The Relation of Fiscal policy with Economic Growth and Inflation in Iran

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Abstract: This paper is regarded as an applied research in terms of objective and a library study in terms data collection as it seeks to explain the relation and calculate correlation coefficient of independent variable (government expenditures and tax) with economic growth and inflation in Iran. To gather the required data, library research method has been applied, and information pertaining to the variables has been gathered by referring to the annual reports of the global bank from 1978 to 2012. To determine whether there is a significant relation between independent and dependent variables, Spearman correlation coefficient test via SPSS software has been used. To assess reliability of time series, Dickey – Fuller unit root test which is the most appropriate tests in this regard has been applied through EViews software. In the following, ARDL model has been used by Microfit software to determine the long-term relation among variables. The results reveal that there is a significant and long-term relation between independent variables (tax and government expenditures) and dependent variables (economic growth and inflation).
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1. Introduction

Scientific studies depict that fiscal policies can play an important role in the economic growth (Ghali, K.H., 2008). An efficient financial system transfer funds from depositors to the loan applicants and guides resources towards productive and profitable projects. As productivity of investments is more, the rate of economic growth will be more (King, R.G., et al., 1993). Some scholars believe that financial markets are the brain of economic system and main center of decision-making, and if these markets encounter failure and inefficiency, the performance of the whole economic system will suffer (Stiglitz, J., 1994). Economists approach towards importance of financial systems for economic growth has been strangely changed during last 50 years. Many studies have been carried out regarding the relation between financial development and economic growth; yet in these studies, no proper analytical framework has been offered for whether financial development influences the economic growth or not (Asari, A., et al., 2008). One of the factors that may play an essential role in achieving rapid and continuous economic growth is financial development. Financial sector is comprised of various markets including money and capital market. The importance of the efficient financial sector development is in the role it plays in equipping financial resources for investment, import, attracting foreign capital, optimization, and so on. The concept of fiscal policies development drew more attentions when the concept of financial repression was raised in 1970s (Komeijani, A., et al., 2006). After near two decades of scientific debates, the literature of the relation between fiscal policies development and economic growth reached a relative maturity. At a macro level, it has been revealed that development of fiscal policies has a positive and significant causal effect on the economic growth. Also economic research has been transmitted from the macro level to the micro economic areas. Economic theories indicate that policies applied to strengthen the financial sector reduce costs of information, interchange, and supervision and consequently increase production through efficiency improvement. To measure economic growth rate, all different effective factors including the fiscal policies development index must be taken into account. Different aspects of fiscal policies can be searched in the framework of its variables. This paper aims at investigating the relation of fiscal policies that are embodied in the form of this paper's variables with economic growth and inflation in Iran.

2. Literature Review

Economic growth is regarded as the main representation of the governments' performance. Thus through better and more accurate understanding of effective factors on this index development, economists try to contribute policy-makers in this regard. In the economic literature, accumulation of physical capital has been regarded as an important factor in reaching more efficiency and creating more steady flow of income. To achieve the theoretical relation between investment and economic growth, production function must be applied. The most famous production function in analyzing the economic

growth process was used in 1940s by "Harrod-Domar". The main assumption of this model is that the rate of production in each economic unit ranged from an enterprise, industry, or the whole economy, is dependent upon the rate of investment in that unit. So if we show production rate by "Y" and investment rate by "K", then production and investment will be related based on below relation.

$Y = K / k$

Where, k is a constant number and this relation is named as the ratio of capital to production. By subtracting the above equation and dividing both sides by the production rate "Y", the relation of economic growth with capital changes is obtained.

$\Delta Y = \Delta K / k$

$g = \Delta Y / Y = (\Delta K / Y) * 1/k$

Where, ΔK can be substituted by its equivalent, i.e. rate of investment (I), which equals to the rate of saving (s). So (ΔK / Y) will be converted into (I / Y) and this equals to (S / Y); and since (S / Y) is the rate of national saving (S), the growth equation can be rewrite as below.

