THE TOTAL FACTOR PRODUCTIVITY (TFP) OF THE TRADE SECTOR IN IRAN

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Abstract:

This article explores the important and effective components of the total factor productivity (Tfp) of the trade sector of Iran and estimates their effect in the recognized model by the annual data of the period of 1960-2004.

First, we have estimated the function of the producing sector of the commerce to calculate the total factor productivity (TFP). Then we have calculated the index of the total factor productivity (Tfp) on the basis of the part of the factors of the production in the section of the devebpment. And at last, we have explored the key and determining factors of the of the total factor productivity of the section in the model of the related model.

The results of this research show that the development of the capital stock per capita, the medium development the years of the education and the real exchange rate have the positive and meaningful effect on the total factor productivity, whereas the inflation rate has the negative and meaningful effect. It is important to say that the medium growth of the years of the education has the most positive effect on the total factor productivity (TFP) and the inflation rate has the most negative effect on the total factor productivity (TFp) of the section.

Key words: *the total factor productivity human capital, the inflation rate, the real exchange rate, the section of commerce, Iran.*

1. Introduction

The aim of this article is to explore the effective factors on the total factor productivity (TFP) of the commerce if Iran. In his study, the model of the total factor productivity in the commerce sector of Iran is explored on the basis of the theoretical fundamentals and the experimental evidences in the international and national level and also the examination and the analysis of the stylized facts of the commerce sector of Iran. About this subject, we emphasizes not only on the exploration of the effective factors on the total factor productivity abut also on the subject of the science and its role in the growth of the total factor productivity.

Today the section of the trading(1) as a producing and accelerating portion for the trend of the economical growth in every country, has the important role in the international economy by allocating the significant volume of the economical activities to it. By glancing at the different parts of the economy in the added value of the country in the last years, we see that the service section has allocated roughly half of the total added value of the country and the trade sector also has the significant part of the total added value of the country. This section mainly acts as the facilitator of the running of the transportation of the goods and the services from the producer to the user. So if the effective factors on the total factor productivity are explored and if it is policy make on the basis of these discoveries, the perspective of the section helps property the dynamism of the total economy, therefore the increasing the productivity of the trade part leads to the increasing the total productivity of the economy.

2. Main text

The development of the economy is made by two ways: the individual growth of the producing part and the development of the mixed effect of the factors of the total factor productivity (TFP). In the last years, the fulfillment of the continuing economical growth for the total factor productivity has been taken consideration.

In this direction, the exploration of the key factors of the growth productivity in the economy or the sub sections of the economy including the trade section has the economy including the trade section has the tremendous importance. The continual increase of the productivity while making the economical growth brings the other aims like the increasing the employment and decreasing the inflation. Searching and the studying on the data of the last years show that the situation of the productivity in the section of trade hasn't have the suitable trend in regard to the other parts, so knowing the effective factors in the total factor productivity seem necessary for policy – making to promote the productivity of the trade part.

It is important to say that in the trade of the country of Malaysia, the share of total factor productivity in ensuring the production growth has been roughly 13 percent between the period of 1971 and has been 25/5 percent in the 1990's and researchers has anticipated that this will be raised to 42/5 percent in the period of 2001 – 2015(2). Whereas the total factor productivity has been faced with the negative growth in the recent decades in the trade of Iran and including the trade part (3). In the length of this period, the medium annual growth of the total factor productivity has been – 16 percent.

The structure of the continuation of this article is as following. The second part allocates to the theoretical fundamentals and the experimental evidences of this subject and the third part allocates to the methodology of

the research. The forth part explains the emphasis of this model and its estimation and at last; the fifth part presents the adding up and the suggestions.

The theoretical fundamentals and the experimental evidences:

In the field of the development and the productivity, the tremendous studies concerning the productivity and the effective factors unit with the emphasis on the total factor productivity have been done that in this article, some of the most important studies are explored and analyzed yet we must soupy that although the analysis and the modeling to explore the factors of the total factor productivity in the literature of economy are the subjects that has the long precedence, most of the done studies in the relation with the total factor productivity have been related to the total area of the economy and the limited studies concerning the total factor productivity of the part of commerce have been done.

