Investigation of Foreign direct investment impact on Iran's government budget deficit

Samad Maleki

M.Sc. of Economic Sciences (corresponding author)

Abstract

If there is a correct arrangement and budgetary discipline in government funding, government spending in the realm of strategic and fundamental imperatives can lead to a protective effect; This means that any increase in government spending as a supplement and infrastructure, increases foreign direct investment. For this, the present thesis examines relationship between deficit and foreign direct investment in Iran. This has compounded importance of government's focus on foreign direct investment in recent years to offset state budget deficit. In this paper, proposed model is used to assess relationship between foreign direct investment and short and long term impacts of the budget deficit for the years 1997-2014 (in quarterly manner). According to results, effect of short-term dynamic model estimate on government deficit variable foreign direct investment is negative and significant. Effect of variable GDP on budget deficit is negative but statistically significant.

Keywords: State budget deficit - economy openness degree, foreign direct investment economy - GDP – ARDL

JEL classification: C33, C36, D31, F43, E40

1-Introdcution

In recent decades one of the economic issues of many countries has been budget deficit. This problem is more widely spread in developing countries because these countries are deprived of an efficient private sector. This expansion of government activities and increasing the share of government in the economy leads to such countries; so that government consumption and investment spending accounted for a major proportion of the total demand. In contrast, the revenue side, the government does not have resources enough money to account for much costs incurred. Such a process results in these countries is nothing other than a persistent budget deficit (Kachumesqali, 2012). In different periods, the functions of government and its role in economic activity is not the same obligation of the state according to changes in the economic and social life of the community has changed and at each stage of the development of a new series of specific tasks and the governments and in addition, social and political philosophy that prevails in society, governments will determine the type and scope of tasks. The governments are more involved in their community and economic affairs, as well as revenues and government spending is more important and highlights the role of the state in the economy and the resulting investigation about the budget (especially the deficit) is important. A variety of factors can affect the important factors that affect it. If the government to finance its budget deficit in this situation rely on financial resources, will cause inflation this lack of internal balance be transferred to the outer part of the economy because the rise in government spending in the first stage in the growth of aggregate demand. However, the rise in government spending on the supply side of the country due to structural problems of the economy and inelastic supply, the increase did not result in supply. The pure result of these effects is inflation in the economy. In such a situation, increasing imports and decreasing exports. As a result, the imbalance in the state budget transferred to the outside, causing the current account deficit in these countries (Zavareian, 2012). In these circumstances the government to finance its spending resorted to issuing paper money, obtaining direct taxation and indirect borrowing from the banking system (internal or external) to which the interest rates and general price level increases. By raising interest rates tend to strengthen the savings or non-productive activities and thus cancel out the private sector from its investment activities. In fact, the expansionary fiscal policy of the government influence on improve their economic conditions and cause leaves no substitution effect on

investment spending. Of course, structuralism economists believe that if the right mix of government budget and budget discipline exist, government spending in the realm of strategic imperatives and Immunotherapy can lead to a protective effect; this means that the increase in government spending as a supplement and infrastructure, increase foreign direct investment. The purpose of this paper is to identify the impact of fiscal imbalance on foreign direct investment.

2-Literture review

One way to meet budget deficit is foreign direct investment. Foreign direct investment in the host country would transfer its technology and production efficiency is increased. With the boom in production and improve the economic environment, as a result, the amount of taxes and received by the government through fiscal policy to increase productive sectors. This increases government revenue and reduces the deficit in the economy. (Oskoee, 2009)

FDI affect budget deficit as follow:

By increasing foreign direct investment, transfer of technology to the host country is facilitated and as a result, the period of time thereby increasing production efficiency in the economy is the guest country. By increasing the productivity of capital and labor in the past, increased economic output and consequently the amount of state tax revenue from businesses will be increased. Increase in government tax revenues in fiscal year the budget deficit will be reduced. According to the reference model and role of foreign direct investment in the economies of least developed countries and as a result of its impact on government revenues, can be affected by the deficit of foreign direct investment is realized. Since the relationship between macroeconomic variables such as government deficits and money growth, inflation, foreign direct investment and economic growth is one of the most important issues that will be examined in the macro economy, in many countries, a deficit fiscal policy as one of the tools they will be used. Since the allocation, distribution and stability known as the government's economic tasks, thus one of the tools to achieve this goal the state budget. Ashvar (1985) states that the increase in public investment, a level that is higher than the national rate of capital accumulation are considered private firms, increases. Thus, government capital spending may support consumer spending on capital goods. On the other

