TSX EQUITIES MAKER-TAKER REDUCTION PROGRAM
IMPACT REPORT 1

TMX | Toronto Stock Exchange | TSX Venture Exchange | TSX Alpha Exchange

CANADA'S MARKET. FOR ALL.

TSX Equities Maker-Taker Reduction Program

IMPACT REPORT 1

OVERVIEW

On June 1, 2015, TSX Equities implemented a program of phased reductions to its maker-taker fees in response to industry concerns with the maker-taker model relating to its impact on transaction costs, intermediation levels, routing conflicts of interest and market fragmentation. We also committed to monitor the impact in order to help inform future phases of the fee reduction program.

Fee reductions from first phase of program

The first phase of the program resulted in reductions to active fees and passive rebates of approximately 26% and 31% respectively, across Toronto Stock Exchange (TSX) and TSX Alpha Exchange (TSXA) for securities priced at or above $1 (Table 1). Other markets were invited to follow this initiative. Two responded with limited changes: Aequitas reduced its fees for non-interlisted securities and ETFs, and Chi-X reduced its fees for ETFs.

TABLE 1

TSX		BEFORE	AFTER
	INTERLISTED EQUITIES ≥ $1	35 / (31)	30 / (26)
	NON-INTERLISTED EQUITIES ≥ $1	35 / (31)	23 / (19)
	ETFs	30 / (26)	23 / (19)
TSXA		**BEFORE**	**AFTER**
	EQUITIES ≥ $1 AND < $5	25 / (21)	18 / (14)
	EQUITIES ≥ $5	28 / (25)	18 / (14)
	ETFs	25 / (21)	18 / (14)

Rates shown are per share, in hundredths of a penny, for standard equity and ETF trades during the continuous trading session.

Commitment to monitor impact

TSX Equities undertook to monitor for any negative effects from the fee changes on liquidity and market quality, and formed the Market Impact Measurement Working Group to assist with this task. The group consists of a broad selection of industry stakeholders including institutional investors, sell-side brokers, proprietary trading firms, regulators, academics, and technology vendors. The group provides advice on appropriate metrics and calculation methodology, shares unique observations and feedback, and in some cases performs parallel analysis of the market impact.[1]

First report

This is the first report issued and it covers the first three months following the fee change (June – August). During those first three months there were significant macro events that likely contributed to increased market-wide volatility and higher trading volumes. This was followed by changes to the Canadian market structure in September that resulted from the introduction of the first visible unprotected market.[2] For these reasons, and because market participants often require time to fully adjust their behaviour in response to significant fee and market structure changes, we are being cautious to not draw any conclusions at this time. This report is therefore intended to only highlight our key observations based on the first three months following the fee change.

In general, our review of the selected metrics to this point has not provided any clear indications of negative impact to market quality related to the fee reductions. The extent and timing of further reductions and subsequent reports will be based on continued analysis, monitoring and customer feedback.

1 Any views expressed in this report do not necessarily reflect the views of the Working Group or its members.

2 On September 21, 2015, TSX Alpha Exchange launched a new visible market model that is not considered to be 'protected' for the purposes of the Order Protection Rules.

METHODOLOGY AND APPROACH

Metrics

With the assistance and advice of the Working Group, we developed a number of metrics that could be applied to the market in aggregate, and across various security segments and price tiers. In determining which metrics were most appropriate, our focus was on metrics that would assess the impact to market quality in Canada, as a whole, rather than the specific impacts to the TSX Equities markets.

The types of metrics selected include those that allow us to evaluate impacts on top-of-book (TOB) liquidity, diversity of orders and trades, trade sizes, spreads, autocorrelation and intraday volatility.

These metrics were calculated individually for six security groups (Fig. 1). Securities were further divided into various price categories to account for volume and value biases that can arise in the lower and higher price tiers.

FIGURE 1 - SECURITY GROUP CLASSIFICATION — BY % OF VOLUME

The data against which the metrics were applied represent Canadian consolidated and venue-specific TOB quote information.[3] We continue to work towards expanding our review to include data on US-interlisted securities.

Certain securities and trade types were excluded in accordance with common industry practices[4].

