Measuring Core Inflation for Turkey
- Trimmed Means Approach -

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Abstract

This paper is one of the the pioneers in measuring the core inflation for Turkey and uses the methodology developed by Bryan, Cecchetti and Wiggins II (1997). As the price change distributions are not normally distributed, weighted sample means are not the efficient estimators of inflation. In such leptokurtic distributions trimmed means provide statistically more efficient estimators of inflation. For the consumer prices, using historical data, the optimal trim is found to be 19 percent from the each tail of the cross sectional distribution and for the wholesale prices it is found to be 12 percent (percentage that minimizes MAD). Trimmed mean estimators of inflation move in line with the headline inflation in the long run, implying a potential use for future inflation forecasting.

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1. Introduction

This paper is one of the first efforts to measure the core inflation in Turkey and aims at finding out whether there is an efficiency increase in the inflation measurement in Turkey by using a statistical method, namely the trimmed means proposed by Bryan, Cecchetti and Wiggins II (1997). The concept of core inflation is a critical issue for Central Banks in conducting the monetary policy. The core inflation should represent persistent source of inflationary behavior. However, the headline inflation may not represent the long term price movements. Short term movements in inflation can blur the actual inflationary trend. Non-monetary events like,- changing seasonal patterns, resource shocks, changes in indirect taxes and asynchronous price adjustments, sector specific shocks and sampling problems-, may cause transitory noise problem in frequently used price indices (Bryan and Checchetti, 1993; Cecchetti, 1996). Such a situation creates substantial difficulties for implementation of monetary policy. No matter what the target is, defining and measuring the core inflation determines the direction of the policy.

Neither the definition nor the measurement of core inflation is unique. Indeed, there are mainly two branches of definitions of core inflation (Roger, 1998). While, the first definition takes core inflation as the persistent part of the measured inflation, the second definition considers core inflation as the generalized component of the measured inflation. According to both definitions, non-core part is associated with supply side disturbances.

As in the case of definition, there is no single way of measuring core inflation. Central banks have different methods of core inflation estimation according to their priorities in their monetary policy. Some of the common methods of measuring core inflation includes the use of filtering and smoothing methods such as, Hodrick-Prescott filter and Kalman filter; excluding some product groups that are thought to be the source of short term volatility in inflation or thought to be independent from the policy implications - the well known examples are excluding food and energy prices or administered prices -; and excluding the outliers from the price indices regardless of the character of the product group such as limited influence estimators - like median and trimmed means.

This paper compares three different core inflation measures, namely trimmed means, index excluding food and energy prices , and median inflation, as proposed by Bryan, Cecchetti and Wiggins II (1997). The rest of the paper is divided into 5

parts. The next section explains the concept of trimmed means. The third section describes the statistical characteristics of the price data of Turkey. The fourth section presents trimmed mean estimation results for Turkey. The fifth section examines the robustness of the trimmed mean estimators. The sixth section specifies the relation between the measured inflation rates and trimmed mean estimators of inflation. And the last section puts the concluding remarks.

2. Trimmed Mean Estimators

One of the common characteristics of the high frequency price change distributions is that they are non-normally distributed. They present high levels of skewness and excess kurtosis. In other words price change distributions are leptokurtic (i.e, they have thicker tails than a normally distributed random variable). In such a distribution, as the probability of drawing from the tails increases, the probability of being skewed also increases. As mentioned before, there are several statistical solutions to this problem and one is to exclude food and energy prices. However, they may not be the only source of volatility and may represent long term inflationary trends in some economies, especially in low income economies. Besides, they may not increase the efficiency statistically as expected. Another method is to calculate limited influence estimators, like median and trimmed means. In this method, there is not a priori exclusion of the some determined components, but rather a percentage of the price distribution is excluded regardless of the type of the component at each month.

