Market Developments: High Frequency Trading

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Introduction

Markets have changed considerably over the past decade:

- Automation
- Globalization
- Dispersion – multiple trading venues
- Internalization
- Etc.

Introduction

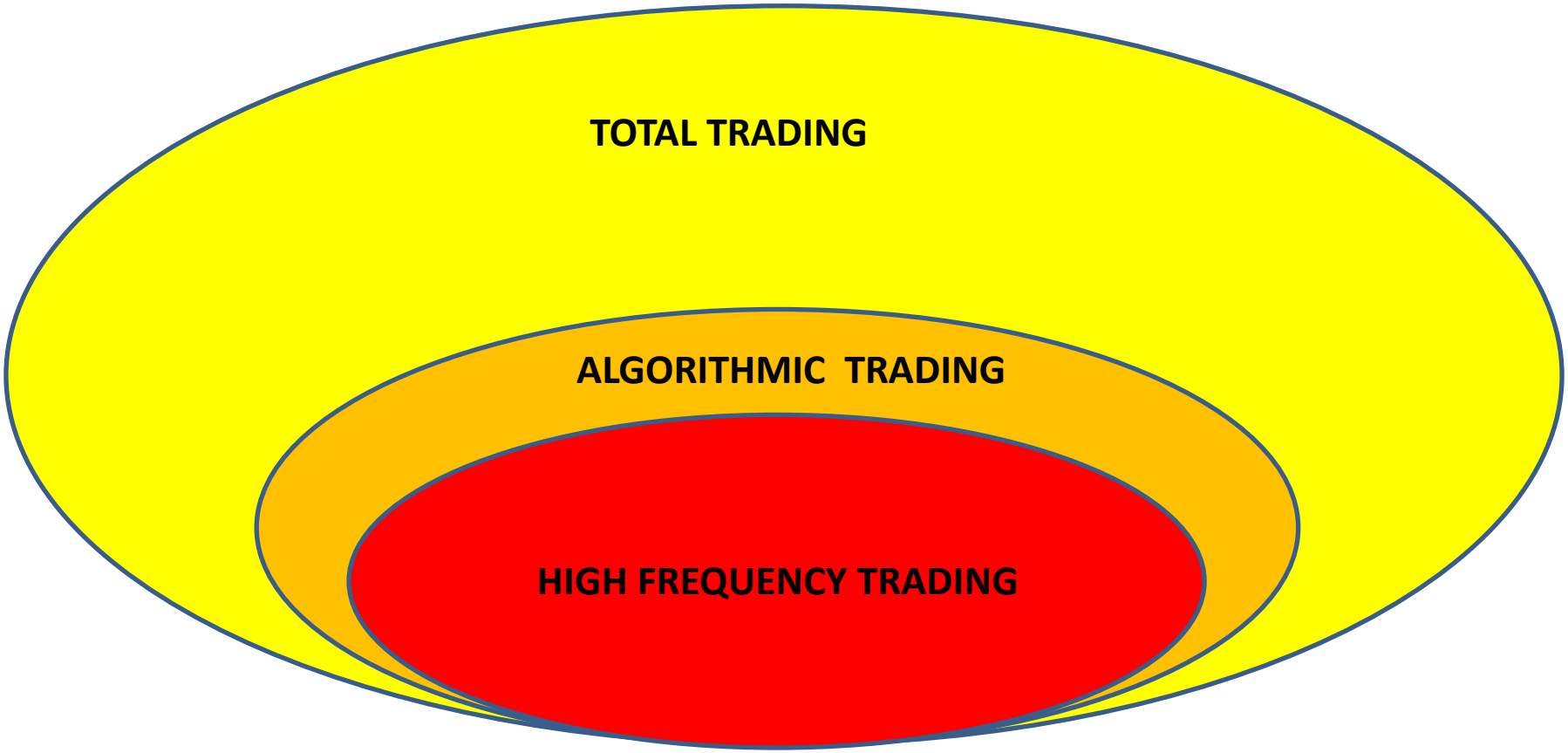
Changes have brought benefits…

- Increased efficiency
- More use of markets

… and challenges:

- Scattered trading venues and information
- High speed trading
- Increased difficulty of oversight
- Systemic risk?

