



# Inside days in major currency pairs

Alone, inside days don't tell you much. Combined with other price action, though, they can become more useful guides.

BY CHRIS PETERS

**T**he inside day, which is a day with a lower high and a higher low than the previous day, is the subject of many analysis and trading techniques because of what it is and what it's thought to represent.

By definition, an inside day represents a volatility contraction from the previous day — a condition that is often characterized as the calm before a potential market storm (i.e., renewed volatility). This pause gives traders the opportunity to enter the market and catch the

next move before it occurs.

If only things were that straightforward. This simplified interpretation leaves out the many nuances that are required to understand price action, and which make or break an actual trading approach, such as the price action preceding an inside bar and the activity within the inside bar itself.

Do inside days simply represent a pause in the prevailing trend or do they signal an important shift in market conditions? The following analysis examines inside days in the major currency pairs, focusing on those that form after short-term price runs.

The study examined behavior after inside days in seven currency pairs: U.S. dollar/Canadian dollar (USD/CAD), Euro/U.S. dollar (EUR/USD), British pound/ U.S. dollar (GBP/USD), U.S. dollar/Japanese yen (USD/JPY), U.S. dollar/Swiss franc (USD/CHF), Australian dollar/U.S. dollar (AUD/USD), and New Zealand dollar/U.S. dollar (NZD/USD). The analysis spanned

15 years of daily price data from Jan. 4, 1993 to Sept. 12, 2008.

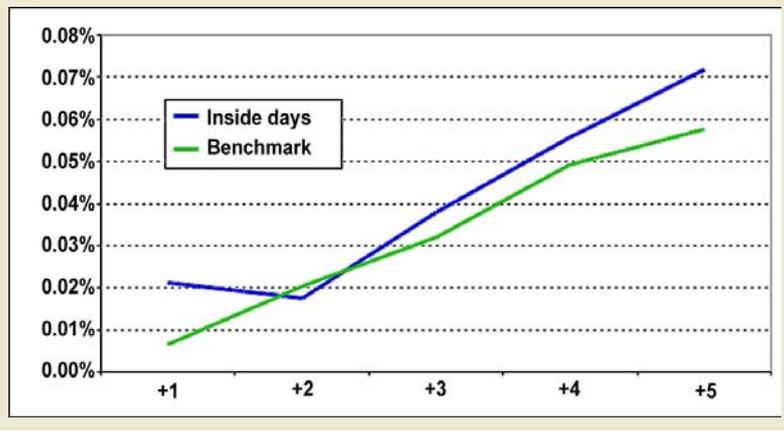
TABLE 1 — INSIDE DAY STATISTICS

Overall, inside days were followed by positive moves in the following week.

Performance following inside days							
	Day 1	Day 2	Day 3	Day 4	Day 5	5-day LUM	5-day LDM
<b>Avg.</b>	0.01%	0.01%	0.00%	0.00%	0.01%	1.06%	-1.05%
<b>Med.</b>	0.02%	0.02%	0.04%	0.06%	0.07%	0.85%	-0.78%
<b>Min.</b>	-3.49%	-4.35%	-5.84%	-5.68%	-7.17%	0.00%	-8.13%
<b>Max.</b>	2.55%	3.43%	3.69%	4.34%	4.48%	5.69%	0.00%

FIGURE 1 — PERFORMANCE AFTER INSIDE DAYS

The currencies outperformed their average (benchmark) performance the week after inside days.



### Basic statistics

The first step is to measure price moves one week after all inside days in the seven currency pairs. There were 4,174 inside days during the test period, averaging 596 per currency pair. About three inside days formed per month in each pair.

Table 1 lists performance statistics across all seven currency pairs, including the average, median, maximum, and minimum cumulative moves from one to five days after inside days. The table also shows the five-day largest up move (LUM), or close-to-high move, and largest down move (LDM), or close-to-low move, during the following week.

Overall, Table 1's median values show an upside bias following all inside days. Figure 1 compares these median moves to benchmark price moves, or same-length moves, in all currency pairs during the test period. After all inside days, currencies climbed slightly higher than their benchmarks.

### Up-closing and down-closing inside days

The patterns were then split into two groups: Inside days that closed above yesterday's close and those that closed below it. Slightly more than half of all inside days (52 percent) closed below the previous close.

Table 2 compares the currencies' cumulative performance after up-closing and down-closing inside days. The pairs climbed modestly, regardless of whether the inside days closed higher or lower. By the fifth day, however, the currencies were slightly more bullish after inside days that closed higher, although the LUMs and LDMs were roughly the same.

Let's examine how the currencies behaved after strings of consecutive highs and lows that culminate in an inside day. Do these trends tend to continue after inside days form?

### Trend runs

You should always consider the context in which an inside day occurs, because any existing trend tends to influence short-term price action. In this case, we'll look at price action after inside days that were immediately preceded by short-term price thrusts. Uptrends are defined as a series of consecutive higher highs and higher closes (HH+HC); downtrends are defined as strings of lower lows and lower closes (LL+LC).

For example, three-day runs of HHs and HCs occurred 1,613 times in the analysis period, averaging about 230 per currency pair. Of those total runs, just 260 (around 16 percent) were followed by an inside day.

Table 3 lists the currencies' overall performance after uptrends of different lengths — consecutive HHs and HCs from two to five days long, followed by an inside day. Table 4 shows the pairs' behavior after downtrends of different

**TABLE 2 — UP-CLOSING AND DOWN-CLOSING INSIDE DAYS**

*Currencies tended to rally more after inside days that closed higher.*

	Day 1	Day 2	Day 3	Day 4	Day 5	5-day LUM	5-day LDM
<b>Inside day gains</b>							
<b>Avg.</b>	0.01%	0.00%	-0.02%	-0.01%	0.03%	1.06%	-1.05%
<b>Med.</b>	0.01%	0.00%	0.04%	0.04%	0.10%	0.86%	-0.77%
<b>Min.</b>	-3.27%	-3.92%	-5.65%	-5.55%	-6.39%	0.00%	-7.53%
<b>Max.</b>	2.27%	2.76%	3.14%	3.87%	4.10%	5.11%	0.00%
<b>Inside day losses</b>							
<b>Avg.</b>	0.01%	0.02%	0.02%	0.01%	0.00%	1.06%	-1.05%
<b>Med.</b>	0.03%	0.03%	0.04%	0.06%	0.06%	0.85%	-0.79%
<b>Min.</b>	-2.50%	-3.41%	-4.03%	-4.10%	-5.22%	0.01%	-6.32%
<b>Max.</b>	2.12%	3.31%	3.56%	3.70%	4.06%	5.05%	0.00%

