Inequality in a Developing Country (Evidence from Iran)

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Abstract

Globalization is a multidimensional phenomenon, which is of different economic, social and political aspects. The phenomenon is defined as a process of integration through trade liberalization, facilitating the international capital fellows and rapid technological changes. Although, in the economic literature, globalization is of several aspects such as trade liberalization, technical changes, free immigration and capital flows, trade liberalization is a common accepted feature that is of our special interest in this paper. As it has been experienced, during the last two decades, the flows of goods and services among nations have increased; and also it was one of the notable aspects of economic integration among different countries. Generally, free trade is mutually beneficial, and creates wealth and economic growths for nations are accepted. Thus, there are various sources through which trade benefits the nations. However, in many problems of applied econometrics, the equation of interest is only defined for a subset individuals from the overall population, while the parameters of interest are the parameters of that refers to the whole population. This paper examines these overall identify and evaluate of the trade liberalization effects on her/his earning. Moreover, it has been focused on Iran's economy and studied the behavior of evidences indicates that openness of economy plays an outstanding significant role in the relative wages formation around the world. According to the Stolper-Samuelson theory, this paper presents the impacts of trade liberalization and tariff reduction on wages inequality in Iran. In addition, the main hypothesis is; trade liberalization should increase unskilled wages more than skilled wages and therefore reduce wage inequality. In order to achieve our objective we rely on the economic sector which the employee is occupied in and we estimate a linear panel model for log wages of workers who participated in the labor market over the period 2001-2012 so that test the impact of trade liberalization on wages. The model is run by the data of about 67263 labor forces in all provinces of Iran. To measure openness, three different proxies, namely export and import magnitude of economic activities

and tariff rates (based on 4- digit ISIC) are going to use. The finding to support that Iran has a comparative advantage in unskilled and semiskilled labor-intensive products.

Key Words: Trade liberalization, Inequality, Panel data, Globalization

Introduction

Globalization is a multidimensional phenomenon, which is of different economic, social and political aspects. The phenomenon is defined as a process of integration through trade liberalization, facilitating the international capital fellows and rapid technological changes. Alternatively, several definitions emphasize on the tariff reduction and removal of quantitative restrictions, technological and legal barriers among nations as well. Although, in the economic literature, globalization is of several aspects such as trade liberalization, technical changes, free immigration and capital flows, trade liberalization is a common accepted feature that is of our special interest in this paper. Trade liberalization, defined as a moving towards free trade through reductions of tariffs and other trade barriers, is known as the accelerating force of globalization. As it has been experienced, the flows of goods and services among nations have increased; and it was one of the notable aspects of economic integration among countries during the last two decades. Generally accepted, free trade is mutually beneficial, and creates wealth and economic growth for nations. There are different sources through which trade benefits the nations. The adherents and critics point out on the advantages and disadvantages of globalization and specifically trade liberalization. The formers argue that, during the process of globalization labor market becomes more flexible and transparent, and the demand for skilled labor (of sectors which are globalized), increases due to trade promotion. Indeed, among other expected outcomes of globalization, increases efficiency in production processes, investment promotion in physical and human capital, growth in output of the sectors (which are of advantage), more transparent relationships in labor market, higher than competitiveness in markets, and elimination of distortions in input prices are its remarkable consequences. On the other hand, critics of globalization argue that, it leads to unemployment, higher inequality in wages, and exploitation of workers, increasing in the poverty, and it sharpens inequality in income distribution.

However, if the free trade has been considered in the framework of international trade theories, globalization is inevitable benefits for developing countries that have abundant supply of unskilled labor. Free trade not only increase efficiency and growth, but also raises employment opportunities and the level of wages of

