# EFFECT OF INFLATION UNCERTAINTY ON PRICE DISPERSION IN IRAN

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## Abstract

This paper studies the inflation relationship analysis and inflation uncertainty with relative price' dispersion in Iran by using the ordinary minimum squares method, during monthly data 1991:4-2012:12. In this paper, we used the GARCH technique in order to modeling and measuring the inflation uncertainty variable. The results show that inflation uncertainty increasing leads to increased relative price dispersion. Also unexpected inflation regardless of being positive or negative increases the relative price dispersion considerably, but the unexpected inflation decomposition to two positive and negative components and lack of considering them in the equation showed that each component is in a high significant level and cannot be considered for symmetric effect of positive or negative unexpected inflation. Corporations change their price against the positive unexpected inflation alternatively in responding to the inflation shocks and consequently the price will be fluctuated for reaching the balance strictly, therefore positive unexpected inflation cases have been increasing in relative price dispersion. In the other hand, corporations have no tendency for changing the goods' price against the negative unexpected inflation. Also according to the results, inflation variable coefficient is significant from the statistical viewpoint and this means that this variable increases the relative dispersion considerably.

**Keywords:** Inflation, Inflation Uncertainty, Relative Price Dispersion, Generalized Conditional Dissimilarity Variance Auto Regressive Model, Ordinary Minimum Squares Method

## 1. INTRODUCTION

Inflation is a hurtful phenomenon in economy which most of the countries have been faced with it specially developing countries in levels. Inflation that have been rooted in 1970s, in recent years increased with increasing ratio and inchmeal have been changed as the one of the country's economic problems.

One of most hurtful effect of inflation is the inflation uncertainty originating from it. Uncertainty about the future inflation is effective on economical agent decisions and related decisions with consumption, investing, saving and etc. will face them with deviation. Inflation uncertainty can't be eliminated completely but this is possible to minimize the prices originating from inflation uncertainty through price fixation policies.

In recent empirical studies the aim was that inflation uncertainty or prices dispersion to be a representative which shows the present major economic situation of the country. In this paper in order of finding a suitable place for inflation uncertainty, we used from Generalized Auto Regressive Conditional Heteroskedasticity method (GARCH) for inflation series. Also contents' inflation deviation squares summation from total inflation, obtain an index for prices relative dispersion which rather is the economic instability index.

Regarding the mentioned above, in this paper firstly, we introduce an appropriate criterion for inflation uncertainty and relative prices dispersion. Secondly, this subject will be tested that is relative prices dispersion increases with the inflation and inflation uncertainty increasing?

Thirdly, findings have been analyzed and Finally, the results of paper have been presented.

## 2. LITERATURE REVIEW

Inflation is a situation that prices general level continually and gradually will be increased. The important point in the inflation definition is the time and increasing stability in prices general level. This means that prices should continually increase by passing time.

Inflation uncertainty is considered for conditions that in those situations, possible events that will be occurred in future can't be identified and or if these events are identifiable, related probabilities to the occurrence of these events are not available and in the time that each of these items are occurred, uncertainty environment will be formed in the decisions. Actually in inflation uncertainty situation, economic attendants are uncertain about the future inflation amount. Golob believe that inflation uncertainty considers as the one of the important inflation prices and inflation uncertainty is expanded just like a cloud on economic agents' decisions and decreases their welfare, because they can decide better in certainty conditions.

There are two sources which lead to inflation uncertainty presence. These sources respectively one relates to the disruption sentences variance dissimilarity and one another relates to the unknown and unwanted in inflation regime. Disruption sentences variance dissimilarity have the effect of presented shocks on models and inflation processes. In the other words, we can say that is the shocks' representative on inflation process. These effects and shocks are measureable by using from conditional variance. The second source which is known as the change in inflation regime, long time uncertainty or inflation process regressive model coefficient changes, is the changes result in private sector behavior, economic policies or governmental organizations and systems behavior which lead to basic changes and changing in inflation process regressive model coefficients. According to the logical expectations considerations when the economic structure has the change possibility, presented coefficients in regressive model will be changed rather than time. Economic agents will learn about the political regimes changes and will program their behaviors and decisions according to the new information and according to their new information if the changes are presented in policies (FarzinVash and Abbasi, 2005).

High inflation is considered an undesirable outcome. In fact, during the last 20 years most central banks in industrial countries have set price stability as their primary objective. It is widely agreed that this focus of monetary policy on price stability has been the main cause of disinflation in these countries (Greenspan, 2004).

For measuring the inflation uncertainty we used from different successor criteria. These criteria can be categorized in two general levels: one is the indexes that are measured through field studies such as Livingston index. This index is measured that people perform predictions about the inflation and there is used from these predictions for evaluating the inflation and finally measuring the inflation uncertainty amount. The second method is the utilization from statistical and econometric methods for obtaining the suitable successor for inflation uncertainty variable. In the first studies they used from the unconditional changes for measuring the inflation uncertainty. For example Fisher (1981) used from the inflation movable criteria deviation as the inflation uncertainty index. In 1982 by presenting the auto regressive conditional dissimilarity variance models (ARCH) by Engle and after it in 1986 by introducing the generalized auto regressive conditional dissimilarity variance (GARCH) by the Bollerslev, there were presented a suitable index for inflation uncertainnty.

Inflation uncertainty is estimated as a conditional variance in an AR(p)-EGARCH(1,1) model. Granger causality tests show that rising inflation increases inflation uncertainty and that rising inflation uncertainty increases inflation in all five countries. The ASEAN-5 have had low inflation rates relative to other emerging markets. Thus, our study shows that even in low inflation emerging markets inflation can lead to inflation uncertainty and uncertainty can lead to inflation. Given current inflationary pressures in these countries, our results warn of possible costs of not keeping inflation in check (Komain Jiranyakul and Timothy P. Opiela, 2010).

