International Workshop on Algorithmic and High Frequency Trading

Charles-Albert LEHALLE – November 2013
Raising questions on market microstructure?

2010-Jan - SEC Issues Concept Release Seeking Comment on Structure of Equity Markets
2010-May – The Flash Crash
2010-November – LSE glitch
2011-June – Chi-X Europe glitch
2011-July – Four glitches in a month for Euronext
2011-November – Australian Stock Exchange glitch
2011-December – Chi-X Australia glitch
2012-March – BATS IPO glitch
2012-June – Euronext glitch
2012-Aug – Knightmare on wall street
2013-April – The Hash Crash
2013-Aug – Goldman Sachs marker-making outage
2013-Aug – China: the Everbright “fat finger”
2013-Sept – NASDAQ SIP glitch

...
The dynamics of the Price Formation (or Price Discovery) Process is twofold:

**A forward dynamics**
The balance between offer and demand at $t$ move prices at $t+$

**A backward dynamics**
The comparison between current prices and future expectations triggers new offers and demands

It simultaneously creates (endogenous) information and conveys (exogenous) information. Having a sound PFP is crucial.
Recent changes

Regulatory changes (MiFID + Reg NMS) and post-crisis liquidity attrition reshaped the market design, now we have:

- a distributed network of trading pools,
- connected together by heterogeneous protocols (and different regulators).
- Plus “liquidity bridges” operated by a new kind of middlemen turning rapidly a small inventory between pools.
The story of European fragmentation in one slide

The Bid-Ask spread is the price difference between the best offer and the best demand. It is an important component of the trading costs (it is part the price to pay for immediacy, the other part is the “market impact”).

- From the blue (2008) to the red curve (2013): the BA-spread decreased,
- with more emphasis at the end of the day;
- it is significant of HFT practices (reducing their overnight inventory).

=> less cost, more traceability, but more operational risk?

For the full story in 280 pages, see “Market Microstructure in Practice”...
Understanding recent issues

3 kinds of issues

- **Operational Risk**
- **Misleading information**
- **Emergence; collective runaway**

**Technology**

- Hash Crash
- Flash Crash
- NASDAQ-SIP
- BATS IPO
- European outages

**Emergence**

- Goldman Sachs
- Chinese Everbright

**Misleading information**

- Operational risk
What can be done?

- Standards and norms
  *End-to-end standards for electronic markets, a norm for the development of matching engines, a certification for the dev. of automated trading systems...*

- Operational Risk

- Education
  *Improve investors’ knowledge on market microstructure, simplification of market design (tick sizes, liquidity segments, circuit breakers, etc)...

- Misleading information

- Multiple means
  *Improvement of the market maker status, circuit breakers, end-to-end testing sessions...*

- Emergence; collective runaway