Weekly trend prediction:
An adaptive breakout technique analysis

A breakout from the range established in the initial trading hours of the week proves to be a high-probability setup.

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Most breakout strategies are trend-following approaches designed to capture larger moves. Strategies based on shorter-term breakouts are typically profitable only in very specific market conditions and require a fair amount of trader discretion.

Is it possible to develop a shorter-term breakout system that can operate successfully across different market conditions with minimal trader input? Evaluating a strategy that trades a breakout of the range in the first trading hours of the week offers some clues.

Early week breakout signals

The system's logic is simple. Every Monday at 12 a.m. ET the high-low trading range for the previous 14 hours, referred to as the "box size," is calculated.

A buy-stop order is placed one box size above the high of the range, while a sell-stop order is placed one box size below the low of the range. The distance between the high and buy stop or the low and sell stop (the "breakout buffer") is intended to protect the system from false breakouts.

A long trade triggered by a buy-stop order uses the low of the range as a stop-loss while a short trade triggered by the sell-stop uses the high. Both long and short orders have a profit target of 80 percent of the box size. If the box size is less than 20 pips (ticks), no orders are entered for the week. To summarize, the rules are:

Enter long with a buy-stop if price is more than one box size above the high of the box.

Enter short with a sell-stop if price is more than one box size below the low of the box.

Exit long at the entry price plus 0.80 * box size.

Exit short at the entry price minus 0.80 * box size.

For example, if the range has a high of 146.50 and a low of 145.00, the box size would be

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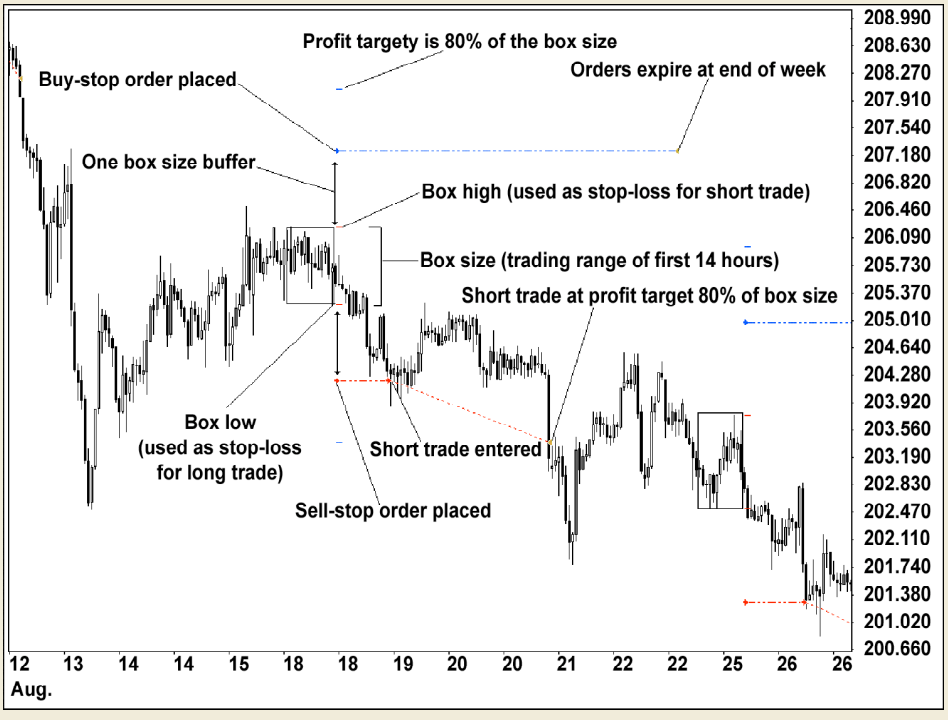
FIGURE 1 — TRADE EXAMPLE

The early week breakout trading system went short when price traded below the "box" formed in the first 14 hours of the trading week (starting at 12 a.m. ET).