The total factor productivity calculates the tandem and effective usage of the factor of the production and also the degree of the participation of the growth of the technology in the development of the economy the total factor productivity in fact shows the usage of the effectiveness and the management of the resources materials and the production agencies in the production of the products (goods) and the services. The total factor productivity helps to making the product more from the area of strengthening the effectiveness resulting from the training the personnel , their skill, learning the management of the innovation, techniques and the modern technologies and the improvement of the organizational management.

Concerning to this matter that TFP (total factor productivity) is interpreted the remaining function of the production in the models of the developvnent, the resources of the total factor productivity are also affected by the structure of the function of the production and its theoretical fundamentals are also related to the theoretical fundamentals of the development and so in this section, first we examine shortly the theoretical fundamental of TF in relation with the production and the models of the development and in the continuation of this section, we consider the experimental studies in relation with this subject.

A- The theoretical fundamentals:

In the primary models of the development of Harod (1948) and Domar (1947), the rate of the population growth among the determining parameters, and other factor weren't important and these models were completed by solou (1965) and swan (1956) on the basis of the physical capital. As indicated before, the neoclassical models that were indicated firstly, totally attributed the economical growth to the accumulating of the physical capital and exogenous technological development and claimed that the slower the development of the population is and the higher level of technology and also higher the accumulations the human capital are, the higher the rate of the growth in the short term will be bout all of these patters admit that to attain to the growth of the constant and long term growth, we must add the technology development that develops with the exogenous rate, to this pattern, that then weak point of the exogenous models of the growth appears. Because although that the technology in the theory of the neoclassical growth is one of the central fractions of the models, for this phenomenon hasn't been modeled, and the technological development in the model enters as exogenously and with the constant rate.

In one or two past decades, the theories of the macro economy have been concentrated on changing in the theories of the endogenous development that along it, the total factor productivity is determined as endogenously and by the policies of the governments including the economical policies supervising the macro variables including the inflation, tax, etc.

Solou (1956) emphasizes in his model of the growth to the importance of the technology as one general goods in the improvement of the total factor productivity. Denison (1961) examined the accounting of the growth for America and noticed that the production factors of the simple labor and the physical capital cant explain the economical growth of this country alone and another factor or the missed loops must be that can Justify the economical growth and at last that missed loop was named as the human capital. Uzawa (1965) reformed the model of the neoclassical growth by adding the human capital. Although there is a different interpretation about the human capital in the aforesaid model, the human capital was crystallized in the labor and the only way to increasing the stock of the human capital was that the workers must be for from the production circle and allocated the free time to increasing their skills.

Arrow (1962) took the human capital as the storage of the knowledge that was hidden in the layout (like the technical or the scientific knowledge is available to the books). In this model, the storage of the knowledge increases by increasing the asset of the physical capital of the agencies Becker (1964) and lucas (1988) emphasize on the role of the human capital in the growth of the technology and divide the labor into two indices (labor on the basis of the labor hour or the simple labor and the human capital) and merit the role and the effect of the human capital on the development and the extension of the technology and at last the productivity. So the role of the government appears in making and improving the human capital more than before. Lucas (1993) examined this theory for the countries of the eastern – south of Asia and took that as a big miracle. As the model of Lucas, the function of the production has been considered as following:

$$y = F(K, \mu Nh)$$

(1)

That in it is a part of the time of the labor that allocates to the production. The function of the production of the human capital is as following linear form:

$$\dot{h} = \sigma(1-\mu)h$$

(2)

The linearity of this function means that the constant value of the worked time to study, insures the constant rate of the accumulation of the human capital If the yield of the future studies is diminishing (i.e. the coefficient of his smaller than 1), so in this form, the capitalizing will be stopped in the human capital, because the yield of the spent extra time in the study isn't enough to compensate the lost product. If C is the usage in the per capita, NC will be the total usage. Also if the function of the utility is defined as following:

$$U = \int_0^{\infty} \frac{N}{1-\sigma}[C^{1-\sigma} - 1]e^{-\rho t} dt$$

(3)

