© 2014, World of Researches Publication

Academic Journal of Accounting and Economics Researches
www.worldofresearches.com

Ac. J. Acco. Eco. Res.
Vol. 3, Issue 3, 134-148, 2014
ISSN: 2333-0783

The Impact of R and D on Economic Growth in Developed and Emerging Countries

Naser Ali Yadolah Zadeh Tabari[1], Ali Nabavi Chashmi[1] and Davood Atri Negharchi*[2]

1. Ph.D, Azad University of Babol
2. Researcher in Monetary and Student Azad University of Babol

*Corresponding Author: davood_atri@yahoo.com

Abstract: Nowadays, research and development expenses have a great of importance in the development and advancement process of different communities. The only way of survival for any organization is spending to permanent research and development, so investment in research and development is a key to economic growth for each country. This study attempts to examine the impact of research and development on economic growth in developed and emerging countries related to 50 countries that divided by Human Development Indicator by using of panel data during the years 2004 to 2010. According to The results of this study, there is a positive correlation and significant between research and development and economic growth. On the other hand Investment in research and development to maintain and improve the economic conditions, market share and competitive advantage in organizations that represent the position of the organization. Therefore, the requirement for entry into any country in the developed world markets and industries, scientific research is driven placement.

Keywords: R&D Investment; Panel Data; Human Development Indicator

INTRODUCTION

Economic development needs investment accumulation. Investment market as one of the bases of financial market have a great role in collecting financial and investment possibilities in order to economic development and growth and now in many countries of universe is responsible for required credits financial providence of economic institutes [1]. Quantitative change of any variable is called growth in certain period of time. Growth, long term increase of production capacity is in order to increase total supply for providing needs of population [2]. In reality, economic growth of any country shows continuous growth of production which is associated with population increase or infrastructure changes. Surely, it should be mentioned economical system will improve with economic growth of all economical sections for more productions [3]. Research and development of any continuous and creative activity is for increasing knowledge level related to human being, culture, society and using this knowledge for new applications [4]. The importance of research and development is so great that the countries will be divided into developed or non- developed based on measurement of research budgets from national gross income [5]. The expenses of research and

development will increase profits of institution in addition to driving economic development and growth of society. This research will analyze the impact of research and development in rate of economic growth of developed and merged courtiers in order to review the following premises. To do this, in first part, in theoretical bases section, expenses of research and development and economic growth, Growth evaluation measures of societies economic growth and development, production function of Lucas model and index of human power development will be represented briefly. Then, in third part of studies, influence of research and development on economic growth will be considered. In continuous, research method, statistical society and selected models and review of variables will be reviewed in fourth part and in part five, pattern estimation method, data panel regression, F and Human test, test of capability of mixing datum and analyses of results are represented in part six and seven respectively. Finally, in last part, the conclusion is represented.

Theoretical bases and background of research:

1. Expenses of research and economic growth and development:

Research and development is main bases of innovation and technical changes in production process and therefore has great role in increasing production capacity of society or economic growth. For showing this role, a non-linear model of production function is used which is based on theoretical shape of Cobb- Douglas function

$$Y = f(L,K,R) \quad (1)$$

$$Y = aL^{\beta L} K^{BK} R^{Br} \quad (2)$$

In this equation, y , L, K and R, represent total real production, labor force, datum related to investment accumulation and expenses of research and development to the meaning of capital saving or technical knowledge respectively. Now, if we differentiate two parts of the equation, we will have equation No.3 which shows effective factors on economical growth.

$$\mathring{y} = \boldsymbol{\beta_L} + \boldsymbol{\alpha_k}\left(\frac{\boldsymbol{dk}}{\boldsymbol{y}}\right) + \boldsymbol{\alpha_R}\left(\frac{\boldsymbol{dR}}{\boldsymbol{y}}\right) \quad (3)$$

