

March 2022

FX Market Structure Monthly

CHANGES IN SPREAD AND VOLATILITY FOR MAJOR MARKET PAIRS

This month, volatility spiked to the highest levels we have seen since May 2020. Spreads widened most for regions most affected by the Ukraine/Russia conflict and EUR spreads versus all the majors, rose. Spreads in countries less directly affected, USD.CAD for example, did not move as much on average. Of the 23 pairs that we track, 18 had wider spreads last month during the 12:00-16:00 GMT trading window; 17 pairs had wider spreads than three months ago. Volatility increased for 21 of the 23 pairs last month and tracked higher for every pair compared to three months ago. Anyone interested in a more in-depth review should contact their Virtu or Virtu Analytics representative directly.

READING THE RESULTS

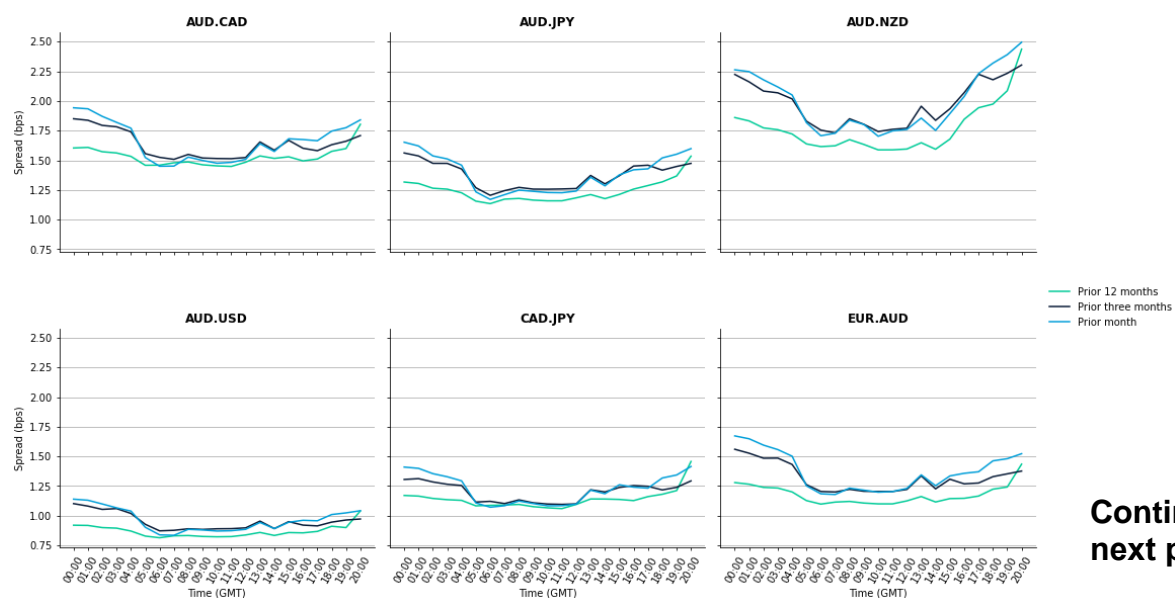
In the intraday charts, the green line presents the average spread or volatility for the past 12 months, the black line is for the past three months and the blue line is for the past month. On the daily charts, the green area represents the 95th percentile confidence interval for the spread and volatility, giving a sense of the stability of the calculated median value.

