

**OSC-IIROC Conference – November 21, 2013**

**Presentation Notes**

**Market Quality in a Rapidly Changing Environment**



This presentation provides an update on IIROC’s ongoing work in analytics which we hope will provide some insight into a number of debates currently taking place in the Canadian equity markets.

## New Developments in Analytics



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As part of IIROC's current Strategic Plan, we have committed to the use of data, research and organizational knowledge to deliver effective and expert regulation. This commitment recognizes the importance of IIROC as a regulator keeping pace with the rapidly changing environment that is the Canadian equity markets. To that end, we have been building our capacity to do our own research and enable others with their research, with the aspirational goal of developing a "Centre of Excellence" at IIROC.

There are three critical components necessary to achieve this goal:

The first component is technology. On April 1, 2013 we launched a new data repository called the Equity Data Warehouse or EDW which allows us to retrieve large datasets for analysis quickly, enhancing our ability to do proactive and reactive analysis in a timely and efficient manner. This is only the first step to building an analytics tool kit.

The second component is people / expertise. We are pleased to announce that Baiju Devani has joined the IIROC Analytics team as Director. Baiju has a strong background in computer engineering, research and business, and brings extensive experience including developing an analytics platform from the ground up and utilizing predictive analytics techniques (such as machine learning). We intend to further build our team through the addition of quant expertise and the leveraging of in-house expertise.

The final component is partnerships. We have been working diligently to establish a framework to enable collaboration with academics for the third phase of our HFT Study. This work will lay the foundation for what we hope will be ongoing collaborations with academics and other stakeholders.

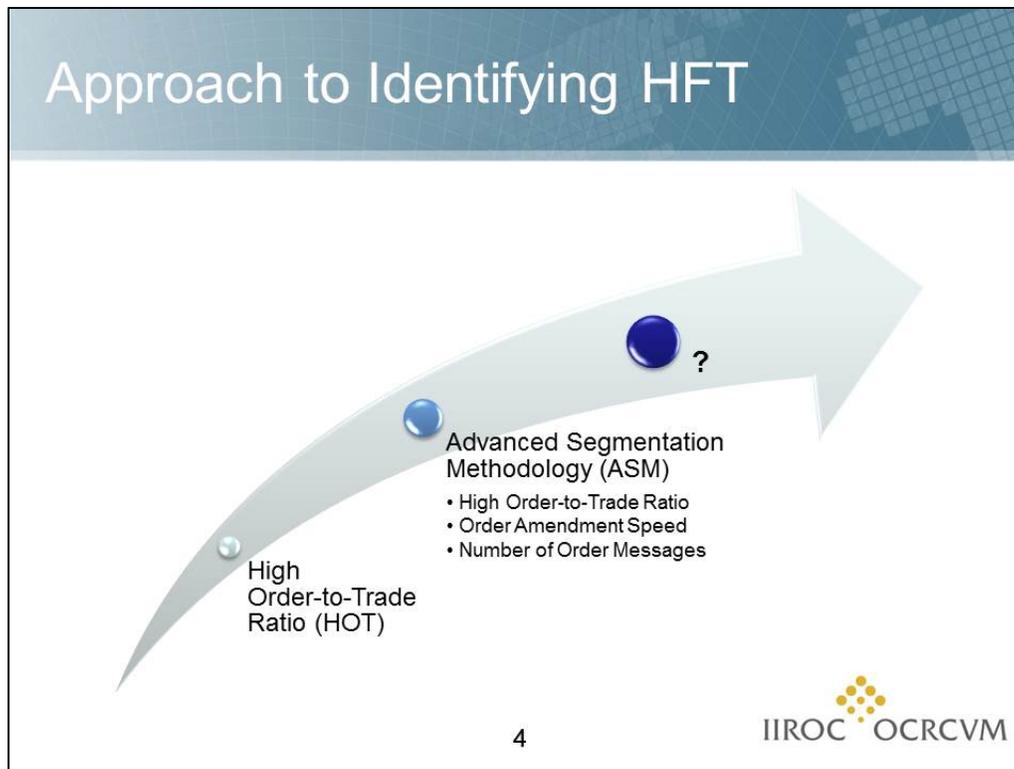
Here are some preliminary results of our studies of high frequency trading (HFT) and the impact of the new rules around trading in the dark.

## Agenda

- Insights into the intermediation debate
- Insights into the short selling debate
- Some preliminary thoughts on the impact of the new Dark Liquidity rules

The focus of the preliminary insights presented today is on three market structure issues that are being discussed in Canada:

- intermediation by HFT;
- the impact of the repeal of the tick test; and
- the impact of the new dark liquidity rules.