unskilled (abundant) labor. However, existing empirical evidences have left the rejection and confirmation of the hypothesis ambiguous. During the 3rd developing 5 years plan (2000-2004), Iranian economy experienced a significant trade reform and particularly its tariff regulations have been changed. While an average tariff rate was 92 percent in 2001, it was reduced to 26.7 percent in 2002. This tariff reduction to 30.5 in agricultural commodities amounted and the industrial sector to 21.8 percent in 2005. Moreover, imports restriction and barriers on commodities reduced from 950 items to 82 during 1997-2005. Furthermore, the nontariff barriers have been changed to tariff equivalents, import duties integration laws been approved, and about 90 percent of imports restrictions (like certifications) have been removed since 2000. In addition, mechanized customs services, has been practiced and unified exchange rate system were established. After the approval of import duties integration rules in 2003 it was increased for about 4 percent again. In many problems of applied econometrics, the equation of interest is only defined for a subset individuals from the overall population, while the parameters of interest are the parameters of that refers to the whole population. For example in a wage equation, dependent variable can only be measured when the individual participations in the labor market. If the subpopulation is no randomly drawn from the overall population, OLS estimation method leads to inconsistent parameter estimates. This problem is known as *sample selection bias.*

In many applications, including ours, both of the problems occur simultaneously. Recently, some useful estimators have been proposed which deal with the both sources of estimation bias. Wooldridge (1995) indicates a straightforward technique to test and correct for sample selection in the fixed effect models. The method relies on standard profit estimates for each year to calculate T Inverse Mills ratios, and explicitly models the conditional mean of the disturbance terms in the decision equation.

The second estimator has been proposed by Kyriazidou(1997), which developes a semi-parametric estimator by taking difference between any two years to get rid of both individual heterogeneity and sample selection. Rochina- Barachina(1999) adds a distributional assumption for the error term in the decision rule. Finally, Semykina and Wooldridge (2005) enhances the Wooldridge's (1995) work and illustrate how to test and control for sample selection in an fixed effect model with endogenieity in regresses.

We estimate a linear panel model for log wages of workers who participated in the labor market over the period 2001-2012 in order to test the impact of trade

liberalization on wages. The model is run by the data of almost 67263 labor forces in all provinces of Iran.

To measure openness, three different proxies, namely export and import magnitude of economic activities and tariff rates (based on 4- digit ISIC) are used. It is consider that Iran has a comparative advantage in unskilled and semiskilled labor-intensive products, our main hypothesis is; trade liberalization should increase unskilled wages more than skilled wages and therefore reduce wage inequality. In summarize, given the economic sector that the worker is occupied in, our main propose is to evaluation the trade liberalization effects on her/his earning.

The paper is organized as follows: in section 2, we provide a brief outline of literature on trade liberalization and wage in equality. The technical framework of analysis is presented in section 3. Section 4 is devoted to the econometrics analysis and hypothesis testing. Finally, we summarize the obtained results of analysis in the last section.

Literature Review

Most of papers on globalization and wage inequality, raise hypothesis according to them, trade liberalization and trade policy are the main causes of wage inequality. In this regards, it is usually based on the well-known international trade theory of Hecher and Ohline (henceforth H-O). The theory, in the simplest form, includes two factors of production (skilled and semiskilled works) and two commodities, which one of them is more skill intensive. It implies that, countries are specialized in the production of commodities, whose factors are abundant. Developed countries are specialized in production of commodities whose labor input is skilled; conversely developing counties are specialized in activities which are unskilled labor intensive. International competition leads to a higher relative wages for skilled workers in the developing countries, if and only if relative price of commodity, which these countries are involved in, increases. Two famous propositions, which are corollaries of H-O's theorem and directly related to the effects of trade on wages and the prices of other inputs, are the unity of input prices and the Stolper-Sumuelson's theorems. The unit prices theory implies that free trade makes the absolute and relative prices of inputs in the involved countries equal. One of the important applications of the H-O's trade model is the theory of Stolper-Samuelson, which asserts the tariffication effects on factors' income distribution. According to the theory, tariffication on imports increases the price of that production factor which is relatively scarce. In Stolper-Samuelson theorem, there are two countries, two commodities, two factors of production, and markets

for the inputs and products are perfectly competitive. The theory states that, trade liberalization will increase the demand for input, which is relatively abundant, and subsequently will raise its price. Since, the developed countries are mostly endowed with more skilled labor, and developing countries are of more unskilled labor, trade liberalization between these two groups raises the wages and demand for skilled labor in developed countries, but it will increase the demand and wages of unskilled people in developing countries as well. Therefore, trade liberalization will decrease the inequality of wages in developing country.