**TABLE 3 — CONSECUTIVE HIGHS**

*The longer an uptrend lasted, the more likely it was to continue after an inside day.*

	Day 1	Day 2	Day 3	Day 4	Day 5	5-day LUM	5-day LDM
<b>2 days of consecutive higher highs + higher closes</b>							
<b>Avg.</b>	0.02%	0.02%	0.01%	0.00%	0.00%	1.02%	-1.00%
<b>Med.</b>	0.01%	-0.01%	-0.01%	0.04%	0.02%	0.83%	-0.77%
<b>Max.</b>	1.70%	2.59%	2.71%	3.21%	3.60%	4.25%	0.00%
<b>Min.</b>	-1.71%	-2.20%	-2.52%	-3.22%	-3.30%	0.01%	-3.81%
<b>3 days of consecutive higher highs + higher closes</b>							
<b>Avg.</b>	0.01%	0.03%	0.06%	0.11%	0.14%	1.09%	-0.96%
<b>Med.</b>	0.02%	0.01%	0.05%	0.08%	0.11%	0.86%	-0.75%
<b>Max.</b>	1.22%	2.24%	2.37%	3.17%	3.58%	4.22%	-0.04%
<b>Min.</b>	-1.44%	-1.98%	-2.40%	-2.69%	-2.93%	0.02%	-3.54%
<b>4 days of consecutive higher highs + higher closes</b>							
<b>Avg.</b>	0.01%	0.00%	0.00%	0.02%	-0.01%	1.05%	-1.04%
<b>Med.</b>	0.00%	0.04%	0.07%	0.02%	0.12%	0.88%	-0.73%
<b>Max.</b>	0.96%	1.47%	1.62%	2.36%	2.45%	2.91%	-0.18%
<b>Min.</b>	-1.10%	-1.57%	-1.99%	-2.23%	-2.57%	0.07%	-3.09%
<b>5 days of consecutive higher highs + higher closes</b>							
<b>Avg.</b>	0.07%	0.03%	0.11%	0.15%	0.13%	1.09%	-0.91%
<b>Med.</b>	0.08%	0.04%	0.18%	0.18%	0.27%	1.00%	-0.65%
<b>Max.</b>	0.65%	0.81%	1.08%	1.46%	1.73%	2.28%	-0.20%
<b>Min.</b>	-0.63%	-0.95%	-1.18%	-1.47%	-2.10%	0.25%	-2.51%

lengths — back-to-back LLs and LCs from two to five days long, followed by an inside day. (Note: All patterns end with an inside day, so they are one day longer than these labels indicate.)

The shorter-term patterns are included within longer-term patterns. For example, each of the four-day consecu-

*continued on p. 24*



**TABLE 4 — CONSECUTIVE LOWS**

*Price tended to climb after inside days formed in the wake of strings of consecutive lows.*

	Day 1	Day 2	Day 3	Day 4	Day 5	5-day LUM	5-day LDM
<b>2 days of consecutive higher highs + higher closes</b>							
<b>Avg.</b>	0.02%	0.03%	-0.03%	0.02%	0.02%	1.10%	-1.06%
<b>Med.</b>	0.01%	0.04%	0.01%	0.15%	0.12%	0.89%	-0.72%
<b>Max.</b>	1.94%	2.12%	2.53%	2.90%	3.74%	4.27%	-0.01%
<b>Min.</b>	-2.22%	-2.51%	-3.64%	-3.83%	-4.25%	0.04%	-5.68%
<b>3 days of consecutive higher highs + higher closes</b>							
<b>Avg.</b>	0.11%	0.11%	0.03%	0.09%	0.10%	1.17%	-0.95%
<b>Med.</b>	0.09%	0.14%	0.05%	0.23%	0.21%	0.99%	-0.68%
<b>Max.</b>	1.86%	1.79%	2.06%	2.36%	3.36%	4.06%	-0.02%
<b>Min.</b>	-1.58%	-2.24%	-2.76%	-2.72%	-3.08%	0.12%	-3.96%
<b>4 days of consecutive higher highs + higher closes</b>							
<b>Avg.</b>	0.05%	0.14%	0.05%	0.16%	0.14%	1.18%	-0.94%
<b>Med.</b>	0.02%	0.13%	0.06%	0.23%	0.17%	1.03%	-0.68%
<b>Max.</b>	1.60%	1.74%	1.84%	2.00%	2.14%	3.26%	-0.04%
<b>Min.</b>	-1.29%	-1.70%	-2.21%	-2.12%	-2.43%	0.19%	-3.24%
<b>5 days of consecutive higher highs + higher closes</b>							
<b>Avg.</b>	-0.07%	0.12%	-0.04%	0.06%	-0.25%	1.11%	-1.08%
<b>Med.</b>	-0.18%	0.11%	0.04%	0.08%	-0.33%	0.92%	-0.93%
<b>Max.</b>	1.03%	1.13%	0.80%	0.95%	0.87%	2.05%	-0.53%
<b>Min.</b>	-0.79%	-0.77%	-1.20%	-0.96%	-1.47%	0.65%	-2.45%

tive patterns is included in the list of five-day patterns, all three-day patterns are included within four-day patterns, and so on.

When comparing Tables 3 and 4, you will notice few differences between both patterns. Price tended to climb after either type of pattern, and LUMs were skewed higher than LDMs in both tables.

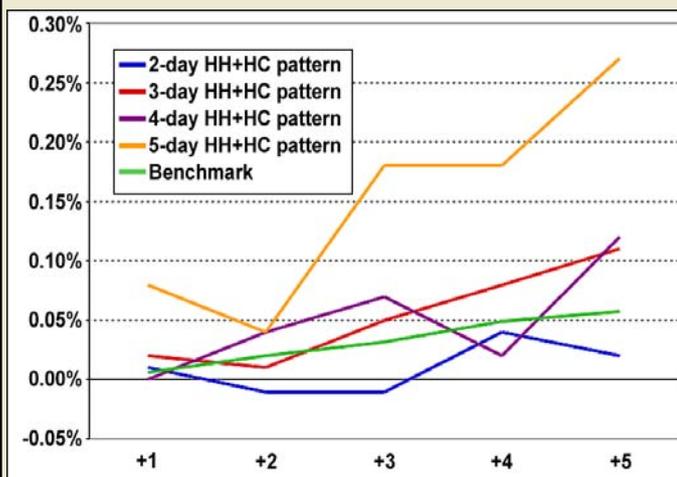
Figure 2 compares weekly median moves after consecutive HHs and HLs 2 days to 5 days long ending with an inside day. Overall, the longer the uptrend lasted, the more likely it was to continue after an inside day.