In this equation, $\mathring{y}$ and $\mathring{L}$ shows rate of economical growth and rate of labor force as $\frac{dy}{y}$ and $\frac{dL}{L}$ respectively. (Ik) dk shows amount of total investment and (dR) IR shows expenses of research and Development which is a evaluation for measuring changes in saving knowledge of society. B_L shows production tension against labor power (FL.L/y), a_k and $a_{R\ are}$ called investment final production and final production of research and development expenses which are also considered as rate of real efficiency of capital accumulation and technical knowledge. By adding fixed component and also disorder in equation No. 3, appropriate equation for estimation and measurement the influence of expenses of research and development on economic growth will be acquired which is as equation No.4.

$$\boldsymbol{y} = \boldsymbol{A} + \boldsymbol{\beta_L i} + \boldsymbol{\alpha}\left(\frac{\boldsymbol{IK}}{\boldsymbol{y}}\right) + \boldsymbol{\alpha_R}\left(\frac{\boldsymbol{IR}}{\boldsymbol{y}}\right) + \boldsymbol{U} \quad (4)$$

In this equation, expenses of research and development are introduced as percentage of internal gross production or real production of economics.

2. Societies economic development and growth measurement standards

Society's development measurement standards is production level or per capita expenses. But because the economic development includes qualitative aspects, for evaluation of development level of societies and its comparison, combined index are used. For example, hope to life in birth time, amount of educated population, per capita foreign business and etc. can be mentioned.

For comparison of condition of different societies with each other, per capita income of different countries should be calculated based on the same currency. Per capita incomes of all countries are announced based on dollar of America. The importance of economic growth rate indicates the method and duration of economic growth. Among the indexes of economic growth, rate of per capita production growth is of great importance, because this rate will determine the amount of per capita income of a country in future. Based on the fact that changes of per capita income to changes of time shows the growth of per capita income , therefore line gradient of YAN and YBF in figure 3 indicates rate of per capita income growth of two considered country of A and B.

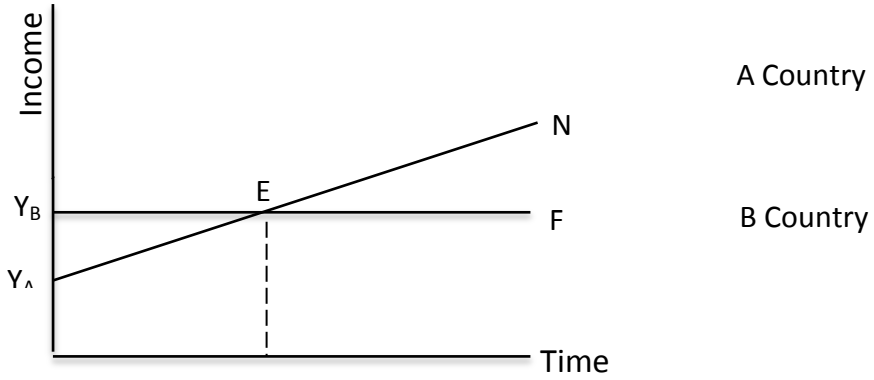

Figure 3. Per capita income figure for country A and B [6]

Per capita income/ time = Per capita income growth rate

The other important point is that the possibility of high growth for a country which is in primary stages of development is more than the next stages. This principle is also correct in comparison of two developed and developing countries. Because the countries which do not use their production factors can access to rate of growth better than the developed countries which use their production factors near to complete occupation [6].

