Throttling hyperactive robots - Order to Trade Ratios at the Oslo Stock Exchange

Kjell Jørgensen, Johannes Skjeltorp and Bernt Arne Ødegaard

Journal of Financial Markets, 2018

Abstract

We investigate the effects of introducing a fee on excessive order-to-trade ratios (OTRs) on market quality at the Oslo Stock Exchange (OSE). We find that traders reacted to the regulation as measured OTRs fell. However, market quality, measured with depth, spreads, and realized volatility, remain largely unaffected. This result differs sharply from the experience in other markets, such as Italy and Canada, where similar regulatory changes have been accompanied by a worsening of liquidity. The unchanged market quality at the OSE is likely due to the different design of the regulation, which is tailored to encourage liquidity supply.

Modern Equity Markets

The World of Equity Trading is automated.
Trading fragmented across market places.

- "Lit markets:" limit order markets competing for order flow (pre-trade transparency).
- "Dark Pools:" Trading without a limit order book (post-trade transparency).

Market participants very focused on speed.
Concerns:
Press: Unfair advantage to "robots"
Regulators: Fragile system (Flash Crash)

Economic Inefficiency: Excessive Communications

High Frequency Trading in a limit order market: *entering* new orders, *modifying* existing orders and *cancelling* orders.
Imposes costs:

- The Exchange needs large IT investments.
- Other traders try to catch "fleeting orders"

Solution to externality:
Tax traders with "excessive" communications.

This paper

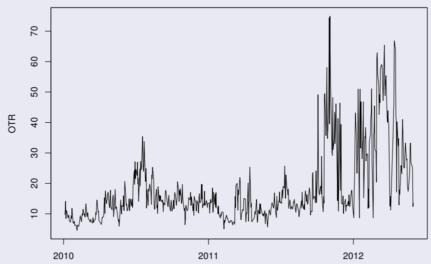
Investigate the introduction of such a tax on the Oslo Stock Exchange

- Does it achieve its purpose (lowering excessive communications)?
- Does it have any adverse effects on market quality?

The Regulation

Traders with "*excessive*" messages relative to transactions should be paying for the costs they impose on others.
How to measure *excessive*?
The OSE implementation: Calculate a ratio of messages to transactions. Set some (arbitrary) limit. Traders with ratios above limit pay for messages above limit.
Number chosen: Fee start running when the ratio exceeds *70*.

Extent of problem



OTR of Statoil

What to expect?

- Traders at the OSE: Less messages? larger orders?
- Possibility: Traders at OSE may migrate to other market places to avoid the tax.

What to look for?

- Are traders adjusting?
- Is trading quality at the OSE worsening?

Empirical strategy

Compare Empirical Market Quantities

- *After:* Sep-Nov '12
- *Before:*
  - Previous Fall: Sep-Nov '11 (comparable seasonality)
  - Previous Spring: Jan – May 24 '12 (closer in time)

Do Market Participants at the OSE react?

	Averages		
	Fall '11	Spring '12	Fall '12
Order to Trade Ratio	*24.4*	17.3	16.7
Trade size (thousands NOK)	**26**	30	31
Turnover(%)	**0.19**	**0.22**	0.16

(Numbers in bold are significantly different from Fall '12)

Traders

- reduce messages
- increase order size

What happens to market quality at OSE?

	Averages		
	Fall '11	Spring '12	Fall '12
Depth(thousands NOK)	**200**	**267**	291
Relative Spread(%)	**3.43**	2.84	2.82
Effective Spread(%)	**0.88**	**0.66**	0.59
Realized Spread(%)	**0.30**	**0.23**	0.19
Realized volatility(%)	**0.81**	**0.60**	0.51
Roll(%)	**0.54**	**0.42**	0.36

(Numbers in bold are significantly different from Fall '12)

Common measures of market quality
→ No reduction in trading quality.

What about trading moving elsewhere?

A possible reaction from traders to the fee in Oslo: Trade elsewhere.
Investigating *Fractions traded* on different markets (to abstract from level changes):

	Fall '11	Spring '12	Fall '12
Oslo	70.3	68.1	69.2
All lit markets	79.6	79.1	78.9
OTC/Dark markets	17.3	19.5	15.7

No loss of market share in Oslo
OTC trading even falling.

Trading quality at OSE vs main competitor

To look directly at casaulity (Diff in diff):
Trading at the OSE limit order market vs main competitor for each stock (trading in Stockholm, BATS, etc).
→ OSE trading quality actually *improving* relative to its main competitor.

Conclusion

Investigated the introduction of a fee for high "Order to Trade" participants at the Oslo Stock Exchange.
→ *Nothing much happens* in terms of trading quality in at the OSE.
Very different from introduction of similar fees in Italy and Canada, where trading quality deteriorated.
Due to better design of regulation: The OSE scheme designed to reward "market making" (supplying liquidity) by e.g. not taxing limit orders that "lives" in the limit order book more than one second.