Globalization and Income Inequality: Case of Iran

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Abstract: The main objective of this study was to investigate the effect of globalization on income distribution among Iranian households. To get the objective ratios such as trade to GDP, import to GDP, Foreign Direct Investment (FDI) to GDP and lagged terms of FDI to GDP were used as criteria indicating globalization level. Based on the criteria, four equations were estimated for rural and urban households separately. In all specifications the sign of coefficients were found consistent with Kuznets hypothesis. Turning point would be found between around 6800-8540 and 7190 7520 thousand Rials for urban and rural households, respectively. Findings showed that none of hypotheses, developed for relation between globalization and income distribution, are supported in the case of Iran. It was also revealed that there is no strong evidence indicating positive relation between inequality and globalization.

Key words: Globalization % Income distribution % Iran

INTRODUCTION

Today globalization has emerged as a well known phenomenon, so it is necessary to recognize different dimensions of globalization. Liberalization and globalization lead to increased trade of goods and services and high flow of foreign investment as well as acceleration of technology transformation [1] Globalization is spreading such that failing to determine the proper economic policies and to determine how to face such a fact or to have a passive reaction will lead to irreparable losses. Like other historical changes globalization also has positive and negative impacts [1].

Position of the poor and income distribution in the course of globalization are of the main concerns that there is not same opinion on how they are affected by globalization leading to pose them as more controversial concerns in the world. Mundell [2] believes that increased foreign investment due to more accessibility to capital lead to increase labor marginal product as well as high wages, resulting in decreased inequality. Feenstra and Hanson [3] showed that increased foreign investment results in increased demand for labor and higher labor wages and finally, difference among various income groups tend to increase. Figini and Gorg [4] believe differently in that globalization impact on inequality depends on the stage of globalization. Based on the study there is an inverse U-shaped relation between inequality

and foreign investment. In the first stages of globalization inequality increase due to increase in wages of skilled workers and then it tend to fall because of skill learning by the unskilled workers. Regarding the importance of knowledge about globalization impact on income inequality and presence of different opponent viewpoints, the aim of this study is to know how globalization influences Iranian urban and rural households' income distribution.

Regarding the importance of providing the low income groups with their needs, income distribution has emerged as a main concern in polices. Globalization is regarded equal to reduced trade barriers and increased trade volume as well as increased foreign trade [5].

In the next section some of the studies have been reviewed, then the methodology has introduced. After that the results are presented for rural and urban households separately. In last part the policy implications has been discussed.

Other studies indicate that increased trade results in more desired income distribution. For example, Dorosh and Sahn [6], showed that more liberalized trade policies in Cameron, Gambia, Madagascar and Niger may decrease inequality in these countries.

Based on the findings of Mujeri and Khandaker [7], urban Bangladesh is expected to experience lower income inequality after trade tariff reduction as compared to rural one; however the income inequality will be more

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equal after trade liberalization as a whole. Cororaton and Cockburn [8], revealed that the reduction of tariff in the Philippines cause to lower consumer price, leading to increased consumer price and finally more equal income distribution.

Contrary to the explicit statement of the above studies in that liberalization lead to improved income distribution, some believes that it depends on the condition and the type of policy. Fischer [9], showed that liberalization cause to increased income distribution in the case of nations with great supply of land while in the case of nations with high level of capital it cause to more equal income distribution. Bhasin and Annim [10], also showed the importance of the policy combination. As the results showed in the case of Ghana, removing the import tariff along with 100 percent increase of value added tax will improved the income distribution among all groups. While combining the value added tax with export tax alleviation will affect income distribution adversely.

Harrison and Hanson, [11], for Mexican economy and Barro, [12], for some of the nation showed that increased trade will worsen the income distribution.

Findings of Mah [5], contrary to the above investigations, revealed no relation between globalization and income distribution for Korean case. In general an explicit relation between trade liberalization and income distribution is not supported and it is highly dependent on the condition of the nations.

