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Auction Volume Report: Americas

Tethys Auction Volume Report is an independent analysis of auctions in global equity markets. This report includes current and historical auction data. It also includes factor cross-section analysis. The report features a subset of the data and analysis that contributes to the success of our award-winning settlement price benchmark **ECLOS** algorithm.

For the purpose of this report, the phrase 'auction' refers to both auction and cross based market open and close mechanisms. The term "auction volume %" is the auction volume as a percentage of total daily volume.

Auction Volume % = Auction volume on the primary exchange / Total traded volume across all venues

This report utilizes both the straight median and the notional weighted average in measuring auction volume. The difference provides an insight into the auction participation divergence in the liquidity spectrum. To manage the noise of the data, we filter the equities by putting the minimum median auction volume of 500 shares and 1,000 shares for opening and closing auction, respectively.

This report covers major listing exchanges in the Americas. Table 1 below presents the current six-month straight median and notional weighted auction data.

	Daily Median Closing Auction Volume % (Changes)*	Daily Notional Weighted Closing Auction Volume % (Changes)	Daily Median Opening Auction Volume % (Changes)	Daily Notional Weighted Opening Auction Volume % (Changes)
BSP (BRAZIL)	7.94% -0.87%	12.82% -0.94%	0.38% -0.00%	0.62% -0.04%
TOR 1 (CANADA)	10.67% +0.32%	33.00% -0.49%	0.54% +0.01%	2.75% -0.36%
TOR 2 (CANADA)	5.20% +0.14%	21.03% -1.24%	0.66% +0.04%	1.94% -0.59%
TSX (CANADA)	0.58% +0.23%	2.49% +0.60%	1.10% +0.01%	1.61% -0.11%
SGO (CHILE)	11.05% +1.10%	15.38% +0.03%	0.11% -0.03%	0.23% -0.04%
MEX (MEXICO)	9.86% -0.21%	28.35% +0.02%	0.01% +0.01%	0.04% -0.02%
ARCA (US)	0.70% -0.05%	2.97% +0.23%	1.32% +0.08%	0.68% +0.09%
AMEX (US)	2.20% -0.23%	4.80% -1.03%	1.08% +0.17%	1.22% -0.06%
BATS (US)	0.61% -0.08%	2.10% -0.06%	1.27% +0.09%	0.94% -0.02%
NYSE (US)	12.48% -0.42%	14.18% -0.64%	0.87% +0.03%	1.25% +0.04%
NSDQ (US)	10.08% -0.84%	9.31% +0.03%	0.79% +0.03%	0.99% +0.05%

* The term "Daily Auction Volume %" denotes the 4 auction volume % metrics presented in Table 1.
* Change in Daily Auction Volume % = Daily Auction Volume % of the past month – Daily Auction Volume % of the 6 months before the past month.
* TOR 1 includes Interlisted stocks with TOR (Toronto Stock Exchange) as the primary exchange and TOR 2 includes Non-Interlisted stocks with TOR as the primary exchange.

Closing Auction Volume % Trend by Country

We use two metrics to demonstrate the evolution of auction volume over time: weekly notional weighted average closing auction volume % and weekly median closing auction volume %. The first metric measures the average auction volume % of the entire country or exchange symbol universe on weekly basis with the value being weighted by each security's daily notional traded value (definition is on page 6). The latter calculates the median auction volume % of entire country or exchange symbol universe on weekly basis
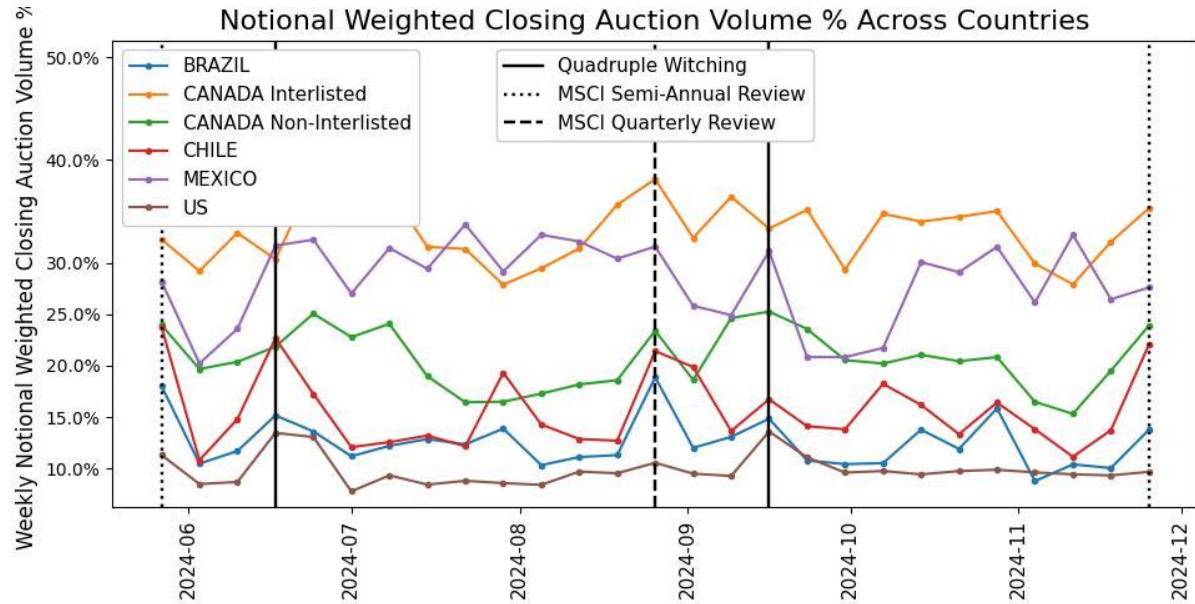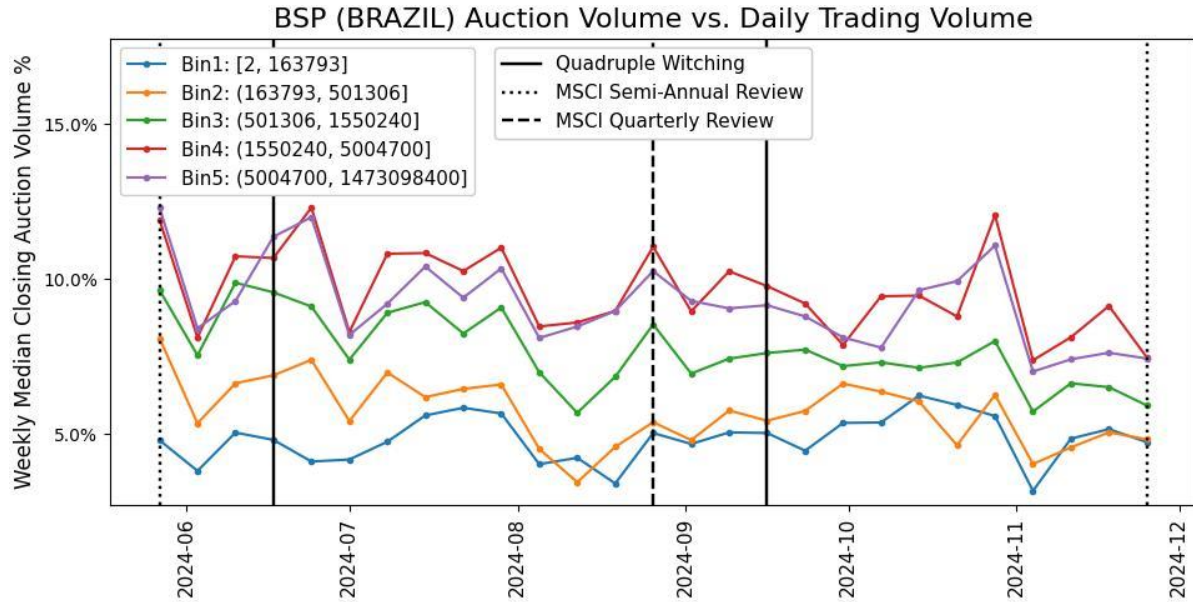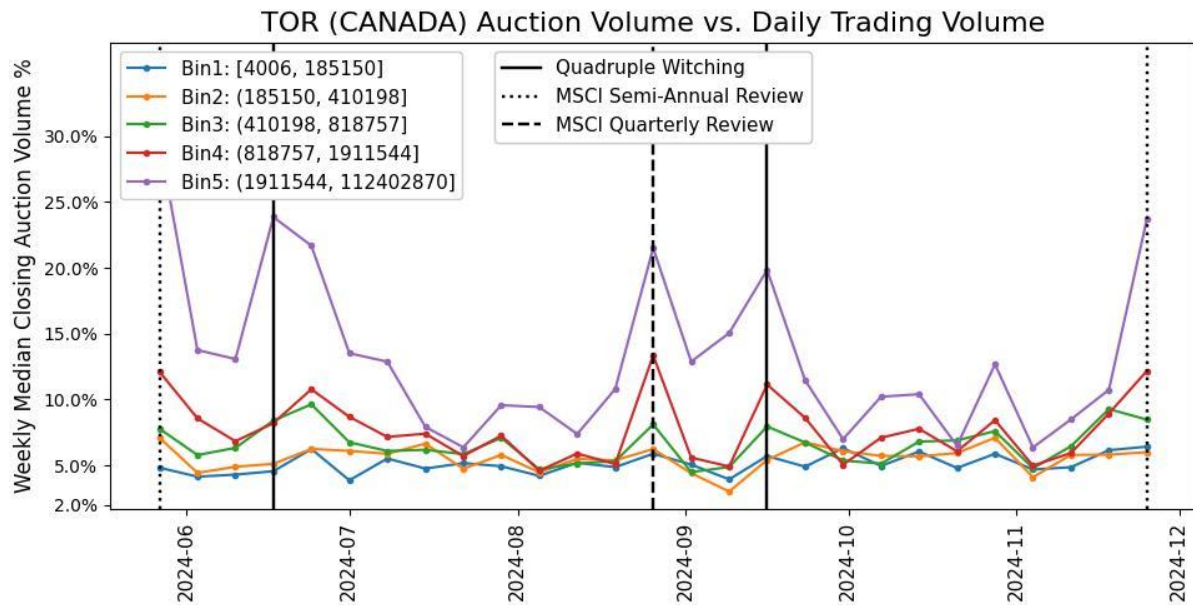