During the past recent years, this simple implication has been the concern of numerous papers. The researchers have studied the relation of wages inequality and trade liberalization by making use of a variety of definitions for trade liberalization. Literature shows two directions in empirical works. In the first direction, aggregate data are used to test the hypothesis. In the second direction of studies, micro-data of families and firms have been used. Making use of micro data, Mithra and Kumar (2005) found a negative but significant relation between trade liberalization and wages inequality in India.

Additionally, Dutt (2003) explored a similar conclusion between wages and tariffs in the Indian economy at sectors level. Goldberg and Pavcnik (2004) indicated a positive relationship between wages inequality and trade liberalizations in the framework of micro data on family survey in Columbia. They confirmed a positive significant relation between tariffs and wages premiums. Katz and Murphy (1998) analyzed the structure of wages in the USA from 1963 to 1987 and concluded that, increases in the demand for college educated and highly skilled labor will raise their wage in comparison with unskilled wage earners, although this pattern was not stable for entire range of their sample. Furthermore, they note a change that bring about the shifts in the demand for labor, only happens in specific sectors of the economy. They argue that these kinds of intra sector shifts are due to skill bias. Finally, they conclude that solely 1/3 of wage differences among workers can be assigned to the education, experience and gender, and the rest of it arises from skill differences among workers. Esquivel, G. Rodriguez-Lopez, J.A. (2003), Ketzo Dikenson(1989), Keroger msumerz (1988), Gusston and Terfler(1998), Beaulieu E. ,et al.(2004), Goldberg and Pavcnik (1994) in the framework of a model known as "*industry wage premium*" have appraised the relation between tariffs and wages; and trade policy variable, like tariffs, among the others. Those papers have used microdata in family (micro) level and estimated two stage regressions to evaluate the relation of trade liberalization and wage premium steamed from the industries, which the individuals are employed in. Gusston and Terfler (1994) reported a negative relation between trade and wage premium steamed from Industry in the USA in 1993. Attanasio, Goldberg and Pavcnik (2004) undertake a research on the

impact of trade liberalization on the wage inequality. They studied tariff reduction effects (during the 1980- 1990) on wage distribution in Columbia. Their results depict that, greater reduction in tariff results in more wage premiums. In addition, wage premium arising through skill in each sector is independent of tariffs level in that sector and the effects of trade liberalization on the wage distribution is modest. Mishra Kumar and (2005) with a similar model of Attanasio, Goldberg and Pavcnik (2004), have studied the inequality of wages in the industry sector of India. Their findings show a strong negative relation between changes in trade policy and wage difference in India. They note that, tariff reductions in the sector that is of larger share of unskilled worker, lead to larger increase in wage premium. Therefore, relatively unskilled worker are winners of the policy. Beter et al. (1999), based on H-O – Samuelson theorem, application of co-integration technique and makes use of a micro type regression, have estimated long run relationship of wage premium and openness of economy and the commodity prices as well. They conclude that, falls in the prices of labor-intensive commodity, explain the inequality of wags during two last decades, but the raises in college educated labor share decrease the inequality of wages in Chile. In addition, openness of economy, which is defined as higher trade size to GDP, increases the wage gaps of skilled and unskilled workers. Using micro data, Sanguinett & Galiani (2003) estimated the relation between imports and wage inequality in the general framework of H-O in Argentina. The finding shows that trade reform contributed to increases in wage differences, but explains a relatively small proportion of the observed increase in wage inequality. To our knowledge there is no study addressing trade liberalization and wage inequality in Iran.

The Framework of Analysis

This section first describes the empirical model, then gives details about the data, and finally, explains estimation procedure. To test the impact of trade liberalization on relative wages, we estimate wage equations for workers. The general empirical model is formulated as augmented Mincer type earning equation, which uses micro data in family level obtained from socioeconomic characteristic of family surveys of provinces between 2001 and 2012.