MATERIALS AND METHODS

As mentioned before, globalization is interpreted as reduction of trade barriers and increased trade as well as increased foreign direct investment (FDI) [5]. So in this paper, FDI/GDP and openness indices, including (Import+Export=)Trade/GDP and Import/GDP, were used as variables indicating globalization.

A general view is that more trade has different impact on economic agents depending on the degree of access to production resources. Agents with high level of access will be able to enjoy more due to have more chance to use from new introduced opportunities, while the others with low access will fail to get it. Therefore, the existence hypotheses are needed to test [5]. On the relation between FDI and inequality three views are available in the literature.

Mundell [2] believes that using more foreign capital will result in an increase in labor marginal product, leading to higher wages and finally less inequality will be achieved.

Viewpoint of Feenstra and Hanson [3], is that increase in foreign investment results in an increased demand for skilled labor, leading to higher wages for this class of labor and finally gap among the different class of labor tend to increase. Finally, Figini and Gorg [4], poses a moderate view in that potential impact is not unique depending on the stages of being globalize. Based on the view in the primary stages of globalization, condition of some workers, known as white workers that are more skilled as compared to the majority of the labor, is improved. Whereas workers with low skill known as blue workers will be left unskilled, of curse, with low wages. In the next stages of globalization the blue workers are skilled and able to work in technologically advanced production process, of course are able to get higher wages. According to this view, there is an inverse U-shaped relationship between income inequality and foreign investment.

To examine the impacts of globalization on income distribution in Iran, the model developed by Mah [5], was applied, the model is as follow:

$$G(t) = a + bPGNP(t) + cPGNP^2(t) + dOR(t) + \sum_{i=0}^{k} e_i FDI(t-i) + u(t)$$

where u is the conventionally assumed disturbance term, G is Gini coefficient, PGNP is per capita GNP, PGNP is squared per capita GNP, or is openness ratio, FDI is foreign direct investment used as globalization criteria, openness ratio which are defined as (export+import=)Trade/GDP×100 and (import/GDP)×100 are used as measures of openness.

Gini coefficient is the ratio of income inequality to highest income inequality and is defined as follow:

$$G = \left[\frac{1}{2n^2\mu} \right] \sum_{i=1}^{n} \sum_{j=1}^{n} |x_i - x_j|$$

where, G is Gini coefficient, n stands for household number, x_i is income (expenditure) of ith household, x_j is the income (expenditure) of jth household and μ is average income (expenditure) of society. Gini coefficient varies between 0 and 1, the former indicates the completely equal and latter indicates the absolutely unequal. In other words, higher values of the coefficient show more inequality in society.

The above mentioned hypotheses are tested as follows:

Mundell Hypothesis: $e_0<0$ and e_i for $i>0$

Feenstra and Hanson Hypothesis: $e_0>0$ and $e_i=0$ for $i>0$

Figini and Gorg Hypothesis: $e_0<0$ and $e_i<0$ for $i>0$

The augmented Dicky-Fuller test was used to examine the stationary of the series.

The Data set used in the current paper are taken from Central Bank of Iran's Custom Statistical Yearbook [13] and reports developed by Statistical Center of Iran [14].

RESULTS AND DISCUSSION

Applying the augmented Dicky-Fuller test revealed that all variables are stationary. Based on the test rural and urban Gini coefficient, per capita GDP and its squared values, the ratio of import to GDP and FDI/GDP are stationary at 5% level of significance. Globalization is interpreted to great extend event that results in more trade transactions on foreign direct investments. Therefore it is relevant to use Trade/GDP, Import/GDP or FDI/ GDP as measures indicating globalization.

Urban Households: Table 1 shows OLS estimation results without time lag terms to FDI for urban households. In model I of Table 1 the Trade/GDP has been applied as globalization measure, whereas in model II Import/GDP has been used instead of Trade/GDP indicator.

