Changing Euro Day Structures Over Time

Relativity is just fine, especially if you are into astrophysics, but you need a few absolutes to anchor any system and prevent it from being completely "unidentified" or replete with multiple solutions. Currency traders are quite well aware of this difficulty in that the fundamental cost of carry equation has three unknown variables in terms of the exchange rate and the two interest rates involved. You have to fix at least two of the variables or one variable and the relationship between the other two to make the whole thing work. Even Einstein had to set the speed of light as an absolute.

Market analysts used to be able to assume human behavior as an absolute. No matter what asset was being traded or no matter the speed of the trading system or even the culture of the traders involved, the human responses to different situations were predictable. You should be able to cite the litany from anything you have read on behavioral finance: Traders hate taking small losses; they anchor on previous highs in equity, etc. Moreover, these behavior patterns exhibit fractal scalability, a fancy way of saying a five-minute bar chart can be read on the same basis as a daily bar chart, a weekly bar chart and so on.

What happens, though, when trading algorithms take over the decision-making from human traders and high-frequency trading activities enabled by improved technology and lower execution costs increasingly turn trading from a game of capturing long-term signal into one of capturing short-term noise or Brownian motion? Let's take a look at some daily trading structures for the euro since its January 1999 inception to see if and when they have changed with the rise of the machines.

A Day Structure Classification Scheme

We can normalize a trading day's structure by taking key points such as its open, high, low, close, and midpoint (O, H, L, C and M) and locating them on a stochastic distribution of the day's range. We can create eight different day structures by classifying each day in along the relationship of its open to its close, then along the relationship of its open to its midpoint and finally along the relationship of its midpoint to its close. As an aside, this construct was used almost seventeen years ago to analyze the effect of various trading-day lengths and adoptions of new trading technologies for Treasury bond futures (see "Days Of Our Lives," December 1998).

O ≥ C				O < C			
O ≥ M		O < M		O > M		O ≤ M	
(1)	M ≥ C	**(3)**	M < C	**(5)**	M > C	**(7)**	M ≤ C
(2)	M < C	**(4)**	M ≥ C	**(6)**	M ≤ C	**(8)**	M > C

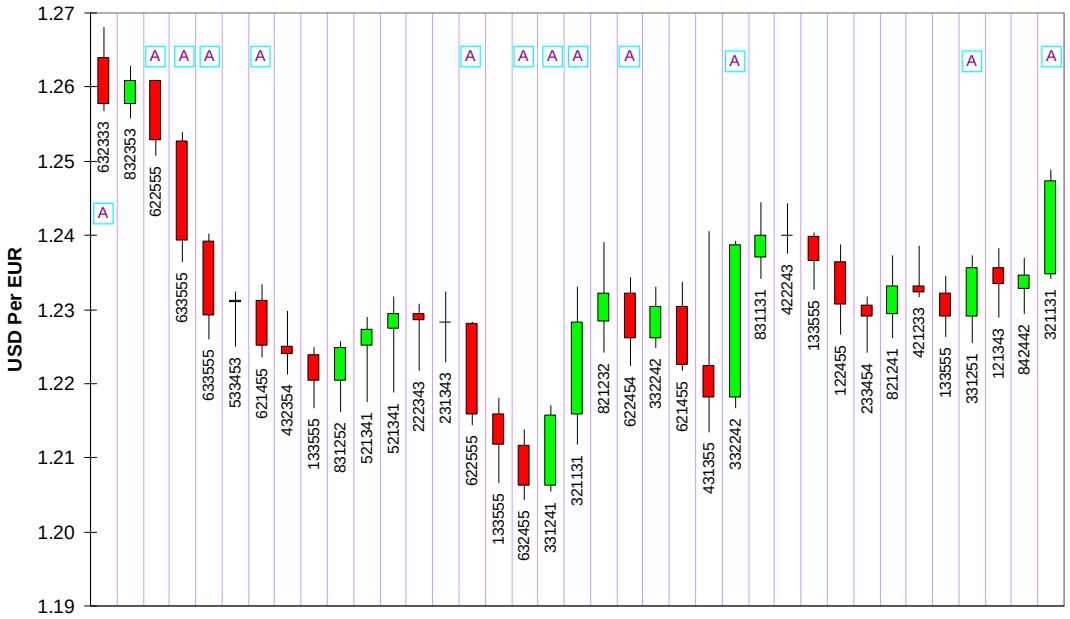
These intraday structures can and indeed should be placed in context with each day's relationship to the previous day. After all, a market closing on its low and below the previous day's low after making a higher high, a classic reversal-type of day, denotes something very different from a market closing on its low after opening above the previous day's midpoint, a classic downtrend-continuation formation.