3. Lucas model production function:

Today, many economists believe that lack of investment in human being invests are the most important factor for low level of economic growth level in developed countries and if these countries do not improve professional skills level by knowledge, the efficiency of labor power and investment will remain in low level and economic growth will be done slowly and with higher expenses. In reality, it can be said that physical invests will be increased when the country has necessary amount of human being invests. Human being invests includes trainings, specialties, skills and quality of labor power. Lucas reviews models related to Solow, Arrow etc. and acquired a relationship between total production, Solow growth model and ideas in which level of human being invests are influential in production. Based on the fact that physical invest and human being invest are accumulated, therefore economic growth will depend on accumulation of physical invest and capital and human being skills accumulation. Lucas inside growth model will make differences between human being invest and physical invest directly. Total frame in this model is like previous works in which human being and physical invest are produced as input function. Also it is considered that physical and human being invest are produced based on different technologies. In this model, focus is on training human being force which weak descending input limitation of invest and as a result, in absence of extrinsic technology, long term per capita growth will not be zero. Lucas believes that we can consider the fixed efficiency in comparison with scale about accumulated input. He profits from human being invest instead of physical number of human being in production function. Unlike the extrinsic exploitation growth, human being invest can be accumulated through investment. It means that people will choose the duration of education. Therefore in this model it is considered that human being invest is an accumulated input with fixed output in comparison with scale. Therefore it final production will be fixed. Production function of Lucas model is as follows*:*

$$Y = AK^{\beta} H^{1-\beta} \qquad 0<\beta<1 \qquad (5)$$

In which Y shows national products or national income, K shows physical invest and H also shows trained

Human being force. If part of non- leisure time of people which are applied for work on producing Y is considered u and the average of quality of labor force is considered h and number of people are represented by L, then function of assumed production will be as follows:

$$Y = AK^{\beta} (uhL)^{1-\beta} \qquad (6)$$

uhL is often called human being invest. Above production function has fixed output against physical and human being invests. Because the motivation for studying and education does not decrease within time , production function will be sufficient for inside growth. Now, if $h_{a,}$ is considered as work labor human being invest average, then the production function will be equal to:

$$Y = AK^{\beta} (uhL)^{1-\beta} h_{\alpha}{}^{\Psi} \longrightarrow Y = AK^{\beta} (uh)^{1-\beta} h_{\alpha}{}^{\Psi} \qquad (7)$$

h_α^{Ψ} represents outside effects through average human being invest. The outside factor increase uniformity level of production function as of (2-B) to (+Ψ-B2) >1. If it is consumed that people choose a usage currency and an appropriate function based on the following limitations:

$k^0 = AK^{\beta}(uh)^{1-\beta} h_\alpha^{\Psi} - c - (б$ (8)

$h^0 = \varphi h (1 - u)$ (9)

Now, using active optimization, rate of invest per capita growth (or use) and rate of human being invest growth in constant status will be:

$$\gamma_h = \frac{(\varphi - p - \sigma)(1-\beta)}{\theta(1+\Psi-\beta)-\Psi} \quad (10)$$

$$\gamma = \frac{(\varphi - p - \sigma)(1+\Psi-\beta)}{\theta(1+\Psi-\beta)-\Psi} \quad (11)$$

If Ψ=0 which means we have no external effects, we will have:

$\gamma_c = \gamma_k = \gamma_h = \gamma = \theta^{-1}(\varphi - p - \sigma)$ (12)

Growth rate in above equation is equivalent into rate of growth in AK model. The only difference is in A and φ. In AK model, the rate of A invest output leads into long term improvement and growth, whereas model of human being invest accumulation, φ or parameter of knowledge exploitation, has caused such a growth. Also it is obvious that in absence of external technical improvement, rate of long term growth will be explained by human being invest accumulation parameter [6].

4. Human Development Indicator

After 1990, a report from human development has been published by United Nations Development Program annually. In the annual reports, by using detailed indicators such as hygienic, training, economic, political, social, environmental indicators, the status of countries and different areas are compared with each other. As it is mentioned in the first report of human development in 1990: people, who means men and women will establish real wealth of any nations. The goal of development is creating a condition in which people will have long, healthy and constructive life. For calculating , numerical value of human development indicator, each country has 3 components which are as follows: power of having long and health life, power of acquiring knowledge and power of access to resources and necessary facilities for having an appropriate life level and a special formula has been used in this regard. Hope indicator for life, rates of literariness and percentage of registration in different academic levels, and income of changed per capita to purchase power parity are used for first, second and third components respectively. The most and the least indicator of human force development is between zero and one. The countries with development indicator equal to 0.8 or more are considered as " high human development ", countries with development indicator equal to 0.5 to 0.8 are

considered as " average human development " and countries with development indicator less that 0.5 are considered "low human development"[7]. In report of "United Nations Organization Development Program "in 1990, it is said that Besides human development indicator which its greatness shows success of a country, we can also refer to deprivation index which its greatness shows lacks and distance from acquiring success. In establishing this indicator, the following relations are used [7].

