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SPURIOUS CYCLING IN THE ANNUAL INFLATION RATE

Abstract:

The annual inflation rate is defined as the year-over-year growth rate of the consumer price index, which is, in fact, the seasonal difference of the logarithm of the consumer price index. The monthly inflation rate is defined as the month-over-month growth rate of the consumer price index, i. e. the regular difference of the logarithm of the consumer price index and the annualized rate of inflation is twelve times the monthly rate of inflation. The annual rate of inflation can be computed as a one-sided simple (all values have equal weight) moving average of twelve annualized inflation rates. The one-sided moving average is the smoothing filter, which has special properties. First, it is well known that there is a lag time between a turning points of the original time series and the filtered time series. Second, the moving average removes some part of the seasonality and noise from the original time series and leaves the cyclic components. It has been shown that the annual inflation rate has such high autocorrelation that it can be considered as a nearly nonstationary time series in contrast with the monthly and annualized inflation rates. The level of the autocorrelation depends on the width of the moving average window, the wider the window, the higher the autocorrelation and the persistence in the resulting time series. The autocorrelation is directly related to the observed cycles in the time series. The wider moving average window leads to the cycles that are not so pronounced and conversely. So, the shapes of cycles are created by the length of the moving averages, as the biased estimates of the mean of the stationary generating process for the original time series and so it is evident that the cycles need not have a source in the original time series and can be spurious. It follows that the shape of the annual inflation rate is somewhat artificial, since other filters can create different cycling of the resulting time series. For these reasons, the use of the annual inflation rate in practice is problematic.

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Inflation rate, smoothing, moving average, cycle

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