Friedman (1977) in his speeches for novel award states that higher inflation ratio lead to higher inflation uncertainty. He is also believed that relative prices dispersion led to allocating the undesirable sources through inflation directly and the society's welfare will be decreased.

The effects of the Euro introduction in 1999 are examined by utilizing a dummy variable. Tests for endogenously determined breaks are also employed. We find a considerable degree of heterogeneity across EMU countries in terms of average inflation, its degree of persistence, and both types of uncertainty, whilst the trend component of inflation is generally decreasing. Various breaks in the relationship between inflation and inflation uncertainty are found, frequently well before the Euro introduction (Guglielmo Maria Caporale and Alexandros Kontonikas, 2009).

Ball (1992) believe that if the current inflation is low, corporations think that the monetary agents aim for reaching low inflation ratios, so inflation uncertainty will be low. Now if one unexpected shock increases the inflation ratio, there will be one uncertainty situation related with the future money policy which leads to inflation uncertainty increasing in higher ratios.

Holland (1993) despite of Ball considered a situation which corporations are uncertain about the price level originating from one known change in money volume. Inflation uncertainty in his model relates to the monetary and non-monetary shocks variance. This condition lead to inflation uncertainty increases in higher expected inflation ratios.

Grier & Perry (1996) obtained one relative price dispersion index by using from monthly data of United States price indexes and measured the inflation uncertainty by using from GARCH model. They analyzed the inflation uncertainty effect on relative prices dispersion in one equation system and concluded that inflation uncertainty have a meaningful effect on relative prices dispersion.

Also Grier & Perry (1998) analyzed the relationship between inflation and inflation uncertainty in 7 countries during 1918-1993. They

measured the Grier & Perry by using from GARCH technique and by using from Grenjer test paid to analysis of the inflation uncertainty and inflation reason and concluded that inflation have positive and meaningful effect on inflation uncertainty but by increasing the inflation uncertainty, will have negative effect on inflation.

Vitek (2002) by using from monthly Canada's industry manufacturing price data concluded than by increasing the inflation and inflation uncertainty, relative prices dispersion will be increased.

Tashkini (2005) paid to analysis of the relationship between inflation and inflation uncertainty by using from 1990:4 till 2004:3 data. For finding the appropriate successor for inflation uncertainty he used from GARCH (1, 1) model and through Grenjer test showed that increasing in inflation will lead to inflation uncertainty but inverse relationship is not verified.

Farzinvash and Abbasi (2005) measured the short time inflation uncertainty through GARCH models and longtime inflation uncertainty through space-situation. They concluded that the relationship between inflation uncertainty and inflation in Iran in short time is positive but in longtime they don't have any relationship. Also in short time, negative inflation shocks have less effect rather than positive inflation shocks, therefore the asymmetric situation obtained.

Ebrahimi and Soori (2006) paid to measuring the inflation uncertainty by using from GARCH models. They indicated by using from monthly data during 1968-2004 that inflation uncertainty was presented during this period; also they reached one mutual relationship between inflation and inflation uncertainty and finally found that there is an impact between inflation and inflation uncertainty and in the other hand inflation uncertainty will lead to high inflation and higher uncertainty.

Mohammadi and Talebloo (2007) concluded by using from monthly data from 1990 till 2004 that there are asymmetric effects in inflation shocks and inflation reaction in confrontation with the positive and negative socks is not equal and by using from Grenjer reasoning test they proved that reasoning direction is mutual, means both uncertainty on inflation effect and inflation lead to uncertainty.

GholiBegloo (2008) after measuring the inflation pattern by using from seasonal time series in 1981 till 2006 by GARCH method, reached one positive relationship between inflation and conditional variance as the uncertainty index and showed that during the study periods, by increasing the inflation uncertainty, relative prices dispersion in different economic parts will be increased. According to his results, unexpected inflation separated from being positive or negative will be considerably increased in comparison with other exogenous variables but in Iran's economy, positive and negative shocks have no similar effect on relative prices deviation in different economic parts and the unexpected positive or negative inflation symmetric effect hypothesis won't be verified.

Dehmorde and Safdariand Poor shahabi (2009) paid to inflation uncertainty modeling in Iran econoy during Farvardin1990 till Esfand2008 by using from GARCH models and then analyzed the asymmetric and stable inflation shocks effects on inflation uncertainty. The study results showed that shocks effects are aymetric and positive price shocks had more effect on inflation uncertainty rather than negative price shocks, of course these price shocks are not permanent on inflation uncertainty but have high stability degree.

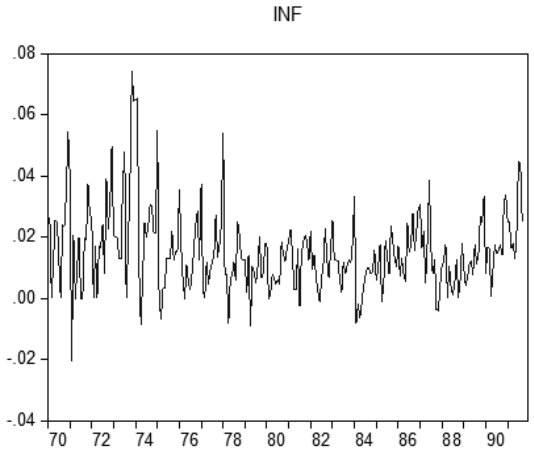
## 3. MODEL AND DATA STRUCTURE INTRODUCTION

In this paper we used from monthly data "consumable price index" (CPI) for 2004 during 1991:4 till 2012:12 for measuring the inflation ratio. Monthly inflation ratio regarding to the mentioned statistics can be obtained by using from the following formula:

$$INF_t=D(log(CPI_t)) \quad (1)$$

Which $INF_t$is the inflation in time t and $CPI_t$ is the consumer price index in time t.