For example, price rose just 0.02 percent in the week after 2-day HH+HC patterns, but it climbed 0.27 percent in the week after five-day HH+HC patterns. In addition, price gained ground nearly 70 percent of the time after five-day HH+HC patterns, compared to only half the time after shorter-term up trends. However, five-day HH+HC patterns were rare, appearing only 36 times over the test period, or about twice per year (not shown).

Figure 3 shows the pairs' behavior after back-to-back LLs and LCs was slightly more erratic. The currencies tended to rally after inside days fol-

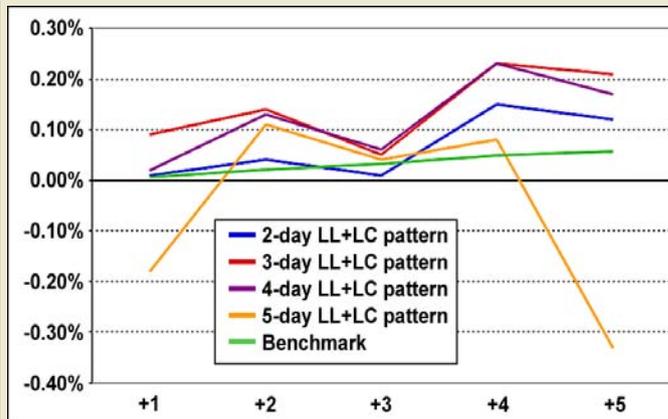
**FIGURE 2 — HIGHER HIGHS AND HIGHER CLOSES**

*The currency pairs beat the benchmarks when inside days were preceded by at least three consecutive days of higher highs and higher closes.*



**FIGURE 3 — LOWER LOWS AND LOWER CLOSES**

*Overall, the currencies remained in positive territory in the week following strings of lower lows (LL) and lower closes (LC) that ended with inside days. However, price fell 0.33 percent in the week after five-day LL+LC patterns that ended with inside days.*



lowed downtrends. However, price fell 0.33 percent in the week after five-day LL+LC patterns, the one exception to this rule. And price continued to drop 60 percent of the time after that pattern (not shown).

### Looking for patterns

The largest price moves tended to occur after the longest trends. For instance, price climbed 0.27 percent after five-day HH+HC patterns followed by an inside day. And price fell 0.33 percent after five-day LL+LC patterns followed by an inside day. However, these patterns were too rare to draw meaningful conclusions as they formed only 36 and 32 times, respectively, during the 15-year test period.

By contrast, three-day HH+HC and three-day LL+LC patterns appeared 252 and 247 times, respectively — a larger, more reliable sample.

Table 5 shows the performance statistics in the week after three-day HH+HC and three-day LL+LC patterns, depending on the direction of the subsequent inside day's close.

Roughly 80 percent of all inside days that followed three-day HH+HC patterns closed lower. However, when these patterns ended with a up-closing inside day, price continued to trend higher. For example, price climbed an average 0.33 percent in the week after three-day HH+HC patterns with a up-closing inside day. On the other hand, price was flat after three-day HH+HC patterns with a down-closing inside day.

Figure 4 compares the currencies' median performance after three-day HH+HC patterns with up-closing inside days vs. down-closing inside days. The pairs were much more bullish when the inside day gained ground as they rose 0.27 percent within a week. Also, price posted gains 60 percent of the time after these bullish patterns. By contrast, price lagged its benchmark, rising only 0.03 percent when three-day HH+HC patterns ended with down-closing inside days.

Figure 5 compares the performance after three-day LL+LC patterns with up-closing inside days vs. down-closing inside days. Performance wasn't as consistent after consecutive lows. Most of these patterns ended with up-closing inside days instead of down-closing inside days (74 percent vs. 26 percent, respectively).

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**TABLE 5 — THREE-DAY CONSECUTIVE HIGHS AND LOWS**

Price rallied after three-day HH+HC patterns with up-closing inside days, but it also climbed after the opposite pattern — three-day LL+LC patterns with down-closing inside days.

	Day 1	Day 2	Day 3	Day 4	Day 5	5-day LUM	5-day LDM
<b>3-day HH+HC pattern with inside-day gain</b>							
<b>Avg.</b>	-0.01%	0.12%	0.11%	0.25%	0.33%	1.27%	-0.93%
<b>Med.</b>	0.01%	0.06%	0.15%	0.20%	0.28%	1.08%	-0.78%
<b>Min.</b>	-0.87%	-1.15%	-1.72%	-1.79%	-1.97%	0.15%	-2.40%
<b>Max.</b>	0.74%	1.38%	1.47%	2.33%	2.85%	3.52%	-0.30%
<b>3-day HH+HC pattern with inside-day loss</b>							
<b>Avg.</b>	0.01%	-0.01%	0.01%	0.03%	0.05%	1.01%	-0.99%
<b>Med.</b>	0.02%	-0.02%	-0.02%	0.04%	0.03%	0.77%	-0.78%
<b>Min.</b>	-1.44%	-1.97%	-2.17%	-2.73%	-3.00%	0.02%	-3.71%
<b>Max.</b>	1.21%	2.06%	2.18%	2.33%	2.89%	3.30%	-0.06%
<b>3-day LL+LC pattern with inside-day gain</b>							
<b>Avg.</b>	0.06%	0.04%	-0.12%	-0.03%	-0.06%	1.14%	-1.11%
<b>Med.</b>	0.07%	0.12%	0.01%	0.20%	0.06%	0.98%	-0.77%
<b>Min.</b>	-2.43%	-2.93%	-4.03%	-3.86%	-4.84%	0.10%	-5.58%
<b>Max.</b>	1.85%	1.79%	1.61%	2.09%	2.44%	3.24%	-0.05%
<b>3-day LL+LC pattern with inside-day loss</b>							
<b>Avg.</b>	0.07%	0.12%	0.18%	0.23%	0.27%	1.21%	-0.84%
<b>Med.</b>	0.02%	0.15%	0.05%	0.24%	0.25%	0.98%	-0.64%
<b>Min.</b>	-0.90%	-1.03%	-1.18%	-1.33%	-2.16%	0.19%	-2.58%
<b>Max.</b>	0.99%	1.34%	1.82%	1.85%	2.68%	3.42%	-0.15%

Price rallied much further after these downtrend patterns ended with down-closing inside days. For instance, price jumped a median 0.25 percent and beat its benchmarks by day 5. The response to this downtrend pattern was nearly as bullish as its reaction to three-day HH+HC patterns with up-closing inside days (Figure 4). On the other hand, the currency pairs climbed only 0.06 percent in the week following three-day LL+LC patterns with up-closing inside days.

