

# Understanding the Dynamics of Core Inflation of newly created Consumer Price Indices of India

RINALANI PATHAK KAKATI\*  
RASHMI REKHA MAHANTA\*\*

---

---

## Abstract

The study examines the relationship between headline and core inflation for the Consumer Price Index (CPI) and evaluates the suitability of the measures of core inflation. By using exclusion based measure two core measures have been constructed for newly created CPIs: CPI (Rural): CPI Rural excluding Food Index, CPI Rural excluding Food and Fuel Index; CPI (Urban): CPI Urban excluding Food Index ,CPI Urban excluding Food and Fuel Index; CPI (Combined): CPI Combined excluding Food Index ,CPI Combined excluding Food and Fuel Index. Test of Predictability , Test of Volatility and Test of Causality have been performed to find the suitable core measure. The CPI-Urban Excluding Food and Fuel has been found as the best core measure because (a)For all the three time periods (1, 2, and 3 months) the headline CPI-Urban reverted back to the core measure CPI-Urban Excluding Food and Fuel; (b)It has been found to be the least volatile measure; (c) It has unidirectional causality at both lags 1 and 2.

---

---

## I. Introduction

ONE OF THE most important concepts that economists refer to while discussing inflation dynamics of a country, is the concept of “core inflation”. Every economy generally faces demand and supply-side shocks which might lead to huge variations in relative prices. In such cases, the behavior of headline inflation, i.e. the Consumer Price Index (CPI) or the Wholesale Price Index (WPI) could be deceptive for policy purpose. Therefore, a proper analysis of the price changes as to which price changes are momentary and which are permanent is critical. This is more important because the monetary policy of the central bank operates after a time-interval. If the price increase is due to temporary shocks that could very soon reverse themselves, it might not require any monetary policy action.

\* Professor, Gauhati University, Department of Business Administration, Jalukbari Gauhati, Assam 781014, INDIA

\*\* Research Scholar, Gauhati University, Department of Business Administration, Jalukbari Gauhati, Assam 781014, INDIA

**Table X (F)**  
**Granger Causality Test between CPI Combined and**  
**CPI Combined Excluding Food and Fuel**

Lag 1	CPI Combined does not Granger Cause	1333.07000	0.00000
	CPI Combined excluding Food and Fuel		
	does not Granger Cause CPI Combined	0.01092	0.91717
Lag 2	CPI Combined does not Granger Cause	753.75100	0.00000
	CPI Combined excluding Food & Fuel		
	does not Granger Cause CPI Combined	0.49836	0.61045

Source : Self Computed

### V. Conclusion

The predictability, volatility and causality test of the core measures established that, in case of Core Measures based on CPI, the CPI-Urban Excluding Food and Fuel was the best core measure because

- i. For all the three time periods (1, 2, and 3 months) the headline CPI-Urban reverted back to the core measure CPI-Urban Excluding Food and Fuel.
- ii. The CPI-Urban Excluding Food and Fuel was found to be the least volatile measure of core inflation, whereas the other measures had quite persistent volatility.
- iii. The CPI-Urban Excluding Food and Fuel and CPI-Urban had unidirectional causality at both lags 1 and 2.

### References

- Aleem, A. and A. Lahiani, (2011), "Estimation and evaluation of core inflation measures", *Applied Economics*, Vol. 43, pp. 3619-3629.
- Andrade, I.C. and R.J. O'Brien, (1999, 2001), "A Measure of Core Inflation in the UK" Department of Economics, Institute for Economics and Business Administration (ISEG), Technical University of Lisbon Working Paper, No. 2001/05
- Ball, L., (1992), "Why does high inflation raise inflation uncertainty?", *Journal of Monetary Economics*, Vol 29, No.3, pp. 371-388.
- Bicchal. M., N. K., Sharma, B. Kamaiah, (2012), "Evaluating Core Inflation Measures for India", *IUP Journal of Applied Economics* Vol. 11, No.3, pp. 22-64
- Blinder, A.S., (1997), "Is there a core of practical macroeconomics that we should all believe?", *The American Economic Review*, Vol. 87, No.2, pp. 240-243
- Bollerslev, T., (1986), "Generalized autoregressive conditional heteroskedasticity". *Journal of Econometrics*, Vol. 31, No. 3, pp. 307-327
- Bryan, M.F. and S.G. Cecchetti, (1994), "Measuring Core Inflation", *Monetary Policy*, pp. 195-219
- Clark, T.E., (2001), "Comparing measures of core inflation". *Economic Review*, Federal Reserve Bank of Kansas City, Vol. 86, No. 2, pp. 5

