Canadian Securities Administrators
Autorités canadiennes en valeurs mobilières

CSA Staff Notice 21-336 and Consultation on *Proposed Revisions to the Data Fee Methodology for Professional Real-Time Market Data Fees*

October 27, 2026

Item 1 – Introduction

The Canadian Securities Administrators (**CSA** or **we**) are publishing for comment proposed revisions to the Data Fee Methodology (**DFM**) set out in CSA Staff Notice 21-319 *Data Fees Methodology* (the **Proposed Revisions**).[1] The Proposed Revisions reflect recommendations made by the DFM industry committee (**DFM Committee**) in its report published by the CSA on December 5, 2025 (**DFM Report**). The Proposed Revisions also include additional changes identified by the CSA based on experience applying the DFM, stakeholder feedback, and market developments since the DFM was implemented.

Item 2 – Purpose

The purpose of this publication is to seek stakeholder feedback on the Proposed Revisions before any changes to the DFM, as currently set out in CSA Staff Notice 21-319 *Data Fees Methodology*, are implemented. The implementation of the Proposed Revisions will not require changes to any regulatory requirements.

The Proposed Revisions are summarized in Item 3 and discussed in more detail in Item 6 and Item 7. They are intended to improve the transparency, effectiveness, and long-term sustainability of the DFM while continuing to support the assessment of whether professional real-time market data (**RTMD**) fees are reasonably related to a marketplace's contribution to price discovery, liquidity provision, and trading activity, and do not unreasonably condition or limit access to marketplace services.

[1] The BC Securities Commission (BCSC) is not publishing the Proposed Revisions for comment at this time due to publication restrictions related to the B.C. provincial election. Staff of the BCSC anticipate publishing the Proposed Revisions for comment at a later date.

The Proposed Revisions do not include recommendations that did not receive majority support or consensus from the DFM Committee, nor do they address issues that were outside the DFM Committee's mandate, such as non-display fees.

The CSA is aware and continues to monitor policy proposals in the U.S and other jurisdictions.

Item 3 – Summary of Proposed Revisions

The Proposed Revisions relate to the following areas:

1. **Transparency** – publication of calculated fee ranges, associated confidence intervals, reference points by listing market, and related explanatory information;

2. **DFM** – potential consideration of different methodological factors or parameters for senior and junior listing markets, annual adjustment of the reference points by listing market, treatment of non-charging marketplaces, and selected changes to pre-trade and post-trade metrics;

3. **Implementation** – consideration of whether the revised DFM should be implemented using a new baseline; and

4. **Emerging issues** – consideration of how product-specific RTMD feeds should be treated in the context of the revised DFM.

After providing some additional background, the discussion below addresses these proposals in the order outlined above.

Item 4 – DFM Overview

4.1 What is the DFM?

The DFM is a tool used by the CSA to assess whether professional RTMD fees charged by marketplaces for top-of-book and depth-of-book feeds (i.e., Level 1 and Level 2 feeds) are reasonably related to a marketplace’s contribution to price discovery, liquidity provision, and trading activity. The DFM measures these contributions using a set of pre- and post-trade metrics and uses the resulting marketplace rankings to calculate fee ranges for Level 1 and Level 2 RTMD feeds. These ranges assist Staff of the CSA in evaluating whether RTMD fees are reasonable and do not unreasonably condition or limit access to a marketplace’s services.

The DFM does not prescribe the RTMD fees that a marketplace may charge for Level 1 and Level 2 feeds to professional users. Rather, it provides a consistent framework for assessing whether professional RTMD fees are fair and reasonable in the context of a marketplace's contribution to the Canadian equity market.

4.2 Formalization and application of the DFM

The DFM was developed in response to concerns regarding the cost of professional RTMD and the increasing fragmentation of trading activity across Canadian equity marketplaces. As trading activity became distributed across multiple marketplaces, market participants raised concerns regarding the relationship between RTMD fees and a marketplace's contribution to price discovery and trading activity. At the same time, the CSA sought to ensure that RTMD fees remained consistent with the requirements of National Instrument 21-101 *Marketplace Operation*, including the requirement that a marketplace not unreasonably prohibit, condition, or limit access by a person or company to the services that it offers.