To set the context, we want to discuss how IIROC has been refining our approach to identifying HFT. As you know, IIROC published the results of Phases 1 and 2 of our study in December 2012. The “HOT Study”, as it was called, relied on a methodology using a High Order-to-Trade ratio as the sole measure; this resulted in a very broad definition.

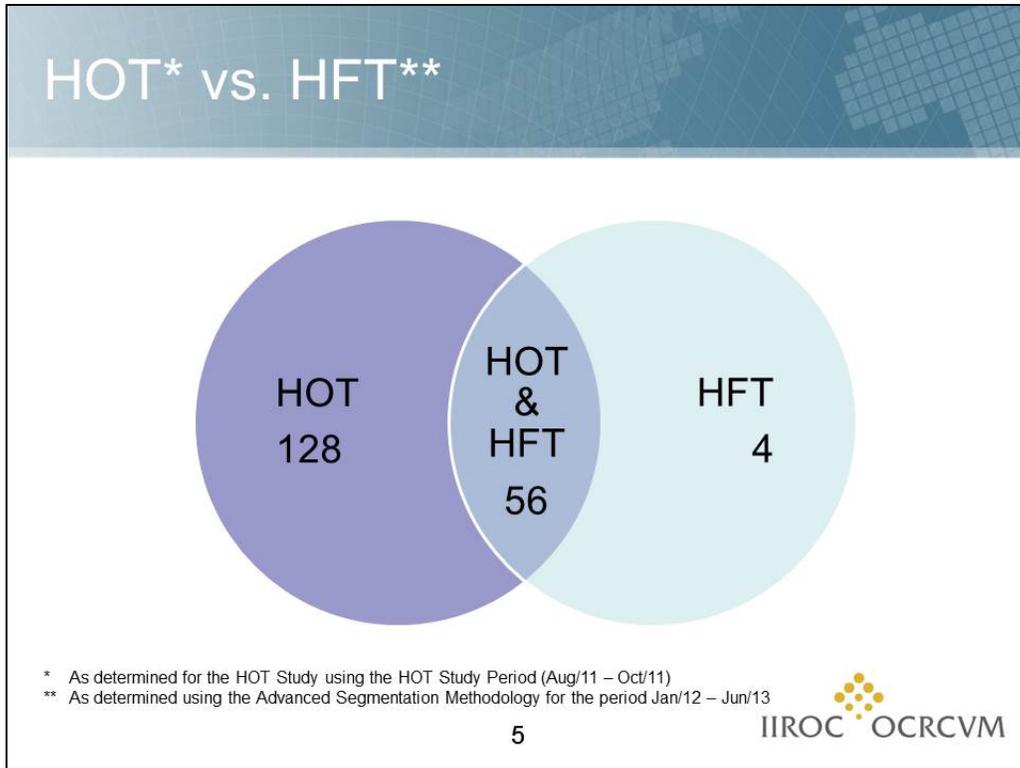
Since publication of the study, the team has been exploring other approaches to identifying HFT activity. Today’s results rely on an Advanced Segmentation Methodology (ASM) which allows for a narrower definition encompassing more factors.

Several steps are involved in this methodology:

- First we filtered out User IDs with minimal orders or trades.
- Then we applied three measures to the remaining universe of IDs:
  - order-to-trade ratio (still a factor);
  - fast order amendment speed; and
  - number of orders entered.

As with the HOT Study, this methodology captures certain types of activity in the marketplace regardless of source. As a result, we recognize that it will capture any type of market participants using HFT-like strategies, be they proprietary HFT firms, or dealers and clients using strategies that are “HFT-like”. Going forward, we will continue to refine our identification of HFT.