Report

This report covers the first three months after the fee change (June – August). As mentioned earlier, September has been excluded because of changes in market structure that month.

The report also focuses on TSX-listed securities only, and does not consider trading in securities priced under $1 as the fee changes did not involve securities in this price tier. All charts in this report therefore reflect the broader '$1 and over' price tier, unless otherwise noted.

3 Raw data was sourced through a data vendor and contained 'public content' only. Consolidated TOB information provided by the vendor was sourced from the TMX Information Processor.

4 For example, excluded securities types include preferred shares, rights, warrants, notes and debentures. Excluded trade types for various metrics include opening and closing auctions, block crosses and odd-lot trades.

GENERAL MARKET ENVIRONMENT

The three-month period following the fee change saw the types of macroeconomic events that can contribute to increased market volatility and higher trading volumes. These included the Greek economic crisis, steady declines in oil and commodity prices, and heightened concerns around China's economy.

The increased volatility can be seen through the rise in the S&P/TSX 60 VIX® that began in mid-July (Fig. 2).

The peak on August 24 is believed to have been related to heightened concerns about China's economy. As a result of the degree of volatility seen on that particular day, we have excluded that date from our calculations. Such macroeconomic effects may obscure market impact otherwise correlated with the fee changes.

As noted in Figure 3, market-wide volumes were down slightly in the early Summer, but started on an upward trend around the same time as the observed increase in market-wide volatility.

Finally, when considering the key observations included in this report, it is also important to note that market-wide asset values in Canada have been on the decline since early April, before the fee changes, as can be seen in Figure 4.

FIGURE 2

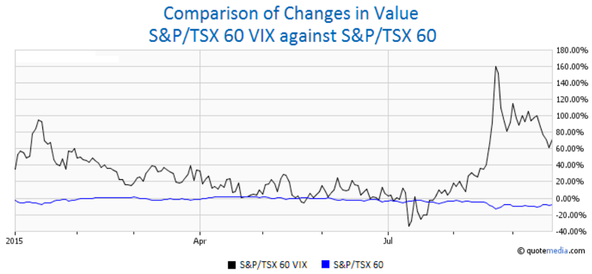


FIGURE 3

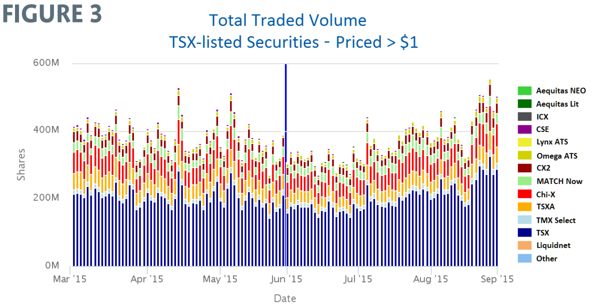
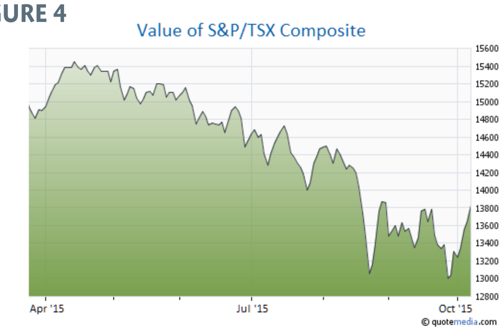


FIGURE 4



KEY OBSERVATIONS

The following represents our key observations after applying the selected metrics across the various securities groupings and price tiers. In general, our review of the selected metrics to this point has not provided any clear indications of negative impact to market quality related to the fee reductions. The following highlights that further analysis is warranted in certain areas.

OBSERVATION 1

Widening of spreads across numerous categories and price tiers

A widening of time-weighted quoted spreads and volume-weighted effective spreads as measured in basis points (bps) was observed across numerous categories and price tiers, and similarly across marketplaces for those categories and price tiers.[5]

As an example, Figure 5 shows an increase in effective spreads for highly liquid interlisted securities priced above $1, representing some of the most liquid securities, following the fee change. The blue vertical line identifies the fee change date, while the blue and black time-series lines represent the results of the metric for TSX and the total market, respectively. For this example, the average of the observed median effective spreads over the pre- and post-fee change period increased by approximately 19%.

