Introduction: Market Microstructure Matters

In recent years, American equity markets have continued to evolve in response to a number of factors. Regulations, technological developments and efforts at improvement of execution quality have led to significant changes in equity market microstructure. Instinet continues to focus on the analysis of trends in microstructure in order to improve our trading solutions.

The quarterly Americas Market Structure Summary issues seek to provide periodic updates on topics such as market concentration, intraday trading profiles, liquidity trends and auction volume participation.

Highlights from this quarter include:

- **United States:**
  - Volumes were stable this quarter marked by select higher volume days driven largely by broader macro events
  - Volatility has consistently declined in the U.S. for large cap securities, but small cap volatility has stayed stable at ~30%
  - Trading costs, however, were stable through the quarter due to volume and volatility effects offsetting each other
• **Canada:**
  - The most concentrated in the Americas region, with just 10% of the highest market cap stocks accounting for over 90% of the traded value in the market
  - Auction volumes for large caps have seen a marked increase, especially in the close, with average close volumes crossing 10% of the daily volume

• **Brazil:**
  - Trading activity increased overall this quarter, marred by a decline in the last week of the month
  - The last hour of trading was distinct from the rest of the region in that despite much higher traded volume, bid/ask spreads during this period were significantly higher as well

• **Mexico:**
  - The most diversified market in the Americas region, with large caps accounting for only 52% of market traded volume
  - The close auction accounted for a substantial proportion of volume for Large Caps (14%), but an insignificant amount for Small Caps (1.9%)
I. Trade Concentration

The charts show the percentage of total securities, of total market capitalization and of total average daily value traded across market capitalization categories for the United States, Canada, Mexico and Brazil. Please see Glossary for more details.

Source: Instinet

Across the region, Canada was the most concentrated market in terms of trading activity and market cap. Over 91% of the market cap and traded value in Canada was concentrated in the mega cap group. On the other hand, Mexico had the greatest diversity of trading activity, with only 52% of traded value attributable to the 10% of securities with the highest market cap.

This distribution of available volume directly affects trading costs, thus making small caps in Canada particularly expensive to trade, even when compared to Mexico and Brazil securities (as highlighted in Section III).
II. **Liquidity Trends: Daily Value Traded, Volatility, Bid/Ask Spread**

The charts above show the 5-day average daily value, 30-day volatility and average quoted spread per week during the quarter.

*Source: Instinet*

Average daily value traded and volatility varied significantly through the quarter, with U.S.-related events amplifying volume fluctuations across the region without a consistent directional trend. Volatility, however, generally declined across the board.

Bid/ask spreads in the United States and Canada declined slightly over the quarter. It is interesting to observe that large cap stocks in Brazil and Mexico have quoted bid/ask spread values broadly similar to those of mid-cap stocks in the United States.
III. METRIC Estimated Impact Costs

This chart indicates the estimated cost of trading an index basket of a specified size using a 1-day VWAP trading style, estimated using Instinet's METRIC model.

Source: Instinet

As expected, U.S. execution costs were the lowest across categories. Large cap costs showed a slight decline due to decreasing volatility. However, trading costs in smaller cap stocks were primarily influenced by fluctuations in volume, as shown in Exhibit II on page 4.

Although volatility in Mexican markets is lower than Brazil, and bid/ask spread numbers are comparable across both markets, the trading costs in Brazil are around half those seen in Mexico. We believe this is largely attributable to larger available trading volume. Both markets saw a general decline in trading costs over the quarter. However, Mexico saw a much larger variation in February and March, in line with changes in traded volume.
IV. Auction Participation

This chart displays the auction volumes as a percentage of daily traded volume, aggregated by country and market capitalization group. Please see Glossary for more details.

Source: Instinet

In terms of auction participation, there is considerable variation between the developed and emerging markets. Across all countries, the close auction clearly dominates in terms of traded volume. However, this proportion is much higher outside the U.S. (upwards of 10% vs. ~5% for large cap).

An interesting pattern exists in markets outside the United States: as market cap reduces, participation in the closing auction declines dramatically. This effect may be attributable to the relatively lower passive investor interest in and the use of portfolio/liquidity optimization techniques to reduce exposure to these categories.
V. Intraday Profiles: Volume, Volatility, Spread

This chart displays continuous volume in ten-minute buckets compared to daily traded volume, bid/ask spread versus mid-price and volatility based on five-minute price returns scaled to a daily basis. These are aggregated by country and price groups. Please see Glossary for more details.

Source: Instinet

We compare the intraday profile variations by price band across countries. Comparing liquidity profiles by price group, high-priced stocks had higher close volumes in the U.S. and Canada. This effect, however, was reversed in Brazil and Mexico.