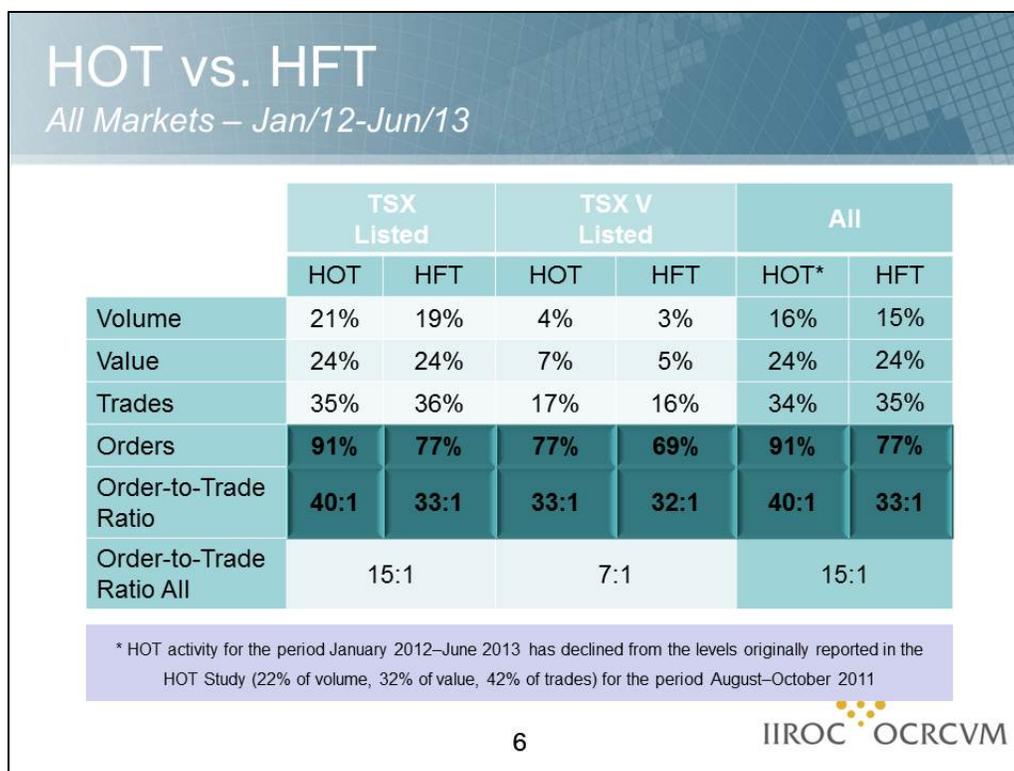
What is the impact of the new methodology?



This slide illustrates the difference in results from the two methodologies:

- 182 User IDS were identified using the HOT methodology for the period August 2011 through October 2011 (the period of the HOT Study).
- 60 User IDs were identified using the ASM methodology for the period January 2012 through June 2013.
- 56 User IDs are common to both the HOT methodology and ASM.

As a result of the new methodology, 128 of the HOT User IDs are therefore now excluded from our HFT group.



This chart compares both the HOT and HFT groups trading in TSX-and TSX Venture-listed securities for the period January 2012 through June 2013. We have not included CNSX-listed securities as our analysis shows extremely small amounts of HFT activity in these securities.

Of note is that in the HOT study, we reported that HOT represented 22% of volume, 32% of value, 42% of trades in all trading for the period August through October 2011. For the more recent period of January 2012 through June 2013, HOT activity (defined using the same methodology for an “apples to apples” comparison) declined to 16% of volume, 24% of value and 34% of trades.

When comparing HOT to HFT:

- Most metrics show slightly less HFT activity when compared to HOT with some exceptions.
- In general we do not see a reduction in the percentage of trades executed by HFT when compared to HOT; in fact there is a slight increase in the percentage of trades in TSX-listed securities
- We see a more dramatic decrease in the percentage of order activity by HFT (vs. HOT) which we believe may partially result from our change in methodology. The HOT methodology counted pegged orders (which inflate order numbers) while the ASM approach excludes these orders. This also accounts for the smaller order-to-trade ratio in the HFT group.

So IIROC is leaving the HOT methodology behind us.

Please also note that with one exception (slide 11) all information presented going forward is based on an 18-month period encompassing January 2012 through June 2013.

# Intermediation

Active / Passive Rates (Jan/12 – Jun/13)

## HFT

% of Traded Volume	TSX Listed	TSX V Listed
Active	27%	11%
Passive	69%	80%

## Non-HFT

% of Traded Volume	TSX Listed	TSX V Listed
Active	42%	44%
Passive	32%	43%

\* Do not equal 100 as certain types of executions (e.g. opening trades, crosses) do not differentiate active / passive

HFT execute more volume in passive trades than active trades

Non-HFT execute a more balanced proportion of active and passive trades

This slide shows how often HFT trades actively (takes liquidity) and passively (provides liquidity). There is no surprise here and the results support other research – HFT trades passively more than actively.

Please note that the percentages do not add up to 100% as our analysis included certain types of executions that do not differentiate active / passive, such as opening trades, intentional crosses and other matched trades.

# Intermediation

Active / Passive Rates (Jan/12 – Jun/13)

Do fees and rebates influence HFTs' tendency to trade actively or passively?