**Figure 1**. Consumer's cost index inflation series diagram




Now in the monthly inflation ratio, price index subset of 12 consumer price indexes include the: foods and drinks, smoking, clothes and shoes, building, water, electricity, gas and other fuels, equipment and home services and welfares, health and treatment, transportation, welfare and cultural affairs, education, restaurants and hotel, goods and other services can be measured from the following formula:

$$INF_{it}=D(log(CPI_{it})) \quad (2)$$

Which $INF_{it}$ is the $i^{th}$ group inflation in time t and $CPI_{it}$is the $i^{th}$ group index in time t.

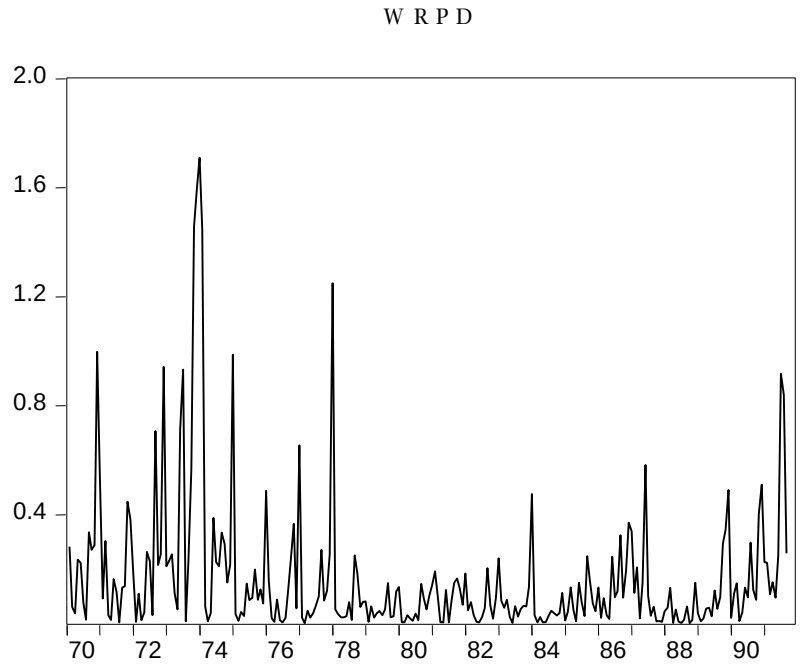
For data descriptive analysis we measured the different indexes of 12 consumer price index sub groups statistics by using from time sries data during 1991:4-2012:12.

**Table1.** General inflation mean in consumer's cost index groups during 1991:4 – 2012:12

| | *Total* | *Foods and drinks* | *Smokes* | *Clothes and shoes* | *Building, water, electricity, gas and other fuels* | *Welfare, home service and equipment* | *Health and treatment* | *Transportation* | *Communication* | *Culture and amusement affairs* | *Education* | *Restaurant and hotel* | *Goods and other services* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mean | 0.015258 | 0.016199 | 0.014896 | 0.012915 | 0.015158 | 0.0132 | 0.018584 | 0.013959 | 0.009094 | 0.011 | 0.016705 | 0.016894 | 0.014729 |
| mean | 0.012995 | 0.014878 | 0.006144 | 0.00896 | 0.012306 | 0.008987 | 0.013129 | 0.009159 | 0 | 0.005427 | 0.001369 | 0.01326 | 0.007178 |
| maximum | 0.074503 | 0.1046 | 0.230225 | 0.083849 | 0.066445 | 0.109859 | 0.175891 | 0.141671 | 0.257145 | 0.097612 | 0.459532 | 0.081746 | 0.31087 |
| minimum | -0.02062 | -0.06138 | -0.05716 | -0.00233 | -0.00311 | -0.01519 | 0 | -0.03663 | -0.07801 | -0.04065 | -0.05239 | -0.01813 | -0.03804 |
| Criterion deviation | 0.013339 | 0.027872 | 0.035698 | 0.013228 | 0.012405 | 0.016714 | 0.018962 | 0.019971 | 0.033055 | 0.019978 | 0.048642 | 0.012998 | 0.031188 |

*Source: results of the study*

**Figure 2.** Relative price dispersion series diagram



Descriptive statistics values are shown in tables 1 which during the mentioned period, health and treatment group, restaurant and hotel have the most growth in prices between 12contents respectively 1.85 and 1.68, consumer price index monthly growth mean equals to be 1.52 which have altered in -2.06 and 7.45 and is dispersed with criteria deviation equals 1.33 around the monthly mean.

As we mentioned in the introduction, content inflation deviation square summation from total inflation is known as the dispersion or price relative dispersion. Therefore by using from this definition we pay to measuring the relative prices dispersion indexes. According to this RPD in time t will be obtained from the following formula:

$$RPD = \frac{1}{n}\sum_{i=1}^{n}(INF_{it} - I\overline{NF}_t)^2 \quad (3)$$

$$\overline{INF}_t = \frac{1}{n}\sum_{i=1}^{n} INF_{it} \quad (4)$$

Therefore relative prices dispersion concordant index in time t will be obtained as the:

$$WRPD_t = \frac{1}{n}\sum_{i=1}^{n} W_{it}(INF_{it} - I\overline{NF}_t)^2 \quad (5)$$

Which in this formula, $W_{it}$ is the importance coefficient of each consumer price index sub groups according to the year 2004.

