

## **Predictability and trading strategies in financial markets**

**(Abbreviated Title: Predictability and trading strategies)**

### *NES Research Project Proposal for 2008-2009*

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The aim of this project is to explore some issues related to predictability in financial markets, particularly related to direction-of-change prediction and profitable trading strategies.

Students with interests in time series econometrics and empirical finance are invited to participate in this project. The research in spirit is empirical modeling using real financial data, but necessarily with some twists in econometric methodology or theory. The target is producing high-quality research publishable in international journals.

Most of proposed research is concentrated on directional predictions (i.e., those which predict the direction of, say, stock prices, or other binary outcomes), as it is widely recognized that financial returns in efficient markets are not mean predictable. The interest to directional forecasting has increased in recent years (e.g., Hong and Chung, 2003; Anatolyev and Gospodinov 2007; Bekiros and Georgoutsos, 2008), both in applications to macro markets (Kauppi and Saikkonen, 2005; Startz 2008) and financial markets (Christoffersen et al, 2007; Anatolyev, 2007). Good directional predictions are useful because they allow forming (hopefully profitable) trading strategies.

It is planned to combine ideas from exploration of the following three orthogonal directions:

- (1) The first direction concerns properties of directions of financial returns (ups/downs), modeling the realized direction, and forming effective directional forecasts.
  - (a) One issue of interest here is verifying which of data properties are important for directional predictability as detected by trading strategies and statistical tests for predictability. It is established that the direction of financial returns may be predictable merely due to volatility clustering (Christoffersen and Diebold, 2006). Preliminary

simulations performed by the project leader indicate that this directional predictability is quite weak even when strong ARCH effects are present (Anatolyev, 2008). It is interesting to find out which features of series will drive the directional predictability up.

(b) Another issue is formulating successful models for directional indicators (i.e. binary outcomes). Classical binary response analysis is easily extended to the stationary time series context by introducing dynamic effects (Kauppi and Saikkonen, 2005; Startz, 2008). Such models are widely used to primarily predict economy's expansions and recessions, but it is straightforward to carry these ideas over to modeling the directions-of-change in financial markets.

(2) The second direction is exploring predictability in intra-daily financial data. It is a common knowledge that medium-frequency financial returns (frequencies from daily to monthly) are barely mean predictable. It is interesting to establish if the intra-daily returns are predictable, and if yes, find the sources of this predictability. In particular, effective directional predictions may help to set up profitable real-time trading strategies; see Delia (2007).

(3) The third direction is application of directional predictability in a multivariate context, as it is often interesting to analyze several markets simultaneously.

(a) One issue of interest is formulating a multivariate version of a dynamic binary response model. A variation based on dependence ratios is proposed in Anatolyev (2007).

(b) Another interesting possibility is to devise a trading strategy that would allow investment/disinvestment decisions in the face of several investment opportunities represented by multiple assets. For such trading strategies, it is clearly insufficient to predict directions of returns of assets under consideration; in addition, predictions are needed on which of those will be higher. An additional issue is how to take account of transaction costs. To our knowledge, the literature on this is void.

In effect, this project is continuation of projects on predictability run over last several years by the same project leader. Several articles authored by the leader and students in previous years' projects have been already published; two examples are Anatolyev and Gerko (2005) and Anatolyev and Kitov (2007). Of course, a student may approach the project leader with own ideas different from those outlined in this proposal.

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