$Y = S / k$

That is, the rate of economic growth equals to the ratio of saving to the production (Akbarian, R., et al., 2009).

Inflation refers to a situation in which monetary demand for product grows relative to production, a situation that is revealed in the form of increase in the price of one unit of produced goods in the absence of an effective control. Inflation is usually associated with an actual or potential increase in prices, or in the other words, fall in the purchasing value of money. Sometimes inflation is created when general level of prices does not fall consistent with increase in the efficiency of economic factors and processes. Inflation, as usually understood, has a relation with the unusual increase in prices. When economists speak about inflation, they refer to the general level of prices. Inflation occurs when more money must be paid for purchasing goods and services. Some other definitions regard inflation as the cumulative price increase and its irreversibility. Other experts such as Rimon Bar, John Marshal, and Gunnar Myrdal have defined inflation as a high and continuous increase in the prices. If wages growth equals to the efficiency growth in the economy, inflation will not be created (Gold and Colb, 2005).

Fiscal policy in economy and political sciences applies the set of government income (tax) and expenditures (cost) for influencing the economy. Two major tools of fiscal policy are tax and government expenditures. Changes in the level and combination of tax and government expenditures may influence total demand, level of economic activities, resource allocation model, and income distribution. Fiscal policy refers to using the government budget for influencing economic activities.

Three main stances of fiscal policies are namely neutral fiscal policy, expansionary fiscal policy, and contractionary fiscal policy. Neutral fiscal policy is usually adopted when the economy is in equilibrium, the government expenditures are fully supplied by tax revenue and in general the budget outcome has a neutral impact on the level of economic activities. Expansionary fiscal policy involves government expenditures exceeding tax revenue and is usually adopted in the recessions. Contractionary fiscal policy occurs when government expenditures are lower than tax revenue and it is usually committed to pay the government debts. However, these definitions may be misleading because, even with no changes in expenditures or tax laws at all, cyclic fluctuations of the economy cause cyclic fluctuations of tax revenues and of some types of government expenditures, altering the deficit situation; these are not considered to be policy changes. Therefore, for purposes of the above definitions, "government expenditures" and "tax revenue" are normally replaced by "cyclically adjusted government expenditures" and "cyclically adjusted tax revenue".

Tax revenue; by applying tax tools by the government, many enterprises will be forced to reconsider their allocation decisions and so occurrence of this deviation in the enterprises allocation decision will certainly create a net loss in the social welfare. For example, if the production function of the whole economy is in the form of Cobb-Douglas, the net income of tax equals $Y = (1-t)A_t K_t^{\alpha} L_t^{1-\alpha}$ and then the rate of return on capital will equal $r_t = (1-t)\alpha A_t (\frac{K_t}{L_t})^{\alpha-1}$. So it will be clear that income tax reduces the final return on capital and influences the motivation of capital accumulation among individuals and consequently the growth[1]. Increase in tax leads to reduction of return on savings and so motivation of physical capital accumulation (K) is decreased. However its final effect on growth depends upon how much human capital (H) is influenced by this matter (Shafiei, A., et al., 2006).

Government expenditures are the second tool by which the government can influence the economic growth. To study how this tool influences the economic growth, it must be noted that financing any level of government expenditures, whether through tax or by public sector borrowing, will result in more actual resources absorption by the public sector, and will lead to the crowding out effect from allocation perspective (Tari, F., et al., 2005). Government

[1] Romer (1986, 1989)

expenditures refers to all costs defined in the budget including current expenditure (wages of government employees, properties maintenance, military costs, payment of interest and subsidy for covering losses of public institutions) and capital expenditures (costs of construction of irrigation canals, roads, schools, and purchasing state-owned non-military equipments).

