Impact of Budget Deficit on Inflation and Unemployment in Iran's Economy

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ABSTRACT

Since the objective of policy making is reaching the proper level of Macro economy variables, governments try to remove the barriers on the way of their development, the most important variables of Macro economy indicating a government growth are general level prices, inflation and unemployment rate. Achieving a desirable rate of inflation and unemployment is only possible by a proper policy making. The main instrument that governments own for such a policy making is budget. It is attempted herein to study the effect of budget deficit on inflation and unemployment. So, the theoretical structure of the research is based on Keyns theory, and three models are applied to estimate required functions and multi-variable linear functions which measure the effect of each independent variable on dependent ones. The findings show that budget deficit has a meaningful effect on inflation and unemployment in Iran economy.
KEYWORDS: Macro economy; budget deficit; inflation; unemployment; Iran.

INTRODUCTION

In view of economic Macro Policy objectives, economists emphasize on some issues in most such as full employment, fixed price (inflation control), righteous income distribution, and perpetual economic growth. Due to critical effect of inflation on economy, controlling this issue is one of main objectives of economic macro policy for economists. (Fischer et al, 2002, 837-880) Budget deficit means planned exceeding of expenditures to income. This status now exists in most countries and through which the total demand and affordability increase in national economy. This policy was introduced at the time of big crisis for the purpose of promoting demand and employment at the time of keyns. Such a policy is applied in developing countries because of non investment of private sector and total demand shortage. (King and Plosser, 1985, 147-196) Economic phenomena of each country jointly and separately have the traits of study and revision. The existing research considers 2 important issues of inflation and unemployment a significant Macro economy factors which is influenced by budget deficit and then the way of financial supply. After introduction, the theoretical concepts are studied, then the previous surveys are reviewed, and finally the hypothesis is tested by econometric methods.

Theoretical concept
Today, monetary policy is applied for making decision about the appropriate amount of money or the appropriate rate of money growth to influence economic activities (e.g production, employment,...) (Moraseli, 2005, p189-193). The name of Milton Freedom is integrated with monetary economy theory. Freedom says: 'inflation is basically a monetary phenomenon which is created by increasing money volume faster than production volume. Outstanding change in prices or nominal income in most likely the reason of change in nominal money supply. (Ahmadi Kashani, 2010,12) Based on a dynamic systematic analysis, the relation between budget deficit, money supply, and inflation can be analyzed as follows: increase in government budget deficit leads to more debts for public sectors, and further increase in monetary base balance, and finally more money supply. Now, considering the positive relation between general inflation and liquidity, the money supply increase will result in more general inflation. One the other hand, price growth also decreases actual value of cabinet expenditure in the next run, and enforces the cabinet to compensate such a decrease by increasing the figurative expenditure increase (budget deficit) and inflation. .(Piontkivsky, 2001) Inflation is a situation where general level of prices is continuously growing. An important point in inflation is time and continuation of general price level (Tafazoli, 1997, p.431).

Keynes believes inflation takes place when consumables demand is more than their supply. This exceeding demand makes an inflation gap so that the price goes up to the level of filling the gap. The distinctive point between classic economists (advocates of money value theory) and Keynzians changes have no effect on real economic

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variables; production is placed in full employment level. So, production is determined according to real economic factors. But in Keynzian model, money can affect production (Tashkini, 2004. P.10). its supply as an inflation reason has drawn a great attention since freedman's approach (1968). In the literature, the relation between budget deficit and inflation is important in many respects: budget deficit increases total expenditure and price level because economy involves in full employment. (Dwyer, Gerald P. 1982, 315-329) Keynzian approach supports the positive relation between budget deficit and actual demand. In economic literature there is a theory called demand management policies about unemployment which is mainly based on keynz theory. It states that unemployment can be effected by increasing total production demand or increasing money supply many economists believe when economy confronts high rate of unemployment and capital exploitation is low, growth in total production demand usually leads to unemployment reduction, and decrease in demand usually leads to higher unemployment. (World Economic Outlook, 1995, 74–75) Low inflation rate is an objective of economic poly like low unemployment rate.

