Protocols for Graphics, Reporting Volatility, and Related Topics

1 Units

1.1 Scaling Returns

The convention is to use geometric returns expressed as a percent. Thus if $P_i$ are the 5-min price observations, then we compute the returns as

$$r_i = 100 \times \left[ \log (P_i) - \log (P_{i-1}) \right]$$

1.2 Scaling Variance

The variance measures are in units of variance per day. The daily realized variance is

$$RV = \sum_{1}^{n} r_i^2$$

The variance measures are convenient mathematically but very hard for the user to interpret. Thus we will always report, unless told otherwise, the annualized versions. For the case of the realized variance this would be

Annualized Realized Variance: $= \sqrt{252} \times RV$

The units are now in percent standard deviations per year.

2 Graphics

2.1 Default Matlab Graphics are Unacceptable

The default graphic for Matlab is optimized for viewing on the screen, but it is terrible for reporting results in papers and presentations. Below is a pretty bad plot of BAC 2007–2014. A plot of the returns is equally bad. Some better graphics follow.
Some more effective plots of Bank of America are as follows:
Figure 1: Bank of America, 2007–2014
Figure 2: Bank of America, 2007–2014
Figure 3: Bank of America, 2008
Figure 4: Bank of America, September 9, 2009
Figure 5: Realized Variance (Annualized) XOM 2007-2010
Figure 6: Bipower Variation (Annualized) XOM 2007-2010