

Canadian Dollar Day Structures Over Time

“Say not, ‘I have found the truth,’ but rather, ‘I have found a truth.’” – Kahlil Gibran

One of the conclusions reached last month (see “Changing Euro Day Structures Over Time,” September 2015) was the rise of high-frequency and algorithmic trading coincided with a decrease in wide-ranging trend days and an increase in symmetric normal days. The idea computer-driven trading can and apparently does focus more on capturing minor fluctuations and statistical noise over longer-term economic signal does not inhibit markets from performing functions such as price discovery or risk management.

The euro was selected as it is the most active of all of the major currencies and unlike the Japanese yen or Swiss franc, the euro has had fewer bouts of outright manipulation or imposed cross-rate ceilings. This is damning with faint praise.

Does the Canadian dollar, a major currency whose active trade can be tracked on a daily basis since July 1977 using the CRB-Infotech CD-ROM, confirm the conclusion above for the euro? The answer, to end the suspense right here and now, is “No.” The relative frequency of trending intraday structures, discussed below, has been increasing for the Canadian dollar since 1985 in direct contravention of the pattern noted for the euro. However, the relative frequency of normal trading days for the Canadian dollar has been rising since 2002. Restated, the intraday trading structures for the Canadian dollar are something of an either-or proposition where four of the eight intraday structures described below account for 87.2 percent of the observations.

A Day Structure Classification Scheme

To refresh from last month, 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.

$O \geq C$				$O < C$			
$O \geq M$		$O < M$		$O > M$		$O \leq M$	
(1)	$M \geq C$	(3)	$M < C$	(5)	$M > C$	(7)	$M \leq C$
(2)	$M < C$	(4)	$M \geq C$	(6)	$M \leq C$	(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.

Canadian Dollar Sample

Let’s map these codes against a standard candle chart for the Canadian dollar over the September 10 – November 9, 2012 period. This encompasses the end of a three-month rally for the CAD starting with the June 2012 anticipation of QE3 and the beginning of a long downtrend extending through March 2015. Each day’s candle is displayed with its classification label. The exchange rate is depicted in the “USD per CAD” format more familiar to futures traders so that a stronger CAD appears as a higher number.

