

On Improving Your Results

David Stendahl And Position Sizing

David Stendahl is the portfolio manager at Capitalogix, a Commodity Trading Advisor (CTA) firm specializing in systematic trading. He is also a leading industry expert, author, and speaker focused on the managed futures industry. Stendahl has lectured at numerous national and international conferences and written on system evaluation and money management techniques. He is also the author of Profit Strategies: Unlocking Trading Performance With Money Management and the coauthor of two additional books, Dynamic Trading Indicators and Computerized Trading. His trading expertise has been featured in a number of educational videos, including The Systematic Trader. He also co-created various performance analysis software packages, including Performance Summary Plus (now incorporated into TradeStation), Portfolio Evaluator, and Money Manager.

STOCKS & COMMODITIES Editor Jayanthi Gopalakrishnan and Staff Writer Bruce Faber spoke with David Stendahl on June 7, 2012.

Dave,

how did you get interested in technical analysis?

As a kid, I was interested in the stock market, but it wasn't until I became a stockbroker that I started taking things more seriously. Then I began to examine technical analysis. I discovered I liked to design trading systems, but to analyze and design them, I knew I needed better tools. Eventually, I cofounded a software company called Rina Systems. We ended up creating a number of tools such as the Performance Summary Plus, Portfolio Evaluator, and Money Manager, each of which are now part of TradeStation.

After that, I started a career on the trading side. I am now with Capitalogix, where we are forming a fund. It is all systematic, which is how I like to trade. We are looking at new ways of designing systems and how to construct portfolios.

You have done a lot of work with money management. How did that come about?

I realized that with trading systems, there was money to be made, but the real money was in how you manipulated the buys and sells.

In addition, the real money could also be found in the use of position sizing, finding ways in which you can increase/decrease position size, number of contracts, or leverage to maximize your ability to make as much money as you can, given whatever buy and sells were presented.

How do you go about determining position size?

That is a complicated question. I view the markets now in terms of baskets. You could think of them as mini-portfolios combined into a larger one. In certain instances we use a fixed fractional with an average true range (ATR) formula (see sidebar, "Position Sizing Terms") that looked at when a position was on, how much downside risk it had, how many positions you want, and how much capital you have for that individual portfolio.

In other instances, we use a basket



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POSITION SIZING TERMS

Fixed-fractional position sizing with ATR component: Fixed fraction position sizing means risking the same percentage or fraction of your total equity account into each trade. The equation is:

$$N = f * (\text{Equity} / \text{Trade risk})$$

where

N is the number of contracts

f is the fixed fraction

Equity is the total value of your account

Trade risk is the amount you could lose on the trade

There are various methods to incorporate an average true range (ATR) component. One is to implement it into the trade risk. TradeStation recommends multiplying the ATR of the tradable with an ATR component.

Maximum adverse excursion (MAE): The largest loss a trade had while it was open. The value of the MAE will help you determine whether the system you are considering is worth implementing. It can also help you set stop-losses.

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concept where we have a lot of systems similar to one another each with an equal weighting within that basket. We then trade the basket taking positions once certain ratio levels are triggered. We call them “ratio levels” because we are looking for certain ratios of systems to trigger before we execute our position.

The position sizing is in how you combine those baskets using portfolio allocation. Basically, you are giving a weighting to that individual basket. The way I implemented money management was simple, but I have taken things further and extended them to understanding what mini-portfolios/baskets are all about, and what kind of a strategy or position sizing, money management, and formula you want to apply to it.

Based on our trading systems, I have discovered that one position size formula does not fit all situations. In some instances we may use certain position size styles and in another, we may use something different. That’s where my research team and I have a lot of fun as we build our portfolios.

Do money management strategies vary depending on market conditions?

That’s exactly the point. That would come into play with the systems and what they are designed to look for. A lot has to do with how the systems within a basket or mini-portfolio work and how a portfolio works with other baskets. So a straight allocation methodology would work in some instances, and for other baskets, a fixed fraction with an ATR component would be more appropriate.

Whenever I mention money management to retail traders, they seem to think that it is the same thing as placing stops. Do you think the two are similar?

I hear that people think money management is the same as position sizing. I put them into two categories. Stop management, which is sometimes referred to as “risk management,” is when you look at an individual system.

In that case, how do you use it?

Here’s how. You have a system that tells you when to get into the market

based on some criteria, and it also tells you when to liquidate positions based on some criteria. Sometimes the market wants you to liquidate the position based on the stop management or risk management you implemented. I use things like maximum adverse excursion (MAE), chandelier stops, the parabolic, or things of that nature. I use something that works well with the underlying system and that strategy. I look at that as stop management/risk management.

At the portfolio level you are viewing things from the perspective of position sizing and that allows you to increase or decrease the number of contracts you are trading. For the retail trader, if they are looking at any particular system, stop management is critical, but you also want to look at the position sizing so you are not trading a single contract all the time.

