Monthly Foreign Exchange Rates

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Topics

• Data measurement issues
• Univariate time series models
• VAR models
Measurement Issues

- For many government time series, monthly values are reported as the averages of daily numbers
  - e.g. FRED [Federal Reserve Economic Data]
  - http://research.stlouisfed.org/fred2/

- This might make sense for some data, but not for prices of financial assets

- Normal convention with stock prices, bond prices, exchange rates, etc. in financial research is to use end-of-month prices

Pound/Dollar Exchange Rate

- EXUKUS for FRED (averages of daily values)
- EXUKUSD end-of-month daily values from FRED
- Both from January 1971-September 2015
Pound/Dollar Exchange Rate

• Summary statistics and graphs look identical, as do autocorrelations of levels:

Pound/Dollar Exchange Rate

• Autocorrelations of differences show first clue:

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Pound/Dollar Exchange Rate

• Time averaging the data for EXUKUS creates an IMA(1,1) process, even though the underlying data is a random walk (EXUKUSD) – “Working effect”

Pound/Dollar Exchange Rate

• Cross-correlations show the strongest relation is between EXUKUS and EXUKUSD(-1)
Pound/Dollar Exchange Rate

VAR(2) model for EXUKUS and EXUKUSD shows how
time-averaging makes EXUKUS seem to be predictable

Pound/Dollar Exchange Rate

VAR(2) model for D(EXUKUS) and D(EXUKUSD) makes
it clear that the end-of-period exchange rate is a random
walk (so differences are unpredictable)
Pound/Dollar Exchange Rate

-“Granger Causality Test” shows that lags of EXUKUSD predict EXUKUS, but not vice versa

Note that the “Granger Causality Test” from the pull-down menu does not use heteroskedasticity correction.
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