Figure 1
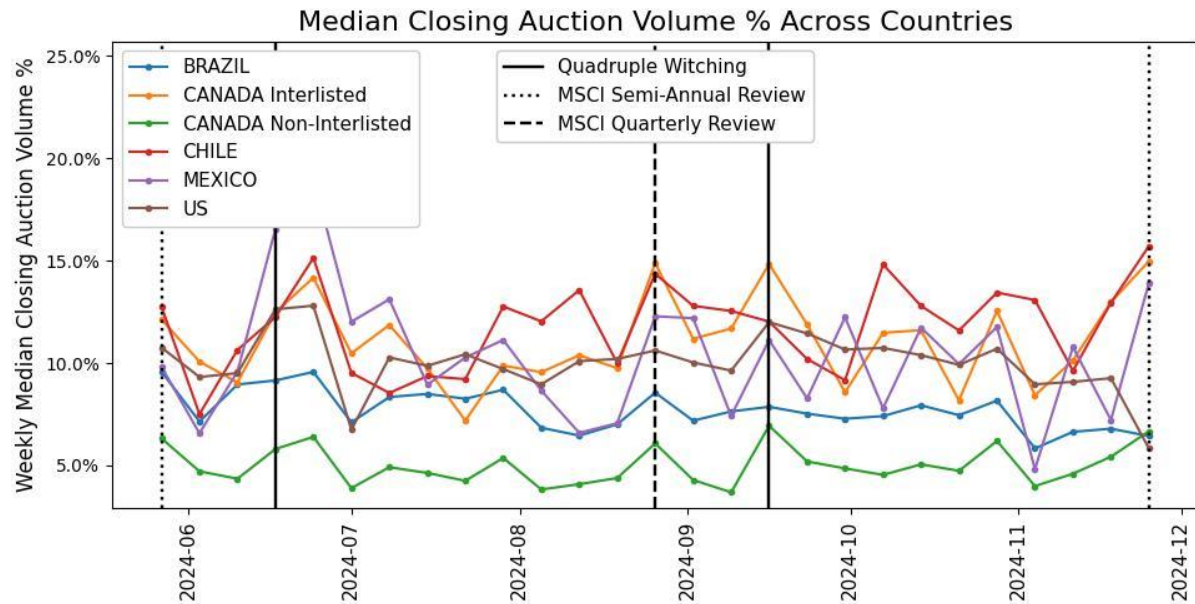
Figure 2

2

Closing Auction Volume % Trend by Exchange
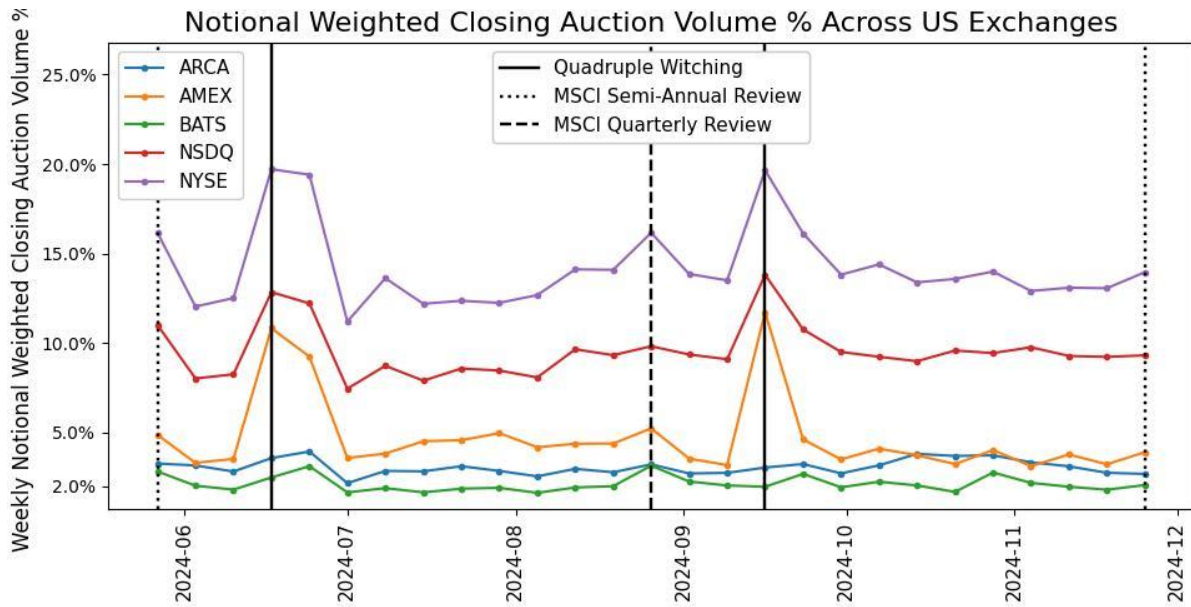
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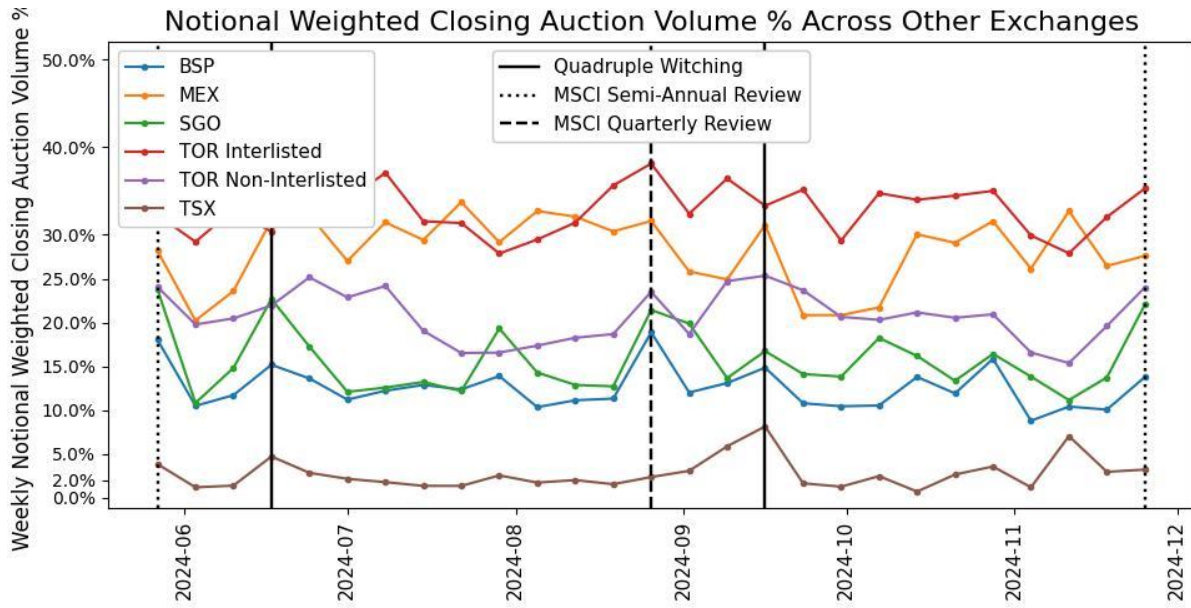
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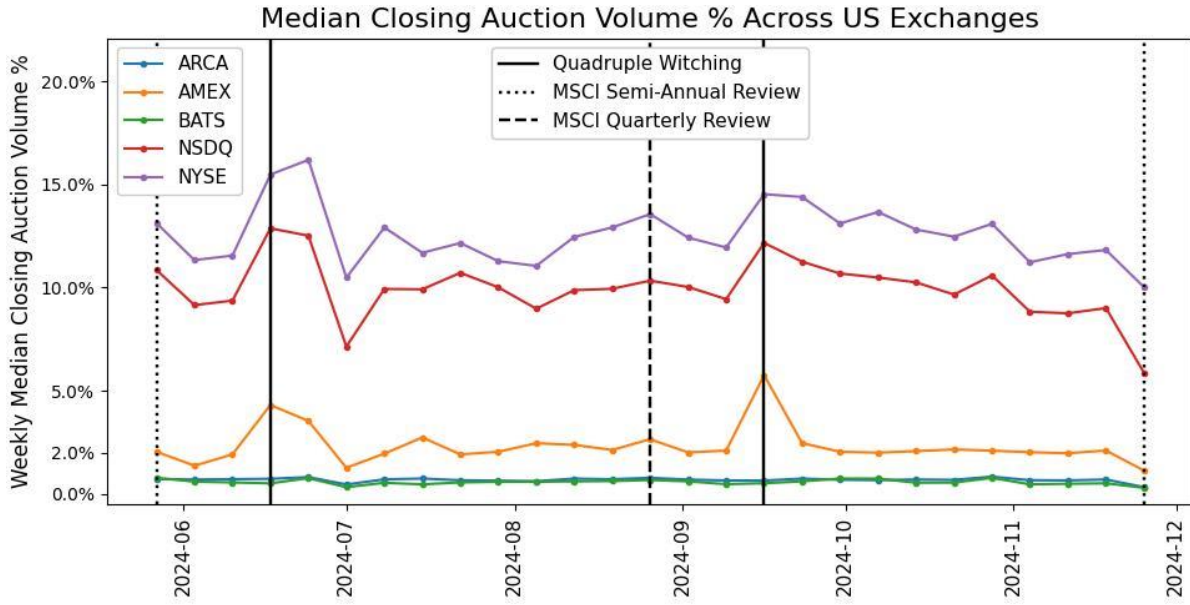
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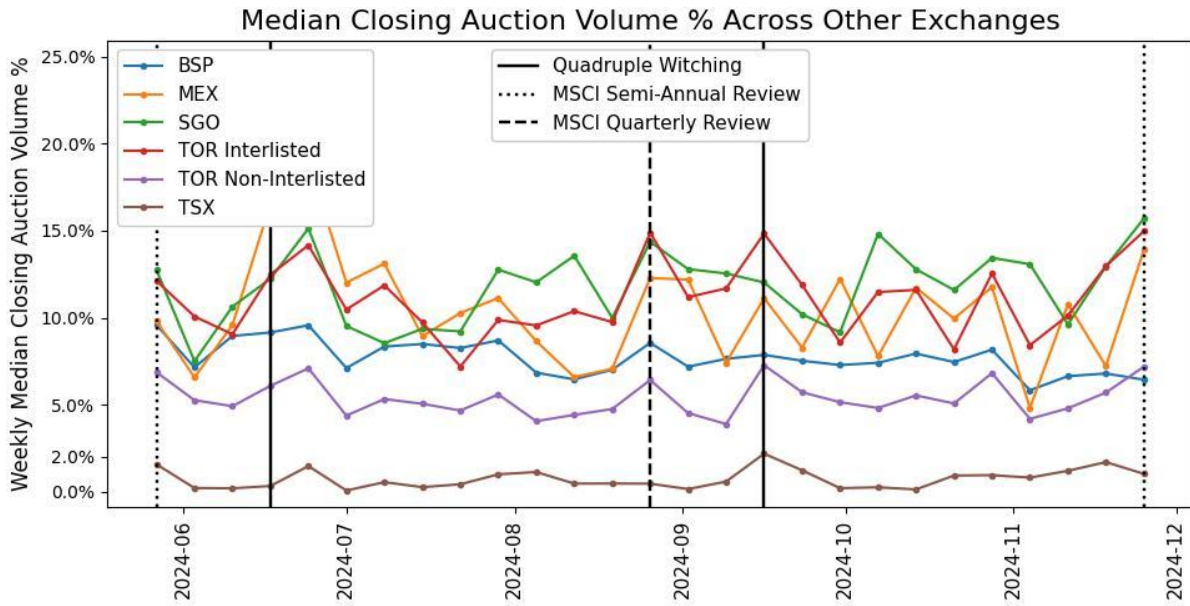
Figure 6

Summary

- Closing Auction: On notional-traded basis, the Brazilian Bovespa, the Mexican BMV, the Santiago Stock Exchange, the Nasdaq Stock Exchange, the New York Stock Exchange and the Toronto Stock Exchange stand out for the high level of closing auction participation. BATS and ARCA have the lowest level of closing auction participation on notional-traded basis among American Exchanges, since they are dominated by ETF listings, and ETFs usually have low auction volume % participation, except for low liquidity ETFs and certain US-listed Asian and European focused funds.

As expected, the median Auction Volume % data is significantly more stable than the notional weighted data.

It is notable that quadruple witching, shown on our time series graphs, plays an important role across major exchanges in closing auctions. We will publish a separate report studying the influence of quadruple witching on the opening auctions.

- Price Level is the factor with highest explanatory power in the list of factors we presented in this report.
- Daily Price Range has a negative correlation with Auction Volume %. This is explicable, as spreads tend to be higher for these securities and imbalances will have proportionately higher impact.
- Daily Trading Volume also exhibits negative correlation with Auction Volume %, since it is positively correlated to Daily Price Range.
- Trade size fragmentation has an interestingly negative correlation with Auction Volume %, which we will offer reasons for in a future report. There is an intriguing angle to be explored.

It is also interesting to note that

- NYSE and Nasdaq consistently show high levels of closing auction participation across all liquidity bins (Bin1 to Bin5), as evident in Figures 13, 14, 37, and 38. The spread between low-liquidity securities (Bin1) and high-liquidity securities (Bin5) is relatively narrow, indicating uniform engagement across the liquidity spectrum.
- MSCI Semi-Annual Reviews has lead to increased auction volumes and closing auction participation, reflecting concentrated liquidity during rebalancing periods.
- NYSE: Auction volumes as a percentage of daily trading volumes (Figure 13) are steady across the spectrum but decline slightly in Bin1 during rebalancing events. Auction participation as a percentage of notional value traded (Figure 37) is more pronounced in higher liquidity bins (Bin4 and Bin5).
- Nasdaq exhibits a similar trend, along with slight dips in low-liquidity bins during high-volume events. Auction participation as a percentage of notional value (Figure 38) is consistent across all bins but peaks marginally for high-liquidity securities (Bin5).
- Both exchanges show minimal variability in auction participation across liquidity bins, unlike markets like the Toronto Stock Exchange or Bovespa, where significant disparities exist. This uniformity highlights the efficiency of NYSE and Nasdaq auction mechanisms, attracting diverse liquidity participants. The efficiency of auction mechanisms in NYSE and Nasdaq ensures widespread participation across liquidity bins, as evidenced by the high auction-to-trading volume ratios.

This contrasts with markets like Mexico's BMV, where auction mechanisms are less transparent and underutilized. The Mexican BMV market offers a closing cross instead of an auction, which is complicated to navigate for investors. There is selective information dissemination and non-transparent lockups. We are hopeful that launch of competitor BIVA exchange will serve as a catalyst for the BMV to improve its closing auction mechanism.

Exchange and Factor Description

The primary listing exchanges covered in our report are listed below. These exchanges encompass a majority of the auction volume in North America and LATAM. Tethys offers execution algorithms for all the countries below as well as Colombia, which will be included in upcoming reports.

Brazil

- o   BSP: Brazilian Stock Exchange (BOVESPA)

Canada

- o   TOR: Toronto Stock Exchange
- o   TSX: Toronto Stock Exchange Venture

Chile

- o   SGO: Santiago Stock Exchange

Mexico

- o   MEX: Mexican Stock Exchange (BMV)

United States

- o   ARCA: NYSE ARCA
- o   AMEX: NYSE American
- o   BATS: BATS Exchange
- o   NYSE: New York Stock Exchange
- o   NSDQ: NASDAQ

For brevity we only include commonly known trading related factors to analyze closing auction volumes. Fundamental factors like market capitalization are not included in this report. Tethys maintains an extensive list of factors in context of auctions. Please note that the factors are not mutually orthogonal (i.e. not completely independent of each other). The factors presented are:

- Daily Trading Volume
- Price Level = 0.5 * (Open Price + Closing Auction Price)
- Daily Price Range = Ln (High/Low), where Ln is the natural logarithm
- Notional Value Traded = Daily Trading Volume * Price Level

Average Trade Size = Daily Trading Volume / Number of Trades

Closing Auction Volume in Multi-Dimensional Factor Space

Closing Auction Volume is affected by various factors. Analyzing Closing Auction Volume % with respect to each factor conveys an understanding of the closing auction microstructure behavior for each exchange. Please note that the factors are not mutually independent.

We divided the respective security universe into 5 bins with respect to each factor.

For example, we sort the securities into 5 bins by daily trading volume, where Bin 1 contains the 20% of the securities with the lowest daily trading volume, and Bin 5 keeps the 20% with the highest daily trading volume. Straight median and notional weighted average closing auction volume % are then calculated on a weekly basis. Note that we only include securities that have median close auction volume > 1000 shares.

The chart below summarizes the overall correlation between closing auction volume % and each factor by exchange. The plus "+" indicates positive correlation and minus "-" negative correlation. A blank cell indicates that we can't validate that there is a correlation by using the binning method.