How does somebody determine where to place a stop? When should you take a loss to avoid further losses? How do you choose that value?

I am a systematic trader, so the placement of stops comes down to when it is designed in the system. It is worked into the system itself. If you don’t have a trading plan, either at the portfolio level or at the system level, then you are doomed, in my opinion. You need to have stop management incorporated into your system so that if or when an unusual condition occurs, you are ready to liquidate at a moment’s notice. I’d suggest traders research maximum adverse excursion (MAE), chandelier, parabolic, trailing, and pivot high/low level stops. Each of these stop management styles will help to some degree.

There are so many ways in which you can apply different types of stop management formulas. You do it at the



research level. You do it before you get into the trade so there is no ambiguity in what you are going to do once you get into that position.

The market does what it wants, and you need to react. When the conditions that got you into the trade are no longer valid, you need to have some type of stop management to protect you.

Do you think traders should have different stop management systems for different markets? If it is a trending market, should they have a different application than if the market were in a trading range or volatile?

Yes. I would look at what the underlying system is attempting to do and then match an appropriate stop management. I am in the camp where you would apply different stop management applications to different systems and even different markets. When the Standard & Poor’s 500 is volatile, you will apply an MAE and have it be far away from the market. If you are trading the euro, which has nice trending qualities, you might want to use something like the parabolic.

There are so many different strategies to which you can apply so many stop management or risk management styles. The battle is won or lost while you are doing the research. From that side, it is all done even before you get into the trade.

Do you think people tend not to place much importance on the stop or risk management part of their trading and look more at how much they can make, as opposed to how much they can lose?

Definitely. If you look at trend-oriented trading, a lot of people are surprised that you might have a profitable number at around 35% or so. You have a large number of losses. The opposite is the saying “Let your profits run” so you allow that system to take advantage of whatever the market is willing to give you.

When that is not possible, you use some other form, maybe multiple stop-loss logic, for your trading. A lot of people focus on how accurate a system is. When I design a system, I focus on the negatives or the risk side of the equation. A lot of

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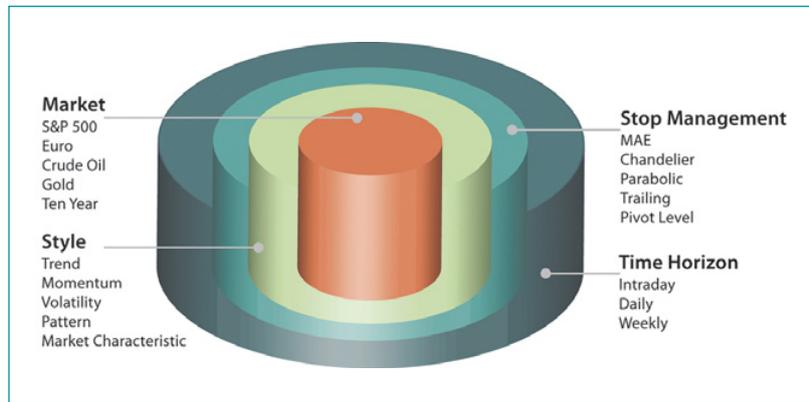


FIGURE 1: PORTFOLIO MANAGEMENT. Here you see the different markets, trading styles, stop management, and the time horizons used for trading various portfolios or baskets.

people, especially those new to trading, will gravitate toward the rewards side of the equation. I suggest they spend equal, if not more, time evaluating the risk side of the equation.

Do you trade mostly stocks or futures or forex?

Right now, Capitalogix focuses on five separate markets. We are going to broaden that eventually to 40 separate markets, but all of those markets will be futures oriented. I traded a stock back in 1990, Dell Inc. (DELL). I wish I had held on to it. But that was the last time I traded a stock.

Everything I have traded since then has been focused on futures. With the leverage on the futures side you have a lot of flexibility in how you actually operate. The trading tools I have created over the years all relate to the futures markets because I can manipulate leverage to my advantage. It allows me to trade however aggressively or conservatively whenever I want. The one thing I won't do is abuse the leverage. Do that, and it will come back to haunt you.

A lot of people know what stops are, but when it comes to things like position sizing, I am surprised at how little importance people place on it. They don't understand that you can do so many things with variables like position size that can affect your trading results. Do you find that?

Absolutely! You can take a below-average system and do a lot with it using position sizing algorithms. You can be

selective when you trade and go into a position with a small dollar amount, but use other tools along the way to increase your position size once it is validated.

MAE is a perfect example of increasing your position size once a trade has validated itself. There is an arsenal of tools out there that allow you to manipulate the system. When market conditions change, there is always an opportunity to increase and decrease your position size. If you only look at trading from the buy-sell side, you're thinking in terms of black & white. I believe traders need to look at all the gray as well.

