The effective factors on inflation in Iran

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Abstract

We can show the importance of studying inflation through its effects and costs. The inflation process and its special aspects have been considered considerably in Iran in recent decades so that we can see contradictory results. In this paper we have considered the main determinants of inflation in Iran in fact we considered different and main factors that are effective in inflation according to different aspects. The combination of theories about inflation emphasizes the surveying of the short-term and long-term relationship between inflation and the major determinants in 1961-2008. We used an empirical model that is called ARDL so that we paid attention to the effect of liquidity, value added services, dummy variables, imported price index, the private sector investment, exchange rate and the variation of CPI in per year and in exchange system. The empirical results revealed that the most important factors are: Imported inflation, the size of government and expected inflation are effective on inflation in Iran.

Keywords: Inflation, Exchange rate, Liquidity, Value added services, ARDL approach.

Introduction

Inflation has had a sustainable rise in general price level: Various inflation are related to expansive physical policies or expansive monetary policies or both of them. We consider this kind of inflation as demand pull in nature profit or salary rises which are classified as either cost push inflation cause inflation to grow war of natural disaster as impermanent causes will lead to inflation[1].

High prices of imported goods and services from abroad can also influence the domestic economy that causes inflation. Therefore many investigations and Studies have been done regardless of various signs and consequences, in fact they have done based on different ideas, also each of these studies considers only one specific aspect of inflation in order to explain the determinates of inflation. Structuralists believe that the root of inflation is the structure of economy. Montarist believe that one of the main causes of inflation is the unreasonable increase in the money supply[2].

In Iran studies have been done according to the viewpoint of monetary and the effect of what we expect from inflation formation. If you remember, the monetary feature of inflation and its physical influences have been considered in recent researches and we have used the exchange rate as imported inflation. The goal of this research is to examine the different effects of various inflation causes and the role of the government. Since the different sources can cause inflation only a theory isn't a good solution so we have designed a theoretical inflation model based on similar study of Aljebrin[3].

Review literature

The literature of the determinants of inflation is almost extensive Adedji and Liu 2000 consider the long-term equilibrium conditions for the market of money. This is the balance of the good a market and payments. They understood that when the exchange rate is weak and lasts for a shot-run the monetary factor is a powerful effect on inflation. They studied it during 1971-2000[4].

Also johansens cointegration Technique revealed that the oil market and its income will have an influence on the inflation roots in developing oil-based economies, these factors include: oil price growth rate, oil production growth, non-oil GDP growth and liquidity.

Bahmani-oskoei[5] applied co-integration analysis to the sample of annual information during 1959 -1990 and identified two co-integration vectors, it means that one for the exchange rate, the other one for the price level, the second one shows money, real output, important prices and the exchange rate as determinants of the equilibrium price level. Delano[6] concluded that one factor has extremely an important role in the process of inflation that is exchange rate so he emphasized the changes in exchange policies.

Kia[7] considers two main factors in developing countries which have influence on inflation rate so that this policy (strategy) is an effective way to conflict with inflation these two factors are: internal and external factors. In Iran internal factors are more important than the external factors during a long run period.

Pesaran[8] focused on money balances on annual data during 1960-1978 before revolution and during 1979-1998 after revolution and during in this case he estimates a demand equation. He paid attention to structural change with slower adjustment to the lack of equilibrium in post revolution period; also he found the growth of M2in the development of credit for public sector and private sector.

The model and data

This study has annual data and they are based on the studies of 1973-2008. We collected these data from the statistics of statistic center of the central bank of Iran; theoretical model has been used to analyze the influence of different variables on inflation.

The theoretical framework of our model according to Aljebrin[9] is as follows:
p = (GM2) a1 (EX) a2 (G) a3 (DP) a4 (PM) a5
we can write this function as follows:
Ln (P) = a1Ln (GM2) + a2Ln (EX) + a3Ln (SER) + a4Ln (DP) + a5Ln (I) + a6Ln (PM)
where: P1 is domestic price, GM2 is the growth rate of economic liquidity, EX is the amount of exchange rate, SER is value added service is divided to GDP (structural inflation)

DP is the change in level of domestic price (as an index of cost-push inflation)

In addition to above cases, we tried to consider another two imitative variables to obtain the influence of revolution (1977-1978) and the change of exchange system (1994-1995).

