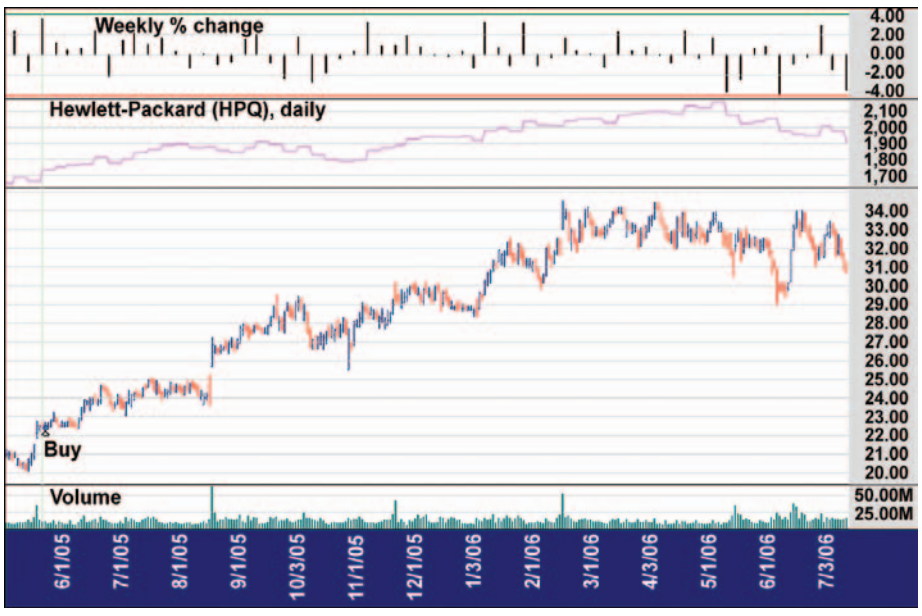
The 4-percent model

BY VOLKER KNAPP

Market: Stocks.

System concept: The 4-percent model is a mechanical trend-following approach developed by Ned Davis and popularized in Martin Zweig's book *Winning on Wall Street*. It is based on weekly percent changes in the Value Line Composite index, also known as the Value Line Geometric index (VLG). The model goes long when the market makes a 4-percent up move (on the assumption this indicates an uptrend and price will continue to rally) and gets out (or sells short) during downtrends.

FIGURE 1: SAMPLE TRADE



The system typically has long holding periods. In this case, a long trade that opened in January 2005 was still open more than a year later.

Source: Wealth-Lab Pro 5.0

The system tested uses the Value Line Arithmetic index (VLA) which, like the VLG, equally weights every stock in the Value Line Investment Survey — 1,700 stocks across a broad spectrum of capitalizations and industries.

The VLA is constructed by calculating the ratio of each stock's closing price to its previous close — e.g., if today's price is 52.64 and yesterday's price was 51.22, the ratio would be 1.03 (52.64/51.22). All the ratios are summed and then divided by the total number of stocks in the index. (For more information about the VLG and VLA go to www.valueline.com/news/vlv070406ut.html.)

The most notable aspect of this technique is its simplicity; there is nothing to calculate except the weekly close of the VLA. The system generates a buy signal when the index rises at least 4 percent from the previous week's value, and does the opposite when the index drops 4 percent.

This method is comparable to the Donchian four-week breakout rule, which goes long when price exceeds the highest high of the past four weeks and goes short when price drops below the lowest low of the past four weeks. The essential goal of both models is to avoid trading insignificant market swings while staying on the right side of the dominant market trend.

This system takes long trades and stays out of the market during downtrends. Figure 1 shows a typical trade.

Strategy rules:

1. When the VLA rises 4 percent or more from the previous week's close, go long at the market

on the next bar.

2. When the VLA falls 4 percent or more from the previous week's close, exit tomorrow at market.

Money management: Allocate 10 percent of equity per position. Because it would be impossible to take a 10-percent position in all 17 stocks in the portfolio whenever a buy signal is generated, trades are prioritized by lowest price (i.e., positions are established in lower-priced stocks first) to capture as many opportunities as possible.

Starting equity: $100,000. Deduct $8 commission and 0.10 percent slippage per trade.