High frequency trading



High frequency trading

Algorithmic trading:

- In simple words an algorithmic trading strategy is a step-by-step instruction for trading actions taken by computers (automated systems)

High frequency trading:

- High frequency trading is a subset of algorithmic trading – use of high speed/technology/co-location is part of it

High frequency trading

Impact of algorithmic trading:

1. Automated trading – less likelihood of emotional attachment to trading
2. Perhaps more efficient
3. Well thought out positions
4. Odd/smaller trade size

Is this really different from traditional strategies but now using computers?

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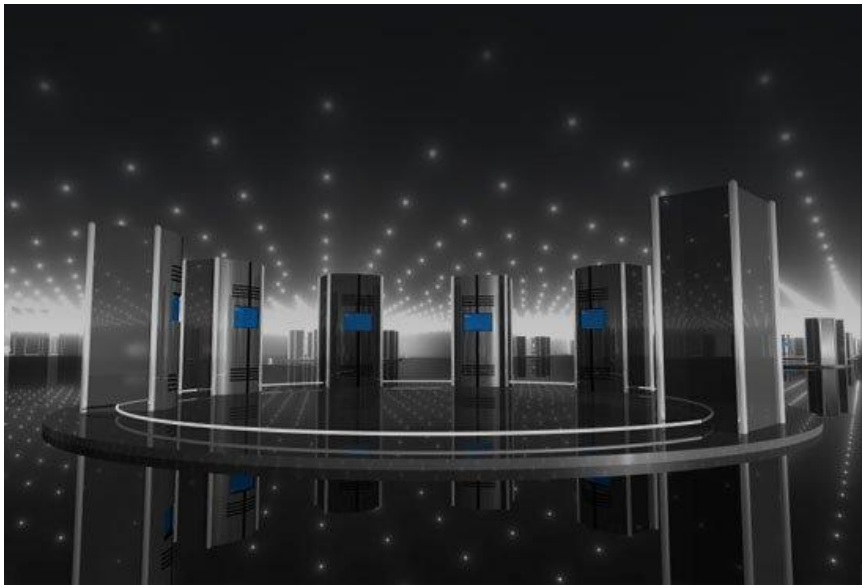
Challenges of algorithmic trading:

1. If similar strategies employed than large directional movements
2. Increase in volatility
3. Human error – algo design
4. There is no time for human intervention
5. Upper hand (unfair) advantage employed by institutions – but this has always been the case?

High frequency trading



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HFT is a subset of algorithmic trading:

- Using speed and reduced latency
- Proprietary trading
- Limited capital commitment
- Wide range of strategies – combining "quasi-market making", arbitrage, directional, etc.

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Impact of HFT on the markets:

- Quicker price discovery
- Tighter spread
  - Narrower effective spreads
  - Other dimensions (depth, resiliency, etc.) not fully assessed
- Increase in liquidity
- In normal times – reduces market volatility
- Promotes competition among market centers and liquidity providers

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Consider the following situation:

- DJIA falls sharply in 20 mins, with some stocks plummeting >9% in under 12 mins. The SEC launched an investigation but its cause remains unknown.
- During the crash:
  - Liquidity disappeared and sell orders flooded the market
  - Spreads widened
  - Orderly price discovery ceased
  - Confidence evaporated

WHEN DID THIS TAKE PLACE?

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Concerns with HFT:

1. May 6th event (or other) – Could it happen again?
2. During times of market stress
   - Increased volatility
   - Unstable liquidity
3. Can quickly add momentum to prices
4. Leverage/risk management
5. Manipulation (transitory volatility, spoofing)
6. Unfair advantages in information and latency
7. Technological “arms race”

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Can HFT add to systemic risk?