Revision of previous surveys

Goharian and Nazari's survey (2002) reveals a controversial relation between liquidity and employment in Iran economy. Jafari Samimi etal (2006) found la long term negative relation between budget deficit and economic growth and between inflation and economic growth, while a positive meaningful relation exists between inflation and growth in money volume and oil income-Bonato (2007) concluded that money growth rate leads to inflation even in short term. Monjazeb (2006) emphasizes neutral effect of money on production in long term. It is also focused that inflation has a neutral affect on production as a nominal variable, and short term money growth really affects inflation.

Harberger (1963) starts in his research on Chil'e economy that a direct relation exists between general price level and production level, and money growth increases general price level. Aghevli and Mohsinkhan's survey (1987) on Indonesia economy indicates that money extension is affected by inflation, rate through cabinet budget, and a cause-effect relation between money supply and price level is acknowledged Vamvoukas (2000) states there is a positive meaningful relation between actual GDP, money demand, budget deficit, money demand, budget deficit, and inflation rate in Greece economy. The findings of Salman Saleh (2003) show that according to Keynzian model there is a positive meaningful relation between budget deficit and interest rate, and budget deficit may lead to inflation because of national income deficit and money supply increase. Boariu and Bilan (2007) state in their research on the effect of financing budget deficit in contemporary economy that if governments seek supplying their budget deficit through increasing money supply, the reason will be higher inflation rate.

Makochekanwa's survey on Zimbabwae economy (2008) reveals a positive relation between budget deficit and inflation because of increase in monetary base. Carp and Vasiliu's experimental study throughout Europe (2010) shows if investment rate is fixed, and average budget deficit decrease of 0.673 percent will lead to one percent increase in unemployment rate. Gherghina et.al (2010) compares Romanian economy with other members of EU and finds a decrease of budget deficit policy in 2000 which has led to inflation rate reduction proper with budget deficit reduction. Rana Ejaz Ali Khan et al (2011) survey on Pakistan economy reveals more unemployment, unbalanced income and increased inflation due to budget deficit reduction. Titan et.al (2011) state in their survey on Romania economy that budget deficit or economic activities reduction is associated with more inflation and unemployment, and public income reduction causes more, inflation unemployment.

METHODOLOGY

The existing research is applied in view of scope, and retrospective and deductive in view of methodology. The theoretical structure of the research is based on Keyn's theory. Based on case studied data collected in time series, the hypothesis is defined as mathematical equations and analyzed by statistics. Here, 3 models for estimating required functions and multi-variable linear functions were applied to measure the effect on dependent ones. To estimate the considered parameters, OLS, and LS square minimum methods were used together with Eviews 5/1 and SPss17 programs. The tables show the result of linear regression, correlation coefficients, Watson Camera test statistic, Fischer test statistics, T Test statistics. Variance analysis, and other statistics and coefficients which shows insurance level of 95% or 0.05 error between budget deficit and inflation unemployment. The models are:

1-   Vamvoukas relation of budget deficit and money demand (2000).

$Mt = \beta_0 + \beta_1 RGNP + \beta_2 INTR + \beta_3 BDFF + \beta_4 INFL + \beta_5 GF + \beta_6 G + \beta_7 Mt\text{-}1 + U_t$

Mt= overall definition of money with actual prices;
RGNP= GDP growth to fixed prices
INTR= average of one-year-bonds nominal interest rate
BDFF= level of families general expenditure

INFL= calculated inflation rate through consumer price index

GF= Goods and services purchase by government with fixed price

GT= remitted payment with fixed price by government

Mt-1= one-year pause money

Ut= Model disorder sentence

2-   Azizi (2006) survey on the relation between budget deficit and inflation.