The CAD And Its Structures September 10 - November 9, 2012



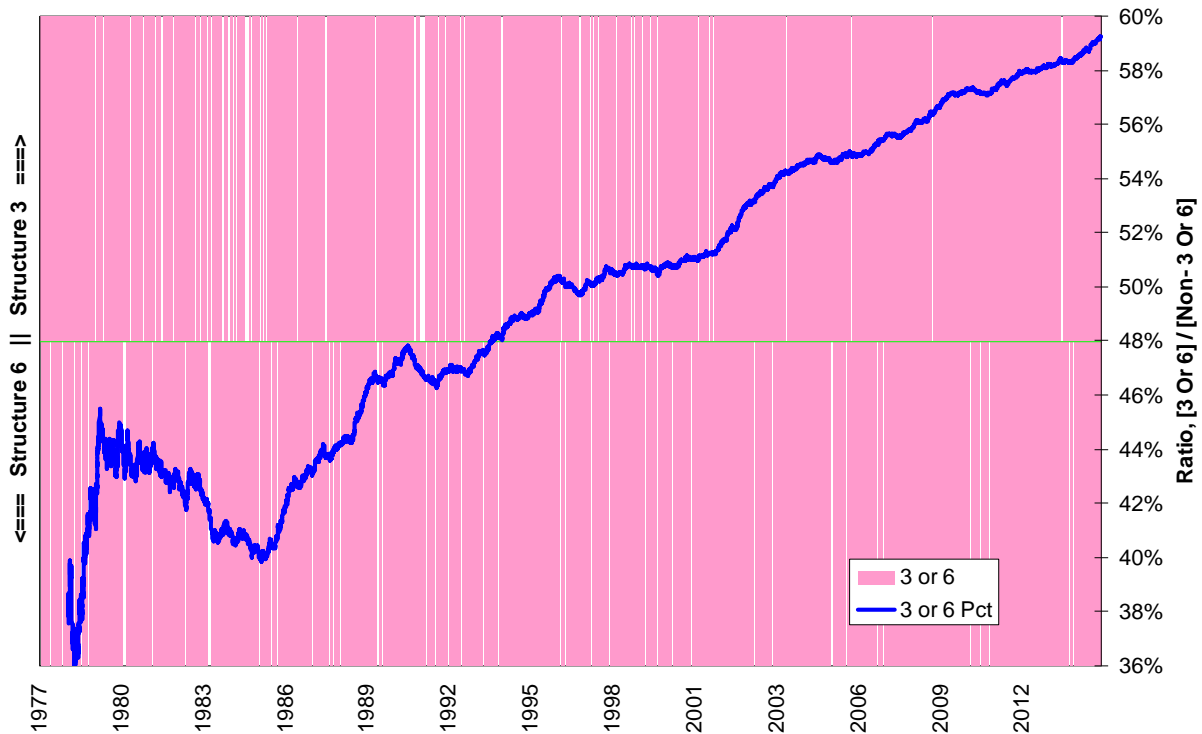
Data Mining For Behavioral Shifts

To review from the euro case study as well, 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. 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. How have the frequencies of these two intraday structures changed since July 1977?

Let's map observations of intraday structures 3 and 6 and their cumulative frequency relative to their complements; the ratio begins at the end of June 1978. This chart only has two trends of significance, a declining relative frequency of intraday structures Nos. 3 and 6 during the massive USD rally of the early 1980s followed by a three decade-long uptrend in this measure. The implications for currency traders are extraordinary: The CAD produces pronounced unidirectional day-trading opportunities more than 59 percent of the time.

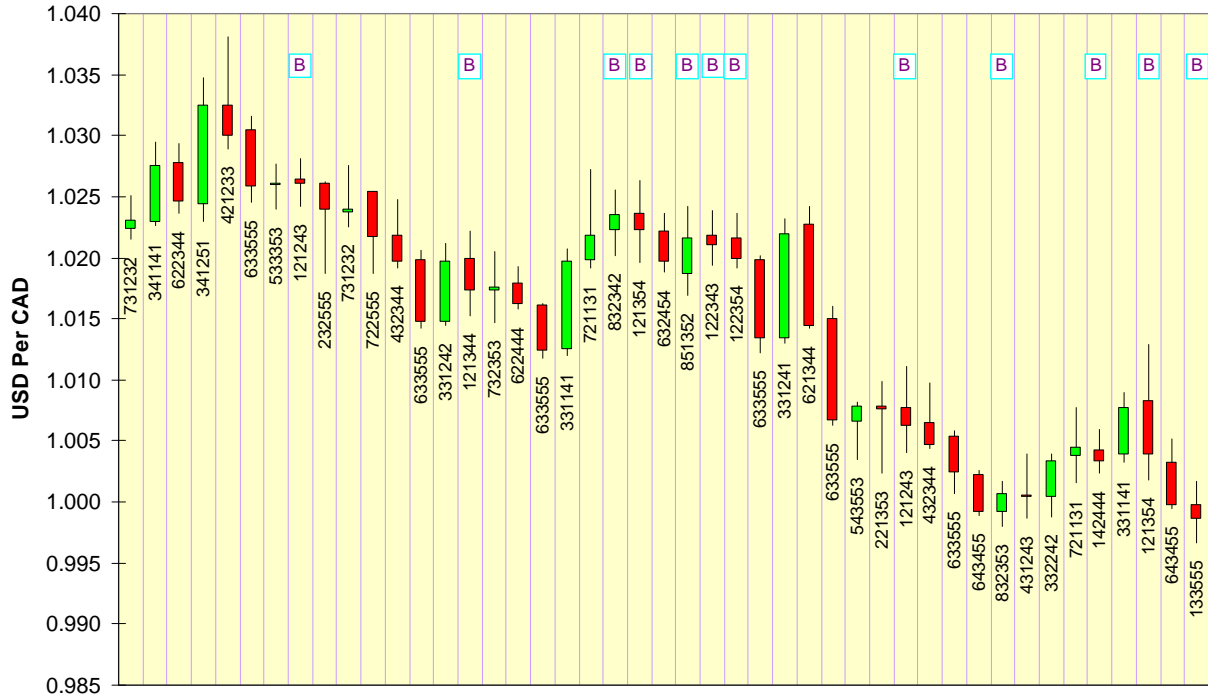
Cumulative Frequency Of Day Structures 3 Or 6



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'.