Just as the intraday structures can be classified on a mutually exclusive and collectively exhaustive basis, we can compare each day's open, high, low, close, and midpoint to those of the previous day on another unique scale:

1: Greater than the previous high
4: Less than the previous low
2: Greater than or equal to the midpoint
3: All else

These two schemes can be combined to give each day a unique six-character tag where the first digit is one of the eight intraday codes and the next five digits are one of the four comparison codes vis-à-vis the previous day for the O/H/M/L/C points, respectively.

Let's map these codes against a standard candle chart for the euro over the July 2 - August 21, 2012 period encompassing the euro's slide and its recovery after Mario Draghi's "whatever it takes" statement promising a defense of the euro. This period has a wide variety of day classifications. Each day's candle is displayed with its classification label.



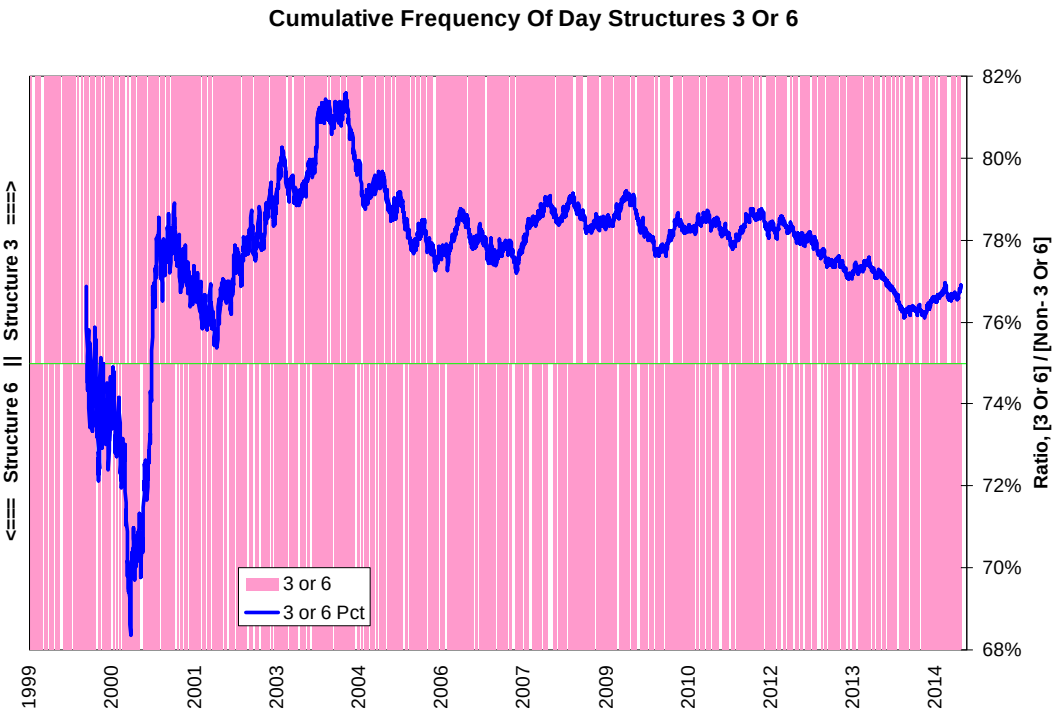
Data Mining For Behavioral Shifts

If algorithmic and high-frequency trading drives trading patterns more in the direction of trying to capture small opportunities and noise than in the direction of capturing longer-term signal, then we should see fewer days with large ranges and closes hard upon the high or low of the day and more days lying within the previous day's ranges. Such questions can be addressed within a data-mining construct.