Quoted spreads showed similar increases for highly liquid interlisted securities priced above $1 (Fig. 6). For this example, the average of the observed median quoted spreads over the pre-and post-fee change period increased by approximately 18% on TSX and 19% market-wide.

As similar impacts were observed across numerous categories and price tiers, as well as across marketplaces, this may indicate a more systemic cause. This view is bolstered by our observations of increased spreads for securities priced under $1 where fees did not change. The macro events and associated volatility arising during the post fee change period may have contributed to the observed spread increases. Additional analysis is warranted to assess the degree to which the post-period increases can be explained by other factors.

OBSERVATION 2

Differing trends in average CBBO and trade sizes on a volume versus value basis

The market-wide average number of shares at the Canadian Best Bid and Offer (CBBO®) appeared to be relatively consistent between the pre- and post-periods for most categories, with a slight upward trend observed for ETFs. Average trade sizes (in shares) also appeared to be relatively consistent.

However, for highly-liquid interlisted and non-interlisted securities priced between $1 and $5, a decreasing trend in the market-wide average number of shares at the CBBO was observed. For highly-liquid interlisted securities in this price tier (Fig. 7), the average number of shares at the CBBO decreased by approximately 18% between the pre- and post-period

FIGURE 5

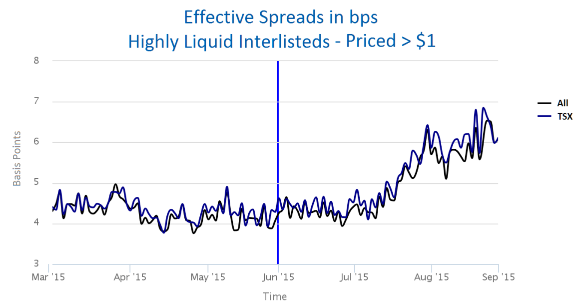


FIGURE 6

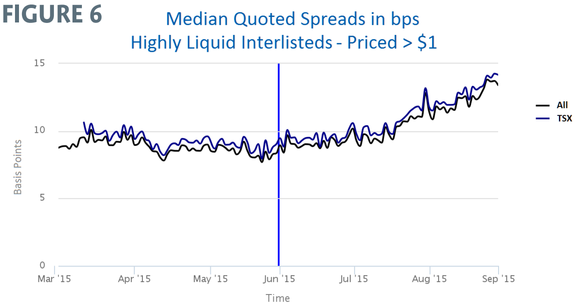
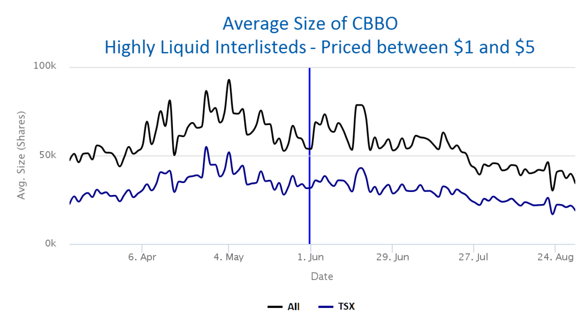


FIGURE 7



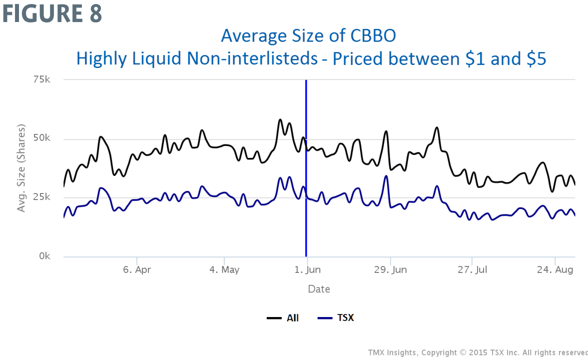
5 For marketplaces with greater than 1% market share.

on TSX and 11% market-wide. For non-interlisted securities (Fig. 8), the decrease was approximately 12% for TSX and 8% market-wide.