The value of Hall – Hamiltonians (with one constant population) is measurable as following:

$$H = \frac{N}{1-\sigma}[C^{1-\sigma} - 1] + \theta_1[F(k, \mu Nh)] + \theta_2 \sigma h(1-\mu)$$

(4)

The condition of the first order is extracted as the relationships of 5 – 8:

$$C^{-\sigma} = \theta_1$$

(5)

$$\dot{\theta}_1 = \rho\theta_1 - \theta_1 F_k$$

(6)

$$\dot{\theta}_2 = \rho\theta_2 - \theta_1 F_2 \mu N - \theta_2 \sigma(1-\mu)$$

(7)

$$\theta_1 F_2 Nh = \theta_2 \sigma h$$

(8)

$$K = F(k, \mu Nh) - Nc$$

(9)

$$\dot{h} = \sigma h(1-\mu)$$

(10)

On the basis of the relationship (8), $\frac{\dot{\theta}_1}{\theta_1} = -\sigma\frac{\dot{C}}{C}$, but by substitution of the equation (7) in(6), the relationship of $\frac{\dot{\theta}_2}{\theta_2} = \rho - \sigma$ yields. So there isn't $\theta_2 = 0$, i.e. there isnot the constant value for k, y, c or h. If there is one constant relationship, it is in the place of $\frac{\dot{\theta}_1}{\theta_1} = \frac{\dot{\theta}_2}{\theta_2}$, so $\frac{\dot{C}}{C} = \frac{\sigma - \rho}{\sigma}$. As long as σ > p, the usage of the per capita will develop in the constant rate in the long-term equilibrium. In fact, the production and the asset of the physical capital will develop in the rate of $\frac{\sigma - \rho}{\sigma}$. On the basis of the relationship (6), $F_k = \rho - \frac{\dot{\theta}_1}{\theta_1} = \sigma\rangle\rho$. So the rate of the capital yield is always more than the factor of the discount, and the person always incline to capitalize in the physical capital one way to interpret this result is that in this model, $\frac{\dot{K}}{K} = \frac{\dot{h}}{h}$ and the value of are always constant, and the proportion of the physical capital to the effective labor given in the production $\frac{K}{\mu Nh}$ is also constant. Therefore, because the effective labor in each period increases in relation with the linearity of the function of the production of the human capital, so the development of the asset of the physical asset lasts and the long-term of the development of per capita yields. Because the rate of the growth is dependent on 6 (the

determining parameter of the productivity of labor), the more effective the policy of the government in the field of the education is , more the rate of the development per capita increases in the long term.

Another key question is about the relationship between the real exchange rate and the productivity. The relationship between these two variables of the productivity as its primary form, taken as a exogenously in the productivity of the tradable sector by keeping the productivity of the non – tradable sector constantly causes to increase the real exchange rate . In this model, nothing said about the origin of the changes of the productivity.

Gradually, the relationship between the exchange rate and the productivity was expanded in the framework of the theories related to the total factor productivity in the form of the endogenous models of the growth. These theories in the models of AK, models of R & D or the models of the growth on the basis of the innovation, the theories of shoumpeter, and the changes of the technology with the high scale in the framework of the models of the development were analyzed. The exchange rate affects on the growth and the productivity by the different channels. One of the equipments relates to the effects for demand. Decreasing the exchange rate by increasing the exports and by decreasing the imports results to increasing the production and the growth of the economy, and its effect on the productivity by increasing the usage of the economical capacities with the constant agencies causes to increase the production and the trade

The physical capital in the neoclassical model has a much determining role in justifying the economical growth and is very important in justifying the resources of the development of TFP, because without the existence of the physical capital in this model, embodiment of the knowledge in the factor of the capital and the technological development will not have meaning. So that the human capital is taken as important resources of the growth of TFP thanks to expanding the function of the production by the skill of labor, the physical capital can be effective on TFP as one of the connecting bridges of the impact of the technological developments on the total factor productivity.