- Clinton, K. (2006), "Core inflation at the Bank of Canada: A critique", Queen's University Department of Economics working paper, 1077
- Cogley, T. (2002), "A Simple Adaptive Measure of Core Inflation", *Journal of Money, Credit and Banking*, Vol. 34, No. 1, pp. 94-113
- Eckstein, Otto, (1981), "Core Inflation", Prentice Hall Books, pp. 121
- Engle, R.F., (1982), "Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation", *Econometrica Journal of the Econometric Society*, pp. 987-1007
- Granger, C.W., (1969), "Investigating causal relations by econometric models and cross-spectral methods", *Econometrica Journal of the Econometric Society*, pp. 424-438
- Grier, R. and K.B. Grier, (2006), "On the real effects of inflation and inflation uncertainty in Mexico", *Journal of Development Economics*, Vol. 80, No. 2, pp. 478-500.
- Kar, S., (2009), "Statistical tools as measures of core inflation for India", *Indian Economic Review*, pp. 225-245.
- Khan, M., L. Morel, and P. Sabourin, (2015), "A comprehensive evaluation of measures of core inflation for Canada" Discussion Paper. No. 2015-12, Bank of Canada.
- Kim, J.C., Y.W., Kim, and S.Y. Lee, (2009), "Measures of core inflation in Korea", Working Paper#49, BIS, in Participants in the meeting, pp. 233
- Lafleche, T., and J. Armour, (2006), "Evaluating measures of core inflation". *Bank of Canada Review*, Summer 2006, pp. 19-29
- Mallick, A. and N. Sethi, (2014), "Comparing the measures of core inflation in India: trimmed mean and structural vector auto-regression approach", *International Journal of Monetary Economics and Finance*, Vol. 7 No. 4, pp. 288-301
- Mankikar, A. and J. Paisley, (2004), "Core inflation: a critical guide", Working Paper no. #242, Bank of England
- Nelson, D.B., (1990), "Stationarity and persistence in the GARCH (1,1) model", *Econometric Theory*, Vol. 6, No.3, pp. 318-334
- Quah, D. and S.P. Vahey, (1995), "Measuring Core Inflation", *The Economic Journal*, Vol. 105, No. 432, September 1995, pp. 1130-1144
- Raj, J., and S.Misra, (2011), "Measures of Core Inflation in India : An Empirical Evaluation", Reserve Bank of India Occasional Papers Vol. 32, No. 3
- Rich, R.W., and C.C. Steindel, (2007), "A comparison of measures of core inflation" *Economic Policy Review*, December 2007
- Roger, S., (1998), "Core inflation: concepts, uses and measurement" SSRN
- Shahiduzzaman, M., (2009), "Measuring core inflation in Bangladesh : The choice of alternative methods", *The Bangladesh Development Studies*, Vol. 32, No. 1, pp. 23-44.
- Tahir, S., (2006), "Core inflation measures for Pakistan", *State Bank of Pakistan Research Bulletin* Vol. 2, No. 2, 2006.
- Wynne, M., (2008), "Core inflation: a review of some conceptual issues", *Federal Reserve Bank of St. Louis Review*, May-June 2008, Vol. 90, No.3, (Part 2), pp. 205-228.

