

# Chapter 2

## Trading as a Business

A question often heard around traders is how to best make trading a business. What do you need to have your trading account grow from, say, \$100,000 to several million dollars?

Because of year to year variations in rates of return and drawdown, it is risky to count on trading to generate monthly profits. Throughout this book, we will focus on growth of the trading account.

## THE TRADING ACCOUNT

How much money is in my trading account now?

How much of my assets am I willing to use to fund trading positions? Call that the “active” portion. The remainder will be inactive, and will not be at risk. Drawdowns will be measured relative to the active portion and the equity it generates. A trader might have a combination of cash, real estate, collectibles, and retirement funds totaling \$500,000, with \$100,000 of that in the trading account.

What is my monetary goal, and in how much time? The trader might have a goal of building the \$100,000 into \$1,000,000 in four years.

What size of loss will cause me to stop trading? Losses can be measured as a portion of initial equity or of highest equity. If the limit is 40%, and based on initial equity, the trader will continue as long as the funds in the active trading account remain above \$60,000. If the limit is 40%, and based on highest equity, the trader will continue as long as funds remain above 60% of the highest equity. Equity and drawdown can be computed on either a closed trade basis or an intra-trade (or open trade) basis.

## THE TRADING SYSTEM

*Modeling Trading System Performance (MTSP)* is a sequel to *Quantitative Trading Systems (QTS)*. *QTS* explained the process of the design, testing, and validation of trading systems. In *MTSP*, we are not concerned with the system itself – only the trades that result from it.

You can test any list of trade results, including actual trades, out-of-sample test results, or hypothetical results, but in order for the trading account to grow the system must be profitable (have a positive mathematical expectation) in the future.

The system is the combination of the logic and the data. Characteristics that are important include:

- The issue to trade, including its liquidity.
- Being sufficiently mechanical that it can be tested and statistically validated.
- The length of the bars used to generate the trading signals, such as hourly, daily, or weekly.
- Methods of entering trades, such as at a limit price, at a stop price, or at the market at the next trading opportunity, including being able to fill actual orders at prices suggested in the simulation.
- The length of time the typical trade is held.
- Frequency of trading.
- The statistical distribution of gains per trade. Analysis of these stats will show the mean, standard deviation, percentage of trades that are winners, win to loss ratio, and fatness of the tails. Actual trade results (or hypothetical results) are used rather than theoretical distributions.
- Proper use of leverage. A futures system that always buys one contract, without regard to the size of the account or the trading history, is unleveraged. Similarly, a stock system that always buys \$10,000 worth of an issue is unleveraged. Growing an account requires use of leverage and compounding.

## **IS THE SYSTEM WORKING OR BROKEN?**

### **HOW DO I KNOW THE SYSTEM WORKS?**

Future profits depend on the system being profitable in the future. The best estimates we can get of future performance are results of trades made using data that was not used during the development of the system – that is, out-of-sample data. It would be folly to trade a system that is untested; and equally poor judgment to trade a system known to be unprofitable in backtests. Even if the system appeared to be profitable using in-sample backtest results, that is no guarantee that it will be profitable in the future. Use of in-sample results always over estimates future profitability and under estimates future drawdown. It is not uncommon for systems that are profitable using in-sample data to be unprofitable in the future. Use in-sample results to plan your trading business at your financial peril.

## HOW CAN I TELL WHEN THE SYSTEM IS BROKEN?

Encountering a large drawdown is one of the primary reasons traders stop trading. Understanding, estimating, and limiting drawdowns, and determining whether a drawdown is within reasonable expectations of the system or a symptom that the system is broken, are among the primary goals of this book.

The price and volume data consists of a combination of signal and noise. The trading system logic has been designed to recognize the signal portion of the data in anticipation of profitable trading opportunities. Systems rely on the continued synchronization between the logic and the data. As variations occur in the data stream, the degree of synchronization shifts. When they are in sync, the system is profitable; when they are out of sync, the system is unprofitable. One of the most difficult questions traders face is how to determine whether the system is working as expected, or is temporarily out of sync, or is broken.

Determination of whether the system is working or broken relies on comparison of recent trading results to some benchmark. Comparison implies that there is some metric, such as profit per trade, available for both the recent results and the benchmark. There are two easily established benchmarks:

- Previous performance – compare recent results against actual trades previously made with the system, or against the out-of-sample results from the validation process.
- Random – compare recent results against random results.

Statistical analysis is used to evaluate the comparison. Several sections of *MTSP* explain statistical testing procedures, suggest appropriate tests, and give rules for actions.

## IS IT POSSIBLE TO MEET THE GOAL?

Having a terminal wealth 10 times the initial wealth in 4 years requires an annual compounded rate of 78% per year. That is,  $1.78^4 = 10.0$ .

Whether this is possible depends on several factors:

- The distribution of trade results, including the average profit per trade and variation among trades.
- The number of trades per year.
- The portion of the active account used to take each position.

If the mean trade profit is 0.5%, winning trades are about equal in size to losing trades, trades are 60% accurate, and there are 52 trades per year, then the annual percentage profit will be approximately:

$(0.995^{21}) * (1.005^{31}) = 0.900 * 1.167 = 1.050$ . This is well below the required 1.78.

If there are 252 trades per year, the annual percentage profit will be approximately:

$(0.995^{101}) * (1.005^{151}) = 0.602 * 2.123 = 1.278$ . By using correct position sizing, the goal can be successfully accomplishing if the drawdown remains within accept bounds.

## MANAGING THE BUSINESS

As a trader planning to grow your account, you are running a business. Just as with any other business, you need office space, equipment, supplies, and personnel, all of which require funds – either directly expended or as lost opportunity. Calculate your monthly expenses and determine where that money will come from. Throughout this book, we will assume that the trading account has no withdrawals to meet business or living expenses.

Structure your business so that it can be run like a DVD. When there appears to be a problem, or you want to take a break, press Pause and go flat. Analyze and modify as necessary, then press Resume. You do not need to remain exposed to risks during the adjustment period.

You will need time. Time to generate signals, place trades, record and analyze results.

And you will need skills. In particular, you need to be enough of a statistician to understand the techniques used to determine the health of the system.

## GAMBLING AND TRADING

We begin with some examples from gambling that illustrate some of these points, after which we will extend the examples to trading.

