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The Effect of Capital Gain Tax on Capital Formation, Financial Development and Economic Growth, "Case Study of Selected OECD Countries"

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Abstract

Tax is the first and most important source of revenue for governments. Tax affects economic activities and also macroeconomic variables. One type of taxes is capital gain tax. The capital formation, financial development and economic growth are among the variables which are affected by economic structure.
In this paper, by simultaneous equations system in GMM method, the impact of capital gain tax on the capital formation and financial development in selected OECD countries will be studied in panel form within the period of 1980-2014. The results indicate that the capital gain tax growth rate, with one lag, increases the physical capital formation growth rate. Also, capital gain tax growth rate, with one lag, decreases the financial development growth and increases the economic growth rate.

Key words: Capital gain tax, capital formation, economic growth, simultaneous equations system, GMM.

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1. Introduction

Economic growth is one of the goals which is followed in every economy and it is of great importance for programmers and politicians because of the benefits and interests gained in the growth process. Achieving a high permanent growth in economy demands answering the following question: "what factors are involved in the rate of economic growth?" or "What factors and politics affect the economic growth rate and how". The author's first supposed that financial development and capital formation are the main factors involved in economic growth. On the other hand, taxes and especially capital gain tax, affects the three-above-mentioned variables. So it is necessary to consider its positive and negative effects on economic growth and consequently on economic development. In recent years, the severe reaction of Iran's economy to politics and changes of the financial markets indicates the prominent role of financial markets in Iran's economy. If the financial markets perform its main tasks in decreasing the cost of information, facilitating the transactions, careful considering costs, providing fund for innovative activities, establishing a suitable source for providing capital for investment, economic growth will be facilitated (Fetors, Najarzadeh Noshabadi & Mahmoudi 2010). One of the most important issues in economic growth literature, which is discussed a lot, is the impact of financial development on economic growth. There is more efficient financial sectors in developed countries because of having widespread financial institutes and organizations and because of using different financial tools and having suitable financial laws. However, the condition in developing countries is different from developed countries. Because of controlling a large part of financial system by government, having inefficient bank services, shortage of resources, existing dual financial sector structure (formal and informal) and dominating the informal sector's operation, institutions and organizations don't have an efficient operation. So, some economists ascribe the dullness of economic growth in developing countries to inefficient and undeveloped financial sector. They recommend an organized reformation of this sector in order to achieve a more economic growth (Salmani and Amiri, 2009).

Most economists emphasized on the establishment of physical capital, and human capital as the main factors involved in economic growth and development. High capital formation requires the development of financial intermediaries or briefly financial development. The ideas, which introduce capital formation as a determinant factor in economic growth and are approved by experimental and theoretical studies, has existed in economy from the Adam Smith period. In this theory, it is supposed that the mechanism of achieving high amount of capital formation innately exists in economy and high economic growth is achieved by reinforcing this mechanism (Yoshihisa & Hayami, 1999). Also it is true that since economic growth leads to the development of skill level and workforce specialty and capacities, improvement of production quality and the rise of efficiency of using material capital and optimal implementation of them, causes the rise of investment in physical and human capital formation.

Economic growth has an undeniable effect on the improvement of people's welfare level and more physical and human investment, employing new production technologies, presenting new knowledge in this field, are the main bases for growth process. Because of this effect on the output of physical and

human investment, taxes can affect economic decision making and consequently growth rate. One type of taxes is capital gain tax which, depending on the growth selected model, has different effects on the economic growth. Saving and investment are two main canals, through which, capital gain tax can affect economic growth. Capital gain tax can affect investment in two ways: one through increasing capital cost. When capital gain tax rate increases, investment output rate decreases and capital cost increases. When the investment output is low, investment and capital stock decreases. When capital tension is lower than capital cost, the above-mentioned

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analysis is not acceptable. The second way, through which, capital gain tax affects investment is assets blocking. The results of asset blocking slow down the investment in new risky assets because investors are induced to postpone selling the taxable assets. This argument is true if the output rate related to new risky investment is not big enough to compensate the cost of paid tax of selling the assets. About the capital gain tax, capital gain tax rate change leads to investment output change after changing tax rate. The decrease in tax rate leads to increasing output rate after exerting the tax. The change in the output rate has two compensating influences on saving. The increase in the output rate can lead to increasing saving in the families (replacement effect). At the same time, the output rate increase makes it possible for families to keep low level of fortune (income effect). So, the effect of capital gain tax on personal saving depends on the resultant of the two-mentioned effects.

Since financial development, capital formation and capital tax influence economic growth and since economic growth has some influence on the saving and investment variable and changes the above-mentioned factors, this study aims at investigating the effect of capital gain tax on capital saving, financial development and economic growth. After investigating the accomplished research, in the next part, the research patterns are presented and appraised and finally the results will be analyzed.

2.Background

Sameti, Dalali & Sharifi (2014), in their thesis titled "capital gain tax and its effect on house price in some selected OECD countries" investigate the effect of capital gain tax on house price in some selected countries which are members of economic co-operation and development organization. To do this, they use annual combined data in the years 2000-2013. Considering inbreeding variables and using GMM method, they concluded that business tax and capital gain have no effect on each other.