B – The experimental evidences:

In this section, firstly the studies done in the international level and then the studies done in Iran are considered and evaluated. Daniel landau (1983) in his study in the title of the government and the economical growth in the developing countries, introduces the most important resources of the total factor productivity as the technology and the efficiency in the optimized productivity, by the usage of the function of the production that in that level of the real production, one function of the asset of the labor is the asset of the human capital and the physical capital and the total factor productivity. The results of this study show that the expenditure of the government has the positive and the meaningful effect on the growth of GDP. So, because of the in – efficiency of this variable in the developing countries, the expenditure of the government can't have effect on the capitalizing in the education on the growth of the productivity and at last on the production.

Bean (1990) in one study in the title of the endogenous development and the periodic character of the productivity, attributes one part of the development, that isn't explained by the value of the physical factors of the production (remaining) to the factors like the growth of the technology and the human capital. The results of this study show that the human capital as one endogenous resource of the growth has a positive and meaningful effect on the development of the productivity and in effect on the economical growth of Britain in the period of 1855 – 1987. Also the temporary shock impulses bring the constant effects on the factors of the stimulus of the technology and lastly on the production.

Barow (1991) studies the important factors on the growth on the basis of the information and data of the 98 countries of the world in the period of 1960 – 85. Among the important variables, we can mention to the human capital and the conditions of the market place. In this framework and in the models of the growth, the important, key role of the human capital from the channel of the total factor productivity has effect on the economical growth. The important hypothesis of this study is that the countries with the higher asset of the human capital have the higher rate of the total factor productivity and in effect the faster growth. In these conditions, having more assets of the human capital is very effective in the change of the technology and the aforementioned countries could have leaded the technology in the world by this way.

Zoliu and khan (1996) in the study by the title of why is the economical growth of china such an accelerating?

Study the resources of the economical growth in china. That study shows that totally the participation of the factors of the physical capital and the human capital and the total factor productivity have had the determining role in the development of china. The human capital is among the effective factors on the total factor productivity, that plays role as the variables of the education, the extension of the hygiene and increasing the hope to the life.

Gora (1997) considers the effect of the different variables (including the asset of the human capital) on the growth. The results show that the extension of the human capital plays one important and sensitive role in the production. In this study, the effective factors on the private capitalizing and their effect on the growth are studied and analyzed by the aforementioned variable. Among the important variables considered, we can mention to the role of the real exchange rate and the percent of the change in the relationship of the exchange.

The results of this study show that the improvement in the power of the competition (i.e., the variable of the real exchange rate) has one positive and meaningful effect on the growth.

Also, the effect of the change in the relationship of the exchange is positive and meaningful on the growth of the economy of Cameron.

Hajy and Goura (1996) in one study by the title of "the study of the growth in the desert of African", study the role of the variables including the technical development, accumulation of the human capital, constancy of the macro economy, the rate of the inflation and the exchange rate by usage of the modified problem of the model of solow – swan, that directly or indirectly affect on the growth of the African countries.

The results of this study show that the variables of the constancy of the macro economy have the positive and meaningful effect on the growth by affecting on the capitalizing and the productivity, and the economical growth has one high correlation with the decreasing the rate of the inflation, decreasing the value of the national money, the extension of the human capital and the decreasing of the rate of the population growth. Also in the countries of the desert of Africa that the structural reform in them (like the improvement of the tax system) leads TFP increase the governmental incomes, has enabled the government to spend the high expense in the education and the hygiene that cause to expand the human capital, and in these courtiers , the effect of the variable of the human extension is positive and meaningful on the growth strands (1999) used the method of the modeling VAR in studding the relationship between the real exchange rate and the productivity, and unlike the model of bella balassa– Samuelson, recognized the relation of the causality from the side of the real exchange rate toward the productivity. Barrow (1991) takes the equality of the power of the buying (ppp) as one of the effective indexes on the productivity.