As we can see in the figure 2, since the beginning of study period till end of 1999, relative prices dispersion approximately was higher, while in next years after beginning of the third economic and social development program, relative prices dispersion decreases and during this period have been faced with decreasing approach, after it in recent years due to the embargos pressure increasing, relative prices dispersion had a rising flow again.

## 3.1. Conditional mean modeling for inflation series

In order of determination of mean equation, at first following equation by using from monthly consumer prices inflation ratio data for period: 1991:4 – 2012:12 was measured by using from ordinary minimum squares:

$$INF_t = \beta_0 + \sum_{i=1}^{p}\beta_i INF_{t-i} + \sum_{j=1}^{q}\gamma_j e_{t-j} \quad (6)$$

For determination of appropriate mean equation we used from inflation series Correlogram diagram. Then appropriate conditional mean model was selected regarding to Akaike and Schwarz Criterion statistics. The models which have the mentioned minimum values were selected. Therefore selected mean equation pattern for performed measurements is identified.

Selection model and also Akaike (AIC) and Schwarz (SBC) Criterion are listed in table 2.

**Table 2.** Selection correction evaluation of conditional mean model results

| *Variable* | *Measured coefficient* | *t-statistic* | *probability* | *provisions* |
|---|---|---|---|---|
| C | 0.015 | 9.163 | 0.0000 | AIC = -6.292 |
| (1) AR | -0.275 | -3.900 | 0.0001 | SBC = -6.193 |
| (11) AR | -0.135 | -2.222 | 0.0272 | H-Q = -6.252 |
| (12) AR | 0.499 | 9.549 | 0.0000 | F-statistic = 27.004 |
| (1) MA | 0.707 | 8.655 | 0.0000 | prob (F) = 0.0000 |
| (2) MA | 0.172 | 3.332 | 0.0001 | = 0.402 |
| (11) MA | 0.452 | 7.362 | 0.0000 | = 0.387<br>D.W. = 1.848 |

*Source: results of the study*

## 3.2. GARCH model description

Now for analyzing the "ARCH effects" in mean equation resultant we use from ARCH-LM. Related results to this test statistics and their meaningfulness level are listed in table 3 for selection equation resultant.

**Table 3.** ARCH-LM rest results for arch's effects presence

| | *Interrupt 1* | *Interrupt 2* | *Interrupt 3* |
|---|---|---|---|
| F statistics | 66.832 (0.0000) | 34.524 (0.0000) | 29.504 (0.0000) |
| statistics $\chi^2$ | 52.937 (0.0000) | 54.433 (0.0000) | 65.812 (0.0000) |

*Source: results of the study*

Numbers in first row relates to the test statistics and numbers in parenthesis indicate the meaningfulness level.

Auto regressive dissimilarity variance test (ARCH) shows that the disruption sentence variance dissimilarity hypothesis is rejected with high probability and respectfully ARCH effect presence in related disruption is proved.

Now, after selecting the best mean model during the performance levels and after the ARCH-LM test on it and proving ARCH effects presence we paid to determining the conditional variance model.

We used from GARCH model correction for obtaining the conditional variance as the index for inflation uncertainty.

Related results to the GARCH model correction are listed in table 4.

After determining the conditional variance, ARCH-LM test was performed once more. Regarding to the related results of this test statistics and meaningfulness level that are listed in table 5, we can conclude that evaluated ARCH effects in conditional variance model resultant has been eliminated.

**Table 4**. GARCH model selecting correction evaluation results

| *Conditional mean* | | | | *provisions* |
|---|---|---|---|---|
| *Variable* | *Measured coefficient* | *z-statistic* | *probability* | AIC = -6.446 |
| C | 0.013 | 8.933 | 0.0000 | SBC = -6.304 |
| (1) AR | -0.242 | -4.562 | 0.0000 | H-Q = -6.389 |
| (11) AR | -0.203 | -5.294 | 0.0000 | F-statistic = 17.311 |
| (12) AR | 0.493 | 12.292 | 0.0000 | prob (F) = 0.0000 |
| (1) MA | 0.690 | 9.616 | 0.0000 | $R^2$ = 0.395 |
| (2) MA | 0.175 | 3.573 | 0.0004 | = 0.372 |
| (11) MA | 0.470 | 13.106 | 0.0000 | D.W. = 1.883 |
| *Condition variance* | | | | |
| | $^{-5}10\times$ 2.59 | 2.396 | 0.0165 | C |
| | 0.315 | 2.967 | 0.0030 | *t-1* |
| | 0.423 | 2.899 | 0.0037 | $\sigma^2_{t-1}$ |

*Source: results of the study*

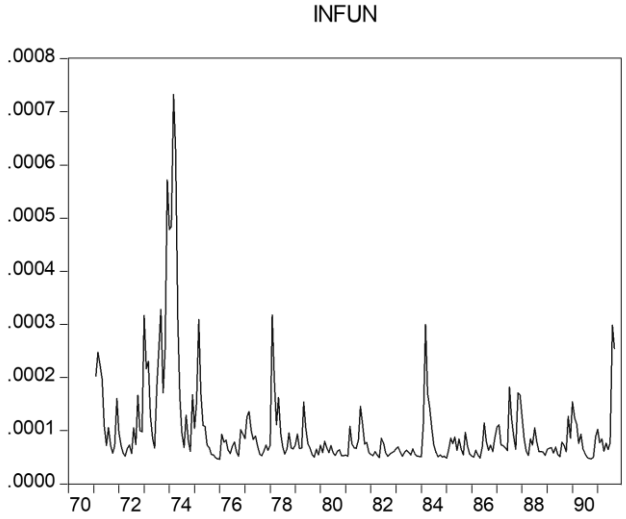
**Table 5.** ARCH-LM test results for arch effects presence after conditional variance model measurement

| | *Interrupt 1* | *Interrupt 2* | *Interrupt 3* |
|---|---|---|---|
| F statistics | 0.031 (0.8588) | 0.0685 (0.5049) | 1.395 (0.2449) |
| statistics $\chi^2$ | 0.031 (0.8581) | 1.379 (0.5016) | 4.182 (0.2424) |

Numbers in first row relates to the test statistics and numbers in parenthesis indicate the meaningfulness level.