*TSX-Listed Securities*

	Active	Passive	% of Traded Volume	Fee Model
TSX	31%	67%	13%	Active fee \$0.0035 Passive rebate \$0.0031
Pure	29%	59%	8%	Active fee \$0.0025 Passive rebate \$0.002
Omega	25%	75%	24%	Inverted model: No active fee Passive fee \$0.0002 – 0.0006
CX2	21%	79%	39%	Inverted model: Active Rebate \$0.0010 Passive fee \$0.0014

HFT are willing to pay to intermediate active orders

There has, however, been debate about maker / taker fee structures and the impact on HFT behavior. It is interesting therefore to look at the active / passive rates of HFT on four marketplaces with differing fee structures.

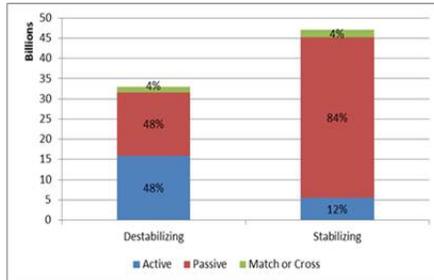
Omega and CX2 both have inverted models; that is, either not charging for taking liquidity or in the case of CX2 offering a rebate for taking liquidity. Both markets also charge for posting liquidity, and yet HFT's active / passive rates do not change; if anything passive rates are higher on those marketplaces.

Is it possible the maker / taker fee model is not a major driver of HFT behaviour? There is not enough data to answer this today but it is certainly food for thought.

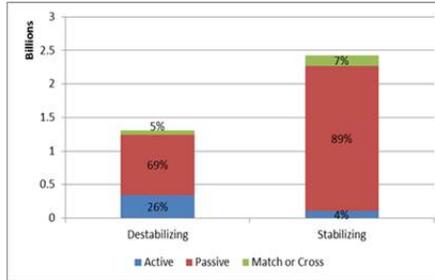
# Intermediation

Stabilizing\* / Destabilizing\*\* Trades by HFT (Jan/12 – June/13)

TSX-Listed Securities



TSX Venture-Listed Securities



A higher % of HFT volume executes as stabilizing trades.

A large % of HFT volume of stabilizing trades is executed passively.

\* Stabilizing buys = zero-minus or downtick; stabilizing sells = zero-plus or uptick

\*\* Destabilizing buys = zero-plus or uptick; destabilizing sells = zero-minus or downtick

One of the factors we can look at for the discussion on the impact of HFT is how often they execute stabilizing trades versus destabilizing trades.

Our approach to measuring this is based on a historical definition of stabilizing / de-stabilizing; that is, stabilizing trades are buys executed on a downtick or zero minus tick or sells executed on an uptick or zero plus tick. Destabilizing trades are the opposite; for example a sell on a downtick is considered a destabilizing trade. It will be important for us to also look at the market's reaction to these trades as a future step in our analysis.

Based on this measure, a higher percentage of HFT volume executes as stabilizing trades and a large percentage of those trades is executed passively.

This is true for trading in both TSX-listed securities and TSX Venture-listed securities.

# Short Selling

## *Repeal of the Tick Test*

- Effective October 15, 2013
- Highlights
  - Repeal of tick test (applied to non-interlisted securities)
  - Introduction of “short-marking exempt” (SME) marker
  - Non-SME (i.e. directional) sales from short position still have to be declared

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The next slides (10 – 17) provide some preliminary insights into the short selling debate. These insights are focused on HFT and shorting, and cover three concerns we have heard about short selling:

- the repeal of tick test would have a detrimental impact on markets;
- the repeal of tick test and introduction of the short marking exempt or “SME” marker (exempting users from declaring themselves short) would lead to rampant short selling by HFT; and
- the idea that the SME marker is a proxy for HFT.