At last we have the following equation to estimate the process:
Ln(P1) = a0 + a1Ln(DP) + a2Ln(EX) + a3Ln(G) + a4Ln(DP) + a5Ln(I) + a6Ln(PM) + D57 + D 74

Where: D 57: { 1   1977,1978   -   0   other }
        D 74: { 1   1994,1995   -   0   other }
We used the ARDL co-integration approach to survey the existence of long-run relations between inflation and its determinants as we showed in equation.

We used a traditional estimation model based on stationary of variables to option the results; unfortunately this wasn't true in many cases. In order to examine the stability of variables we used augment Diki-fuller test.

Based on results of ADF test, pm is I (0) and SER, EX, GM2, P and ΔP are I (1). We used autoregressive distributed lag (ARDL) approach to determine long-run relationship between variables. The advantage of ARDL is that it is necessary to have all of the regressors to be integrated.

Based on Ghattak and Siddighy[10], ARDL approach small samples is better than other methods also we can different variables with different optimal numbers of legs so for these

advantages we have used AREDL for our research. The error correction representation of the ARDL model based on pesaran et al[11] is as follows:

$$\Delta LP = a_0 + \sum_{j=1}^{n} b_j \Delta LP_{t-j} + \sum_{j=1}^{n} c_j \Delta LGM2_{t-j} + \sum_{j=1}^{n} d_j \Delta LEX_{t-j} + \sum_{j=1}^{n} e_j \Delta LSER_{t-j}$$

$$+ \sum_{j=1}^{n} f_j \Delta LI_{t-j} + \sum_{j=1}^{n} g_j \Delta LPM_{t-j} + \sum_{j=1}^{n} h_j \Delta LDP_{t-j} + \delta_1 \Delta LP_{t-1} + \delta_2 \Delta LGM2_{t-1}$$

$$+ \delta_3 \Delta LEX_{t-1} + \delta_4 \Delta LSER_{t-1} + \delta_5 \Delta LI_{t-1} + \delta_6 \Delta LPM_{t-1} + \delta_7 \Delta LDP_{t-1} + D74 + \varepsilon_{1t}$$

The parameters of bj, ej, cj, gj, fj,.   are dynamic short-run coefficients of ARDL model and i=1,2,3,4,5,6 are long-run multipliers to survey the model. We have used 36 annual observations based on Schwarz-Bayesian criteria (SBC), 4 was chora as the maximum lag length.

According to Table-1 the most effective variable is imported inflation and all variables have significant effects at 95% confidence level. Coefficients dummy variables are also significant and positive. It revealed that how exchange rate and revolution strategies had influences on inflation level in Iran.

Now the study of Table-2 shows the long-run coefficients of variables. As we expected the imported inflation, government size, expected inflation and Liquidity exchanges rate are very important.

Table-3 shows the adjustment speed in short run model according to equilibrium and the results of error correction term. The ECM term is 1386 and is very considerable. It means that 13% of deviation is corrected in every year. You can see the result of diagnostic tests for functional form, serial correlation, normality and heteroskedasticity in Table-4 the results show that the model has been used completely.

Finally, we used cumulative sum of squares (CUSUMSQ) tests and cumulative sum of recursive residuals (CUSUM) tests to tests constancy of parameters. Following figure shows the CUSUM and CUSUMS Q statistics. The results revealed that during the investigated period, there was no instability of the coefficients.

Conclusion

The aim of the present study was to determine the main determinants of inflation using ARDL model, during the period of 1974 to 2008 in Iran. Based on the empirical results the most significant influenced factor on inflation in both long-run and short-run relationship is imported inflation, so that a percent rise in imported inflation rate will cause percent increase in inflation.

Iran is a dependent country in many economic sectors since economy of Iran is a small part of world's economy. Other results of this research are: The expected inflation has the second role in inflation of Iran. Value added services division is another factor in Iran's inflation. The expansion of governmental sector causes reduction the share of private sector and production.