Then by using from evaluated conditional variance model we extract the inflation uncertainty series which are depicted in the following figure.

**Figure 3**. Inflation Uncertainty series diagram




## 3.3. Relative prices dispersion model measurement

There are used from different patterns for analyzing the relationship between inflation and relative prices dispersion. In this part, we tried to test the inflation and inflation uncertainty effect on relative prices dispersion by using from monthly time series as the following pattern.

$$WRPD_t = \alpha_0 + \alpha_1 INF_t + \alpha_2 \log(INFUN_t) + |e_t| \quad \text{(A)}$$

$$WRPD_t = \alpha_0 + \alpha_1 INF_t + \alpha_2 \log(INFUN_t) + epe_t + ene_t \quad \text{(B)}$$

In above equations, $WRPD_t$ is the relative prices dispersion, $INFUN_t$ indicates the inflation equation conditional variance and in the relative prices dispersion equation, uncertainty effects are considered, $INF_t$ indicates the inflation and inflation equation error values absolutely is an index from unexpected inflation which entered for positive $epe_t$ and $ene_t$negative unexpected inflation separation in order of testing similarity effect hypothesis in relative prices dispersion equations.

Before measuring the mentioned model we pay to considered variables dynamics analysis in model. One of the mentioned subjects in time series analysis is the variables' dynamics or stationary. Time series is one of the most important statistics data that is used in empirical analysis. In studies there is also considered that time series, are stationary and if this situation doesn't present, statistical common tests that their basics are t, F, $x^2$ and similar tests, will be doubted. Before performing one analysis in time series or determination of one model we should be certain that time series are static. In the other words, used series have one variable that shouldn't be randomly, otherwise the regression algorithm is fake (Farnaghi, 1390).

Therefore in this part we pay to analyzing the variables static used in the model, by the "generalized DickiFooler" (ADF).

**Table 6**. Single root test results of variables generalized DickiFooler

| | *With width from center and without process* | *With width from center and with process* | *Without width from center and without process* |
|---|---|---|---|
| Inflation | -9.991<br>(0.0000) | -10.091<br>(0.0000) | -0.422<br>(0.5300) |
| Inflation uncertainty | -5.415<br>(0.0000) | -5.244<br>(0.0001) | -3.416<br>(0.0007) |
| Relative price dispersion | -8.819<br>(0.0000) | -9.016<br>(0.0000) | -7.141<br>(0.0000) |
| Positive unexpected inflation | -11.881<br>(0.0000) | -11.989<br>(0.0000) | -4.725<br>(0.0000) |
| Negative unexpected inflation | -16.053<br>(0.0000) | -16.106<br>(0.0000) | -4.900<br>(0.0000) |
| Unexpected inflation absolute value | -10.789<br>(0.0000) | -11.007<br>(0.0000) | -3.209<br>(0.0014) |

*Source: results of the study*

Numbers in first row relates to the generalized DickiFooler test statistics and numbers in parenthesis relates to the test statistical probability level for zero consideration of single root in related series.

Table 6 results shows that the single root presence zero hypothesis in the generalized DickiFooler test is rejected with high probability and model variables all series are static.

Now we pay to evaluate the pattern (a) and (b) by using from monthly data during the 1991:4 - 2012:12 by the OLS method.

**Table 7**. Relative price dispersion equation measurement results

| | *Variable* | *Measured coefficient* | *t-statistic* | *probability* | *provision* |
|---|---|---|---|---|---|
| Pattern (a) | C | 0.411 | 3.852 | 0.0001 | AIC= - 2.081<br>SBC= - 2.024<br>H-Q= - 2.058<br>F-Statistic=682.111<br>Prob(F)= 0.0000<br>$R^2$= 0.893<br>=0.892$\overline{R^2}$<br>D.W.= 1.763 |
| | $INF_t$ | 15.319 | 34.337 | 0.0000 | |
| | $Log(INFUN_t)$ | 0.059 | 5.316 | 0.0000 | |
| | \|e\| | 9.912 | 10.700 | 0.0000 | |
| Pattern (b) | C | 0.484 | 4.515 | 0.0000 | AIC= -2.114<br>SBC= -2.044<br>H-Q= -2.086<br>F-Statistic=533.840<br>Prob(F)= 0.0000<br>$R^2$=0.897<br>$\overline{R^2}$=0.896<br>D.W.= 1.808 |
| | $INF_t$ | 13.320 | 17.538 | 0.0000 | |
| | $Log(INFUN_t)$ | 0.063 | 5.807 | 0.0000 | |
| | $epe_t$ | 13.223 | 9.637 | 0.0000 | |
| | $ene_t$ | -7.196 | -5.804 | 0.0000 | |

*Source: results of the study*

Performed evaluation results shows that inflation uncertainty increasing causes the increasing in relative prices dispersion. Also unexpected inflation separated from being positive or negative, relative prices dispersion will be increased considerably, but unexpected inflation decomposition to two positive and negative contents and considering them in the equation showed that both contents have high meaningfulness level and can't consider them for positive and negative symmetric effect of unexpected inflation. Corporations changes their positive costs against the unexpected inflation alternatively in responding to the inflation shocks and consequently prices will change strictly for reaching balance, so positive unexpected inflation cases the increasing in relative prices dispersion. In the other hand, corporations have no tendency for changing goods price against the negative unexpected inflation, therefore negative unexpected inflation decreases the relative prices dispersion. Also according to the obtained results, inflation variable coefficient from the statistical viewpoint has high meaningful level and this means that inflation, relative prices dispersion.