hand, the state capital, especially capital infrastructure such as highways capital in the external sector have a complementary relationship. Therefore, more public investment may increase the marginal productivity of foreign direct investment and lead to a protective effect. According to the theory of substitution and complementarity, there are different sets of government spending may have different effects on foreign direct investment. Keynesian economics in its analysis to the demand for particular attention, believe that the criterion of marginal efficiency of capital is a very important role in investment decisions. Keynesian analysis, as the real rate of return on investment, the discount rate is the discounted value of expected earnings net of investing in a particular project at a cost equal to the initial investment in that project. The rate is marginal efficiency of investment.

Landau (1983) and Cameron (1982) in cross sectional and time series data on Cooperation and Development have shown that government spending by reducing private-sector investment, lowers economic growth.

Gus and Coford (1984) used annual data Granger causality test and the 17 countries of Organization for Cooperation and Development for the period 1949 -1981 found that budget has not affected deficit, inflation, GDP and private sector investment. Bayram and Ward (1993) evaluated relationship between private and public investment for 25 OECD member countries. Based on the results in 24 of the 25 countries, there has been a correlation between government spending and investment. Among them, in 19 countries have strong negative relationship between these two variables together. Ternosfki and Fisher (1995) government spending was considered as productive capacity in the context of a general equilibrium model. On balance, government spending had a positive effect on private sector investment. Ahmed and Miller (2000) used Miller and Rosique (1997) method to introduce the regression model equations have budget deficit. The empirical findings of this paper, both the traditional view (with emphasis on substitution effect) and non-traditional perspective (with an emphasis on protective effect) were confirmed. Wang (2003) in his paper empirically evaluated effects of various forms of government spending on private sector investment in Canada using annual data from 1961 to 2000 during the period. The study was conducted using convergence and error correction approach. The results of this study, the positive effect of government spending on education and health and government capital expenditure and

infrastructure had a negative impact on private sector investment. Jalali Naini and Khiabani (1997) used an econometric model and by taking advantage of the acceleration to analyze the impact of macroeconomic variables on the trade balance. The results indicate that this model, increasing the size of government spending, especially in construction costs has a positive effect on the demand for private sector investment. Based on the results Parvin and Quli Begloo (2001) in a study used econometric models to assess relation between private sector investment and government expenditure. Private sector investment to the credit of the banking system relative to the volume of supply, positive sensitivity is high. Increased government spending to public investment without interruption and immediately had a positive effect on private sector investment. Abdoli (2001) evaluated influence of government funding private investors, the most important factors in private investment in developing countries, governments, financial constraints resources, foreign investment and other factors. According to other research, the development of the state budget and its components (long-term, short term, infrastructural and non-infrastructural, expectations) had a positive effect on private sector investment, but the severity of these effects have been different. Asali (2004) studied effect of government spending on economic growth in a dynamic model. The study of equations for important variables such as production and investment diminished and demand for labor was. Based on model assumptions in terms of economy, increasing investment and production within budget cuts and labor demand. Ghatmiri et al (2006) evaluated effect of government spending on GDP and sources of funding in Iran's economic growth. According to some research results a positive relation between GDP and government expenditure during the period under review (1967-2003) and long-run equilibrium relationship between government spending and economic growth was found. Studies in the field of foreign direct investment and the factors impacting it was, each economic variable, positive and negative effects on foreign direct investment. But in most previous studies observed that the budget deficit and government spending associated with foreign direct investment, and variable political decision by government spending and budget deficits in the period before and on foreign direct investment were determinant.

3-Model Estimation

If there is a correct arrangement and budgetary discipline in government funding, government spending in the realm of strategic and fundamental imperatives can lead to a protective effect; This means that any increase in government spending as a supplement and infrastructure, increases foreign direct investment. For this, the present thesis examines relationship between deficit and foreign direct investment in Iran. This has compounded importance of government's focus on foreign direct investment in recent years to offset state budget deficit.