Following the fee change, the market-wide average value at the CBBO and the average trade value also exhibited downward trends in numerous categories and price tiers. Declining asset prices may provide a logical explanation, as evidenced by the downward trend in the value of the S&P/TSX Composite Index since late April 2015 (Fig. 4).

Continued monitoring and data analysis will help to ascertain whether the areas exhibiting decreased size at the CBBO are a result of the fee changes or if they are more likely related to macro effects.

FIGURE 8



OBSERVATION 3

ETF metrics remained stable

ETFs rely heavily on market makers who quote and price these securities according to intraday net asset value (NAV), employing passive strategies that have historically benefitted from higher maker rebates. Consequently, it is not unreasonable to question whether reductions in maker-taker fees might negatively impact average quoted spreads or limit the aggressiveness of quoting activity in other ways.

The data shows that ETFs were not generally impacted by the fee change. In a few cases, notable improvements have been observed.

For example, for highly liquid ETFs priced between $5 and $10, there was a 41% increase in the market-wide average number of shares at the CBBO after the fee changes and a 20% increase when measured in value terms (Fig. 9). The lower magnitude of the decrease observed in value terms may be a result of the decrease in underlying equities values suggested by the average value at CBBO metrics discussed earlier.

At the same time, market-wide quoted spreads (Fig. 10) and effective spreads have widened for ETFs, although seemingly to a lesser degree than on interlisted and non-interlisted securities. Further analysis is warranted to confirm the extent to which wider spreads in ETFs are being driven by volatility.

FIGURE 9

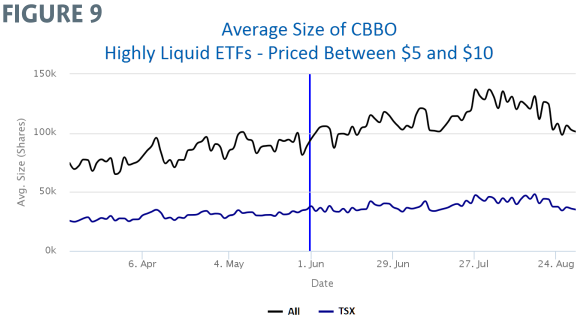
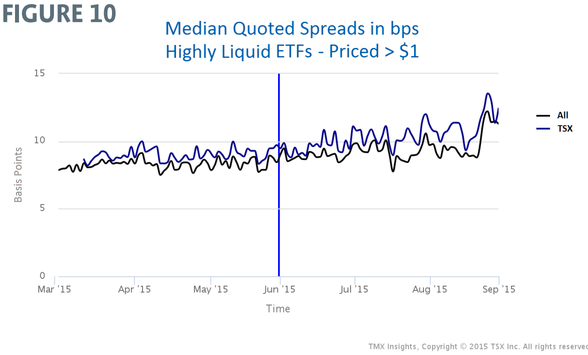


FIGURE 10



OBSERVATION 4

Consistent intraday volatility

The selected intraday volatility metrics are intended to implicitly adjust for macro volatility by measuring across short intraday trading ranges, and specifically measure based on 15-minute dispersions from volume-weighted average price (VWAP) and 5-minute high/low trading ranges.[6] This allows for better assessment of intraday volatility without reflecting possible interference of broader market events. Using these metrics, the results are generally consistent before and after the fee changes, and in many cases indicate a very modest decline (e.g. a 2% - 3% decline for highly-liquid securities priced over $1).

6 Based on the same metrics used in "Evolution of Canadian Equity Markets", RBC Capital Markets, Global Electronic Trading, February 2013

OBSERVATION 5

Fee changes have affected market share

Some additional observations worth noting are related to impact on market share. Using ETFs as an example, each of TSX, TSXA and Chi-X reduced their fees, with TSXA and Chi-X effectively dropping their rates to the lowest levels among markets employing make-take fee models.