3.1. Econometric Model Specification

A log linear Gasparini and Singuity (Mincer) type, in the framework of a panel limped model is used to test the posed hypothesis.

$$\log(w_{ijt}) = \sum_g edu_{ijgt}\alpha_g + \sum_g edu_{ijgt}imp_{jt}\alpha_{impg} + \sum_g edu_{ijgt}exp_{jt}\alpha_{expg} + \sum_g edu_{ijgt}tar_{jt}\alpha_{targ} + f_t(age) + gender_i\varphi + u\_r_i\gamma + \mu_i + v_{ijt}$$

Where;

- w_{ijt}: Wage of individual i in the j[th] industry for period t
- edu_{ijgt}: Dummy variable for different educational groups, including unskilled, semi skilled and skilled.
- imp_{jt}: Imports of j[th] industry in the period of t
- $gender_i$: Worker's gender
- exp_{jt}: Exports of j[th] industry in the period of *t*
- tar_{jt}: Tariff rate in j[th] industry in the period of t
- μ_i: shows the individual specific effects and v_{ijt} idd$(0, \sigma_v^2)$
- u_r_i: Dummy variable of urban area 1 and rural area 0

Dependent variable of the model is hourly wage of worker *i* in his main job (some workers hold second jobs). In spite of log-log model of Gaspariny et. al, we use a linear regression model, because in our database a remarkable number of workers whose earnings are reported as zero, their work hours in their main job are greater than zero. Therefore, the log form specification is not possible. The property is taken into our consideration when we model the earning equation. Workers' skill is identified by their level of education.

Those with primary and secondary education are specified as unskilled workers. High school educates are called as semiskilled, and finally college educated labor force are categorized as skilled workers. The volumes of imports, exports and tariff rates are used as trade liberalization proxies in each industry. Furthermore, product of each level of education and trade indexes are used to take into account the interaction effects of those variables on the earnings.

In addition to variables like gender, skill, age, square of age which have been included in the canonical model, we add a new variable of living in rural or urban area of the individual *i* for the period *t* as an explanatory variable. As well, given the modeling wage premium arose from specific industries; we have incorporated characteristics including being employer, wage earners in each sector at agricultural, industry and services as dummy variables in earring equation.

3.2. Data

The main propose of the paper is to ascertain the effects of trade liberalization on the wages inequality in Iran. To achieve the aim, the data set of socioeconomic characteristics of families (which are provided annually by SCI[1]), together with the database of PC/TAS[2] have been employed for the period 2001-2012. This section introduces main features of the datasets. SCI conducted sequences of annually surveys during 2001-2003 in all the provinces (27 provinces) of Islamic Republic of Iran. The surveys aimed at providing an integrated database about socioeconomic characteristics of Iranian families who work in rural and urban areas.

SCI's surveys on socio-economic characteristics are of two main sections. In the first section, social characteristics of family including age, gender, and relation of the individual with the head of family, area of residence, immigration situation, and reason of immigration, literacy situation of family members and level of education are provided. The second section includes family expenditure, daily work hours in his/her main job and second job, and type of his/her activity according to ISIC and ISCO classifications. The level of education of observed individuals were categorized in 3 levels. the level 1 represents primary school and secondary , 2 shows those whohave high school and pre-university degrees, finally 3 is used for college degrees(from B.A. to PhD.). Since all family members are not in the age of economic activity, we have discarded low age(less than 15) from our dataset which were as a panel data for *N* 22421 and *T* 3. It is necessary to point out that according to ISC's definition an employed is an individual who;

i	Has a job but in the last 7 days was not involved because of his (her) illness, or shutting down of his work place and his unemployment is not permanent.
ii	Does not have regular job but during last 7 days were at work at least for 2 days.
iii	was in training during last 7 days
iv	is a seasonal worker and does not work because of the season
v	is a Soldier who is passing the mandatory military service
vi	is student of military and police training centers
vii	Works for one of his / her family member and does not earn any wages.

[1] Statistical Centre of Iran
[2] PC- Trade Analysis System

Data on trade liberalization, have extracted from PC-TAS for 2001-2012. Classification system in PC-TAS is HS[1] in U.S. million dollars. Main complexity of modeling and estimation in the paper is associated to the differences of two systems of coding in ISIC and H.S. We had to use CPC[2] coding to correspond the H.S to 4-digit ISIC, (revision 3). Given the recoding, we made a direct correspondence between the individual and the quantity of exports, imports and tariff rate of the activity (sector) which he/she works in.