Argger, brown & Rossi (2013), in an article titled "transfer tax, capital gain tax, and house price" investigate the effect of capital gain tax and transfer tax on house price growth in 92 Switzerland regions in 1985-2009. The results indicate that house price growth in regions, where capital gain tax increased, is stable while in regions where capital gain tax decreased, is not the same. Also, in this study, the estimations are based on five periods: two deflations periods as 3 prosperity periods. The results shows that in deflation period, capital gain tax has no effect on house price growth, while in prosperity period, it is has a significant positive effect on house price growth. The results also indicate that the regions are divided into three regions, based on the tourism intensity: 1. High tourism intensity 2. Low tourism intensity 3. Mediocre tourism intensity. The results show that a 1% increase in capital gain tax rate leads

to a 12% increase in house price growth and a 1% increase in capital gain tax rate leads to a 43% increase in house price growth. However, in low and mediocre regions, changes in tax rate don't have a significant effect on house price.

Rajabi, Ibn Ibrahim Khajavi & Mir Mohammad Sadeghi (2011), in an article titled "the analysis of the effect of tax rate on Iran economic growth in the years 1352-1386, using the general equilibrium system of economy sectors, in three-stage least squares method, investigate the effect of tax on Iran economy growth and concluded that there is a direct relationship between government expenditure and economic growth rate and there is a reverse relationship between tax rate and growth rate.

Sameti, dallali Esfahani & Shahriarifar (2011), thesis in titled "the effect of tax and tax fraud on capital gain (in OECD countries in the years 1979-2009). Based on empirical, theoretical studies and referring to Backus and his colleagues (2008), in an econometrics pattern and using the combined time series cross-sectional data, investigate the effect of tax, in different criteria, and tax fraud on capital gain in the OECD countries in the years

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1979-2009, and concluded that the effect of formal company tax rate, the effective company tax in two models (final and average), the tax income gained by the government on capital gain is negative and capital gain tax fraud increase leads to a decrease in the amount of capital gain.

Kilimani (2009), in an article titled "the relationship between financial development and economic growth in Uganda: causality test" using time series data in the years 1970-2006 for Uganda, and regarding that economic growth is measured by real GDP and financial development is measured by M2 ratio to GDP, in order to investigate whether financial development leads to economic growth or economic growth leads to financial development, applying causality test concludes that financial growth leads to economic growth and consequently, economic growth leads to financial sector growth.

Motmeni (2009), in an article titled "the investigation of the relationship between financial development and Iran economic growth" using the GDP data and non-governmental sector's debts to banks in the years 1340-1385, investigated the Granger analyses test and stated that although the data show improvement in financial development in recent years, Iran financial development, comparing the neighboring countries, is not desirable, and also concluded that, in Iran economy, economic growth leads to improvement in financial development and statistic data don't show a revers relationship.

Rajabi, Ranjbar, Jafari (2009), in an article titled "the analysis of the effect of tax on Iran economic growth in the years 1370-1386" using the vector of autoregressive (VAR) pattern, with extensive lags investigated the effect of tax on Iran economic growth in the years 1370-1386. They concluded that there is a revers relationship between tax rate and growth rate.

Salmani, & Amiri (2009), in an article titled "financial development and economic growth: developing countries in the years 1969-2004, using unbalanced panel data method, concluded that financial development has a positive meaningful effect on economic growth in developing countries.

Taghavi, Darvishi, Shahiki Tash (2009), in an article titled "capital tax gain (CGT)" introduce capital gain tax base to amend the tax system structure through introducing new tax base. At first, they introduce the theoretical and applied concepts related to capital gain and then investigate the economic effect of this tax and the experiences of other countries in tax base and using the results of investigating the empirical and theoretical literature and related countries in this field, they show that it is necessary to notice the real and unreal earnings, long-term and short-term earnings, the adjustment of inflation and earning depreciation, the difference between earning and individual usual income and also the procedure of dealing with the loss versus earning. Also, considering the results, they concluded that levying tax can affect some economic variables such as: investment, saving, companies financial policy, the families' portfolio, and demand for asserts, and the number of assets exchanges. The effect of tax on these variables depends on the different procedures of levying tax on capital gain.

Ahmad, horner & Rafiq (2008), in an article titled "financial development and economic growth: experiences of selected economic development" investigate the relationship between financial development and economic growth in some selected developing countries (Brazil, Mexico, and Thailand). In this study, using panel data, estimated a Cobb-Douglas for the 3-mentioned countries. In most models, they concluded that financial development has a positive effect on economic growth.

Ang & Mckibbin (2007), in an article titled "financial liberation, financial development and growth: witnesses from Malaysia" using time series in the years 1960-2001 of Malaysia and using co-integration test and Granger analyst, concluded that both repressive politics and real interest rate have negative effect on financial development. Also, they found out that, although financial depth and economic growth related to each other

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positively, unlike the conventional findings, in long period of time, production growth leads to higher financial depth.

Scully (2006), in an article titled "taxes and economic growth" investigates the relationship between tax and economic growth in the United States in the years 1929-2004. Studies show that high tax rate and subsidy damage the efficiency of economy and cause to decrease the productive motivation in people and consequently decrease the economic growth. Economic growth results from productivity increase and the more the size of the government increases, the more the productivity decreases. So, there is an optimum size for government, determined by a tax level, which maximizes the growth. Using the data from the U.S in the years 1929-2004, estimates that the economic rate is about 23% of the GDP.