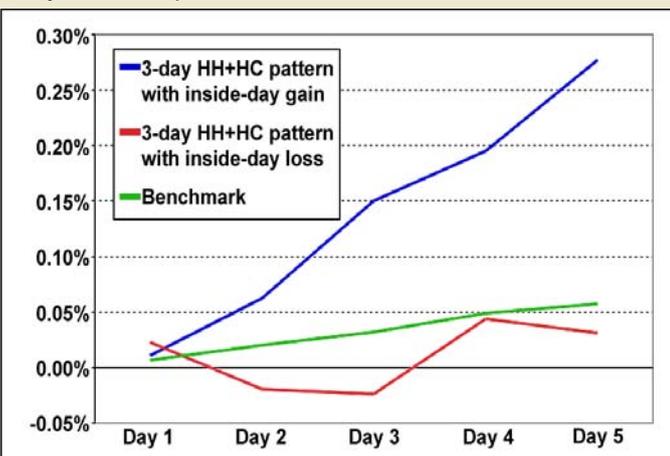
Overall, the seven currency pairs analyzed in this study had an upward bias from January 1993 to September 2008. However, price was slightly more bullish after inside days, especially when they closed higher after strings of consecutive HHs and HCs up to five days in length.

But not all currency pairs are alike, and more significant patterns might emerge if we applied the same approach on individual currencies. 📍

*Next month's issue of Currency Trader will include more analysis of inside-day patterns in the forex market.*

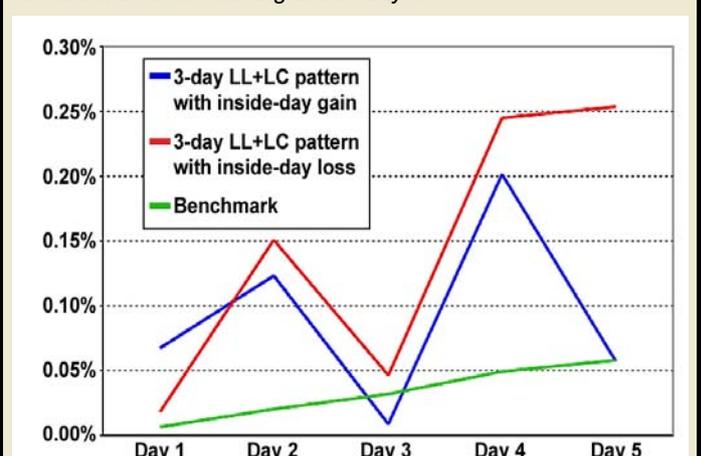
**FIGURE 4 — CONSECUTIVE HIGHS WITH UP-CLOSING AND DOWN-CLOSING INSIDE DAYS**

After three-day HH+HC patterns, the currency pairs were much more bullish when the inside day closed higher as they rose 0.27 percent within a week.



**FIGURE 5 — CONSECUTIVE LOWS WITH UP-CLOSING AND DOWN-CLOSING INSIDE DAYS**

Price rallied much more after three-day LL+LC patterns that ended with down-closing inside days.





# Inside days: Part 2

This follow-up study digs deeper into inside days and focuses on the U.S. dollar/Canadian dollar (USD/CAD) and the Euro/U.S. dollar (EUR/USD) pairs.

BY CHRIS PETERS

In last month's issue, we looked at short-term performance following inside days across seven currency pairs ("Inside days in the major currency pairs," *Currency Trader*, November 2008). Inside days have a lower high and a higher low than the preceding day and

signal a volatility contraction. The study found, overall, inside days preceded slight gains within a week, slightly better than the seven pairs' benchmarks, or typical random moves.

The analysis measured price action after all inside days,

**TABLE 1 — INDIVIDUAL CURRENCY PAIRS**

Table 1's left side shows currency pairs declined consistently after inside days that close in the upper 20 percent of their range. However, the table's right side reveals less consistent behavior after inside days that close in the lower 20 percent of their daily range.