$$PI_{Y_J} = \frac{Max\ Y - Y_J}{Max\ Y - Min_Y} \quad (13)$$

$$DI_{e_J} = \frac{Max\ e - e_J}{Max\ e - Min\ e} \quad (14)$$

$$DI_{L_J} = \frac{Max\ L - L_J}{Max\ L - Min\ L} \quad (15)$$

In these equations, YJ is state per capita income J, eJ is expectation of life in country J and LJ is level of literariness in country J. Finally, for calculation DI related to one country, these three detailed index will be multiplied and divided to 3.

$$DI_J = 1/3(PL_{YJ} + PL_{eJ} + DI_{LJ}) \quad (16)$$

Deprivation indicator of a country (DIJ) can also be acquired in the other way:

$$DI = 1 - HDI \quad (17)$$

Deprivation indicator of a country= 1- human development indicator of that country

Research background

Kwack and Lee [8] have analyzed the experience of Korea growth from neoclassic growth aspect. Annual datum of Koreas has been used between 1971-2002 in order to test qualitative importance of main determiners of growth. Rate of research and development invest, training, academic years, financial policies of making free, size of government and age structure of all this human training and specification of invest shows meaningful influence on growth.

Yule Kio represents relation between intensity of research and development, rate of inventions and rate of production growth on 4 productive part for 17 country of OECD. The result shows that the accumulation of knowledge increase main factor of inventions in chemical materials, electronic and electronics and medicine and medical services department.

Grosman compares positive and normative applications of two replaced measurement for growth increase based on research and development in his article: financial aids of research and development to institutions and general training with goal of scientific and engineering skills development.

Wang [9] has reviewed investment determiners in research and development activities in national level for 26 countries which are member of OPEC by

emphasize on role of supporting right of invention registration, economic growth, and human investment accumulation and number of scientific scholars.

The result of research shows that academic education and ratio of scientific scholars have determining and meaningful role on intensity of research, development and outside technology transfer from business and FDI channel.

Based on research under the title of financial market development and efficiency of investing of research and development based on documents from developed countries, Reza Chowdhury and Min Maung [10] found that financial business development helps to efficiency of research and development investment by sum of square , review of changeable regression of materials and panel regression.

Ali Dehghani et al.[5] has reviewed efficiency of expenses of research and development. They approved that estimation of economical evaluation models in the method of panel data in 133, 4 figure code from Iran industry between 1994-2001, shows influence of expenses of research and development on profitability.

By method of general squares, Rabiee [6] reviewed role of research and development on economic development and in this study, the importance of research and development on growth of value added through inside growth models are explained and besides review of Romer inside growth model, a mathematical model is made for Iran economic growth. The results show positive influence of research and development on economic growth of country.

In research under the title of to review determining factors of research and development intensity on selected countries which are developed and are developing between 1995-2006 has been done by Shahabadi and Heidari [11]by applying data panel method. The results of studies shows that intellectual property right variable has positive and meaningful role on intensity of research and development and variables of economical openness and demand pressure are not meaningful from statistical view.

MATEREALS AND METHOD

1. Research methodology

In order to review influence of variables on economic growth, it has been tried to analyze the information related to advanced countries between 2004-2010. Based on this fact, required information are collected and processed from international sites such as United Nations, International Money Fund and World Bank. It should be mentioned that based on research goals, the type of research has been considered in applied research area.