- **Transmitting shocks** through markets and other market segments
  - With increased global market interconnectedness
  - Fuel contagion effects
- Effect on price formation, cost of capital and confidence in market as a whole
- Increased speed provides limited opportunities for regulators to intervene during high volatility/uncertainty
  - Too much data to track (regulator don't have the technology)
- Size
  - Broad use of HFT – equities, commodities, FX
  - 70% of US trade in HFT, around 30% in Europe, 10-20% in ROW

High frequency trading

New IOSCO recommendations for **trading venue operators and trading participants**

- ***Recommendation 1****: Regulators should require that trading venue operators provide* ***fair, transparent and non-discriminatory access to their markets*** *and to associated products and services*;

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New IOSCO recommendations for **trading venue operators and trading participants**

- ***Recommendation 2****: Regulators should seek to ensure that trading venues have in place* ***suitable trading control mechanisms*** *(such as trading halts, volatility interruptions, limit-up-limit-down controls, etc.) to deal with volatile market conditions. Trading systems and algorithms should be robust and flexible such that they are capable of dealing with, and adjusting to, evolving market conditions. In the case of trading systems, this should include the ability to adjust to changes (including sudden increases) in message traffic;*

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New IOSCO recommendations for **trading venue operators and trading participants**

- ***Recommendation 3****: All order flow of trading participants, irrespective of whether they are direct venue members or otherwise, must be subject to* ***appropriate controls, including automated pre-trade controls****. These controls should be subject to the regulatory requirements of a suitable market authority or authorities. In addition, regulators should identify any risks arising from currently unregulated direct members/participants of trading venues and, where any are identified, take concrete steps to address them;*

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New IOSCO recommendations for **Regulators:**

- ***Recommendation 4****: Regulators should* ***continue to assess the impact on market integrity and efficiency of technological developments and market structure changes, including algorithmic and high frequency trading****. Based on this, regulators should seek to ensure that suitable measures are taken to mitigate any related risks to market integrity and efficiency, including any risks to price formation or to the resiliency and stability of markets, to which such developments give rise.*

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New IOSCO recommendations for **Regulators:**

- ***Recommendation 5****: Market authorities should monitor for* ***novel forms or variations of market abuse*** *that may arise as a result of technological developments and take action as necessary. They should also review their arrangements (including cross-border information sharing arrangements) and capabilities for the continuous monitoring of trading (including transactions, orders entered or orders cancelled) to help ensure that they remain effective.*

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Further work:

- Study on **additional tools** to deal with the challenges arising from market surveillance, some of which may include:
  - additional audit trail or surveillance data consisting of all orders and trades by market participants in a given instrument;
  - a single reporting point for all orders and for all transactions, by jurisdiction or geographical zone and across asset classes; and
  - unique legal entity identifiers.

- In addition, IOSCO will build on its work on **supervisory cooperation** to consider how best to enhance operational contacts and cooperation between regulators in order to more flexibly share information and views for day-to-day market supervision.

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Further work**:**

An analysis of the new market structure and its impact on market efficiency/integrity

IOSCO will analyse the evolving markets' structure, in order to assess what specific issues such structural developments raise with regard to market efficiency and integrity; and consider whether and what recommendations may be needed to address any risks.

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Conclusions:

- Speed combined with automation is new
- Stretches markets
- Some old wine in new bottles
- Can be of systemic risk?
- Challenges to regulators