Different scholars have researched in this regard. (Liang, Q., et al., 2006), financial development and economic growth, (Liu, V. S., et al., 2006), the role of financial development in economic growth, (Hao, S., 2006), growth of financial intermediaries and economic growth, (Folster, S., 2001), the effects of increase in government expenditures and tax in rich countries, (Mitchell, D., 2005), the effect of government expenditures on economic growth, (Akbarian, R., et al., 2006), a study on the relation between development of financial market and economic growth with a collective approach, (Torki, L., 2003), development of financial markets and its effect on the economic growth, (Kazerouni, Reza, 2003), the relation between financial development and economic growth – Iran experiences, (Naderi, Morteza, 2003), financial development and economic growth, financial crisis occurrences and reasons of selecting an appropriate financial system.

3. Research Methodology

This paper is an applied research in terms of objective and a library study in terms of data collection because it seeks to explain the relation and calculate correlation coefficient of each independent variable (fiscal policy) with economic growth and inflation in Iran. To gather the required data, library research method has been applied, and information pertaining to the variables has been gathered by referring to the annual reports of the global bank from 1978 to 2012.

3.1 Research Hypotheses

To formulate the main hypothesis, this question is raised that whether economic growth and inflation as the dependent variables have a significant relation with fiscal policies as the independent variable. To answer this question, below hypotheses are determined.

- Main Hypotheses

There is a significant relation between economic growth as the dependent variable and fiscal policies (tax and government expenditure) as the independent variables.

- Subordinate Hypotheses

In the following, we investigate the relation between subordinate hypotheses and dependent variable through Pearson test. Subordinate hypotheses are as per below.

H_{01}: there is a significant relation between tax and economic growth.

H_{11}: there is no significant relation between tax and economic growth.

H_{02}: there is a significant relation between government expenditure and economic growth.

H_{12}: there is no significant relation between government expenditure and economic growth.

H_{03}: there is a significant relation between tax and inflation.

H_{13}: there is no significant relation between tax and inflation.

H_{04}: there is a significant relation between government expenditure and inflation.

H_{14}: there is no significant relation between government expenditure and inflation.

3.2 Research Conceptual Model

The conceptual model of the relation between independent variables (tax and government expenditures) and dependent variables (economic growth and inflation) is presented in figure 1.

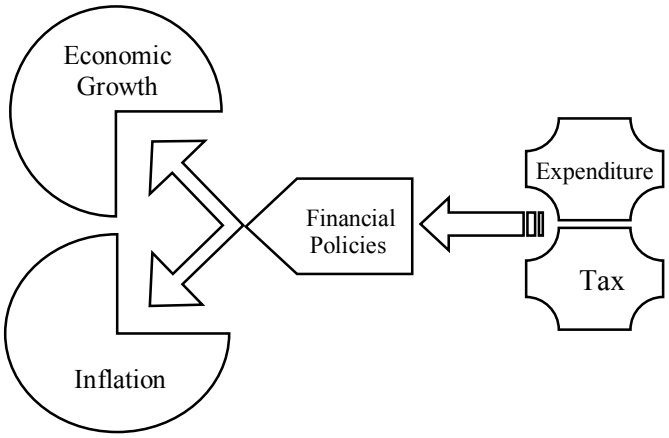

Figure 1. Conceptual Model

4. Research Methodology

To determine whether there is a significant relation between dependent and independent variables or not, Pearson correlation coefficient test is applied. SPSS software has been used for calculations. The results reveal that for many economic time series, variables are unreliable. In this state, the results of estimations are not so reliable that the researcher reaches inaccurate inferences. To assess reliability of time series, Dickey – Fuller unit root test which is one of the most appropriate tests of variables reliability, is applied. In this method, t-statistic of ADF test compares the related delay variable with MacKinnon critical values. If value of the obtained t is less than critical values, the related variable is reliable. Examination of reliability by Dickey – Fuller unit root test has been carried out via EViews software. To determine the long-term relation among research variables, ARDL model has been used via Microfit software.

4.1 Pearson Correlation Coefficient

Pearson test has been used to determine the significant relation of main hypotheses and correlation coefficients. Table 1 presents the test results.