Table 2

Factors / Exchanges	Daily Trading Volume	Price Level	Daily Price Range	Notional Value Traded	Average Trade Size
BSP (Brazil)				+	
TOR (Canada)		+	-	+	
MEX (Mexico)					
ARCA (US)		+			
AMEX (US)					-
BATS (US)	-				
NYSE (US)		+			-
NSDQ (US)	-	+			-

Correlation between Closing Auction Volume % and Factors

I. Weekly Median Closing Auction Volume % Binned by Daily Trading Volume

Figure 7

Figure 8

Equities▪Futures▪Options▪F/X

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Figure 9

Figure 10

Equities ▪ Futures ▪ Options ▪ F/X
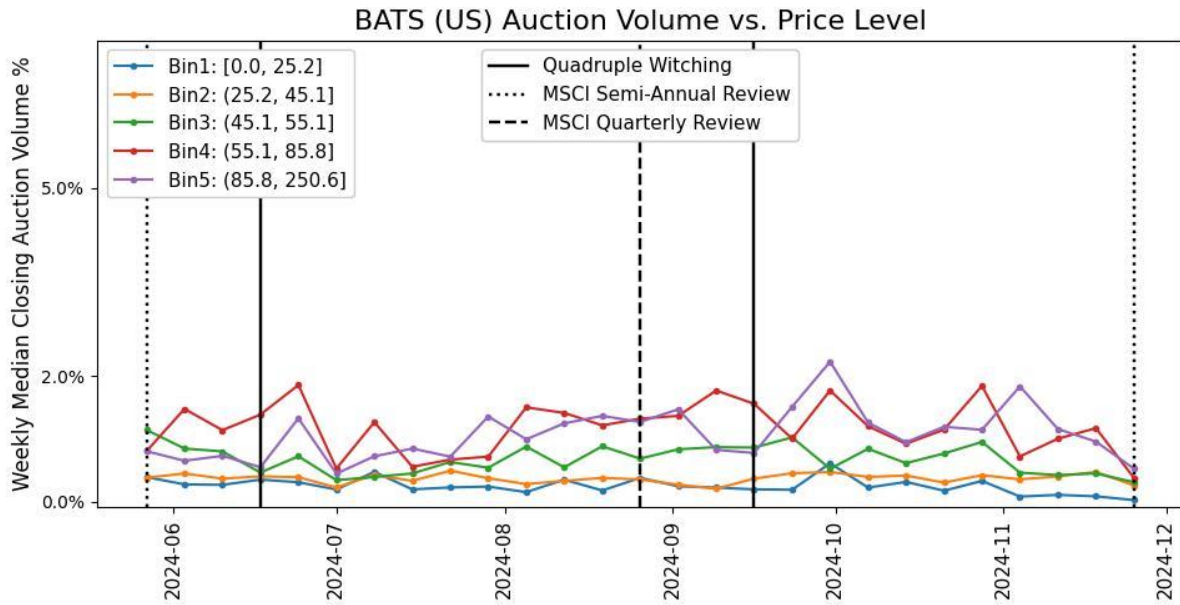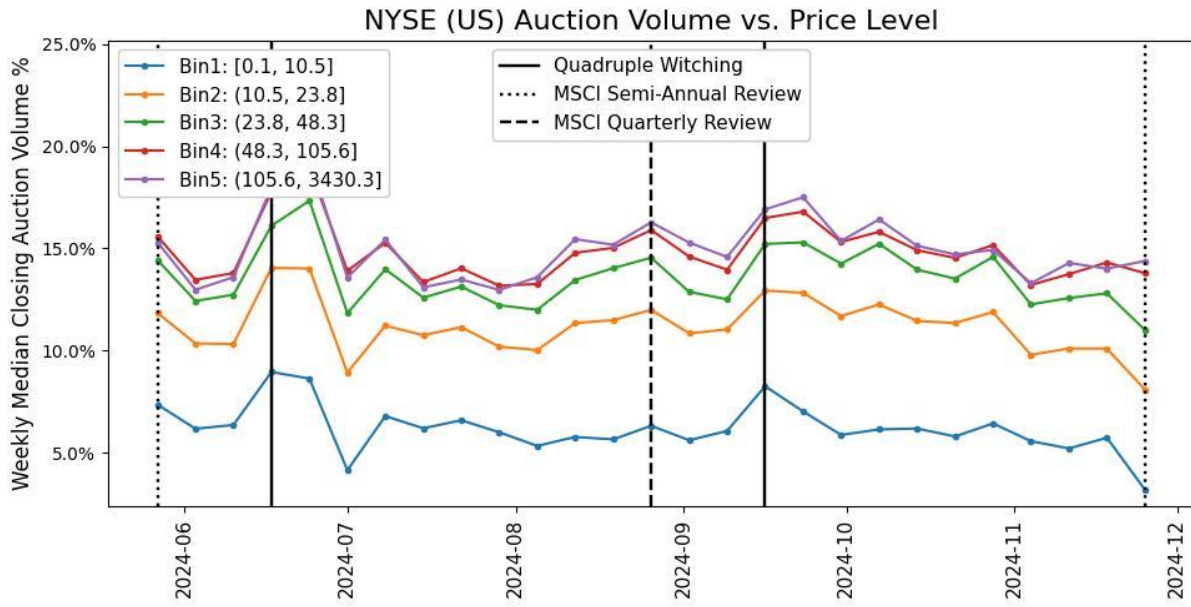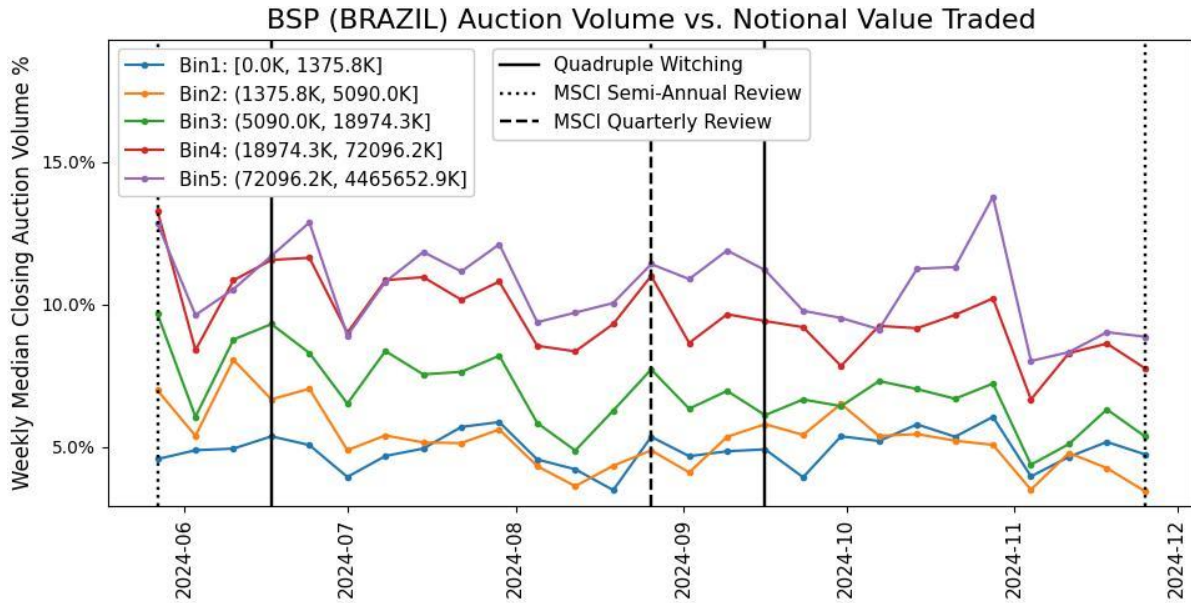
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Optimal Execution
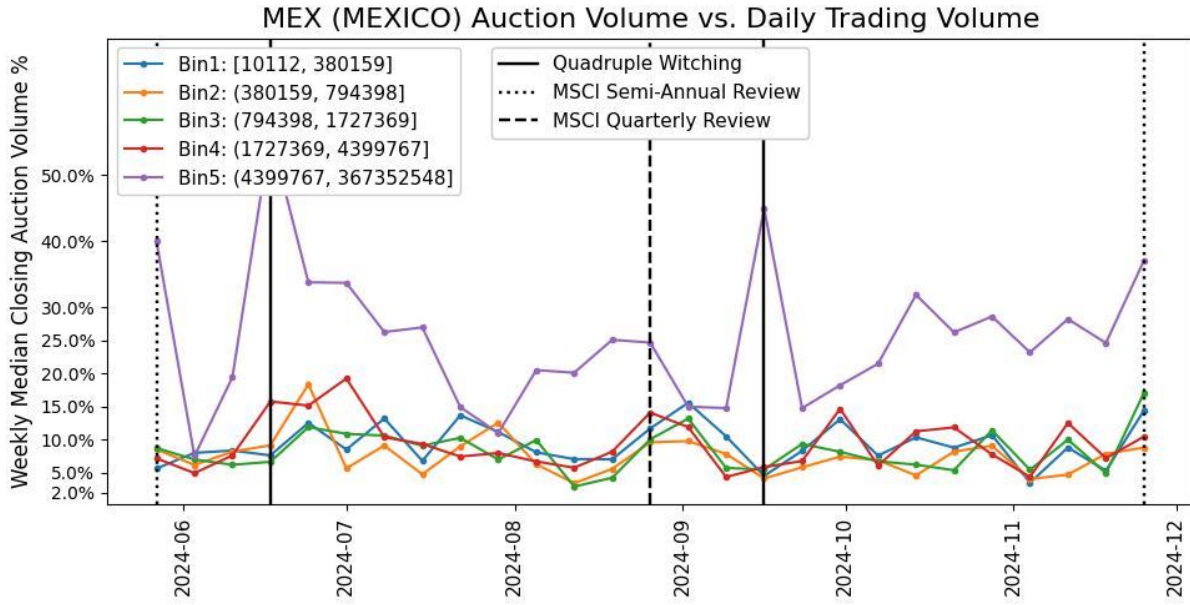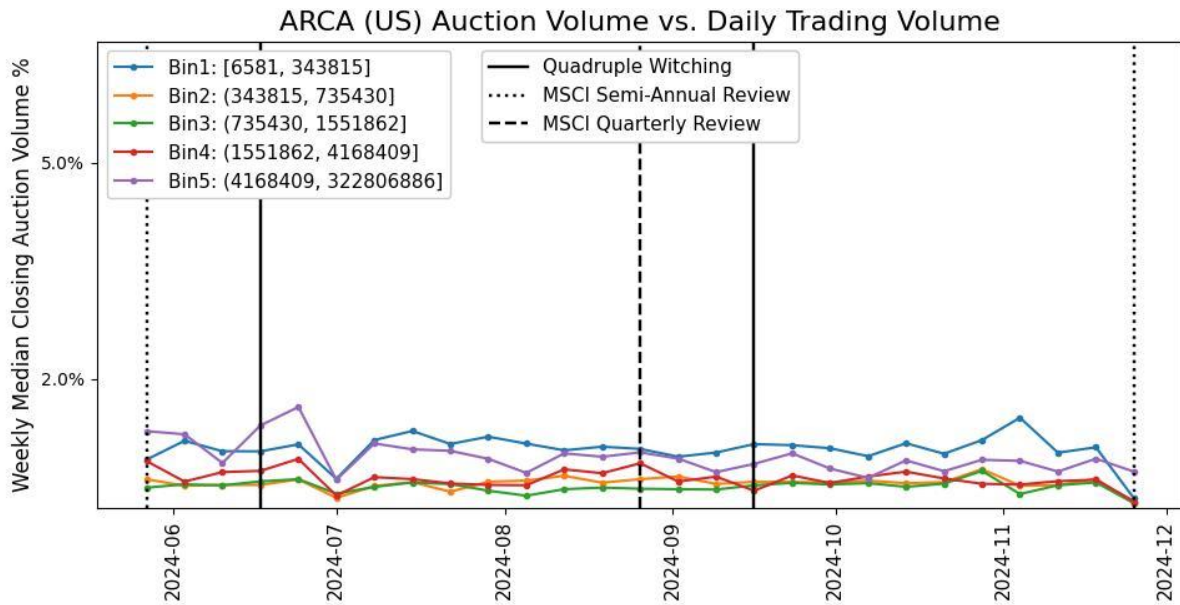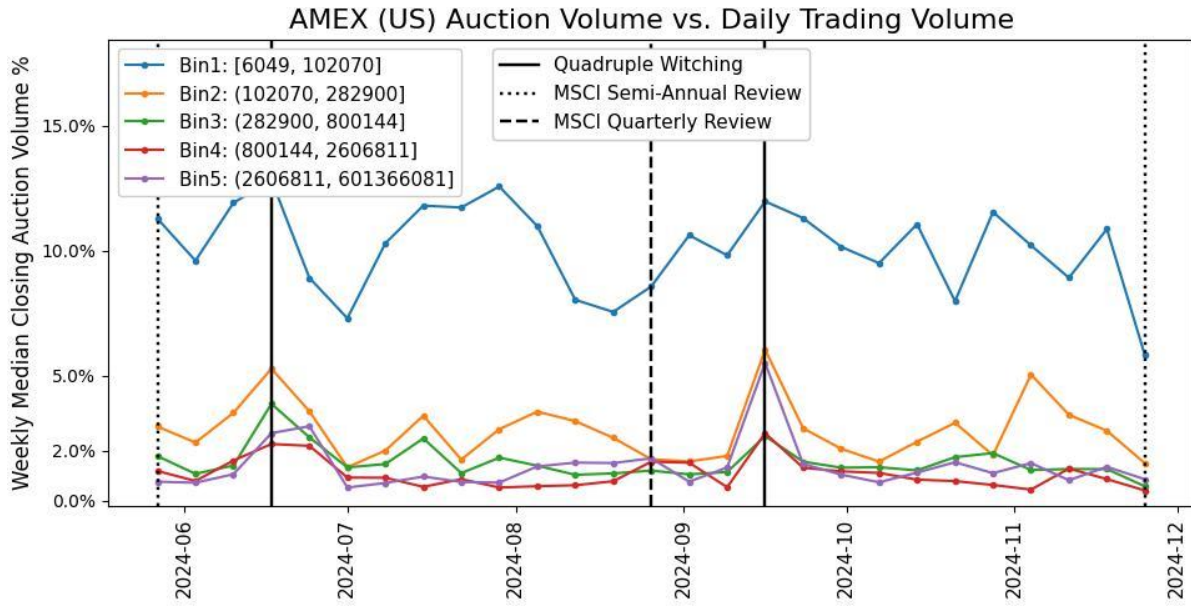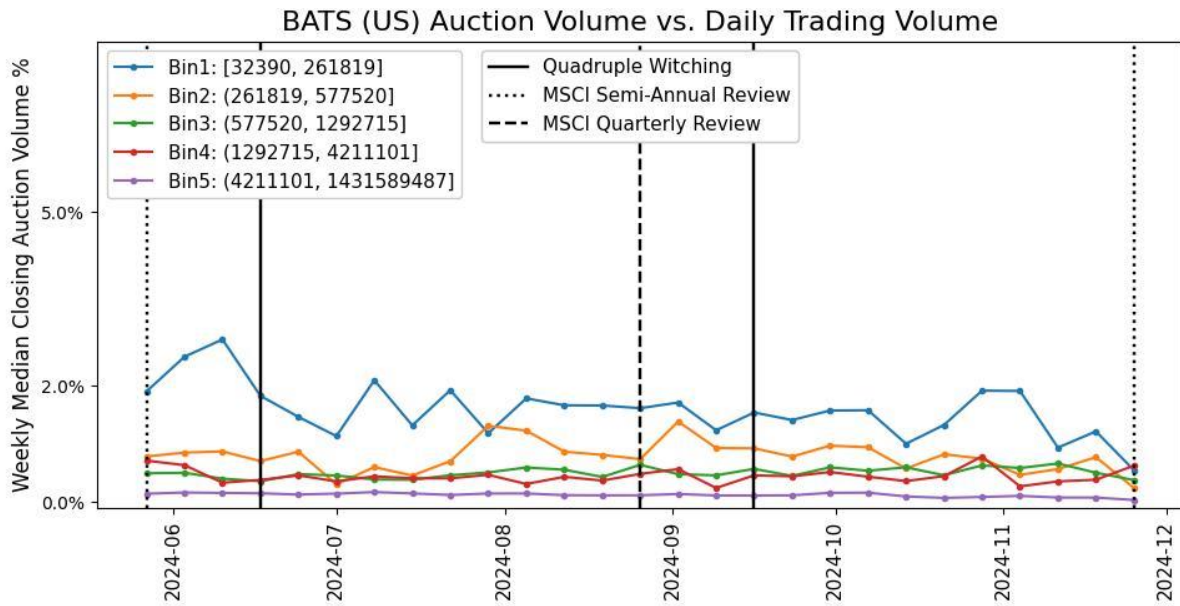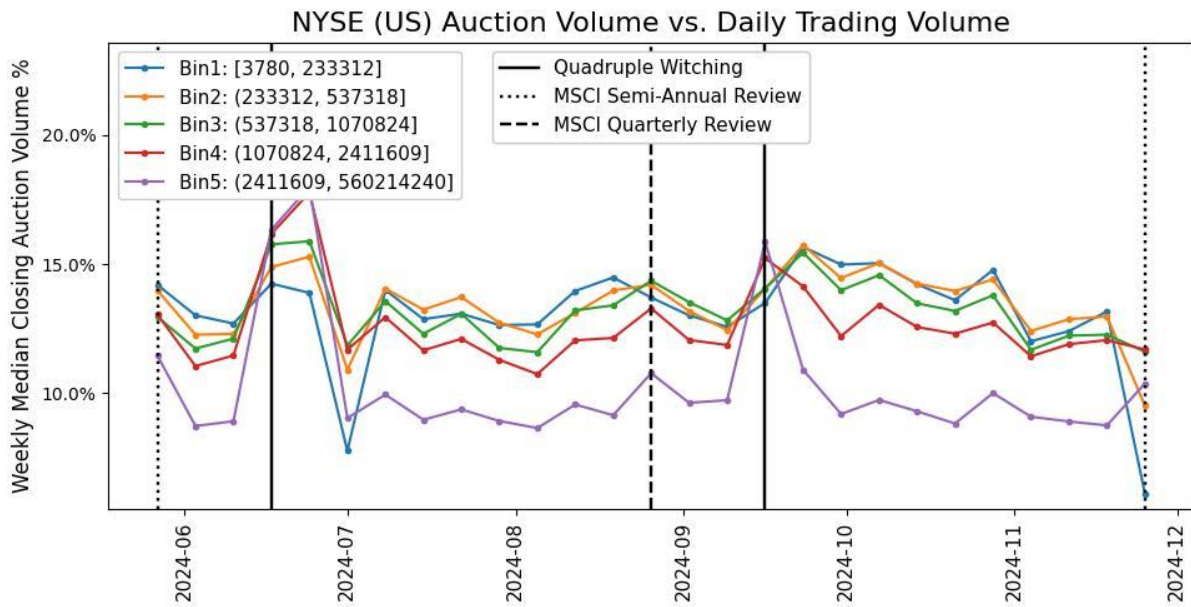
Figure 11