Young Lee & Roger Gordon (2005), in an article titled "tax structure and economic growth" using panel data of 70 countries in the years 1970-1997 investigates the effect of tax on the economic growth and the results show that the effect of tax rate change the companies is negative.

Fuest, Hurber & Nielsen (2004), in an article titled "capital gain tax and house price fluctuations" investigate whether using OLG model, capital gain tax decreases the house price fluctuations or increases them. In this study, to investigate the effect of capital gain tax on house price fluctuations, the authors use the two periodic overlapping generation model. They show that those, who have bought their estate in a prosperity period, likely lose some of their properties when they want to sell in and those, who have bought their estate in depressive period, will have a great benefit and make a lot of money from selling them. Capital gain tax decreases the expected loss in these purchases in prosperity period, and also decreases the benefits of these purchases in deflation period.

Fase & Abma (2003), in an article titled "financial development and economic growth in selected Asian countries" using statistic data from nine developing southeast Asian countries in the years 1974-1999 tested the empirical relationship between financial development and economic growth. Using the causality test, they concluded that causality relationship is from financial development to economic growth.

Seida & Wempe (2000), in an article titled "Do the increases in capital gain tax rate affect the individual investors and commercial decisions?" investigate the effects of capital gain tax rate on the investors' commercial decisions. To do this, they compared the exchange of profitable assets and detrimental assets before and after the tax reform. The results show that people tendency to sell their long-term profitable assets decreases while people tendency to sell their non-profitable assets increases.

Steven & Benjamin (1995), in an article titled "the decrease in capital gain tax, investment and growth" investigate the effect of capital gain tax rate in the U.S economy in 1995. They also explain how the decrease in capital gain tax rate affects the capital cost and consequently investment and growth. They concluded that the decrease in the capital gain income, considering capital gain as an inflation index, decreases business capital cost. They argue that the decrease in capital cost increases and improves the U.S economy condition. They also argue that the increase in the capital stock leads to an increase in GDP. Also they argue that the nominal growth of economy doesn't need to political change for production increase resulted from the decrease in capital gain tax.

Goldsmith (1969), in an article titled "development and financial structure", using the data from 35 countries in the years 1960-1963, investigates the relationship between financial intermediaries and growth and concludes that the results show that financial development index has a positive effect on real per capita as an economic growth index.

In each of the above-mentioned studies parts of the factors involved in economic growth for example the effect of financial development or the effect of capital formation on growth is investigated, but there are no studies to

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investigate capital formation, financial development, and economic growth. Because of the effect of capital gain tax on saving, investment, and economic growth, the importance of this study is the investigation of the effect of capital gain tax on capital formation, financial development, and economic growth in selected OECD countries (Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Irelands, Italy, Netherlands, Spain and Sweden) in the years 1980-2014.

3.Model Specification

The base of economy is economic growth. One of the main purposes of economic growth studies understands the cause of enormous changes in the world per capital income. Most research models used for this purpose are endogenous models. Endogenous growth theory is a simple concept for economic growth which comes true inside the system or inside the country. In general, there are two main reasons for developing endogenous growth models. Firstly, the growth of economy and production in industrial countries is higher than their growth in the last century. Such high growth requires theories and reasons which are able to explain fully these economic and technological growths. Secondly, endogenous growth theory represents another branch of development which is not dependent on business. The first model of endogenous growth tried to show that technological improvement result from the individual activities. In

1980s, Roomer & Lucas applied the endogenous technology in the growth models. They considered the technology as a peripheral effect of investment of private sector. So, the technology is pure public good and consequently, the businesses are the receivers of the price. A large group of endogenous growth patterns are introduced as patterns. In the endogenous growth models, with the presupposition of existing of just one cargo and one type of institutes, that is, capital, the production function is determined as the following (Pagano, 1993 & Trablesi, (2002):

$$Y_t = f(K_t) \tag{1}$$

In which, the capital formation includes physical and human capital. If we differentiate the function then, we have:

$$\frac{dY_t}{dt} = \frac{\partial f}{\partial K_t} \frac{dK_t}{dt} \tag{2}$$

if we divide the function by 2, we will have the following function:

$$\frac{dY/dt}{Y_t} = \frac{(\partial f/\partial K_t) \; (dK_t/dt)}{Y_t} \tag{3}$$

The left statement is equal to production growth rate and the right statement is equal to the ratio of growth rate to production. Here the growth rate is equal to the production of final capital. Also the rate of investment is equal to:

$$\frac{(dK_t/dt)}{Y_t} = \frac{I_t}{Y_t} \tag{4}$$

in which the capital amount change is equal to investment. Here the presupposition is that the economy is closed and in balanced mode, financial market equalize saving and investment. Also it is supposed that a part of saving is not used in investment. Only a part of saving is used in investment:

$$\varphi \, S_t = I_t = \varphi \, s \, Y_t \tag{5}$$

in which "s" represent saving rate and is equal to:

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$$g_y = \frac{(\partial f / \partial K_t)}{Y_t} \left(dK_t / dt \right) = \frac{(\partial f / \partial K_t)}{Y_t} I_t = \frac{(\partial f / \partial K_t)}{Y_t} \varphi s Y_t \quad (6)$$

Now, combining the equation, we will have the following formula.

$$g_y = f(K_t') \varphi s \quad (7)$$

Using the equation number 7 which is derived from the endogenous growth theories, we can deduce that financial media can affect the economic growth 1. Improving efficiency, 2. Increasing the investment stock out of the whole savings, 3) increasing the saving rate, that is increasing the "s" (Fetres & his colleagues, 2010).