Trimmed means are obtained by trimming a percentage from the tails of a histogram and averaging the rest. In order to calculate α percent trimmed mean, the sample is ordered as $\{x_1,\ldots..,\ x_n\}$, then the associated weights $\{w_1,\ldots\ldots,w_n\}$ are ordered. Then W_i is defined as cumulative weight from 1 to i ($W_i \equiv \sum_{j=1}^{i} wj$). Next, the set of observations to be averaged is determined as $\alpha/100< W_i <(1-\alpha/100)$ and called as I_α. Finally trimmed mean is calculated with the following formula (Bryan, Cecchetti and Wiggins II, 1997):

$$\overline{\chi}_\alpha = \frac{1}{1-2\dfrac{\alpha}{100}} \sum_{i \in I_\alpha} w_i x_i$$

While $\overline{\chi}\,0$ represents the sample mean, $\overline{\chi}\,50$ represents the sample median. From this formulation it is clear that in each period product groups that are excluded are not constant. Trimmed means provide more efficient results for leptokurtic distributions than the simple sample average. The efficiency criterion most commonly used are root-mean-square error (RMSE) and mean absolute deviation (MAD). RMSE places higher importance on the deviation from the centered moving average (CMA) that represents the long term trend in inflation. The optimum trim is the percentage of trim that minimizes either RMSE or MAD.

After being proposed by Bryan and Cecchetti, trimmed mean estimator of inflation has applied to various countries, like the United Kingdom, Colombia, Portugual, Sweden, Poland, Albania and Japan. In some cases, trimming disproportionately from the tails produce more efficient results when the distribution tends to display persistent asymmetries (Jaramillo, 1998).

3. Statistical Characteristics of Price Data of Turkey

This paper uses the monthly changes of both consumer and wholesale prices in Turkey. While the sample period covers 1988:01 to 1998:12 for the consumer price index (CPI), for the whole sale price index (WPI), it covers 1987:1 to 2000:02. The different coverage periods are simply the result of the availability of the data. 50 components for the CPI and 23 components for the WPI are considered. As there are no published seasonally adjusted price series in Turkey, the results can not be filtered out from the seasonal effects. In order to reflect the long term trend in inflation, 36-month centered moving average is used.

For the last two decades, Turkey has been experiencing persistent high inflation. On annual basis, the average inflation rates measured by CPI and WPI (with 1987 based indices) between 1988 and 1998, are 76 percent and 71 percent respectively, with the maximum values as high as 130.5 percent and 156.8 percent respectively. On monthly basis, the average inflation rate is 4.9 percent for the CPI and 4.6 percentage for the WPI.

Figure 1 and 2 present the monthly inflation rates together with 36-month centered moving average for the wholesale and consumer prices for the given sample periods. It can be seen from the figures that the deviations from the long term inflation trend are quite large and show sharp reversals. One indication of this reversals is that in high frequency inflation data there is a noise problem. It is

observed that the standard deviation of the difference between the annualized monthly price changes and the moving average is 3.46 percentage points for the CPI and 3.88 percentage points for the WPI.

This volatility is the result of cross sectional distribution of the price index. Table 1 and 2 present various statistics of cross sectional distribution of the price changes for both CPI and WPI at different horizons. From the tables, it is seen that the distributions are skewed. Both WPI and CPI show high levels of mean absolute value of skewness. As horizon increases, the level of skewness decreases. Another characteristic of price change distributions is that they exhibit excess kurtosis. The average value of kurtosis of monthly changes is 9.9 for CPI and 14.42 for the WPI. Especially, price change distribution of the WPI has very fat tails. The CPI has also fat tails, except for 24-month and 36-month horizons. As horizon increases, the level of excess kurtosis decreases. The WPI presents a different structure than the CPI. Both skewness and kurtosis of the WPI get higher at 36-month horizon.

To sum up, the price changes measured by both the CPI and WPI are not normally distributed. They present high levels of skewness and excess kurtosis. As horizon increases the price change distributions approach to normality. However, unlike CPI, WPI diverges from normality again at 3-year horizon, which is the longest horizon in our sample.

4. Estimation Results for Turkey

As the cross sectional distribution of price changes is not normally distributed, the weighted sample mean is not the efficient estimator of population mean any more. Then this section searches for the most efficient estimator of long term inflation for Turkey. For this purpose the efficiencies of weighted sample mean, sample mean excluding food and energy prices, median and trimmed means are compared.

The sample periods for CPI and WPI are 1988:01-1998:12 and 1987:1-2000:02 respectively. Fifty components of the CPI and twenty three components of the WPI are considered. State Institute of Statistics provides 1987 weights for both CPI and WPI components. Therefore throughout the estimation periods the weights are fixed. However, concerning the CPI, only the weights of dried and fresh vegetables and fruits and the weights of meat, fish and poultry differ in each month, while the rest is constant throughout the year. In order to reflect the long term trend in inflation, 36-month centered moving average is used. There are two different

estimation methods of trimmed means. Optimal trim can be obtained by applying the bootstrap procedure (Monte Carlo simulations) or by using actual data calculation. Both methods are examined in detail separately for the Turkish data.