Following a public consultation process, the CSA formalized the DFM in April 2016 as a transparent framework for assessing whether professional Level 1 and Level 2 RTMD fees are reasonably related to a marketplace's contribution to price discovery, liquidity provision, and trading activity. The DFM was designed to provide a consistent and objective approach to the regulatory review of RTMD fees while recognizing the increasingly competitive and fragmented nature of Canadian equity markets.

Since April 2016, CSA Staff have applied the DFM in:

- annual reviews of professional subscriber fees charged by marketplaces for Level 1 and Level 2 RTMD feeds by listing market;[2] and
- reviews of new fees or changes to existing Level 1 and Level 2 fees that are submitted for review and approval.

The DFM has been applied to all marketplaces, regardless of whether they are protected or unprotected, to support a consistent regulatory approach to assessing RTMD fees and their relationship to marketplace contributions and access to market data. The DFM has also formed an important part of the CSA's oversight framework for RTMD fees and has been used by CSA Staff for almost a decade to assess whether professional RTMD fees remain consistent with applicable regulatory requirements.

4.3 DFM Framework

Under the DFM, a set of pre- and post-trade metrics is calculated annually for each marketplace by staff of the Canadian Industry Regulatory Organization (**CIRO**).

The pre-trade metrics, consisting of time at the best bid and offer, time at the narrowest spread, and a value weighted measure of quoting activity at the best bid and offer, are designed to reflect liquidity provision and price discovery and include all quotes from all marketplaces during regular trading hours. Under the current DFM, odd lot quotes are excluded from the pre-trade metrics. We also note that securities that have no quotes on any marketplace during the relevant period are also not included in the pre-trade calculations for that period.

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[2] The DFM was applied to TSX-, TSXV-, CSE- and Cboe Canada-listed securities (formerly NEO-listed securities).

The post-trade metrics, consisting of percentage of trading volume, trading value and number of trades, as well as percentage of square root dollar volume, are designed to reflect trading activity. Under the current DFM, post-trade metrics include all regular open market trades, intentional and unintentional crosses, special term trades, and after-hour trades. Odd lot and cancelled trades are excluded from the calculation of post-trade metrics.

These metrics are used as inputs into two ranking models – Model 1 (formerly SIP Value) and Model 2 (formerly Model 3). Each ranking model produces a ranking for each marketplace that reflects its contribution to price discovery, liquidity provision, and trading activity. Separately, the professional Level 1 and Level 2 RTMD fees charged by marketplaces are aggregated by listing market to establish reference points by listing market. The applicable reference point by listing market is then allocated based on each marketplace's rankings under the two ranking models to calculate the marketplace's fee ranges. These fee ranges assist CSA Staff in assessing whether the professional RTMD fees are reasonable considering that marketplace's contribution to liquidity and price discovery, as well as its share of market activity.

Appendix A sets out the proposed revised DFM (**DFM 2**) which incorporates the Proposed Revisions discussed in this Notice.

4.4 DFM Impact and Limitations

Since implementation, the DFM has provided a consistent framework for reviewing professional Level 1 and Level 2 RTMD fees. However, stakeholder concerns about the overall cost of RTMD have persisted, including concerns that fee reductions by some marketplaces may be offset over time by increases by others whose calculated fee ranges allow for higher fees.

Earlier consultation work on RTMD fees[3] identified several related concerns, including:

- marketplaces with smaller market share were charging fees that appeared high relative to their share of trading activity,
- the cost of consolidated data in Canada is high relative to trading activity, and
- greater transparency around fee changes and the regulatory review of fees is needed.

In recognition of these concerns and the importance of the DFM to the Canadian RTMD regulatory framework, the CSA stated in CSA Staff Notice 21-334 *Next Steps to Facilitate Access to Real-Time Market Data* (**CSA SN 21-334**) that it would, among other initiatives, review the current DFM.

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[3] CSA Staff Consultation Paper 21-401 – Real-Time Market Data Fees published on November 8, 2012, CSA Staff Notice and Request for Comment – Proposed Amendments to NI 23-101 Trading Rules, published on May 15, 2014, and CSA Consultation Paper 21-403 – Access to Real-Time Market Data, published on November 10, 2022.

More recent stakeholder feedback has also raised concerns about certain inputs into the DFM, including the treatment of intentional crosses in post-trade metrics, the absence of an annual adjustment to the reference points by listing market, and the limited transparency of calculated fee ranges.