## 4. CONCLUSION AND SUGGESTION

Regarding to the inflation and its changes that have very important effects on economy development and growth, many of performed studies in economic sciences had been focused on this topic. The most importance loss originating from inflation, lack of uncertainty will be in future periods. Inflation uncertainty is considered as the inflation important costs. Uncertainty about the inflation ratio makes an uncertainty and instability in prices and this channel always lead to changes in economic decisions.

In Iran's economy changeability or instability in different economic policies during different years increased the inflation uncertainty by making

sudden changes. Finally by increasing the uncertainty, economical actives especially in manufacturing and service corporations are sensitive in economic pricing decisions and products and service prices will be changed several times.

In this paper, analysis of the consumer prices index descriptive statistics and 12 groups during the period: 1991:4-2012:12 showed that during the mentioned period health and treatment, restaurant and hotel groups had the highest price growth between 12 contents respectively with 1.85 and 1.68 percent monthly inflation. Consumer price index monthly growth mean equals the 1.52% which alters in the -2.06 and 7.45 ranges and disrupted with the criteria deviation equals to 1.33 in month average amount.

Relative prices dispersion index value since the beginning of the study till the end of 2008 approximately was in higher level while in next years after the third social and economic developmental program, relative prices dispersion has been decreased and during this period had a decreasing flow, after it in recent years increasing in embargos pressure on country again relative prices dispersion had a rising flow.

In the second part of the paper, regarding to the relative prices dispersion equations practice results which inflation uncertainty increasing causes the increasing in relative prices dispersion. Also unexpected inflation separated from being positive or negative, relative prices dispersion will be increased considerably, but unexpected inflation decomposition to two positive and negative contents and considering them in the equation showed that both contents have high meaningfulness level and can't consider them for positive and negative symmetric effect of unexpected inflation. Corporations changes their positive costs against the unexpected inflation alternatively in responding to the inflation shocks and consequently prices will change strictly for reaching balance, so positive unexpected inflation cases the increasing in relative prices dispersion. In the other hand, corporations have no tendency for changing goods' prices against the negative unexpected inflation, therefore negative unexpected inflation decreases the relative prices dispersion. Also according to the obtained results, inflation variable coefficient from the statistical viewpoint was in high meaningful level and this means that this variable, decreases relative prices dispersion considerably.

Therefore regarding to the inflation and inflation uncertainty meaningful effect on relative prices dispersion in Iran should be found first inflation prohibition strategies in country. Iran's inflation originates structural factors and has structural treatment inevitable. Just with an intelligent effort for restructuring the Iran's economy and regarding to the equipment and requirements which can be hopeful for preventing from inflation. Also monetary policies such as increasing the money volume should be balanced and related with the production amounts. In order of creating motivation in manufacturing part, presented pinches in manufacturing part and goods delivery and services should be eliminated so laws' modification in all related areas with manufacturing should be done. Also by private sector investing attraction for increasing manufacturing, inflation path should be guided toward a decreasing process. Policy makers should prohibit from taking non-economic and performing inflation maker policies promises and decrease from the inflation by attracting and guiding the flowing liquidity in society.

## IDEAS FOR FUTURE RESEARCHES

Regarding the nature of our economics and background of applied studies through Iran's economics, we refer these subjects for future studies:

1. Effects of basic inflation on price dispersion
2. Relationship between inflation uncertainty and sectors performance
3. What factors causes inflation uncertainty in Iran?

## LIMITATIONS OF STUDY

The most important restrictions are consisting:

1. Lack of acceptable data for developing countries in order to present an adaptive study.
2. Poor relevant studies in Iran and weakness of local literature to present an advanced analysis with perfect policy implications.

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# APPENDIX

## Related table to the best determination of conditional mean model for inflation series

| | | | | |
|---|---|---|---|---|
| Dependent Variable: INF | | | | |
| Method: Least Squares | | | | |
| Date: 09/04/13 Time: 18:59 | | | | |
| Sample (adjusted): 1992M05 2012M12 | | | | |
| Included observations: 248 after adjustments | | | | |
| Convergence achieved after 28 iterations | | | | |
| MA Backcast: 1370M03 1371M01 | | | | |
| ***Variable*** | ***Coefficient*** | ***Std. Error*** | ***t-Statistic*** | ***Prob.*** |
| C | 0.015147 | 0.001653 | 9.163287 | 0.0000 |
| AR(1) | -0.275439 | 0.070624 | -3.900064 | 0.0001 |
| AR(11) | -0.135993 | 0.061199 | -2.222150 | 0.0272 |
| AR(12) | 0.499226 | 0.052275 | 9.549958 | 0.0000 |
| MA(1) | 0.707358 | 0.081723 | 8.655593 | 0.0000 |
| MA(2) | 0.172559 | 0.051784 | 3.332281 | 0.0010 |
| MA(11) | 0.451464 | 0.061320 | 7.362382 | 0.0000 |
| R-squared | 0.402022 | Mean dependent var | | 0.014863 |
| Adjusted R-squared | 0.387135 | S.D. dependent var | | 0.013113 |
| S.E. of regression | 0.010266 | Akaike info criterion | | -6.292229 |
| Sum squared resid | 0.025397 | Schwarz criterion | | -6.193059 |
| Log likelihood | 787.2364 | Hannan-Quinn criter. | | -6.252307 |
| F-statistic | 27.00419 | Durbin-Watson stat | | 1.848791 |
| Prob(F-statistic) | 0.000000 | | | |
| Inverted AR Roots | .90 | .79-.45i | .79+.45i | .46+.80i |
| | .46-.80i | -.00+.94i | -.00-.94i | -.49+.83i |
| | -.49-.83i | -.85-.49i | -.85+.49i | -.99 |
| Inverted MA Roots | .83-.26i | .83+.26i | .55+.70i | .55-.70i |
| | .07+.91i | .07-.91i | -.45+.84i | -.45-.84i |
| | -.85-.50i | -.85+.50i | -1.00 | |