A. Monte Carlo Results

In order to decide on which definition is the most efficient estimator of inflation, Bryan, Cecchetti and Wiggins II (1997) take the deviations of monthly component price changes from the 36 month centered moving average and call this as relative price changes. Then they apply bootstrap procedure and generate 10,000 samples by randomly drawing one observation for each of the component of time series. Then, they compute root mean square error (RMSE) and mean absolute deviation (MAD) for all of the core inflation definitions, namely trimmed mean estimators, median and the estimator excluding food and energy prices. Monte Carlo simulations is just used to prove that the trimming increases the efficiency in measuring inflation in terms of the lower short term deviations from the long term trend.

For the consumer prices, there is no need to trim large percentages. The optimal trim is found to be 3-5 percents from each tail of cross sectional distribution. RMSE reaches its minimum amount at 5 percent and MAD reaches at 3 percent. By trimming 5 percent, efficiency increases by 17 percent. Figure 3 shows the efficiency of trimmed estimators of CPI. From the graph it is clear that as the percentage to be trimmed increases, the efficiency decreases. Interestingly, the median appears to be the least efficient estimator for the CPI. On the other hand, excluding the food and energy prices increases the efficiency only slightly.

For the wholesale prices, weighted means are the least efficient estimators. As in the case of CPI, excluding food and energy prices from the WPI increases the efficiency only slightly. The optimal trims are found to be 27 percent (according to both MAD and RMSE) and the efficiency increases by approximately 31 percent. Figure 4 shows the efficiency of trimmed estimators for WPI. It is clear from the figures that while trimming small percantages is enough to increase the efficiency for the CPI, as for the WPI higher percentage of the distribution should be excluded in order to increase the efficiency.

B. Optimal Trim for Turkey with the Historical Data

In this section trimmed mean estimators of inflation and their efficiency are calculated month by month by comparing their deviations from 36 month centered moving average. Besides, alternative inflation estimators are also calculated.

Accordingly, the most efficient inflation estimator is found to be the trimmed means for both the CPI and WPI. The results of the efficiency of trimmed estimators are shown in figures 5 and 6, for the CPI and WPI respectively. Trimming does not increase the efficiency as much as in the case of Monte Carlo estimations. Both RMSE and MAD take higher values in actual data estimation. Besides, the percentages of the optimal trims of both indices are different in historical data estimation. In Monte Carlo estimations there are 10,000 samples. Hence, RMSE and MAD produce the same or closer optimal trim percentages for both the CPI and WPI. However, there is a short data problem in the actual series of Turkey. In such a situation, it is difficult to define the long-term trend of inflation. Thus, actual data estimations are more vulnerable in terms of efficiency.

Table 3 compares the efficiencies of the four commonly used inflation estimators for both the CPI and WPI. For the purpose of pure inflation measurement, CPI has an importance in the sense that it reflects price level faced by the consumers. Therefore, the long-term trends in CPI reflect the perception of the inflation by public in real terms. The optimal trim for consumer prices is 31 percent, taking RMSE as our efficiency criterion, and 19 percent, taking MAD as our efficiency criterion. It should be noted that RMSE puts more emphasis on the deviation from moving average. The percentages to be trimmed are higher than that of appeared in Monte Carlo results, as previously mentioned.

It is worthwhile mentioning that both RMSE and MAD take higher values. Nevertheless, trimming 19 percent from the each tail increases the efficiency by approximately 25 percent. Efficiency gain in this method is higher than Monte Carlo results. As an alternative estimator, exclusion of food and energy prices also improves the efficiency. However, it should be remembered that expenditures on food constitute a large share of the total expenditures in Turkey, like many other developing countries. Together with energy prices, food prices constitute approximately 32 percent of the CPI. Hence, excluding food and energy prices from the CPI is not a good indicator of long-term inflationary trend since it consistently ignores a large portion that the consumers spend from their budgets. The last alternative estimator of inflation, median, performs also well. It provides a considerable amount of efficiency gain. In sum, all three kinds of inflation estimators, namely, excluding food and energy prices, median and optimal trim, provide efficiency gains compared to simple weighted sample mean. However optimal trim performs better in capturing the long-term trend in inflation.