Collectively, these concerns suggest that while the DFM continues to be an important regulatory tool, certain elements of the methodology may require refinement to improve transparency, maintain effectiveness, and ensure that calculated fee ranges continue to reflect current market structure and trading behaviour.

Item 5 – CSA Review and DFM Committee Recommendations

In CSA SN 21-334, the CSA announced changes to make RTMD fees more transparent and established the DFM Committee.

5.1 Enhanced Transparency

As an initial response to concerns about the transparency of marketplace RTMD fee changes, CSA Staff and marketplaces introduced enhanced transparency measures. Under these measures, for a period of approximately 18-months,[4] marketplaces published proposed RTMD fee changes for stakeholder feedback, together with supporting information such as the rationale, methodology, and expected impact of the proposed fee changes. No stakeholder feedback was received on any of the published proposals and the CSA ultimately determined not to continue with the enhanced transparency measures, except where these fee proposals are novel, complex, or raise new issues for the capital markets, consistent with the normal course for all marketplace fee changes.

5.2 The DFM Committee

The DFM Committee was composed of representatives from a broad range of stakeholders, reflecting diverse perspectives, including marketplace and non-marketplace members (i.e., dealers (large, medium, and small), market data vendors, and other stakeholders). The DFM Committee was led by consultants retained by the CSA to review the current DFM in accordance with the mandate appended to CSA SN 21-334.[5]

The DFM Committee completed its work and provided the CSA with the DFM Report, which was published in December 2025. The DFM Report sets out recommendations to improve the current DFM, including refinements to certain pre-trade and post-trade metrics, enhanced transparency, and changes intended to improve the consistency and effectiveness of the DFM. The DFM Report also recommended an inflation-based adjustment to the reference points by listing market.

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[4] Beginning in April-June 2024 and effective to October 23, 2025.
[5] A list of the DFM Committee members and consultants can be found on page 1 of the DFM Report.

The Proposed Revisions reflect those DFM Committee recommendations that received majority support or consensus, together with additional changes identified by the CSA based on Staff's experience applying the DFM, as well as recent market developments.

Item 6 – Discussion of Proposed Revisions

Overall, the Proposed Revisions are intended to improve transparency, strengthen the framework for calculating and maintaining reference points by listing market, and update certain inputs used by the ranking models to assess marketplace contributions, while retaining the core structure of the DFM.

The DFM Committee supported the continued use of a DFM to assess professional RTMD fees charged by Canadian marketplaces. The DFM Committee recognized the DFM as an appropriate framework for evaluating whether RTMD fees are reasonably related to a marketplace's contribution to price discovery, liquidity provision, and trading activity.

The DFM Committee also considered whether the current approach of calculating separate reference points for each listing market should be replaced with a single reference point applicable to all listing markets. While some members expressed support for pursuing a unified benchmark, the DFM Committee concluded that additional analysis would be required before such an approach could be recommended. As a result, the Proposed Revisions retain the current framework of calculating reference points by listing market, while introducing targeted changes intended to improve the transparency, consistency, and effectiveness of the DFM.

6.1 Transparency of certain elements of the DFM

The DFM Committee considered whether greater transparency should be provided regarding the operation of the DFM and the calculation of fee ranges. The majority of the DFM Committee supported annual publication of calculated fee ranges, together with appropriate confidence intervals and related explanatory information.

The DFM Committee also recognized that publication of fee ranges alone may not provide sufficient context and supported the disclosure of reference points by listing market information used in the calculations. Consistent with these recommendations, the Proposed Revisions would increase transparency by publishing calculated fee ranges, reference points by listing market, and other information.

If confidence intervals are introduced as part of the revised DFM, the CSA is also considering whether they should be published alongside the calculated fee ranges to provide additional context on how these ranges should be interpreted.

We are seeking additional feedback on this aspect of the Proposed Revisions.

Question 1:	**Please discuss any risks of making this information public.**

Question 2:	**Should the revised DFM include confidence intervals as part of the published calculated fee ranges? Please discuss the potential benefits and risks of doing so.**

Question 3:	**Is there additional information that should be published alongside calculated fee ranges? If yes, please discuss the potential benefits and risks of publishing it.**

6.2 DFM Methodology

The Proposed Revisions include methodology changes recommended by the DFM Committee, including annual adjustments to the reference points by listing market, the treatment of non-charging marketplaces, and selected refinements to pre-trade and post-trade metrics. We are also seeking feedback on whether the revised DFM should reflect different methodological factors or parameters for senior and junior listing markets.

