Trend following systems

White Paper

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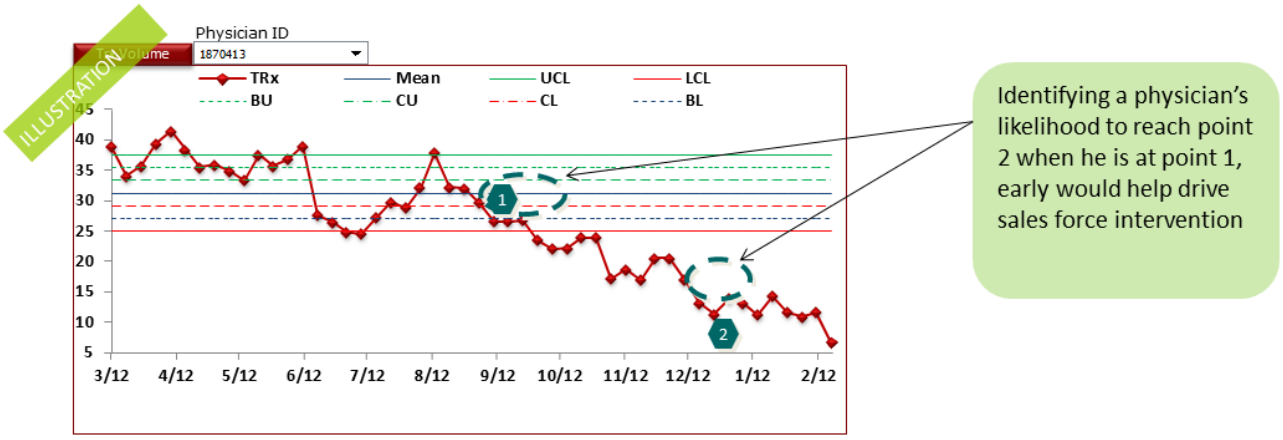
Trend following systems have been among some of the earliest investment strategies and are still counted as among the most prevalent in financial markets. In fact by recent estimates, of the roughly 2 Trillion dollars allocated to hedge fund strategies globally roughly 300 Billion is invested with trend following managers – second only to equity centric strategies. So what really is a trend and why does it attract so much capital? Wikipedia defines trend following as a strategy that tries to take advantage of long, medium and short term moves that seem to play out across various markets. The most common approach is a moving average based system that looks to take long or short positions in markets as and when prices exceed or fall below the average price level of that market over a predetermined look back period. So for example a trend following trading system could buy gold (i.e. go long the gold market) when gold prices on a particular day exceed the average price of gold over say the last 30 trading days (look back period).

Now you may ask what really creates a trend and how does an investor make money with such a strategy? What's interesting is that financial pundits have long tried to prove that trends exist in the market and the causal factors they can be attributed to. However statistical tests have proved quite inconclusive. While usual factors such as supply demand dynamics, risk aversion etc. have been quoted to explain why trends happen it's been quite hard to pin point exact factors that cause trends across various markets and thereby show definitive causality. Instead, investors bet that trends happen from time to time across markets and the key is to get on it as it happens and make an exit before it breaks. Consequently the focus in such strategies has been on spreading bets across various markets and look back periods and having excellent risk management systems that allow the portfolio manager to exit markets when a breakdown in trend in confirmed based on some pre-defined metric. Hence it's little surprise to see a manager of such strategy have thousands of positions in its portfolio as it's not clear when and where trends will happen. Clearly this is a strategy that relies on breadth (large number of bets) versus depth (level of research; i.e. what can the trend be attributed to). Finally the simplicity of the strategy with excellent risk management controls has given investors a lot of comfort that explains the large amounts of capital in this space.

Now what's interesting is that trend following can find applicability outside the world of financial markets. At Mu Sigma we have worked with large pharmaceutical clients to create real time physician monitoring systems that can alert sales representatives when their physicians are either on the verge of switching to competitor drugs or in identification of physicians that have higher potential for future sales than indicated by their current prescription volumes.

So how exactly does an analytics firm use decision sciences to apply financial market concepts to the pharmaceutical space? The process starts with tracking physician trends using metrics such as prescription volumes over certain look back periods into statistical process control and pattern recognition techniques. This is similar to using price data as a key input in financial trend following systems. The next step which should give a lot of comfort is that unlike in financial trend following systems where causal factors cannot be determined to explain trends; in the case of our pharmaceutical clients we use analytics to identify physician characteristics that can help us understand their tendency to prescribe a particular drug. These characteristics include factors such as physician

location, insurer coverage, drug preference (generic vs. branded). We also study past sales activity data to understand market factors and decision influencers that can help us understand why a physician prescribes a drug and what can lead them to switch to competitor products.



The next question that one should ask is how accurate are these trend following systems? Before we answer that it's worth getting back to the financial markets. It's widely accepted that the even the best trend following systems struggle to get close to a 50% hit rate (defined as number of right bets relative to total number of bets placed). The reason these systems still make money for their investors is in their ability to ride trends well when they identify one and cut losses quickly when they get on the wrong trend. In short, asymmetry of gains versus losses. It's also worth noting that the odds in favor of Las Vegas casinos are just 51% (slightly better than a coin flip). Compared to these our real time physician monitoring systems were able to accurately flag physicians at risk of switching to a competitor product or with high future potential with 65% to 70% accuracy. In fact a decent amount of effort was spent to optimize our systems to minimize false alerts. One of the primary reasons we were able to achieve much better hit rates were because with analytical rigor we were able to understand the causal factors that explain physician behavior. Once the "cause" could be pin pointed with a fair degree of accuracy the resulting "effect" was not hard to predict.

The applicability of trend following systems across verticals is not just limited to finance and the pharma space as highlighted above. Similar systems are being used to identify and more importantly preempt fraudulent claims across insurers and credit card firms. Similarly a client that is a technology provider is using trend following systems to identify at risk behavior across its small and medium business accounts. Finally we have increasingly helped retailers in forecasting of store level sales which is helping them in in making smarter inventory management decisions.

In summary its worth reiterating the role decision sciences can play in making fact based business decisions as well as the portability of similar analytical methods across domains. At Mu Sigma our work across all industry verticals has allowed us to create an ecosystem where our clients are increasingly able to leverage this portability and learn new techniques to solve their business problems.