Research Model

According to theoretical budget deficit and taking into account the empirical studies regarding the relationship between foreign direct investment and government deficits, such as the Suchismita & JHA, Sudipta (2012)[1] empirical model was presented as follow:

$$BD = f(FDI, GDP, LP, INF, RER, Trade)$$

BD: Government Budget deficit

LP: Labor production

INF: Inflation

GDP: Gross domestic product (% GDP Growth)

FDI: Foreign direct investment, net inflows (% of GDP)

Trade: Trade (% of GDP)

RER: Real exchange rate

In this paper, using the proposed model, the relationship between foreign direct investment and short and long term impacts of the budget deficit for the years 1997-2014 (quarterly) was investigated.

Results of reliability test

Research showed that about many economic time series, the variables are non-stationary (non-reliable). Therefore, in accordance with the co-integration or convergence[2] theory in

[1] BOSE, Suchismita & JHA, Sudipta, CRISIS EXACERBATED FISCAL DEFICITS AND POSSIBLE IMPACT ON FDI FLOWS: AN EMPIRICAL ANALYSIS OF EMERGING EUROPE AND INDIA

modern econometrics is essential to the reliability of the (stationary) or non-reliability (to measure the actual) of research. Phillips-Perron unit root test, this test is most appropriate. Phillips-Perron test than the static tests of benefits it can be noted that such there is no need to determine the optimal lag by the researcher. Here reliability and viability test by unit root test (Unit root test) Phillips - Perron for individual variables in the control (non-differencing), followed by an order of differencing is discussed.

Table 1: Phillips-Perron unit root test for the 1st level and after one level differencing

1st Probability level			*Probability at level*			*variable*
prob	**Test critical values %۵**	**Adj. t-Stat**	**prob**	**Test critical values %۵**	**Adj. t-Stat**	
0.00	-2.90	-4.91	0.30	-2.90	-1.94	BD
0.00	-2.90	-3.71	0.51	-2.90	-1.51	FDI
0.00	-2.90	-9.30	0.70	-2.90	-1.11	GDP
0.00	-2.90	-3.68	0.71	-2.90	-1.09	LP
0.01	-2.90	-3.32	0.21	-2.90	-2.17	INF
0.00	-2.90	-3.65	0.52	-2.90	-1.50	RER
0.04	-1.96	-1.96	-2.58	-2.90	1.44	TRADE
Reference: research findings						

[2] Convergence means long-term equilibrium relationship between the variables time series

Phillips-Perron test the primary hypothesis of the unit root, so the Phillips-Perron test must obtained probabilities of below 5% (95% confidence level chosen) to the initial hypothesis is rejected and the opposite hypothesis is to be accepted that represents the non-root units and if the variables are not static level must be differencing variable to be reliable.In accordance with the table above and the resulting probability of all variables of the model are not sustainable in the LEVEL and then once differencing are valid.

Co-integration test

Although reliability of the time series variable-based differencing is met, but long-term relationship between the varying levels of valuable information will be lost. Econometric specialists trying to solve this problem led to the emergence of a new method called co-integration or integration method, to be able to have no fear of spurious regression, model coefficients based on the varying levels respectively. The economic concept of co-integration is that when two or more variables, time series based on the theoretical foundations linked together to form a long run relationship - although it may be non-stationary time series with trend - but over time each to pursue well so that the difference between them was steady. Thus the concept of co-integration of the associate. Given the variables in the model time series are stationary at a time differencing is the need for co-integration test. One way to find a long-term relationship between the variables in the model is Johansson Julius method -. Integration is necessary to review the test results presence or absence of trend and intercept the co-integration vector, pattern selection, which in this context is five patterns: The first pattern, without intercept and process time; the second model, the intercept bound and without the time; third model, the intercept non-binding and without the time; the fourth pattern, origin unrestricted and when the tying and fifth model, the intercept unrestricted and bad time bound process. The five most constraint model (model I) to non-constraint (model V) is estimated figure for variables. The null hypothesis of the existence of co-integration vector against a vector of integration, followed by a maximum of one vector of co-integration hypothesis is tested against the two brothers. The test for the presence of n-1 (n number of variables) vector integration will continue. Summary of test results regarding the number of co-integration vector based on the five patterns are listed in Table 2. As can be seen, the null hypothesis of the existence of co-integration vector against a vector of integration between

the variables in all models has been rejected, in all models, there are at least 3 co-integrating vector among the variables were studied.