SPREADS

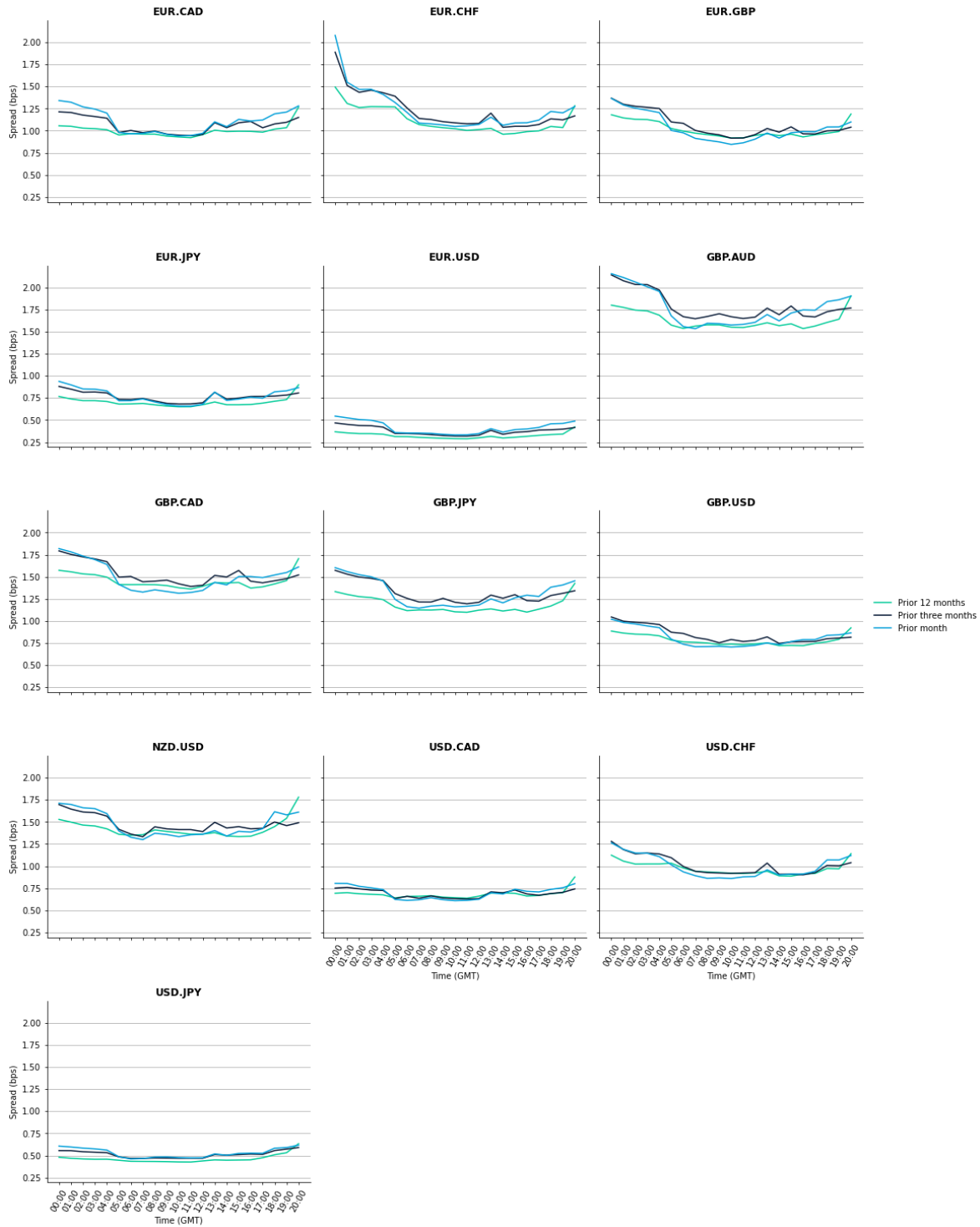
- EUR.USD, EUR.CHF, EUR.GBP and EUR.JPY spreads widened throughout the trading day when compared to the past one-, three and six months.
- AUD.USD and USD.CAD traded tighter in the 12:00-16:00 GMT trading window than one month ago while GBP.USD and USD.CHF spreads were quoted narrower than three months ago.
- All four Scandinavian pairs continue to trade at wider levels globally in the recent past.

