

# Systematic Trading

## ATONCE Capital Management AG

### 1. Introduction

The team of ATONCE Capital Management AG has a history in common reaching back to 1999. The goal was always to develop trading systems that perform in every market.

The first research and trading was done with futures. The problem with futures is the fact, that only about 30 products are really liquid and well tradable. To find statistical anomalies in these few markets may be possible, but the data based on is too small to build reliable products.

One major step in research was done, when we met the people from the University of Karlsruhe, who developed statistical research methods named NeuroBayes for the CERN in Geneva. With Bayes statistics, a preprocessing is done before data is fed to a neuronal network. The neuronal network is trained to give the right answers. We licensed this technology and tried to develop futures trading systems with it. Indeed the system discovered anomalies in the data. But to do this, the system needs data for at least 10 years. Nobody believes that markets 10 years ago were the same as they are today. The Mouse Game developed with NeuroBayes is still impressive: It reads the mind of a person who clicks the mouse buttons left and right.

Aware of these facts and with all the know-how, we decided to develop our own statistical basis and tools. We call this powerful tool **Discovery**.

Based on Discovery the trading system **M8** was developed. This system is in production for more than three years now and shows a stable track record, even in the crash year 2008.

In the following text the actual development methods and trading system are described.

### 2. Systematic Trading

We are convinced that only systematic trading based on a thorough and statistically correct tested market-anomaly can deliver sustainable profits.

The efficient-market hypothesis (EMH) says that it is impossible to consistently outperform the market by using any information that the market already has, except through luck. There are three common forms in which the efficient-market hypothesis is commonly stated —

weak-form efficiency, semi-strong-form efficiency and strong-form efficiency, each of which has different implications for how markets work.

Many trading system developers think that this is not true and they can find methods to build winning systems though. But we found that the market behavior is so close to the random walk that it is nearly impossible to find any anomalies that could open a door to a winning system.

Prof. Zhang from the University of Fribourg wrote a very interesting article about this: "Toward a Theory of Marginally Efficient Markets".

In this article he shows that there are still anomalies in the markets because infinite amounts of capital are needed to let existing anomalies totally disappear.

But these anomalies are either very small, close to zero or they are extremely fast, existing only for a few seconds.

That is exactly the place where we found the M8-effect: Very fast, hidden in the noise of the market, in the range of a few cents, disappearing when brokerage costs are too high.

## **2.1 Discovery**

Discovery consists of a database with intra-day data from all Nasdaq 100 and S&P 500 Stocks. The data is pre-processed and optimized for fast anomaly detection. The biggest table in the database has 1'600 Million records.

Research for anomalies is far from dealing with simple normal distributions. Discovery analyzes the data by using indicators and bins. Every trading idea can be implemented very fast and analyzed over time.

One of the biggest traps in research is curve fitting. It is very difficult to do the research and test correctly in-sample and out-sample. Our methods to do this are very sophisticated and statistically correct.

Once an anomaly is found, Discovery generates the code to trade this anomaly. This magic piece of software can be directly plugged in into the best trading software development tool: Right Edge (RE). RE allows historical testing event driven, very close to what really happens in the market. It is programmed in C# and can be enhanced with plug-ins.

We developed a plug-in for bootstrap loading different market conditions; it is comparable with an enhanced Monte Carlo Simulation. A historical test only delivers one single random walk that reflects the market behavior in the past. There would have been possible infinite other walks. Bootstrap-loading varies all existing trades several thousand fold and calculates the probabilities for each random walk. So we get tables that define the different probabilities for profit, draw down, number of trades, number of shares traded, winning trades percentage.

Our System Quality Indicator is an enhanced Sharpe Ratio and gives us an easy overall-value of the quality of the system developed.

## 2.2 Trading Systems

Once a trading system is found, it goes into production, into real trading. First it is paper traded, then on a low capital account and finally other accounts are traded with the system.

M8 is our actual trading system, in production since September 2006 with a remarkable track record. The M8 traded today is not exactly the same as it was 2006. With Discovery different filters were found, that enhance the quality of trades and avoid losing trades. It is still the same effect in the market traded, but with less and better trades.

M8 is market neutral in the manner, that every long entry is immediately hedged with shorting the same equity with an ETF. The system goes flat outside trading hours by selling all positions at the close of the exchange. Therefore it is highly liquid.

M8 trades approximated:

- 10 Million shares / million / year
- 20 Million shares round turn / million / year
- 1'000 Million transaction volume in USD / million / year
- 50'000 shares / million / trading-day
- 2'500 trades / year
- 12 trades / day
- 6 positions / day

Documentation of M8-performance is separately available with different fact sheets.

## 2.3 Risk Management

Our automated trading requires a most sophisticated risk management. In several studies all components of our trading were analyzed and measures taken to avoid risk as much as possible. Independent hardware and communication paths enable a high security trading.

The trading platform controls real-time risk per trade, risk per product, leverage, overall risk, and any other parameter we set.

Depending on the statistical basis all weekly, monthly and quarterly parameters are known. Should in real trading only one parameter break the limits, a trading stop is issued and the rules for restarting are well defined. A trading stop occurred in September 2008 as we faced a one century crash in the stock markets.

## 2.4 Trading Platform

This heavy trading can not be done by humans. A fully Automated Trading Platform (ATP) was developed by ATONCE Capital Management AG over several years. The fourth generation of ATP is run today. It acts from a computer center and is operated by remote desktop by the traders from different locations.

In a different computer center a totally independent Trade Guard surveys all activities and with different alarms Trade Guard signals any failure or broken parameter.

The third monitor is delivered by the broker with its trading tools.

ATP is capable to trade many different accounts in parallel, each with its own risk parameters.

## 2.5 Products

Due to legal restrictions, the only product ATONCE Capital Management AG offers to the public is the **Managed Account**. This account is usually opened with Interactive Brokers (IB) and belongs to the customer. The minimum requirement is 250'000 CHF to be well above the minimum required for portfolio margins.

The customer has full control over his accounts. From IB he gets daily, monthly and yearly activity statements with every transaction well documented. He is the only one who can transfer equity to and from the account.

We have funds that let their equity trade by ATONCE. In this case the funds management opens an account with IB and has the same control over the account as every other client has.

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