Professionals look more at risk management, stop-loss logic, and portfolio allocation. They are looking at all of the gray in-between areas that allow you to take a below-average or average system and make that an excellent system. If that is not done at the system level, it should be done with risk/stop management or at the portfolio allocation level.

You spoke about putting together baskets of futures for your mini-portfolios, and one of the considerations is downside risk. How do you determine that risk?

We have a lot of trading systems, trend-based, momentum-based, pattern-based, volatility-based, market condition-based portfolios, or baskets if you will (Figure 1). We monitor all of those baskets, some of which are trading and some of which are being monitored. We look at a lot of risk/reward calculations or risk metrics, and monitor the performance of those individual baskets.

We turn them on or off based on risk/reward metrics like Calmar and risk metrics like drawdown in an effort to find baskets that generate superior performance going forward. We are essentially trying to figure out when certain baskets are in or out of phase. We then incorporate those baskets into our portfolio.

Once the baskets are set for trading, they are given a percent allocation within the active portfolio. At that stage, we turn our attention to three different portfolio allocation formulas: optimal weight, minimum variance, and risk parity. Each of these portfolio allocation models focuses on the risk side of the equation relative to reward.

So why do you use three different models?

We use three models so that we have flexibility in building our portfolio. As an example, when the markets are quiet, we might use optimal weight. When the markets become more volatile, we might use minimum variance or risk parity. In the end, it's a great way to organize all of our baskets as we construct the most stable portfolio possible.

Can you tell us about your use of risk parity?

Risk parity is about formulas that focus on the risk side of the equation. We look at calculations that allow us to give weightings to these baskets.

It is really a twofold answer. One is the risk calculation if it is performing well and if we want to increase or decrease leverage based on performance. The other is if we have to give it an allocation. We would use things like risk parity, which is similar to efficient frontier, where you are focusing on the standard deviation of risk and how the allocation of those individual baskets work with one another.

It has become more complicated after we started to incorporate more into the mixture where the allocation side of the business has turned out to be just as important to us as position sizing. Is position sizing important? Yes. Most people don't use it enough and don't appreciate it enough. You will find that more people are starting to look at portfolio allocation

in different modules. They will look at their portfolio and try to do what we are doing, which is view lots of portfolios or baskets, and see how they relate so you can be as efficient as possible, given whatever those particular baskets are attempting to do.

I assume you mean buy and sell these baskets. Do you buy and sell the entire basket, or change position sizing inside the baskets or one futures contract in the basket?

We actually trade a portion of a basket, as we have hundreds of systems in a single basket. Here's an example of how a basket operates. First, a basket does not have to trade all the time; it can be turned on or off. Once the market moves into trend mode, based on our indicators, the basket would be activated. We would then follow the same procedure for each market we trade. This allows us to have a variety of trading styles applied to a diverse basket of markets.

Our allocation models would then provide us with a weighting for our portfolio.

Let's say we allocate 60% to the S&P and 40% to crude oil. Both baskets are trend oriented and are actively trading. Now, within the individual baskets we might have 500 systems tracking the S&P and 100 systems tracking crude oil. We then track all systems, each of which can go long, short, or flat, and trade the aggregate based on different thresholds for each basket. It can get a little complicated. Take a look at Figure 2, which helps to explain the process.

Given that there might be 500 different systems inside each basket, is each system at least one contract?

Yes, each could trade a single contract. But that would be a lot of contracts and a lot of risk. So we lump all the systems together within a basket and wait for the systems to trigger. If a large number