Figure 12

Figure 13
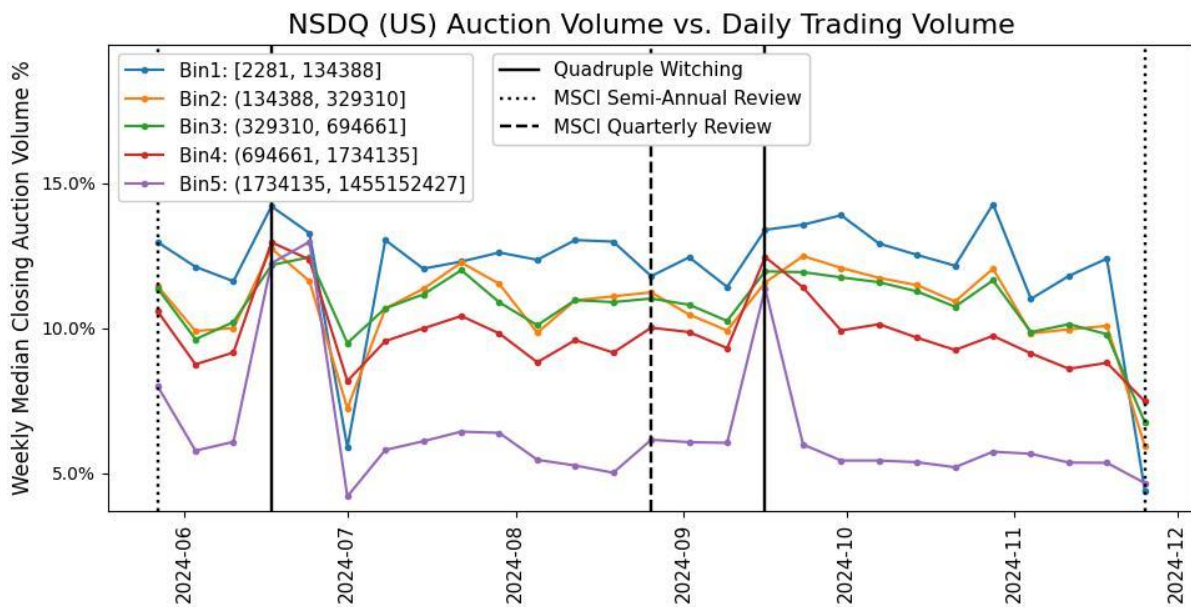
Figure 14

II. Weekly Median Closing Auction Volume % Binned by Price Level
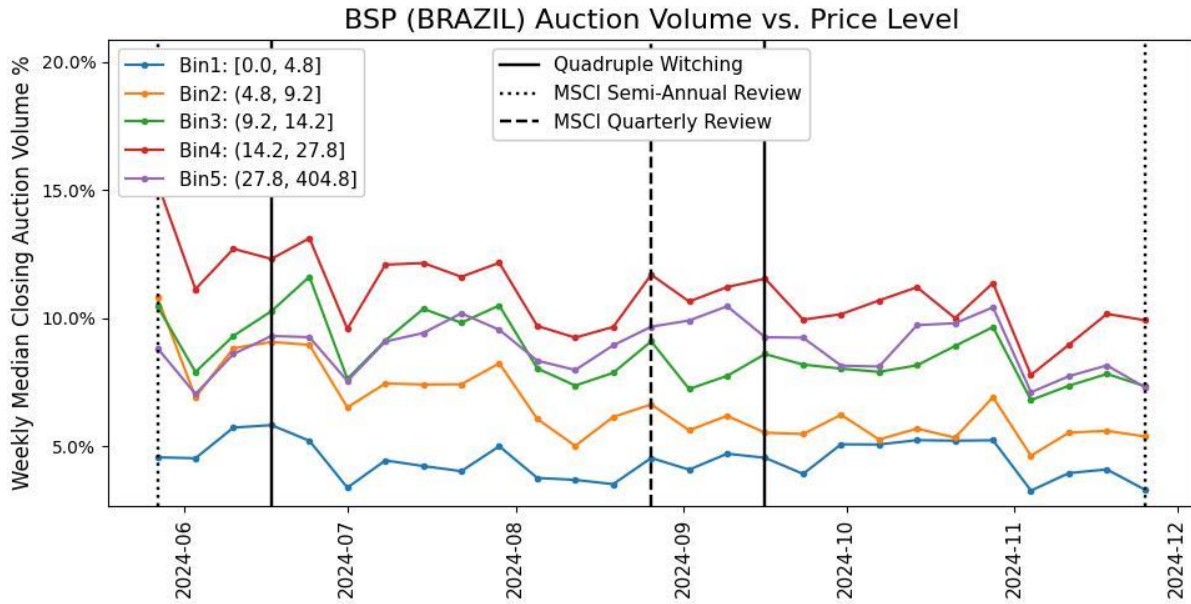
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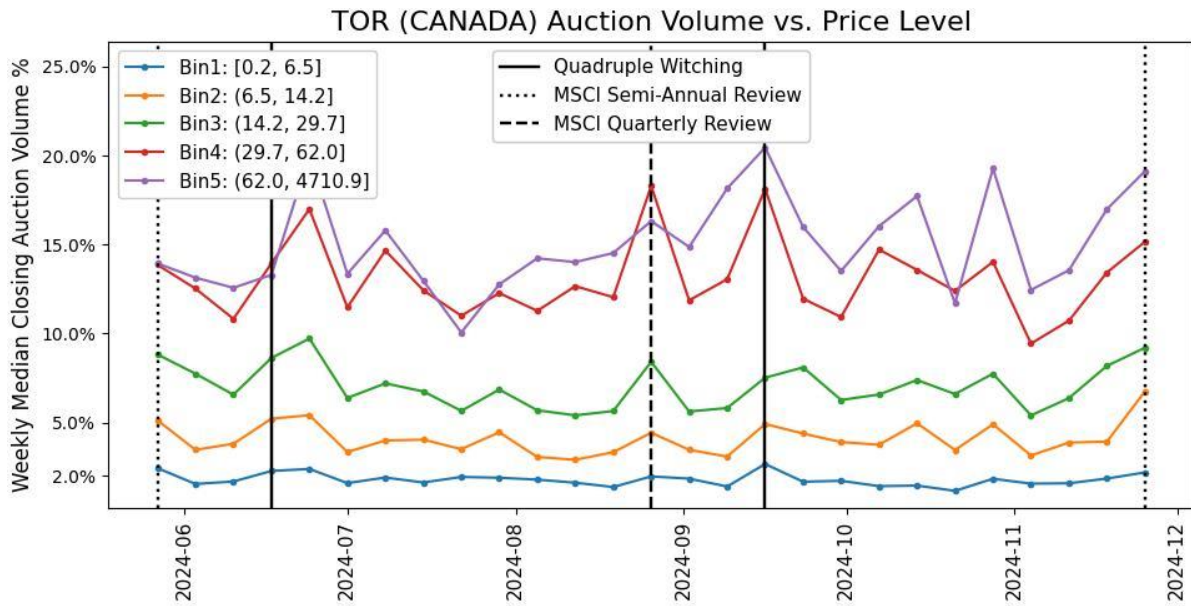
Figure 16