Table 3: results of co-integration vector test

Model 5	Model4	Model3	Model2	Model1	**model**
5	5	4	3	3	**Effect testing**

However, after evaluating validity and co-integration among the variables of the model to estimate the model Vector Autoregressive was used.

Estimation of budget deficit dynamic model using ARDL model to short-term estimate

At first budget deficit dynamic model is as follow. Results are shown below:

Autoregressive Distributed Lag Estimates
ARDL(2,0,0,2,0,2,2) selected based on Schwarz Bayesian Criterion

Dependent variable is BD
70 observations used for estimation from 1376Q3 to 1393Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
BD(-1)	-1.6274	.10977	-14.8255[.000]
BD(-2)	-.72945	.11030	-6.6134[.000]
FDI	-214.4087	104.0	-2.05735[.037]
GDP	-7161.5	36518.6	-.19611[.845]
LP	1078710	141901.9	7.6018[.000]
LP(-1)	-2079432	282283.6	-7.3665[.000]
LP(-2)	-969495.0	186750.4	-5.1914[.000]
INF	1087.7	314.9	3.45832[.001]
RER	-128962.0	26804.1	-4.8113[.000]
RER(-1)	258103.1	53581.1	4.8171[.000]
RER(-2)	133641.3	34263.2	3.9004[.000]
TRADE	-262998.1	48882.8	-5.3802[.000]
TRADE(-1)	-527765.3	102491.5	-5.1494[.000]
TRADE(-2)	-264427.7	69556.4	-3.8016[.000]
INC	-24134.1	203694.4	-.11848[.906]
T	-4.3690	112.0212	-.039001[.969]

R-Squared	.97575	R-Bar-Squared	.96902
S.E. of Regression	2582.7	F-stat. F(15, 54)	144.8829[.000]
Mean of Dependent Variable	-16341.0	S.D. of Dependent Variable	14673.4
Residual Sum of Squares	3.60E+08	Equation Log-likelihood	-640.2036
Akaike Info. Criterion	-656.2036	Schwarz Bayesian Criterion	-674.1916
DW-statistic	2.1222		

In accordance with a short-term dynamic model, impact of foreign direct investment on government deficit variable, is negative and significant. The variable impact on GDP is negative but statistically significant of funding deficit.

VECM test

Co-integration relationship between a set of economic variables provides a statistics base for model corrections. These patterns have become increasingly famous in experimental work. The main reason for the reputation of correction models (ECM) is that short-term volatility variables to their long-run equilibrium values are associated. When two variables Y1 and X1 have cointegration equilibrium relationship between them is a course in the short term there may be an imbalance of ECM. Shows the speed of adjustment towards equilibrium is expected to be negative and statistically. BD test result vector error correction for the dependent variable in Iran is as follows.

Table 4

Error correction model for variable (BD)			
Abbreviation	**CV**	**T statistic**	**Probability level**
ecm(-۱)	-0.10209	-2.6516	0.010
Source: author research			

According to the index ecm (-1) can be stated that the country's budget deficit pattern in each period by 10 percent from imbalance tends to the long term balance. Reason for this tendto balance the country's budget deficit model the long run, is that the factor ecm (-1) is negative, and smaller than one and is statistically significant.

Long term test using Banerjee, Dolado statistic

After estimating ARDL, following hypothesis is tested

$$\begin{cases} H_0: \sum_{i=1}^{k} \varphi_i - 1 \geq 0 \\ H_1: \sum_{i=1}^{k} \varphi_i - 1 < 0 \end{cases}$$

The null hypothesis is the lack of co-integration or long-term relationship. a test was developed by Banerjee et al, , A number of factors have lagged dependent variable coefficients deductions and the standard deviation divided by the sum of the test statistic of the t-statistic is obtained.

$$t = \frac{\sum_{i=1}^{p} \widehat{\varphi_i} - 1}{\sum_{i=1}^{p} S_{\widehat{\varphi_i}}}$$

If the absolute value of t-statistics obtained from the absolute critical values provided by Banerjee, Banerjee, Dolado and MasterCard at 95% larger, reject the null hypothesis that

there is no co-integration and long-term relationship will be accepted. Computational statistics obtained 15.90- times. Because this number (15.90-) the absolute value of the critical value Banerjee table, Banerjee, Dolado (3.27) is higher. Therefore, the null hypothesis is rejected address the long-term relationship.