	After inside days closed in upper 20 percent of range							After inside days closed in lower 20 percent of range							
	+1	+2	+3	+4	+5	5D LUM	5D LDM	+1	+2	+3	+4	+5	5D LUM	5D LDM	
<b>USD/CAD (84)</b>								<b>USD/CAD (119)</b>							
Avg.	-0.03%	-0.08%	-0.13%	-0.13%	-0.13%	0.65%	-0.78%	Avg.	0.00%	0.01%	-0.01%	-0.03%	-0.06%	0.74%	-0.73%
Med.	0.01%	-0.06%	-0.09%	-0.07%	-0.09%	0.52%	-0.65%	Med.	0.02%	-0.02%	-0.04%	-0.08%	-0.02%	0.54%	-0.54%
Min.	-1.76%	-1.88%	-3.22%	-2.24%	-2.27%	0.00%	-4.75%	Min.	-2.00%	-1.54%	-2.34%	-2.47%	-2.94%	0.03%	-3.50%
Max.	0.78%	1.06%	1.64%	1.62%	2.76%	3.25%	0.00%	Max.	1.42%	1.48%	2.59%	2.70%	3.15%	3.69%	0.00%
<b>EUR/USD (86)</b>								<b>EUR/USD (115)</b>							
Avg.	-0.11%	-0.22%	-0.24%	-0.16%	-0.19%	0.89%	-1.16%	Avg.	0.05%	0.08%	0.10%	0.15%	0.07%	1.19%	-1.04%
Med.	-0.10%	-0.16%	-0.26%	-0.16%	-0.16%	0.76%	-1.04%	Med.	0.07%	0.06%	0.07%	0.07%	0.01%	0.90%	-0.79%
Min.	-1.57%	-2.52%	-2.95%	-2.46%	-3.06%	0.00%	-3.78%	Min.	-1.47%	-2.61%	-4.33%	-3.28%	-6.18%	0.00%	-6.83%
Max.	1.18%	1.62%	2.09%	2.38%	2.60%	2.90%	0.00%	Max.	1.65%	3.12%	2.68%	4.13%	4.93%	4.97%	0.00%
<b>GBP/USD (102)</b>								<b>GBP/USD (85)</b>							
Avg.	-0.02%	0.03%	0.19%	0.10%	0.12%	1.01%	-0.87%	Avg.	0.09%	0.06%	0.06%	0.02%	-0.01%	0.96%	-0.91%
Med.	-0.03%	-0.04%	0.20%	0.03%	0.21%	0.81%	-0.61%	Med.	0.06%	0.13%	0.16%	0.05%	-0.03%	0.85%	-0.74%
Min.	-2.60%	-1.79%	-2.47%	-3.41%	-3.00%	0.00%	-4.21%	Min.	-1.60%	-1.69%	-1.70%	-2.28%	-2.86%	0.03%	-2.86%
Max.	2.12%	2.70%	2.86%	3.38%	2.75%	4.41%	-0.02%	Max.	1.45%	2.19%	2.36%	2.91%	2.82%	3.02%	0.00%
<b>USD/JPY (124)</b>								<b>USD/JPY (120)</b>							
Avg.	-0.04%	-0.11%	-0.11%	-0.10%	-0.12%	1.05%	-1.30%	Avg.	0.01%	-0.02%	0.05%	0.02%	-0.02%	1.27%	-1.34%
Med.	0.05%	-0.04%	0.00%	-0.04%	0.12%	0.88%	-0.89%	Med.	0.11%	0.09%	0.14%	0.23%	0.17%	1.10%	-0.83%
Min.	-3.08%	-3.34%	-4.67%	-4.81%	-5.83%	0.04%	-7.15%	Min.	-2.75%	-5.37%	-3.92%	-5.16%	-5.56%	0.02%	-6.55%
Max.	1.84%	2.63%	3.09%	4.18%	3.36%	4.52%	-0.04%	Max.	2.24%	2.51%	3.02%	3.47%	4.15%	4.28%	0.00%
<b>USD/CHF (86)</b>								<b>USD/CHF (113)</b>							
Avg.	-0.07%	-0.10%	-0.17%	-0.17%	-0.11%	1.03%	-1.15%	Avg.	-0.01%	-0.02%	0.00%	-0.05%	-0.02%	1.19%	-1.16%
Med.	-0.04%	-0.08%	-0.13%	-0.15%	-0.03%	0.92%	-1.03%	Med.	0.05%	0.04%	0.17%	0.00%	-0.12%	1.00%	-0.97%
Min.	-1.39%	-2.87%	-2.40%	-3.20%	-3.38%	0.03%	-3.90%	Min.	-1.70%	-2.69%	-3.70%	-3.17%	-3.86%	0.00%	-4.93%
Max.	1.85%	2.23%	2.63%	2.06%	3.39%	3.74%	-0.01%	Max.	1.26%	1.83%	2.72%	3.15%	3.84%	4.01%	-0.01%
<b>AUD/USD (90)</b>								<b>AUD/USD (114)</b>							
Avg.	0.01%	-0.09%	-0.16%	-0.04%	0.05%	1.11%	-1.16%	Avg.	-0.06%	-0.01%	-0.05%	-0.06%	-0.06%	1.16%	-1.24%
Med.	0.03%	-0.06%	-0.08%	-0.09%	0.05%	0.86%	-0.78%	Med.	-0.01%	0.02%	0.03%	0.06%	0.05%	0.96%	-0.97%
Min.	-1.81%	-3.16%	-3.00%	-3.57%	-3.14%	0.00%	-5.13%	Min.	-1.64%	-2.76%	-5.46%	-5.46%	-5.09%	0.00%	-8.85%
Max.	1.52%	2.18%	2.34%	3.48%	3.58%	4.53%	0.00%	Max.	1.69%	4.82%	3.86%	4.85%	4.14%	7.37%	0.00%
<b>NZD/USD (86)</b>								<b>NZD/USD (146)</b>							
Avg.	0.03%	0.02%	-0.08%	0.02%	0.03%	1.09%	-1.05%	Avg.	-0.02%	-0.07%	-0.01%	-0.03%	-0.04%	1.14%	-1.12%
Med.	0.05%	0.14%	0.06%	0.04%	-0.07%	0.84%	-0.76%	Med.	0.04%	0.02%	0.04%	0.06%	0.01%	0.93%	-0.78%
Min.	-1.83%	-3.16%	-4.56%	-5.13%	-4.90%	0.00%	-6.53%	Min.	-2.34%	-3.98%	-3.70%	-3.14%	-3.63%	0.00%	-5.78%
Max.	1.69%	2.02%	2.09%	2.80%	4.56%	4.89%	0.00%	Max.	2.37%	2.18%	3.10%	4.46%	4.30%	5.98%	0.00%
<b>Avg. total</b>								<b>Avg. total</b>							
Avg.	-0.03%	-0.08%	-0.10%	-0.07%	-0.05%	0.98%	-1.07%	Avg.	0.01%	0.00%	0.02%	0.00%	-0.02%	1.09%	-1.08%
Med.	-0.01%	-0.04%	-0.04%	-0.06%	0.00%	0.80%	-0.82%	Med.	0.05%	0.05%	0.08%	0.06%	0.01%	0.89%	-0.80%
Min.	-2.00%	-2.68%	-3.32%	-3.54%	-3.66%	0.01%	-5.06%	Min.	-1.93%	-2.95%	-3.60%	-3.57%	-4.30%	0.01%	-5.61%
Max.	1.57%	2.06%	2.39%	2.84%	3.29%	4.03%	-0.01%	Max.	1.72%	2.59%	2.90%	3.67%	3.90%	4.76%	0.00%

after up- and down-closing inside days, and after inside days that followed trend runs of consecutive higher highs and higher closes (and back-to-back lower lows and lower closes). In almost all cases, inside days were followed by upward price moves over the next five days.

For example, currency pairs gained more ground after inside days that closed above yesterday's close than those closing below it (a median 0.1 percent vs. 0.06 percent, respectively).

However, the previous study focused on the combined performance of the major currency pairs. By contrast, this second installment breaks out the performance of individual currency pairs following several types of inside-day patterns: All inside days, inside days that closed in the upper and lower 20 percent of their daily ranges, and up- and down-closing inside days.