## Arch effects test table in selecting conditional mean model redundant

| | | | | |
|---|---|---|---|---|
| Heteroskedasticity Test: ARCH | | | | |
| F-statistic | 66.83274 | Prob. F(1,245) | | 0.0000 |
| Obs*R-squared | 52.93763 | Prob. Chi-Square(1) | | 0.0000 |
| Test Equation: | | | | |
| Dependent Variable: RESID^2 | | | | |
| Method: Least Squares | | | | |
| Date: 09/21/13 Time: 03:29 | | | | |
| Sample (adjusted): 1992M06 2012M12 | | | | |
| Included observations: 247 after adjustments | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 5.41E-05 | 1.27E-05 | 4.271358 | 0.0000 |
| RESID^2(-1) | 0.462246 | 0.056543 | 8.175129 | 0.0000 |
| R-squared | 0.214322 | Mean dependent var | | 0.000102 |
| Adjusted R-squared | 0.211116 | S.D. dependent var | | 0.000199 |
| S.E. of regression | 0.000177 | Akaike info criterion | | -14.43507 |
| Sum squared resid | 7.66E-06 | Schwarz criterion | | -14.40666 |
| Log likelihood | 1784.732 | Hannan-Quinn criter. | | -14.42363 |
| F-statistic | 66.83274 | Durbin-Watson stat | | 2.086132 |
| Prob(F-statistic) | 0.000000 | | | |
| Heteroskedasticity Test: ARCH | | | | |
| F-statistic | 34.52442 | Prob. F(2,243) | | 0.0000 |
| Obs*R-squared | 54.43383 | Prob. Chi-Square(2) | | 0.0000 |
| Test Equation: | | | | |
| Dependent Variable: RESID^2 | | | | |
| Method: Least Squares | | | | |
| Date: 09/21/13 Time: 03:30 | | | | |
| Sample (adjusted): 1992M07 2012M12 | | | | |
| Included observations: 246 after adjustments | | | | |
| ***Variable*** | ***Coefficient*** | ***Std. Error*** | ***t-Statistic*** | ***Prob.*** |
| C | 4.87E-05 | 1.31E-05 | 3.711170 | 0.0003 |
| RESID^2(-1) | 0.416434 | 0.063981 | 6.508656 | 0.0000 |
| RESID^2(-2) | 0.098433 | 0.063968 | 1.538786 | 0.1252 |
| R-squared | 0.221276 | Mean dependent var | | 0.000101 |
| Adjusted R-squared | 0.214866 | S.D. dependent var | | 0.000199 |
| S.E. of regression | 0.000177 | Akaike info criterion | | -14.43252 |
| Sum squared resid | 7.58E-06 | Schwarz criterion | | -14.38977 |
| Log likelihood | 1778.200 | Hannan-Quinn criter. | | -14.41531 |
| F-statistic | 34.52442 | Durbin-Watson stat | | 2.038714 |
| Prob(F-statistic) | 0.000000 | | | |

| | | | | |
|---|---|---|---|---|
| Heteroskedasticity Test: ARCH | | | | |
| F-statistic | 29.50485 | Prob. F(3,241) | | 0.0000 |
| Obs*R-squared | 65.81217 | Prob. Chi-Square(3) | | 0.0000 |
| Test Equation: | | | | |
| Dependent Variable: RESID^2 | | | | |
| Method: Least Squares | | | | |
| Date: 09/21/13 Time: 03:37 | | | | |
| Sample (adjusted): 1992M082012M12 | | | | |
| Included observations: 245 after adjustments | | | | |
| ***Variable*** | ***Coefficient*** | ***Std. Error*** | ***t-Statistic*** | ***Prob.*** |
| C | 3.65E-05 | 1.31E-05 | 2.781365 | 0.0058 |
| RESID^2(-1) | 0.387740 | 0.062603 | 6.193599 | 0.0000 |
| RESID^2(-2) | -0.006308 | 0.067392 | -0.093607 | 0.9255 |
| RESID^2(-3) | 0.255365 | 0.064036 | 3.987812 | 0.0001 |
| R-squared | 0.268621 | Mean dependent var | | 0.000101 |
| Adjusted R-squared | 0.259517 | S.D. dependent var | | 0.000200 |
| S.E. of regression | 0.000172 | Akaike info criterion | | -14.48535 |
| Sum squared resid | 7.11E-06 | Schwarz criterion | | -14.42818 |
| Log likelihood | 1778.455 | Hannan-Quinn criter. | | -14.46233 |
| F-statistic | 29.50485 | Durbin-Watson stat | | 1.946337 |
| Prob(F-statistic) | 0.000000 | | | |