$$Y= \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \beta_5 X5 + U_i$$

CPI=2/63+1/01CPI(-1)–0/002BD(-1)+0/0003YO(-1)+0/01GM– 1/6DUM

3-   The relation between economic growth and budget deficit; Nelson and Singh's relation between inflation unemployment; in Jafari Samini et.al (2006).

gGDP=a0+algBD+a2GgTR+A3gPUIN+a4gPVIN+a5gEMP+a61NF+U

g GDP: economic growth (GDP changes with base and fixed price (1997)

gBD= growth in budget deficit

gGTR= growth in government tax revenue

gPUIN= growth in public investment expenses

gPVIN= growth in private investment

gEMP= growth in employment

INF= inflation

The method of data collection, research domain, sample society and volume

        Secondhand data were the economic data gathered in Central Bank, Statistics Organization, and Management and Planning Organization. Data banks, computer networks, and websites of Statistics Organization, and Management and Planning Organization Central Bank, were applied. Time domain was (1979-2006), and the effect of budget deficit on inflation and unemployment variables are shown after studying the findings.

Presenting model and defining variables

        Concerning presented theoretical concepts and experimental studies, the considered model is given. Then according to statistics and information, Iran economy is studied and by econometry methods, its relation with budget deficit, inflation and unemployment is estimated and analyzed. The most important factor in Iran economy effecting inflation is the liquidity resulted from government inflation and unemployment. Since the considered estimated function gained necessary validity, it was likely to be affected by some factors such as War (1979-1989). Therefore, chow test was performed on estimated function. So, a function based on war time data and another function based on post-war data was estimated and both of them gained necessary validity. In this research budget deficit, Budget deficit (BD), Inflation rate of last run (INF (-1)), Budget deficit of last run (BD (-1)) and war (Dummy Variable) are independent variables and Inflation rate and UE rate are dependent ones. The proper model in this research between budget deficit and inflation and unemployment is as follows:

1 - INF=F(BD, INF(-1) , DUM) $INF= \beta_0 + \beta_1 BD + \beta_3 INF(-1) + \beta_4 DUM + U_i$

2 - UE= F(BD, BD(-1) , DUM) $UE= \beta_0 + \beta_1 BD + \beta_2 BD(-1) + \beta_3 DUM + U_i$

Table 1- Results of estimating function between budge deficit and inflation

Name	variable	Value of estimated coefficient	Prob
Width from origin	β_0	3/17	0/05
Budget deficit	BD	0/025	0/03
INF rate of last run	INF(-1)	0/023	0/02
Dummy war change	DUM	1/4	0/03
R^2		0/91	
F-Statistic		22/50	0/02
Durbin-Watson stat		1/97	

INF= 3/17 + 0/025 BD + 0/023 INF (-1) + 1/4 DUM

C	BD	INF(-1)	DUM	DW	F	$\overline{R^2}$	R2
T1= 1.76	T2=3.78	T3= -4.83	T4=2.43	1/97	22/50	89	91

According to estimated regression shown on table 1, all parameters coefficient are meaningful (T1 to T4 are all over 2), so the existing regression is efficient and valid. $\overline{R^2}$ and F=22.50 show that estimated model is meaningful and valid. (R^2) coefficient shows that 91% of changes in dependent variable (INF rate) are due to changes in independent variables and the remaining 9% relates to other factors. The above table reveals that if budget deficit increases for 1%, inflation rate will increase for 25%. If inflation rate of last run has an increase of 1%, present inflation rate will increase for 23%. So, there is a direct relation between inflation rate of last run and present run, and the relation has a ratio of 1 to 4. In case of war inflation rate increases up to 1.4% in a run. So, there is a direct relation between budget deficit, dummy variable, and inflation rate.