So, we can define models, such as King & Levin, in which financial development is one of the most effective variables in economic growth so, we can write:

$$Y_t = f(FD_t, Z_t) \quad (8)$$

The mathematical model of the above-mentioned relationship is as following:

$$Y_t = \alpha_0 + \alpha_1 Z_t + \alpha_2 FD_t + \alpha_3 K_t + \mu_t \quad (9)$$

So that:

Y_t : Gross Domestic Production is equal to the base price or economic growth.

Z_t is a vector of the other independent variables.

The definition of other independent variables depends on the economic condition of each country. Regarding that the economy of every country is dependent on the other countries; we must determine an index for Trade Openness (TOP) which is the ratio of the total annual import and export to GDP.

FOP is Financial Openness. This index indicates the increase and expansion of global connections by means of international financial flow. To measure this variable, chin-Ito index is used. This index is determined based on the Binary unreal variable and exterritorial exchanges. The information about the index is available in the annual IMF report.

Because the Inflation has an inevitable effect on the other economic variables, especially growth rate, consumer price index growths affect the economic growth.

 Also, because in most countries, a considerable part of the effective factors in GDP and economic growth is determined by the public sector, Government consumption Expenditure index in the GDP can be a useful variable (GOV/GDP).

K_t: Total capital formation includes physical and human capital. Since physical and human capitals are not homogenous, we don't add them together and we can consider physical capital as a function of human capital.

In this formula, we mean physical capital formation.

In this study, FD, financial development index is the ration of liquidity to GDP.

μ_t is residual.

Also we can say that the development of financial organization leads to economic growth and consequently economic growth leads to the demand for financial services and the need for new financial tools. So, economic growth leads to financial development and due to the increase of saving and investment level, it affects capital formation. Due to the expansion of new financial tools and improvement financial services, capital formation leads to changing financial structure. So we can write:

$$FD_t = \alpha_0 + \alpha_1 Z_t + \alpha_2 Y_t + \mu_t \quad (10)$$

Z_t is A vector of controlling variables such as Economic Growth Rate Fluctuation, Trade Openness, Financial Openness, Inflation and Physical Capital Formation.

GDP is at the base price or economic growth.

Also, capital gain tax, due to its effect on capital formation, affects economic growth and we can write:

$$K_t = \alpha_0 + \alpha_1 Z_t + \alpha_2 FD_t + \alpha_3 Y_t + \alpha_4 CGT + \mu_t \quad (11)$$

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Z_t is A vector of controlling variables especially Economic Growth Rate Fluctuation , Inflation and Human Capital.

In this study, the number graduates are considered as human capital index.

Y_t is GDP at the base price or economic growth.

Also, capital gain tax is another factor which affects economic growth. Levying of tax can affect some of the economic variables such as investment, saving, portfolios, capital cost, demand for assets, the number of asset exchange and so on. Since there is no information about this variable in Iran, here by CGT, we mean the wealth tax.

μ_t is residual.

It is necessary to mention that, in this study, all the variables are considered in the rate form.

Empirical work, in this study, are based on simultaneous equations system .So, the effect of capital gain tax on the capital formation, financial development and economic growth in Austria, Belgium, Czech

4.Research hypotheses

1- There is no relationship between economic growth rate and financial development growth rate.

2- There is no relationship between economic growth rate and capital formation growth rate.

3- There is no relationship between financial development growth rate and capital formation growth rate.

4- There is no relationship between capital gain tax growth rate and capital formation growth rate.

5- There is no relationship between capital gain tax growth rate and financial development growth rate.

6- There is no relationship between capital gain tax growth rate and economic growth rate.

5.Methods, Experience tools, Data analysis

It is necessary to determine the condition of equation recognition before the analysis of related patterns which are in the form of simultaneous equations system. Also, in this study, GMM is used to estimate the equation. This method has some advantages such as considering individual differences and more information and eliminating of existing biased in cross sectional regression. Using this method leads to more exact and efficient estimation and the less co-linearity in the GMM (generalized method of moments). Since the dependent variable with a lag in the right is related to residual. This problem leads to OLC estimator become inconsistency and biased**.** Also, the GLS estimator's random effects become biased in a dynamic mixed panel data. So, to estimate the applied simultaneous equations system in the study, the Eviews econometric software and GMM are used.

Also the standard test for validation of moving limitations in GMM estimation process, is Sargan test of over identify concentrates. J-statistic test in GMM estimation, under the null hypothesis of Moving limitations is valid. In other word, in this test, null hypothesis show the appropriate selection of tool variables used in the pattern and also it is an approval for tool variables.

The sargan statistic is asymptotically distributed chi-square with degrees of freedom equal to the number of over-identifying restrictions. The number of over-identifying restrictions is equivalent to the number of extra instruments (instrument – parameters).

