From cliché to strategy

When developing a trading strategy, ignore half-baked advice and start defining rules.

BY KEVIN J. DAVEY

You can't learn to trade by following clichés that lack the specifics necessary to make trading decisions. When was the last time you made easy money by, say, "Letting profits run and cutting losses short?" Great advice, but how exactly do you do it?

You can learn how markets behave by constructing specific, objective rules for a chart pattern or trade setup and then measuring how price moves afterward. The process can initially seem complex, but it is easier than many people think, especially when you can combine a handful of simple trading concepts.

KC *For more information about the following concepts, go to "Key concepts" on p. xx.*

- *Forward and out-of-sample testing*
- *Average true range*
- *Optimization*
- *Price oscillator*
- *Stochastics*
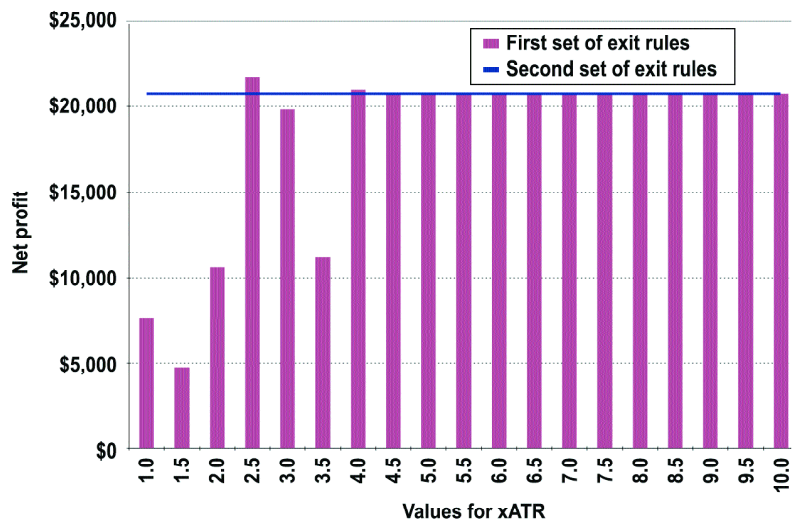- *Relative strength index*
- *Rate-of-change*

FIGURE 1: TESTING GOLD FUTURES
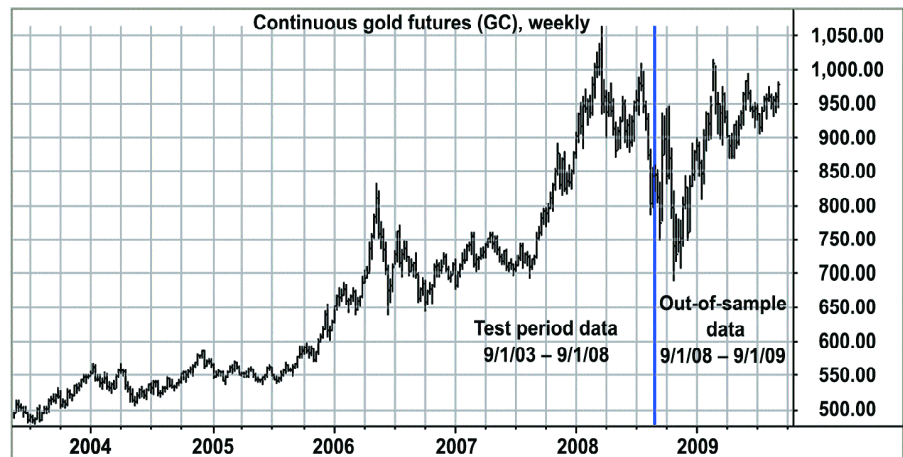
The strategy was initially tested and revised on continuous gold futures data from 2004-2008 (in-sample) and 2008-2009 (out-of-sample).
Source: TradeStation

FIGURE 2: TWO PROFITABLE STRATEGIES

Although the first strategy was profitable for all optimized values (red bars), the second strategy (blue line) was simpler and earned almost as much profit.
Source: TradeStation

To prove the point, the following takes several trading clichés, defines them as objective trading rules, and uses them to create a trading strategy in gold futures (GC).

Start with the market's trend

The first step in designing a trading strategy is to identify the market's trend. If the trend really is our friend, as the cliché suggests, then we should enter the market in the trend's direction.

This strategy enters long or short at the market's open the day after it detects a trend. So, what defines a trend? The answer can be as complicated as a quantum physics formula requiring thousands of lines of code, or as simple as a single rule.

To keep the approach simple, an uptrend is defined as a higher close than yesterday, and a downtrend is defined as a lower close than yesterday — in other words, the system trades in the direction of the one-day trend.