6.2.1 Potential consideration of senior and junior listing markets

We are considering whether the revised DFM should continue to apply the same methodology across listing markets, or whether differences between senior and junior listing markets warrant different methodological factors or parameters. Senior and junior listing markets may differ in issuer profile, trading characteristics, liquidity, price levels, and the role each market plays in price discovery and capital formation. These differences may affect how marketplace contributions are measured and how reference points by listing market are maintained over time.

At the same time, introducing different approaches for senior and junior listing markets could increase complexity and may raise questions about consistency, comparability, and the treatment of marketplaces that trade securities listed on more than one type of listing market. The CSA is seeking feedback on whether any distinction should be reflected through separate methodologies, different factors or parameters within a single methodology, or no distinction at all.

Question 4:	**Should the revised DFM continue to apply the same methodology across listing markets, or should different methodological factors or parameters be considered for senior and junior listing markets? Please discuss the potential benefits and risks of such an approach, including any impact on transparency, consistency, comparability, complexity, and the treatment of marketplaces that trade securities listed on more than one type of listing market.**

6.2.2 Annual adjustment of the reference points by listing market

The DFM Committee considered how the reference points by listing market should be updated over time and whether adjustments should reflect general inflation or industry-specific cost trends. Views were divided among the DFM Committee members. Marketplace members supported applying a Consumer Price Index-based (**CPI**) adjustment, citing ongoing increases in personnel and operational costs that are not captured by narrower technology indices.

In contrast, non-marketplace members questioned the appropriateness of standard CPI, arguing that it does not reflect declining technology costs associated with the production and dissemination of market data, and advocated for a technology-based or reduced adjustment. Reflecting these competing considerations, the DFM Committee supported a moderated approach, under which the reference points by listing market would be adjusted by approximately one-half of CPI, subject to periodic review, as a practical compromise between these perspectives.

6.2.3 Treatment of non-charging marketplaces

The DFM Committee also examined how the reference points by listing market should account for marketplaces that elect not to charge RTMD fees. Concerns were raised that non-charging marketplaces could reduce the reference points by listing market over time, potentially lowering calculated fee ranges for other marketplaces and creating incentives for strategic pricing behaviour. At the same time, some DFM Committee members noted that such marketplaces may contribute positively to market efficiency and competition.

To address these issues, the DFM Committee recommended that non-charging marketplaces should be treated as though they were charging for the purposes of the reference points by listing market calculation and fee allocations. The DFM Committee did not, however, recommend the amount that should be used for this purpose or prescribe how that amount should be determined under the DFM.

We are therefore proposing to use an amount equal to the midpoint of the marketplace's calculated fee range for the purposes of the reference point by listing market calculation and related fee allocation. This approach would avoid using a zero fee, as is currently the case for non-charging marketplaces, or an amount at either end of the calculated fee range. Using the midpoint could promote greater stability and predictability in the calculations of the reference points by listing market and could reduce the potential impact of strategic pricing decisions on DFM calculations.

The Proposed Revisions reflect the DFM Committee's recommendation to treat non-charging marketplaces as though they were charging, together with a proposed approach to determining the amount used for that purpose. We are seeking responses to the following questions to understand whether there are any concerns with this approach.

Question 5:	**Should the revised DFM include an annual CPI adjustment to the reference points by listing market based on approximately one-half of CPI? Please discuss the potential benefits and risks of this approach, including whether it appropriately balances inflationary pressures and technology-related efficiencies.**

Question 6:	**Please discuss the potential benefits and risks of treating non-charging marketplaces as though they were charging, including any impact on the stability of the reference points by listing market, marketplace behaviour, competition, and RTMD fee levels.**

6.2.4 Changes to pre-trade and post-trade metrics

At the outset of its review, the DFM Committee considered whether the current set of pre- and post-trade metrics continues to provide an appropriate basis for assessing each marketplace's contribution to price discovery and trading activity. These metrics are central to the DFM framework as they determine marketplace rankings and, ultimately, the allocation of calculated fee ranges. The DFM Committee considered whether refinements were needed to ensure that the methodology continues to reflect evolving market structure and trading behaviour, while remaining practical, robust, and resistant to manipulation.