6.Empirical results

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In this study using the related simultaneous equations system and estimating it in GMM method, the effect of capital gain tax on capital formation, financial development and economic growth is investigated in selected OECD countries in the years 1980-2014 and the results will be analyzed.

1.6. Recognition of equation

Before estimating the equations, it is necessary to determine the condition of equation. So, Rank and Order condition is used for equation recognition. In the table (1), order condition based on recognition ability. Is used in which 'k' represents exogenous variables and 'm' represents endogenous variables in the models. Also, 'k' and 'm' are representatives of endogenous, exogenous variables in under-investigation equations.

Regarding the results of (1), in all three equations, $K - k > m - 1$ is true which is based on the order condition of given equations, are over identified

Based on the ranking condition, in a model including M equations and M endogenous variable, an equation will be determined if and only if we can write at least one nonzero degree determinant of coefficients of other equations (Guajarati, 2006).

Table (1): Order Condition Based Identify ability of Simultaneous Equations System

Equation	$K - k$	$m - 1$	Identify ability
Economic Growth	3	2	Over identified
Financial Development	3	2	Over identified
Physical Capital Formation	3	2	Over identified

Source: Research Findings

Table (2): Rank Condition Based Identify ability of Simultaneous Equations System

Equation	1	Y	FD	K	YV	TOP	FOP	CPI	GCE	HC	CGT
Economic Growth Rate	$-\alpha_0$	1	$-\alpha_2$	$-\alpha_3$	0	$-\alpha_{11}$	$-\alpha_{12}$	$-\alpha_{13}$	$-\alpha_{14}$	0	0
Financial Development Growth Rate	$-\beta_0$	$-\beta_2$	1	$-\beta_{11}$	$-\beta_{12}$	$-\beta_{13}$	$-\beta_{14}$	$-\beta_{15}$	0	0	0
Physical Capital Formation Growth Rate	$-\gamma_0$	$-\gamma_3$	$-\gamma_2$	1	$-\gamma_{11}$	0	0	$-\gamma_{12}$	0	$-\gamma_{13}$	$-\gamma_4$

Source: Research Findings

Since for all the three under investigation equations, we can write a nonzero determinant, so the
Equations are identified and we can use (3SLS)

2.6. Stationary test

Macro-economic variables often include a random method (Unit Root) which is eliminated by one differencing. Since the existence of such process invalidate the estimation and statistical inference in conventional econometrics method, so the first step in econometrics analysis in modern methodology is determining degree of integration (number of Unit Roots). Non-standard variables turning into stationary variable after differencing are

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called integrated of 1degree or $I(1)$. Other variables may be stationary or stationary in trend (that is mean $I(0)$). In addition, it is possible that some variable turn into stationary variables after several differencing (for example d times). So they are called integrated of d degree or $I(d)$ (Noferesti, 1999).

In this study, augmented Dickey Fuller test is used to investigate the properties of stationary data. The results of this test obtained from Eviews software are presented in table (3). As shown in the table, all the variables used in the pattern are stationary and applying them in the model doesn't damage the results.

Table(3): Unit Root Test Results (The Case of Iran and Some Selected Business Partners)
Using ADF

Variable	ADF Statistics	The Possibility of Accepting The Null Hypothesis
Economic Growth Rate	112.241	0.0000
Financial Development Growth Rate	54.8146	0.0018
Physical Capital Formation Growth Rate	120.904	0.0000
Trade Openness Growth Rate	177.477	0.0000
Financial Openness Growth Rate	107.249	0.0000
Inflation Growth Rate	116.633	0.0000
Government Consumption Expenditure Growth F	155.490	0.0000
Economic Growth Rate Volatility	68.2511	0.0000
Human Capital Growth Rate	79.5988	0.0000
Capital Gain Tax Growth Rate	158.249	0.0000

Source: Research Findings

Regarding the results shown in the table, the entire variables are stationary during the study period.

3.6. Estimated results gained from the patterns

In this section, the estimated system of simultaneous equation is estimated by GMM method.

Table (4): Simultaneous Equations System Estimated in GMM Method

Variable	Coefficient	t Statistics	Possibility Value
Economic Growth Rate Equation Intercept $C(1)$	0.009221	1.526128	0.1272
Financial Development Growth Rate $C(2)$	0.201878	2.923334	0.0035
Physical Capital Formation Growth Rate ($C3$)	0.044482	2.565011	0.0104
Trade Openness Growth Rate $C(4)$	0.022289	2.872491	0.0041
Financial Openness Growth Rate $C(5)$	0.000291	0.797111	0.4255
Inflation Growth Rate $C(6)$	-0.083270	-3.127301	0.0018
Government Consumption Expenditure Growth Rate $C(7)$	-0.536066	-11.99927	0.0000
AR Coefficient $C(8)$	0.823334	40.19152	0.0000
Financial Development Growth Rate Equation Intercept $C(9)$	-0.000501	-0.014398	0.9885
Economic Growth Rate $C(10)$	0.325982	1.394683	0.1633
Physical Capital Formation Growth Rate $C(11)$	-0.321328	-2.558366	0.0106
Economic Growth Rate Volatility $C(12)$	2.287324	3.236943	0.0012
Trade Openness Growth Rate $C(13)$	0.147603	1.631596	0.1030
Financial Openness Growth Rate $C(14)$	0.000771	0.381865	0.7026
Inflation Growth Rate $C(15)$	0.112457	1.188267	0.2349
AR Coefficient $C(16)$	0.796040	19.57512	0.0000
Physical Capital Formation Growth Rate Equation Intercept $C(17)$	-0.016357	-2.915954	0.0036
Economic Growth Rate $C(18)$	2.370996	27.19065	0.0000