### Top to bottom

The study examines seven currency pairs from Jan. 2, 1993 to Sept. 12, 2008: U.S. dollar/Canadian dollar (USD/CAD), Euro/U.S. dollar (EUR/USD), British pound/U.S. dollar (GBP/USD), U.S. dollar/Japanese yen (USD/JPY), U.S. dollar/Swiss franc (USD/CHF), Australian dollar/U.S. dollar (AUD/USD), and New Zealand dollar/U.S. dollar (NZD/USD).

There were 4,174 inside days that formed during the test period across all seven currency pairs; 658 patterns closed in the upper 20 percent of the day's range and 812 closed in the lower 20 percent for an average of 94 and 116, respectively, per currency pair.

Figure 1 shows the median five-day performance following inside days (in all seven pairs) that closed in the top 20 percent of the day's range and those that closed in the bottom 20 percent. The figure compares this performance to its

**TABLE 2 — INSIDE DAYS IN USD/CAD AND EUR/USD**

*Inside days closed more often in the bottom 20 percent of their range than in the top 20 percent.*

	Inside days	Up-closing inside days	Down-closing inside days	Closed in the upper 20 percent of range	Closed in the lower 20 percent of range
USD/CAD	542	274	269	84	119
EUR/USD	551	244	308	86	115

median benchmark moves, or the typical same-length moves in the past 16 years.

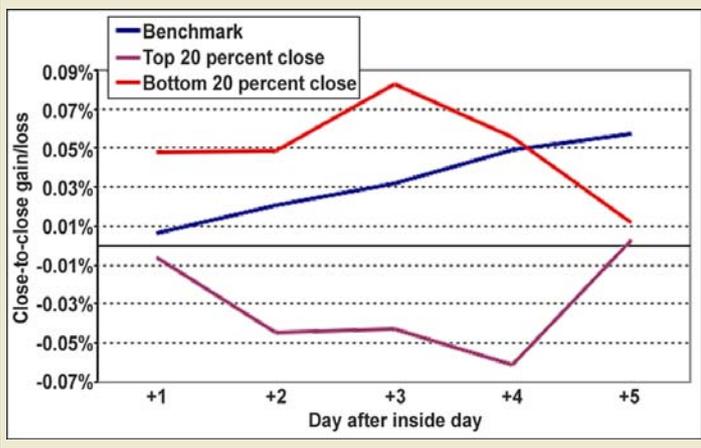
Price rebounded after inside days that closed in the lower 20 percent of their daily range, and it dropped after inside days that closed in the upper 20 percent of their daily range. For example, currency pairs gained a median 0.05 percent on the day after forming an inside day that closed in the lower 20 percent. By day 3, price rose a cumulative 0.08 percent before giving back those gains in the next two days.

Meanwhile, price fell 0.04 percent by day 2 after inside days that closed in the upper 20 percent of their range, a loss that was extended to 0.06 percent by day 4. Overall, Figure 1 suggests price reversed direction after inside days that closed near daily extremes even though that pattern

*continued on p. 24*

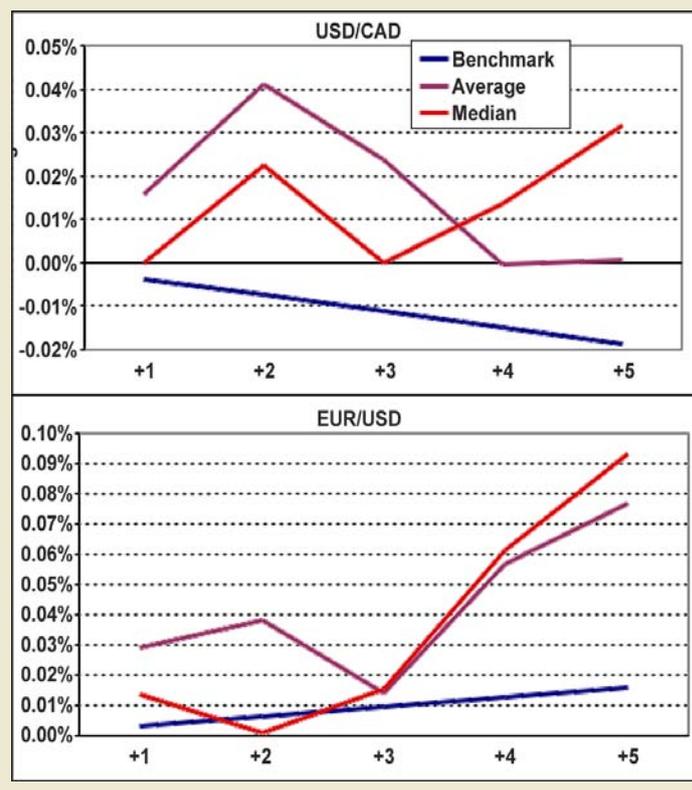
**FIGURE 1 — INSIDE DAYS CLOSING NEAR EXTREMES**

*Price rebounded after inside days that closed in the lower 20 percent of their daily range, and it dropped after inside days that closed in the upper 20 percent of their daily range.*



**FIGURE 2 — AFTER ALL INSIDE DAYS IN USD/CAD AND EUR/USD**

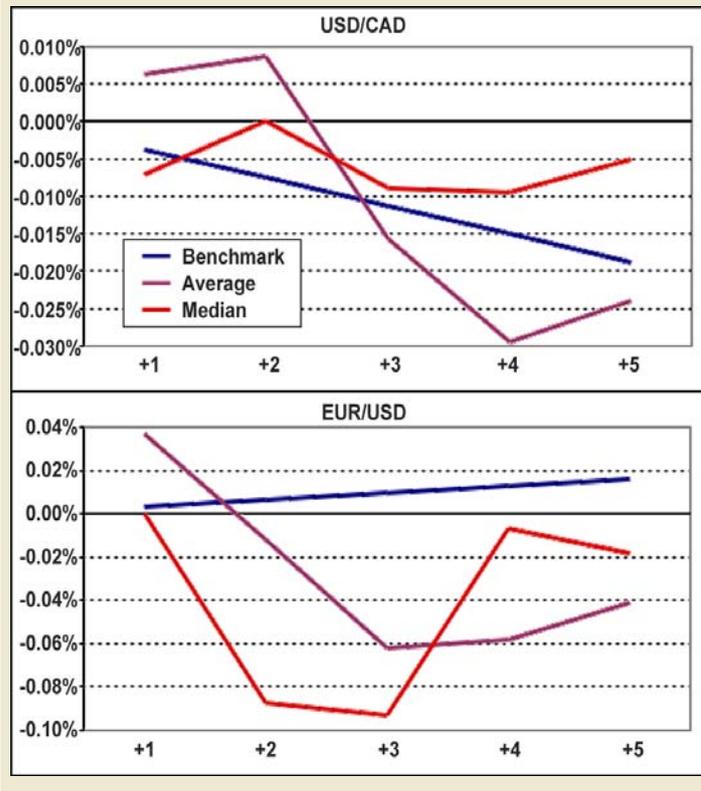
*Price tended to gain in USD/CAD and EUR/USD following inside days.*





**FIGURE 3 — UP-CLOSING INSIDE DAYS**

Both markets lost ground after up-closing inside days as USD/CAD slipped an average 0.03 percent by day 4 and EUR/USD fell twice as far during the same period.



lasted less than a week.