Table 1. The results of Pearson correlation coefficient test

Independent Variables	Correlation Coefficient	Sig	Result
Tax – economic growth	0.038	0.001	Direct significant relation
Expenditures – economic growth	0.062	0.010	Direct significant relation
Tax – inflation	0.022	0.008	Direct significant relation
Expenditures – inflation	0.074	0.002	Direct significant relation

The coefficients of (economic growth) tax and expenditures equal respectively 0.038 and 0.062, and coefficients of (inflation) tax and expenditures equal respectively 0.022 and 0.074, and their significance level is less than 5%. This indicates that all variables (tax and expenditures) have a direct significant relation with economic growth and inflation and this relation is approved by 99% confidence. Also it is concluded that below subordinate hypotheses are approved.

H_{01}: there is a significant relation between tax and economic growth.

H_{02}: there is a significant relation between government expenditures and economic growth.

H_{03}: there is a significant relation between tax and inflation.

H_{01}: there is a significant relation between government expenditures and inflation.

4.2 Dickey – Fuller Unit Root Test

The studies reflect that for many economic time series, variables are unreliable. So according to the co-integration theory in the modern econometrics, it is necessary to research whether they are reliable or not. Dickey – Fuller unit root test is one of the most appropriate tests. If the value of t-statistic is less than critical values, one can conclude that the related variable is reliable. To shorten the test process, the results are presented in table 2.

Table 2. The results of Dickey – Fuller unit root test

Variable	Dickey-Fuller Statistic	MacKinnon Critical Value	Result	Degree
D(Economic Growth)	-7.402722	-4.004425	Reliable	I(1)
DD(Inflation)	-5.841399	-4.582648	Reliable	I(2)
DD(Tax)	-7.499792	-4.582648	Reliable	I(2)
DD(Expenditure)	-8.315216	-4.803492	Reliable	I(2)

4.3 Ordinary Least Squares Test

This test has been carried out for two dependent variables of economic growth and inflation separately. The results of calculations by Dickey – Fuller model and EViews software for economic growth and inflation are respectively presented in tables 3 and 4.

T-statistic and coefficients of variables depict that tax and expenditures influence economic growth. So by one unit increase in tax and expenditures, the economic growth is increased by 0.266474 and 2.368926, respectively.

R-squared value equals 0.746917 which indicates that 0.75 percent of changes in dependent variable (economic growth) is explained by independent variables and this shows high explanatory power of the model.

Durbin – Watson statistic rejects the assumption of correlation between model components.

The model high F statistic (97.677780) indicates significance of the whole regression.

Table 3. The results of Dickey – Fuller test for economic growth

Dependent Variable: Economic Growth				
Method: Least Squares				
Sample: 1978 2012				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TAX	0.266474	0.565139	2.011455	0.0210
EXPENDITURE	2.368926	0.230517	2.600430	0.0303
C	17.82544	14.64170	1.217443	0.4422
R-squared	0.746917	Mean dependent var		5.277778
Adjusted R-squared	0.713172	S.D. dependent var		3.967598
S.E. of regression	3.901235	Akaike info criterion		5.711475
Sum squared resid	228.2946	Schwarz criterion		5.859871
Log likelihood	-48.40328	Hannan-Quinn criter.		5.731937
F-statistic	86.291639	Durbin-Watson stat		2.193373
Prob(F-statistic)	0.003694			

Table 4. The results of Dickey – Fuller test for inflation

Dependent Variable: INFLATION				
Method: Least Squares				
Sample: 1978 2012				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TAX	3.686141	1.142118	-3.227460	0.0121
EXPENDITURE	1.240751	0.535839	-2.315527	0.0493
C	133.3544	34.48687	3.866817	0.0048
R-squared	0.884487	Mean dependent var		27.36364
Adjusted R-squared	0.605609	S.D. dependent var		11.75817
S.E. of regression	7.384194	Akaike info criterion		7.063561
Sum squared resid	436.2106	Schwarz criterion		7.172078
Log likelihood	-35.84959	Hannan-Quinn criter.		6.995157
F-statistic	97.677780	Durbin-Watson stat		2.076008
Prob(F-statistic)	0.009910			

T-statistic and coefficients of variables depict that tax and expenditures influence inflation. So by one unit increase in tax and expenditures, inflation is increased by 3.686141 and 1.240751, respectively.