Source: MetaTrader

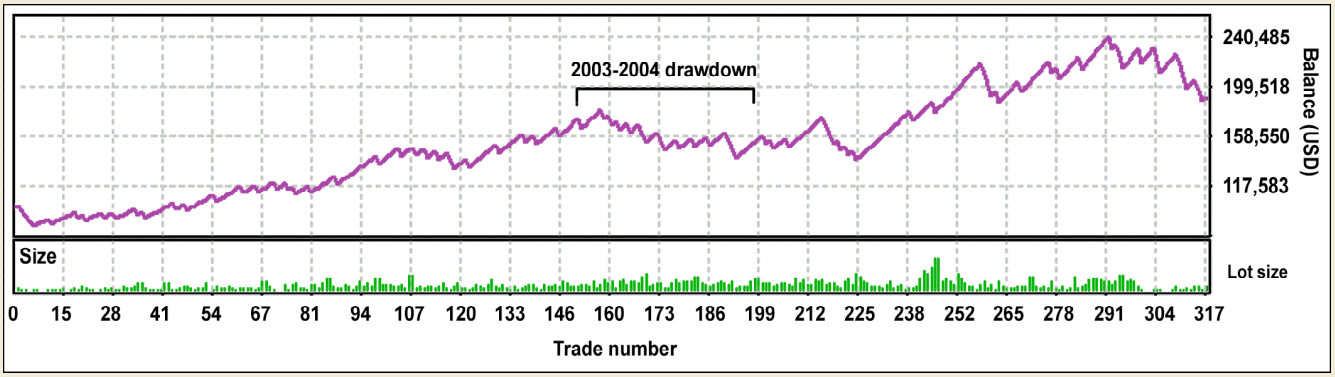
TABLE 1 — TRADING COSTS

These were the spread charges assessed in testing.

Currency pair	Spread
EUR/USD	2
GBP/USD	3
GBP/JPY	5
USD/JPY	3

FIGURE 2 — POUND/YEN EQUITY CURVE

The system experienced some extended drawdowns but was profitable overall.



1.50, or 150 pips (146.50 - 145.00). A long-entry stop will be placed at 148.00 (146.50 + 1.50) with a stop-loss at 145.00 and profit target at 149.20 (148.00 + 1.5 * 0.8); a short-entry stop would be placed at 143.50 (145.00 - 1.50) with a stop-loss at 146.50 and profit target at 142.30 (143.50 - 1.5 * 0.8). These orders expire on Friday an hour before the market closes. Figure 1 show a trade example on a 60-minute chart of the British pound/Japanese yen pair (GBP/JPY).

Position sizing

The lot size traded is calculated using the following formula. The idea is to adapt the position size to each week's market conditions based on available equity and volatility, as represented by the box size:

Lot size = (2*AccountBalance)/(ContractSize*(BoxSize))

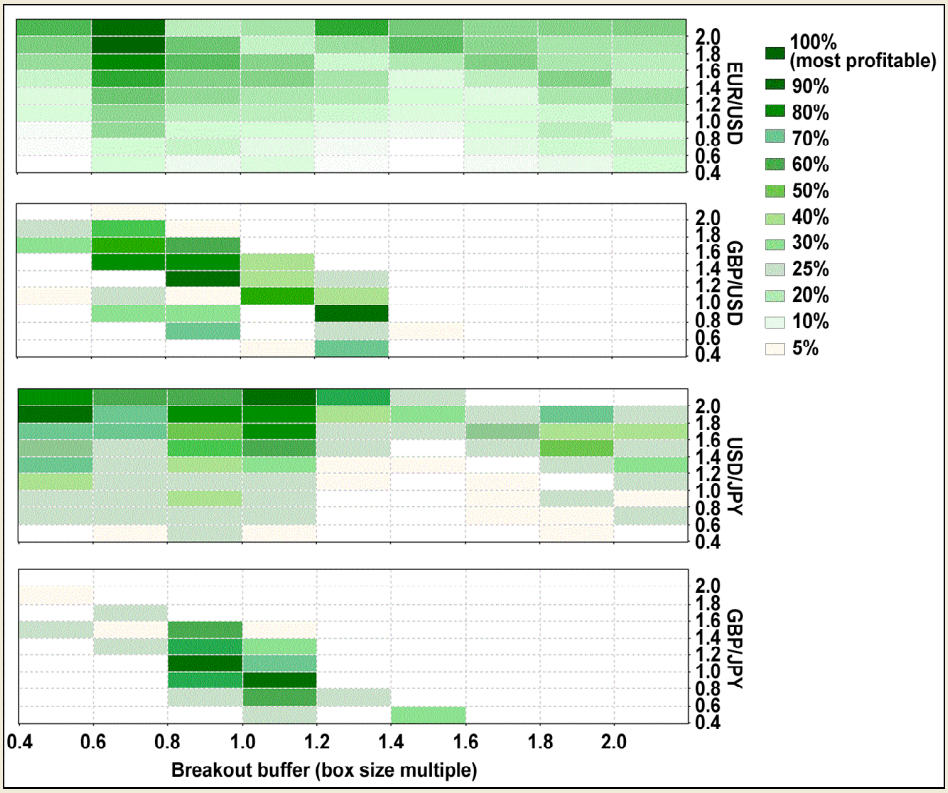
For example, for an account balance of $100,000 USD, a standard forex contract size of 100,000, and a box size of 1.5, the lot size would be 1.3 (2 * 100,000 / 100,000 * 1.5). The "2" multiplier in the numerator was chosen to trade with an asset allocation of approximately 2 percent per trade.