Coe, Helpman and Hoffmaister (1994) introduce the ways of the economical growth and the total factor productivity of the factors of the production in one study in the title of "the extension of the research and the extension corm the industrial countries to the developing countries." In this study, they emphasize on the role of three important effect of the asset of the capital of the research and the external extension (as the storage of the embodied knowledge in the trade composition) the degree of the opening of the economy and the human capital among the most important variables on the total factor productivity of the factors of the production in the seventy seven countries of the world. In these three factors, the variables including the changes of the exchange rate and the relationship of the exchange, the technological development, education have been hidden and these variables are among the important and effective factors affecting on the growth of the total economical yielding (total factor productivity). The results of this study show that the returns and the benefits are very high from the developing countries in the fields of the research and the extension and it is apparent that the relationship of the exchange and the technological development is very important. Moen and Raw (1999) introduce the technology, the relationship of the exchange and the change in the preferences as the most important resources in their study as the title of the resources of the growth of the productivity.

Miller and padyay (2000) have studied the effect of being opening, the orientation of the trade and the human capital on the total factor productivity, and the results show that the human capital has one positive effect on the productivity. Bitrous, panas (2001) has studied the effect of the total factor productivity on the industry of the factories of Greece.

And the results show that there is one negative relationship between the inflation and the total productivity.

Komeijani and shah Abadi (2002) show in their study in the title of "study of the effect of the internal and external activities of R&D (by the external trade on the total factor productivity that the recent theories of the economical growth customarily take the orientations of the innovations in the reaction to the economical motives as one major motor in the technological development and the growth of the productivity. Safavi (2006) concludes by the study between the growth and the productivity and the trade orientation that the external business variables (including the index of the export extension) have the meaning full effect on the total factor productivity of the factors of the production in the industrial sector. In this study, the used model of the side of the supply and demand of the sector of the industry and at the end that khalesi (2005) take the asset of the capital per capita, the degree of the being open the economy, the rate of the inflation, index of the research and the extension and the structural changes in the country as the effective factors on the total factor productivity in the period of 1960 – 2004. the asset of the capital per capita, the degree of being open of the economy and the index of the research and the extension have the positive effect on the productivity and the rate of the inflation and the structural changes have the negative effect on the growth of the productivity.

The review of the theoretical fundamentals and the experimental evidences show that the key and effective variables on the growth of the productivity are the human capital, the physical capital, the rate of the inflation, the real exchange rate this conclusion will be basis of the modeling and the estimation.

3. Methodology:

In the regard to this matter that the aim of the article is to explore and determine the value of the emphasis of the effective factors on the total factor productivity in the trade sector, In the first phase, we study the calculation of the growth of the TFP by the usage of the function of the production of cab – Doglass and in the second phase, our model that is consistent with the structure of the section, will be studied and analyzed.

One of the centers of the gravity of the new theories is the economical growth on the basis of the importance of the role of the knowledge and the learning in the development and the productivity. In this direction, co, Helpman, Hephmayster (1994) explain the general form of the function of the production of cab – Doglas by the assumption of the scale of the dynamic economy, the incomplete competition and the existence of the vertical and horizontal differentiation. This model is on the basis of the research and the extension that from the channel of the innovation, takes the growth of the productivity in addition to the physical agencies as the function of the storage of the knowledge and the variables dependent to the trade. The general form of this function is as following:

$$Y = AK^{\beta} L_Y^{\gamma} D^{1-\beta-\gamma}$$

(11)

And in the log form:

$$LogY = LogA + \beta LogK + \gamma LogL_Y + (1-\beta-\gamma)LogD$$

(12)

y is the production, A is the total productivity, LY is the labor that has been used directly to produce the end goods y , D is the index of CES from the middle agencies , K the factor of the capital, α, β, γ are the constant parameters that take the quantity between zero and one In the equilibrium:

$$D = n^{(\frac{1}{\in -1})} L_D$$

(13)

N is the numbers of the medium agencies availble, LD is the spent labor in production of the medium agencies, and $\in > 1$ is the elasticity of the substitution.