## SME vs. HFT

*% of SME Activity that is HFT (Apr – Jun/13)*

	Buy	Sell
TSX Listed	73%	71%
TSX-Venture Listed	72%	68%

27% - 32% of activity marked SME is not HFT

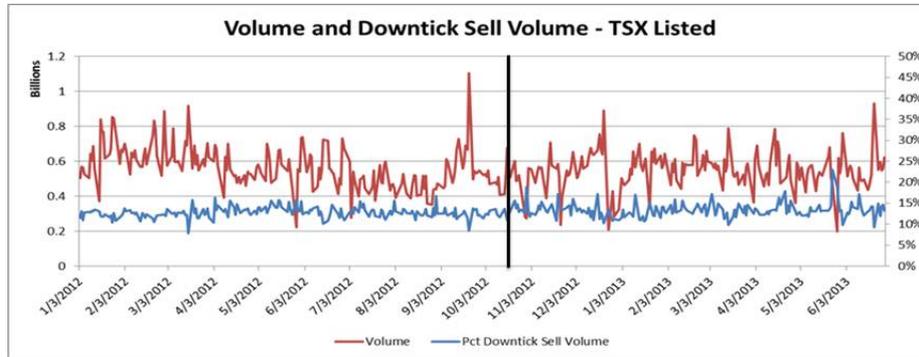
Let's deal with the last issue first. Our analysis shows not all users utilizing SME exhibit HFT behaviours based on our definition.

We note that the SME marker is a regulatory marker applied to all trades (both buys and sells) for an account that employs strategies which result in the account being flat at the end of the day – i.e. directionally neutral – regardless of how those trades are entered (i.e. manually or electronically).

Note the period of analysis for this is April 2013 – June 2013. The SME marker was introduced in October 2012, although IIROC allowed a grace period for implementation. Use of the market therefore stabilized after the end of March 2013.

# Short Selling

Activity on a Downtick – TSX-Listed (Jan/12 – Jun/13)



Selling activity resulting in a downtick has remained constant –  
there is no discernible change as a result of the tick test repeal

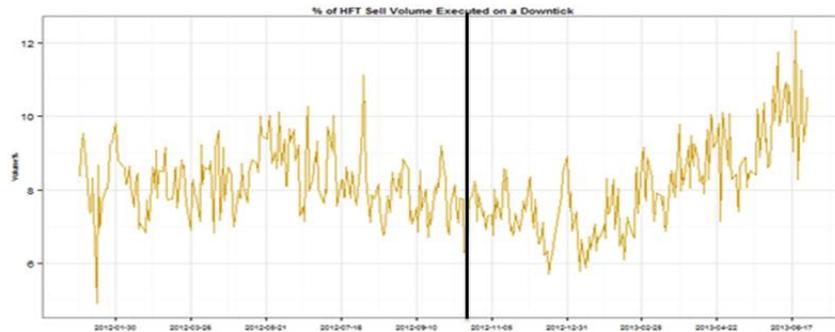
The next 3 slides (12 – 14) focus on trading in TSX- listed securities.

This slide represents the percentage of volume of all selling activity whether from a short or long position, executed on a downtick compared to actual volume executed in TSX-listed securities during the period.

From this we can see that selling on a downtick remained constant regardless of changes in executed volume. There is also no change as a result of the repeal of the tick test.

# Short Selling

HFT – TSX-Listed (Jan/12 – Jun/13)



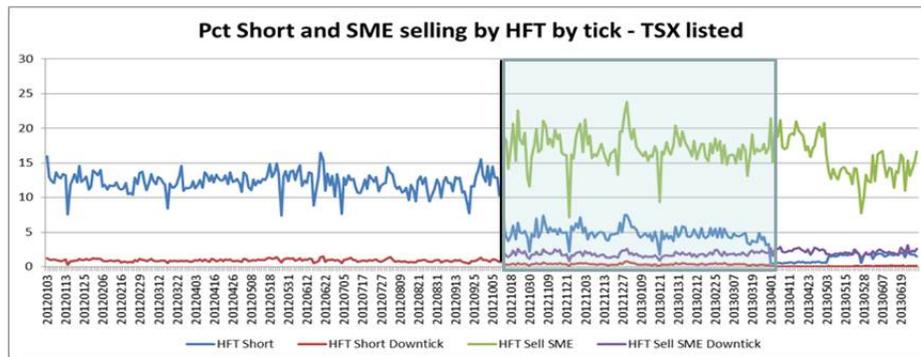
HFT sales executed on a downtick were relatively stable directly following the tick test repeal, but have recently increased

This slide focuses on HFT activity and specifically illustrates the percentage of their activity which is executed on a downtick during the review period.

It appears that HFT down-ticking was relatively stable directly following the tick test but has recently increased.

