Measuring core inflation in Iran and compare it with total inflation

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Introduction:

Consumer Price Index (CPI) as a principal indicator must cover goods and services consumed by households and used as a measure of inflation. In Iran CPI and inflation rate has been computed since 1935. This laspeyres index is available in a monthly basis. Efforts have been made to improve the methodology for calculating the CPI in Iran.

Central Banks employ price indexes to explaining monetary policy to the public monetary experts try to employ the CPI to make fine economic situation. Inflation in Iran, because of some reasons, like unexpected problems in pricing and policies has a variant and high rate .There is trying to control inflation according to inflation target regime in monetary policy, with measure core inflation. Because of different pricing system in Iran and other countries, there is no evidence to introduce a single method to estimate core inflation. Here asymmetric trimmed mean have been used and results of this method will be presented to project underlying inflation trend and try to use core inflation not only as a trend indicator, but also as a forecasting tool.

Inflation and core inflation in Iran:

Monetary authorities like Central Banks employ price indices to explaining monetary policy to the public. Central Bank of Iran publishes a Consumer Price Index (CPI) that measures the headline inflation rate since1935. It is a Laspeyres price index that covers goods and services consumed by households for urban cities, which is available at a monthly frequency. Although according to IMF reports, CPI in Iran is one of the sharpest indexes, volatility and high rate of inflation caused some problems to the policymakers. On the other hand the inflation target was laid out by the government stating that inflation rate must be decreased to1-digit form (less than 10%). These encourage interests in experts and policy makers to isolate temporary and noisy changes in prices from underlying ones.

Core inflation has not been computed in Iran yet. Here core inflation is measured to capture long term price trends and to illustrate long term trend in price change and take a better and smoother course as computed to the CPI and total inflation, and shows influence of monetary policy on inflation .Core inflation represent the underlying trend in inflation. This measure is always an estimate and will be reliable after the fact.

In the context of inflation rate process, as it said, Central Bank of Iran uses Laspeyres price index, so there is a fixed basket of goods and services that covers majority of consumption pattern in Iran. It the time period which was considered here, this basket contains 359 goods and services and CPI index compiled from more than 121000 outlets every month. Also the CBI computes the CPI after seasonal adjustment, but seasonal effects are something different. They are some changes that affect CPI orderly and have a quite regular pattern over years.

Central Bank of Iran (CBI); because of different local cultures and consumption behavior among provinces, faces to a lot of goods and services, but this selected basket could present a perspective of consumption pattern in Iran. Special condition in Iran like long lasting aftermath of 8 years war on economy and society; economy based on the oil market and some unexpected problems like international sanctions, made authorities to control prices or subsidizing some of goods and services or stabilized some of them in price. These policies help them to control inflation in short term but in medium or long terms they will be insufficient. In most of the cases volatility of prices caused by noisy or temporary effects which can be related to one-off shocks, changes in market or some special decisions. Beside these factors of changing price, there is underlying changes, which is ordinary trend of price changes. Undoubtedly such unexpected shocks are one of the main factors of price changes. On the other hand, in most of the cases, prices increase easily and decrease hardly and most of the time these increased in item prices, are related to each other. To isolate these temporary parts of price changes from underlying part, and help decision makers to take better decisions core inflation of Iran.

Although exclusion-based method is really well-known and most of the countries exclude energy, food or all administrative controlled prices which are not determined by market mechanism, but in Iran some goods and services are directly subsidized or controlled and therefore have no changes. On the other hand most of the items indirectly affected by administrative regulation which can not be traced easily and their prices are not determined by market completely. Therefore in each period different goods and services have volatile prices. So here asymmetric trimmed means has been used. Asymmetric trimmed means if one be able to find the best cut-point will be more efficient estimator. In this method after removing trimmed components from both tails, core inflation will be calculated as a weighted average of remaining items.

Inflation and core inflation here have been measured in the third sub-classes to avoid the misleading volatility of seasonal or natural change percent of goods prices as an individual item.

