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The Role of Human Capital on the Development and Progress of Various Sectors in Iran Economy

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Abstract: We investigated the factors affecting the whole of value added of Iranian economy as well as agricultural and industrial sectors. As, educated labor can affect value added more than uneducated labor, labor was divided to two groups and their effects on value added were investigated separately. Also, selected economical indices were compared pre and post Islamic revolution by using time series data from 1962-2002. Ordinary Least Squares, autoregressive distributed lag model, Johanson cointegrated vectors and vector error correction model were used to investigate the long and short run effects of variables on value added. Student Test (t) was used to compare selected indices pre and post the revolution. The results showed elasticities of economy value added with respect to investment, educated and uneducated labor force are 1.46, 0.059 and -2.32%, respectively. Elasticities of industrial value added with respect to the above-mentioned variables are 0.268, 0.895 and -1.3, respectively, while elasticities of agricultural value added with respect to investment, educated and uneducated labor force are 0.321, 0.369 and 6.94, respectively shows the most important factor in this sector of economy is uneducated labor force. Comparing the average growth rate of variables pre- and post-revolution indicated growth rates of economy value added, the economy investment, industrial and agricultural educated labor force and the economy uneducated labor force are different significantly. Other variables such as growth rate of value added of agricultural and industrial sectors and investment in these two sectors did not have significant differences.

Key words: Value added, educated labor force, autoregressive distributed lag model, vector error correction model

INTRODUCTION

Nowadays, human (skilled labor) plays a major role in economical, social and cultural development (Becker and Murphy, 1990). While, previously, limitation in natural resources has been assumed as the major development factor, human resources have substituted natural resources in the world development process (Jorgenson and Fraumeni, 1989). As a result, if the countries can not employ the science and technology by using creative researches and initiative human resources, other countries with improved human developmental indexes take their positions (Abadi, 2003; Akihiko, 2000; Becker and Murphy, 1990). Importance of human resources development is so critical that UN has presented a new method for estimated development calling human development index (Soumyanada,

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2008). Human development implies activation of physical and non-physical potentials and achievement of human capabilities (Barro, 1998). Study the role of educated labor in developing countries like Iran can provide valuable information (Nili and Nafisi, 2004).

In some countries such as China, the increase in labor has generally been found as a less important growth factor and recent research shows that 10-20% of GDP growth may be attributable to the growth of labor force (Lin, 2001; Lucas, 1988; Salimi and Mortazavi, 2006). Despite the importance of the question, whether and how human capital contributes to fast economic growth in developing countries has not been examined thoroughly. Relatively few empirical studies have included human capital as a growth factor in addition to labor (Tayebi and Arbabian, 2003; Young and Miyagiwa, 1987). It have been found that capital, labor, human capital and Total Factor Productivity (TFP) each accounted for 48, 16, 11 and 25% of GDP growth during the period 1978-1999 in China (Guangwen, 2003). Also the impact of human capital on TFP with human capital measured by the percentage of university graduates in the population has been examined and the results showed human capital had a significant effect on TFP (Lin, 2001). Several studies have included human capital in the regressions to explain regional growth disparity (Becker and Murphy, 1990; Benhabib and Spiegel, 1992; Brempong and Kwabena, 2004; Gary and Nigel, 1986).

Iran has a special oil-base economy influencing by particular governmental politics, Islamic revolution and events like sanction (Nili and Nafisi, 2004; Shah'abadie and Mahmudie, 2007). As a result, Iran presents a different specific economical model which can not be found in any other developing country (Chaichian, 2001; Tayebi *et al*., 2004). In this study, the factors affecting the whole of value added of Iranian economy as well as agricultural and industrial sectors has been studied by different models like Ordinary least squares, autoregressive distributed lag model, Johanson cointegrated vectors and vector error correction model (Abadi, 2003; Chaichian, 2001; Dinmore, 2001; Nili and Nafisi, 2006; Shah'abadie and Mahmudie, 2007; Tayebi *et al*., 2004; Tayebi and Arbabian, 2003). In this study a particular attention has been paid to the role of human capital as educated (skilled) and uneducated labor.