Figure 17

Figure 18

AMEX (US) Auction Volume vs. Price Level

Figure 19

BATS (US) Auction Volume vs. Price Level

Figure 20

14
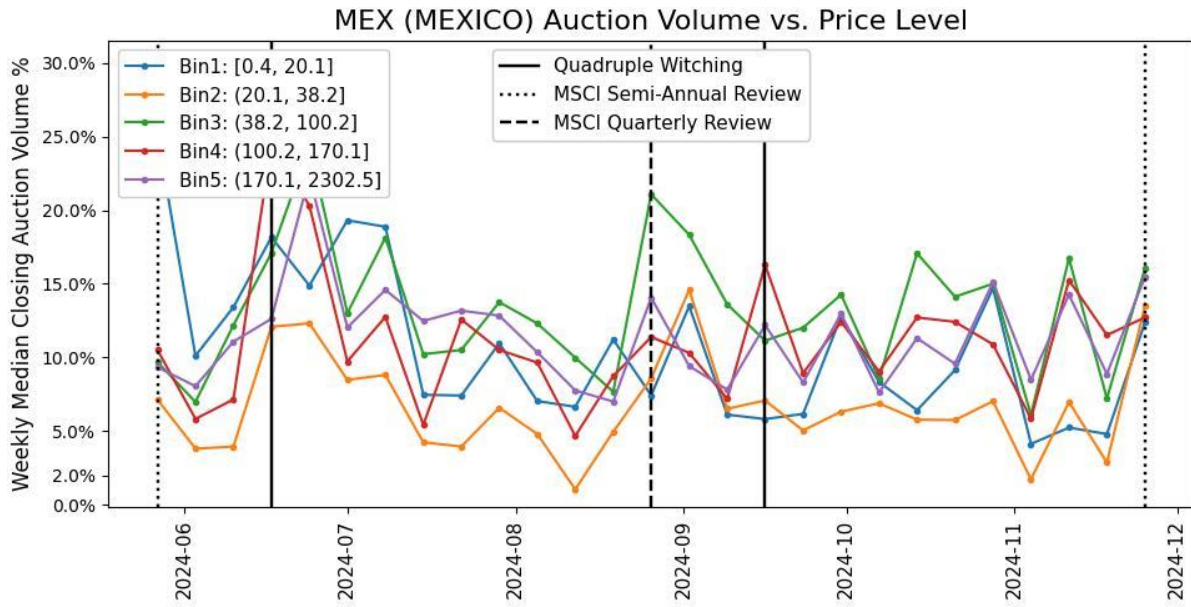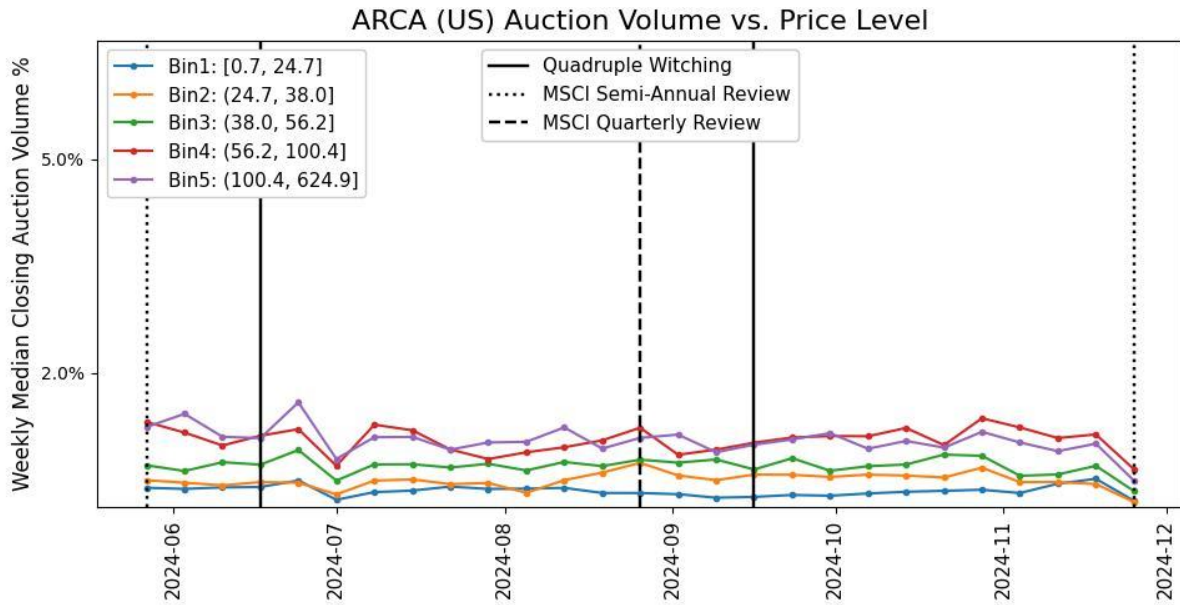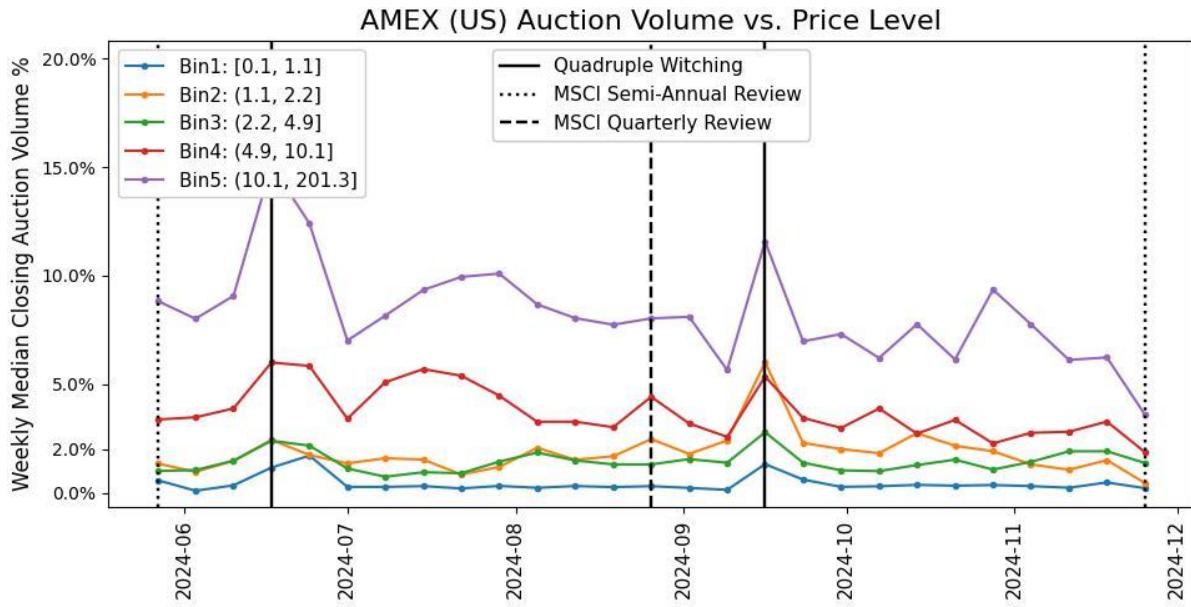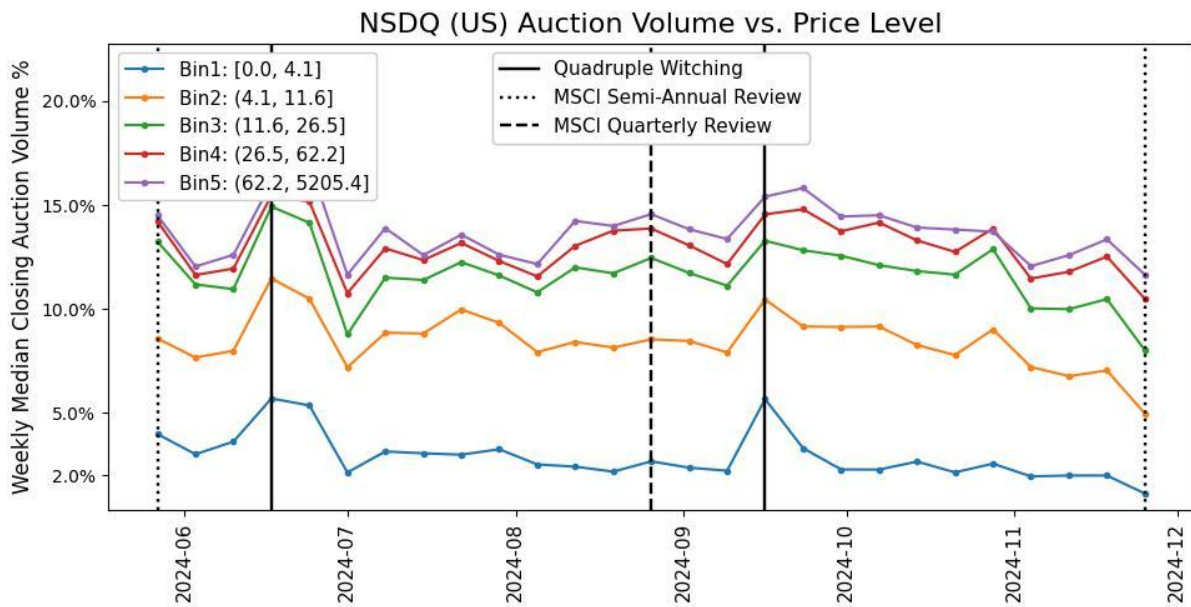
Figure 21

Figure 22

III. Weekly Median Closing Auction Volume % Binned by Daily Price Range
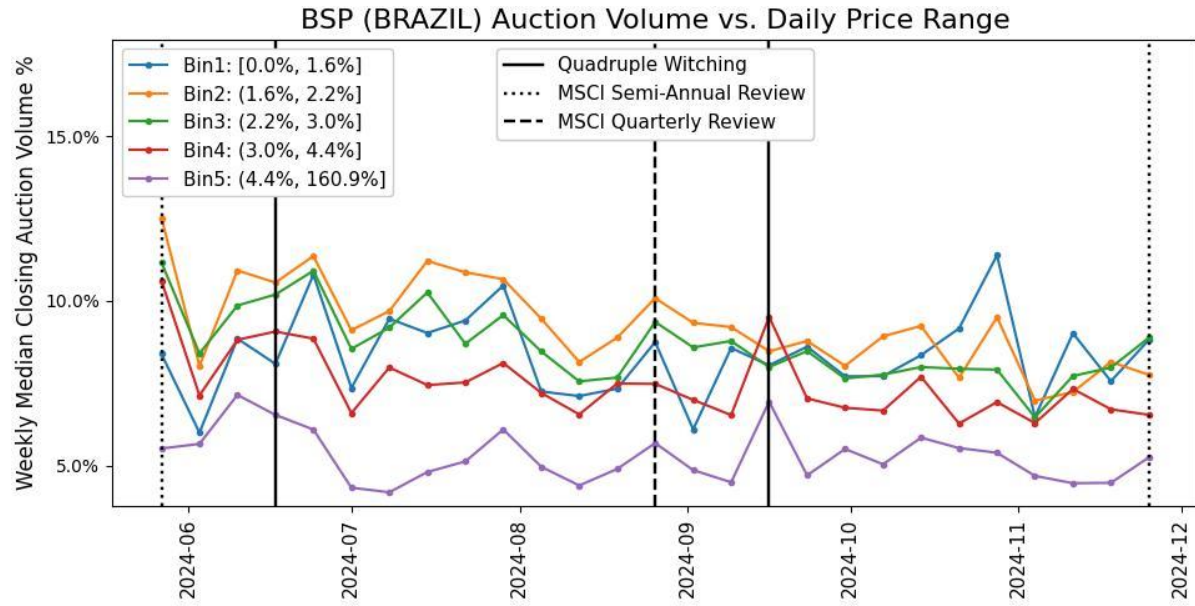
Figure 23

Figure 24

Equities▪Futures▪Options▪F/X

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Figure 25

Figure 26

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AMEX (US) Auction Volume vs. Daily Price Range

