Blended Automation and beyond: algorithmic pricing and its implications for the sociology of markets

Daniel Beunza and Yuval Millo LSE and University of Leicester

What did we learn from the NYSE story?

- NYSE was a the world's dominant floor-based exchange
- Starting in 2004 it moved trade facilitation to algorithms, but not completely....
- The floor still remained, but operated fully only for two periods of 30 min each day
- The floor is 'switched on' when price volatility reaches a certain threshold.
- Blended automation duplication and exceptionality

Why did the NYSE keep the floor?

- The floor is a prop and helps in the IPO business
- The specialists had power and Blended Automation maintains it in a new setting
- · The floor 'intervenes' when algos fail



Blended Automation as Specialists' power?

- Demutualization specialists' seats were bought
- NYSE acquired an ECN (Archipelago)
- NYSE merged with Euronext
 - Floor trading fell to 10% of overall revenue
- Then, Regulation NMS pushed specialists to 1second reaction time.

Crude Signalling (1)



Algorithms and crude signalling

- When Anne Hathaway's name was mentioned frequently in Twitter, Berkshire Hathaway's stock rose in prices.
- Possible: trading algorithms bought the BH stock.
- The algorithms' 'perceptions' were crude they had to be fast!

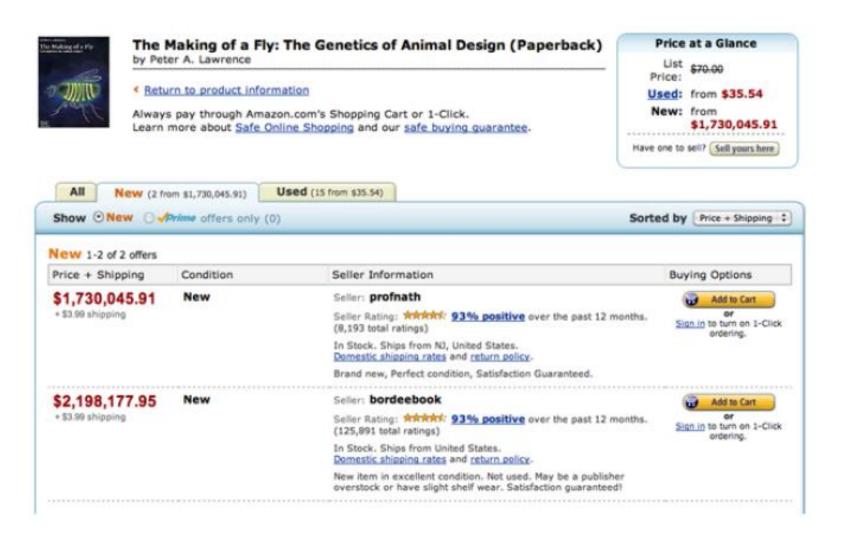
The Flash Crash

 In the afternoon of 6 May, 2010, the Dow Jones Industrial Average (DJIA) began a precipitous decline of nearly 700 points in a few minutes. Twenty minutes later, the market rebounded, regaining most of the 700 point drop on the DJIA.

The Flash Crash and Blended Automation

- A single trade, a large sell order worth about \$4 billion through an automated execution algorithm triggered other algos to react.
- During the Flash Crash, HFT traders "traded proportionally more as volume increased, and overall were net sellers in the rapidly declining broad market along with most other participants."
- In contrast, "The partially manual LRPs allowed the Big Board to apply some measure of old-fashioned reasonability tests to price formation."
- NYSE maintains a very high (est. 70%-90%) share of transactions in stocks during manual trading facilitation periods.

Crude Signalling (2): Algorithmic price wars on Amazon



Crude Signalling (2)

theguardian

Amazon sellers face financial uncertainty after 1p automated pricing glitch

Businesses whose products were discounted to 1p hear no response from Amazon

Rupert Neate

Monday 15 December 2014 19.51 GMT

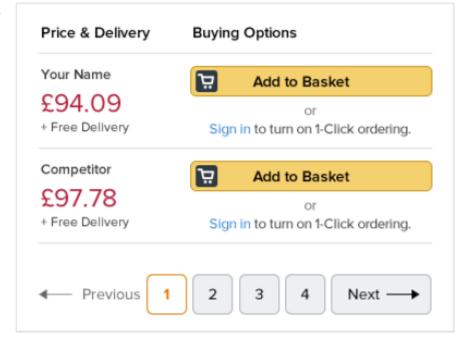
Amazon as a trading facilitation platform

Sellers' algorithms compete on placement
Amazon's algorithmic trading platform

Beat your Amazon competitors!

Everything you need to be smarter and faster than your Amazon

competition.





Amazon itself competes with its traders

Amazon Changes Their Prices 2.5 Million Times a Day

December 16, 2013

From Amazon job ads

 software developer - "The Pricing Analytics team builds the infrastructure to run large scale pricing experiments and simulations on millions of products ranging from books to electronics to shoes.

(http://amzn.to/OV6tEH)

 A senior manager of retail pricing - "... Large scale distributed systems that are the brains behind every price on every item sold by Amazon worldwide... "

(http://linkd.in/QbfMjn)

Differentiation strategy

- But, there are areas where Amazon determines prices manually. For example, Kindle and e-books.
 - These are the areas where Amazon seeks market domination (Amazon PR announcement, November, 2013).

Theoretical discussion: intra-market

- Blended Automation provides sensemaking when the algo systems break down
 - Related to the high-reliability literature (Perrow 1984, Weick and Roberts 1993, Roberts 1990)
- Aspers distinguishes between Fixed-role and Switch-role markets (2007, 2011) – we claim that the picture is dynamic: trade facilitators try to maintain the fixity of roles.

Theoretical discussion (2)

- Blended automation may also provide a macro political-competitive power:
- NYSE and Amazon facilitate trading between potential traders
- Trading facilitators try to be effective in maintaining a differentiation ecology, where they differ from traders.