MATERIALS AND METHODS

In this study some economical indices of Iranian economy compared pre and post Islamic revolution in 2007 by using time series data from 1962 to 2002 and the following function has been used to investigate the influences of independent variables on value added of industrial and agricultural sectors and the whole of Iranian economy:

$$Y_t = f(X_{1t}, X_{2t}, X_{3t})$$

where, Y_t is value added, X_{1t} to investment, skilled labor and unskilled labor, respectively. Before estimating the model, some tests were carried out on the variables (Akihiko, 2000). One of the most important assumptions of traditional econometrics methods in estimating the model coefficient is that the time series variables are stationary. If the time series variables would not be stationary, whereas there is no exact relation among the model variables, but the coefficient of determination (R_2) is very high and the researcher may attain wrong inference about the relation among variables; in other words the estimated regression shall be spurious (Jorgenson and Fraumeni, 1989).

The most common tests in the study of stationary are Dickey-Fuller and augmented Dickey-Fuller tests (Gary and Nigel, 1986). It is necessary to point out that the stationary and

the estimation of the functions have been carried out on the natural logarithm of the used variables. In other words the estimated functions are of the logarithmic form of Cob-Douglas (Arani, 2001).

Whenever, a variable is not stationary, it can diverted to stationary by differentiation, but in this case the long term information pertaining to the level of variables shall be eliminated and therefore, in estimation of an econometric model which holds the kinetic variables, application of the variables differentiation is not recommended in the model. In order to avoid this problem, the co-integration process can be used and regression on the level of variables can be estimated without fearing their falseness in conclusion the result (Abadi, 2003; Barro, 1998). The economic concept of co-integration is that, whenever two or more time series variables are interrelated on the theoretical basics leading to the creation of balancing long term relation, though it may be possible that, these very time series are non-stationary but they may follow each other during the time, so that, any difference between them keep up a stable formation (Soumyanada, 2008; Tayebi and Arbabian, 2003). Therefore, this concept of co-integration is recalling, a balanced long term relation towards which the economic system moves ahead in due course of time. Many approaches have been suggested to carry out the co-integration test. Two methods of Engle-Gringer test and Johnson-Uscellius test have been applied in this study (Schukz and Theodore, 1960).

According to Engle-Gringer method, the model has been estimated using ordinary least squares and then the residual terms of model calculated and eventually its stationary tested by Dickey-Fuller. Since, the model was estimating with non stationary variables, ordinary least squares method was used. Therefore Dickey-Fuller and the augmented Dickey-Fuller tests were not suitable to test stationary of residual terms of this regression (Benhabib and Spiegel, 1992). As a result, the calculating quantities must be compared with the crucial levels other than those applied for ordinary values. The supposition which is, of course, put forward here is that, in order to use the Engle-Gringer method, all the variables have to be integrated of order one. However, if this was not the case and some of the variables were integrated of order one, the values of Dickey-Fuller and the augmented Dickey-Fuller could be compared with the Haldrup statistics instead of the statistics of Engle-Gringer. If the variables be co-integrated, the long term relation among the variables can be estimated by ordinary least squares method (Benhabib and Spiegel, 1992).

Whenever, the sample size is small (and of course, it seems that the sample size is not small in the present study), application of the least squares method in estimation of long term relation shall not lead to a unbiased estimation and that is due to ignorance of short term research reactions between the variables. In order to avoid this problem, the research models can be regulated for the long term dynamic relation, so that by this way the relatively unbiased estimations of long term models is achieved (Nili and Nafisi, 2006).

The bellow research model should be assumed:

$$Y_t = \delta_0 X_t + \delta_1 X_{t-1} + \alpha y_{t-1} + u_t$$

By some manipulating, the above equation can be written as:

$$Y_t = BX_t + \delta_1 \Delta X_t + \delta_2 \Delta y_t + V_t$$

The existence of ΔY_t, ΔX_t variables in this model can cause the unbias related to the estimation of beta parameter of the model to be eliminated based on a small sample. In order

tableto minimize the bias thereto the estimation of the model coefficients in the small samples, it is preferred that a large number of lags for the variable to be taken into consideration (Nili and Nafisi, 2006).