Table3-1 : Description of Variables

Variables	**Description**
h	Dummy variable indicating participation in labor market ,h 1=if he/she works
lwageh_	log of hourly wage
Experience_	Total years of worked as a wage earner in labor market
Experienc2_	Experience squared
Age_	Age of individual
Age2_	Age squared
Edu1_	Dummy variable indicating the unskilled workers(primary and secondary school degrees edu1_=1 and zero otherwise)
Edu2_	Dummy variable indicating the semiskilled workers(high school degrees edu2 1=_andzero otherwise)
Edu3_	Dummy variable indicating the skilled workers(collage educated edu3_=1 and zero otherwise)
Gender_	Dummy variable of gender with gender_=1 for male
R_u_	Dummy variable with 1 if area of living is urban and zero otherwise
Non_wagei_	Non-labor incomes during the last year
Tar_	Tariff rate in the activity which the employee is working
Exp_	Total value of exports in the economic sectore which the employee is working
Imp_	Total value of imports in the economic sectore which the employee is working
Agri_	Dummy variable indicating agricultural sector
Indu_	Dummy variable indicating industrial sector
Serv_	Dummy variable indicating service sector

[1] Harmoniesed System
[2] Customs Procedure Codes

3.3Model and Estimation Procedure

This section describes estimation procedure of the specified model. To simplify the notations in this section, we consider a model which consists of a binary selection rule propensity to participation in the labor market, and an unobserved (time constant) additive individual effect, which may be correlated with repressors. This model can be written as:

$$w_{it} = x_{it}\beta + \alpha_i + \varepsilon_{it}\ ; \qquad i = 1, \ldots . N \quad t = 1, \ldots , T$$

$$h_{it}^{*} = z_{it}\gamma + \eta_i + u_{it}\ ; \qquad h_{it} = 1[h_{it}^{*} > 0]$$

Where $1[d_{it}^{*} > 0]$ is an indicator function, which is equal to one if its argument is true and zero otherwise. Moreover, β and γ are unknown vectors, and x_{it} and z_{it} are vectors of explanatory variables with possibly common elements, including both time variant and invariant variables; and time effects. The α_i and η_i are unobservable and time invariant individual specific effects which are possibly correlated with x_{it} and z_{it}. The ε_{it} and u_{it} are unobserved disturbances. The dependent variable w_{it} is only observable if $h_{it} = 1$. The parameters vector that we seek to estimate is β. Wooldridge (1995) introduces an estimation procedure for the parameters of interest which consists of two steps:

- Estimate standard profit models of selection rule for each T years to calculate T inverse Mills ratios for $h_{it} = 1$, where the binary choice model for the calculation is:

$$h_{it} = z_{i1}\gamma_{t1} + \cdots + z_{iT}\gamma_{tT}$$

- Estimate the conditional mean of decision rule which includes the *T* Mills ratio as regresses by OLS for all $h_{it} = 1$ in each year.

$$w_{it} = x_{i1}\Psi_1 + \cdots + x_{iT}\Psi_T + x_{it}\beta + \theta_t\lambda\left(\frac{h_{it}}{\sigma_t}\right) + e_{it}$$

Where $x_{i1,\ldots,}x_{iT}$ are lagged and leads valuesx_{it}, and λ (.) is the Inverse Mills Ratio which is calculated by the standard normal density and cumulative normal standard distribution of estimated (step1) $\frac{h_{it}}{\sigma_t}$.