The DFM Committee's discussion focused on whether certain categories of activities—particularly intentional crosses, opening and closing volume, and odd-lot trades—should be included or excluded from these metrics. While these activities differ in their characteristics and informational content, the DFM Committee generally agreed that the DFM should continue to capture a broad measure of trading activity, subject to targeted refinements where certain inputs may distort the calculation of marketplace contributions and may not appropriately reflect contributions to price discovery.

With respect to intentional crosses, the DFM Committee identified concerns that these transactions may not reflect the same contribution to market-wide price discovery as other executed trades, particularly given their pre-arranged nature. The majority therefore supported excluding intentional crosses from post-trade metrics, while noting that alternative treatments could be explored. By contrast, there was strong support for continuing to include opening and closing volumes, recognizing their important role in price discovery and market transparency.

The DFM Committee also supported expanding post-trade metrics to include odd-lot trading activity given the increasing relevance and informational value of this metric. However, the DFM Committee did not support including odd-lot quotes in pre-trade metrics at this time, reflecting current market structure and data considerations. Taken together, these recommendations from the DFM Committee could improve the

representativeness of the metrics, while maintaining a consistent and operationally practical framework.

The Proposed Revisions incorporate the DFM Committee's recommendations, and we are seeking responses to the following questions to understand whether there are any concerns with this approach.

Question 7:	**Should intentional crosses be excluded from post-trade metrics? Please discuss how this would reflect marketplace contributions to price discovery and trading activity.**

Question 8:	**Please discuss the potential benefits and risks of including opening and closing volume and odd-lot trades in the post-trade metrics, including whether their inclusion would improve the DFM's ability to reflect marketplace contributions to trading activity and price discovery.**

6.2.5 Introduction of confidence intervals for calculated fee ranges

The DFM currently calculates fee ranges by applying two ranking models that assess marketplace contributions using different combinations of pre-trade and post-trade metrics. As a result, the DFM already recognizes that there is no single definitive estimate of a marketplace's contribution to price discovery, liquidity provision, and trading activity. The DFM Committee nevertheless considered whether additional information should be provided regarding the uncertainty associated with calculated fee ranges.

One possible approach would be to calculate and publish confidence intervals in addition to the calculated fee ranges generated by the ranking models. Confidence intervals would not replace the calculated fee ranges. Rather, they would provide additional context regarding the extent to which calculated fee ranges may vary as a result of normal fluctuations in the underlying market data used by the methodology.

The CSA has not identified a preferred approach for calculating confidence intervals and is seeking stakeholder feedback on whether confidence intervals would provide meaningful additional information beyond the calculated fee ranges currently produced by the DFM. The CSA is also seeking feedback on how confidence intervals could be calculated and presented in a manner that improves stakeholders' understanding of the calculated fee ranges, without creating undue complexity.

Question 9:	**If confidence intervals were introduced, what would be the most appropriate approach for calculating and presenting them? What benefits and risks would such an approach create for stakeholders?**

6.3 Implementation – Consideration of a new baseline for a revised DFM

The CSA is seeking feedback on whether the DFM 2 should be implemented using a new baseline, rather than as a continuation of the original. This issue arises because the Proposed Revisions would affect several core components of the original DFM, including the pre-trade and post-trade metrics, the ranking models, the treatment of non-charging marketplaces, and the annual adjustment of the reference points by listing market. These changes may affect the inputs used by the ranking models and the reference points used to generate calculated fee ranges.

The current reference points by listing market were established using the current metrics and ranking models and continuing to rely on them for future calculations may impact the future reference points. A new baseline may provide a more transparent and internally consistent starting point for applying DFM 2.

We are therefore seeking stakeholder feedback on whether a new baseline would appropriately reflect the cumulative impact of the Proposed Revisions and developments in the Canadian equity market since the DFM was formalized. Stakeholders are also invited to identify any transition considerations or unintended consequences that should be considered if a new baseline implementation is adopted.

Question 10:	**Should the revised DFM be implemented as a new baseline rather than as a continuation of the existing DFM? Please discuss the potential benefits and risks of a new baseline implementation, including any transition or market structure considerations.**

Item 7 – Product-specific RTMD fees and potential implications for access and the revised DFM

Recent developments in the Canadian market have included the introduction of product-specific RTMD fees. While Level 1 and Level 2 feeds will continue to include all securities, the introduction of product-specific RTMD fees may, over time, affect how RTMD is consumed and priced. The CSA is using this consultation as an opportunity to seek stakeholder feedback on how product-specific fees may affect access to RTMD and whether they raise concerns in relation to the application of DFM 2.