Test data: The system was tested on the *Active Trader* Standard Stock Portfolio, which contains the following 17 stocks: Apple Inc. (AAPL), Boeing (BA), Citigroup (C), Caterpillar (CAT), Cisco Systems (CSCO), Disney (DIS), General Motors (GM), Hewlett Packard (HPQ), International Business Machines (IBM), Intel (INTC), International Paper (IP), J.P. Morgan Chase (JPM), Coca Cola company (KO), Microsoft (MSFT), Starbucks (SBUX), AT&T (T), and Wal-Mart (WMT). Data source: Fidelity (www.fidelity.com).

Test period: February 1998 to January 2008.

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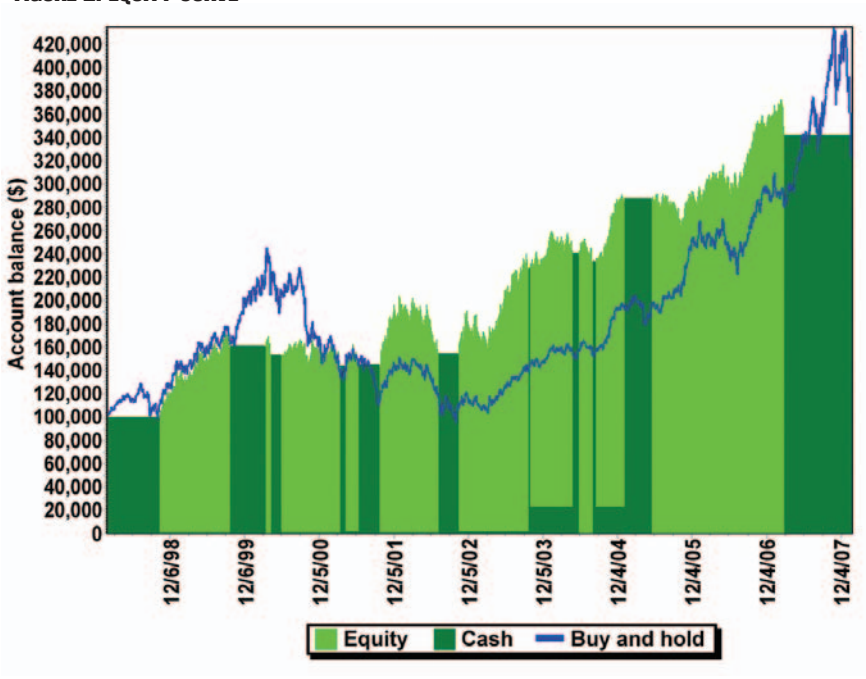
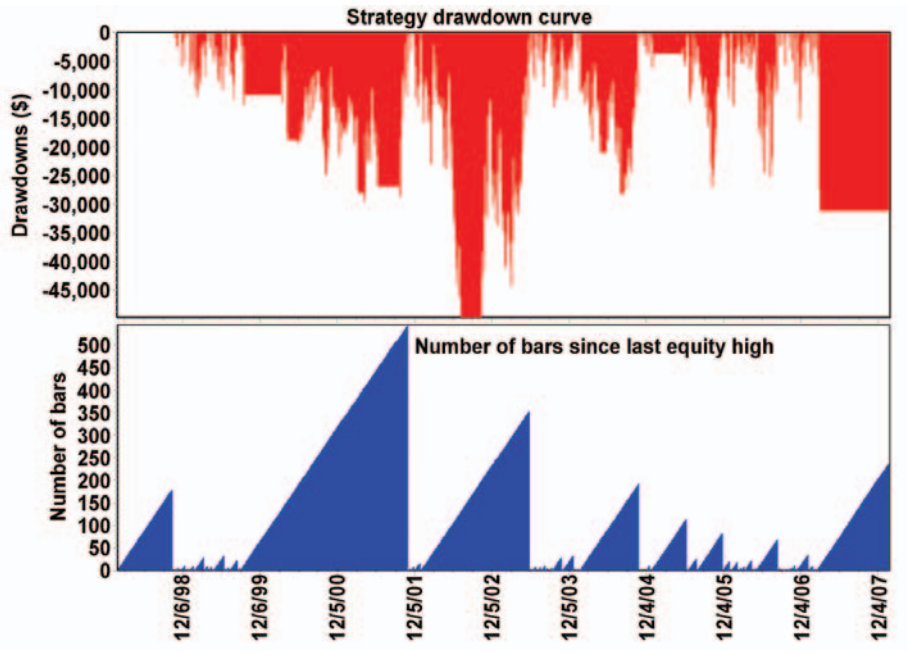
FIGURE 2: EQUITY CURVE



The system outperformed buy-and-hold for the majority of the test period.

