# Impact of Inflation Uncertainty on Unemployment

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**Abstract:** In his nobel prize lecture, Friedman points out the potential for increased inflation to create nominal uncertainty that hinders the efficient allocation of resources and reduces real output. Ever since then, there have been several theoretical and empirical discussions on the relationship between inflation, save, investment and inflation uncertainty. This study examines the effects of inflation uncertainties on unemployment. There were used time series data of Japan economy since, 1961-2010 and estimate effect of inflation uncertainty on unemployment. Therefore, researchers 1st measure inflation uncertainty using the EGARCH model and then estimate the effect of inflation uncertainty on unemployment by VAR model. Positive shocks in inflation increases inflation uncertainty but negative shocks does not change inflation increases inflation. Also, inflation uncertainty makes to reduce unemployment.

**Key words:** EGARCH model, inflation uncertainty, unemployment, allocation, investment, VAR model, Iran

## INTRODUCTION

Friedman (1977) believed that inflation is harmful and costly. He believed that inflation will cause uncertainty and it cause to difficult to forecast economic variables and it causes the increase in costs arising from business risks because that increase decision variables variance and will be cause to limited investment and reduced productivity factors and ultimately, it will be effective on the unemployment. Hence, the inflation uncertainty became an important variable in the economy and economists have studied it. Many studies reached the conclusion that inflation causes inflation uncertainty (Friedman, 1977; Ball and Cecchetti, 1990; Cukierman and Meltzer, 1986; Evans, 1991; Evans and Wachtel, 1993; Berument and Dincer, 2005; Chen et al., 2008; Samimi and Motameni, 2009).

Expected inflation based on fundamental principles of the Phillips' curve is effective on unemployment. Since, forming expectations among people based on their knowledge of history so, the uncertainty can be effective on inflation expectations hence, inflation uncertainty can be effective on the unemployment (Hayford, 2000).

Among previous studies, Hayford (2000) examined the relationship between inflation uncertainty and unemployment uncertainty with use of the Phillips curve for 1961-1997 in the US and used of the Granger causality. He used Eq. 1 and concludes that inflation uncertainty could cause unemployment uncertainty as:

$$E_{t-1}[(U_t - U^n)^2] = \alpha^2 e_{t-1}[\pi_t - E_{t-1}\pi_t)^2] \qquad (1)$$

In another study, Seyfried and Ewing (2001) examined whether uncertainty associated with uncertaint (volatility) of inflation impacted unemployment in the G7 countries. The results indicate that inflation uncertainty had a significant short run effect upon the unemployment rate in Canada, France, Italy and the US while no effect in Germany, Japan and UK. They find no evidence of a long run tradeoff between inflation uncertainty and unemployment. In this study, we will analyse the relationship between inflation uncertainty and unemployment rate in Iran for 1960-2009.

## MATERIALS AND METHODS

To achieve the objectives of this study, researchers 1st will use EGARCH model for estimating inflation uncertainty in Iran and then will use the VAR model for estimating the effect inflation uncertainty on unemployment.

## RESULTS AND DISCUSSION

Researchers use an autoregressive model for estimating conditional average inflation (Fountas also used similar model to estimated inflation uncertainty in the UK). Researchers use SBC and Akaike criteria for choosing best model. Researchers used ARCH-LM test to check autoregressive conditional Heteroskedasticity model. The results are shown in Table 1.

$$RESID^2 = 27.996 + 0.3863\ RESID^{2(-1)}$$
$$Prob. \quad (0.0422) \quad (0.0114)$$

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According to the results, the model variance is not constant so, there must use variability models to estimate. Tests showed to estimate inflation uncertainty in Iran, the best model is similar to Eq. 2, It is clear that a EGARCH model is:

$$p = c + \sum_{t=1}^{a} p_{t-i} + \mu_t$$

$$\sigma_t^2 = \omega + \sum_{j=1}^{q} \beta_j \sigma_{t-j}^2 + \sum_{k=1}^{p} \alpha_k u_{t-k}^2 + \sum_{k=1}^{r} \gamma_k u_{t-k}^2 I_{t-k} \qquad (2)$$

$$\begin{cases} l_{t-k} = 1 \ \ \text{if} \ \mu_{t-k} > 0 \\ l_{t-k} = 0 \ \ \text{if} \ \mu_{t-k} < 0 \end{cases}$$

The results of the estimation model:

$$p = 2.22 + 0.74p_{t-1} - 0.34p_{t-2} + 0.46_{t-a}$$
Prob. (0.00) (0.00) (0.0006) (0.00)

$$\sigma_t^2 = 0.99 + 0.65\sigma_{t-1}^2 - 0.48u_{t-1}^2 + 0.81u_{t-1}^2 I_{t-1}$$
Prob. (0.00) (0.0007) (0.0075) (0.00)