G-10 Currency Pairs: Average Hourly Spread, 00:00-20:00 GMT

Comparison over the past month, three months and year



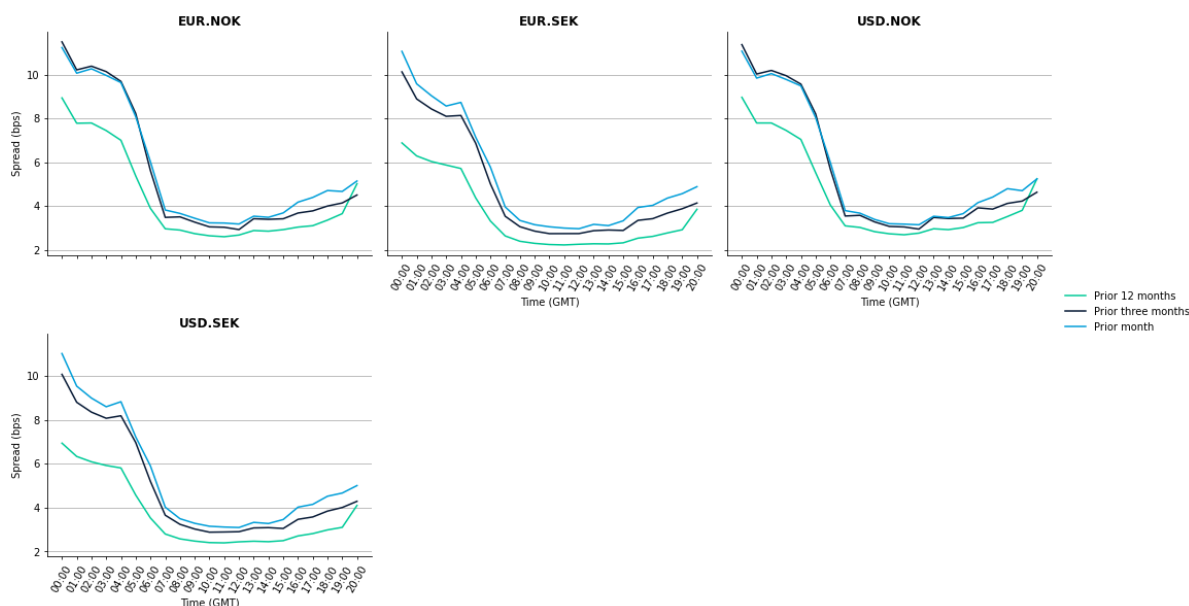
Continued next page...



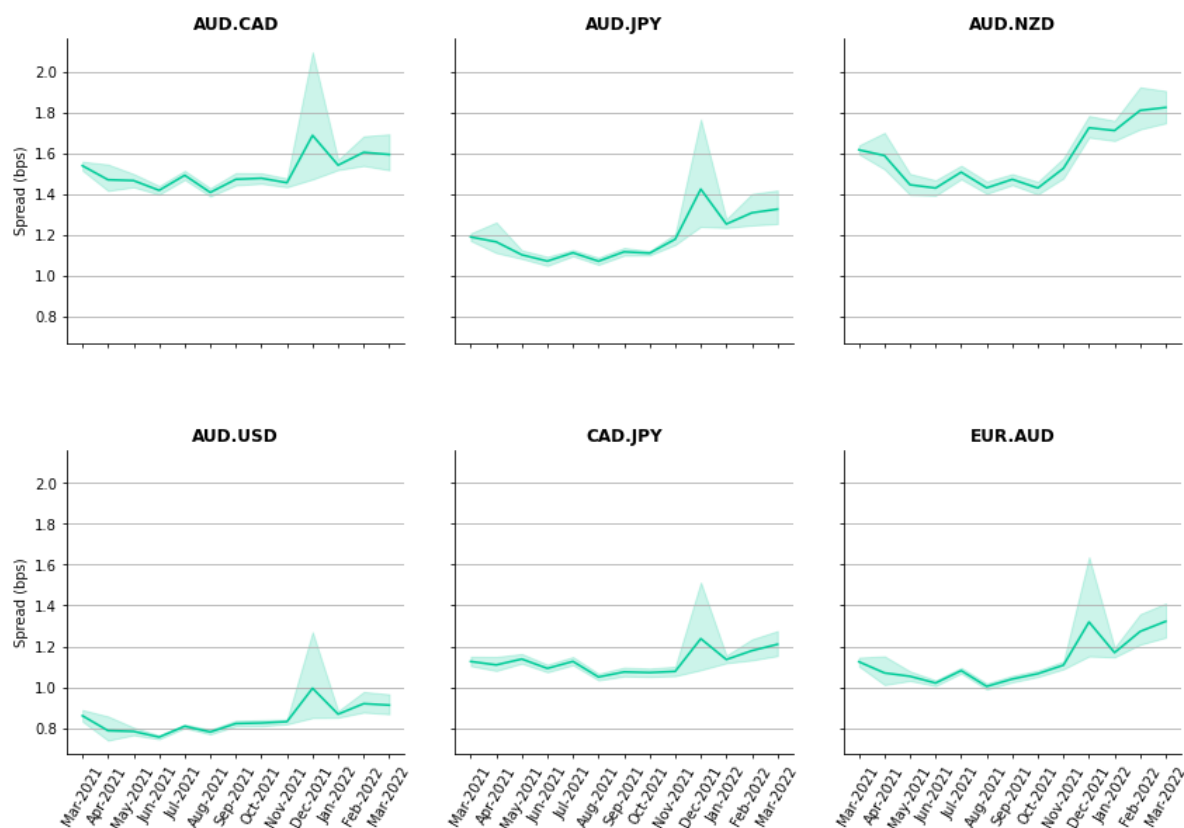
All chart sources: Virtu Financial, 2022. Spread and volatility calculations are derived from sources that Virtu believes to be reliable, but Virtu does not make any claims to its accuracy. USD.NOK, USD.SEK, EUR.NOK and EUR.SEK are shown in separate exhibits.