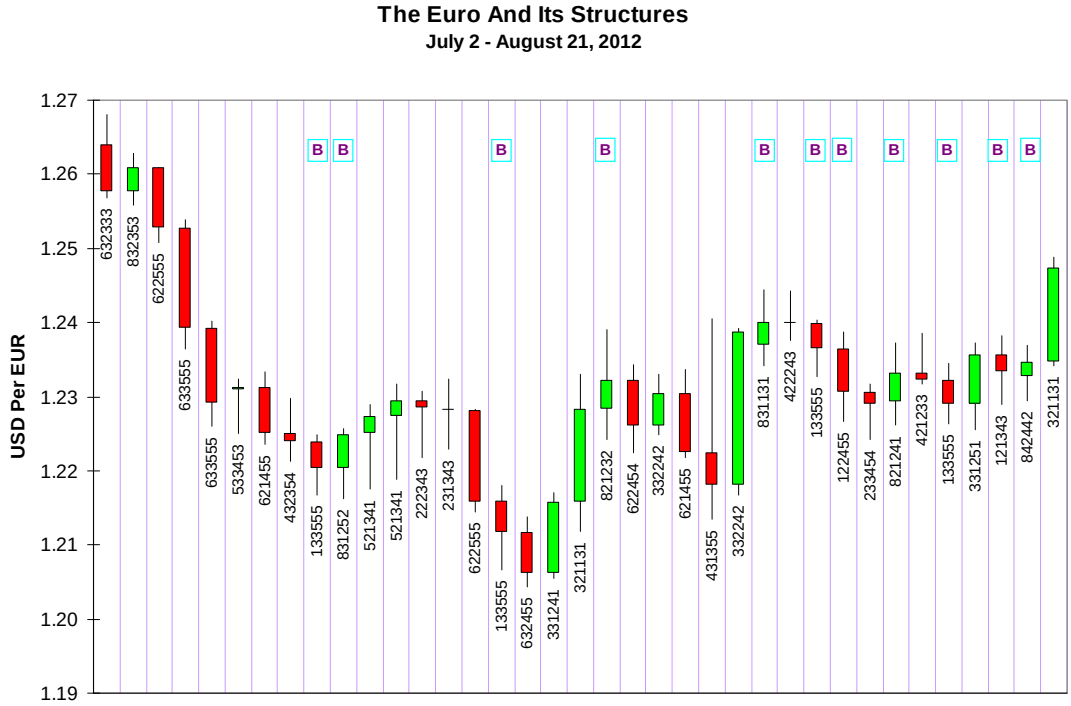
Let's take two of the intraday structure types first, Nos. 3 and 6, both of which are marked with an 'A' in the chart above. Structure No. 3 involves an opening greater than or equal to yesterday's close, an open below today's midpoint and a midpoint below the close; you can see these days involved large green candles. Structure No. 6 involves an opening less than yesterday's close, an open greater than today's midpoint and a midpoint less than or equal to today's close; these are the large red candles in the chart above. How have the frequencies of these two intraday structures changed since January 1999?

Let's map observations of intraday structures 3 and 6 and their cumulative frequency relative to their complements; the ratio begins in January 2000. Four trends in this intraday structure map are apparent immediately. The first is how the euro's initial downtrend into October 2000 involved a declining relative frequency of these two intraday structures. The second was its prolonged rally into July 2004 involved a rapid increase in their relative frequency. The third trend was a very gradual but prolonged decline in their relative frequency. This decline came to an end during the euro's strong downtrend during the second half of 2014 and led to the current and fourth period of increasing frequency of intraday structures 3 and 6.

