M2 Research Internship: The Physics of Trend and Value

November 23, 2019

Laboratory name: CFM Chair of Econophysics & Complex Systems, LadHyX
CNRS identification code: UMR CNRS 7646
Internship location: Ecole polytechnique, Palaiseau, and Capital Fund Management, Paris.
Thesis possibility after internship: YES
Funding: YES

Supervision: Michael Benzaquen (Ecole polytechnique)
Stefano Ciliberti & Jean-Philippe Bouchaud (Capital Fund Management)

Email: michael.benzaquen@polytechnique.edu

Subject

Financial markets exhibit trend and mean-reverting dynamics across different geographies and asset classes (see e.g. [1] and [2]). Such "universal" anomalies are often explained in terms agent-based models, where their co-occurrence is the result of a non-trivial (impact driven) interaction between technical and fundamental trading strategies. In a recent extension of the pioneering work of Chiarella [3], the parameters of the model were calibrated in order to describe the dynamics of global, macro-markets [4]. The objective of this internship is to apply a similar approach to the single-name equity markets in order to better understand the Value-Momentum dynamics and correlation. Moreover, we expect this generalised model to explain the correlation between directional anomalies (such as trend following) and their relative-value counterpart (such as equity momentum). Finally, we shall seek to understand why short term trends (few days) have become less significant in the past few years, by agent-based modelling how the increased liquidity at intraday time scales could prevent such trends from being born or persisting at the few days scale.
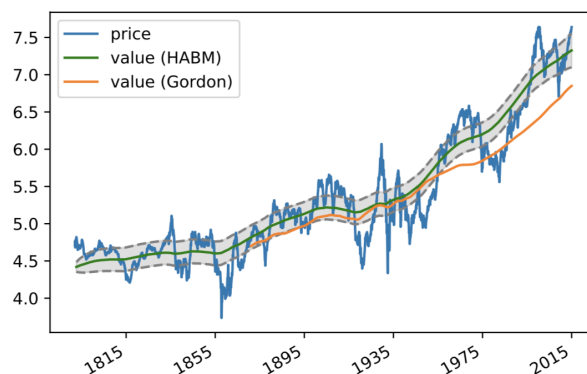

Figure 1: Log-level of the US stock index, together with estimates of the fundamental value, from [4].

The internship will be held within the CFM Chair of Econophysics and Complex Systems at Ecole polytechnique (visit `www.econophysix.com`) in close connection with Stefano Ciliberti and Jean-Philippe Bouchaud (Capital Fund Management). The internship will comprise theoretical and numerical components. A good background in statistical physics, data analysis and Python is advised.

[1] Value and Momentum Everywhere, CS Asness, TJ Moskowitz, LH Pedersen, The Journal of Finance 68 (3), 929-985 (2013).
[2] Black was right: Price is within a factor 2 of Value, JP Bouchaud, S Ciliberti, Y Lemperiere, A Majewski, P Seager, K Sin Ronia, Risk Magazine (2018), available at https://ssrn.com/abstract=3070850
[3] The dynamics of speculative behavior, C Chiarella, Annals of ops research 37(1), 101-123 (1992).
[4] Co-existence of Trend and Value in Financial Markets: Estimating an Extended Chiarella Model, A Majewski, S Ciliberti, JP Bouchaud (2019), to appear in JEDC.