The strategy will be applied to daily continuous gold futures over a recent six-year period (Figure 1); it could be applied to any market or time interval. System parameters were initially optimized on an in-sample period (Sept. 1, 2004 to Sept. 1, 2008) and then applied to an out-of-sample period (Sept. 1, 2008 to Sept. 1, 2009) to evaluate how the system performed on new data. The entry rules are:

1. **Go long** at tomorrow's open if today's close is higher than yesterday's close.
2. **Sell short** at tomorrow's open if today's close is lower than yesterday's close.
3. The system must be flat (no open positions) to take entry signals so they aren't confused with exit signals.

While the entry rule is straightfor-

System code

The following TradeStation code can be copied from the Strategy Code page at www.activetradermag.com//index.php/c/Strategy_code.

Strategy #1:
```
input: xATR(1);

//ENTRY RULES
if close<close[1] and marketposition=0
then
sellshort next bar at market;

if close>close[1] and marketposition=0
then
buy next bar at market;
```

```
//EXIT RULE - LOSS
if openpositionprofit<0 then begin
     sell next bar at market;
     buytocover next bar at market;
end;

//EXIT RULE - PROFIT
if
openpositionprofit>BigPointValue*xATR
*AvgTrueRange(14) then begin
     sell next bar at market;
     buytocover next bar at market;
end;
```

Strategy #2:
```
//ENTRY RULES
if close<close[1] and marketposition=0
then
sellshort next bar at market;

if close>close[1] and marketposition=0
then
buy next bar at market;

//EXIT RULE - LOSS
if openpositionprofit<0 then begin
     sell next bar at market;
```

```
     buytocover next bar at market;
end;

//EXIT RULE - PROFIT
if marketposition=1 and close>close[1]
and close[1]>close[2] and
close[2]>close[3] then
 sell next bar at market;

if marketposition=-1 and close<close[1]
and close[1]<close[2]  and
close[2]<close[3] then
buytocover next bar at market;
```

Strategy #3:
```
input: yATR(1);

//ENTRY RULES
if close<close[1] and marketposition=0
then
sellshort next bar at market;

if close>close[1] and marketposition=0
then
buy next bar at market;

//EXIT LOSS RULE 1
if openpositionprofit<0  then begin
     if close>close[1] and
close[1]>close[2] then sell next bar at
market;
     if close<close[1]  and
close[1]<close[2] then buytocover next
bar at market;
end;
```
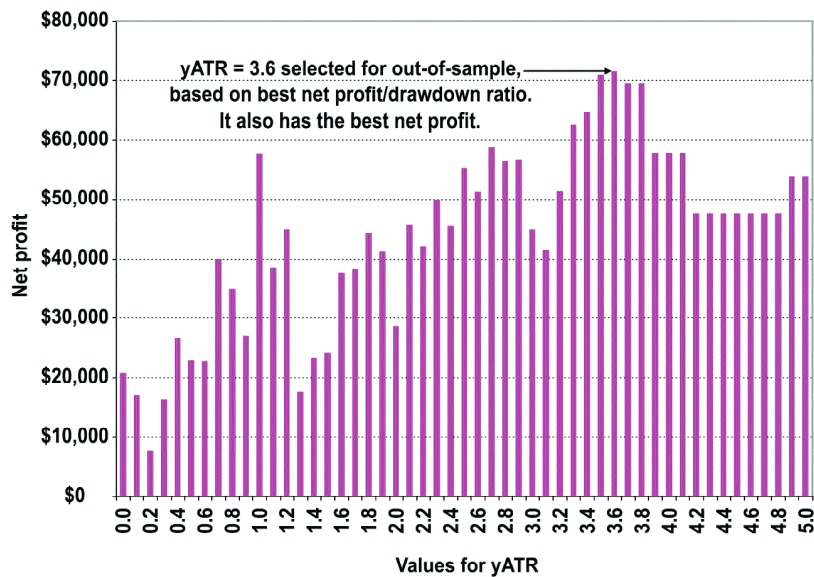
```
//EXIT LOSS RULE 2
if openpositionprofit<-
BigPointValue*yATR*AvgTrueRange(14)
then begin
     sell next bar at market;
     buytocover next bar at market;
end;

//EXIT RULE - PROFIT
if marketposition=1 and close>close[1]
and close[1]>close[2] and
close[2]>close[3] then
 sell next bar at market;

if marketposition=-1 and close<close[1]
and close[1]<close[2]  and
close[2]<close[3] then
buytocover next bar at market;
```

FIGURE 3: OPTIMIZING EXITS

yATR = 3.6 selected for out-of-sample, based on best net profit/drawdown ratio. It also has the best net profit.