This model is an economical analyze from relation between per capita variance of internal gross production, expenses of government and etc. on economic growth of developing countries. For estimation of regression of useful and applicable regression in used model, panel data are used.

2. Selected model

In order to review annual operation of 50 countries which is based on human power development indicator of United Nations between 2004-2010, the following model is used [10]:

(18)

$$GROWTH_{it} = \beta_0 + \beta_1 . RD_{it} + \beta_2 . (RD_{it} \times ADVANCED_{it}) + \beta_3 . (RD_{it} \times SMCAP) + \beta_4 . ADVANCED_{it} + \beta_5 . FINANCIAL\ DEVELOPMENT\ INDICATOR_{it} + \beta_6 . OPEN_{it-1} + \beta_7 . GOVT_{it-1} + \beta_8 . CAPITAL_{it} + \beta_9 . PCGDP_{it} + \sum_{t=1}^{9} \delta_t YD_t + \varepsilon_{it}$$

Independent and dependant variables of research model are as follows:

Research and development expenses: is considered as percentage of internal gross production. Commercial openness: total ratio of export and import to internal gross production is used. Governmental expenses: ratio of government expenses to internal gross production is considered. Intensity of physical investment: in mentioned models, ratio of total investment to internal gross production is used. Internal gross production per capita (based on dollar of America)

Developing variable has been determined form developing courtiers for distinguishing developed countries. With this definition, the sample countries which their development variance is equal to 1 belongs to advanced economy and the countries which their development is equal to 0 belongs to developed economies. Financial development indicator: in order to review influence of financial development in efficiency of research and development, the common indicator of stock market investment is used in order to evaluate credit business activities and share and economic growth in this model is a dependent model. Ratio of investment of stock market to internal gross production, value of mentioned internal share in internal exchanges in one year is considered as deduction in economy which is achieved from ratio measure of stock market of inside the economy.

Pattern evaluation method- data panel regression

In basic economic evaluation, we want to explain the changes of a variance(Y) based on some variance (Xs) and believe that it will change Y. It will be done based on a function:

$$Y_i = f(x_{ki}); \quad k=1,2,\ldots,K; \quad i=1,2,\ldots,N \qquad (19)$$

K shows number of illustrative variance. for starting , the figure of this function is considered linear.

$$Y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \ldots + \beta_k x_{ki} + \varepsilon_i \qquad (20)$$

i shows number of observation from each variance. The number of observation can be based on the time. In this case, we will have Xkt and yt and any variable will be measured in year, season , month and etc and we will have:

$$T = 1, 2,\ldots, T \qquad (21)$$

In other words, yt and Xkt is time series. It means that a single variance which its values are produced in considered time intervals based on determined mechanism. In other condition in certain time such as 2001, a variance can be measured in statistical society. In this case, income will change between people not during time. In this case one level of society will be survived in certain time and in technical language , it is called cross- Section or Section. Model (19) is the simplest model in regression analysis based on cross section or sections. By applying regression classis assumption, the mentioned model will be estimated for finding B or function coefficient .by rejecting classic assumption, we will face with problems such as serial correlation of εt, in time series variance and Hetoroskedasticity in cross section models.

Statistical tests about coefficient, regression, R2 statistics, regression F and etc to number of observation depends on T about series time and N about cross section data and number of parameters (B).we often face with a general problem in these models. Illustrative variance (X) are in the same linear which leads into not correct answer of B and inference will be faced with problem. Therefore, answer to many economical questions and test of some assumption in time series model will be face with problem in section and sometimes is impossible. In Data Panel model, the variance are measured among section of statistical society and during time. For example, income of people in society such as different labor force can be measured in time interval as of 1991 to 2005. It means that a special doctor or engineer will be surveyed in time interval. In case of death or immigration, following statistical particulars in interval is not possible. Therefore, some observations will be lost and you have to omit a record completely or your panel will be unbalanced. Therefore you deal with two dimension: time and section dimension which are also called group- time data. It is obvious that the number of your observation from a variance such as income, has been multiplied. It means that from N or T in time series data or section data will be increased into N×T in data of panel. Income in society is measured and variance of width will provide many information for test of economical assumption. In interval, the same variance is measured and its variance in time can provide useful information from dynamics of income in time for testing economical assumption with other nature and possibility of income dynamic modeling will be create based on what is defined in literature of time series. Then you will observe that these dynamics in the form of a model with distributed lag will let different effects of illustrative variance within time reflect from origin of regression of data panel and many questions about initial value, panel data dynamic modeling and time dynamic effects will be defined and inferences will be gained with more confidence [12].