Source: *Wealth-Lab Pro 5.0*

FIGURE 3: DRAWDOWNS



The biggest drawdown occurred in 2002 in the depths of the post-2000 bear market. None of the other drawdowns exceeded 30 percent (top). Aside from a nearly two-year stretch that ended in 2001, the time between new equity highs was not excessive for a trend-following system (bottom).

Source: *Wealth-Lab Pro 5.0*

Test results: Despite its simplicity, the 4-percent model is a surprisingly robust trend-following strategy. The system outperformed buy-and-hold by a small margin, producing a slightly higher net profit (240.9 percent vs. 233.9 percent), with annualized gains coming nip and tuck as well (13.1 percent vs. 12.8 percent).

However, a look at the equity curve (Figure 2) reveals the prolonged depth of the buy-and-hold drawdown in the aftermath of the 2000 market collapse, which took the market almost six years to overcome. The 4-percent system, though, continuously set new equity highs after 2001.

Although the system's equity line is quite jagged, its risk is considerably lower than buy-and-hold's, with the typical drawdown lasting only six months to a year. The maximum drawdown (which occurred more than five years ago) was less than 25 percent (Figure 3), compared to buy-and-hold's devastating 61 percent drawdown.

STRATEGY SUMMARY

Profitability		**Trade statistics**	
Net profit:	$240,916.71	No. trades:	98
Net profit:	240.92%	Win/loss:	64.29%
Profit factor:	4.44	Avg. profit/loss:	15.34%
Payoff ratio:	2.74	Avg. holding time (bars):	168.54
Recovery factor:	4.83	Avg. profit (winners):	29.91%
Exposure:	65.97%	Avg. hold time (winners):	192.89
Total commission:	$1,568.00		
Drawdown		Avg. loss (losers):	-10.90%
Max. DD:	-24.45%	Avg. hold time (losers):	124.71
Longest flat period:	544 bars	Max consec. win/loss:	10/4

The system made only a handful of trades (98), but the average trade returned a whopping 15.3 percent. A high payoff ratio (the absolute average profit divided by the absolute average loss) of 2.7 and a high profit factor (4.4) are results you would expect from a trend-following system, but a 64.3-percent win rate was quite a surprise.

The system's most significant drawback is its excessive exposure; it spent nearly 66 percent of the time in the market. The

PERIODIC RETURNS

	Avg. return	Sharpe ratio	Best return	Worst return	% profitable periods	Max consec. profitable	Max consec. unprofitable
Monthly	1.14%	0.53	15.50%	-11.15%	42.50	5	4
Quarterly	3.41%	0.48	28.14%	-14.55%	46.34	5	3
Annually	13.02%	0.48	43.61%	-8.60%	54.55	2	1