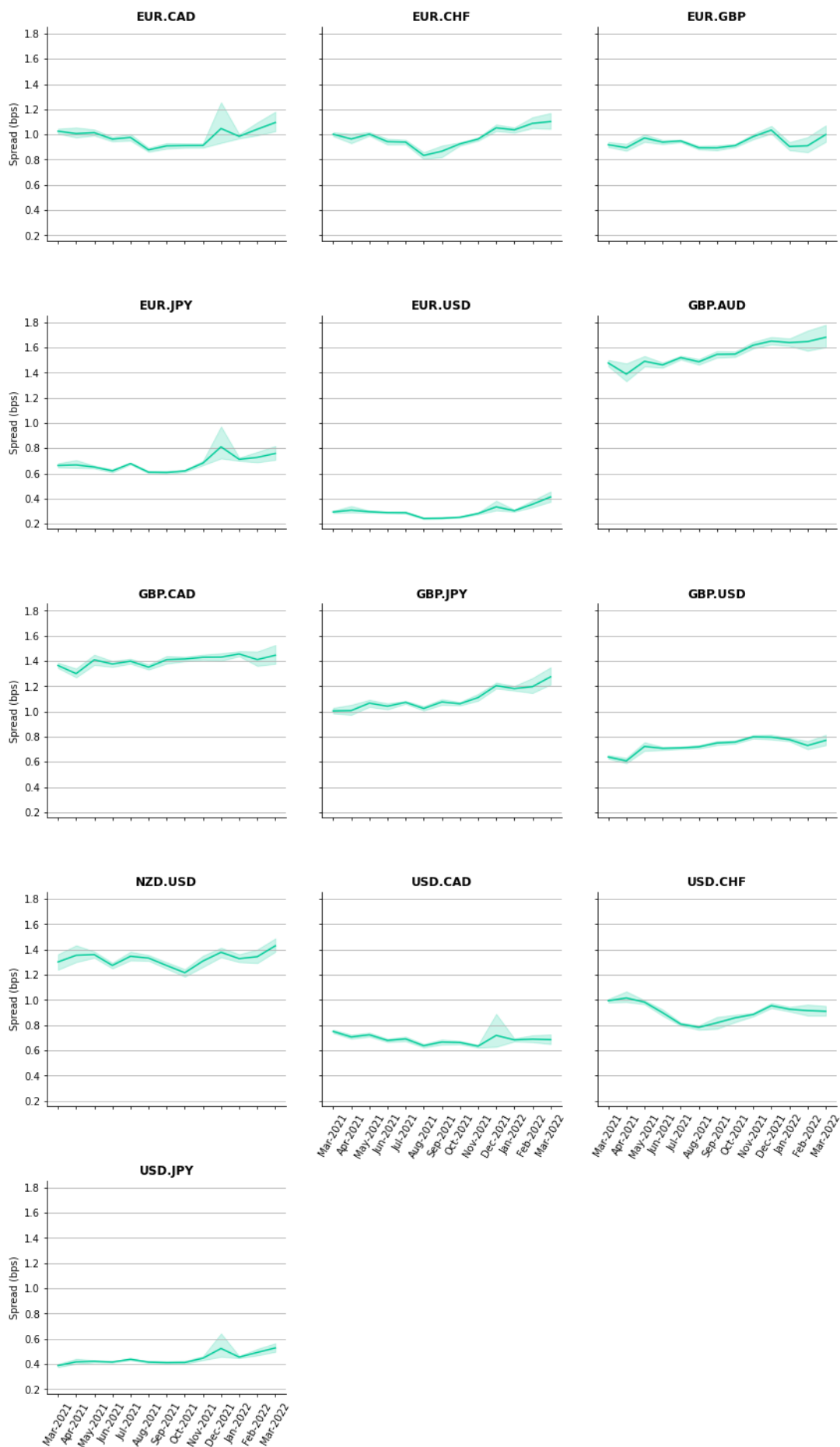
Scandinavian G-10 Currencies: Average Hourly Spread, 00:00-20:00 GMT Comparison over the past month, three months and year