1. F test

What is defined in panel models in general is that there are n separate decision unit which are numbered with index of I from 1 to n and also there is t

continuous time series and totally we will have N=nt observation. If panel linear regression are as follows:

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k \quad (22)$$

we will have varience :
Yit: dependence varience value for unit i in t
Xjit: illustrative varience value of j for unit i in t
i = 1,2,3,…,n (23)

t = 1,2,3,…,t (24)
j = 1,2,3,…,k (25)

in this regression of general machinery, parameters of all units are defined in all times. Differences between section in ai is shown and will be assumed fixed during time. If we assume that ai is fixed for all the countries, effective estimation of OLS method from α and β will be acquired. But if we assume that there is a difference between different sections, integration data method will be applied for measurement. For determining existence of separate intercept from any country, F statistic will be used as follows. Zero assumption defines that α_i is fixed for all the countries:

$H_0 : \alpha_0 = \alpha_1 = \ldots = \alpha_n = \alpha$ (26)
$H_1 : \alpha_i \neq \alpha_j$ (27)
$$F(n-1,\ nt-n-k) = \frac{(R^2_{FIX} - R^2_{POOL})/(n-1)}{(1-R^2_{FIX})/(nt-n-k)} \quad (28)$$

K is number of considered descriptive variance in model, n is number of countries and nt is number of total numbers and (t is considered time period). If calculated f is greater than F of table with free grade of (n-1) and (nt-n-k), therefore the assumption of zero will be rejected and therefore constrained regression will not be valid and different intercepts in estimation will be considered [12].

2. Husman test: selection between fixed or random effects

Ashrafzadeh, Mehregan and Baltagi define that there are two important assumptions about effects of section in models of panel.

1.in model of accidental effect, the effect of sections will not be associated with illustrative variance.

2. in model of fixed effect, the effect of section and countries will be associated with illustrative variance.

Husman correction test will be used in order to determining method of fixed or accidental effect for evaluation of models. Assumption of zero in Husman test is that there is no relation between component of distribution related to

intercepts and illustrative variance and they are separate from each other." In other words, when the assumption of zero is rejected and the opposite assumption is accepted, methods of fixed effects are compatible and method of accidental effect is incompatible. Husman test statistics includes K2 distribution and in case that it is lower than 0.05, model of fixed effect will be accepted in confidence of 95% level [12].

RESULTS

Data integration capability test (by Chav test)

When we deal with panel data, this question will be raised that "can these data be integrated or not?" zero assumption of this test indicates using combinatory regression method and in this case, there is no need to use panel analysis.

Table 1. Result of data integration capability test

Chav Test	
Test statistics	2.353810
Probability (Test statistics)	0.0000

Table 2. Husman test result

Husman Test	
Probability (Test statistics)	0.0000

As it has been observed in table 1, test statistics probability is equal to 0.0000 which is lower than a=0.05 meaningful level. Therefore, zero assumption of this test will be rejected. Therefore, data do not capability to be merged and instead of merged data, panel data will be used. Based on the fact that, data merging capability test, has confirmed existence of regression model of panel data, among two method of panel data estimation which means fixed or accidental effect, one should be chosen. To do this, Husman test is used. Zero assumption of Husman test indicates that using the model of effects is accidental. As it is observed in table No.2, probability of Husman test statistics is equal to 0.0000 like table number 1 which is lower than a=0.05 meaningful level. Therefore, zero assumption of this test will be rejected. Therefore, coefficient of model will be estimated based on fixed effects.