**Related table to the best determination of conditional variance model for inflation series**

| | | | | |
|---|---|---|---|---|
| Dependent Variable: INF | | | | |
| Method: ML - ARCH | | | | |
| Date: 09/04/13 Time: 18:54 | | | | |
| Sample (adjusted): 1992M052012M12 | | | | |
| Included observations: 248 after adjustments | | | | |
| Convergence achieved after 13 iterations | | | | |
| MA Backcast: 1991M061992M04 | | | | |
| Presample variance: backcast (parameter = 0.7) | | | | |
| GARCH = C(8) + C(9)*RESID(-1)^2 + C(10)*GARCH(-1) | | | | |
| ***Variable*** | ***Coefficient*** | ***Std. Error*** | ***z-Statistic*** | ***Prob.*** |
| C | 0.013712 | 0.001535 | 8.933125 | 0.0000 |
| AR(1) | -0.242392 | 0.053126 | -4.562606 | 0.0000 |
| AR(11) | -0.203331 | 0.038406 | -5.294238 | 0.0000 |
| AR(12) | 0.493016 | 0.040108 | 12.29222 | 0.0000 |
| MA(1) | 0.690983 | 0.071854 | 9.616545 | 0.0000 |
| MA(2) | 0.175292 | 0.049051 | 3.573645 | 0.0004 |
| MA(11) | 0.470048 | 0.035865 | 13.10611 | 0.0000 |
| | ***Variance Equation*** | | | |
| C | 2.59E-05 | 1.08E-05 | 2.396605 | 0.0165 |
| RESID(-1)^2 | 0.315586 | 0.106335 | 2.967841 | 0.0030 |
| GARCH(-1) | 0.423998 | 0.146229 | 2.899537 | 0.0037 |
| R-squared | 0.395642 | Mean dependent var | | 0.014863 |
| Adjusted R-squared | 0.372788 | S.D. dependent var | | 0.013113 |
| S.E. of regression | 0.010385 | Akaike info criterion | | -6.446224 |
| Sum squared resid | 0.025668 | Schwarz criterion | | -6.304554 |
| Log likelihood | 809.3318 | Hannan-Quinn criter. | | -6.389193 |
| F-statistic | 17.31181 | Durbin-Watson stat | | 1.883442 |
| Prob(F-statistic) | 0.000000 | | | |
| Inverted AR Roots | .89 | .78-.44i | .78+.44i | .47+.79i |
| | .47-.79i | .01+.95i | .01-.95i | -.48+.84i |
| | -.48-.84i | -.85-.49i | -.85+.49i | -.99 |
| Inverted MA Roots | .84-.26i | .84+.26i | .55+.70i | .55-.70i |
| | .07+.92i | .07-.92i | -.45+.85i | -.45-.85i |
| | -.85-.51i | -.85+.51i | -1.00 | |

**Related table to the relative price dispersion models determination**

| | | | | |
|---|---|---|---|---|
| Dependent Variable: WRPD | | | | |
| Method: Least Squares | | | | |
| Date: 09/21/13 Time: 04:16 | | | | |
| Sample (adjusted): 1992M05 2012M12 | | | | |
| Included observations: 248 after adjustments | | | | |
| ***Variable*** | ***Coefficient*** | ***Std. Error*** | ***t-Statistic*** | ***Prob.*** |
| C | 0.411639 | 0.106854 | 3.852361 | 0.0001 |
| INF | 15.31967 | 0.446145 | 34.33784 | 0.0000 |
| LOG(INFUN) | 0.059010 | 0.011098 | 5.316981 | 0.0000 |
| ABSE | 9.912374 | 0.926385 | 10.70006 | 0.0000 |
| R-squared | 0.893465 | Mean dependent var | | 0.160839 |
| Adjusted R-squared | 0.892155 | S.D. dependent var | | 0.258215 |
| S.E. of regression | 0.084797 | Akaike info criterion | | -2.081112 |
| Sum squared resid | 1.754496 | Schwarz criterion | | -2.024444 |
| Log likelihood | 262.0579 | Hannan-Quinn criter. | | -2.058300 |
| F-statistic | 682.1114 | Durbin-Watson stat | | 1.763841 |
| Prob(F-statistic) | 0.000000 | | | |
| Dependent Variable: WRPD | | | | |
| Method: Least Squares | | | | |
| Date: 09/21/13 Time: 04:17 | | | | |
| Sample (adjusted): 1992M052012M12 | | | | |
| Included observations: 248 after adjustments | | | | |

| *Variable* | *Coefficient* | *Std. Error* | *t-Statistic* | *Prob.* |
|---|---|---|---|---|
| C | 0.484299 | 0.107256 | 4.515360 | 0.0000 |
| INF | 13.32034 | 0.759508 | 17.53812 | 0.0000 |
| LOG(INFUN) | 0.063846 | 0.010994 | 5.807330 | 0.0000 |
| EPE | 13.22341 | 1.372149 | 9.637008 | 0.0000 |
| ENE | -7.196721 | 1.239775 | -5.804861 | 0.0000 |
| R-squared | 0.897829 | Mean dependent var | | 0.160839 |
| Adjusted R-squared | 0.896147 | S.D. dependent var | | 0.258215 |
| S.E. of regression | 0.083213 | Akaike info criterion | | -2.114869 |
| Sum squared resid | 1.682634 | Schwarz criterion | | -2.044033 |
| Log likelihood | 267.2437 | Hannan-Quinn criter. | | -2.086353 |
| F-statistic | 533.8404 | Durbin-Watson stat | | 1.808463 |
| Prob(F-statistic) | 0.000000 | | | |