# Short Selling

HFT – TSX-Listed (Jan/12 – Jun/13)



**Prior to October 15, 2012 –**  
HFT selling marked short was consistent, very little executed on a downtick (short-exempt)

**After October 15, 2012 –**  
Grace period until March 31, 2012 during which both SE and SME markers were used

**After March 31, 2103 –**  
HFT selling on a downtick remains low

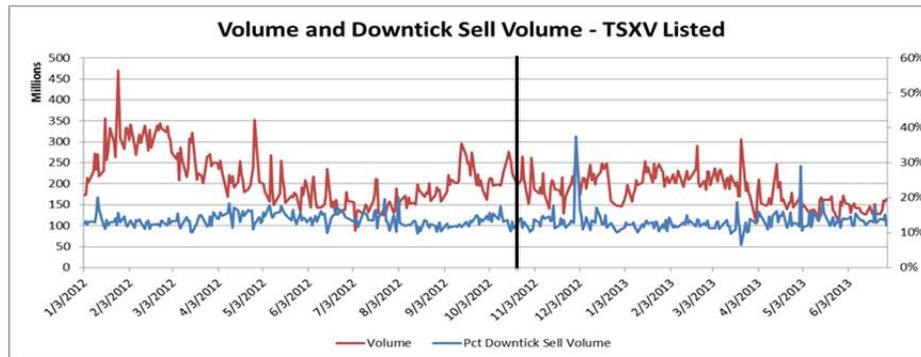
Slide 14 shows more of a “dissection” of HFT selling activity focused on short selling.

Use of the SME marker exempts those participants using it from having to declare themselves short. As noted earlier, there has been concern expressed that this could result in rampant short selling on a downtick.

The chart demonstrates that even with the introduction of the SME marker, that portion of HFT participants who use it are still not executing on a downtick.

# Short Selling

Selling on a downtick - TSX Venture-Listed (Jan/12 – Jun/13)



TSX-Venture selling activity resulting in a downtick has remained constant –  
no discernible change as a result of the tick test repeal

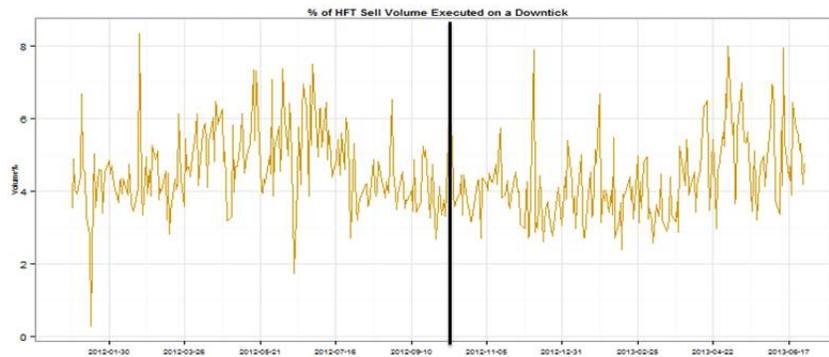
The next 3 slides (15 – 17) present similar information for trading in TSX Venture-listed securities.

IIROC is aware of concerns expressed by some market participants regarding trading activity in the TSX Venture market specifically around short selling and HFT. It is our hope that these charts provide some insights in the ongoing discussion.

This chart illustrates that the percentage of sell volume executed on a downtick has remained constant regardless of the state of the market.

# Short Selling

HFT – TSX Venture-Listed (Jan/12 – Jun/13)

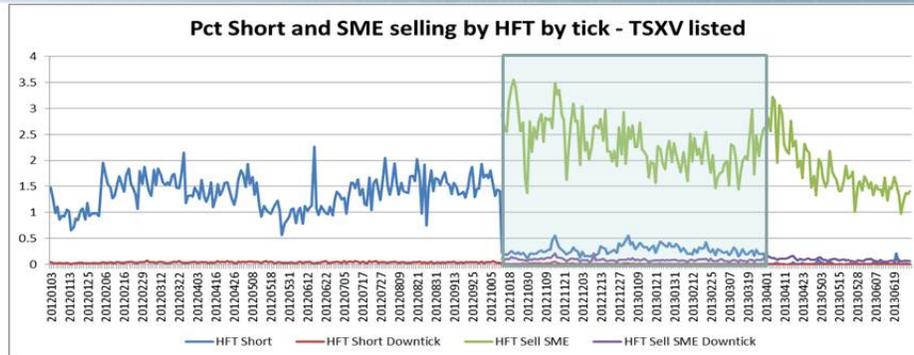


HFT sell volume executed on a downtick decreased slightly immediately post-rule amendment

When we focus in on HFT activity on the TSX Venture, we can see that the percentage of HFT selling on a downtick (regardless of whether from a short or long position) slightly decreased after the repeal of the tick test.

