Multiple average trend-following

Translating a multi-moving average technique into a mechanical forex-trading system highlights the benefits of simplicity and diversification.

BY DANIEL FERNANDEZ

In his 1997 book *Trading Tactics: An Introduction to Finding, Exploiting and Managing Profitable Share Trading Opportunities*, Daryl J. Guppy discussed the application of an indicator he called the Guppy Multiple Moving Average (GMMA), which was based on using groups of moving averages to better determine trend direction and strength.

The idea is to use several slow moving averages to determine long-term trend direction, coupled with a group of faster moving averages to gauge short- and medium-term developments. The goal is to help traders spot trade opportunities by analyzing the level of interaction and separation between the different moving averages, rather than using moving average crossovers, as most moving-average trading systems do.

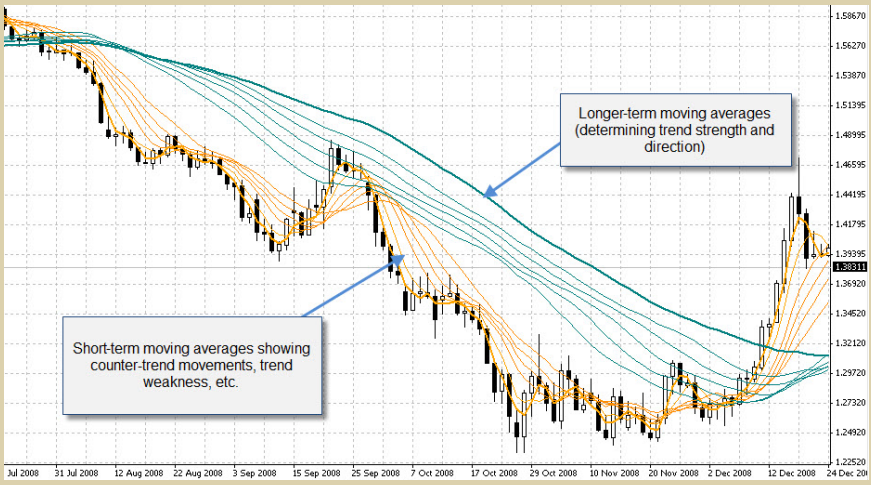
The following analysis explores the idea of using two groups of moving averages to create a simple system to follow longer-term trends.

Reviewing the indicator

To create a mechanical strategy to trade on the daily time frame, we will first establish the two groups of moving averages, as Guppy originally did: The "slow group" will consist of the 60-, 50-, 45-, 40-, 35- and 30-day simple moving averages (SMAs) and the "fast group" will consist of the 15-, 12-, 10-, 8-, 5- and 3-day SMAs.

Figure 1 shows a chart of these averages reveals several pieces of information, including the longer-term trend direction and the presence of consolidation periods and small countertrend moves highlighted by the shorter averages. However, translating such visual impressions into a mechanical trading strategy can be difficult because of the varying relationships between the 12 different moving averages. A simple approach is to evaluate the order of the moving averages, and enter trades when they are arranged in such a way that indicates trends on the long-term, intermediate, and short-term time frames are moving in the same direction.