For the WPI, like CPI, the optimal trims are different from Monte Carlo results. While the percentage of trim that minimizes the RMSE is 47 percent, it is 12 percent according to MAD (compared to Monte Carlo results of 27 percent). Trimming by 12 percent of distribution from each tail improves the efficiency by 14 percent. Unlike CPI, the efficiency gain is much lower than those indicated by the Monte Carlo results. According to MAD, the efficiency gain from excluding food and energy prices is negligible. According to RMSE, this even reduces the efficiency. Finally, the sample median has also a good performance in capturing the long-term trend in inflation. However, trimming is again the best estimator for the WPI in terms of the efficiency gain based on the minimum deviation from the persistent part of inflation.

Figure 7 and 8 show the monthly inflation estimators, 12 percent trimmed mean for the WPI and 19 percent trimmed mean for the CPI. For both indices, trimming smoothes the inflationary process. However stability achieved by trimming the CPI is more remarkable. On the whole, at high frequencies, such as monthly price changes, trimming helps in capturing the long-term trends in inflation. In deciding on what percentage to trim, actual data estimations should be preferred over Monte Carlo simulations as it represents the real time changes in price indices.

The frequency of the trimmed items can be seen at the appendix. Concerning 19 percent trimmed CPI, the most trimmed items are fresh vegetables, fishes, cigarettes, tea and fresh fruits that are truncated 89.4%, 80.3%, 80.3%, 78.8% and 74.2% of the months respectively. Similarly, tea, vegetables and fruits, fishing, water and crude petroleum are among the most trimmed categories of WPI. One of the-noteworthy points is that manufactured goods under WPI are the least trimmed categories.

The divergence between headline inflation and the trimmed indices can be called as relative price shock component (Mio and Higo, 1999). This relative price shock component is not caused by macroeconomic variables but rather caused by some other exogenous factors. An analysis of contribution of the mostly trimmed items to relative price shock component puts light on the structure of the inflation in Turkey. As the detailed data is not available for the CPI (1987 based index) after 1999, relative price shock component is examined solely for the WPI. It is observed that the main source of volatility in the monthly changes in the WPI turns out to be the vegetables and fruits sector. Animal husbandry and other farming corps are the two other sectors that contribute to the relative price shock component. However, we

need to keep in mind that these series are not seasonally adjusted and seasonal effect is one of main the dominant factors in these sectors. Using annual changes in estimations may eliminate the seasonality factor. However, in Turkish case annual changes is not appropriate due to the short data problem. Nevertheless, the weather condition is one of the factors that create transitory supply shocks and its effect on several sub-items can be excluded when the trend for future and /or long-term inflation are evaluated. In the same manner, the highest contribution to relative price shock component of CPI comes from the sectors like, fresh vegetables and fruits, cigarettes, men and women garments and footwear.

5. Robustness

Different country applications reveal that kurtosis is higher for higher levels of disaggregation. Overall higher kurtosis implies higher optimal trim. For Turkey, different disaggregation level is only available for CPI data. While, monthly kurtosis is 6.8 for the 18 components of CPI, this is 9.9 for 50-items CPI. Thus lower level of disaggregation implies lower kurtosis for Turkey. It is seen that on the basis of RMSE, the optimal trim decreases by only 1 percent, from 31 percent to 30 percent. However, on the basis of MAD, the optimal trim increases from 19 percent to 24 percent. Therefore, for Turkey, whether the optimal trim increases with the level of aggregation depends on the efficiency criterion used.

Another way to check the robustness is to explore the optimal trim at different core inflation benchmarks. In the baseline estimation, 36-month moving average is taken as a benchmark. Table 4 presents the optimal trims and minimum RMSE and MAD values for different long-term inflation definitions. For both consumer prices and wholesale prices, while RMSE gives the same optimal trim- except 12-month moving average for CPI and 48-month moving average for WPI-, MAD gives very close optimal trims for different definitions. Hence, we can say that optimal trim is robust to changes in the benchmark inflation rate.

Finally, actual data estimation is run for both the period, covering 1987:01 to 1991:02 and the period, covering 1987:01 to 2000:02 for WPI. The same optimal trim percentages are obtained.