The next step is to break down how individual currency pairs behaved following these patterns.

**Individual results**

Table 1 lists performance statistics for each currency pair and the combined results after inside days that closed in the upper and lower 20 percent of their daily range (left and right sides, respectively). In addition to each pair’s cumulative close-to-close moves, it also shows the five-day largest up moves (LUMs), or close-to-high gains, and the five-day largest down moves (LDMs), or close-to-low losses.

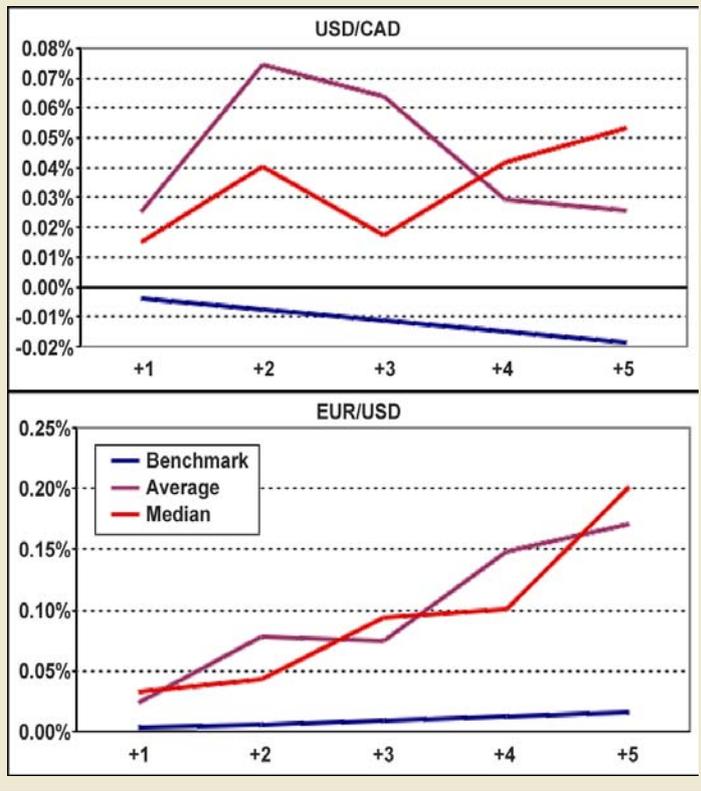
The currency pairs that fell furthest after inside days closing in the upper 20 percent of their ranges are USD/CAD, EUR/USD, and USD/CHF. Each of these three pairs dropped at least a median 0.09 percent by day 3, although price tended to bounce back by day 5.

AUD/USD responded the same way to this pattern, except price gained ground on day 1 before dropping from days 2 to 4. GBP/USD declined slightly on day 1, but ultimately ended the week squarely in positive territory.

By contrast, NZD/USD and USD/JPY swung back and forth between positive and negative territory. The Japanese yen was especially inconsistent, even though it formed the most patterns of all pairs tested (124 vs. 102 or fewer). For instance, its median five-day move was 0.12 percent, but its average value was -0.12 percent, meaning a few large drops

**FIGURE 4 — DOWN-CLOSING INSIDE DAYS**

EUR/USD made relatively strong gains following losing inside days.



skewed the average lower than usual.

Also, the difference between average five-day LUMs and LDMs is most striking in the Japanese yen, another sign its post-pattern moves were more volatile than in other markets.

**Closes in the lower 20 percent**

Table 1’s left side shows currency pairs declined consistently after inside days that close in the upper 20 percent of their range. However, the table’s right side reveals less consistent behavior after inside days that close in the lower 20 percent of their daily range.

For example, there are significant discrepancies between average and median values in four of seven pairs: JPY/USD, USD/CHF, AUD/USD, and NZD/USD.

By contrast, the Euro, British pound, and Canadian dollar produced the most consistent results. Both EUR/USD and GBP/USD climbed at least a median 0.07 percent by day 3 before pulling back by the end of the analysis period, very similar to Figure 1’s overall performance. But while USD/CAD’s average and median values are roughly in sync, price fell after this pattern instead of rallying as the Euro and British pound did.

Finally, inside days closed in the bottom 20 percent of their ranges far more often than they closed in the upper 20 percent. These upper-range closes formed 154 times more than lower-range closes.

## Focusing on the Canadian dollar and Euro

The study's final section focuses on two currency pairs that showed the most consistent results in Table 1 — USD/CAD and EUR/USD.

Table 2 lists the number of inside-day patterns in the Canadian dollar and Euro: All inside days, up- and down-closing inside days, and inside days that closed in the upper and lower 20 percent of their daily range. Overall, inside days appeared more than 500 times in both currency pairs — roughly 35 times per year.

Figure 2 compares the average and median performance in the five days following all inside days in USD/CAD and EUR/USD (upper and lower sections, respectively). Price tended to rally after inside days in both pairs, climbing an average 0.04 percent by the second day in USD/CAD and gaining 0.08 percent by the fifth day in EUR/USD.

## Up- and down-closing inside days

Figure 3 shows both currency pairs' average and median moves following up-closing inside days, and Figure 4 shows their performance after down-closing inside days.

Both markets lost ground after up-closing inside days as USD/CAD slipped an average 0.03 percent by day 4 and EUR/USD fell twice as far during the same period.

The Canadian dollar's loss was roughly in-line with its benchmark. On the other hand, EUR/USD's five-day decline is out of sync with its benchmarks' slight gains, a sign the dip is worth investigating. By day 5, the Euro turned upward, but still ended in negative territory, nearly 0.04 percent lower than its benchmark move.