Table 2- Results of estimating function between budge deficit and unemployment

Name	variable	Value of estimated coefficient	Prob
Width from origin	β_0	2/25	0/002
Budget deficit	BD	-0/13	0/02
Budget deficit of last run	BD(-1)	0/04	0/01
Dummy war change	DUM	0/11	0/04
R^2		0/89	
F-Statistic		37/02	0/04
Durbin-Watson stat		2/02	

UE= 2/25 - 0/13 BD + 0/04UE(-1) + 0/11 DUM

C	BD	INF(-1)	DUM	DW	F	$\overline{R^2}$	R2
46/T1=3	55/T2=4	94/T3=2	13/T4=5	2/02	02/37		89

According to the estimated regression on table 2, all parameters coefficients are meaningful (T1 to T4 are all over 2), so the present regression is efficient and valid. $\overline{R^2}$ and F=37.02. Show that estimated model is meaningful and valid. (R^2) coefficient shows that 89% of changes in dependent variable (INF rate) are due to changes in independent variables and the remaining 11% relates to other factors. The above table reveals that if budget deficit increases for 1%, unemployment rate will decrease for 13%. If inflation rate of last run has an increase of 1%, present unemployment rate will increase for 0.04%. In case of war unemployment rate increases up to 0.11% in a run. So, there is a reverse relation between budget deficit, and unemployed rate.

Research findings
Budget deficit has direct effect on Iran economy.
H0: Budget deficit has no direct effect on Iran economy.
H1: Budget deficit has direct effect on Iran economy.

Variables Entered/Removed[b] (1)			
Model	Variables Entered	Variables Removed	Method
1	BD[a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: INF			
Model Summary[b] (2)				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.821[a]	.674	.012	8.59302	2.038
a. Predictors: (Constant), BD					
b. Dependent Variable: INF					

ANOVA[b] (3)					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	99.737	1	99.737	21.351	.025[0a]
Residual	2141.359	29	73.840		
Total	2241.097	30			
a. Predictors: (Constant), BD					
b. Dependent Variable: INF					

Coefficients[a] (4)					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	19.975	1.755		11.380	.000
BD	7.6355	.000	.211	3.162	.025
a. Dependent Variable: INF					

According to the above table the correlation coefficient value between budget deficit and inflation is 82.1 which show a direct and effective relation between these 2 variables. Moreover, the coefficient 67% shows that 27% of changes in dependent variable are due to changes and effectiveness of independent variable (budget deficit). Considering (T1=11.38) and (T2=3.16), the dependent variable coefficient is confirmed. In addition, according to (sig=0.02) and (sig=0.00) we can say that: "H0: β_1=0" with over 97.5 assurance is rejected. So, budget deficit has a direct effect on inflation.

Budget deficit has a direct effect on Iran economy.
H0: Budget deficit doesn't have a direct effect on Iran economy.
H1: Budget deficit has a direct effect on Iran economy.

Variables Entered/Removed[b] (1)			
Model	Variables Entered	Variables Removed	Method
1	BD[a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: UN			

Model Summary[b] (2)					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.764[a]	.454	-.016	1.76865	1.983
a. Predictors: (Constant), BD					
b. Dependent Variable: UN					

ANOVA[b] (3)						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.652	1	1.652	15.528	.033[a]
	Residual	90.715	29	3.128		
	Total	92.368	30			
a. Predictors: (Constant), BD						
b. Dependent Variable: UN						

Coefficients[a] (4)						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.607	.361		34.896	.000
	BD	9.8286	.000	.134	4.727	.033
a. Dependent Variable: UN						

According to above tables, the value of correlation coefficient between budget deficit and unemployment is 76.4% which shows a direct and effective relation between these 2 parameters. Also, the determination coefficient 45% shows that 45% of changes in dependant variable (unemployment) are due to changing and effectiveness of independent variable (budget deficit). On the other hand, the value of correlation coefficient between budget deficit and unemployment is 73.4% which reveals a direct and effective relation between these 2 parameters. Also the determination coefficient 53% shows that 53% of changes in dependant variable (unemployment) are due to changes and effectiveness of independent variable (budget deficit).