The above model, as used in research cases, is known as autoregressive distributed lags (ARDL). The number of optimal lags in this model is specified by the help of (AIC) criteria, (SBC) or (HQC). The ARDL model determines the number of optimal lags and considers it in the model. Once this model is estimated, the coefficients of the long term model and standard error related to the long term coefficients can be estimated based on the selected ARDL model (Alfazl and Mahmoudi, 2006). Up to now, it is concluded that, whenever the variables are co-integrated, a long term relation is existed between them. It is possible, of course that, there may be some cases of imbalances may occur in the short term. The model which can establish a relation between the short term fluctuations of variables and the long term balancing values and holds ever increasing application in the empirical works and is known under title of Error Correction Model (ECM) (Nili and Nafisi, 2006). If two variables exist the model is read as follows:

$$Dy_t = \alpha_0 + \alpha_1 \Delta x_t \, \alpha_2 u_{t-1} + \epsilon_t \; \epsilon \sim IID(0)$$

In this equation: u_t is error term of estimating regression of y_t on the Xt. In other words the bellow linear model shall be estimated and then the u_{ts} shall be calculated:

$$Y_t = BX_t + u_t$$

$$U_t = y_t - BX_t$$

The above model is for vector error correction term in which, the variations in y_t which is related to the former period of balance error. To estimate the vector error correction term, the long term model parameters shall be estimated by the help of the statistics pertaining to the level of variables and then the null hypothesis of no co-integrated relation among the variables shall be tested. In the next step the error correction term which is the same long term static model regression (U_t) shall be applied as the explained variable in the vector error correction and the model shall be estimated by this way (Nili and Nafisi, 2006).

Once the model is estimated, the coefficient of Error Correction Term (ETC) shall be obtained in this way. This coefficient shows that, if there is an imbalance in the model, some percent of the imbalance shall be corrected, or in other words, it takes some period for this imbalance to be eliminated.

RESULTS AND DISCUSSION

The investigating stationary of variables indicated that all of them except the skilled and unskilled labor in the agricultural sector which are integrated of order 2, are all of order 1 I(1). These two variables were also acted in the form of (I1) after including of the dummy variable of revolution and after occurrence of structural break. In other words, the structural break has been the cause of their integrating of order 2, whereas the variables were of order 1.

The results of the estimation of the model thereto the agricultural sector by the help of ordinary least squares is shown in Table 1. In this model, all of the variables have the significance and positive effect on value added and explained 88% of the variation of dependent variable. The dummy variable of the Revolution has also the positive and

Table 1: The results of the estimated functions affecting the value added in the agricultural and industrial sector

Variable	Agricultural sector	Industrial sector
Intercept	-101.55±37.36**	8.78±4.54*
Dummy variable of revolution	0.349±0.204*	-
Investment	0.321±0.095**	0.268±0.077***
Skilled labor	0.396±0.053***	0.859±0.296***
Unskilled labor	6.940±2.48***	-1.300±0.604
First halt in value added	-	0.671±0.159***
Second halt in value added	-	0.098±0.181

F = 73.98 D.W = 1.87 R-2 D.W = 1062 R-2 = 0.97, F = 218.07, Source: Research finding. *Significance meaning at the level of 10%, **Significance meaning at the level of 5%, ***Significance meaning at the level of 1%. Data are expressed as Mean±SD

Table 2: The results of stationary test of equation residual

Variable	Calculed dickey-fuller indices	Critical value of hall-drup
Residual of agricultural sector equation	-5.74	-4.71
Residual industrial sector equation	-5.47	-5.22

Table 3: Estimation of auto-regression model with the long term distributed halt in the Industrial and agricultural sectors

Variable	Agricultural sector	Industrial sector
Intercept	-95.440±35.25***	43.601±34.25
Dummy variable of revolution	0.193±0.195	-
Investment	0.420±0.110***	0.6423±0.293**
Skilled labor	0.417±0.049***	3.7300±2.19
Unskilled labor	6.490±2.340***	-6.2100±3.67*