The CSA recognizes that product-specific RTMD fees and the potential creation of associated feeds could result in greater segmentation of access to RTMD if market participants begin consuming only subsets of marketplace data rather than comprehensive Level 1 or Level 2 feeds. If adopted by multiple marketplaces, this segmentation could increase complexity for market participants and may have implications for market transparency, competition, access to information, and the overall cost of accessing RTMD, including where participants pay for both comprehensive feeds and additional product specific feeds that provides access to subsets of the same information.

The CSA is also considering how fees charged for product-specific RTMD should be assessed for compliance with fair access requirements. A product-specific RTMD fee may not raise significant fair access concerns where consumption remains low and access is provided free of charge. In such circumstances, the product may not warrant assessment under the DFM.

However, where consumption of a product-specific RTMD becomes material and a fee is charged for access, the CSA is considering whether the fee should be assessed through the DFM. Under this approach, the fee would not be assessed as a standalone market data fee. Instead, it would be considered within the marketplace's overall calculated fee range under the DFM. This approach may assist in assessing whether fees for product-specific RTMD are reasonably related to a marketplace's contribution to price discovery, liquidity provision, and trading activity, and therefore do not unreasonably condition or limit access to marketplace services.

The CSA is seeking stakeholder feedback on the potential impacts of RTMD feed segmentation and on the proposed approach to assessing fees for the use of product-specific RTMD under the revised DFM.

Question 11:	**Does the introduction of product-specific RTMD fees constitute a form of RTMD segmentation? If so, does such segmentation raise regulatory concerns and what factors should the CSA consider in assessing those concerns?**

Question 12:	**What impact, if any, could product-specific RTMD feeds have on the ability of dealers, vendors, investors, and other market participants to access RTMD, including any implications for market transparency, price discovery, competition, complexity, or the integrity of access to RTMD?**

Question 13:	**Where a marketplace charges fees for both comprehensive Level 1 or Level 2 RTMD feeds and use of product-specific RTMD, should the fees for product-specific RTMD be assessed within the marketplace's overall calculated fee range under the DFM rather than as standalone fees? Please discuss any benefits, risks, or implementation considerations associated with this approach.**

Item 8 – How to Provide Comments

We welcome your comments on the Proposed Revisions and invite comments on the specific questions. Please provide your comments in writing by **December 27, 2026**.

Submit your comments here: Consultations Archive - Canadian Securities Administrators.
By using the link, your comments will be submitted to the following CSA members:

British Columbia Securities Commission
Alberta Securities Commission
Financial and Consumer Affairs Authority of Saskatchewan
Manitoba Securities Commission
Ontario Securities Commission
Autorité des marchés financiers
Financial and Consumer Services Commission, New Brunswick
Superintendent of Securities, Department of Justice and Public Safety, Prince Edward Island
Nova Scotia Securities Commission
Office of the Superintendent of Securities, Service NL
Northwest Territories Office of the Superintendent of Securities
Office of the Yukon Superintendent of Securities
Superintendent of Securities Nunavut

If you are submitting your comments through the link above, you are also submitting your comments to:

The Secretary
Ontario Securities Commission
20 Queen Street West 22nd Floor Toronto,
Ontario M5H 3S8
Fax: 416-593-2318
Email: comments@osc.ca

Me Philippe Lebel
Corporate Secretary and Executive Director, Legal Affairs
Autorité des marchés financiers
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E-mail: consultation-en-cours@lautorite.qc.ca

We cannot keep submissions confidential because securities legislation in certain provinces requires publication of the written comments received during the comment period. Comments received will be posted on the websites of each of the Alberta Securities Commission at www.asc.ca, the Autorité des marchés financiers at www.lautorite.qc.ca and the Ontario Securities Commission at www.osc.ca. You should not include personal information directly in comments as the comments will be published and publicly available. It is important that you state on whose behalf you are making the submission.

Item 9 - Questions

Please refer your questions to any of the following:

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Appendix A

Data Fee Methodology 2

Appendix A sets out the revised Data Fee Methodology (**DFM 2** or **methodology**). Like the current DFM, the purpose of DFM 2 is to assess whether professional RTMD fees charged by marketplaces in Canada are reasonably related to each marketplace's contribution to price discovery, liquidity provision and trading activity.