Table-1
Estimated short-run coefficients using ARDL approach

Regressors	Estimated coefficients	Standard Errors	T-Ratio[Prob]
LP(-1)	.84213	0.010815	77.8675(0.000)
LGM2	.041249	0.012455	3.3118(0.003)
LEX	-0.030460	0.020469	-1.4881(0.151)
LDP	0.10461	0.0071240	14.6846(0.000)
DLPM	0.086669	0.025368	3.4164(0.002)
C	0.25832	0.031065	8.3155(0.000)
LI1	-0.063986	0.018928	-3.3804(0.006)
LSER	0.062235	0.027958	2.2260 (0.037)
D57	0.0058896	0.0035696	2.1837 (0.041)
D74	0.021712	0.0045014	4.8234 (0.000)
	R^2=0.99999	DW=2.0256	F=137096.0(0.000)

Table-2
Estimated long-run coefficients using ARDL approach

Regressors	Estimated coefficients	Standard Errors	T-Ratio[Prob]
LGM2	0.26128	0.066663	3.9193 (0.001)
LEX	0.16175	0.046012	3.5154 (0.002)
LDP	0.66263	0.074041	8.9496 (0.000)
DLPM	0.54897	0.17633	3.1134 (0.005)
C	1.6362	0.16948	9.6541 (0.000)
LI1	-0.54483	0.16606	-3.2809(0.013)
LSER	0.39421	0.17543	2.2472 (0.035)
D57	0.065934	0.030619	2.1534 (0.044)
D74	0.13753	0.031948	4.3047 (0.000)

Table-3
The results of error correction model (ECM)

| Regressors	Estimated coefficients	Standard Errors	T-Ratio[Prob]
dLGM2	.041249	0.012455	3.3118 (0.003)
dLEX	-0.030460	0.020469	-1.4881(0.150)
dLDP	0.10461	0.0071240	14.6846(0.000)
dDLPM	0.086669	0.025368	3.4164 (0.002)
dC	0.25832	0.031065	8.3155 (0.000)
dLI	-0.063986	0.018928	-3.3804(0.006)
dLSER	0.062235	0.027958	2.2260 (0.036)
dD57	0.0058896	0.0035696	2.1837 (0.041)
dD74	0.021712	0.0045014	4.8234 (0.000)
ECM	-0.15787	0.010815	-14.5979(0.000)
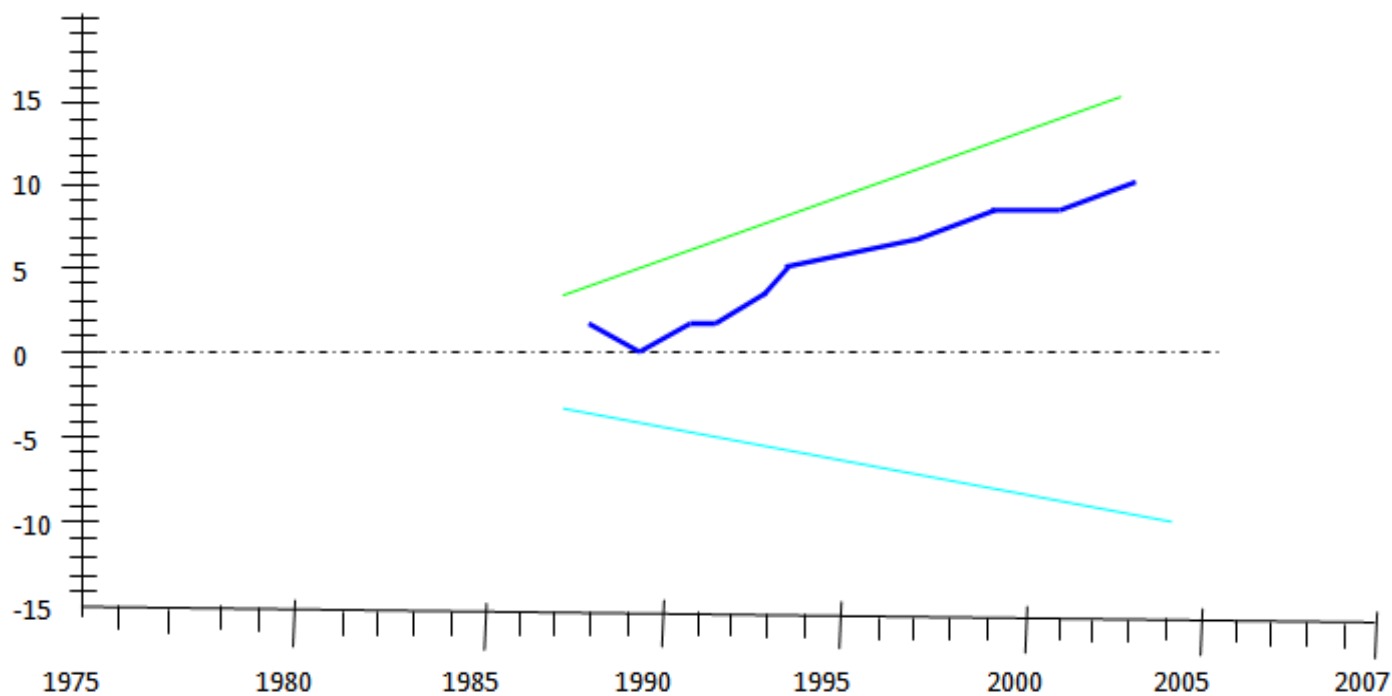
Figure-1
Plot of Cumulative Sum of Recursive Residuals