FIGURE 1: MOVING AVERAGE ALIGNMENT

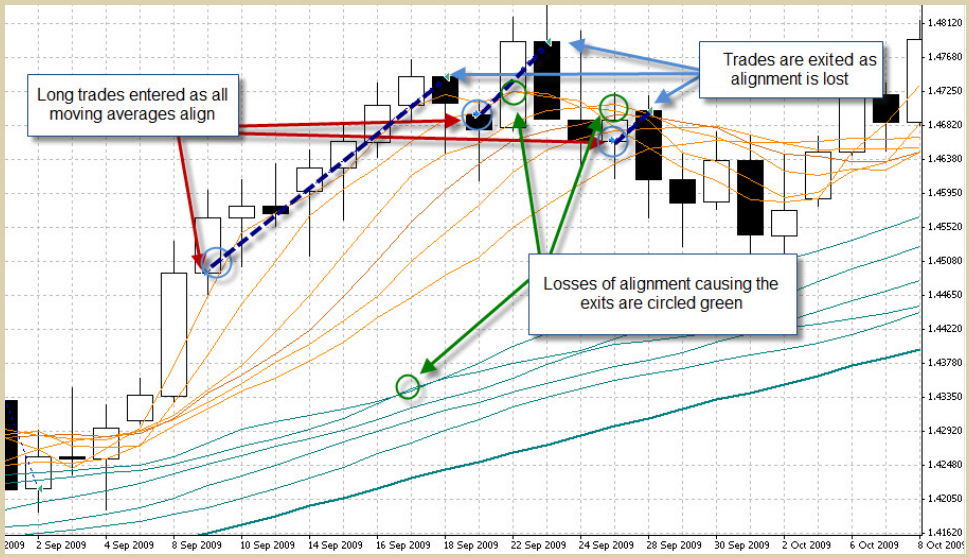


Trades are signaled when a large group of moving averages (in this case, 12) align in such a way that, in the case of long trades, the short-term averages are above the longer-term averages.
Source for all figures: MetaTrader 4

The trading strategy

The system is simple set of rules that are designed to keep you in the market only when there is a high degree of certainty regarding trend direction. Long trades are entered when all 12 moving

FIGURE 2: SAMPLE TRADES



The long trades where entered when the averages were in ascending order (longest average on bottom, shortest on top), and exited when the averages deviated from this alignment.

designed to get into the market when "directionality" is high (i.e., all moving average are aligned) and get out quickly when the market reverses. To limit losses, all trades are also protected with a stop-loss of two times the 20-period daily average true range (ATR). Trade size is calculated dynamically based on changes in volatility and account balance (based on a standard forex "lot" size of 100,000):

Position size = 0.004 * account balance (in USD) / ATR (in pips)

averages align in increasing order — that is, successively shorter moving averages are above the longer averages — e.g., 3-day SMA > 5-day SMA > 8-day SMA > 10-day SMA > 12-day SMA > 15-day SMA > 30-day SMA > 35-day SMA > 40-day SMA > 45-day SMA > 50-day SMA > 60-day SMA. Similarly, short trades are entered when the averages align in descending order (3-day MA < 5-day SMA < 8-day SMA < 10-day SMA, etc.). Any open trades are closed when the SMAs lose their proper alignments.

Figure 2 shows three sample long signals, each one short-term than the preceding trade. All of them are exited before significant price reversals occur. The rules are designed to get into the market when "directionality" is high (i.e., all moving average are aligned) and get out quickly when the market reverses. To limit losses, all trades are also protected with a stop-loss of two times the 20-period daily average true range (ATR). Trade size is calculated dynamically based on changes in volatility and account balance (based on a standard forex "lot" size of 100,000):

Position size = 0.004 * account balance (in USD) / ATR (in pips)

For example, if the current EUR/USD price is 1.3550, the 20-day ATR is 0.0150, and the account size is $10,000, the position size would be 0.26, or $26,000 (0.004*10,000/150), and the stop-loss value would be 1.3250 (1.3550-2*0.0150). The equation results in risk of roughly 8 percent per trade if the stop-loss is hit. However, it should not cause the system to reach a severe drawdown level because the majority of trades will likely be liquidated first by the relatively sensitive exit rule.

The system will be tested on daily data in the Euro/U.S. dollar (EUR/USD), British pound/U.S. dollar (GBP/USD), and Swiss Franc/U.S. dollar (USD/CHF) pairs from June 1, 2000 through May 1, 2010, using an initial account size of $100,000. Trading costs of 2, 3.5, and 3.5 pips will be assessed for the EUR/USD, GBP/USD, and USD/CHF pairs, respectively. The tests will be conducted using MetaTrader 4 using data provided by MetaQuotes.

TABLE 1: TEST RESULTS

	EUR/USD	USD/CHF	GBP/USD	Portfolio
Total profit	215	91	79	822
Profit factor	1.82	1.82	1.38	1.56
Avg. compounded yearly profit	12.2%	6.7%	6%	26.3%
Maximum drawdown	27.2%	20.6%	34.2%	45.6%
Number of trades	99	89	76	264
Win %	50.5	43.8	44.7	47
Average profit:loss ratio	1.78	2.33	1.7	1.78

Performance for the three-pair portfolio was better than the sum of its parts.