DFM 2 Steps

The methodology consists of three steps:

1. Calculation of pre-trade and post-trade metrics
2. Ranking of marketplaces based on the pre-trade and post-trade metrics calculated in step 1
3. Assigning an estimated fee range to each marketplace

The methodology uses the following notations for the pre- and post-trade metrics and ranking methods:

Notation	Description
i	A marketplace regardless of whether transparent or dark, protected or unprotected
m	Total number of marketplaces
j	Securities traded on a marketplace
J	Total securities traded on all marketplaces
t	A trade executed on a marketplace
n	Total trades executed on a marketplace
T	Total trades executed on all marketplaces
d	A trading day
D	All trading days for the period

1. Calculation of pre- and post-trade metrics

Pre-Trade Metrics

a. **Percent of Best Bid and Offer (BBO)**[6] means the percent of the day for which a marketplace had a quote at the national best bid (**BB**) or best offer (**BO**) for a security. This metric rewards marketplaces for being at the BBO for a longer period during the day and is constructed from quote data.

$$\%\boldsymbol{BBO_i} = \frac{BBO_i}{\sum_{i=1}^{m} BBO_i}$$

$$\boldsymbol{BBO_i} = \frac{1}{J}\sum_{\boldsymbol{j=1}}^{\boldsymbol{J}} \frac{Seconds\ at\ BB_j + Seconds\ at\ BO_j}{2 * (6.5 * 60 * 60)} * 100$$

In order to ensure that the addition of each marketplace sums to one, the individual metrics for each marketplace are summed to come up with a market-wide daily percent at the BBO, and each individual marketplace's percentage is then divided by this total to scale the metric to one.

b. **Percent of Best Spread (%Spread)** means the percent of the day that a marketplace is quoting the narrowest spread for a security. This metric tends to reward marketplaces for providing liquidity at both the best bid and the best offer by establishing the narrowest spread in the market.

$$\%\boldsymbol{Spread_i} = \frac{Spread_i}{\sum_{i=1}^{m} Spread_i}$$

$$\%\boldsymbol{Spread_i} = \frac{\boldsymbol{1}}{\boldsymbol{J}}\sum_{\boldsymbol{j=1}}^{\boldsymbol{J}} \frac{Seconds\ at\ tightest\ spread_j}{6.5 * 60 * 60} * \boldsymbol{100}$$

This metric is also constructed from quote level data. In order to ensure that the addition of each marketplace sums to one, the individual metrics for each marketplace are summed to come up with a market-wide daily percent at the narrowest spread, and

[6] The time at BBO could be calculated in fractions of a second, given the rapidity of quoting.

each individual marketplace's percentage is then divided by this total to scale the metric to one.

c. **Dollar-Time (Value) ($Time(value))** means the percent of quoted time-dollar-volume for a marketplace, out of the total time-dollar-volume for the market for the period, when only the best bid and best offer are considered. Each stock is weighted by the value traded in the period of consideration, as described in the weighting "w" below.

$$\$\boldsymbol{Time}(value)_i = \frac{\boldsymbol{Time}(\boldsymbol{v})_{\boldsymbol{i}}}{\sum_{\boldsymbol{i=1}}^{\boldsymbol{m}} \boldsymbol{Time}(\boldsymbol{v})_{\boldsymbol{i}}} \boldsymbol{Time}(\boldsymbol{v})_{\boldsymbol{i}}$$

$$= \frac{\sum_{j=1}^{J}[Price_j * Volume_j * seconds\ at\ BB + Price_j * Volume_j * seconds\ at\ BO] * w_j}{\sum_{j=1}^{J}\sum_{i=1}^{m}\left(Price_j * Volume_j * seconds\ at\ BB + Price_j * Volume_j * seconds\ at\ BO\right) * w_j} * 100$$

$$w_j = \frac{\$Volume_{t,j}}{\sum_{t=1}^{T}\sum_{i=1}^{J}\$Volume_{t,j}}$$

The use of the value weighting places more emphasis on those stocks that trade heavily and less emphasis on stocks that do not trade frequently. At the extreme, a stock that does not trade at all will not be allocated any weight under this metric.

