

Technical note on seasonal adjustment for Wholesale price index (Non food)

July 1, 2013

Contents

1 Wholesale price index (Non food)	2
2 Steps in the seasonal adjustment procedure	2
2.1 Seasonal adjustment with X-12-ARIMA	2
2.2 Diagnostic checks	3
2.2.1 Presence of identifiable seasonality	3
3 Spectral representation	3

List of Figures

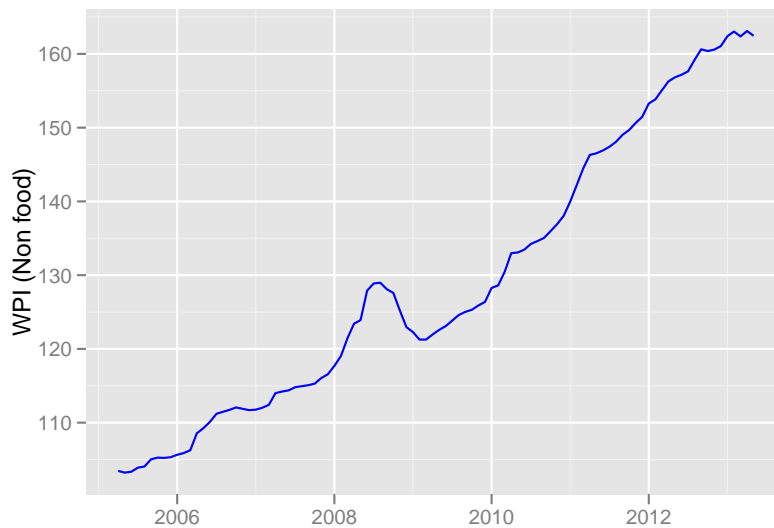
1 WPI (Non food) (Non seasonal adjusted)	2
2 Monthly growth rates across the years	3
3 WPI-Non food (NSA and SA)	4
4 WPI- Non food Spectral (NSA and SA)	4

List of Tables

1 Wholesale price index (Non food)

We construct the series for WPI (Non food) by excluding the food component from the overall WPI. WPI inflation is divided into three broad categories- Primary articles, Fuel products and Manufacturing items. The first category includes food articles. The manufacturing category also has a component of food products which is volatile and move in line with the primary articles. If we exclude food articles and food products from the headline WPI, we get a measure of non food WPI. We analyse this series from April, 1994 onwards. Figure 1 shows the original plot of the series. The series does not show seasonal patterns.

Figure 1 WPI (Non food) (Non seasonal adjusted)



2 Steps in the seasonal adjustment procedure

A visually appealing way of looking at the raw data is to plot the growth rates in each of the months across the years i.e the growth of April over March in each of the years from 1994 onwards. This gives us some idea of the presence of seasonal peaks, if any in the series.

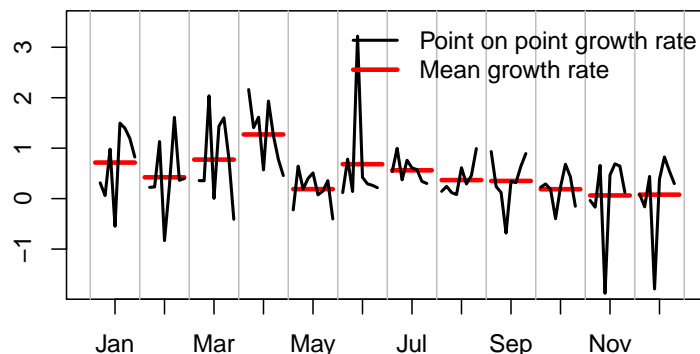
Figure 2 does not show distinct seasonal peaks in any of the months across the years. The mean growth rates for all the months across the years are not markedly different from each other. Thus we infer from Figure 2 that the series does not show identifiable seasonality.

2.1 Seasonal adjustment with X-12-ARIMA

We test our inference by seasonally adjusting the series through X-12-ARIMA program.

Figure 3 shows the non-seasonally and seasonally adjusted non food WPI. The blue line shows the non-seasonally adjusted series and the red line shows the series after filtering the raw series through X-12-ARIMA program. There is not much difference in the raw and seasonally adjusted series. This again shows that the series does not have identifiable seasonality.

Figure 2 Monthly growth rates across the years



2.2 Diagnostic checks

After seasonal adjustment, a series of diagnostic checks are performed to test for the presence of identifiable seasonality in the series.

2.2.1 Presence of identifiable seasonality

The statistic $M7$ shows the amount of moving seasonality present relative to stable seasonality. It shows the combined result for the test of stable and moving seasonality in the series. A value lesser than 0.7 is desirable to show identifiable seasonality in the series.

The value of $M7$ for non food WPI is 0.826. The moving seasonality is high relative to stable seasonality. A high value of $M7$ statistic shows that there is no identifiable seasonality in the series.

3 Spectral representation

Figure 4 shows the spectral plot of the growth rate of the unadjusted and seasonally adjusted series. The spectral plot is an important tool of the frequency domain analysis. It shows the portion of variance of the series contributed by cycles of different frequencies.

Since the series does not have a high degree of distinct seasonality (as is evident from the $M7$ statistic), the figure for non seasonally adjusted growth rate does not show distinct peaks at the seasonal frequencies.

With the latest data, the $M7$ statistic and the spectral plots do not show identifiable seasonality in the series. We do not perform seasonal adjustment of the series and report non-seasonally adjusted annualised month-on-month growth rates (NSAAR) for non food WPI.

Figure 3 WPI-Non food (NSA and SA)

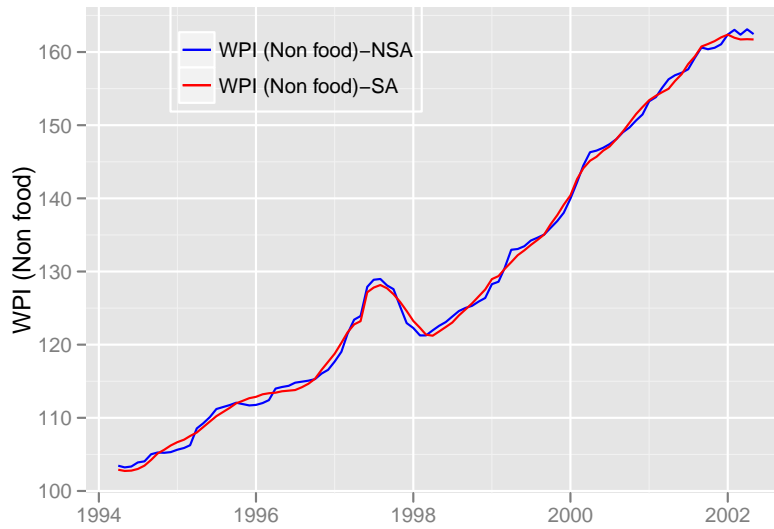


Figure 4 WPI- Non food Spectral (NSA and SA)