DISCUSSION

In order to linear review and meaningfulness of regression model, F test has been used. Zero assumption of F Test , does not indicate meaningfulness and linear of regression model. As it has been observed in table No.3, statistical probability of F is zero which is lower than a=0.05 meaningful level. As a result, zero assumption of F test, will be rejected. Therefore, the model is meaningful and there is a linear relation between independence and dependence variables. In order to review meaningfulness of coefficient, probability of that coefficient is

used. When we have a≤0.05, it means that there is a meaningful relation between mentioned independence variable and dependent variable. The acquired result from model which is based on fixed effect is as the following table:

Table 3.result of model review based on fixed effect

Independent variable	Coefficient	Statistics t	Probability
Fixed amount	20.65722	8.650508	0.0000
Internal gross production per capita	(0.000135)	(7.756484)	0.0000
Governmental expenses	(0.361909)	(7.718965)	0.0000
intensity (physical investment)	0.252603	5.409580	0.0000
Commercial free	(0.237532)	(2.392888)	0.0177
Research and development investment	(9.838364)	(5.505333)	0.0000
Banks private credits	(0.048086)	(5.232088)	0.0000
Private credits of other institutes	0.012525	1.995929	0.0473
Stock market investment	(0.012411)	(1.640694)	0.1025
RD*ADVANCED	7.815120	4.249538	0.0000
RD*SMCAP	0.017379	3.775882	0.0002
Determination index		0.920034	
Statistics F		41.00086	
Statistical probabilities F		0.0000	
Dorbin- Watson Probabilities		1.868706	

As it has been observed in table No.3, R2, of model indicates that independence variables of model are able to explain 92 percent of changes of dependent variables. This result shows that we have good process of model and can be relied on in policies. Internal gross production in many studies is one of the important and effective variables on economic growth and negative influence of internal gross production and meaningfulness indicates that positive growth of internal gross production shows improvement of business and services-industrial activities and other economical sections and it is expected that investment appropriate opportunities in other markets such as stock market will be provided. The rate of governmental expenses has negative and meaningful influence on economic growth in which by one percent increase in governmental expenses, 0.000135 percent decrease in economic growth will be observed and it means that when the government are smaller, the expenses will also be decreased and therefore we will have economic growth of countries. Intensity or accumulation of physical invest has positive and meaningful relation with economic growth. It means that if intensity or accumulation of physical invests increase one percent, economic growth will be 0.25 percent. Between commercial freedom and economic growth, there is a negative and meaningful effect, it means that with one percent increase in commercial freeing, we will have 0.23 percent decrease in economic growth. Private credits of banks have negative and meaningful effect with economic growth. It means that if private credit of banks has been increased one percent, we have 0.048 decrease in economic growth. Private credit of other financial institutes has positive and meaningful relation

with economic growth and it means that by increasing the credit to one percent, economic growth will be increased 0.012. By conducting and equipment of these invests to beneficial short term and long term investing projects, education of effective human power, necessary route for increasing economic growth of countries will be provided. Investment of stock market has negative relation with economic growth and this relation is not meaningful. One percent increase or decrease in investment of stock market has no influence on economic growth. RD*ADVANCED coefficient which is coefficient of research and development investment of developed and merged countries has positive relation with economic growth. As it is observed in table No.3, this relation is strong and by increasing research and development investment in one percent, economic growth will be increased 7.81 percent.

One of the reasons of advanced economic growth of developed countries is existence of expert manpower. By having high population growth rate, developing countries are weak in training and equipment of human power development and in this condition expenses of production and rate of salary in these countries are low. Therefore, reviewing this issue has beneficial effects on economic growth of developing countries. RD*SMCAP coefficient has positive and meaningful relation with economic growth. It means that by one percent increase in this coefficient, economic growth equal to 0.017 percent will be indicated.