By substituting the equation (13) in the function of the production:

$$y = Ak^{\beta} L^{1-\beta} n^{\left[\frac{1-\beta-\gamma}{(\in -1)}\right]}$$

(14)

In the log form:

$$LogY = LogA + \beta LogK + (1-\beta)LogL + (\frac{1-\beta-\gamma}{\in -1})Logn$$

(15)

In the conditions that:

$L = L_y = L_D$

In this form:

$$LogTFP = LogA + \left[\frac{(1-\beta-\gamma)}{(\in -1)}\right]Logn$$

(16)

$$Y = AK^{\beta} L^{1-\beta}$$

(17)

That by linear zing it:

$$Log\,Y = LogA + \beta \log K + (1-\beta)\log L$$

(18)

So will have:

$$dLogY = dLogA + \beta dLogK + (1-\beta)dLogL$$

(19)

The total factor productivity (TFP) equals to that same of the residual factor of the Solow that is consistent with the index of Kendrick's TFP and so

$$TFP = \frac{Y_t}{Q_t}$$

(20)

Now, if we take the log of the equal sides and if we differentiate in proportion to the time:

$$\frac{d\ln TFP}{dt} = \frac{d\ln Y_t}{dt} - \frac{d\ln Q_t}{dt}$$

(21)

SO:

$$\frac{d\ln Q_t}{dt} = \alpha\frac{d\ln L_t}{dt} + (1-\alpha)\frac{d\ln K_t}{dt}$$

(22)

By substitution the relationship (22) in (21), the following equation yields:

$$\frac{d\ln TFP}{dt} = \frac{d\ln Y_t}{dt} - \alpha\frac{d\ln L_t}{dt} - (1-\alpha)\frac{d\ln K_t}{dt}$$

(23)

To calculate the TFP, It is necessary to estimate the coefficients; this requires estimating the function of the production. For it, the function of the production is defined as the labor per capita as in the following form

$$\frac{Y}{L} = A(\frac{K}{L})^{\beta}$$

(24)

4. The exploration and the estimation of the model:

In the regard to the subject of this article the factors affecting on the total factor productivity in the commerce sector of the country include the human capital, the physical capital, the rate of the inflation, and the real exchange rate. In the regard to this matter that the economy of the country has been confronted with the different economical, political, military and social impulses, so the effects of these impulses have been analyzed in this model as the dummy (false) variables.

The medium of the years of the education has been chosen as one index of the human capital in the trade sector that has been taken as one index to calculate the value of accumulation of the human capital. To calculate the human capital, the formula of Brow and Li (1997) has been used and the incumbent workers have been taken as annually in the society in this calculation. In the regard to this matter that there aren't the statistics of the rate of the registration in the school or the separating educational costs for the trade sector, only the medium years of the education of the workers have been calculated in the trade sector and used in this model.

The calculation of the necessary statistics for the human capital has been done in two phases: In the first phase, the statistics of the census and house in the years of 1967, 1977, 1987, 1997 has been used by the usage of the medium of the geometrical growth and the statistics of the years among the has been internalized on the basis of the different grades of the education. In the second phase, the medium years of the education of the workers have been calculated in the trade sector. On this basis, the medium of the years of the education of the workers on the sector provides the improvement and the increasing of the productivity of the factors of the production and at last, the factor has one positive effect on the total factor productivity.

The growth of the asset of the physical capital of per capita of the labor in the trade sector has been defined as the index of the physical capital of the sector. This variable affects on the total factor productivity in the trade sector by affecting on the scale of the production in the commerce activities by increasing the asset of the capital.

Increasing the rate of the inflation in the trade sector decreases the yield of the production by diverting in the allocation of the resources, and has the negative affect on the growth of the productivity of the sector. By dividing the added value of the trade sector to the current price to the added value of the trade sector to the constant price, the index of the implicit price and in effect the rate of the inflation of the sector have been calculated. Because in the period of the past decades , the rate of the inflation has been bi – digits and accompanied with the high fluctuations, the evaluation of its effect on the total factor productivity (from this perspective) is very important(5), and at last in the regard to the near and close relationship of the activities of the trade sector with the fluctuations of the rate of the inflation, especially external trade , this variable has been evaluated as one other effective variable on the total factor productivity in the framework of the theoretical fundamentals as the experimental form. So, the model of the total factor productivity is explained as the following relationship:

$$TFP_g = f(k_g, P_g, H_g, RER)$$

(25)

TFPg is the total factor productivity, kg is the growth of the proportion (K/L) in the trade sector, Pg is the growth of the index of the implicit of the trade sector, Hg is the growth of the medium of the years of the education in the trade sector and RER is the real exchange rate.