R-squared value equals 0.884487 which indicates that 0.88 percent of changes in dependent variable (inflation) is explained by independent variables and this shows high explanatory power of the model.

Durbin – Watson statistic which equals 2.076008 and is between 1.75-2.25 rejects the assumption of correlation between model components.

The model high F statistic (86.291639) indicates significance of the whole regression.

4.4 Autoregressive Distributed Lag Estimates (ARDL) Test

ARDL method was offered by Hashem Pesaran and colleagues in 1996 to determine the co-integration relation among variables. Unlike Johansson method, there is no need to know co-integration degree of model variables in this method. Besides, the number of co-integration vectors is specified. Since this paper seeks to investigate the long-term relation among variables with regard to their different co-integration degree, the best model with appropriate lag was estimated by ARDL method and using Microfit 4 software and Schwarz-Bayesian criterion. Schwarz-Bayesian criterion saves the number of lags. Therefore, estimation will enjoy more degree of freedom. The results of calculation are presented in tables 5 and 6.

Table 5. The results of ARDL test for economic growth
Autoregressive Distributed Lag Estimates
Selected based on Schwarz Bayesian Criterion

Dependent variable is Economic Growth
33 observations used for estimation from 1978 to 2012

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
Tax	.29854	.29137	1.0031 [.027]
Expenditure	2.00526	.29804	1.0129 [.032]

The calculations reveal that prob. of all variables is less than 0.05 and there is a significant relation between independent variables and economic growth in long term. As seen, coefficients of tax and expenditure have a direct relation with economic growth in long term. That is, by one unit increase in the economic growth in long term, tax and expenditures are increased by 0.29854 and 2.00526 units, respectively.

Table 6. The results of ARDL test for inflation
Autoregressive Distributed Lag Estimates
Selected based on Schwarz Bayesian Criterion

Dependent variable is Inflation
33 observations used for estimation from 1978 to 2012

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
Tax	3.68614	.29137	1.0031 [.027]
Expenditure	1.82456	.29804	1.0129 [.032]

The calculations reveal that prob. of all variables is less than 0.05 and there is a significant relation between independent variables and inflation in long term. As seen, coefficients of tax and expenditure have a direct relation with economic growth in long term. That is, by one unit increase in the inflation in long term, tax and expenditures are increased by 3.68614 and 1.82456 units, respectively.

5. Conclusions

This paper aims at studying the relation of fiscal policies by using two variables of tax and expenditures with economic growth and inflation during 1978 to 2012. Pearson correlation coefficient test has been used to determine the relation between independent and dependent variables. Also by using ordinary least squares model, reliability of variables (economic growth and inflation) have been tested and their long term relation has been measured by ARDL method. The main result of this paper is approving the main hypothesis indicating a direct significant relation of fiscal policies with economic growth and inflation. The subordinate hypotheses have all a direct significant relation with economic growth and inflation.

The results suggest that,

1. Calculations of Pearson correlation coefficient test show that there is a significant relation between independent and dependent variables.
2. The results of ordinary least squares method reflect that tax and expenditures influence the economic growth. Furthermore, 0.75 percent of changes in dependent variables are explained by independent variables and this represents high explanatory power of the model. The assumption of correlation among the model components is rejected and the whole regression is significant.
3. The results of ARDL method reflect that among tax and expenditures, expenditures play a more effective role in the economic growth of Iran in long term and the effect of tax on economic growth has a very weak coefficient. Also among tax plays a more effective role in inflation in Iran and the effect of expenditures has a lower coefficient.