## Annexure I

**Table A1**  
**Unit Root Test of the Core Measures for CPI(R), CPI (U) and CPI(Comb)**

Unit Root Test of CPI Rural Ex Food				Period: January 2011-December 2015					
	ADF Test Statistic	R-squared	DW	AIC	SC	F-statistic	Prob (F-stat)	1% CV*	5% CV
At Level	-1.96845	0.06583	1.99011	3.52825	3.63483	1.93776	0.15373	-	3.546
								10% CV	2.912
								5% CV	2.593
At 1st Difference	-5.28243	0.50138	2.00007	3.61528	3.72281	27.1493	0	1% CV*	3.548
								5% CV	2.913
								10% CV	2.594
Unit Root Test of CPI Rural Ex Food & Fuel				Period: January 2011-December 2015					
At Level	-1.82959	0.05737	1.97935	3.01067	3.11725	1.67373	0.19696	1% CV*	3.546
								5% CV	2.912
								10% CV	2.593
At 1st Difference	-5.2698	0.49854	2.00091	3.08772	3.19525	26.8431	0	1% CV*	3.548
								5% CV	-2.913
								10% CV	2.594
Unit Root Test of CPI Urban Ex Food				January 2011-December 2015					
At Level	-1.39637	0.0344	1.62687	4.7714	4.87797	0.97979	0.38184	1% CV*	3.546
								5% CV	2.912
								10% CV	2.593
At 1st Difference	-4.10984	0.38238	1.64586	4.82544	4.93297	16.71622E-06		1% CV*	3.548
								5% CV	2.913
								10% CV	2.594
Unit Root Test of CPI Urban Ex Food & Fuel				January 2011-December 2015					
At Level	-1.74217	0.05259	1.95555	4.19958	4.30615	1.5264	0.22638	1% CV*	3.546
								5% CV	2.912
								10% CV	2.593
At 1st Difference	-5.02096	0.48134	1.96304	4.27233	4.37986	25.0576	0	1% CV*	-3.548
								5% CV	2.913
								10% CV	2.594
Unit Root Test of CPI Combined Ex Food				January 2011-December 2015					
At Level	-1.27104	0.02857	1.49222	4.63475	4.74132	0.80886	0.45059	1% CV*	3.546
								5% CV	2.912
								10% CV	2.593
At 1st Difference	-3.76166	0.34066	1.51577	4.67925	4.78678	13.95	1.3E-05	1% CV*	3.548
								5% CV	2.913
								10% CV	2.594
Unit Root Test of CPI Combined Ex Food & Fuel				January 2011-December 2015					
At Level	-1.95625	0.06618	2.00075	3.61512	3.72265	1.91349	0.15744	1% CV*	-3.548
								5% CV	2.913
								10% CV	2.594
At 1st Difference	-5.15573	0.5013	1.99782	3.69887	3.80737	26.63780	0.00000	1% CV*	-3.55
								5% CV	2.914
								10% CV	2.594

Source : Self Computed

Annexure II  
Wholesale Price Index

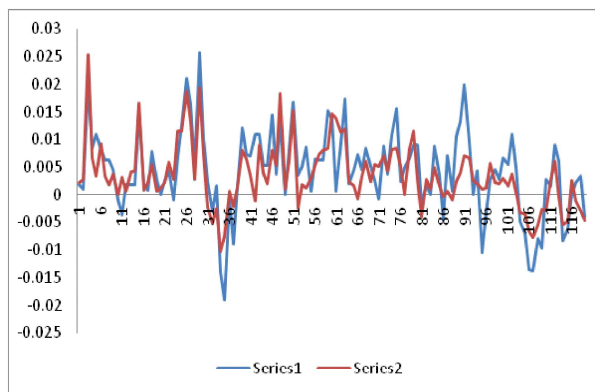


Figure A2.1  
The gap between WPI and WPI - Food & Fuel  
Series 1- WPI & Series 2- WPI - food & fuel

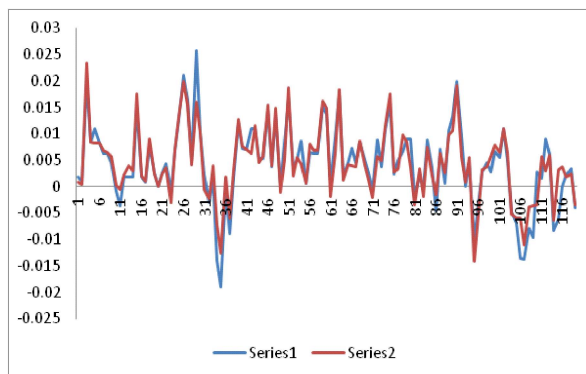


Figure A2.2  
The gap between WPI and WPI - Fuel  
Series 1- WPI & Series 2- WPI - Fuel

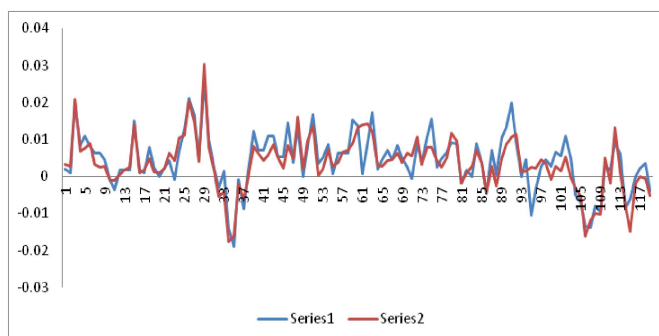
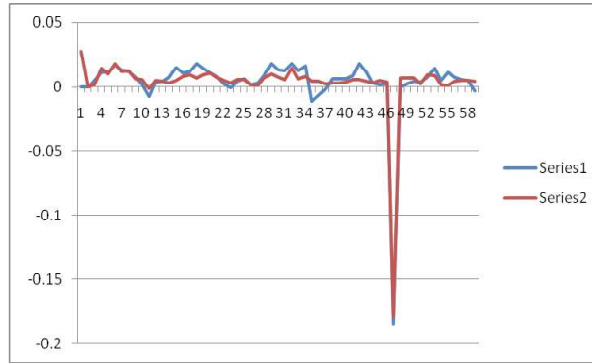