The statistical data have been extracted from the formal references of the countries.

The source of the data of the added value of the trade sector , the index of the implicit price and the rate of the exchange have been extracted from the statistics of the central bank of the Islamic republic of Iran. The medium of the years of the education in the sector has been internalized on the basis of the statistics of the census and the house, and the statistics of the time series of the asset of the capital, and the employment in the sector have been taken from the statistics of the organization of the management and the programming (office of the macro economy).

In the regard to this matter that for the experimental test of the model, we use the date of the time series, so first the variables of the model must be tested from the perspective of the reliability. To this aim, the test of the united root for the all of the variables in the level by the test of prown (1989) has been done. The results of the test of the united root of the variables show that the all of the variables except the real exchange rate have one united root and so these variables in the level are unreliable, but the first difference of the reliable (Table 1).

Table 1: The results of the test of the united root of prown (1989)

The name of the variable	The result of the test	The name of the variable	The result of the test
Y	I(1)	Yg	I(0)
K	I(1)	Kg	I(0)
P	I(1)	Pg	I(0)
H	I(1)	Hg	I(0)
RER	I(0)		

In the first phase, in the regard to existence of the differentiation on the condition of the incomplete competence, and also that the differentiation in the activities of the trade sector is of vertical king, the function of the production per capita has been estimated in the model of the function of the production of cab – Doglas and by the method of the estimation of Philips and Hensen as followings:

$$y = 1.84 + 0.36\,k$$

(۴/۵۱) (۳/۴۹)

(26)

Y, k are the added value per capita and the asset of the capital per capita of the trade sector in the constant prices of the year 1998 respectively and the numbers inside the parentheses are sub – coefficient estimated of the values of t. So, on the basis of the results of the estimations, the share of the labor and the asset of the capital in the production of the trade sector are 0/64 and 0/36 respectively. Nevertheless, on the basis of these results, index of the total factor productivity is measurable. In the second phase, the model of the growth of the productivity in the trade sector that has been explored before is estimated. In the regard to this that all of the variables of the model of the total factor productivity are reliable, the method of estimation OLS has been used:

$n = 44$ $\quad \overline{R}^2 = 0.575$ $\quad s = 0.0522$

$\chi^2_{SC}(1) = 1.19\,[0.27]$ $\quad \chi^2_{FF}(1) = 1.45\,[0.23]$

$\chi^2_{N}(2) = 5.97\,[0.051]$ $\quad \chi^2_{ARCH}(1) = 0.68\,[0.41]$

(۳)

$$TFP_g = -0.76 + 0.24k_g - 0.26P_g + 0.43H_g + 0.09RER + 0.06D_{48-62} -$$

(-۲/۴۴) (۲/۱۱) (-۲/۲۵) (۲/۱۸) (۲/۳۳) (۲/۱۲)

$$0.18TB_{52} + 0.26TB_{62}$$

(-۲/۳۳) (۴/۲۰)

The results of the estimation of the model K are as following

Is the number of the observations usable in the model, R-2 is the modified coefficient of the determination. S is the standard error of the regression, x2sc is the statistic for self correlation of the remaining J

sentence, X^2_{FF} is the statistic RESET for the test of the error of the recognition of the form of the function, x^2_N is the statistic of the test to being normal and x^2_{ARCH} is the statistic of the K test of the variance of the incompatibility of the false variable. D48-62 is the false variable that takes the quantity of 1 for the domain of the years indicated in the index, it takes the quantity of zero (0) for the other years. TB52 and TB62 have been defined for the outlier observations that take the quantity of one for the indicated years in the index and take the quantity of zero for the other years. These two variables have been added to the model to destroy the effect of the observations of the outlier on the basis of the remaining results of the estimated model. The numbers inside the parentheses are the values of t.

The results of the model show that all of the estimated coefficients are meaningful in the standard level of 5 from the perspective of the statistics, and also, their sign is consistent with the theoretical fundamentals.

