Research Proposal

Anti-Streaky behavior in Currency Markets and Other patterns

The reason why I chose the currency market is because it is widely observed that it is a much more trending market than stock market. Trends famously lasts for months and typically many traders try to 'fight' the trend.

Hypothesis: I suspect that the streaks such as (Up,Up, Up) or (Up,Up,Up, Up) may happen less often than what the Bernoulli trials would predict. But others seemingly less streaky patter (Up, down, Up, Up) in a market trending up or (Down, Up, Down, Down) in a market trending down may happen more frequently than expected especially in shorter time frame.

Datasets: Daily currency closing price for various currencies, hourly, 15-minutes period
          Interest rate, commodity prices

Based on the analysis from the book Probability Tales (section 6: Runs in the stock market). I want to carry out a similar project but with certain differences. The same kind of analysis will be carried out using Bernoulli trials as a model to observe the price changes in the currency market.

Instead of the actual trend line during that time period.
Possible source to estimate long-run probability of currency going up:
   1. The currency trend in a longer time frame
   2. Interest rate data
   3. Commodity data trend for 'commodity' currencies

I will compare the actual number of occurrence of these patterns and the expected theoretical value and then using normal approximation to see how far off the z-value is from the expected value.

Also, a more interesting way to look at the data in addition to looking at a constant 15-minutes interval is to not fix the time interval but instead fix a certain level that price has to increase to, in other words fix a certain price changes as up or down.

Another area to explore is to see whether some well-known patterns such as head-and-shoulders. Do they happen by chance or do they occur more frequently than expected?

Other possible ways besides {up, down}: can we do {up, flat, down} or {Up2,up1,flat,down1,down2?} where up2 > up1