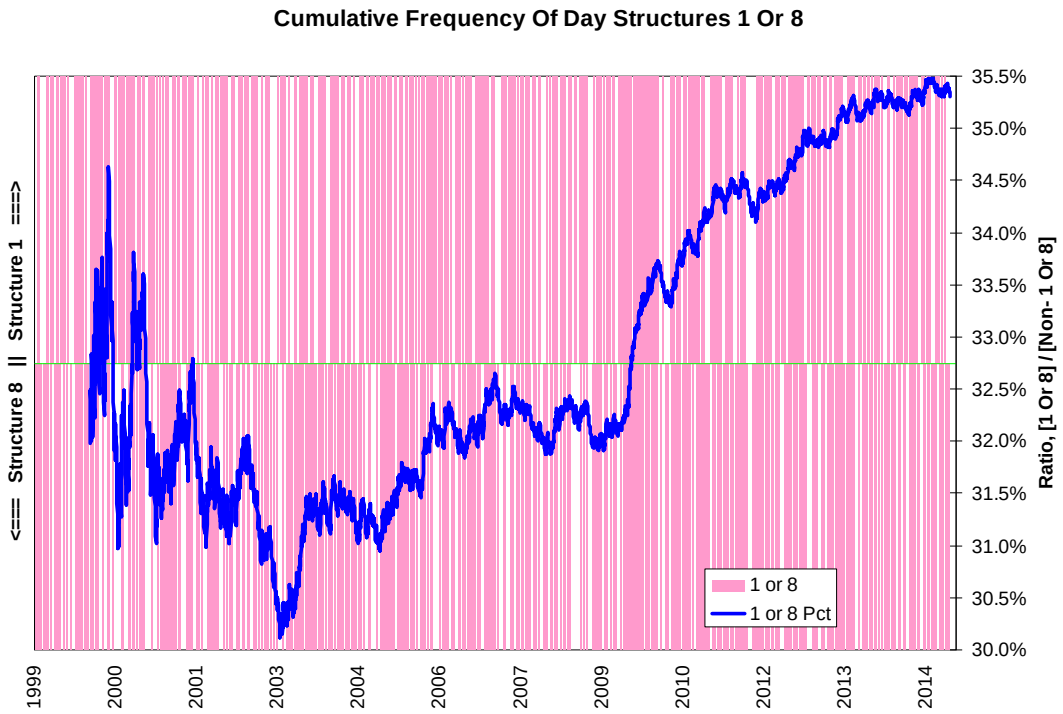
These two intraday structures tend to be "trending" in the parlance of market profile analysis and therefore are likely to be driven by long-term traders acting upon signal and not by short-term traders acting upon noise.



Now let's repeat the exercise above for intraday structures Nos. 1 and 8, marked in the chart below with a 'B.' Structure No. 1 involves an opening greater than or equal to yesterday's close, an open above today's midpoint and a midpoint greater than or equal to the close; you can see these days involved red candles with prominent shadows extending in both directions. Structure No. 8 involves an opening less than yesterday's close, an open less than or equal to today's midpoint and a midpoint greater than or equal to today's close; these are the green candles in the chart below marked with a 'B'.



As before, let's map observations of intraday structures 1 and 8 and their cumulative frequency relative to their complements. The most pronounced trend here has been the two-step expansion of their cumulative relative frequency relative to their complements. The first phase extended from June 2003 to April 2007; the second lasted from June 2009 to January 2015.



These two intraday structures represent days where most of the trading activity is concentrated near the midpoint of the distribution. They can occur during strongly trending periods depending on the five point-to-point comparisons between days. However, these days tend to be "neutral" in the parlance of market profile analysis and therefore are less likely to be driven by long-term traders acting upon signal as opposed to short-term traders acting upon noise.

Rage Against The Machine? Why Bother?

The increasing dominance of intraday structures Nos. 1 and 8 and the declining importance of intraday structures Nos. 3 and 6 over a period characterized by an increasing level of computer-driven trading are consistent with the notion technology is reducing the role of emotion and therefore eroding human behavior as an absolute factor in markets.

Should you care? No, not really; even if market patterns and analytical imperatives change over time, these will affect markets only as trading vehicles for those who livelihoods can be characterized, with no value judgment implied, as professional gamblers. Longer-term applications of markets for purposes of capital formation, asset allocation, price signaling and risk management should be unaffected as the nature of short-term noise does not impede long-term signal. Professional gamblers can adjust to the noise-dominated markets just fine, thank you very much.

As the euro is by far the most active major currency, it was selected for this initial analysis. However, its history is relatively short compared to the other major currencies. A longer parallel analysis for the Canadian dollar will be presented next month.