DW = 1.79 F = 307.34 R = 0.967 F = 61.16 D.W = 1.77 R = 0.84. *Significance meaning at the level of 10%, **Significance meaning at the level of 5%, ***Significance meaning at the level of 1%. Data are expressed as Mean±SD

significance effect on the level value added in the agricultural sector. The result was expected, because the particular attention has been paid to the agricultural sector after the revolution. The ratio of value added elasticity to the amount of investment in this sector is 0.32%. The degree of this elasticity for the skilled and unskilled labor has been 0.369 and 6.94%, respectively, indicating that the most important factor affecting the quantity of production in the agricultural sector is uneducated farmers.

Whereas, the examined variables in the estimated function are not stationary, this conclusion cannot be relied on. By application the Engle-Gringer test on residual terms of all model their stationary were investigated. The results are indicated in Table 2 and represents that residual term is stationary.

The results of the estimation of the autoregressive distributed lag model, in agricultural sector for the examination of the long term impacts of the independent variables on the value added in this sector, are shown in the Table 3.

The results of the estimation of this model have confirmed the results of ordinary least squares method. Because all the three variables of investment, unskilled and skilled labor bear significance meaning likewise the ordinary least squares and the elasticies are also in close proximity to the calculation elasticity in the ordinary least squares.

The vector error correction model has been used, in order to examine the short term effects of the given variables on the value added in the agricultural sector and the results are presented in Table 4. It is observed that, the coefficients of the skilled and unskilled labor variables have significance effect, but the investment variable has not a significant effect on value added. In other words, the process of investment takes a period of time, to put into a necessary effect on the value added of agricultural sector. The coefficient of the error correction term is -1 and shows that if an imbalance is occurred in model, only a period is required to modify the imbalance completely.

Table 4: Estimation of vector correction model (ECM) in the agricultural and industrial sectors

Variable	Agricultural sector	Industrial sector
Intercept	-95.440±35.25**	8.880±3.76***
Dummy variable of revolution	0.192±0.195	-
Investment	-0.250±0.240	0.475±0.263***
Skilled labor	0.417±0.0498***	0.736±0.263
Unskilled labor	6.499±2.343***	-1.250±0.499***
Error correction term	-1.000±0.0001	-0.182±0.078***

F = 1.73 DW=1.82 R = 0.74 F = 7.67 D.W = 1.77 R = 0.51. *Significance meaning at the level of 10%, **Significance meaning at the level of 5%, ***Significance meaning at the level of 1%. Data are expressed as Mean±SD

Table 5: Results of the number of co-integration vectors

	Maximum eigen value		Trace test	
Hypothesis	Statistics	Critical value	Statistics	Critical value
r = 0 r = 1	47.41	33.64	120.63	70.49
r = 1 r = 2	25.60	27.40	43.23	48.88
r = 2 r = 3	14.41	21.12	25.63	31.54

The results of the estimation of the ordinary least squares for the value added in the industrial sector are shown in the Table 1. According to the achieved information in the table it is observed that all the three variables existed in the function at the statistical accepted level have the significance meaning.

In order to avoid the autocorrelation problem; the value added of the industrial sector having one or two lags inserted in the regression model. The coefficient of the model determination shows that 97% of the variations in the industrial sector value added were explained by the variables of investment, skilled and unskilled labor as well as the two cases of lags, occurred in the value added. The value added elasticity in this sector in relation to the investment, skilled labor and unskilled labor are consecutively 0.268, 0.859 and -1.3.

The stationary condition of the test on the model disorder, the result of which is entered in the Table 2, is representing lack of estimation of false regression. The Table 3 indicates the outcomes from the estimation auto-regression with the lag distributed for the industrial sector. By examining the contents of the Table 3, it is observed that, all the three variables of investment, skilled and unskilled labor in the model have got significance meaning and the model estimation output shall be confirmed by virtue of the ordinary least square, although, the quantity of the estimated coefficients have a little difference to one another.