It is assumed that all the regresses in the selection equation are strictly exogenous. Unlike to wooldridge's (1995) estimator which relies on the level of involved variables in the both rules, Kyriazidou's(1999) estimators are based on the pairwise differences over time applied to model(wage equation) for individuals satisfying $h_{it} = h_{is} = 1 \quad s \neq t$ and $z_{it}\gamma = z_{is}\gamma$ with probability one. The requirement is hardly satisfied, particularly when z_{kit} is a continuous variable. Rochina-Barachina (1997) developed an estimation procedure which is also based on the pairwise differencing equation (wage) for individuals satisfying $h_{it} = h_{is} = 1\ s \neq t$ Different from Kyriazidou's(1997) estimator, Rochina_Barrachina's(1999) estimator relies on parameterization of the conditional expectation of the error terms in the differencing form of $\varepsilon_{it} - \varepsilon_{is}$. Semykins and Wooldridge (2005) improve Wooldridge (1995) and show how to estimate panel model in the presence of selection when the decision equation contains endogenous explanatory variables, by a instrumental variables fixed effect model (IV-FE). They assume that:

1- $u_{it}|z_i, \eta_i \ , N(0,1)$, So that h_{it}ollows an unobserved effect probit schema.
2- Following Mundlak (1978) the unobserved effect can be modeled as $\eta_i = \eta + \bar{z}_i\xi + a_i$; where$a_i|z_i$, N (0,δ^2) and $\bar{z}_i$ is the time average of z_{it} for each i.

In the general case, the selection indicator can be written as:

$$h_{it} = 1[h_{it}^* > 0] = 1\{\eta + z_{it}\gamma + \bar{z}_i\xi + a_i + u_{it} > 0\}$$

$$h_{it} = 1\{\eta + z_{it}\gamma + \bar{z}_i\xi + a_i + v_{it} > 0\}$$

Where $v_{it}|z_i \ , N(0,1+\delta^2), t = 1, \dots, T$. In fact, the coefficients in assumption (2) will not be restricted to be same at the different periods, so that selection rule is defined by:

$$h_{it} = 1\{\eta + z_{it}\gamma + \bar{z}_i\xi + a_i + v_{it} > 0\}$$

Where $v_{it}|z_i \ , N(0,\delta^2), t = 1, \dots, T$. In the presence of selection bias the following procedure corrects for selection bias:

- For each time period, we estimate the probability of selection by using a standard (cross section over i) profit model:

$$p(h_{it} = 1|z_{it}) = \Phi(\eta_t + z_{it}\gamma + \bar{z}_i\xi + v_{it})$$

- We compute the estimated inverse Mills ratios $\widehat{\lambda_{it}} = \lambda(\widehat{\eta_t} + z_{it}\,\hat{\gamma} + \bar{z}_i\hat{\xi})$.
- We estimate the augmented decision equation by using pooled-2SLS using $(z_{it}\,,\,\bar{z}_i, \hat{\lambda}_{it})$ as instruments. The decision equation is augmented by adding the interaction of the inverse Mills ratios with time dummies, and the $\bar{z}_i$:

$$w_{it} = x_{it}\beta + \alpha + \bar{z}_i\Psi + \sum_{\tau=1}^{T}\gamma_t\hat{\lambda}_{it}1\{t = \tau\} + \varepsilon_{it}$$

Also to analysis and compare the results of the different estimation procedures of earning equation on the individual level, we propose a panel data censored liner regression, our data set consists of individuals who earn zero wages, but whose working hours are greater than zero for some periods. Presence of lower limit (equal to zero) for earning requires the application of Tobit specification to take into account the property of dependent variable. The following formulation is used for panel limped linear regression:

$$y_{it}^{*} = \acute{\beta}x_{it} + u_{it}\,; \qquad t = 1, \ldots..T_i \quad i = 1, \ldots.., n$$

$$u_{it} = v_i + \varepsilon_{it} \qquad v_i\; NID(0, \sigma_V^2); \quad \varepsilon_{it}\; NID(0, \sigma_\varepsilon^2)$$

Where, *j* stands for industry which the individual *i* works in the period of *t*. $x_{ijt}(N.T \times K)$ is matrix of explanatory variables, *i* is individual effects which can be random or fixed, and are used to capture unobservable characteristics of individual. y_{it}^{*} is an unobservable variable, but it is redefined as an observable variable accordingly:

$$y_{it} = y_{it}^{*} \quad if\; y_{it}^{*} > 0$$

$$y_{it} = 0 \quad \text{otherwise}$$

Disturbance term of u_{it} might be correlated during time. We let it consist of two terms: *i* individual time invariant effect and ε_{it} random effect, and ε_{it} and *i* are considered uncorrelated. Our objective is the estimation of σ_ε^2 and $\boldsymbol{\beta}$.