Bid/ask spreads on higher-priced stocks showed a much wider variation across the trading day. On the other hand, spreads on lower-priced stocks were more stable, constrained due to their tick size.
Glossary

Trade Concentration:

The charts show the percentage of total securities, of total market capitalization and of total average daily value traded across market capitalization categories for the United States, Canada, Mexico and Brazil. Market capitalization categories are defined by the proportion of total number of traded securities in the country, with the 10% highest market capitalization securities in the “Mega” category, the subsequent 10% in the “Large” category, the subsequent 10% in the “Mid” cap category and the remaining 70% classified in the “Small” category.

Liquidity Trends: Daily Value Traded, Volatility, Bid/Ask Spread

The charts below show the average daily value, 30-day volatility and average quoted spread per week. Average daily value is calculated across the prior five trading days on a weekly basis. The chart represents the cumulative change in average daily traded compared to the first week of the quarter. Volatility is calculated weekly as the 30-day close-to-close volatility. These values are aggregated across market capitalization categories and countries using index weights to calculate averages. We use the following indices to represent large, mid and small cap categories per country:

<table>
<thead>
<tr>
<th>Country</th>
<th>Market Cap Category</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Large Cap</td>
<td>S&amp;P 500</td>
</tr>
<tr>
<td>US</td>
<td>Mid Cap</td>
<td>S&amp;P Midcap 400</td>
</tr>
<tr>
<td>US</td>
<td>Small Cap</td>
<td>S&amp;P Smallcap 600</td>
</tr>
<tr>
<td>Canada</td>
<td>Large Cap</td>
<td>S&amp;P/TSX Composite Index</td>
</tr>
<tr>
<td>Canada</td>
<td>Small Cap</td>
<td>S&amp;P/TSX SmallCap Index</td>
</tr>
<tr>
<td>Mexico</td>
<td>Large Cap</td>
<td>Mexican Bolsa IPC Index</td>
</tr>
<tr>
<td>Brazil</td>
<td>Large Cap</td>
<td>Ibovespa Brasil Index</td>
</tr>
</tbody>
</table>

Liquidity Trends: METRIC Estimated Impact Costs for $100m basket

This chart indicates the estimated cost of trading a basket composed of the constituents of an index of a pre-specified size, using an open-to-close VWAP trading style over one day, computed using Instinet’s METRIC model. This cost includes the market impact and spread cost. The primary inputs into this model include available volume, bid/ask spread and volatility. We use the following basket sizes to compute estimated impact costs.
<table>
<thead>
<tr>
<th>Country</th>
<th>Market Cap Category</th>
<th>Basket Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Large Cap</td>
<td>USD 100 million</td>
</tr>
<tr>
<td>US</td>
<td>Mid Cap</td>
<td>USD 100 million</td>
</tr>
<tr>
<td>US</td>
<td>Small Cap</td>
<td>USD 100 million</td>
</tr>
<tr>
<td>Canada</td>
<td>Large Cap</td>
<td>USD 10 million</td>
</tr>
<tr>
<td>Canada</td>
<td>Small Cap</td>
<td>USD 10 million</td>
</tr>
<tr>
<td>Mexico</td>
<td>Large Cap</td>
<td>USD 10 million</td>
</tr>
<tr>
<td>Brazil</td>
<td>Large Cap</td>
<td>USD 10 million</td>
</tr>
</tbody>
</table>

METRIC, the Model-Estimated TRade Impact Cost model, provides a quantitative approach to estimate the execution costs and associate risks given the pre-trade inputs. This model was developed from a combination of empirical studies and theoretical derivation. It is adaptive to trading strategy and is intraday and multi-day aware. It is available via Instinet’s analytics tools including TradeSpex and Indigo, and can also be delivered as cost curve data files or as automated execution cost reports as needed.

**Auction Participation:**

This chart displays the auction volumes as a percentage of daily traded volume, aggregated by country and liquidity group. The aggregation is performed using an average weighted by the daily traded value over the past 20 days. The “Large” category collectively accounts for 50% of the country’s traded value, while the “Mid” and “Small” categories each account for the subsequent 25%.

**Intraday Profiles: Volume, Volatility, Spread**

This chart shows a breakdown of intraday volume, volatility and effective spread profiles during the continuous trading session, by country and stock price. These charts do not include open and close data. We use the following indices to represent the securities in each country:

<table>
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<tbody>
<tr>
<td>US</td>
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<tr>
<td>Brazil</td>
<td>Ibovespa Brasil Index</td>
</tr>
</tbody>
</table>
We use the median price of the index constituents to determine the “high price” and “low price” categories. Aggregations within groups are weighted by average daily traded value. Volume profiles are displayed as percentage volume in ten-minute buckets. Volatility is based on five-minute price returns and expressed in daily percentage point terms. Bid/ask spread is shown as a ratio to the mid-price in basis points.
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