Figure 27

BATS (US) Auction Volume vs. Daily Price Range

Figure 28

NYSE (US) Auction Volume vs. Daily Price Range

Figure 29

NSDQ (US) Auction Volume vs. Daily Price Range

Figure 30

19
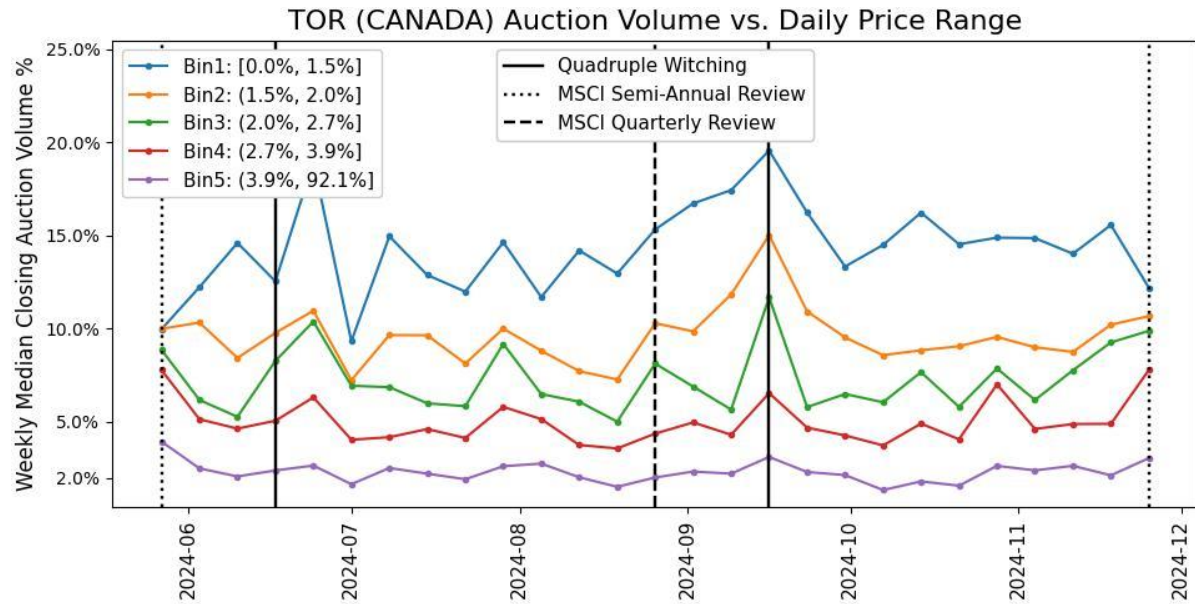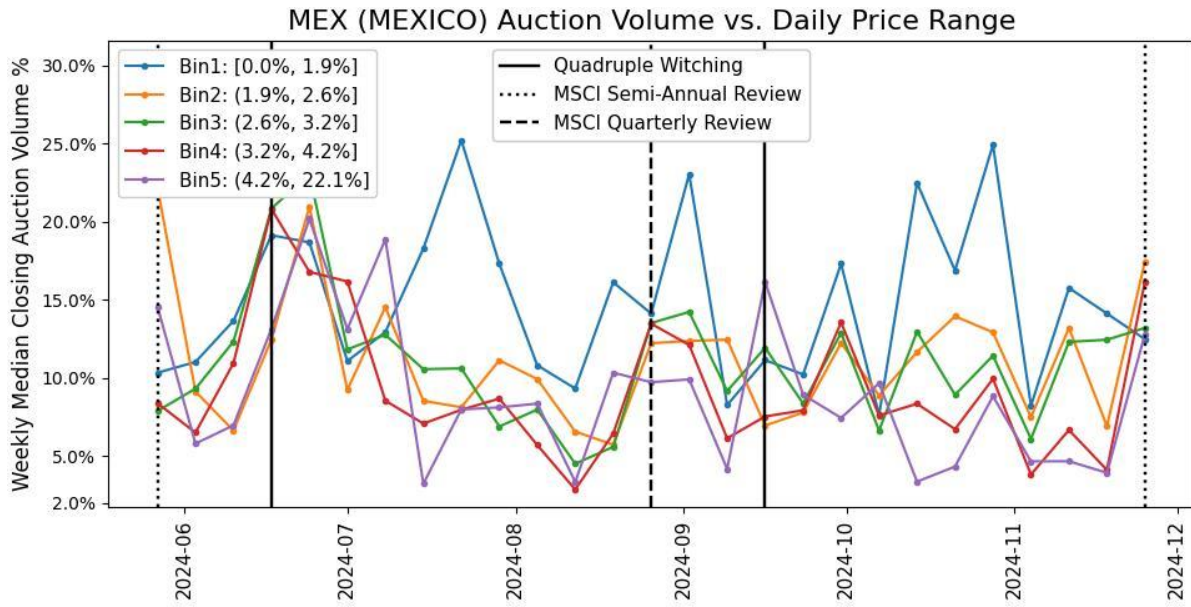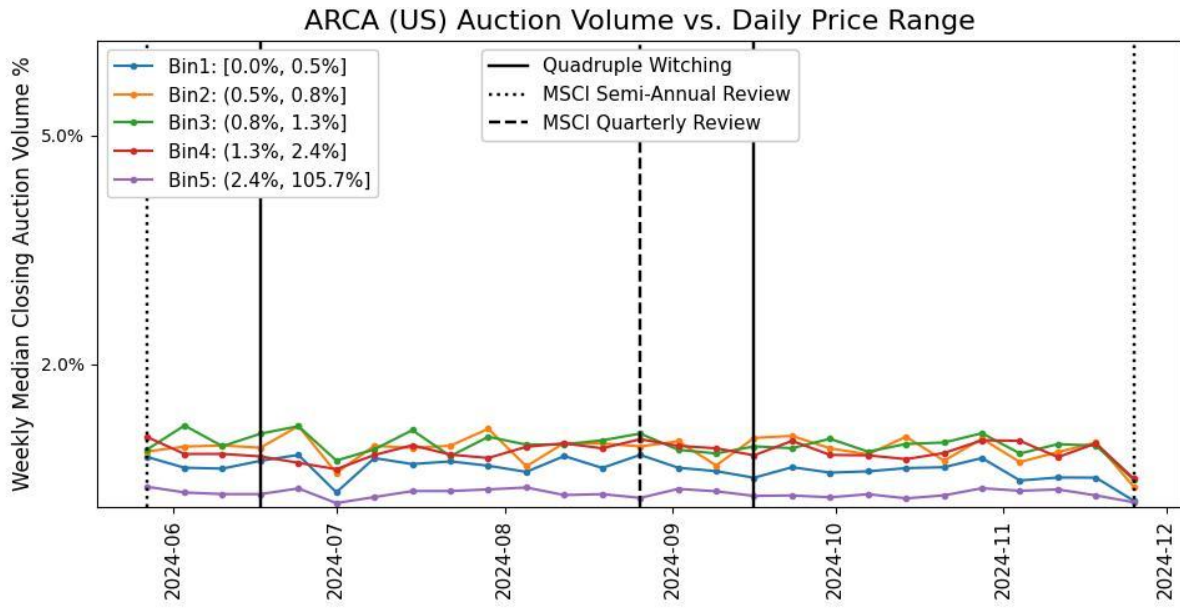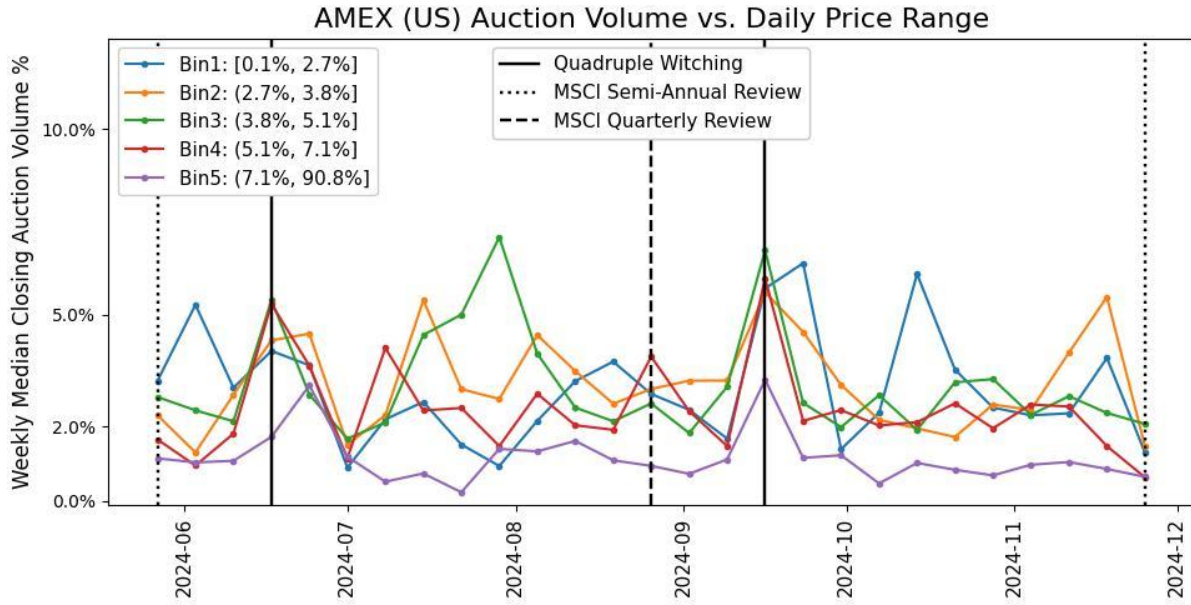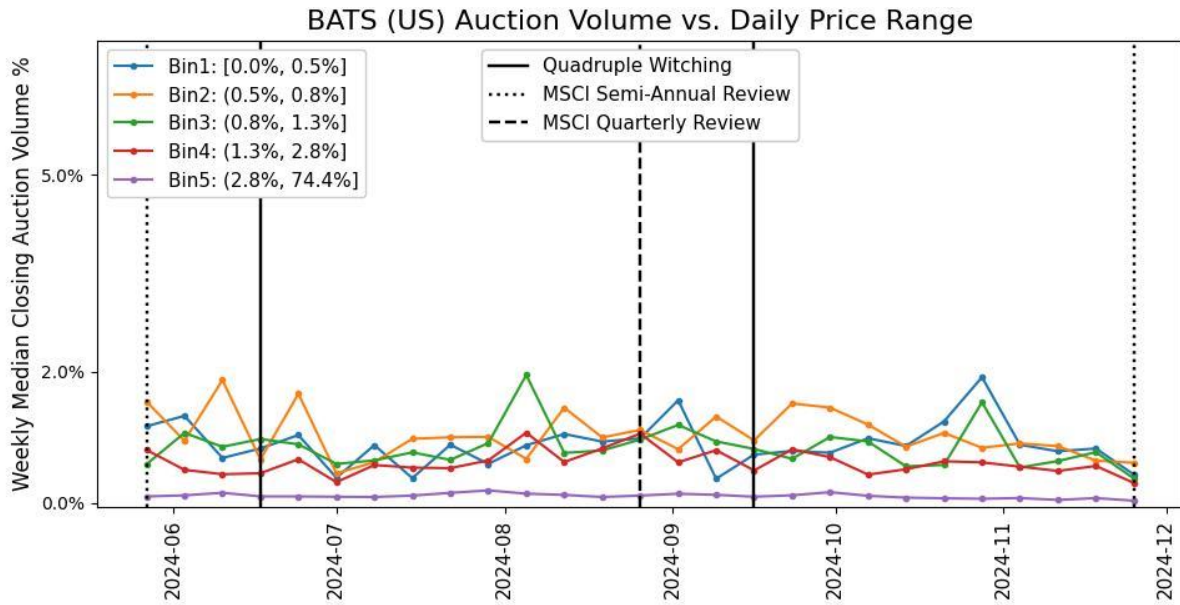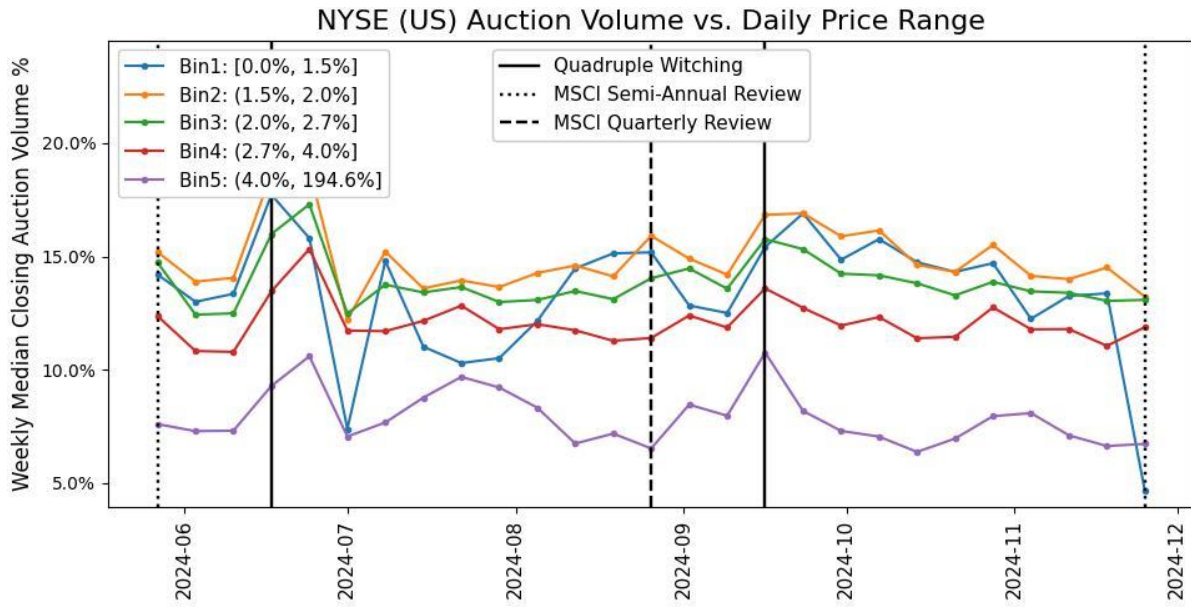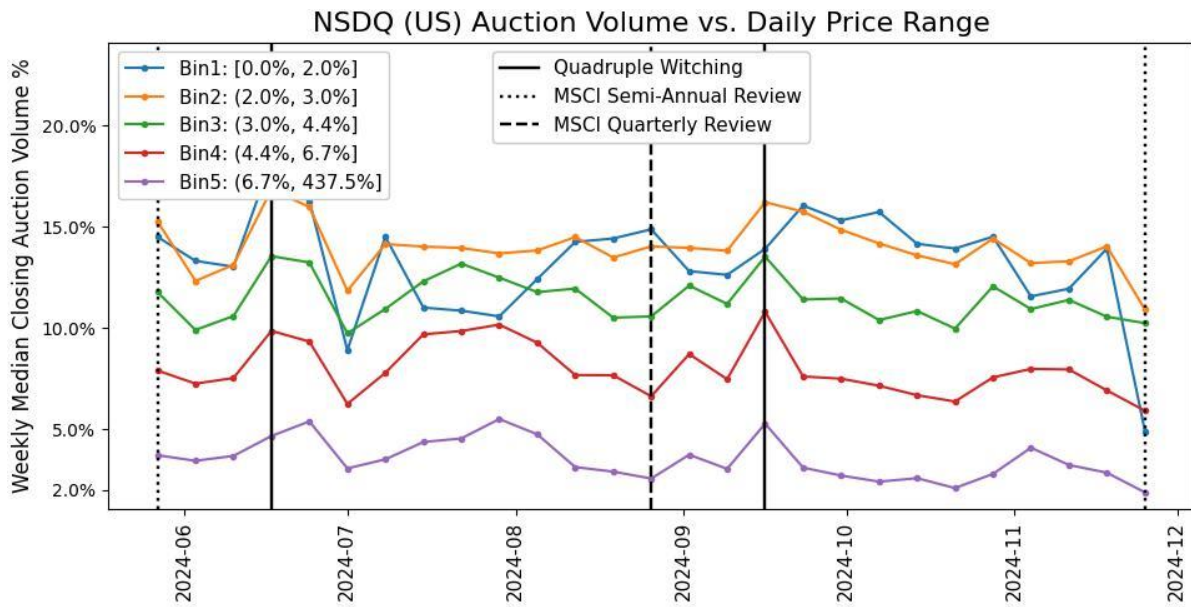
IV. Weekly Median Closing Auction Volume % Binned by Notional Value Traded