The result of estimation of the vector error correction model in the industrial sector, presented in Table 4, is showing the short term effects of the independent variables on the value added of this sector. All of the three variables represent an explanation within the meaningful function. Also, the minor coefficient of the error correction is equivalent to -0.182, which at first corresponds with what is expected and secondly, it is showing that if an imbalance is occurred in the model, it takes about five year for this imbalance to be eliminated and the model attains its balance again.

Test of stationary of variables at the level indicated that all the variables are integrated of order one, but after the examination of structural break it was identified that the unskilled labor in the economy has faced a structural break due to the Revolution shock. In other words, this variable is at the level of lag. Whereas the Engle-Gringer test is applied when all the variable are accumulated kind of degree one, therefore, in order to examine the effective factors on the value added of the economy, the Juhanson co-integration method was applied to determine the number of co-integration vectors, long term relations and the vector error correction in the short term relation.

The results of the co-integration vectors presented in the Table 5 indicated that both maximum eigen value and trace test criteria have suggested one co-integrated vector. The other criteria such as Hennan - quiin and Akaic have suggested five co-integrated vectors.

Determined number of the co-integrated vectors with very long term relations between the variables of the macro-economic value added model is shown as normalized and non-normalized in Table 6. The results indicated that the variables in the model are meeting the envisaged expectation. In order to specify which variable has the significance effect on the value added, deeming the coefficient of the domestic gross production (economy value added) was applied on the co-integrated vector. The results of the marginal long term relation between the model variables are shown in Table 7. Based on the outcome of Table 7, the main variables of the model i.e. investment, skilled labor and unskilled labor are significant statistically. Among these variables, the first two variables have positive effect and the third variable i.e. the unskilled labor has negative impact on the economy value added. The value added elasticity of investment variable, skilled labor variable and unskilled labor variable is, respectively 1.46, 0.059 and -2.32%.

In order to examine the short term impacts of the studied variables on the economy value added the vector error correction model was applied. The result is shown in the Table 8. Whereas, there are a large number of the selected variables, only the variable having statistical significance meaning were mentioned in the above mentioned Table 8. As for some of the variable their third differential has been taken into account in the model. Therefore, the variables are mentioned by their Latin names. In this Table, the IEN, NEEE, DE and ECM represent respectively the economy investment variable, unskilled labor variable in economy, dummy Revolution variable and error correction fraction.

The results indicated that the investment variable has positive impact in the short term on the value added. The unskilled labor which, having a negative significant impact on the value added, had also a negative impact in short term. Also, the Revolution dummy variable

Table 6: The result of estimating normalized and non-normalized co-integration vectors

Variable	Not-normalized vector	Normalized vector
Economy value added	2.54	-1.000
Investment	-3.71	1.460
Skilled labor	-0.15	0.059
Dummy revolution variable	-1.59	0.626
Unskilled labor	5.89	-2.390

Table 7: The result of estimating the long term relations of the economy value added

Variable	Coefficient	SE
Investment	1.460	0.189
Skilled labor	0.059	0.023
Dummy revolution variable	0.626	0.622
Unskilled labor	-2.320	1.092

Table 8: The result of estimating the short term relations of the effective factors on the value added

Variable	Coefficient	SE	Prob.
Intercept	-13.090	4.810	0.013
Dlinel	0.510	0.180	0.010
DLNEEE1	-1.420	0.680	0.050
Deline2	0.323	0.135	0.025
DDE2	-0.112	0.058	0.069
DLNEEE2	-2.179	0.873	0.021
DLEEE3	-2.570	1.110	0.031
DCM1(-1)	-0.369	0.120	0.006

IEN, NEEE, DE and ECM represent the economy investment variable, unskilled labor variable in economy, dummy revolution variable and error correction fraction, respectively