- Suggestions

Theoretical and experimental studies indicate the relation of fiscal policies with economic growth and inflation in different countries. With regard to the economic conditions and financial markets and diversity of its tools in some countries, this relation has been estimated direct or reverse. Although activity of financial sector in Iran has been developed in the related period in terms of size and activity and its importance has been increased, the fluctuations of inflation and economic growth reflect lack of integration of fiscal policies or lack of consistency of these policies with long term plans of economic growth and inflation reduction in Iran. So it is suggested,

1. To guide fiscal policies towards a way in which we witness more economic growth in the industry and agriculture by reducing taxes. On the other hand, reduction of taxes increases people economic power and incentive policies may guide them towards saving, financial markets and productive investments.
2. To stimulate and accelerate the construction projects and the country infrastructures by increasing government expenditures (with short-term refunds) in fiscal policies. Also proper policy-making in this sector makes construction and current expenditures enjoying a sustainable balance consistent with the society needs. As a result of such a balance, the formula expenditures + savings (bank, bonds, factories stocks, etc.) will gain over time its position in all aspects of people life.

References

1. Akbarian, Reza, Heidaripour, Mohsen, 2009, A study on the effect of financial market development on the economic growth in Iran during 1966-2007, Eghtesadi Bulletin, No. 3, pp. 43-63.
2. Akbarian, Reza; Nejati, Mehdi, 2006, A study on the relation between development of financial market and economic growth with a collective approach, Monetary and Banking Research Center, Central Bank of Islamic Republic of Iran.
3. Asari, Abas, et al., 2008, Development of fiscal policies and economic growth, Tahghighat-e Eghtesadi Journal, No. 82, pp. 141-161.
4. Folster, Stefan, Magnus, Henrekson, 2001, "Growth Effects of Government Expenditure and Taxation in Rich Countries", European Economic Review, Vol.45, No.8, pp.1501-1520.
5. Ghali, K. H., 2008, Financial Development and Economic Growth, Review of Development Economics, 3 Issue 3, 310-322.
6. Gold and Colb, 2005, Culture of social sciences, translated by Mohammad Javad Zahedi, Maziar Publication, second edition, pp. 278-279.
7. Hao, C., "Development of Financial Intermediation and Economic Growth: The

Chinese Experience"., China Economic Review, Vol. 17, (2006): 347-362.
8. Kazerouni, Reza, 2003, The relation between financial development and economic growth – Iran experiences, Monetary and Banking Research Center, Central Bank of Islamic Republic of Iran.
9. King, Robert G. and Levine, Ross, 1993, Financial Intermediation and Economic Development, Colin Mayer and Xaviervives, London: Centre for Economic Policy Research, 89-156.
10. Komeijani, Akbar, Seifipour, Roya, 2006, A study on effects of financial repression on the economic growth in Iran, 17 Quarterly Journal, economic research, p. 46.
11. Liang, Q. & J. Z. Teng, 2006, "Financial Development and Economic Growth, Evidence from China"., China Economic Review, Vol. 17, pp. 395-411.
12. Liu, W. C. & C. M. Hsu., 2006 "The Role of Financial Development in Economic Growth: The Experiences of Taiwan, Korea, and Japan"., Journal of Asian Economics, Vol. 17, pp. 667-690.
13. Mitchell, Daniel, 2005, "The Impact of Government Expenditures on Economic Growth", Federal Bank, Working Paper, No.345.
14. Naderi, Morteza, 2003, Financial development and economic growth, occurrences of financial crisis and reasons of selecting a proper financial system, Monetary and Banking Research Center, Central Bank of Islamic Republic of Iran.
15. Shafiei, Afsaneh, Tashkini, Ahmad, Borumand, Shahzad, 2006, Testing the effect of fiscal policy on the economic growth, Economic Research, No. 23, pp. 81-112.
16. Stiglitz, J, 1994, the Role of the State in Financial Market, Supplement to World Bank Economic Review and World Bank Research Observer, 19-27.
17. Tari, Fathollah, Tari, Rasoul, 2005, A study on the effect of expenditures and taxes on the economic growth of OPEC countries, Economic Bulletin, No. 16, pp. 153-181.
18. Torki, Leila, 2003, Development of financial markets and its effect on the economic growth, thesis, Shiraz University.

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