Figure 1: inflation rate trend for every month measured during twelve month ending certain month in Iran from 1385-1389 (Mar 21, 2006 – Mar 20, 2011).
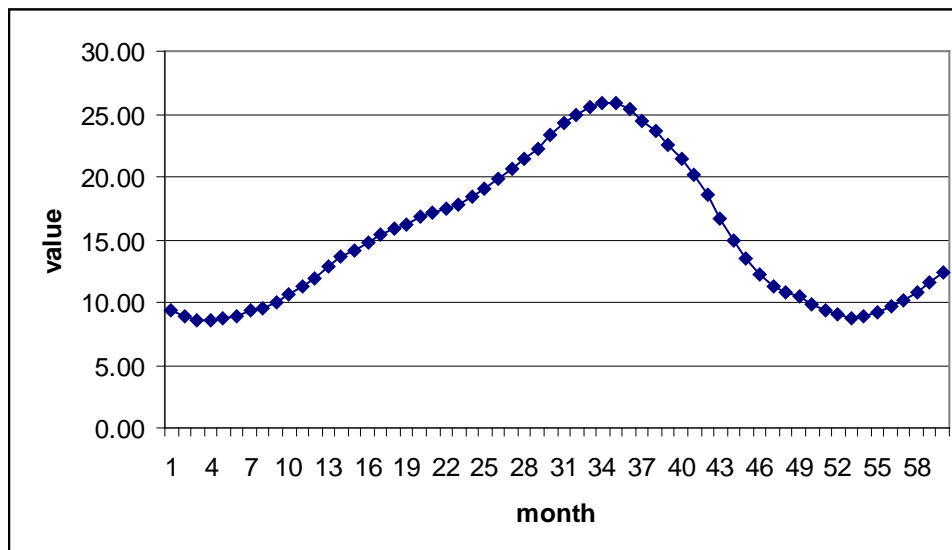
According to this figure some statistics to find suitable trimming cut-point which could reduce volatility of price changes was computed.

Table 1 shows these statistics. As it shows, by considering scale statistics we could choose best trimming alpha percent for period of years 1385-1389; (21MAR 2006-20 MAR 2011) between 25 and 35 percent .In this interval, volatility in each year is minimized or after increasing is leveled off.

Table 1: Statistics of headline and core inflation measures for period of years 1385-1389; (21MAR 2006-20 MAR 2011)

YEAR	STATISTIC	HEADLINE	5%	10%	15%	20%	25%	26%	27%	28%	29%	30%	31%	32%	33%	34%	35%	40%
21MAR 2006-20 MAR 2007	VAR	1.14	0.74	0.65	1.06	2.93	2.75	1.22	0.28	0.28	0.28	0.31	0.37	0.35	0.43	0.43	0.67	2.88
	STD	1.07	0.86	0.81	1.03	1.71	1.66	1.10	0.53	0.53	0.53	0.56	0.60	0.59	0.66	0.65	0.82	1.70
	MEAN	9.71	10.01	10.61	11.29	12.03	11.78	11.49	11.50	11.80	12.12	12.46	12.80	13.16	13.60	14.09	14.52	16.99
	CV	0.11	0.09	0.08	0.09	0.14	0.14	0.10	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.06	0.10
21MAR 2007-20 MAR 2008	VAR	22.24	22.25	23.68	27.48	32.93	36.76	37.54	41.76	47.54	52.51	51.10	34.38	20.25	20.86	21.57	22.80	26.52
	STD	4.72	4.72	4.87	5.24	5.74	6.06	6.13	6.46	6.89	7.25	7.15	5.86	4.50	4.57	4.64	4.78	5.15
	MEAN	14.65	14.48	15.03	16.26	17.79	18.92	19.22	19.35	19.50	19.56	18.24	15.96	14.66	14.92	15.17	15.41	16.71
	CV	0.32	0.33	0.32	0.32	0.32	0.32	0.32	0.33	0.35	0.37	0.39	0.37	0.31	0.31	0.31	0.31	0.31
21MAR 2008-20 MAR 2009	VAR	47.12	45.87	52.51	59.06	70.45	82.14	81.89	87.44	92.62	58.72	61.35	63.68	66.13	69.71	72.49	78.46	116.07
	STD	6.86	6.77	7.25	7.69	8.39	9.06	9.05	9.35	9.62	7.66	7.83	7.98	8.13	8.35	8.51	8.86	10.77
	MEAN	21.44	21.42	22.88	24.29	26.23	27.01	26.98	27.01	27.60	24.79	23.81	24.14	24.44	25.03	25.58	26.05	30.43
	CV	0.32	0.32	0.32	0.32	0.32	0.34	0.34	0.35	0.35	0.31	0.33	0.33	0.33	0.33	0.33	0.34	0.35
21MAR 2009-20 MAR 2010	VAR	46.11	45.33	49.66	59.74	68.10	59.40	66.13	58.28	60.18	62.82	65.92	68.53	71.90	73.69	78.20	85.37	109.19
	STD	6.79	6.73	7.05	7.73	8.25	7.71	8.13	7.63	7.76	7.93	8.12	8.28	8.48	8.58	8.84	9.24	10.45
	MEAN	16.18	16.01	16.68	18.22	18.95	19.33	19.42	18.82	19.26	19.76	20.30	20.80	21.39	21.88	22.45	23.33	26.51
	CV	0.42	0.42	0.42	0.42	0.44	0.40	0.42	0.41	0.40	0.40	0.40	0.40	0.40	0.39	0.39	0.40	0.39
21MAR 2010-20 MAR 2011	VAR	8.87	6.84	6.84	7.45	8.64	9.72	9.79	10.63	10.90	7.91	7.97	8.08	8.33	9.04	9.69	9.72	17.61
	STD	2.98	2.62	2.61	2.73	2.94	3.12	3.13	3.26	3.30	2.81	2.82	2.84	2.89	3.01	3.11	3.12	4.20
	MEAN	9.25	8.28	8.34	8.42	9.12	9.63	9.77	9.70	9.60	9.05	9.16	9.29	9.50	9.31	9.56	9.64	10.07
	CV	0.32	0.32	0.31	0.32	0.32	0.32	0.32	0.34	0.34	0.31	0.31	0.31	0.30	0.32	0.33	0.32	0.42