Table 9: Growth rate of the variable during the period of study

Growth rate	Minimum	Average	Maximum	Standard error
Value added of economy	-12.80	5.59	18.70	7.94
Value added of agricultural sector	-7.02	12.30	290.00	4.96
Value added of Industrial sector	-21.51	15.20	279.60	4.37
Economy investment	-30.77	8.59	50.10	18.46
Investment in agricultural sector	-29.17	5.60	59.30	19.12
Investment in industrial sector	-41.53	13.70	17.20	43.10
Skilled labor at level of economy	10.00	15.49	16.60	0.96
Skilled labor in agricultural sector	3.85	11.63	45.20	10.73
Skilled labor in industrial sector	10.00	12.30	18.20	2.61
Unskilled labor of economy	-5.10	1.56	9.97	2.68
Unskilled labor in agricultural sector	-1.09	-0.084	0.42	0.51
Unskilled labor in Industrial sector	4.50	6.560	9.60	2.02

which had not any significance meaning impact on the economy on value added in the long term has a negative impact in the sort term. The minor error correction coefficient has also met the envisaged expectation and indicates that if an imbalance is occurred in a model, about 0.36 of this imbalance is adjusted so that it takes about three years for the model to reach its optimal balance.

In this part of the study, the growth rate of the applied variables has been calculated and then they have been compared for two periods of before and after the Revolution. The results out of the calculation of the growth rate of these variables for the two periods within the years from 1962 to 2002 are mentioned in Table 9. It is observed that, the average growth rates of economy value added in the two under studied periods, agricultural sector and industrial sector are equivalent to 5.59, 12.3 and 15.2%, respectively. The growth rate in the economy, in the industrial and agricultural sectors have been 8.59, 13.7 and 5.6%, respectively. The growth rates of the skilled labor at the economy, in the agricultural and industrial sectors have been equivalent to 15.49, 11.63 and 12.3%, respectively. Lastly, the average growth rate of the unskilled labor in the above mentioned sectors have been 1.56, -0.084 and 6.56%, respectively.

The results are also representing that the minimum amount of growth rate, except to all three under examination sectors as well the unskilled labor in the industrial sector stands as a negative value which indicates the decrease of values of these variables during some of the under examination years. The adverse growth of the Gross Domestic Product (GDP) within the years of 1978 to 1982, can be granted as an example. Also the value added of the agricultural sector in the years of 1965, 1968, 1978 and 1989 has faced negative growth. As for the industrial sector, the negative growth of this sector has taken place in the years of 1968, 1983, 1987 and 1994.

During many years, investment in all three sectors has faced adverse growth. This situation has been common in economy, on one hand and both sectors of industry and agriculture from1978- 1982.

The unskilled labor in the economy has faced adverse growth during the years of 1987 to 1982. Also the same condition has been prevalent in the agricultural sector from1964 to 1976. In other words, the number of the peasants from the agricultural sector who have relocated to the other sectors of economy and particularly to the industrial service sector has been more than those peasants who have selected agriculture as their occupation.

Whereas, the Islamic revolution as an important phenomenon has affected on all the social, economic and cultural policies, therefore the comparison of the growth rate of examined indications prior and after this important event can be considerable in the estimation of the policies and perhaps the future policy makings; because the strong points

Table 10: The results of the comparison of the economic indices befor and after the revolution by t test

	Before revolution		After revolution			
Indication growth rate	Average	SE	Average	SE	t-statistic	Result
Value added of economy	10.04	7.70	2.630	6.72	3.130	Non-acceptance
Value added of agricultural sector	17.60	7.50	8.700	21.42	0.464	Acceptance
Value added of Industrial sector	12.60	7.50	8.700	21.42	0.366	Acceptance
Economy investment	15.09	16.46	4.260	18.76	1.930	Non-acceptance
Investment in agricultural sector	20.24	45.00	9.300	42.40	0.800	Acceptance
Investment in industrial sector	9.85	21.53	2.790	17.24	1.099	Acceptance
Skilled labor at level of economy	15.42	0.46	15.540	1.19	-0.460	Non-acceptance
Skilled labor in agricultural sector	14.45	1.67	11.990	2.69	3.560	Non-acceptance
Skilled labor in industrial sector	6.01	3.18	15.370	12.33	-3.540	Non-acceptance
Unskilled labor of economy	2.65	1.74	0.080	2.96	2.460	Non-acceptance
Unskilled labor in agricultural sector	8.64	1.62	5.170	0.48	8.320	Non-acceptance
Unskilled labor in Industrial sector	-0.17	0.28	-0.024	0.62	-1.030	Acceptance

Source: Research findings

can by his way be made stronger and the weak points be eliminated. The comparison of the growth indications prior and after the Revolution has been made by the help of the T test. The achieved outcomes are presented in Table 10. It is observed from considering the contents of this Table that, the average of the growth rates of the gross domestic product, investment growth in the economy, skilled manpower growth in industrial sector have a different statistical significance meaning at the level of 10% in prior and after the Revolution.