4. Estimation and Empirical Model

Our starting point in the present section is the augmented form of wage equation together with the selection equation that includes individual specific unobserved effects. The main efforts are devoted to the estimation of the wage equation's parameters by pooled 2SLS-IV Semykina-Wooldridge (2005). However three additional specifications of Rochina- Barrachina(1999), FE-IV Semykina-Wooldridge (2005), which both can take into account the problem of sample selection and endogeneity of regresses and a Tobit panel random effect estimate the model under the assumption of exogenous repressors, to test the postulated hypothesis are used. Table (4-1) reports the full set of estimations, in which column (2) shows the Rochina-Barrachina differences estimators, column (3) presents pooled-IV with the endogenity in experience of workers, column (4) reports the Seymkina Wooldridge FE-IV estimates with endogeneity of regresses and finally the last column demonstrates the random effects panel Tobit under the assumption of exogenous explanatory variables. The augmented form of the canonical model consists of trade liberalization variables (Tariff rates, import and export volumes in each economic activity) and their interactions with education levels and economic activity (sector). It also includes age, age square, gender, education levels, dummy variable for place of residence (urban=1) as the independent variables as well, and log of hourly wage rate in individual's main job, as dependent. A preliminary check for the presence of selection bias has been carried out by *Wald* and *F* tests on the joint significance of the Inverse Mills Ratios [table (4-2)]. As the table shows, in all the specifications null hypothesis of no selection bias are rejected confidentially. Also in all of the estimated models except the panel Tobit random effect, exogeneity of labor experience are highly rejected. Sign and significance of all reported coefficient are acceptable, however the reported result contains solely the significant variables, which statistically affect wage, namely they are constrained models respect to some of explanatory variables. The coefficient of age is positive and that of age square is negative, it reveals that the maximum hourly wage is in the age of 53. Imports negatively and significantly affect hourly wage. Although interaction of the variable and agricultural and industrial dummy variables are of positive sign, the absolute magnitude of the estimated coefficients are equal and significant. It shows that total effects of imports on the wage is equal to zero, even though it statistically significant. Exports impacts significantly the hourly wage, however the magnitude of changes in the agricultural sector is more than the others, because in addition to the total exports, the interaction of exports and agricultural Dummy is significant.

Tariffs are the most attainable policy instrument that is easily used by policy makers, In addition, exports and imports are affected by tariffs. Thus, tariffs and its interaction with other explanatory variables are included in the earning equation. Signs of estimated coefficients for tariff are consistent with our prior expectations. With no exception increase in tariff rates would result in wage increases but the magnitude of the increments are different in various economics activities. A wages response to tariff reduction in industrial sector is more severe than that of agricultural sector. To sum up, a hypothetical simulation has been designed to explore the effects of tariff reduction on the relative wage across agricultural and Industrial sectors.

Table (4.1): Estimation and Statistics of Estimated Models

Expl.variables	Rochina barrachina		Seymkina-wooldridge Pooled 2SLS-IV		Seymkina wooldridge FE-IV		Panel Tobit	
	Coeff	Std. Err.	Coeff	Std. Err.	Coeff	Std. Err.	Coeff	Std. Err.
cons	462.21	245.21	1.844	0.145	2.654	0.544	-9.845	0.152
u_r	345.54	184.23	0.0421	0.0145	-	-	-	-
age	-	-	0.1125	0.0046	0.0872	0.0104	0.4123	0.0054
age2	-	-	-0.00145	0.00004	-0.0014	0.0001	-0.0045	0.0001
gender	1924.22	192.35	-	-	0.3548	0.0285	0.5415	0.0455
experie	118.54	41.21	0.35412	0.0254	0.1845	0.0541	0.61254	0.0041
experie2	-4.125	1.321	-	-	-	-	-	-
edu1	-	-	-0.14511	0.0354	-	-	-	-
edu2	-	-	0.0654	0.0214	-	-	-0.841	0.042
edu3	-	-	-	-	-	-	-1.2541	0.0841
schooli	512.651	94.27	-	-	-	-	-	-
imports	-0.0001	0.0001	-0.008	0.0001	-	-	-0.0018	0.0001
exports	-0.0541	0.0054	3.84E-05	1.04E-06	-	-	4.213	1.7454
expedu1	0.0541	0.0054	-	-	-	-	-	-
expedu2	0.0542	0.0054	-	-	-	-	-	-
expedu3	0.0542	0.0054	-	-	-	-	-	-
tariff	354.21	15.012	-	-	0.0645	0.034	0.9541	0.0412
taredu1	-354.21	15.011	-	-	-	-	-	-
taredu2	-353.05	15.239	-	-	-	-	-	-
taredu3	-323.48	16.213	-	-	-	-	-	-
industr	-	-	-	-	0.5412	0.0742	-	-
agricul	-1284.3	451.1	-	-	-0.8412	0.0841	-	-
service	184.21	185.3	-	-	-	-	-	-