6. The Relation between the Measured Inflation Rates and Trimmed Mean Estimators of Inflation

This section briefly looks into some characteristics of trimmed inflations. In general, one of the important characteristics of a core inflation measure is that it

should be timely, that is computable in real time. Trimmed means satisfy this condition. Secondly, it should follow the same trend as the headline inflation. Thirdly, it should have some predictive power of the future headline inflation. Therefore there should be a close relationship between the measured inflation and the core inflation measure. Besides, the core inflation measure should Granger cause the headline inflation. In order to test whether this conditions are satisfied or not, Engle-Granger two-step cointegration procedure is employed (Freeman, 1998). It is seen that the inflation rates based on the WPI, the CPI, 12 % trimmed WPI and 19 % trimmed CPI are integrated of order 1. Table 5 presents the results of cointegration, which is performed to examine the closeness of relationships between measured inflation rates and the trimmed means. Both trimmed CPI and trimmed WPI are cointegrated with their respective measured inflation rates. The coefficients of the both trimmed inflation rates are very close to unity, which means that they are highly correlated with the measured inflation rates.

The second step is to search for Granger causality via error-correction vector autoregression (VAR) of measured inflation rates, CPI and WPI with trimmed inflation rates. Table 6 gives the summary results of Granger causality tests. In each of the estimations, coefficient of the ECM term is found to be negative and significant. This means that, any deviation of the changes in inflation rates from the long-run equilibrium is corrected by the amount of the corresponding coefficient at the next period. Hence, there is a convergence towards the long-run equilibrium. The speed of adjustment of 19% trimmed CPI is faster than the speed of adjustment of 12% trimmed WPI. In sum, there are bivariate causalities between CPI and 19% trimmed CPI, and WPI and 12% trimmed WPI. In order to have a potential for long-term inflation forecasting, core inflation should Granger cause the measured inflation, but not vice versa. As there is a bivariate causality, trimmed means does not seem to have a potential for long-term inflation forecasting.

7. Conclusion

This paper estimates and evaluates trimmed means approach to core inflation. In monetary policy, particularly for inflation targeting regimes, the choice of core inflation is an important matter. Short-term transitory noise may affect the policy tools and targets of Central Banks. In this context, this study searches for a statistically efficient inflation estimator for Turkey. With the Turkish data, it is shown that the price change distributions are not normally distributed. Hence, the efficiencies of alternative inflation measurement techniques, namely, weighted

sample mean, sample mean excluding food and energy prices, median and trimmed means, were compared.

Among the various core inflation estimations considered in this paper, trimmed means are statistically the most efficient estimators for Turkey. For the consumer prices, using historical data, the optimal trim is found to be 19 percent from the each tail of the cross sectional distribution. Trimming improves the efficiency by 25 percent. For the wholesale prices the optimal trim is found to be 12 percent and efficiency increases by 14 percent. Excluding food and energy prices from the CPI and WPI provides some efficiency improvements. Nevertheless, excluding the whole set of food and energy prices from CPI is not a good indicator of long term inflationary trend in Turkey, because food and energy expenditures constitute a large portion of the consumers' budget. Excluding these items a priori from the price indices may affect the conception of long-term inflation trend adversely. On the other hand, exclusion of the sub-items of these main catagories that are thought to be the sources of high volatility in price indices may be more beneficial. Relative price change components may be a guideline for this exclusion process. The sub-items like fresh fruits and vegetables that are subject to high volatility due to exogenous factors are the best candidates for this exclusion process.

For both indices, the sample median provides efficient results. However, the comparison of all alternative inflation estimators, namely weighted sample mean, excluding food and energy prices, the sample median and the optimal trim, reveals that the trimming produces relatively better estimations in capturing the long-term trend in inflation.

Although two different calculation methods produce different results, the historical data estimation is the preferred one. Therefore, this paper bases its results on the historical data estimation. Two efficiency criteria, namely RMSE and MAD, suggest different optimal trims due to the short data problem. In larger samples, such as in the boostrap procedure with 10000 samples, the two efficiency criteria produce similar results. Optimal trims obtained by using actual data are robust to the changes in long term inflation definition and to the incremental changes in the sample period.

Long term trend in core inflation should be in line with the trend in headline inflation. Otherwise, some information can be lost. In this respect, it is shown that trimmed mean estimators of inflation move in line with the headline inflation in the long run. There is a cointegration relation between trimmed mean estimators and the headline inflation rates, indicating a the close relationship. However, bivariate Granger causality indicates a weak potential for long-term inflation forecasting.