In examining the results on market share for highly liquid ETFs priced above $1, we noted that both TSXA and Chi-X saw noticeable decreases in market share following the fee changes (Fig. 11). At the same time, TSX's market share increased. Subsequent to the drop in ETF market share on Chi-X, Chi-X announced plans to increase its fees for ETFs to a level comparable to TSX.[7]

In comparison, for highly-liquid interlisted securities where rates were significantly reduced on TSXA, but maintained on Chi-X at levels consistent with those charged by TSX, Chi-X's market share remained relatively stable. There was a perceptible downward shift in TSXA's market share at the time of the fee change (Fig. 12).

We expect the above changes may be a result of changes in routing behaviour relating to the lower relative positioning of TSXA's and Chi-X's fees as compared to those charged by TSX in the first example, and as compared to each other in the second. This, together with Chi-X's subsequent reversion to higher rates following their loss of market share, may indicate that in the absence of a market-wide reduction in rates imposed by regulation, any marketplace seeking to reduce make-take rates may be more inclined to make gradual phased reductions to minimize the risk to trading activity on its marketplace.

FIGURE 11

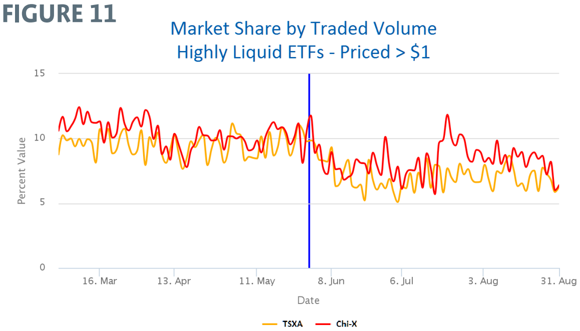
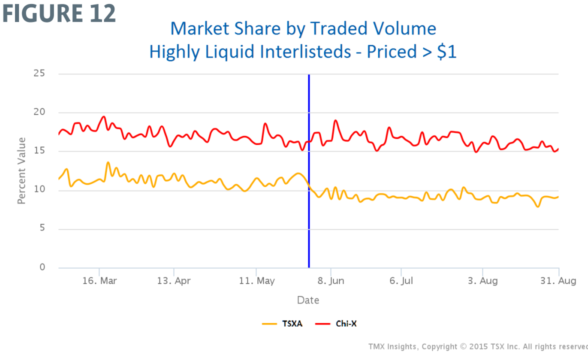


FIGURE 12



NEXT STEPS

We are aware that market structure changes can involve several phases of adoption and reaction that can cause true results to be obscured in the period immediately following a change. As a result, TSX Equities intends to continue monitoring for market impact resulting from the fee changes. We will also be mindful of the difficulties in separating the effects of the fee changes from the effects that might arise from other marketplace changes, including the introduction of the new TSXA model (September 21, 2015) and the TSX Long Life order type (November 30, 2015). We are also working to expand the application of the metrics to incorporate U.S. interlisted data. We will continue to engage with participants formally through the Market Impact Measurement Working Group and informally through our various participant touchpoints. Our goal is to gain greater insight and perspective to better inform subsequent phases of the planned fee changes for consideration in 2016.

Feedback on our report, the TSX Equities Maker-Taker Reduction Program, and its impact, is welcomed and highly encouraged. To do so, or for further questions or comments, please contact us at **trading_sales@tsx.com** or connect directly with your Account Manager.

7 After reducing its ETF trading fees to $0.0017 active / ($0.00013) passive on June 1st, 2015, Chi-X subsequently increased its trading fees to $0.0022 active / ($0.0018) passive effective October 1st, 2015.

TMX | Toronto Stock Exchange | TSX Venture Exchange | TSX Alpha Exchange

tsx.com

FOR FURTHER INFORMATION, PLEASE CONTACT trading_sales@tsx.com OR YOUR TRADING ACCOUNT MANAGER

JEFF FOSTER
T 1 416 947-4229
Jeff.Foster@tsx.com

MATT LEE
T 1 416 947-4665
Matthew.Lee@tsx.com

MONIKA MARCZIOVA
T 1 416 947-4534
Monika.Marcziova@tsx.com

MICHAEL TINTINAGLIA
T 1 416 947-6679
Michael.Tintinaglia@tsx.com