impagri	-	-	0.00054	0.0001	-	-	0.00241	0.0003
impserv	-	-	-	-	-	-	-	-
impindu	-	-	0.00054	0.0001	-	-	0.00241	0.0003
expagri	-	-	3.25E-05	1.37E-09	1.07E-05	2.01E-45	4.14E-42	2.94E-09
expserv	-	-	-	-	-	-	-	-
expindu	-	-	-	-	1.85E-05	1.45E-05	-	-
taragri	-	-	0.00021	0.0001	-0.0454	0.0352	-0.045	0.0271
tarserv	-	-	0.05413	0.0254	-	-	-	-
tarindu	-	-	0.00374	0.0006	-0.0541	0.0352	0.0841	0.0412
lambda1	-74121	5125.3	-0.2145	0.0064	-0.1411	0.0341	-	-
lambda2	114487	5321.3	-0.2541	0.007	-0.1654	0.0451	-	-
lambda3	-	-	-0.2934	0.0084	0.1794	0.0551	-	-
rho	-	-	-	-	-	-	0.4121	0.0084

This simulation based on the assumption of a fixed 10 percent tariff for agricultural Commodities imports, but a decreasing rate of tariffs in the industrial activities. The results are given in table (4-3). It is clear that tariff reduction in the industrial activities, holding other factors fixed, remarkably decreases wages gap, consequently relative wages tends towards one.

Table (4-2): Wald joint test for selectivity bias

Rochina barrachina		Seymkina-wooldridge Pooled 2SLS-IV		Seymkina wooldridge FE-IV	
Wald Statistic	p-value	Wald Statistic	p-value	Wald Statistic	p-value
62.14	0.000	171.23	0.000	9.47	0.000

Table (4-3): Tariff reduction and wages equality

$\ln(w_a) - \ln(w_i)$	w_a/w_i	Tariff rate in industrial Sec.	Tariff rate inagricultural Sec.
-1.7451	0.195421	100	10
-1.6123	0.321415	90	10
-1.2144	0.364719	80	10
-0.9541	0.448902	70	10
-0.6628	0.565422	60	10
-0.4125	0.712571	50	10
-0.1784	0.892421	40	10
0.0451	1.125814	30	10
0.2451	1.232116	20	10

5. Concluding Remarks

Making use of socio-economic characteristics of Iranian households' survey for 2001-2003 and data on imports, exports and tariff rates, we estimated hourly wage equation participated in the labor market. The results explore that, it beside the demographic variables, tariffs, imports and exports affects hourly wage significantly. In addition, the hypothesis of no selection bias was rejected strongly, this implies that the utilized sample is not random and a bias correction is unavoidable to generalize the findings to the population that the sample has been drawn. Estimates are remarkably similar across specifications (rachina-barrachina, semykina and Wooldridge's 2SLS-IV, FE-IV and random effect panel Tobit).

In general, wage differences of labor participated is mainly due to tariff rates in activities, because estimated slops of imports and exports are the same across the activities but the interaction of activities and tariff are of different effects on the hourly wages. A tariff reduction in industrial activities, ceteris paribus, sharply decreases wages gap and in fact tends the relative wages towards one.

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