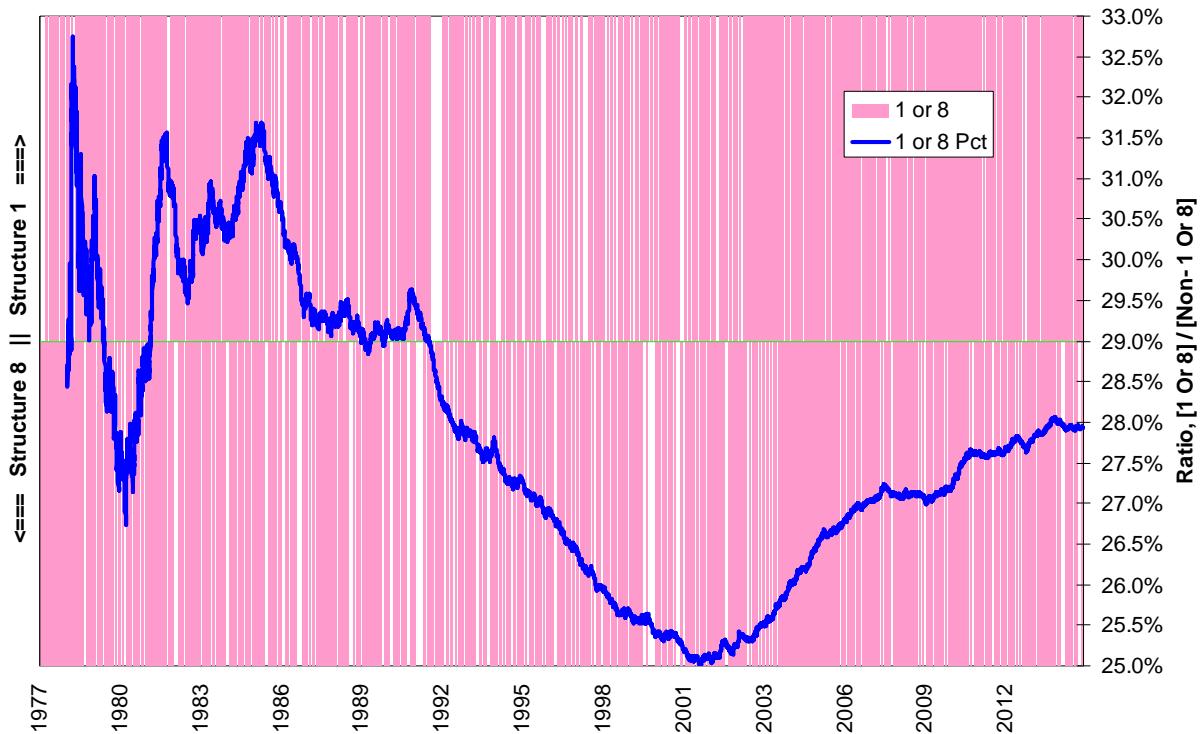
These two intraday structures represent days where most of the trading activity is concentrated near the midpoint of the distribution. They can occur during strongly trending periods depending on the five point-to-point comparisons between days. However, these days tend to be "neutral" in the parlance 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.

The CAD And Its Structures September 10 - November 9, 2012



As before, let's map observations of intraday structures 1 and 8 and their cumulative frequency relative to their complements. This relative frequency time-series has two long-running trends as well; the first is a decline between October 1985 and August 2001; this extended through several trends in the CAD's exchange rate and is intuitively appealing given the rising relative frequency of intraday structures Nos. 3 and 6. The second trend extends from August 2001 onwards. This rising trend establishes the either-or nature of Canadian dollar intraday structures noted above.

Cumulative Frequency Of Day Structures 1 Or 8



One Size Does Not Fit All

The long-running increase in intraday structures Nos. 3 and 6 is unexpected given the observations made for the euro, but is explicable by the different distribution of weekly range returns for the euro and Canadian dollar. The euro has a highly bimodal distribution, almost like the humps on a Bactrian camel, created by the large and sudden relative policy shifts of the Federal Reserve and European Central Bank. The Canadian dollar's distribution of weekly range returns is much more like the normal bell curve you know and love. Different markets have different inputs and serve different roles; their prices are produced by different processes and therefore have different distributions. The doctrinaire assertion made by so many market technicians all markets can be traded on an equal basis is highly questionable as a result.