The third version of the strategy was profitable for each optimized exit-rule value. The value that led to the highest net profit ($71,140) and net profit/drawdown ratio was used in out-of-sample testing.
Source: TradeStation

TABLE 1: FINAL STRATEGY

Parameter	In-sample (5-year period)	Out-of-sample (1-year period)	Combined (6-year period)
Net profit	$71,410.00	$28,590.00	$100,000.00
Number of trades	162	35	197
% winning trades	57%	63%	58%
Profit factor	1.80	1.80	1.80
Avg. trade	$441.00	$817.00	$508.00
Avg. winning trade	$1,680.00	$2,806.00	$1,921.00
Avg. losing trade	-$1,230.00	-$2,549.00	-$1,474.00
Max. drawdown	-$16,720.00	-$17,170.00	-$17,170.00
Profit/drawdown	4.30	1.70	5.80

The final strategy earned $71,410 percent and had a winning percentage of 57 percent and a profit factor of 1.8. It wasn't as successful on a risk-adjusted basis in forward testing, but it still made money.
Source: TradeStation

ward, the strategy's exit rules are slightly more involved. Three sets of exit rules were tested. The first set reflects the aforementioned adage of cutting losses short and letting profits run.

An easy way to cut losses (without using intraday stops) is to exit trades if they are losers at the close. To let profits run, set a target that extracts as much profit out of each trade as possible.

Gold has been extremely volatile in recent years, and a simple dollar-based profit exit won't work. A better idea is to use a profit target that moves with volatility, widening in choppy markets and narrowing in calmer ones. In this case, trades will be exited when the closing profit exceeds x times the 14-day average true range (ATR).

The second set of exit rules sells into strength. This can be modeled many ways, but a simple example is three consecutive daily closes in the direction of the trade. This set of rules includes no optimized variables. The exit rules are:

First set:
1. Exit trade at tomorrow's open if it is a loser at today's close.
2. Exit trade at tomorrow's open if its profit > x * ATR at today's close.

Second set:
1. Exit trade at tomorrow's open if it is a loser at today's close.
2. Exit winning long trade at tomorrow's open if today's close > close [1], close [1] > close [2], and close [2] > close [3].
3. Cover winning short trade at tomorrow's open if today's close < close [1], close [1] < close [2], and close [2] < close [3].

Where: close [1] = yesterday's close
close [2] = close two days ago
close [3] = close three days ago
x = ATR multiplier, ranging from 1-10

The initial goal isn't to create a strategy that's ready to trade, but rather to find out if the basic logic is worthwhile. The system will be tested on one contract with starting equity of $100,000 and $30 round-turn commission and slippage included.

Test results

If a strategy has any merit, it should be profitable across several optimized parameter values. Figure 2 (p. xx) compares the net profits of the two strategies. Red bars represent the net profits of the different optimized ATR multiples (1 to 10 in steps of 0.50). The blue line represents the second strategy's net profit, which doesn't vary because it lacks optimizable variables.

The first strategy was profitable for all optimized values, an encouraging sign. The second strategy earned enough ($20,730) after slippage and commission costs to justify further attention. But because the first strategy's optimized results are only slightly better than the second strategy's unoptimized results, the remaining discussion focuses on the second strategy. Overall, simpler strategies tend to perform better than more complicated ones. The initial tests suggest the clichés of selling into strength in gold futures is better than the cliché of letting profits run.

Searching for a better exit

Comparing net profits of the two trading strategies will only get you so far, though. Risk is another important factor, and a strategy's maximum drawdown — its largest peak-to-valley loss — is one way to measure it.

A major drawback of both strategies is their small net profits relative to maximum drawdowns (not shown in Figure 2). Both systems have net-profit/drawdown ratios of only about 1.5, well below the ratios of most tradable strategies (e.g., 3 or higher).

A third set of exit rules tries to improve this ratio. Instead of simply exiting losing trades at the close, the third strategy exits a loser only if price has closed in the direction of the trade twice in a row. This is a slight sign of strength, which for a losing trade is a chance to get out before losses mount. But if the trade's loss grows large enough, the strategy still needs to exit. To handle these situations, the third strategy adds a stop-loss exit based on the 14-day ATR, which resembles the profit-target exit:

1. Exit long trade at tomorrow's open if it is a loser at today's close, today's close > close [1], and close [1] > close [2].
2. Cover short trade at tomorrow's open if it is a loser at today's close,

FIGURE 4: TRADE EXAMPLES

The strategy isn't perfect, but the winning trades (blue lines) exited when price was moving in the right direction.
Source: TradeStation

FIGURE 5: EQUITY CURVE

This system went nowhere in the first two years of the test period, earning nearly all its profits during the final two years of the in-sample period (2007 and 2008).
Source: TradeStation

today's close < close [1], and close [1] < close [2].
3. Exit losing trade at tomorrow's open if loss > y * ATR at today's close.
4. Exit winning long trade at tomorrow's open if today's close > close [1], close [1] > close [2], and close [2] > close [3].
5. Cover winning short trade at tomorrow's open if today's close < close [1], close [1] < close [2], and close [2] < close [3].