Figure 31

Figure 32

MEX (MEXICO) Auction Volume vs. Notional Value Traded

Figure 33

ARCA (US) Auction Volume vs. Notional Value Traded

Figure 34

AMEX (US) Auction Volume vs. Notional Value Traded

Figure 35

BATS (US) Auction Volume vs. Notional Value Traded
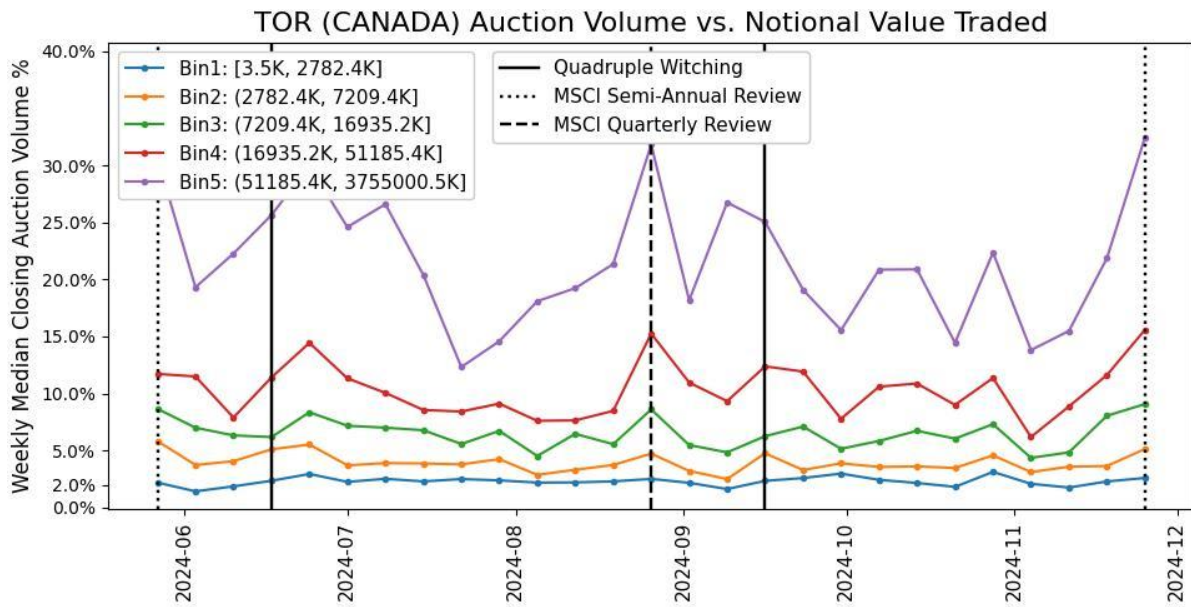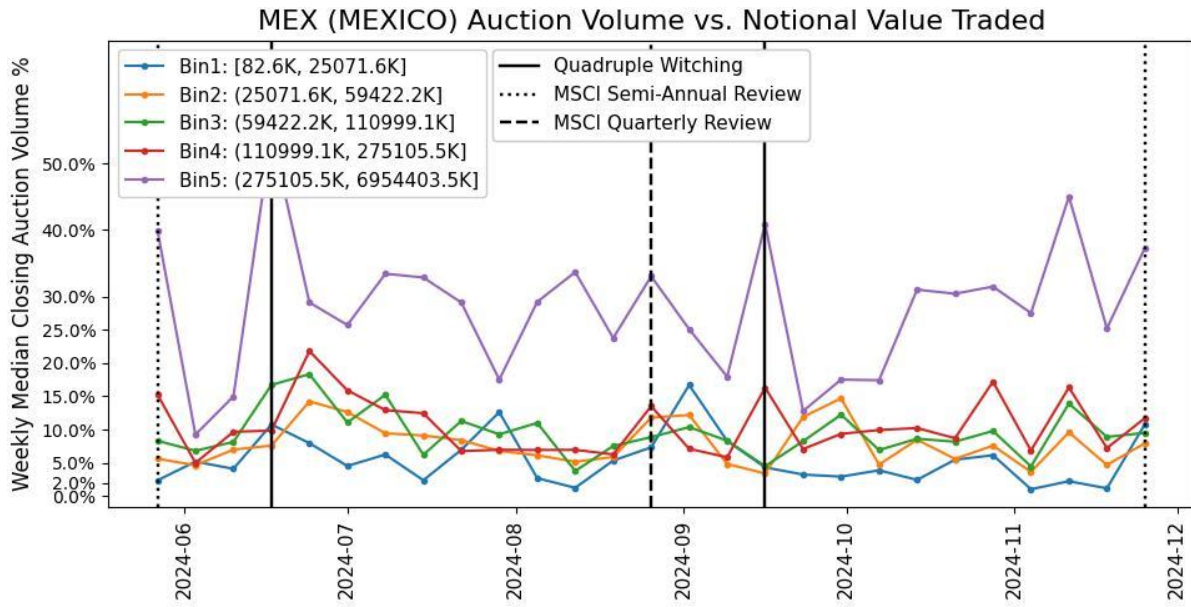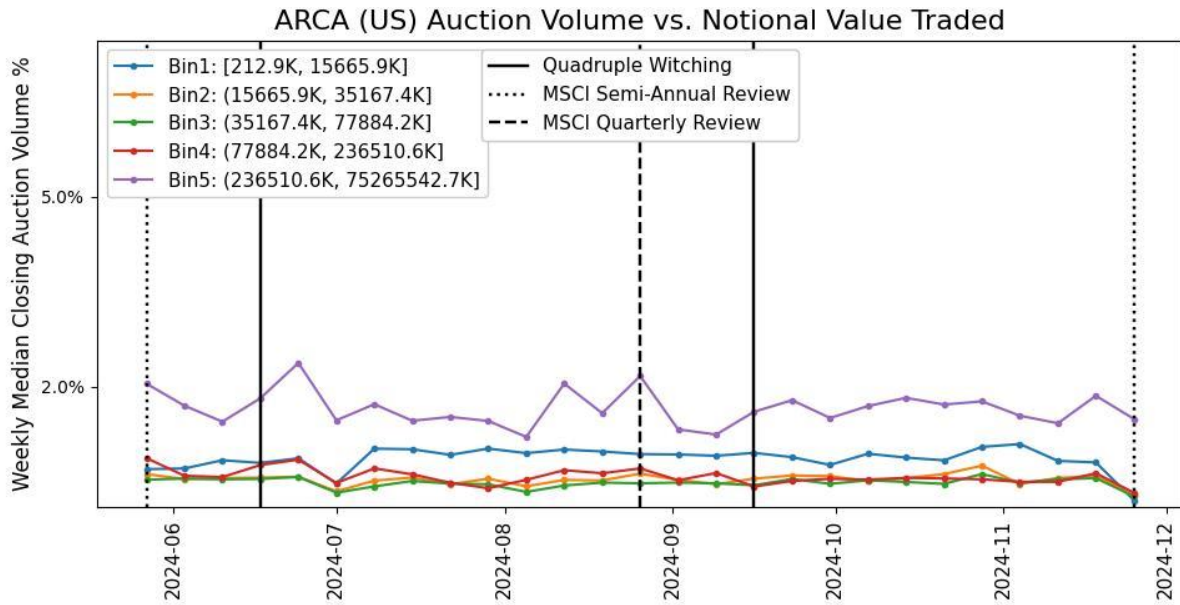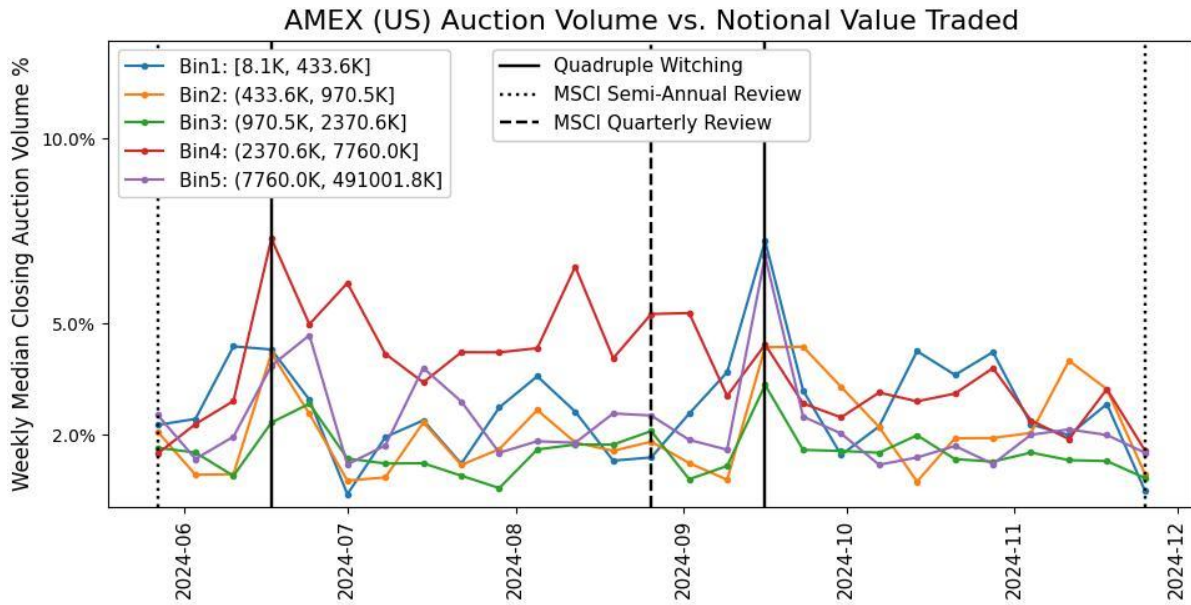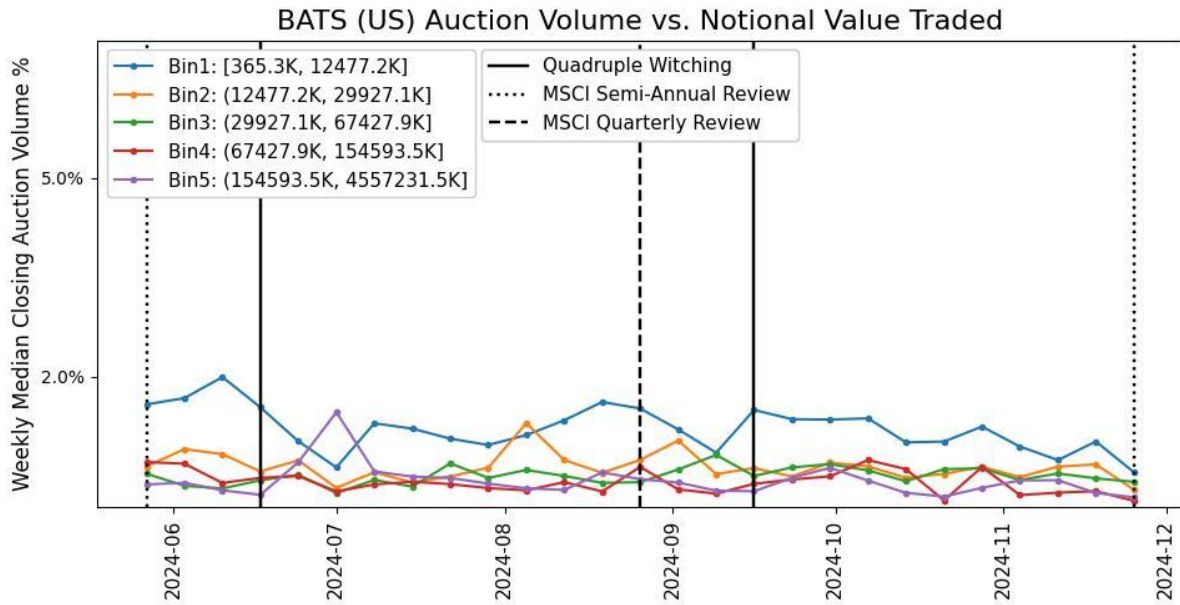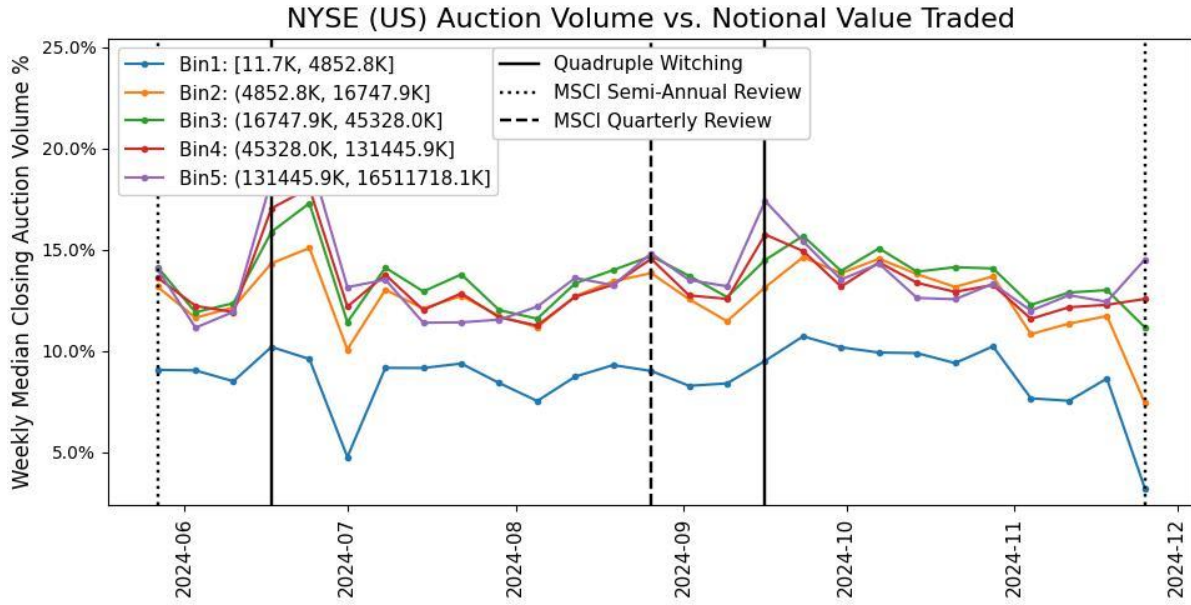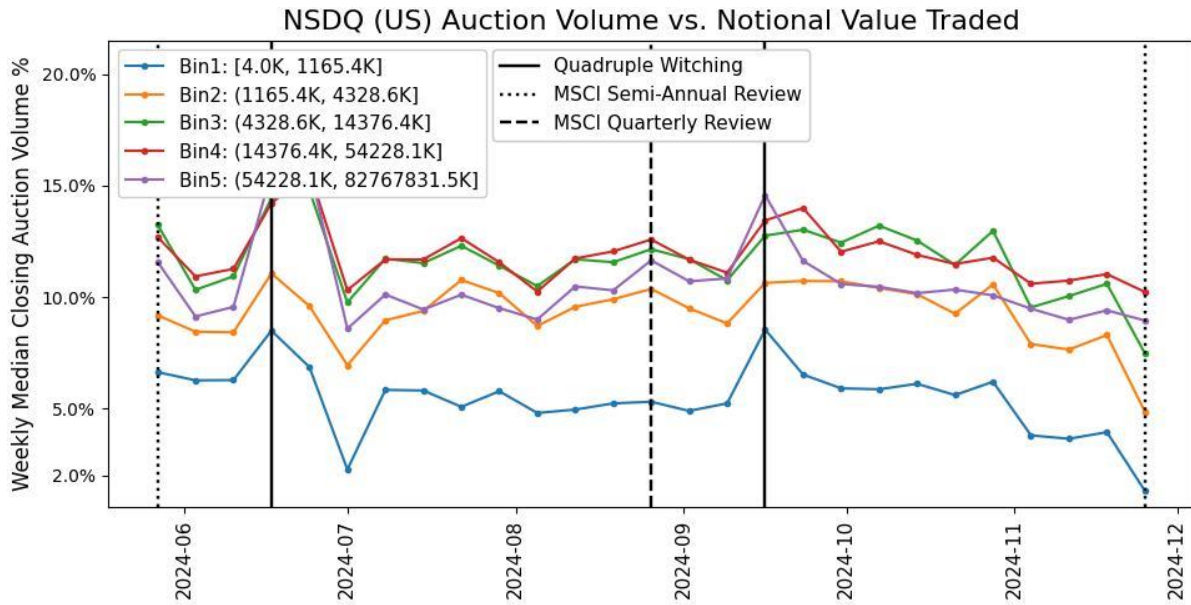
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Figure 37
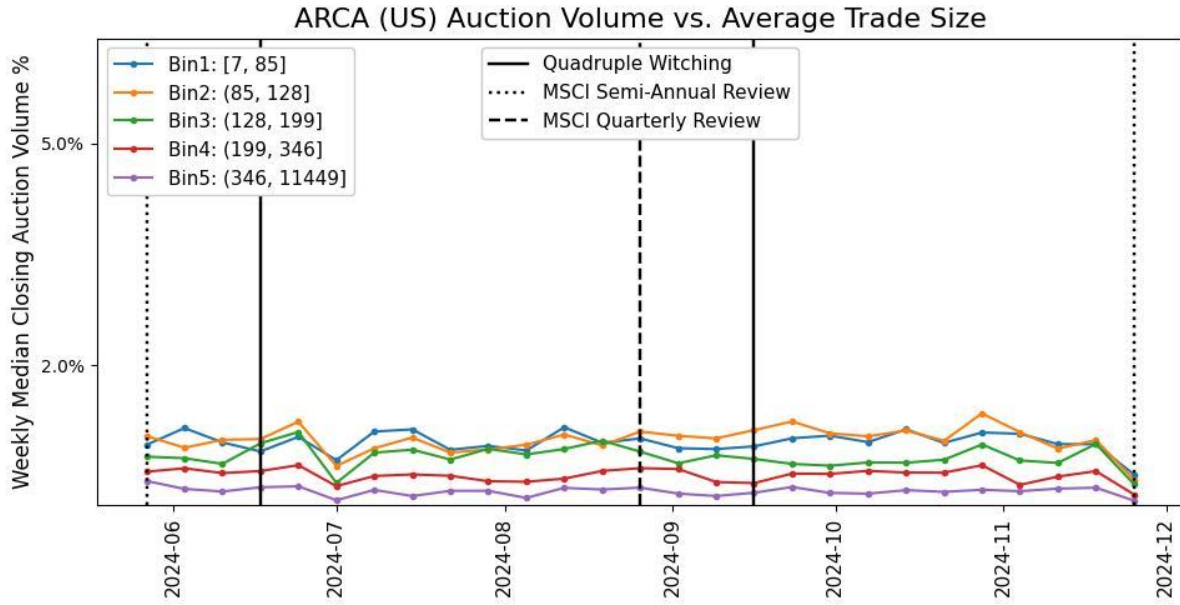