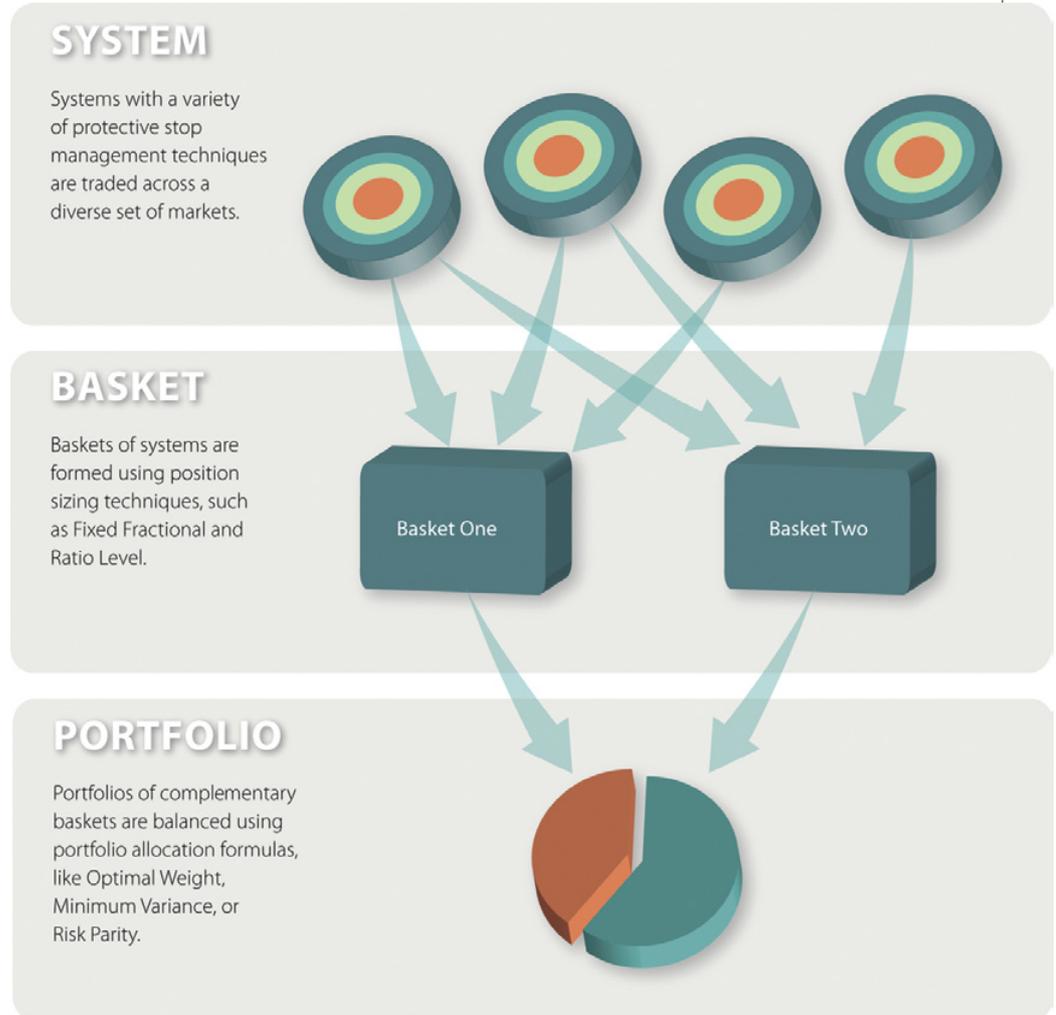


FIGURE 2: THE PROCESS. Here you see a condensed version of the entire portfolio management process.



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trigger long, then we go long and if they trigger short, we go short. We of course have varying ratio levels or thresholds for each of the baskets.

So if a basket had 500 systems and they were all bullish, we would have a +500 reading. On the flip side, if they were all bearish, we would have a reading of -500. Since each system trades independently and can go long, short, or flat, we would never see the extreme reading of +/-500. Instead, we would see a netting of the systems and get a number somewhere in the middle. When the market heats up, we could see the systems hit +50, then +100, and then +150. Ratio levels or thresholds like that would allow the basket to trade one, two, and three contracts, as an example. It would be the same on the flip side, trading short contracts as we hit -50, -100, and -150.

Beyond the obvious system diversification aspect, the other advantage to trading in basket form is that it allows us to trade for different account sizes. If we have a \$10 million account, a \$1 million account, or a \$250,000 account, we could use these ratios to effectively and efficiently trade each account, no matter the size.

What is the average length of time you

are in any position?

That depends on the basket and the market. On average, we are in around 20 minutes or so. Those systems will last three, four, or five hours or so and even hold positions overnight. We have other systems that trade on a daily basis and even a weekly basis. Those can last for months. There are different averages for every single market. There is no reason to look at what the average is for the portfolio because mixing and matching of all these different baskets varies dramatically.

In a smooth market, this sounds like a good system, but what do you do when you have something like the flash crash? That was in the equity market, but sometimes that sort of thing happens in the futures market, doesn't it?

It does. That is where all of the different layers kick into gear. First, all the stops would be triggered on the individual systems. That would turn the basket negative. The basket would then be constrained for a period of time, and be limited in doing any trading. Finally, we have a level of diversification across a variety of sectors. The markets we track fall within five different sectors: equities

(S&P 500), energies (crude oil), interest rates (10-year notes), metals (gold), and currencies (euro).

So the saving grace in a flash crash scenario for our style of trading can be summed up into three points: one, stop management at the system level; two, trading style diversification at the basket level, and three, proper allocation at the portfolio level. We might not make money during a flash crash scenario, but being defensive and preserving wealth through all levels of trading is sometimes just as important.

Good to know. Thank you for speaking with us, Dave.

SUGGESTED READING

Gopalakrishnan, Jayanthi [2002]. "David Stendahl," interview, *Technical Analysis of STOCKS & COMMODITIES*, Volume 20: September.



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