G-10 Currencies: Average Daily Spread, 12:00-16:00 GMT March 2021- March 2022



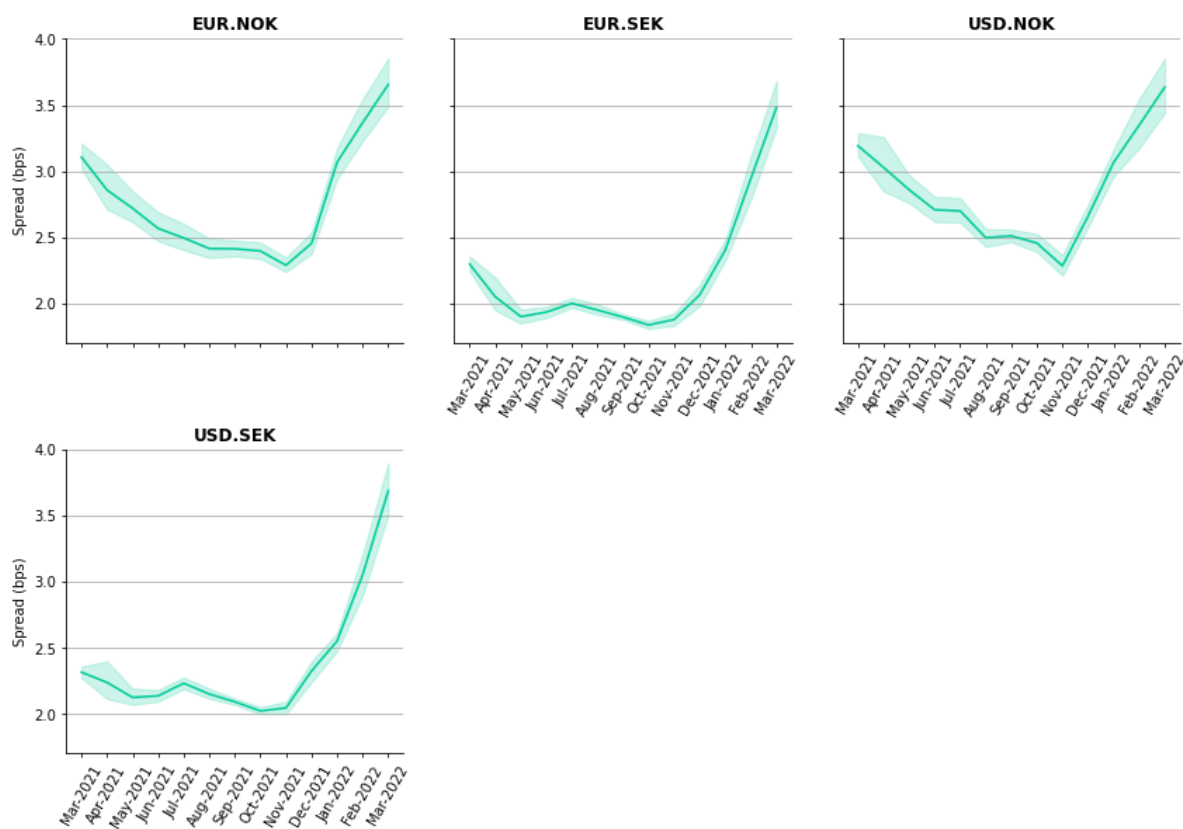
Continued next page...