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مدیــریـت، اقتصــاد
و علــــوم انسـانی

۱۶شهریورماه ۱۳۹۵   آتــن - یونـــان

Financial Development Growth Rate **C(19)**	-0.027893	-2.317697	0.0206
Economic Growth Rate Volatility**C(20)**	0.739823	4.130875	0.0000
Inflation Growth Rate**C(21)**	-0.246289	-12.96347	0.0000
Human Capital Growth Rate **C(22)**	-0.716564	-2.073349	0.0383
Capital Gain Tax Growth Rate **C(23)**	0.012387	3.727409	0.00002
AR Coefficient **C(24)**	0.149452	2.945507	0.0033
The Whole System j Statistics	0.047142		
The Number of Included Observations in The System	461		

Economic Growth Rate Equation
$$Y = C(1) + C(2) * FD(-1) + C(3) * K(-1) + C(4) * TOP + C(5) * FOP + C(6) * CPI(-2) + C(7) * GCE + [AR(1) = C(8)]$$
Instrumental variables
TOP, FOP, CPI, GCE, YV, HC, CGT, C, Y(-1), FD(-2), K(-2), TOP(-1), FOP(-1), CPI(-3), GCE(-1)
Number of Observations: 446   Durbin-Watson statistics: 2.317356
R-Squared: 0.624969   Adjusted R-Squared: 0.618975

Financial Development Growth Rate Equation
$$FD = C(9) + C(10) * Y(-1) + C(11) * K + C(12) * YV(-2) + C(13) * TOP + C(14) * FOP + C(15) * CPI(-1) + [AR(1)=C(16)]$$
 Instrumental variables
TOP, FOP, CPI, GCE, YV, HC, CGT, C, FD(-1), Y(-2), K(-1), YV(-3), TOP(-1), FOP(-1), CPI(-2)
Number of Observations: 446   Durbin-Watson statistics: 2.435876
R-Squared: 0.726944   Adjusted R-Squared: 0.722580

Physical Capital Formation Growth Rate Equation
$$K = C(17) + C(18) * Y + C(19) * FD(-1) + C(20) * YV(-2) + C(21) * CPI(-2) + C(22) * HC(-2) + C(23) * CGT(-1) + [AR(1)= C(24)]$$
Instrumental variables
TOP, FOP, CPI, GCE, YV, HC, CGT, C, K(-1), Y(-1), FD(-2), YV(-3), CPI(-3), HC(-3), CGT(-2)
Number of Observations: 443   Durbin-Watson statistics: 2.055829
R-Squared: 0.845973   Adjusted R-Squared: 0.843494

The Whole System J Statistics: 21.73246
\Probability Value: 0.41506515879

 Source: Research Findings

Regarding the results, Durbin-Watson statistics value for all the three equations is between 1.5 to 2.5 and shows that there is no correlation between residuals.

It is necessary to mention that the statistic J is equal to 21.73 and chi statistics value is twice as much as 0.42 which shows that the entered tool variables in the system of simultaneous equations are valid and all the patterns are estimated correctly.

Using the results, the analysis of results will be investigated based on the research hypotheses and the related tests. The results of the present study about the first hypothesis "economic growth rate and financial development growth rate don't affect each other" show that financial development growth rate with one lag increases economic growth rate about 0.020 units but economic growth rate with one lag does not affect financial development growth rate.

There are different ideas about the relationship between economic growth and financial development. The first idea is that financial development leads to economic growth. This idea is known as "supply idea". The second idea is that economic growth leads to the demand for financial services and the need for new financial tools. So, economic growth results in the formation of financial development. The third idea is that there is no significant relationship between economic growth and financial

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development. The fourth idea is that the relationship between economic growth and financial development is bilateral and concurrent or in other word, both supply and demand theories are underway (Motmemny, 1388). In this study is confirmed supply theory.

The results of the present study on the second hypothesis _economic growth rate and capital formation growth rate don't affect each other_ show that capital formation growth rate with one lag increases economic growth rate about 0.05 units and economic growth rate increases capital formation growth rate about 2.4 units. The rate increases importance of investment in social economic development growth process is emphasized in most economic growth theories.

Regarding the shortage of resources of investment and the necessity of efficient allocating of these resources to evoke economic growth, it is necessary to recognize the relative advantage of a countries in the field of allocating resources and by directing investment of resources to the most productive and efficient sectors, a field for efficient use of limited resources to accelerate economic growth can be provided (Taghavi, Mohammadi, 2009).

So, we can say that investigation in the physical resources such as equipment and machinery, increases the individual power and consequently economic growth and vice versa. Also the results of the third hypothesis _financial development growth rate and capital formation growth rate don't affect each other" show that financial development growth rate with 1 lag decreases about 0.03 units physical capital formation growth rate and physical capital formation growth rate decreases financial development growth about 0.32 unit.