Test results

The system was profitable on the EUR/USD, GBP/USD and USD/CHF pairs without any optimization or changes in logic (Table 1); the results also show the

EUR/USD pair was the best-performing pair, in keeping with its performance in most other trend-following strategies. This superior performance can be attributed to the pair's higher liquidity and more stable trend tendencies, which result in fewer whipsaws than in other pairs.

The strategy produces what we would expect from a good long-term trend-following system: a relatively low trade frequency, a favorable average profit-to-loss ratio, and a winning percentage close or slightly below 50 percent. Also, Figure 3 shows the strategy manifested the extended (one to three years) drawdowns characteristic of this type of trading strategy.

Another aspect of Figure 3 is that the overall portfolio's equity curve has better characteristics than any of the individual currency pair curves. Because trends and drawdowns do not always develop at the same time in the three pairs, the composite performance is smoothed. This, in turn, increases both the total and average compounded yearly profits, while other system metrics, such as the profit-to-loss ratio and winning percentage, are a compromise of the three individual currency pairs' results.

Most importantly, the portfolio's maximum drawdown — although larger than that of any of the individual pairs — is not what we would expect from totaling the three component drawdowns. Because the currency pairs' profit and drawdown periods are not synchronized, the strategy is able to reduce overall risk through diversification.

Simple, effective

The system's performance suggest Daryl Guppy's idea to follow trends based on the alignment of a large group of moving averages can be effectively translated into a simple trading strategy, and demonstrates that complexity is not necessary to achieve positive results when developing trend-following techniques.

The simple base strategy offers much room for experimentation: trading a larger basket of currencies, optimizing the moving averages, or refining the entry and exit rules to provide a better overall mathematical expectancy.

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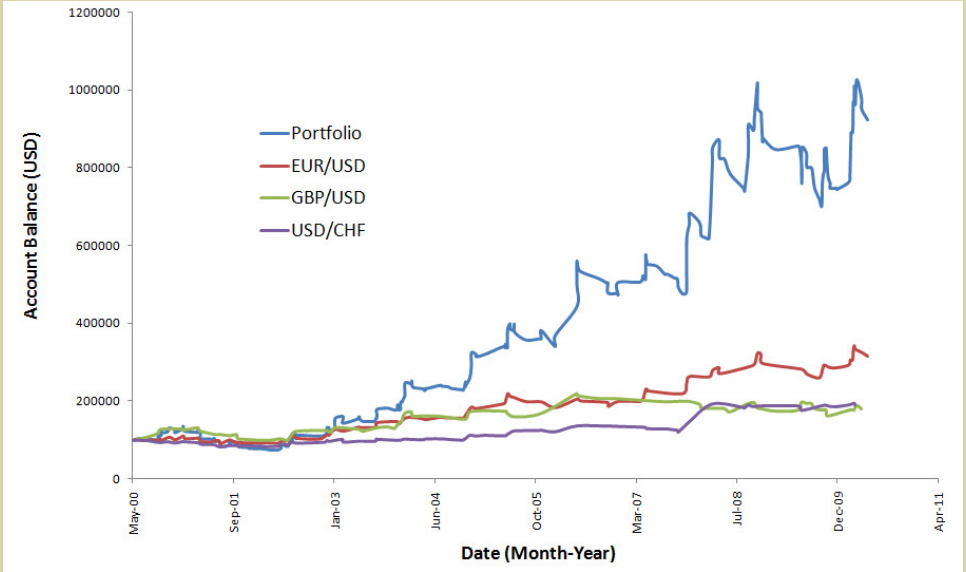
The strategy also allows traders to diversify, since it can be applied to different currency pairs which, although they might not perform brilliantly individually, can provide much better results as a portfolio.

For information on the author, see p. 4.

FIGURE 3: EQUITY CURVES



The portfolio's profitability was much higher than the sum of the individual currency pairs' because their of the lack of correlation between their drawdowns.