Regarding the sign of coefficient both of the specifications presented in Table 1 are same. In both of them signs of the coefficient are consistent with expectation based on Kuznets hypothesis that is, we can say there is a reversed U shape relation between income distribution and per capita GDP. This consistence is equal to appearance of positive and negative sign and of course significant for per capita GDP and its squared value respectively.

The results of the first specification presented in Table 1 indicate that more convergence of Iran's economy toward global one will result in an increased income inequality among urban households. In second specification it is revealed to be the same as first one with respect to globalization effect. The coefficients of globalization measure are same in both of specifications, from viewpoint of magnitude. Therefore these specifications are consistent with the popular view that with expansion of Iran's international trade inequality will be raised considerably throughout urban households.

Table 1: Factors affecting income distribution in urban Iran

	Model I	Model II
Intercept	-0.455 (0.569)	-0.090 (0.306)
Per capita GDP	$2.47\times10^{-6*}$ (1.69×10^{-6})	$1.36\times10^{-6*}$ (0.901×10^{-6})
(Per capita GDP)^2	$-1.72\times10^{-12*}$ (1.24×10^{-12})	$-9.76\times10^{-12*}$ (6.62×10^{-12})
Trade/GDP	0.316 (0.236)	-
Import/GDP	-	0.341** (0.124)
FDI/GDP	0.316 (0.421)	0.242*** (0.421)
War Dummy	0.061*** (0.019)	0.040** (0.016)
R^2	0.269	0.465
F	2.180*	3.614
LM	1.123 (0.36)	2.756 (0.12)

S.E values are in parntesis after each result

* $p<0.10$; ** $p<0.05$; *** $p<0.01$

Table 2: Factors affecting income distribution in urban Iran (FDI/GDP lags containing)

	Model I	Model II
Intercept	-0.247 (0.205)	-0.274 (0.231)
Per capita GDP	$2.00\times10^{-6**}$ (0.78×10^{-6})	$1.63\times10^{-6**}$ (0.685×10^{-6})
(Per capita GDP)^2	$-1.47\times10^{-12**}$ (0.604×10^{-12})	$-0.955\times10^{-12*}$ (0.506×10^{-12})
Trade/GDP	0.101 (0.093)	-
Import/GDP	-	0.130 (0.176)
FDI/GDP	0.100 (0.178)	0.275 (0.210)
FDI/GDP (-1)	-0.580*** (0.123)	-0.867*** (0.245)
FDI/GDP (-2)	-0.015 (0.114)	-0.085 (0.220)
FDI/GDP (-3)	-0.263** (0.113)	-0.831** (0.278)
War Dummy	0.024** (0.009)	0.062** (0.010)
R^2	0.828	0.837
F	9.474***	11.32***
LM	0.85 (0.49)	1.377 (0.32)

S.E values are in parenthesis after each result

* $p<0.10$; ** $p<0.05$; *** $p<0.01$

Next, FDI term is introduced to test the Feenstra and Hanson [3] hypothesis. The coefficient of the variable is revealed not to be significant, indicating that the mentioned hypothesis is not supported in case of Iran. The special condition caused by imposed war was considered using a dummy variable for period of 1980-1988. The dummy variable coefficient revealed negative impact of war on income distribution.

Regarding the goodness of fit, there are differences between two specifications. The first specification can explain 27% of change in Gini coefficient of urban households, while in the case of second one corresponding figure is 46%.