Where: close [1] = yesterday's close
close [2] = close two days ago
close [3] = close three days ago
y = ATR multiplier ranging from 1-5

Testing backward and forward

Figure 3 shows the revised strategy's net profits according to the different ATR multipliers. This approach, which has only one optimizable variable, performed much better than the previous two versions. All the optimized values are profitable; which one should be selected for

forward, or out-of-sample, testing? Because the strategy's weakness lies in its profit/drawdown ratio, let's pick the value that led to the largest ratios (3.6 and 4.3). This value also led to the largest net profit of $71,410 as shown in Figure 3.

The optimized strategy parameters were tested on out-of-sample price data from Sept. 1, 2008 to Sept. 1, 2009. Table 1 (p. xx) lists the performance statistics for the in- and out-of-sample periods. Figure 4 (p. xx) shows several trade examples in gold futures from mid-March to mid-August 2009 and highlights both strengths and weaknesses of this strategy. The blue dashed lines are winning trades, which ride the trend and exit on strength, sometimes after enduring temporary open losses. The red dashed lines are losing trades, the most painful of which occurred from mid-June to early August.

Although the strategy clearly misfired from time to time, it still earned $28,590 with a 63-percent winning percentage and a 1.8 profit factor (gross profit/gross loss) in the out-of sample period.

Other possibilities

There are countless ways to define trends in simple terms, and the same entry rules might help identify longer-term trends on weekly or monthly data. Alternately, a simple oscillator such as stochastics, the relative strength index (RSI), or rate-of-change might identify better entry signals.

Adding time-based exits and intraday stops and profit targets might also improve performance. Figures 5 (p. xx) and 6 show the revised strategy's equity and drawdown curves in the combined six-year test period. The strategy earned little, if any, profit in the early years and suffered its maximum drawdown of roughly 14 percent. This period could be examined closer to see how additional rules might improve performance. 🎧

FIGURE 6: DRAWDOWN
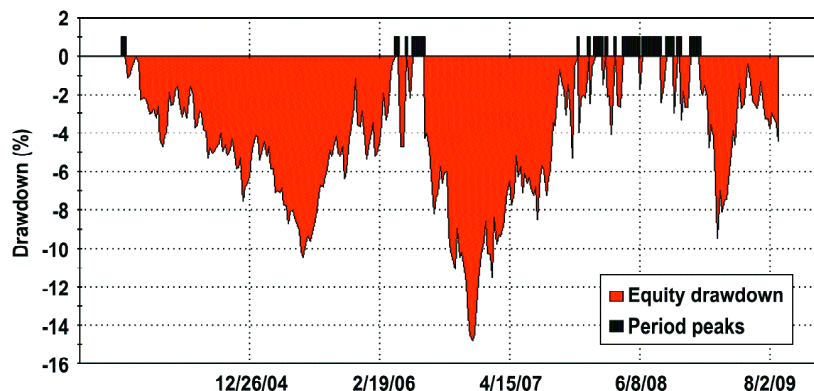
The system suffered two major drawdowns in 2005 and 2007. Surprisingly, losses weren't as large in recent years when gold became more volatile.
Source: TradeStation

Related reading

"Gold runs"
Futures & Options Trader, February 2009.
Trend, as usual, influences whether the market will post more or fewer consecutive highs or lows.

"Beyond the glitter"
Futures & Options Trader, August 2007.
Despite its reputation, gold has a poor record as an investment. That doesn't mean it's not a good trading vehicle, though.

"Trading System Lab: Exiting after profitable closes"
Active Trader, January 2007.
Exiting after a certain number of profitable closes is a time-based technique designed to take profits when a market is still moving in your direction rather than waiting until it moves against you. However, a weakness of this technique is that by factoring out price action, it does not adapt to changing market conditions.

The long-only test system will combine simple trend and countertrend entry rules, each of which will be exited after different numbers of profitable closes.

"One step at a time"
Active Trader, February 2003.
Building a successful trading system doesn't have to be a difficult process. Sometimes, it's as simple as taking an existing system and modifying it for the market you want to trade. Here's step-by-step instructions for how to get from Point A to Point B.

"Trading System Lab: Gold digger system"
Active Trader, April 2000.
A system that goes long (or short) after a period of down (up) moves.