According to the found value of correlation coefficient (76.4) and the value of (T1=34.89) and (T2=4.72), the found coefficient for independent variable (Budget deficit) is confirmed. Also, according to the level of meaningfulness level of (sig=0.03) and (sig=0.00) we can say: the hypothesis "H0: β_1=0" is rejected with more than 96.7% assurance. So, budget deficit has a meaningful (direct) effect on unemployment (budget deficit has a direct effect on unemployment).

Budget deficit has a direct effect on inflation and unemployment in Iran economy.
H0: budget deficit doesn't have a direct effect on inflation and unemployment in Iran economy.
H1: budget deficit has a direct effect on inflation and unemployment in Iran economy.

Variables Entered/Removed[b] (1)

Model	Variables Entered	Variables Removed	Method
1	BD[a]	.	Enter
2	BD[a]	.	Enter

a. Dependent Variable: INF

b. Dependent Variable: UN

Model Summary[b] (2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.811[a]	.656	.812	8.59302	.045	1.351	1	29	.255	2.038
2	.734[a]	.532	.616	1.76865	.018	.528	1	29	.473	1.968

a. Predictors: (Constant), BD

b. Dependent Variable: INF

ANOVA[b] (3)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	99.737	1	99.737	18.351	.025[a]
	Residual	2141.359	29	73.840		
	Total	2241.097	30			
2	Regression	1.652	1	1.652	16.528	.043[a]
	Residual	90.715	29	3.128		
	Total	92.368	30			

a. Predictors: (Constant), BD

b. Dependent Variable: INF

c. Dependent Variable: UN

Coefficients[a] (4)

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	19.975	1.755		11.380	.000
	BD	7.6355	1.478	.211	5.162	.032
2	(Constant)	12.607	.361		34.896	.000
	BD	9.8286	2.079	.134	4.727	.0173

a. Dependent Variable: INF

b. Dependent Variable: UN

According to above tables, the value of correlation coefficient between budget deficit and inflation is 81.1% which shows a direct and effective relation between these 2 parameters. Also, the determination coefficient 65% shows that 45% of changes in dependant variable (inflation) are due to changing and effectiveness of independent variable (budget deficit). On the other hand, the value of correlation coefficient between budget deficit and unemployment is 73.4% which reveals a direct and effective relation between these 2 parameters. Also the determination coefficient 53% shows that 53% of changes in dependant variable (unemployment) are due to changes and effectiveness of independent variable (budget deficit). So, budget deficit has a direct effect on inflation and unemployment.

Based on ANOVA[b] (3) total squares, df (degree of freedom), average squares, and Fischer Statistics (F=18.35) and (F=16.53), and meaningfulness level of regression (0.0250), (0.043) which means the hypothesis 'regression is not meaningful' is rejected with more than 97.5% and 95.7% assurance, H0 is rejected and the regression is meaningful.

Coefficients (4) show independent variable coefficient, model standard deviation, standard deviation, T test Statistics, and the meaningfulness level of estimated regression. So, the values of (T1= 5.16) and (T2=4.72) of independent variable coefficient (budget deficit) are confirmed. Also, based on the found meaningfulness level of (sig=0.01) and (sig=0.03) we can say: "H0: β_1=0" is rejected with more than 97 and 99 percent certainty. So, budget deficit has a direct and meaningful effect on inflation unemployment.

DISCUSSION AND CONCLUSION

The research results show that not only budget deficit increase cause more inflation rate up to 25%, but also the inflation rate affects next year inflation up to 23%.

Also, a non-structural element (war) can increase inflation rate of a period for 1.4%. So, there is a direct relation between budget deficit and dummy variable, and inflation rate.

Budget deficit increase brings us 13% reduction of unemployment rate in the country. This budget deficit has a reverse effect on its next year unemployment rate and causes 0.04% growth in unemployment rate. Moreover, if the country is involved with war, unemployment rate will increase up to 11% in a period. Therefore, a reverse relation exists between budget deficit and unemployment.

The results show that budget deficit has a meaningful effect on inflation and unemployment in Iran economy. Therefore, the findings reveal us that Keynz theories are dominant in Iran economy.

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