Unsuitable financial structure yearly (loss formation, bank debts), not using new accounting method for assessment and surveillance financial condition, not existing a continuous relationship between businesses and the capital markets (the limited sector which exist), shortage of liquidity and disorder in the cash flow, results in this decrease. Based on the results of the above table, about the last three hypothesis "capital gain tax growth rate doesn't have no effect on the changes of capital formation growth rate, on financial development growth rate, on economic growth rate" we can say that: the increase of capital gain tax growth rate with 1 lag, increases capital formation growth rate about 0.01 unit. Also, capital gain tax growth rate with 1 lag decreases financial development growth rate about 0.003 units and increases economic growth rate about 0.001. Also, regarding the above-mentioned information and the results of the forth hypothesis _capital gain tax rate have a positive effect on the physical capital formation_ and also the results of the third and second hypotheses _physical capital formation have a negative effect on the financial development growth rate and physical capital formation has a positive effect on the economic growth rate and also regarding the information about the Model Specification and presented theoretical concepts, since capital gain tax rate, using physical capital formation growth rate, affect economic growth and financial development variables, we can say that capital gain tax growth rate has a negative effect on financial development growth rate and has a positive effect on economic growth rate.

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7. Results and Suggestions

Taxes can affect economic decision and consequently affect growth rate because of their effect on the physical and human investment output. One type of taxes is capital gain tax. Capital formation, financial development, and economic growth are variables affected by tax structure. This study aims at investigating the effects of capital tax on the relationship between capital formation, financial development and economic growth. So, in this study, the effect of capital gain tax on capital formation, financial development and economic growth in the years 1980-2014, using simultaneous equations system and GMM method has been investigated in panel format in selected OECD countries.

The results show that financial development growth rate with one lag increases economic growth rate about 0.020 units but economic growth rate with one lag does not affect financial development growth rate. Capital formation growth rate with one lag increases economic growth rate about 0.05 units and economic growth rate increases capital formation growth rate about 2.4 units. Financial development growth rate with 1 lag decreases about 0.03 units physical capital formation growth rate and physical capital formation growth rate decreases financial development growth about 0.32 unit. Also, the findings show that the increase of capital gain tax growth rate with 1 lag, increases capital formation growth rate about 0.01 unit. Also capital gain tax growth with 1 lag, decreases financial development growth about 0.003 unit and increases economic growth rate about 0.001. Also, the amount of J statistic is equal to 21.73 and the amount of chi statistics is equal to 0.42 which show that the entered tool variables are valid in the system of simultaneous equations and all the patterns are estimated correctly.

Regarding the results of estimating patterns, we can conclude that if financial development can provide suitable condition for optimal allocation of resources and also the increase of capital efficiency, so it can increase production and economic growth and vice versa. Also, regarding the results since the negative effect of financial development growth rate and capital formation growth rate can be due to unsuitable financial structure (yearly loss formation, bank debts ……) and not using new accounting method for assessing and financial condition, not existing a continuous and valid relationship between involved businesses and capital markets (the limited existing sector), lack of liquidity and disorder in cash flow and … . It can be mentioned that the government interference to create assurance for clearance and liquidation by planning a practical process accepted by obliges and debtors and establishment of a situation for production unit which is able to access suitable liquidity flow through continuously improving activity levels. Accepting loan applicants and lending loan to productive units especially troubled ones by banks without considering the normal studies, if the loan applicant can give guaranty, are factors that can leads to positive effect of financial development growth rate and capital formation growth rate on each other. Also, since capital gain tax affect some economic variables such as economic growth, investment, saving, capital formation, companies' financial policy, families portfolio, capital cost, demand for assets, the number of assets exchange, it is necessary that politicians, considering the existing laws and policies, notice the effects of capital gain tax on these variables.

References

Ahmad, S, Horner, J and Rafiq, r. (2008), "Financial Development and Economic Growth: Experiences of Selected Development Economic", Review of Applied Economics, 4(1-2).

Ang, J. B. & W. J. Mckibbin. (2007), "Financial Liberalization, Financial Sector Development and Growth: Evidence from Malaysia", Journal of Development Economics.

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Aregger, Nicole, Brown, Martin, and Rossi, Enzo. (2013). "Transaction Taxes, Capital Gains and House Prices", Swiss National Bank Working Papers, 54-98

Beyengju, J. (1998), "Measurement of Human Capital in Across Countries: A New Method and Result", Retrieved Nov. 11, 2004 from http://www.economics.ox.ac.uk/research/wp/pdf.

Fase, M.M.G. & Abma, R.C.N. (2003), "Financial Environment and Economic Growth in Selected Asian Countries", Journal of Asian Economics, Vol. 14, PP. 11-21.

Feldstein, Martin, Shlomo, Yitzhaki. (1978), "The Effects of The Capital Gain Tax on The Selling and Switching of Common Stock", Journal of Public Economics, Volume 9, Issued 1, Pages 17-36.

Fetros, M.H, Najjarzadeh noshabadi, A, Mahmodi, H, (2010), "Investigation of the Relationship between Financial Development and Economic Growth in Iran: Using Factor Analysis Method", Economic Policy and Research Quarterly, 18th year, no. 56, Winter 1389, pp.73-94.