Post-Trade Metrics

a. **Percent of each marketplace's volume (%Volume)** means the volume traded on each marketplace divided by the total volume traded on all marketplaces in the period.

$$\%Volume_i = \frac{Volume_i}{\sum_{i=1}^{m} Volume_i} * 100$$

This metric rewards traded volume and tends to favour those marketplaces that trade in relatively low-priced shares, as it considers only the number of shares traded, not their value. In an extreme scenario, if a marketplace traded only low-priced stocks, this metric would inflate their overall share of the entire market.

b. **Percent of each marketplace's number of trades (%Number)** means the number of trades executed on each marketplace divided by the total number of trades on all marketplaces in the period.

$$\%Number_i = \frac{Number_i}{\sum_{i=1}^{m} Number_i} * 100$$

This metric rewards those marketplaces that have a larger number of trades. This metric could be manipulated by encouraging traders to break their orders up into smaller pieces. If this were done, neither the volume nor the dollar volume traded would change, but the number of trades would increase significantly.

c. **Percent of each marketplace's dollar volume (%$Volume)** means the dollar volume traded on each marketplace divided by the total dollar volume traded on all marketplaces in the period.

$$\%\ \$Volume_i = \frac{\$Volume_i}{\sum_{i=1}^{m} \$Volume_i} * 100$$

$$\$Volume = Price * Volume$$

This metric takes the value of the transactions into account. This tends to avoid the biases that may be present in the volume metric. However, due to the requirement that crosses matched by a dealer be reported to a marketplace, it is possible that a marketplace being measured on this metric could provide incentives (such as trading rebates) to dealers to ensure that crosses are reported on their marketplace. In this way, the marketplace would have a much larger share of dollar volume without necessarily contributing to pre-trade price discovery.

d. **Percent of Square-Root Dollar Volume** means the square-root of the dollar volume of each trade executed on each marketplace divided by the sum of the square-root of dollar volume traded on all marketplaces in the period.

$$\%\sqrt{\$Volume_i} = \frac{\sqrt{\$Volume_{i,t}}}{\sum_{t=1}^{n}\sum_{i=1}^{m}\sqrt{\$Volume_i}} * 100$$

The square-root of dollar volume is individually constructed for each transaction. This metric is not widely published, but it is easily constructed from trade reports. This metric

reduces the importance of larger trades in relation to smaller trades. This can help alleviate the problem of very large crosses inflating a marketplace's contribution to price discovery. This metric has the potential disadvantage that trades in low-priced stocks (on the order of $1 to $2) will not be reduced at all and will consequently be disproportionately represented. If a marketplace were to trade very frequently at these very low dollar values, their contribution to price discovery would be inflated by this metric.

2. Ranking of Marketplaces

Two ranking models are used to estimate each marketplace's contribution to price discovery. Each model combines pre- and post-trade metrics and applies equal 50:50 weighting between those two categories.

Model 1 - is based on the revenue distribution model used by the U.S. SIP.

$$\left[\frac{\%\sqrt{\$\boldsymbol{Volume_i}} + \%\boldsymbol{Number_i}}{\mathbf{2}}\right] * \mathbf{0.5} + \$\boldsymbol{Time(value)_i} * \mathbf{0.5}$$

The pre-trade component uses value-weighted percent of quoted dollar-time. The weighting of this model by the value traded in each security provides a greater emphasis on those stocks that are heavily traded, rewarding marketplaces more for providing liquidity where the majority is consumed.

The post-trade component uses each marketplace's share of square-root dollar volume and number of trades. Both metrics together are assigned a weighting of 50% of the value of the model.

Model 2 - uses post-trade measures of volume traded, number of trades and dollar volume, together with pre-trade measures of time at the best spread and time at the best bid and offer. These pre-trade and post-trade elements are equally weighted in the final index.

$$\left[\frac{\%\text{Volume}_\text{i} + \%\text{Number}_\text{i} + \%\$\text{Volume}_\text{i}}{3}\right] * 0.5 + \left[\frac{\%\text{Spread}_\text{i} + \%\text{BBO}_\text{i}}{2}\right] * 0.5$$

3. Assigning an Estimated Fee Range

After calculating the ranking methods, the methodology is used to assess whether a marketplace's existing or proposed fee is related to its share of trading activity.

The domestic reference takes the data fees charged by each marketplace by listing market and aggregates them into a single fee pool by listing market. That pool is then re-distributed based on the ranking models to produce estimated fees or fee ranges for each marketplace by listing market.