As it is said investment in research and development section is one of the important and influential factor on economic growth of developed and developing countries. Because of high growth of population and cheap labor work, considering this issue can be benefits of these types of countries in comparison with developed countries. The goal of this research is to review influence of research and development on economic growth of developed and developing countries among 2004-2010 with data panel method. Statistical society of research model also includes 50 countries. In order to distinguish developed countries from developing countries, indicator of human power of United Nation is used. In order to estimate pattern, different variance including internal gross production per capita, governmental expenses, intensity(accumulation), physical invest, commercial freedom, research and development investment, private credits of banks, private credit of other investment and financial institutes of stock market are used.

The result of research indicates effective role of research and development investment in economic growth of studied countries. The results of this research are different with research results of Dr. Akbar Komeyjani and Dr. Abbas Memarnejad[13]. But it is same with research result of Shakeri, Ebrahimi Salari, Dr. ALI Hassan Zadeh and Hassan Heidari[7]. Investment in research and development leads into improvement of economic conditions, stock of market and competition beneficial in organizations which indicates the position of the department in organization. Therefore based on importance of investment in research and development section, it is suggested that by increasing share of research credits in total budget of country and preparing appropriate environment for research

and development activities such as complete execution of intellectual possession rights and providing facilities and necessary equipment's for research will be effective. Also by establishing economical safety and safe environment for investment, development and variety of markets and financial organizations (foreign exchange market, investment companies, and retiring fund activities) movement towards economy is opened and using foreign investment and changes in regulations of investment market with goal of clarity and fixity for increasing saving and investment are attempted. Finally, today, the way for economic growth and development is more complex. The far distance of our country in comparison with advanced countries has increased the complexity and in case of not paying attention, the way of improvement will become more complex. Movement in this way needs to intellect, think, research, training and expressions in different economic and social areas and great attempts. If in future Iran wants to move as an active country in universal society and has role in universal family, it should be able to increase ability of intangible and economical invests more rapidly or at least at the level of the societies.

REFERENCES

1. Senobar, N. & Matoufi, A." reporting and capital market financial management sessions and articles", secretariat of financial management sessions, reporting and invest market.
2. Todaro, Economic development in third universe, Farjadi, Gholamali, Tehran, Research Higher Institute in programming and development, 8th edition
3. Yousefi, A., Alavi Economical system, Tehran, Islamic thoughts and culture research center, first publication
4. Ali Ahmadi, Al. management of research and development in state manufacturing units", Tehran, publication center of Islamic Azad University.
5. Dehghani, A., Kheradmand, K.B. & abdi, M. "effect of research and development expenses and to review productive copperative department of Khorasan Razavi and industry of Iran", Economical review journal, (2).
6. Dargahi, H. & Ghadiri, A." analysis of determining factors of Iran economic growth with review to inside growth patterns ", Business research Journal, (26).
7. Hassanzadeh, A. & Heidari, H. "to review R&D expenses role in economic growth rate", Iran research magazine, (8).
8. Kwack Sung yeung. & Lee Young sun. (2006). " Analyzing the Korea's growth experience: The application of R&D and human capital based Growth models with demography". Journal Asian Economics 17: 812-831.
9. Wang, E.C. (2010). "Determinants of R&D Investment: The Extreme-Bounds-Analysis Approach Applied to 26 OECD Countries", Research Policy, 39(1): 103–1.
10. Chowdhurya, R.H. & Maungb, M. (2012). "Financial market development and the effectiveness of R&D investment: Evidence from developed and emerging countries", University of Dubai, College of Business Administration.

11. Shahabadi, Abolfazl, “to review determining factors of Iran Economical growth”, Mofid letter, (27).
12. Ashrafzadeh, S.H.R., Mehregan, N. Data Panel Economy evaluation, Tehran, Tehran University cooperative Research Institute.
13. Komeyjani, A. & Memarnejad, A. “the importance of human power quality and research and development in Iran Economical growth”, Business Research journal, (3).