Fuest, Clemens. Huber, Bernd. And Nielsen, Soren BO.(2004). Capital Gains Taxation and House Price Fluctuations. Department of Economics Conpenhagen Business School, Working Paper 16.

Guajarati, Damodar, (2006), "Basics of Econometrics Volume 2, Translated by Abrishami, H. Tehran University, fourth publication.

Goldsmith, R.W. (1969), "Financial Structure and Development, New Haven, CT: Yale University Press.

Kargbo, S.M. & P.A. Adamu. (2009), "Financial Development and Economic Growth in Sieraa Leone", Journal of Monetary and Economic Integration 9 (2), 30-61.

Khan, M.A. (2008), "Financial Development and Economic Growth in Pakistan: Evidence Based on Autoregressive Distributed Lag (ARDL) Approach", South Asia Economic Journal 9(2), 375-391.

Kilimani. Nicholas. (2009), "The Link Between Financial Development and Economic Growth in Uganda: A Causality Test", A Paper Presented at the Center of Study of African Economies (CSAE) Conference 22-24th March 2009.

Levin, Ross. (1997), "Financial Development and Economic Growth: Views and Agenda", Journal of Economic Literature, Vol. 35, No. 2, PP: 1-38.

Lutz, H. (2002), "How Important is Human Capital for Development: Evidence from Immigrate Arming", Retrieved May. 9, 2004from http.//www.e-acr.org.

Pagano, Marco (1993), "Financial Markets and Growth- AN Overview", European Economic Review, Vol. 37, PP. 613-622.

Motmeni, M, (2009), "The Investigation of the Relationship between Financial Development and Economic Growth in Iran" Business Reviews Quarterly, Farvardin & Ordibehesht 1388. No, 34 pp. 59-66.

Nofresti, M, (1999), "Unit Root and Co-integration in Econometrics" Tehran Rasa Cultural Services Institutes.

Peter Englund, (1985), "Taxation of Capital Gains on Owner-Occupied Homes: Accrual vs. Realization", EUROPEAN Economic Review, Volume 27, Issue 3, Pages 311-334.

Quartey, P. & F. Prah (2008), "Financial Development and Economic Growth in Ghana: Is There a causal Link?", The African Finance Journal 10(1), 28-54.

Rajabi, M, khajooi, M & Ibn Ib, Sadeghi, M & M.M, Javad (2011), "The Analysis of the Effect of Tax Rates on Iran Economic Growth, 1352-1386, Economic Jihad International Conference, Kerman Esfand, 17,18.

Rajabi, M, & Ranjbar, H, & Jafartadi, M (2009), "The Analysis of the Effect of Tax on Iran Economic Growth, 1370-1386", The First National Economic Meeting in Islamic Azad University Khomeinishahr Branch.

Salmani, B, & Amiri, B, (2009), "Financial Development and Economic Growth: In Developing Countries" Quntitative Economic Quarterly, six period, no. 4, Winter 1388, pp. 125-145.

Samadi, A & H (2009), "Social Capital and Financial Development: Iran Economy (1971-2006)", Economic Study Journal, no. 88, fall, 1388, pp. 117-144.

Sameti, M, & Dallali Esfahani, R, & Shariarifar, M (2011), "The Effect of Tax and Tax Fraud on Capital Gain (OECD Countries, 1979-2009)", An MA Thesis in Esfahan University, Economic and Administrative Science, Economy Department.

Sameti, M, & Samadi, S, & Sharifi, M (2014), "Capital Gain Tax and its Effect on House Price in Selected OECD Countries)", an MA Thesis in Esfahan University, Economy and Administrative College, Economic Department.

Taghavi, M, Drvishi, B, Shahiki Tash, M.N (2009), "The Investigation of Capital Gain Tax_(CGT)", Tax Specialized Quarterly, new period, no. 7.

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Taghavi, M, Mohammadi, H (2009), "The Effect of Investment Bases on Iran Economic Growth, Economic Bulletin Quarterly, no. 32, Economic Affair Institute, ninth years, no.1 .

Trablesi, Mohamad (2002), Financial and Growth, Empirical Evidence from Developing Countries (1960-1990), IHEC, Tunisia.

Scully, G. W.(2006), "Taxes and Economic Growth", National Center for Policy Analysis, 292.

Seida, Jim A, Wempe, William F. (2000), "Do Capital Gain Tax Rate Increases Affect Individual Investors, Trading Decisions?", Journal of Accounting and Economics, Volume 30, Issue 1, Ages 33-57.

Steven, Fazzari., Benjamin, Hrezon. (1995), "Capital Gain Tax Cuts, Investment, Growth", Forthcoming in the Public Policy Brief Series of the Jerome Levy Economics Institute, Working Paper, No. 147.

Young Lee, Roger H.Gordan (2005), "Tax structure and economic growth ".The Journal of Public Economics, 89, 1027-1043.

Yoshihisa, G., & Hayami, Y. (1999), "Accumulation of Education in Modern Economic Growth: A Comparison of Japan With the United States, 1888-1995". ADB Institute Working Paper Series, 4, Tokyo: Asian Development Bank Institute.

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