# Short Selling

HFT – TSX Venture-Listed (Jan/12 – Jun/13)



**Prior to October 15, 2012 –**  
HFT selling marked short stayed within a range; very little executed on a downtick (short-exempt)

**After October 15, 2012 –**  
Grace period until March 31, 2012 during which both SE and SME markers were used

**After March 31, 2103 –**  
HFT selling on a downtick remains low

Similar to trading in TSX-listed securities, this chart demonstrates that even with the introduction of the SME marker that portion of HFT participants executing on a downtick has not dramatically changed.

# Dark Rules

## *The Background*

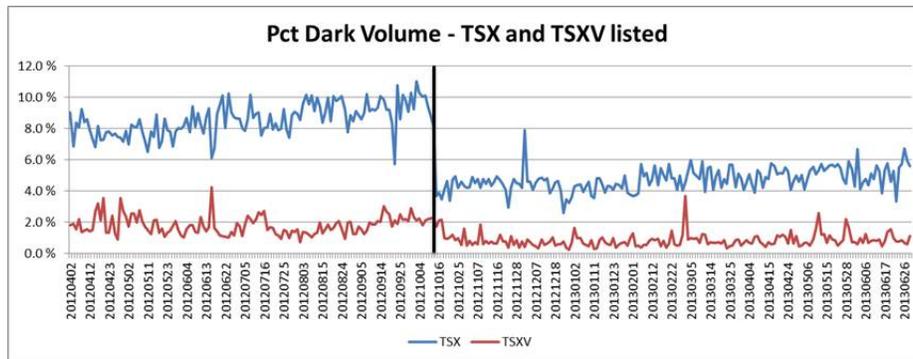
- **New regulatory framework effective October 15, 2012**
  - Meaningful price improvement to small orders
  - Large active orders can trade at the touch
  - Lit priority over dark at same price

This slide provides a brief introduction to the highlights of the new rules around trading in the dark implemented on October 15, 2012.

IIROC committed to studying the impact. We are in the early stages of that study but are happy to present some preliminary insights. Again these insights are focused on HFT.

# Dark Rules

## Impact to Trading



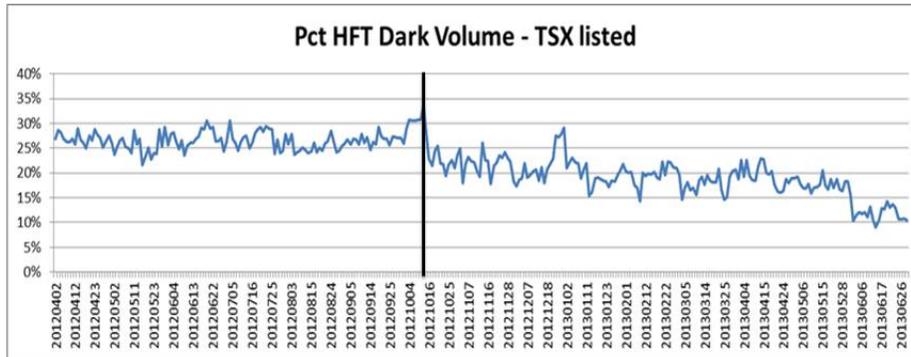
Dark trading is on the rise again – slowly increasing

This slide illustrates that overall, securities listed on both markets, show a decline in the volume of dark trading after the implementation of the new dark rules:

- Dark trading in TSX-listed securities showed the steepest decline after October 15, 2012:
  - 8.6% of total volume prior to October 15, 2012
  - 4.7% after October 15, 2012
- The total percentage of dark trading in TSX Venture-listed securities is small but it also declined after October 15, 2012:
  - 1.8% of total volume prior to October 15, 2012
  - 0.8% after October 15, 2012
- Dark trading is more recently on the rise (at 5.1% of total volume in June 2013 for TSX-listed securities).

# Dark Rules

## HFT in the Dark – TSX-Listed



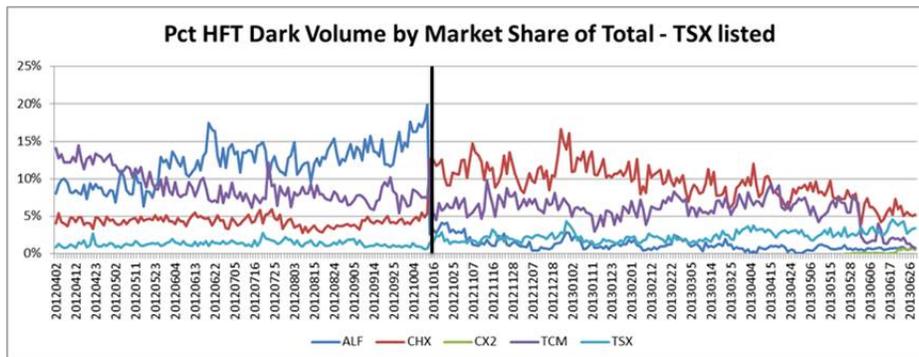
Percentage of TSX-listed dark trading by HFT is declining since rule implementation

When we look at HFT trading TSX-listed securities in the dark:

- Prior to the rule amendment, HFT represented on average 26.6% of all dark trading.
- After the rule amendment, HFT represented on average 19.0% of all dark trading.
- While the pre-rule period appears stable, the post-rule period shows a downward trend.