It is important to say that the results of the model prove that the model of the problem of the self – correlation is not continuous and from the perspective of the subordinate frame of the model, the normality and the variance of the non – compatibility haven't any problem.

The results of the estimations prove that the growth of the asset of the capital, the growth of the human capital and the real exchange rate, total factor productivity have the meaningful effect. The role of the human capital is more important. Than two other variables. In this condition, the growth of the index of the implicit price of the trade sector (as the index of the inflation of the sector) has the negative effect on the total factor productivity.

5. Conclusion

The results and K the suggestions:

The findings of this research show that although the growth of the asset of the capital, the growth of the human capital and the real exchange rate have the positive and meaningful effect on the total factor productivity in the trade sector, the rate of the inflation has the negative and meaningful effect on the growth of the trade sector On the basis of the results of this study, the variables of the human capital and the rate of the inflation have and the most effect on the TFP in the trade sector.

In the regard to this matter that increasing the growth of the TFP of the trade sector leads to making the potential of the effective competition and to increase the effectiveness in the productivity of the factors of the production and the possibilities of the trade sector, so by referring to the findings of this research, the components effective on improving the quality of the human resource must be strengthened. This aim will be reinforced by continuing the policies of improving the potential of the education and the extension of the capitalizing in the education of the labor of the trade sector. Therefore, it is necessary to design the meaningful educational programs that are consistent with the practical, professional and educational needs and it must be performed. To increase the total factor productivity, the attraction of the human capital and the educated persons (especially the educated persons of the university) must be considered. Simultaneously. It is necessary to explore the researching needs of the trade sector in the radical, extensive and practical dimensions and must be performed by allocation of the distinct and clear budget and in the model of the short – term, medium – term and the long – term projects and in the frame works of the study programs. And by this method, the context of using the research findings will be provided by the human capital of workers and the effectiveness of the trade sector will be improved.

To help to the growth of the TFP in the trade sector, it is necessary to explore the channels of the production of the inflation in the sector and the growth of the general level of the prices in the national lever and then in the sector must be prevented. The inflation of the numbers of the agents between the production and the usage (including the wholesalers and the retailers) are among the factor that in the recent years has worked in the way of the growth of the general level of the prices in the trade sector of the country and it hasn't grown in consistent with the value of the economical need of the country in the national level and also in the regional level. The increase of the exchange rate and performing the expansive monetary policies that mainly result from performing the expansive financial policy, among the other factors that affect on the rate of the inflation. There fore government must pay attention to decrease the rate of the inflation for increasing the total factor productivity and must compile the effective package of the policy – making to attain the constant and low rate of the inflation and must withhold to adopt the contradictory policies that bring the inflation and consider the real exchange rate in the policy of the exchange rate by the aim of increasing the total factor productivity.

6. Footnotes:

1. The trade sector on the basis of the third edition of the classification ISIC includes the economical activities of the wholesaling, retailing, and the repair of the vehicles, and the private goods, goods of the homes, hotel, and restaurants.

2. ILO (2002)

3. For more in formation, refer to the economical report and supervision on the third program of the extension (2004).

4. If the agencies be in the horizontal form, i.e. the accumulating activities R&D cause the new agency, in this mode, D is the function with the constant substitution attraction (CES), symmetrical and with the substitution attraction higher than the unit $D = \left[\int_0^n x(j)\,dj\right]^{\frac{1}{a}}$, $0 < a < 1$, So if the agencies are differential and vertical form, the activities of R & D cause to improve the quality of the agency, i.e. the agencies are different from each other because of the quality. In this mode, D is considered as the form function of cab – Doglas and for the simplification, n = 1 is chosen.

5. It is important to say that the rate of the inflation was one – digit in the years before the first, oil impulse in the years of 1975, but its annual medium value in the period of 1961 – 1975 equals to 4/5 percent. This value is high in comparison to the rate of the inflation needed to the economical growth and increasing the productivity. The number is considered as experimental in the developed country in the domain of 1/5 – 2 percent.

6- The variable has been defined in the level on the basis of the logarithm.

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