LEGEND

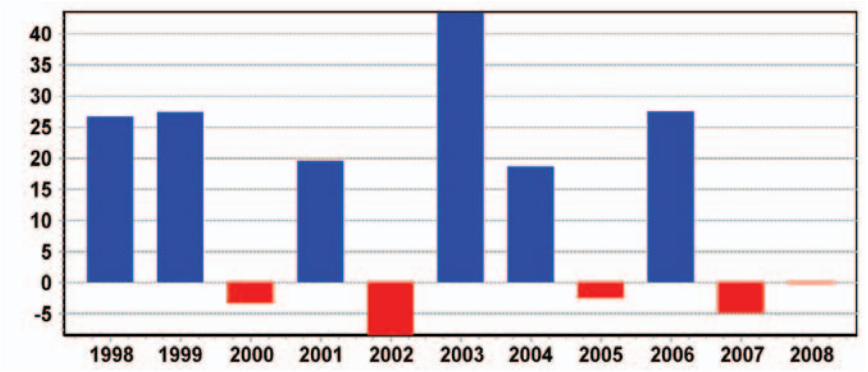
Net profit — Profit at end of test period, less commission. **Profit factor —** Gross profit divided by gross loss. **Payoff ratio —** Average profit of winning trades divided by average loss of losing trades. **Recovery factor —** Net profit divided by maximum drawdown. **Exposure —** The area of the equity curve exposed to long or short positions, as opposed to cash. **Max. DD —** Largest percentage decline in equity. **Longest flat period —** Longest period, in days, the system is between two equity highs. **No. trades —** Number of trades generated by the system. **Win/loss —** The percentage of trades that were profitable. **Avg. profit —** The average profit for all trades. **Avg. hold time —** The average holding period for all trades. **Avg. win —** The average profit for winning trades. **Avg. hold time (winners) —** The average holding time for winning trades. **Avg. loss —** The average loss for losing trades. **Avg. hold time (losers) —** The average holding time for losing trades. **Max consec. win/loss —** The maximum number of consecutive winning and losing trades.

Avg. return — The average percentage for the period. **Sharpe ratio —** Average return divided by standard deviation of returns (annualized). **Best return —** Best return for the period. **Worst return —** Worst return for the period. **Percentage profitable periods —** The percentage of periods that were profitable. **Max consec. profitable —** The largest number of consecutive profitable periods. **Max consec. unprofitable —** The largest number of consecutive unprofitable periods.

average holding time was around 170 days, equivalent to buying around Christmas and selling just before Labor Day. This sluggishness is most likely a result of the system's rudimentary exit strategy.

Equity growth came in stages, and up years alternated with down years (Figure 4). There were six winning years and four losing years and the average annual profit was 13 percent. However, the losses were noticeably smaller.

FIGURE 4: ANNUAL RETURNS



There were four losing years, but none were consecutive and all were smaller than the smallest winning year.

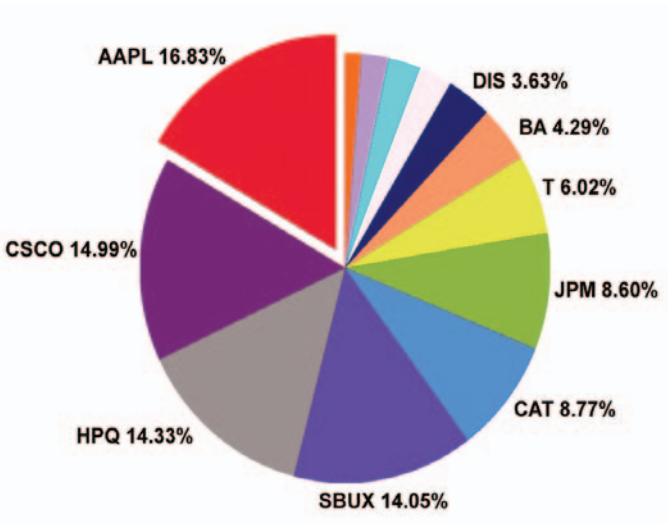
Source: Wealth-Lab Pro 5.0

Bottom line: Despite its simplicity, the system's performance was clearly better than the overall market's (represented by the buy-and-hold approach) in terms of both return and risk. The system's primary drawbacks were its relatively high exposure and occasional tendency to miss some big moves.

Generally, a pullback in the index will save the system before hard times set in, as was the case before the declines of Sept. 11, 2001, late 2002, and 2005. But sometimes the system's logic fails, as it did in late 1999 and last year. Despite an advancing market in 2007, notice how the system sat on its hands throughout 2007; not a single trade was triggered. (On the other hand, the system did not get caught in the January 2008 meltdown.)

One possible way to make the system more responsive would be to base the signals on recent troughs or peaks in the index. For example, a buy signal could occur when the VLA rises 4 percent or more from its most recent trough.

FIGURE 5: PROFIT DISTRIBUTION



Four stocks — AAPL, CSCO, HPQ, and SBUX — accounted for the majority of the system's profits.

Source: Reports-Lab

For information on the author see p. 4.

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