Figure 4 shows both currency pairs gained ground and beat their benchmarks after down-closing inside days. For example, USD/CAD climbed an average 0.07 percent by day 2 before giving back most of that gain by day 5. However, the Euro made strong, consistent gains as it rose an average 0.17 percent within a week.

## Inside days that closed near extremes

Figure 5 shows the performance of USD/CAD and EUR/USD after inside days

*continued on p. 26*

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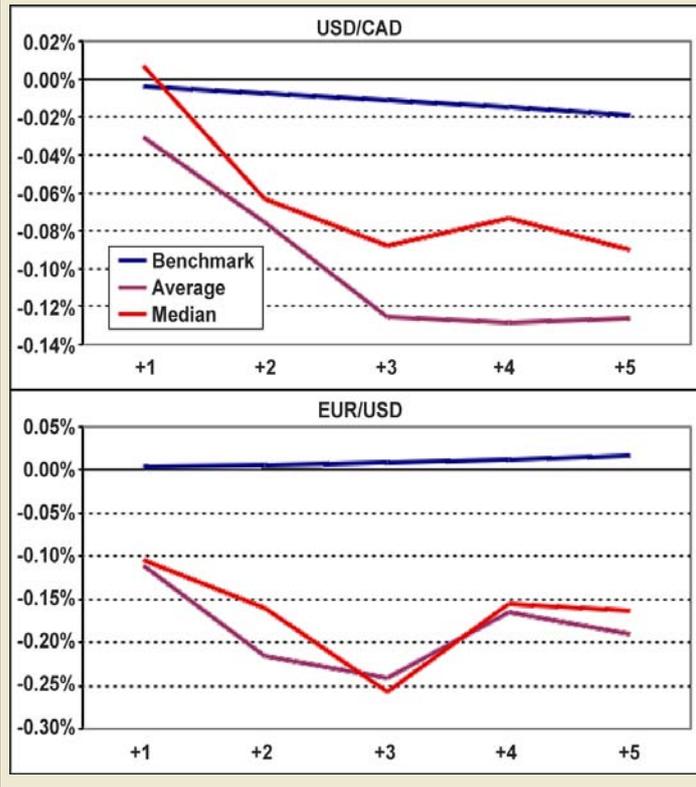
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**FIGURE 5 — INSIDE DAYS — CLOSING IN UPPER 20 PERCENT**

USD/CAD declined 0.13 percent, on average, by day 3 after inside days that closed in the upper 20 percent of their range. Meanwhile, the Euro dropped even further, falling an average 0.24 percent by that point.



that closed in the upper 20 percent of their daily range.

Comparing Figures 1 and 5, you'll notice both markets fall after this pattern, which conforms to the combined results of all seven currency pairs. USD/CAD declined 0.13 percent, on average, by day 3, and benchmark and median moves point in the same direction. And the Euro dropped even further, falling an average 0.24 percent by day 3 before rebounding slightly by day 5.

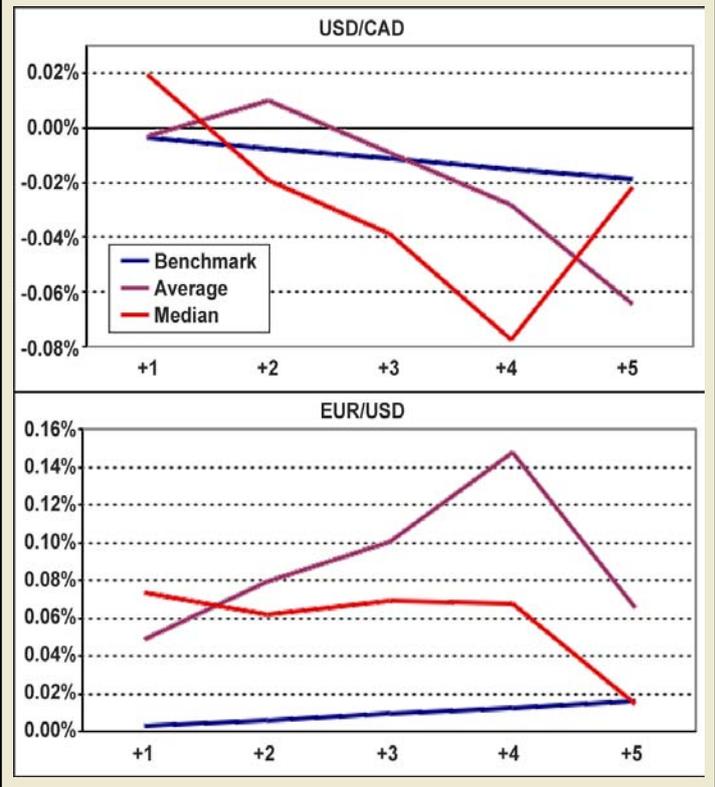
Figure 6 shows the behavior of USD/CAD and EUR/USD after inside days that closed in the lower 20 percent of their range. The response is less consistent than Figure 5's patterns. At first, both currency pairs gained ground, but then the Canadian dollar fell while the Euro advanced, peaking at 0.15 percent, on average, by day 4.

Table 2 shows inside days closed in the upper 20 percent of their range less often than their lower-20-percent counterparts, but Figure 5 shows the markets' subsequent performance is more reliable.

The study's most striking pattern occurred after EUR/USD down-closing inside days. According to Figure 4, the Euro beat its benchmarks and jumped an average 0.17 percent within a week after this pattern. Also, average and median values moved roughly in line with each other. 📌

**FIGURE 6 — INSIDE DAYS — CLOSING IN LOWER 20 PERCENT**

At first, both currency pairs gained ground after inside days that closed in the lower 20 percent of their range. But then the Canadian dollar fell while the Euro advanced, peaking at 0.15 percent, on average, by day 4.



## Related reading

### “Inside days in the major currency pairs”

*Currency Trader*, November 2008.

Analysis of inside days that occur after short-term price thrusts.

### “Technical tool insight: Inside days”

*Active Trader*, January 2003.

An inside day (or bar) is a price bar that is encompassed by the range of the preceding bar. It represents contracting volatility from the previous bar.

### “Trading the Euro inside out”

*Currency Trader*, September 2005.

Analysis of inside and outside days in the Eurocurrency futures offer some interesting surprises — and clues for how to trade this market.

### “Volatility-based currency trading”

*Currency Trader*, February 2005.

Market volatility can be a complex subject, but understanding a few basic principles can help you implement strategies to capitalize on volatility extremes.

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