An increasing account balance will result in larger lot sizes, and vice versa. Including the contract size in the denominator adjusts the lot size to the specific instrument. The box size component adjusts the lot size to the range — i.e., the higher the volatility, the larger the box size and the smaller the resulting lot size.

The flexibility of this position-sizing approach should make the strategy less susceptible to changing market conditions.

FIGURE 3 — PARAMETER PEFORMANCE

Testing different breakout-buffer (x axis) and profit-target (y axis) settings shows the system was able to profit across a wide range of parameter settings. Darker shades of green indicate a higher average yearly profit.



Testing the system

The strategy was tested on 60-minute data from Jan. 1, 2000 to June 1, 2009 with an initial account balance of $100,000. The strategy, which was developed on GBP/JPY data, was tested first on

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TABLE 2 — AVERAGING THE RESULTS

The average of the four most profitable settings (2000-2009) for each currency pair provide an estimate of future performance. The final column shows the best-performing settings for each pair.

	Avg. yearly profit	No. trades	Max. Drawdown	Most profitable (BB/PT)
EUR/USD	41.7%	474	33.4%	0.6/2
USD/JPY	21.4%	434	37.7%	1/2
GBP/USD	8.0%	412	38.9%	0.8/1.2
GBP/JPY	8.0%	367	31.8%	0.8/1.0
Median	14.7%	417	35.6%	0.8/1.7
Average	19.8%	430	35.5%	0.8/1.6

that pair and subsequently on the Euro/U.S. dollar (EUR/USD), U.S. dollar/Japanese yen (USD/JPY), and British pound/U.S. dollar (GBP/USD) pairs. Table 1 shows the per-trade spread charges that were assessed for each pair.

Figure 2 shows the system's equity curve in the GBP/JPY pair. The system performed very well until mid-2008, when the higher volatility during the economic crisis resulted in a large drawdown (similar to the one in 2003-2004), from which the strategy recovered. The system took 64 percent of all possible trades — i.e., in 36 percent of the weeks there were no qualifying breakouts. The strategy achieved an average annual profit of 9.6 percent with a 22.9-percent maximum drawdown. And although the average winning trade/average losing trade ratio was 0.38, the system had a 75-percent winning percentage.

There was a wide range of profitable results for the remaining pairs (which are, in fact, better candidates for trading because of their lower spreads). Figure 3 shows the results of different tests using various settings for the breakout buffer (BB) and profit target (PT); darker shades of green indicate higher average yearly profits. These charts indicate we can find robust parameter settings for the system (without the risk of over-optimization, or curve-fitting) because the most profitable regions are quite dense, which means minor variations in the parameters will have a limited affect on the system's basic performance.

Averaging the results of the four most profitable settings for each currency pair produced the results in Table 2 (the final column shows the single best-performing parameter combinations). Also, applying the most profitable 2000-2005 settings for each currency pair to the 2005-2009 period produced results that were better than the 2000-2005 average for each pair, which suggests the average figures are a good conservative estimate for future system performance.

Table 2 shows the system was especially profitable in EUR/USD and USD/JPY. In these pairs, the strategy was able to achieve higher average yearly profits, lower drawdowns, and better profit-to-loss ratios than in GBP/JPY. The equity curve for the most profitable EUR/USD settings shows the system produced profits over a wide range of market conditions, reaching new equity highs every year (Figure 4).

Capturing something significant?

This simple but effective breakout strategy requires trader intervention only once per week to enter the trade orders, and it is easily applied to any currency pair. (Further testing can be conducted to check its performance on a larger currency basket.)

That the system was profitable over a broad range of parameters in different currency pairs suggests it's tapping into a tradable market inefficiency: a correlation between a breakout of the range established at the beginning of the week and the subsequent trend direction.

For information on the author see p. 6.

FIGURE 4 — EUR/USD EQUITY CURVE

The system made new equity highs each year of the test period.