The statistic is as follow:

$$\frac{(-1.62-0.72)-1}{0.10+0.11}=5.11$$

Results of long term budget deficit dynamic model

After ensuring the long-term equilibrium relationship between variables can be estimated using the software Microfit long-term research model (independent variables impact on the country's budget deficit) did not result can be seen in the following table:

Table 5

Estimated Long Run Coefficients using the ARDL Approach
ARDL(2,0,0,2,0,2,2) selected based on Schwarz Bayesian Criterion

Dependent variable is BD
70 observations used for estimation from 1376Q3 to 1393Q4

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
FDI	-2100.2	834.3	-2.5173[.002]
GDP	-70147.4	361121.0	-.19425[.847]
LP	-305878.6	128547.4	-2.3795[.006]
INF	10653.9	32361.2	.32922[.743]
RER	44080.0	101752.7	.43321[.667]
TRADE	-3325.1	146.7	-22.607[.000]
INC	-236396.1	2001060	-.11814[.906]
T	-42.7943	1100.9	-.038871[.969]

According to long term budget deficit dynamic model, foreign direct investment on budget deficit is negative and significant in long term

Suggestions:

Given negative impact of foreign direct investment on government deficit it is recommended to economic agents reduce the budget deficit and to balance the state budget, provide ground for foreign investment and entry of foreign investors to reduce the size of government and the transfer of technologies-from advanced countries face and to provide improved economic growth and development.

Literature cited:

Parvin, Soheila and Mohammad Reza Qoli Begloo (2001). Effects of financing government expenditure on macroeconomic variables of Iran, programs and budgets, numbers 71 and 72: 0.3 to 43:

Jalali Naini, Sayyid Ahmad and Nasir Khiabani (1997) The effect of macroeconomic variables on Iran's trade balance. Journal of Commerce, 54-1

Zibaee, H. (2004) model for investment forecast economic sectors of Iran, Journal of Planning and Budget, 87, 77-57

Abdoli, Ghareman (2001) private sector investment affected from the state budget's construction budget, schedule and budget, 65 and 66, 47-29

Ahmad, H & S.M. Miller. (2000). Crowdoing-out and Crowding-in Effects of the Components of Government Expenditure. Western Economic Association International. 18 (1): 124-133.

Amuzegar, S. (1993). Iran's Economy under the Islamic Republic. I.B. Tauris and co. Ltd.

Aschauer, D.A. (1985). Fiscal Policy and Aggregate Demand. American Economic Review, 75 (1): 117-127.

Aschauer, D.A. (1989). Does Public Capital Crowd out Private Capital? Journal of Monetary Economics, 24: 171-188.

Bairam, E. & B. Ward. (1993). The Externality Effects of Government Expenditure on Investment in OECD Countries. Applied Economics, 25: 711-716.

Bernheim, B.D. (1989). A Neoclassical Perspective on Budget Deficits. Journal of Economic Perspectives, 3: 55-72.

Cameron. D. (1982). On the Limits of the Public Economy. Annuals of the Aacademy of Political and Social Science, 459: 46-52.

Eisner, R. (1989). Budget Deficits: Rhetoric and Reality. Journal of Economic Perspectives, 3: 73-93.

Guss, G & K. Koford. (1984). Inflation, Recession and the Federal Budget Deficit (or Blaming Economic Problem on a Statistical Mirage).

Policy Science, 17: 385-402.

Landau, D. (1983). Government Expenditure and Economic Growth: A Cross-Country Study. Southern Economic Journal, 49(4): 783-786.

Turnovsky, J. & W.H. Fisher. (1995). The Composition of Government Expenditure and its Consequence for Macroeconomic Performance. Journal of Dynamic and Control, 50: 747-786.

Wang, B. (2003). The Long Run Effect of Government Expenditure on Private Investment in Canada. Journal of Applied Economic, 2(4): 7-19.