Figure 38

V. Weekly Median Closing Auction Volume % Binned by Average Trade Size
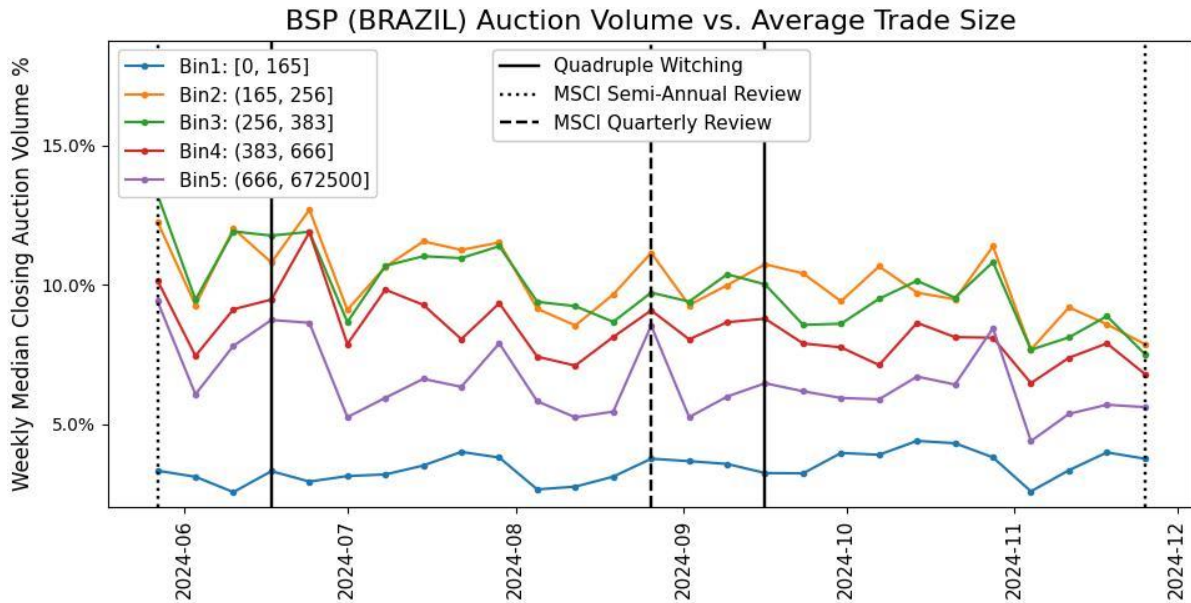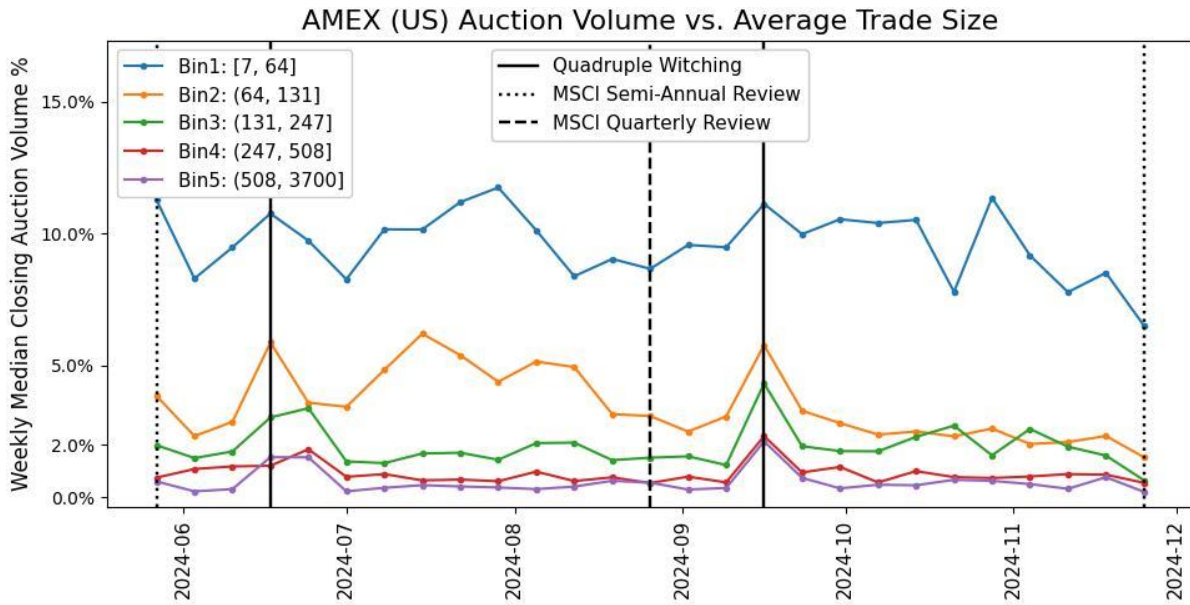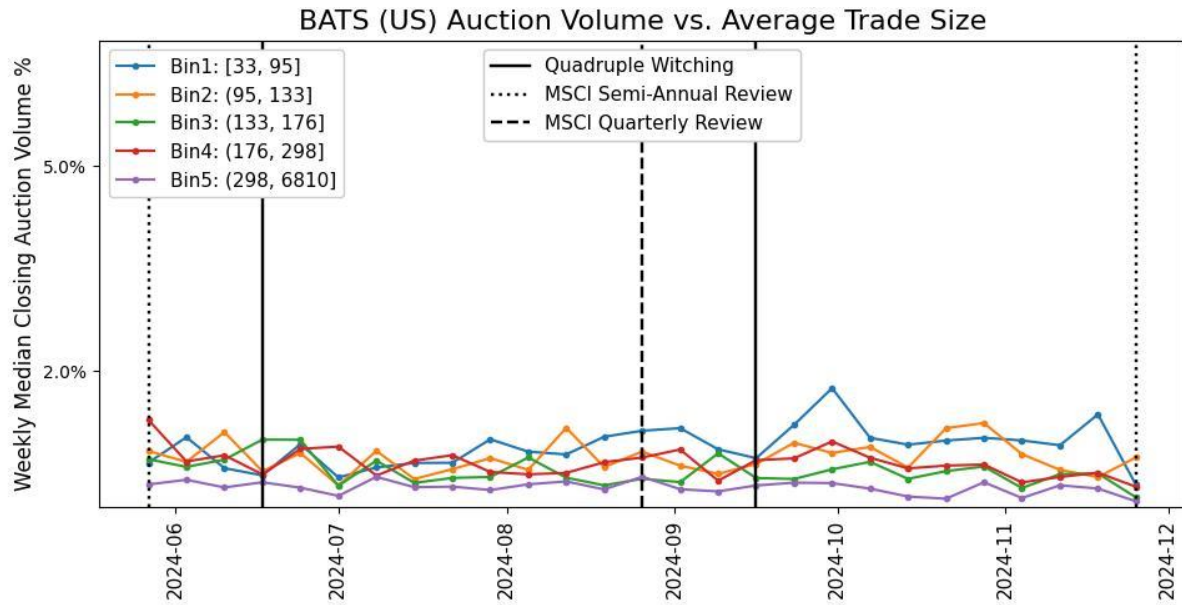

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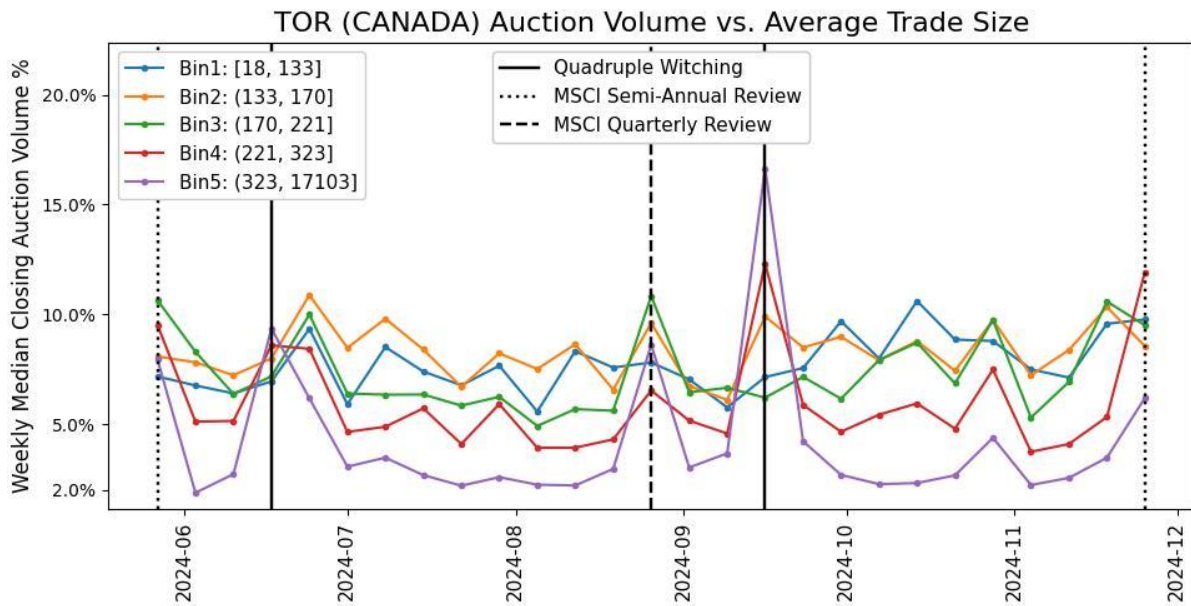
Figure 40

Figure 41

Figure 42

BATS (US) Auction Volume vs. Average Trade Size

Figure 43

NYSE (US) Auction Volume vs. Average Trade Size

Figure 44

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Figure 45