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Table 1
CPI Deviations from 36 Month Moving Average

	Monthly	Quarterly	Annually	24-Month	36-Month
			Absolute Skewness		
Average	2.1	2.0	0.64	0.96	1.1
STD	1.1	1.0	0.33	0.50	0.28
			Kurtosis		
Average	9.9	8.2	3.5	2.6	2.2
STD	6.7	4.5	0.80	0.37	0.58

Table 2
WPI
Deviations from 36 Month Moving Average

	Monthly	Quarterly	Annually	24-Month	36-Month
			Skewness		
Average	2.13	1.90	1.13	0.80	2.03
STD	1.61	0.94	0.72	0.41	1.45
			Kurtosis		
Average	14.42	9.47	7.27	5.75	11.42
STD	21.17	9.39	7.42	4.37	16.45

Table 3

	CPI		WPI	
	RMSE	MAD	RMSE	MAD
Mean	2.797	1.856	3.363	2.004
XF&E	2.312	1.515	3.531	1.837
Median	2.249	1.429	2.949	1.766
Optimal Trim	2.242	1.393	2.945	1.705
Percent to be trimmed	31	19	47	12

Table 4

		CPI		WPI	
		RMSE	MAD	RMSE	MAD
12-month CMA		2.0394	1.3007	3.0042	1.6848
	Percent to be immed (%)	5	21	47	9
24-month CMA		2.0987	1.3294	2.8432	1.6506
	Percent to be immed (%)	31	22	47	11
36-month CMA		2.2418	1.3933	2.9457	1.7056
	Percent to be immed (%)	31	19	47	12
48-month CMA		2.3999	1.5115	3.2592	1.8600
	Percent to be immed (%)	31	23	5	13

Table 5

	Cointegration between CPI and 19 % trimmed CPI	Cointegration between WPI and 12 % trimmed WPI
Cointegrating vector	1, -1.045	1, -0.972
ADF statistic of residual	-7.129	-4.675
Critical value at 1%	-2.582	-2.581

Table 6

LHS Variables (1)	**RHS variables (1)**					
	Adjusted R^2	**CPI**	**19% trimmed CPI**	**WPI**	**12% trimmed WPI**	**ECM_{t-1}**
CPI	**0.94**		**1.087***			**-0.772***
t-stat			**26.394**			**-8.086**
19%trimmed CPI	0.922	0.751*				-0.648*
t-stat		22.889				-6.391
WPI	**0.963**				**0.966***	**-0.699***
t-stat					**45.777**	**-8.149**
12%trimmed WPI	0.923			0.927*		-0.869*
t-stat				35.375		-9.115

(*) 1% significance level
(1) All variables, except ECM, are the second differences of the log price levels.