In order to test the Figini and Gorge [4] hypothesis, the lagged terms of FDI/GDP were used. Table 2 shows the results of this specification. The first specification (Model I) presented in Table 1 is improved with introducing lagged terms of FDI/ GDP. However, the sign

Table 3: Factors affecting income distribution in rural Iran

	Model I	Model II
Intercept	-0.596 (0.294)	-0.463 (0.274)
Per capita GDP	2.78×10^{-6}*** (0.84×10^{-6})	2.39×10^{-6}*** (0.791×10^{-6})
(Per capita GDP)^2	-1.89×10^{-12}*** (6.06×10^{-12})	-1.66×10^{-12}** (0.567×10^{-12})
Trade/GDP	0.047 (0.113)	-
Import/GDP	-	0.153* (0.095)
FDI/GDP	-0.327 (0.212)	-0.089 (0.197)
War Dummy	0.033** (0.019)	0.024** (0.009)
R^2	0.543	0.400
F	5.043**	3.536**
LM	1.942 (0.19)	1.032 (0.41)

S.E values are in parenthesis after each result

*$p<0.10$; **$p<0.05$; ***$p<0.01$

Table 4: Factors affecting income distribution in rural Iran (FDI/GDP lags containing)

	Model I	Model II
Intercept	-0.548 (0.173)	-0.636 (0.150)
Per capita GDP	2.57×10^{-6}** (0.51×10^{-6})	4.981×10^{-6}** (0.285×10^{-6})
(Per capita GDP)^2	-1.71×10^{-12}** (0.038×10^{-12})	-1.900×10^{-12}*** (0.032×10^{-12})
Trade/GDP	-0.050 (0.059)	-
Import/GDP	-	-0.104 (0.115)
FDI/GDP	-0.556*** (0.143)	-0.569*** (0.149)
FDI/GDP (-1)	-0.436*** (0.091)	-0.529*** (0.153)
FDI/GDP (-2)	-0.080 (0.084)	-0.178 (0.141)
FDI/GDP (-3)	0.013* (0.091)	0.087 (0.093)
War Dummy	0.029** (0.006)	0.028*** (0.007)
R^2	0.844	0.846
F	11.888***	12.033***
LM	0.68 (0.53)	0.48 (0.63)

S.E values are in parenthesis after each result

*$p<0.10$; **$p<0.05$; ***$p<0.01$

Table 5: Per capita income in turning point on Kuznets curve (in Rials)

	Urban Iran	Rural Iran
Model I of Table 1	7180230	-
Model II of Table 1	6967210	-
Model I of Table 2	6802720	-
Model II of Table 2	8534030	-
Model I of Table 3	-	7354490
Model II of Table 3	-	7198790
Model I of Table 4	-	7514610
Model II of Table 4	-	7500000

Each US $ equals to 9300 Rials

of variables were emerged unchanged, as it can be seen in Table 2 (Model I) Kusnets hypothesis is supported as table shows the significance level of per capita GDP and (squared per capita GDP) have been raised, but the significance level of FDI/GDP has been reduced from 10% to 15%. In this specification impact of FDI/GDP was also found insignificant. Therefore, hypothesis of Mundell [2], Feenstra and Hanson [3] and Figini and Gorg [4] were rejected.

The models' goodness of fit of model I has been improved considerably and more than 82% of changes in Gini coefficient of urban households can be explained using the models presented in Table 2.

The results of lages-containing specification of second model with three lag terms of FDI/GDP has been summarized in Table 2 (model II). In this specification statistical importance of per capita GDP and (squared per capita GDP) has been increased. However, the variable indicating globalization has revealed to have no important impact. Statistical importance of FDI has increased up to 84%. This specification also supports Kuznets theory. In this model the variable FDI/GDP has no statistical importance, so all the three hypothesis are rejected. In both of expanded models, the globalization variable showed no impact on income distribution.

Rural Households Results: Estimation results of rural households have been summarized in Tables 3 and 4. In first model of Table 3 the sign of variable Trade/GDP was found positive, like urban one but it is not statistically significant in the case of first model. Kuznets hypothesis is supported since the sign of per capita GDP coefficient is positive and the sign of squared per capita GDP coefficient is negative. In this specification the

coefficient of FDI/GDP, contrary to the corresponding coefficient of urban households was emerged negative but without statistical importance. Therefore, Mundell [2] hypothesis was tested. This hypothesis was rejected due to the low statistical importance of the cited coefficient. Like urban models dummy variable of war has a positive impact on Gini coefficient.