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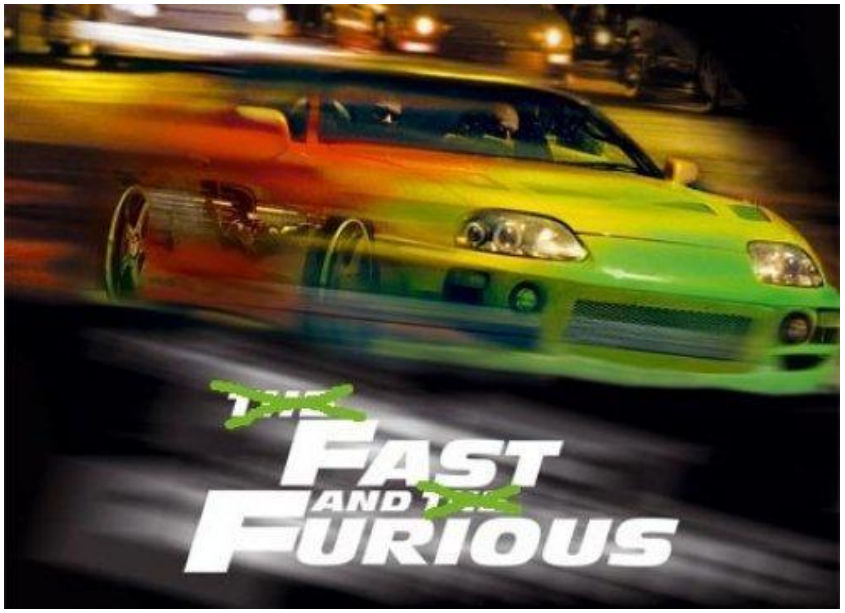
The High Frequency Trader versus the Regulator



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Some recent studies:

- IOSCO Market Efficiency and Integrity paper: *Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency*.
- ESMA Public Consultation on HFT
- Kirilenko *et al.* The Flash Crash: The Impact of High Frequency Trading on an Electronic Market;
- Staff reports CFTC/SEC
- Report of individual regulators (the Netherlands AFM)

Dark liquidity

Dark liquidity (IOSCO report of 27 October 2010):

Dark liquidity and the use of dark pools can have:

- Impact on the price discovery process where there is a substantial number of dark orders and/or orders submitted into dark pools which may or may not be published;
- Impact of potential fragmentation on information and liquidity searches; and
- Impact on market integrity due to possible differences in access to markets and information.

Dark liquidity

IOSCO report of 27 October 2010 on dark liquidity launched new principles that are designed to:

- minimise the adverse impact of the increased use of dark pools and dark orders in transparent markets on the price discovery process;
- mitigate the effect of any potential fragmentation of information and liquidity;
- help to ensure that regulators have access to adequate information to monitor the use of dark pools and dark orders;
- help to ensure that investors have sufficient information so that they are able to understand the manner in which orders will be handled and executed; and
- increase the monitoring of dark orders and dark pools in order to facilitate an appropriate regulatory response.

Dark liquidity

Principles that are designed to:

Transparency to Market Participants and Issuers

Principle 1*: The price and volume of firm bids and offers should generally be transparent to the public. However, where regulators consider permitting different market structures or order types that do not provide pre-trade transparency, they should consider the impact of doing so on price discovery, fragmentation, fairness and overall market quality.*

Dark liquidity

Principle 2*: Information regarding trades, including those executed in dark pools or as a result of dark orders entered in transparent markets, should be transparent to the public. With respect to the specific information that should be made transparent, regulators should consider both the positive and negative impact of identifying a dark venue and/or the fact that the trade resulted from a dark order.*

Dark liquidity

Priority of Transparent Orders

Principle 3*: In those jurisdictions where dark trading is generally permitted, regulators should take steps to support the use of transparent orders rather than dark orders executed on transparent markets or orders submitted into dark pools. Transparent orders should have priority over dark orders at the same price within a trading venue.*

Dark liquidity

Reporting to Regulators

Principle 4*: Regulators should have a reporting regime and/or means of accessing information regarding orders and trade information in venues that offer trading in dark pools or dark orders.*

Dark liquidity

Information Available to Market Participants about Dark Pools and Dark Orders

Principle 5*: Dark pools and transparent markets that offer dark orders should provide market participants with sufficient information so that they are able to understand the manner in which their orders are handled and executed.*

Dark liquidity

Regulation of the Development of Dark Pools and Dark Orders

Principle 6*: Regulators should periodically monitor the development of dark pools and dark orders in their jurisdictions to seek to ensure that such developments do not adversely affect the efficiency of the price formation process on displayed markets, and take appropriate action as needed.*