Fig. 1. Monthly WPI Inflation With 36-Months Moving Average

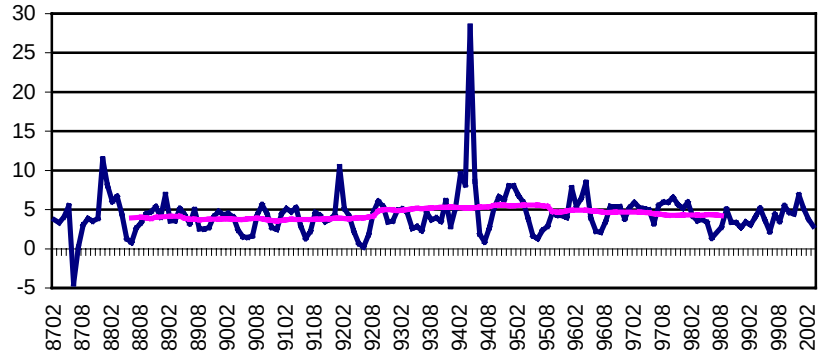


Fig. 2. Mont hly CPI Inflation With 36-Months Moving Average

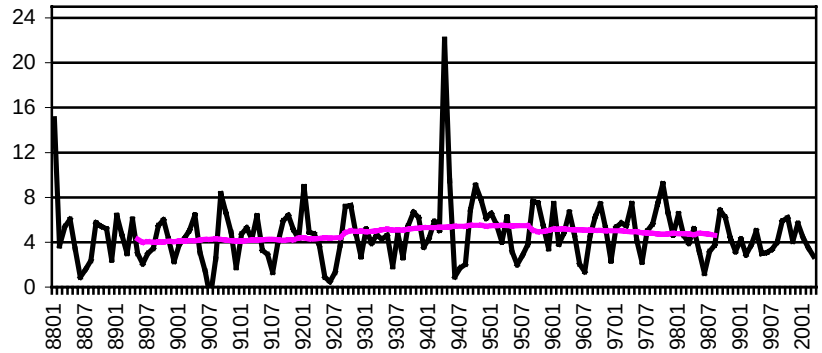


Fig. 3. CPI RMSE & MAD Monte Carlo Rusults

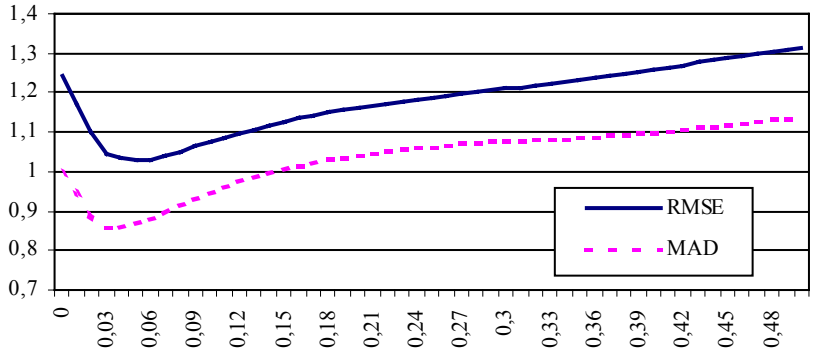


Fig. 4. WPI RMSE & MAD Monte Carlo Rusults

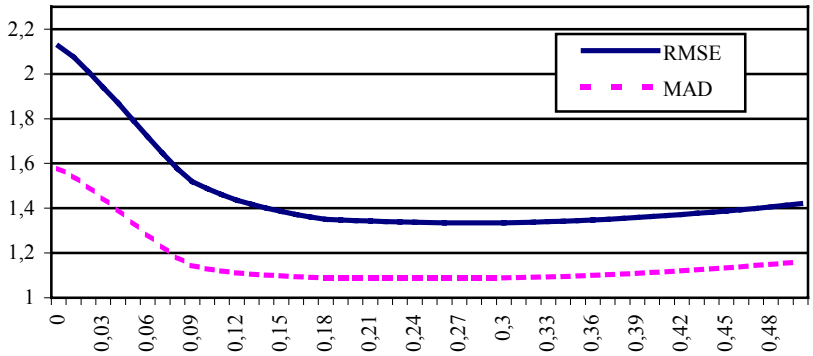


Fig. 5.CPI RMSE &MAD Historical Data

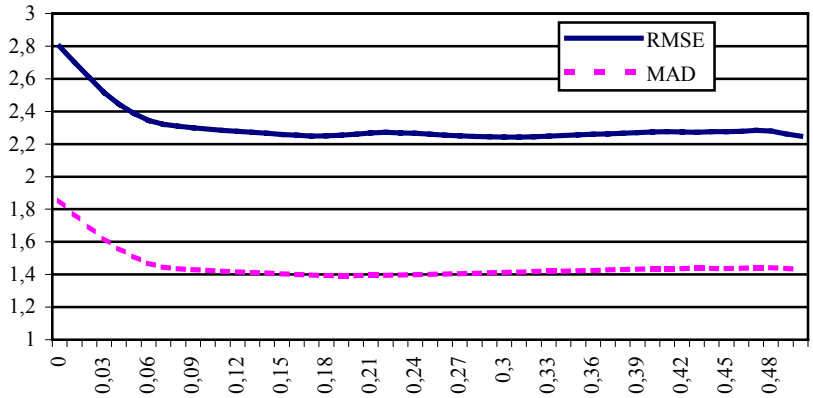


Fig. 6.WPI RMSE & MAD Historical Data

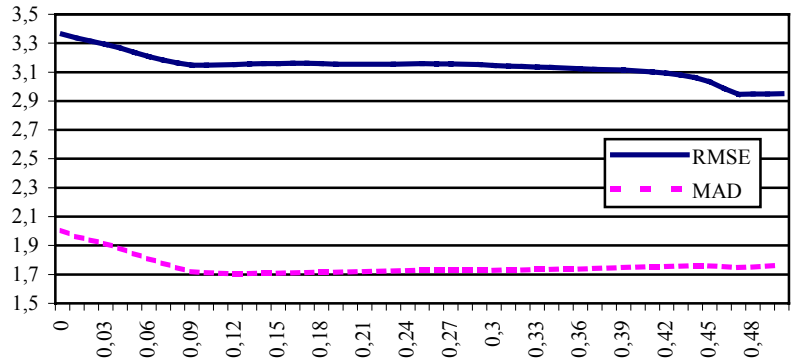


Fig. 7. WPI Estimators Monthly Changes

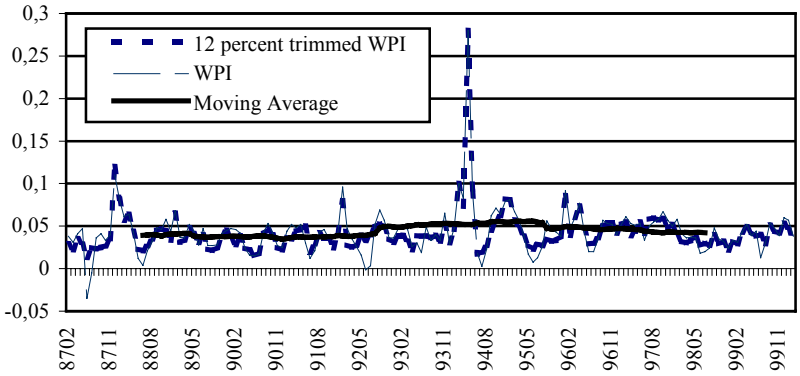
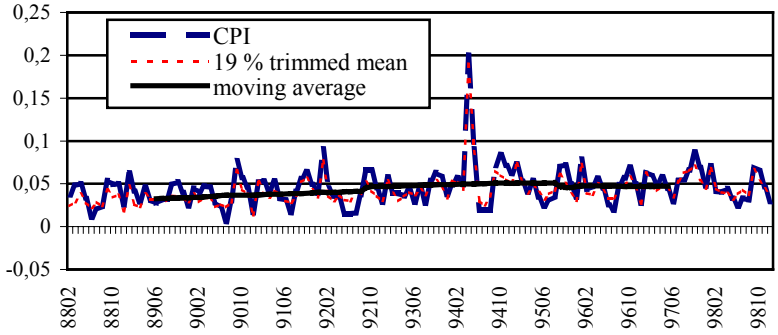


Fig. 8.CPI Estimators Monthly Changes



Appendix

Table A.1.

19 % Trimmed CPI Trimmed Categories	Frequencies %
Fresh Vegetables	89.39
Fish	80.30
Cigarettes	80.30
Tea	78.79
Fresh Fruits	74.24
Eggs	72.73
Pharmaceutical Preparations And Products	72.73
Communication	72.73
Dried Vegetables	69.70
Men's Garments	62.88
Fuel Oil	62.12
Sugar	61.36
Women's Garments	60.61
Alcoholic Beverages	51.52
Footwear	51.52
Children's Garments	50.76
Culture	50.00
Education	40.91
Electrical Appliances	39.39
Recreation	36.36
Bread	34.85
Radio-Television Etc.	34.85
Medical And Paramedical Services	32.58
Electricity, Water Supply, Gas	32.58
Non-Durable Recreational Materials	31.82
Non-Alcoholic Beverages	31.06