Table 2 shows other criteria to find best trimming alpha percent for period of years 1385-1389; (21MAR 2006-20 MAR 2011).

Table 2: Comparing trimming alpha percents

Percentage	MAE	RMSE
25	0.137	0.166
26	0.137	0.167
27	0.137	0.167
28	0.138	0.167
29	0.133	0.163
30	0.135	0.164
31	0.136	0.165
32	0.138	0.166
33	0.136	0.165
34	0.136	0.165
35	0.136	0.164

 According to this table trimming 29 percent of both tails will be a good trim. Also 29 percent trim is suitable for predictive model of core inflation .Here also by 29 percent trim we could find an Autoregressive model AR (3) which has the minimum RMSE.

Figure 2 shows total inflation and 29 percent trimmed core inflation. In this case trend of core inflation and headline inflation could be interpreted for every year. Monitoring specific policies and some international problems in that years will make clear the real trend of inflation.

Figure 2: Comparing total inflation and 29 percent trimmed core inflation
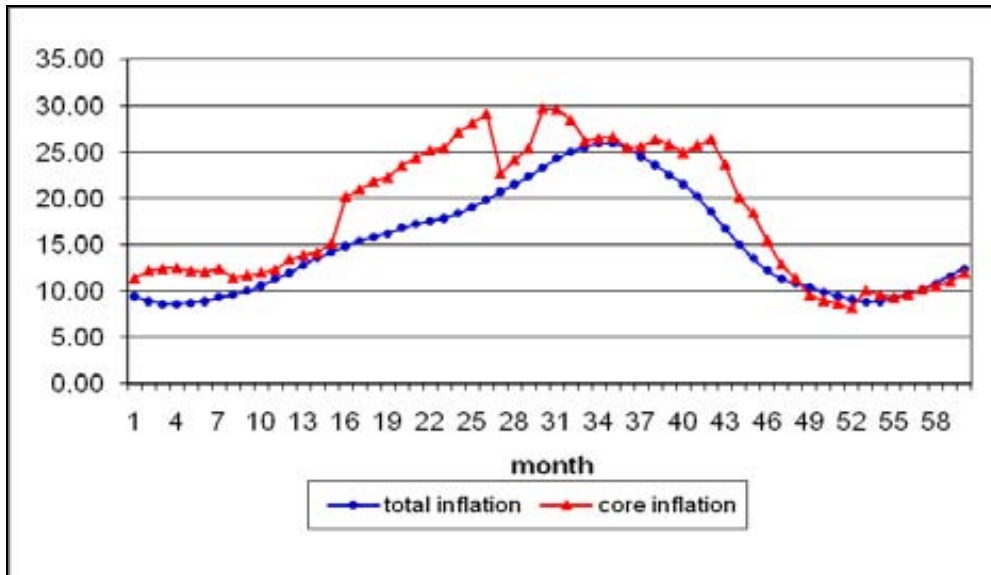
Conclusion:
It is clear that monetary policies to decrease total inflation may affect core inflation and decision makers try to do their best. Although results of computation are available on monthly frequency, here they have presented in annually frequency.
Data have been used here from 1385-1389 (Mar 21, 2006 – Mar 20, 2011) and core inflation compared with total inflation and therefore negative and positive effects of decision made on core and total inflation are interpretable by experts. It seems after reduction of inflation for less than one year, Iran will face to rising inflation during next year. Especially during next year reduction of subsidies on energy and some items, results rising inflation. Core inflation results in comparison with headline inflation shows there must be more effort to reduce inflation in middle and long term. Monetary policies have key role to control inflation. Central bank in this situation could carry out this kind of policies and control volatility of components which affect inflation directly or indirectly.
More detailed reports will be published in future.

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