Figure A2.2  
The gap between WPI and WPI - Food  
Series 1- WPI & Series 2- WPI - Food

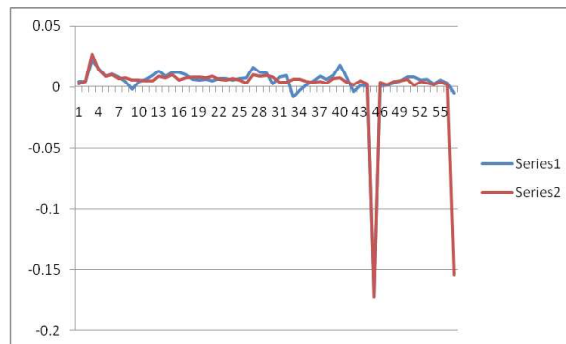
**Annexure III  
Consumer Price Index**



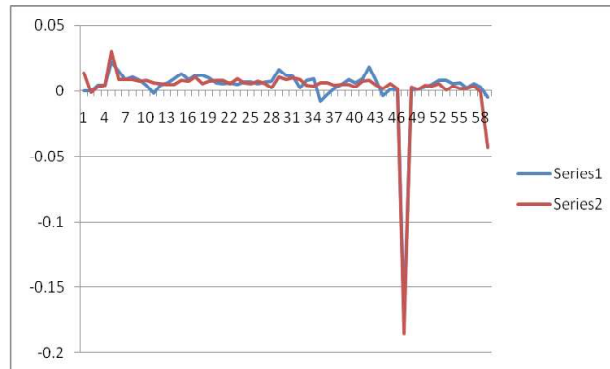
**Figure A3.1**  
The gap between CPI (R) and CPI (R) - Food  
Series S1-CPI-R and S2-CPI(R)



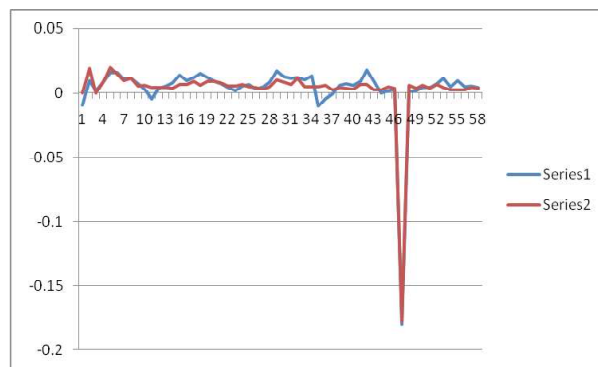
**Figure A3.2**  
The gap between CPI (R) and CPI (R) - Food & Fuel  
Series S1- CPI-R and S2-CPI(R)



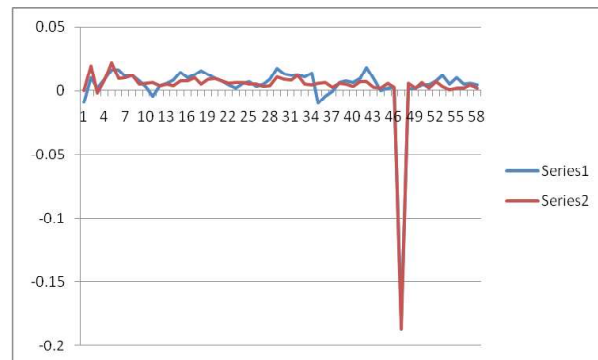
**Figure A3.3**  
The gap between CPI (U) and CPI (U) - Food  
Series S1-CPI(U) and S2-CPI(U)



**Figure A3.4**  
**The gap between CPI (U) and CPI (U) - Food & Fuel**  
**Series S1-CPI (U) and S2-CPI(U)**



**Figure A3.5**  
**The gap between CPI (Combined) and CPI (Combined) - Food**  
**Series S1- CPI-Combined and S2- CPI (Combined)**



**Figure A3.6**  
**The gap between CPI (Combined) and CPI (Combined) - Food & Fuel**  
**Series S1-CPI-Combined and S2-CPI(Combined)**