Meat	29.55
Meat Products	28.79
Restaurants	26.52
Babies' Garments	26.52
Others	26.52
Buffets	24.24
Cafes	24.24
Other Transportation	24.24
Household Maintenance And Repair Services	24.24
Rent	22.73
Dried Fruits	21.97
Cafeterias	18.94
Milk And Milk Products	18.18
Pastry Shops	18.18
Other Cereals	17.42
Household Maintenance And Repair Materials	15.91
Oils	15.15
Furniture And Household Textiles	15.15
Personal Care	15.15
Fabrics	14.39
Non-Electrical Appliances	14.39
Other Ready-Made Foods	12.12
Household Maintenance And Cleaning Materials	11.36
Glassware, Tableware And Household Utensils	9.09

Table A.2.

12 % Trimmed WPI Trimmed Categories	**Frequencies %**
Tea	89.873
Vegetables & Fruits	87.975
Fishing	85.443
Water	79.747
Crude Petroleum	77.215
Animal Husbandry	76.582
Livestock Products	68.354
Other Farm Corps	66.456
Metallic Ore Mining	63.924
Pulses	62.658
Manufacture of Mach & Eq. not elsewhere classified	55.063
Electricity	49.367
Coal Mining	47.468
Cereals	47.468
Manufacture of Paper Products	44.304
Basic Metal Industries	41.139
Manufacture of Other non-metallic Mineral Products	34.810
Manufacture of Wood Products	32.911
Non-metallic Ore Mining	32.278
Manufacture of Food, Beverages and Tobacco Products	26.582
Manufacture of Chemical and Petroleum Products	22.152
Manufacture of Textile Products	14.557
Manufacture of Metal Products	12.025