Essays, interviews and debates

Investigating High-Frequency Trading.
Theoretical, social and anthropological perspectives

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In the last weeks the arrest of the British trader Navinder Singh Sarao has occupied a lot of space in the news media. The trader is accused of market manipulation using automated computer programs to issue fake orders and thereby manipulate the market to move in his favour. The charges against him relates to what is called *spoofing*. That is when a trader issues orders at millisecond intervals, fast enough to cancel them before they actually get executed but long enough to affect other traders' expectations to its future price. The debate and charges against this trader amount to a much broader issue – the good and bad of what is called high-frequency trading (HFT). Recently, we have seen a transition from electronic "hand" trading to automated decision-making and high-speed order execution. Execution of trades now takes place in 740 nanoseconds and is in fact increasing towards the speed of light (Zervoudakis & al., 2013). This development was fostered by technological innovations on the one hand, and new regulations fragmenting market liquidity on the other hand: namely Regulation NMS in 2005 in the US, and the Markets in Financial Instruments Directive in 2007 in the EU. Since then, HFT has been the focus of numerous controversies culminating in a best-selling book by Michael Lewis (2014a & 2014b) denunciating a situation where rigged markets are now unable to perform their function in the economy. He claims that high-frequency traders are able to trade in front of and thereby exploit ordinary investors

HFT has also been seen as one of the contributing factors to the Flash Crash of May 6th 2010 whereby over one trillion dollars evaporated within a few minutes. The Dow Jones Industrial Average plummeted by over 600 points (approximately 5% of its total value) in a matter of minutes. The regulators have concluded that it was a mutual fund's attempt to sell a very large portion of E-mini S&P 500 contracts that caused the big price swing. The presence of high-speed algorithms in that specific market made the downward price move escalate. HFT programs attempt to sell at lower and lower prices to minimize short-term losses triggered a negative feedback loop that drove the price of the E-mini down 3% which in turn spilled over to the equities markets. The negative trends continued until computer systems paused trading temporarily effecting an almost immediate rebound.

To some the flash crash illustrates an unwanted domino effect where algorithms trigger other algorithms to respond to market moves in specific ways. HFT is considered to contribute to similar "mini" crashes continuously destabilizing the financial markets (Golub, Keane & Poon, 2012). In this case crowd psychology is articulated as an explanatory cause of the unintended consequences, negative externalities, feedback loops, technological dangers and regulatory challenges involved with the increased use of HFT strategies. The assumption is that due to the increased volume unwanted domino effects and contagion are likely to escalate (afforded by technical problems with an algorithm, a faulty model or market manipulation as seen in the case against Navinder Singh Sarao).

Others argue that the use of anonymous machine-based processes makes markets more efficient and thereby eliminates the crowd-like emotional and affective qualities that used to characterize the pit and screen-based trading (see for instance Knorr-Cetina & Bruegger, 2002; Zaloom, 2006). Research within financial economics have shown that HFT has beneficial effects on markets in terms of positive contribution to liquidity as measured by bid-ask spread[1] and reduced transaction costs both for retail and institutional investors (Jones, 2013).

The concern on this side of the debate is that the critique of the financial markets and the claim that it might be rigged is what poses the biggest threat to the stability of the financial markets as investor confidence might decrease and consequently lead to increased volatility.

These issues are currently being debated in an international workshop series, which had its first instalment on 24-25 November 2014 in Copenhagen[2]. As HFT represents a complex trading system that operates at, or beyond, the limits of human response times it seems relevant to investigate how the influence of crowd psychology on HFT trading practices might be discussed. The workshop zoomed in on exactly these questions by addressing the relation between HFT sociality, crowd psychology and dynamic collectives. It investigated the changing relation between crowd psychology on the one hand and financial activities on the other hand, when such activities are increasingly based upon automated or computer-based practices, where the involvement of human beings is reduced to a mere expression. Related questions would be: What assumptions might be written into the algorithms. In what way is the social folded into the machine? Some HFT strategies perform highly complex randomization functions coupled with econometrics to optimize the size and execution times. Other types of HFT strategies profit from identifying and anticipating such trades (known as momentum ignition and scalping). What kind of psychology is implied by these algorithmic practices? This also relates to questions of *herding, imitative fashions* and *crowding* in HFT: Does the increase in speed and volume amplify crowd effects in the market? Other questions included: What kinds of feedback loops are created inside the black-box systems and outside itself in the market as a whole?

This workshop covered such questions by bringing together different theoretical, social and anthropological perspectives in order to think about HFT algorithms as more than simply an automated rule, but also as a social space defined by crowd dynamics and other collective dynamics. One way is to explore how the procedures of swarming techniques could be understood in relation to the functioning and interaction between different classes of HFT algorithms. A related question was put forward: Can different classes of algorithms be defined as species (autonomous non-human entities) as proposed by Dragos &

Wilkins (2013), and if so, can we talk about different generations of algorithms and accordingly different HFT practices?

All of this was discussed from an empirical perspective (having observed and interviewed high-frequency traders) in order to understand how high-frequency traders and others working in the industry themselves perceive of the social and account for their own practice. Apart from the fact that HFT, as an industry, remains especially secretive as with any "black-boxed" object, HFT is a difficult area to investigate, even with a history of successful access to industry actors. In fact, access to study the sociality of HFT is not only a methodological concern but is also an analytical one. It was debated that new sociological and theoretical methods are called for in order to study the emerging relations between high-speed algorithms. The problem of trusting informants and a more general problem of how to account for the functions that the algorithms actually perform was raised. This leads us to the next theme addressed: namely, the subjectivity of the high-frequency traders that build and monitor the trading algorithms. A few papers addressed the emotional relationship between the traders and their algorithms as well as the affective attachment produced through the screen, while another attempted at thinking the relation with HFT algorithms with recourse to phenomenology.

To date, the majority of investigative texts have been produced by sociologists working in the social studies of finance tradition, and focus on dedicated aspects such as the reconfiguring effects of market automation on social structures (Beunza & Millo, 2013), the historical development of HFT (MacKenzie, 2013), the differentiated contexts giving rise to HFT practices (MacKenzie, 2014) or, in a slightly different perspective, on the embedded politics of computation borne by such object (Golumbia, 2013). There is indeed still plenty of room for complementary and alternative studies on HFT. The next workshop takes place at the University of Konstanz (22-23 June 2015), and will focus on the cultures of HFT, and their regulations. This theme addresses the relationships between trading companies, political regulators and exchanges. In a more general way, we will ask if and how different political regulations shape and affect HFT in different countries or regions in the world. In this context, regulation should not be

limited to political actions by lawmakers but also be extended to the various specifications, requirements and guidelines of trading platforms in a context where liquidity sources are fragmented.

Furthermore, discussions should include a wide variety of cases, for instance the discussion around Mifid I+II in Europe. Other questions might include the following topics: How do market actors manage to make sense of their technology, from a normative perspective? How do they react when HFT tools do not work correctly or get disrupted?

The third workshop is planned to take place at the European Business School in Paris (November 2015) and will focus on HFT subjectivities and financial narratives. In this last workshop, we will question issues relating to the language used in HFT communities and the related subjectivities.

Notes

1. The bid-ask spread refers to the difference between the price at which a financial instrument is offered and the price at which it is demanded.

2. The Crowd Dynamics in Financial Markets project website and the workshop podcasts can be accessed at the following address: http://info.cbs.dk/crowds/podcasts.

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