Coefficient of FDI/GDP is significant at 10%. The first specification can explain more than 54% of changes in rural income distribution using variables summarized in Table 3. In general based on the first specification, globalization is expected to have no considerable impact on rural income distribution. In addition, to have more globalize economy accompanied by increasing amount of foreign investment is expected to improve income equity throughout rural households.

Model II of Tables 3 also shows the results of second specification of rural households. The sign of

coefficients of this model is same as first one. In thisspecification, variable of Import/GDP, indicating the convergence of Iran's economy toward global one, has revealed a negative and significant impact on income distribution. This finding is consistent with the common view on globalization impact on income distribution. In this model Kuznets hypothesis is also not accepted like the first model as FDI/GDP is not significant. So Mundell hypothesis is rejected.

Dummy variable of war same as urban and first model of rural households indicates a negative impact on rural income distribution. This model can explain only 40% of changes in income distribution of rural households.

The expanded specifications of first and second models were estimated using lag terms of FDI/GDP. There results have been summarized in Table 4.

Using lagged terms of FDI/GDP has changed the sing of the variable indicating globalization impact. In expanded specification the sign of the globalization variable, contrary to its sign in primary specification, is positive. As first specification, Kuznets hypothesis is also accepted.

Regarding the statistical importance of FDI/GDP, Mundell hypothesis can be tested. Because of low statistical importance of lagged terms coefficients, Mundell hypothesis is rejected.

Based on R^2 criteria, applying lagged terms was revealed to improve the model considerably. As presented in Table 4 using lagged terms of FDI/GDP as expended specification of second model (Model II), has reversed the sign of globalization variable same as first expanded specification (Model I). Its impact on income distribution has been turned to be positive and desirable. But contrary to first specification (Table 3) has a low statistical importance. FDI/GDP has revealed a considerable impact on income distribution. In expanded specification of second model Kuznets hypothesis is also supported.

Regarding the negative sign of FDI/GDP and significance of its first lagged term none of hypotheses including Figini and Gorg [4], Mundell [2] and Feenstra and Hanson [3] was supported. This model can explain more than 84% of changes in rural Gini coefficient with 40% improvement compared to first specification (Table 3).

Turning point of Kuznets curve was also calculated. Kuznets believed that at primary stage of economic growth income inequality increases, reaching a special level of income it tends to decrease. As can be seen in Table 5, in the case of urban households, turning points is in range of 6800 to 8540 thousand Rials in constant

price of 1990. The corresponding range for rural households is 7520 to 7190 thousand Rials.

Mousavi [15], revealed that per capita income has been increasing during 1982-1988 and it has been the lowest in 1988(5421 thousand and Rials). After 1988 has been increasing up to 8210 Rials in 2002. Therefore we can express that per capita has passed the turning point.

Conclusion and Policy Implication: In general the globalization will increase the income inequality, based on models without lagged terms of FDI/GDP. While incorporating the lagged terms of FDI/GDP revealed its impact not to be considerable on urban income inequality. None of hypothesis including Mundell [2]; Feenstra and Hanson [3]; and Figini and Gorg [4] was supported.

In the case of rural households, based on the results of the model including the FDI/GDP individually, without its lagged terms, revealed that the impact the globalization depends on the criteria used to study. Expanded models showed a decreased inequality along with increasing convergence of Iran's economy toward world's economy. In rural models none of the above mentioned hypothesis use also accepted.

In general, relying more on the results of expanded models bused on their higher goodness of fit, globalization may not be considered as source of income inequality increment. However, regarding the importance of globalization impact, more investigation is needed using some more comprehensive approach like GGE. There are some differences between rural and urban society in being influenced by globalization, so different policies for each of them is suggested [14-17].

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