Increase of production costs cause the domestic products don't have strong competitors in international markets since people think that domestic products have higher price than the foreign products, so the increase of investment causes the inflation to be decreased.

Since the budget deficit and monetizing of debt were effective factors on liquidity and inflation the role of liquidity is so important.

Stability and diagnostic and ECM term revealed that almost 15% deviation is corrected in every year until seven years will be considered to decrease the inflation in Iran.

On the other hand we should consider all effective factors. The regulation of government budget and banking system are effective to decrease the inflation also improving cost management, controlling non-petroleum based-incomes and competition fields are the other factors to decrease the inflation rate.

Table-4
Diagnostic tests

Statistics	Prob
LM	0.171
RAMSEY RESET	0.834
NORMALITY	0.294
WHITE	0.789

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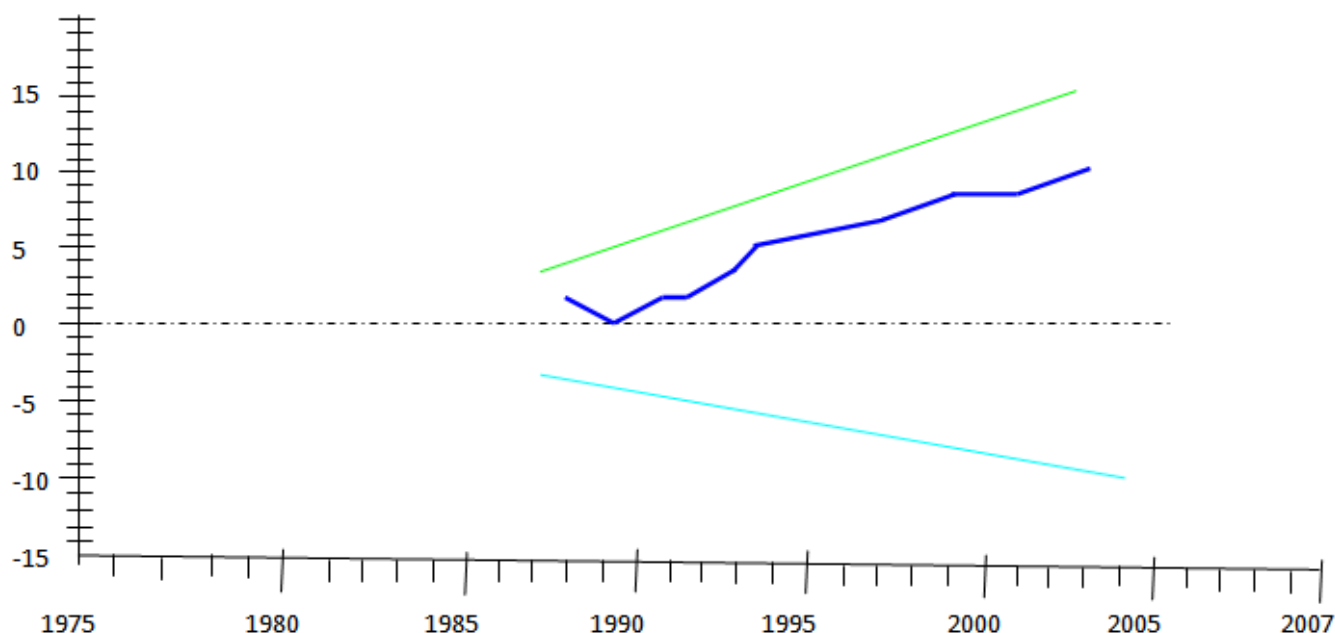
Figure-2
Plot of Cumulative Sum of Squares of Recursive Residuals

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