There is a growing empirical labor literature that examines the role of human capital in economic development using various types of data (Haywood, 2004; Lucas, 1988; Salehi, 2005; Schukz and Theodore, 1960; Soumyanada, 2008; Tayebi *et al*., 2004; Young and Miyagiwa, 1987). Most of these studies use Summers-Heston cross-country data, which became available since the early 1990s. It has been reviewed this literature and pointed out several empirical methodological issues that require attention, such as the measurement of human capital, differences between the stock and accumulation of human capital, 2 endogeneity of physical capital investment and the indirect effect of human capital (Barro, 1998).

Here we used another methodology to look at human capital and the roles of labor as educated or uneducated and by this way the value added variables of the economy, the investment growth of economy, skilled manpower of the industrial sector, unskilled manpower in the economy as well as the Industrial sector in prior the Revolution have faced a more growth, whereas the skilled manpower in the industrial sector has had a more growth rated after the Revolution (Gary and Nigel, 1986). The reason why, notwithstanding the population growth, the unskilled labor still has faced a lower growth rate is that, the manpower born after the Revolution is not yet entered in the labor market (Nili and Nafisi, 2006).

With regard to estimation of the examined models as well as comparison of growth rate of the variable in prior and after the Revolution it was observed that, in the case of agricultural sector all the three examined variables, that is: investment, skilled and unskilled labor have positive and significance meaning in this sector in the long term. In this connection the ratio of the value added elasticity to the unskilled labor variable is more than the other two variables. Therefore it can be concluded that, in the agricultural sector, should the peasants be provided with the necessary capital, they shall attain higher output. On the other hand the results gained from the examining of the variables growth indicated that, the labor in the agricultural sector has faced negative growth; In other words, those who work in this sector are mainly the peasants who are fond of their occupation (Chaichian, 2001;

Nili and Nafisi, 2006). It was observed also that, in the short term, the investment variable did not show any significance meaning affect on the value added in agricultural sector. Therefore, in order to encourage the peasants to invest in this sector, the long term loans have to be granted to them. In the industrial sector as well as in the economy all the three examined variables have got significance meaning but the unskilled labor variable in the both of the function has gained negative coefficient; in other words, in order that the labor acts as the factor for increasing an value added in the industrial sector and consequently in the economy, it has to go under necessary trainings (Nili and Nafisi, 2004; Salehi, 2005; Tayebi and Arbabian, 2003).

Comparison between the variables growth rates represent an increase in the industrial sector, though it does not imply significance meaning, but the value added in the economy as well as the agricultural sector shows a considerable decrease in this connection. In this regard, it can be stated that the value added in the agricultural sector in the post Revolution era has faced much fluctuations, so that, the its standard error of the value added during the post-Revolution era has been 21.5 against the figure of 7.5 of for the ante-Revolution time, though all those fluctuations may be attributed to climatic instability.

CONCLUSION

The results of this paper showed elasticities of economy value added with respect to investment, educated and uneducated labor force are 1.46, 0.059 and -2.32 percent respectively. Elasticities of industrial value added with respect to the above-mentioned variables are 0.268, 0.895 and -1.3, respectively, while elasticities of agricultural value added with respect to investment, educated and uneducated labor force are 0.321, 0.369 and 6.94, respectively shows the most important factor in this sector of economy is uneducated labor force. Comparing the average growth rate of variables pre- and post-revolution indicated growth rates of economy value added, the economy investment, industrial and agricultural educated labor force and the economy uneducated labor force are different significantly.

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