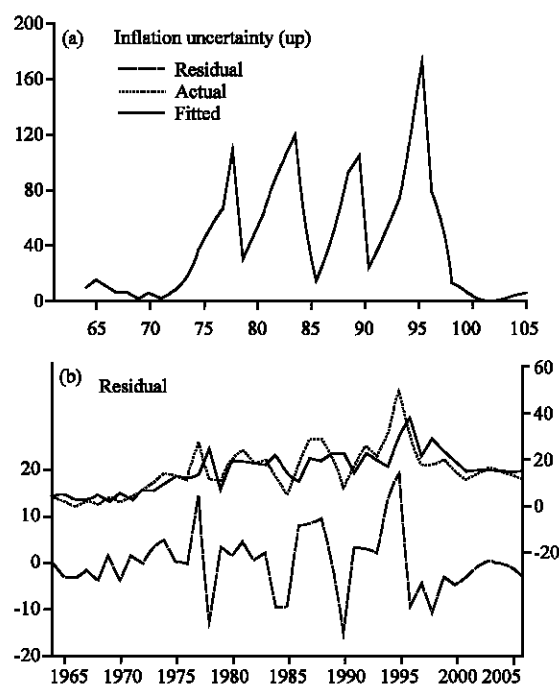Figure 1 shows the inflation uncertainty and model residuals. So far, there was obtained values of inflation uncertainty. According to the model results can

be inferred that the effect shocks on inflation is asymmetric to Fig. 2. Researchers continued use of the values of inflation uncertainty and estimate VAR model. Before estimating, we will test whether the variables are stationary? The results of these tests are shown in Table 2. The results of the estimation VAR model has been shown in Fig. 3. According to the Fig. 3, the shock being created uncertainty inflation will cause unemployment to decrease for three period. But no effect on long-term unemployment. Variance decomposition
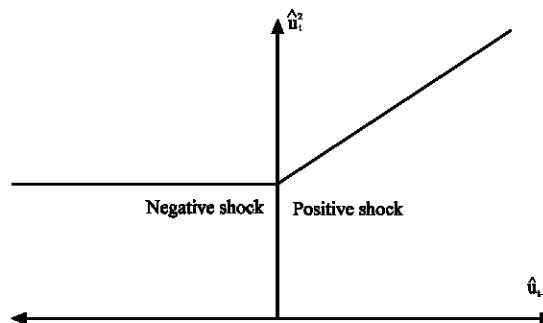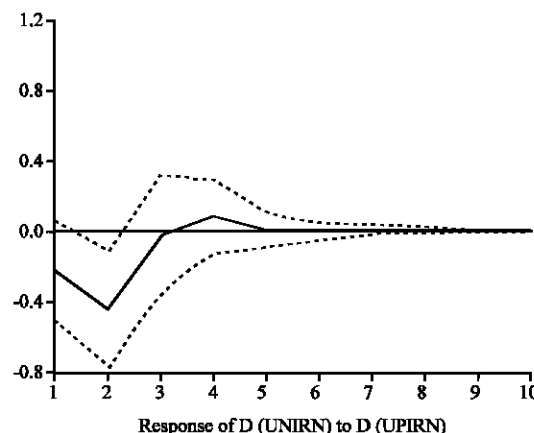


Fig. 2: Effect shocks on inflation

**Table 1: ARCH-LM test**

| ARCH test | Values | Probability |
|---|---|---|
| F-statistic | 7.0307 | 0.0114 |
| Obs*R² | 6.2787 | 0.0122 |



Fig. 1: Inflation uncertainty and model residuals



Fig. 3: Response of unemployment to inflation uncertainty

**Table 2: Stationary test**

| Variables | Dickey-fuller | Phillips-perron | Results |
|---|---|---|---|
| Unemployment | -5.842 (0.00) | -5.817 (0.00) | D (un) |
| Inflation uncertainty | -6.284 (0.00) | -7.479 (0.00) | D (up) |

**Table 3: Variance decomposition for unemployment**

| | Variance decomposition | |
|---|---|---|
| Periods | Unemployment | Inflation uncertainty |
| 1 | 93.08 | 6.91 |
| 2 | 74.98 | 25.01 |
| 3 | 74.97 | 25.02 |
| 4 | 74.57 | 25.42 |
| 5 | 74.57 | 25.42 |
| 6 | 74.56 | 25.43 |
| 7 | 74.56 | 25.43 |
| 8 | 74.56 | 25.43 |
| 9 | 74.56 | 25.43 |
| 10 | 74.56 | 25.43 |

results show that in the 1st period, inflation uncertainty explains only 6% unemployment. This value appears in the long-run to >25% (Table 3).

## CONCLUSION

From the results, it can be observed that inflation uncertainty reduces unemployment in the short-run but it has no effect on long-run unemployment.

## REFERENCES

Ball, L. and S. Cecchetti, 1990. Inflation and uncertainty at short and long horizons. Brookings Papers Econ. Act., 1: 215-245.

Berument, H. and N.N. Dincer, 2005. Inflation and inflation uncertainty in the G-7 countries. Physica A., 348: 371-379.

Chen, S.W., C.H. Shen and Z. Xie, 2008. Evidence of a nonlinear relationship between inflation and inflation uncertainty: The case of the four little dragons. J. Policy Model., 30: 363-376.

Cukierman, A. and A.H. Meltzer, 1986. A theory of ambiguity credibility and inflation under discretion and asymmetric information. Econometrica, 54: 1099-1128.

Evans, M. and P. Wachtel, 1993. Inflation regimes and the sources of inflation uncertainty. J. Money, Credit, Banking, 25: 475-511.

Evans, M., 1991. Discovering the link between inflation rates and inflation uncertainty. J. Money Credit Bank., 23: 169-184.

Friedman, M., 1977. Nobel lecture: Inflation and unemployment. J. Political Econ., 85: 451-472.

Hayford, M.D., 2000. Inflation uncertainty, unemployment uncertainty and economic activity. J. Macroeconomics, Spring, 22: 315-329.

Samimi, A.J. and M. Motameni, 2009. Inflation and inflation uncertainty in Iran. Aus. J. Basic Applied Sci., 3: 2935-2938.

Seyfried, W.L. and B.T. Ewing, 2001. Inflation uncertainty and unemployment: Some international evidence. Am. Economist, 45: 33-39.