# Dark Rules

## HFT in the Dark – TSX-Listed



Share of TSX-listed dark trading by HFT dropped significantly on Alpha and increased significantly on Chi-X. Prior to rule implementation, TriAct's share of HFT dark trading was already decreasing as Alpha's share increased.

This chart allows us to see on which marketplaces HFT execute their dark activity, as measured by market share.

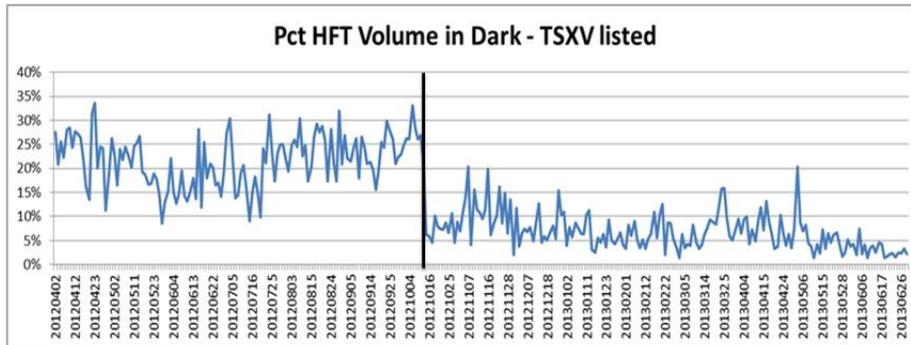
While initially HFT were most active on TriAct MATCH Now, that landscape shifted in the spring of 2012 as they became more active on Alpha IntraSpread.

What is it about Alpha IntraSpread that appealed to HFT? Again, there is not enough data to answer that question today.

With the implementation of the new dark rules it appears that HFT pulled out of Alpha and there is an increase in trading on Chi-X.

# Dark Rules

## HFT in the Dark – TSX Venture-Listed



Percentage of TSX-V-listed dark trading by HFT dramatically declined after rule implementation

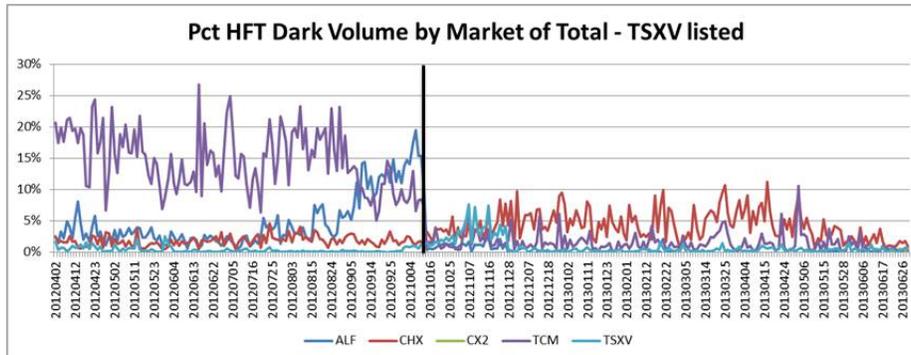
The next two slides look at trading in TSX Venture-listed securities from the same perspective.

- Prior to the rule amendment, HFT was, on average, 21.7% of all dark trading.
- After the rule amendment, HFT was, on average, 6.9% of all dark trading.

The post-rule period shows a downward trend.

# Dark Rules

## HFT in the Dark – TSX Venture-Listed



Prior to the dark rules, the largest share of TSX-V-listed dark trading by HFT executed on TriAct, but decreased in the few months prior to the rule amendments as Alpha's share increased.

Following the dark rule amendments, the share of HFT dark trading on Alpha declined but increased on Chi-X.

Where are they trading dark? We see a similar landscape as HFT trading in TSX-listed securities shows:

- a gradual decrease in activity on TriAct matched by an increase on Alpha prior to the rule implementation; and
- a dramatic decline in their activity on Alpha and increased activity on Chi-X after the rule implementation.