All chart sources: Virtu Financial, 2022. Spread and volatility calculations are derived from sources that Virtu believes to be reliable, but Virtu does not make any claims to its accuracy. USD.NOK, USD.SEK, EUR.NOK and EUR.SEK are shown in separate exhibits.



Scandinavian G-10 Currencies: Average Daily Spread, 12:00-16:00 GMT March 2021-March 2022

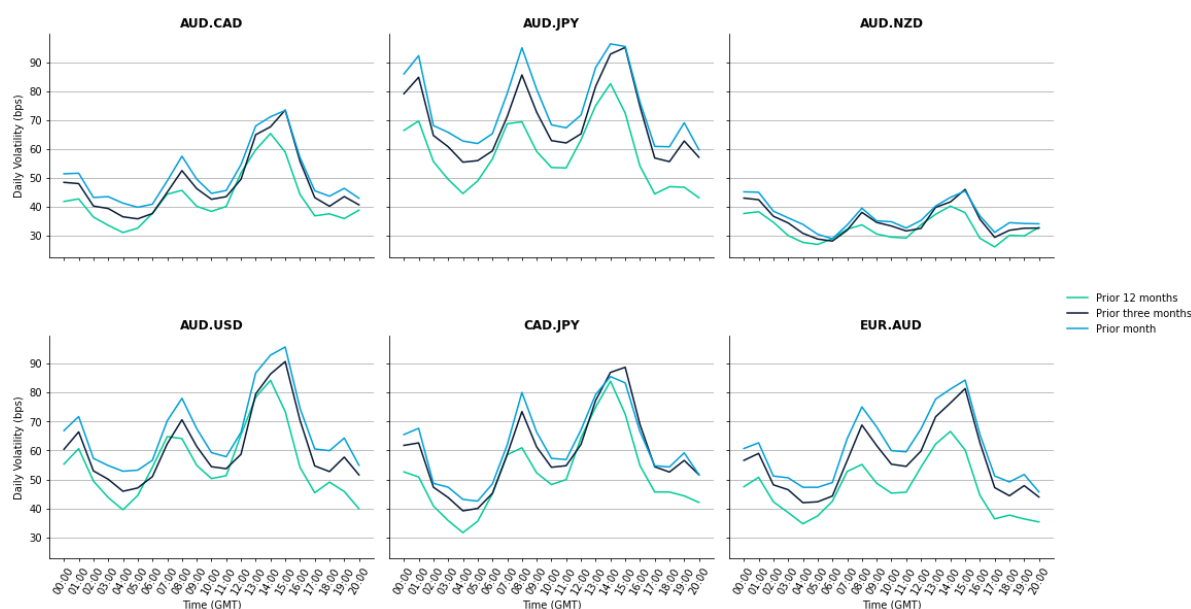




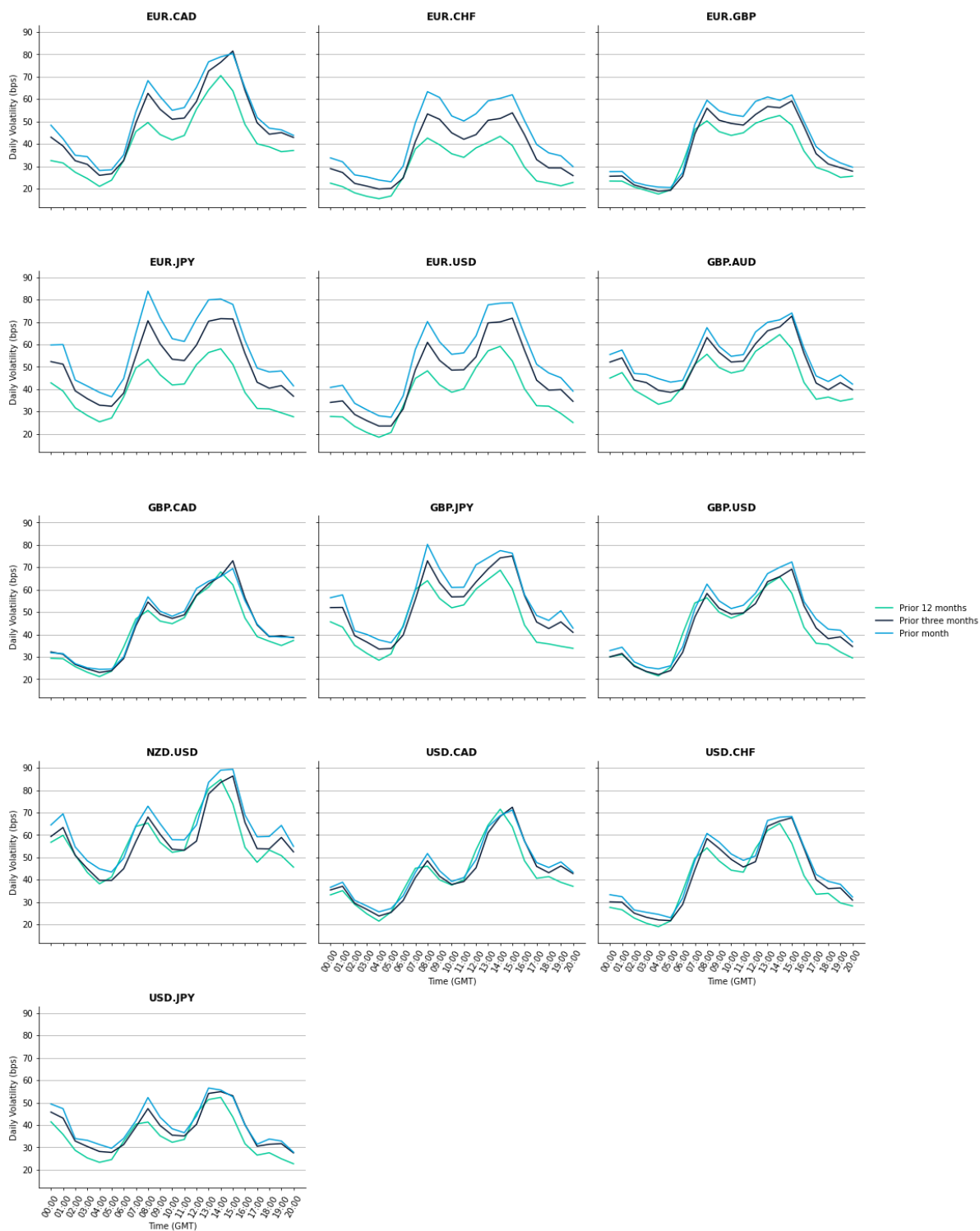
VOLATILITY

- Volatility spiked in March for 21 of the 23 G-10 currency pairs during the 12:00-16:00 GMT trading window. Compared to three months ago, volatility is higher for all 23 pairs and compared to a year ago, volatility is higher for all the major pairs except AUD.USD and NZD.USD.
- Currencies with strong ties to Russia, particularly the Euro, experienced the sharpest increase in volatility. On page 7, see that daily volatility rose throughout the entire trading day for EUR.CHF, EUR.JPY and EUR.USD. Also note that the light blue line, the March 2022 volatility, is clearly distinguishable throughout the trading day.
- Looking at the hourly patterns, volatility increased a bit less during New York's trading hours compared to Tokyo or London's desk hours. Quote volatility for AUD.USD and NZD.USD dropped last month during New York trading.
- Among the Scandinavian pairs, volatility continued to rise for all four pairs throughout the trading day. Intra-day volatility for all four pairs is at or near levels from May 2020. During March 2020, daily volatility for the four pairs ranged from 200-400 bps.

G-10 Currencies: Average Daily Volatility, 00:00-20:00 GMT Comparison over the past month, three months and year

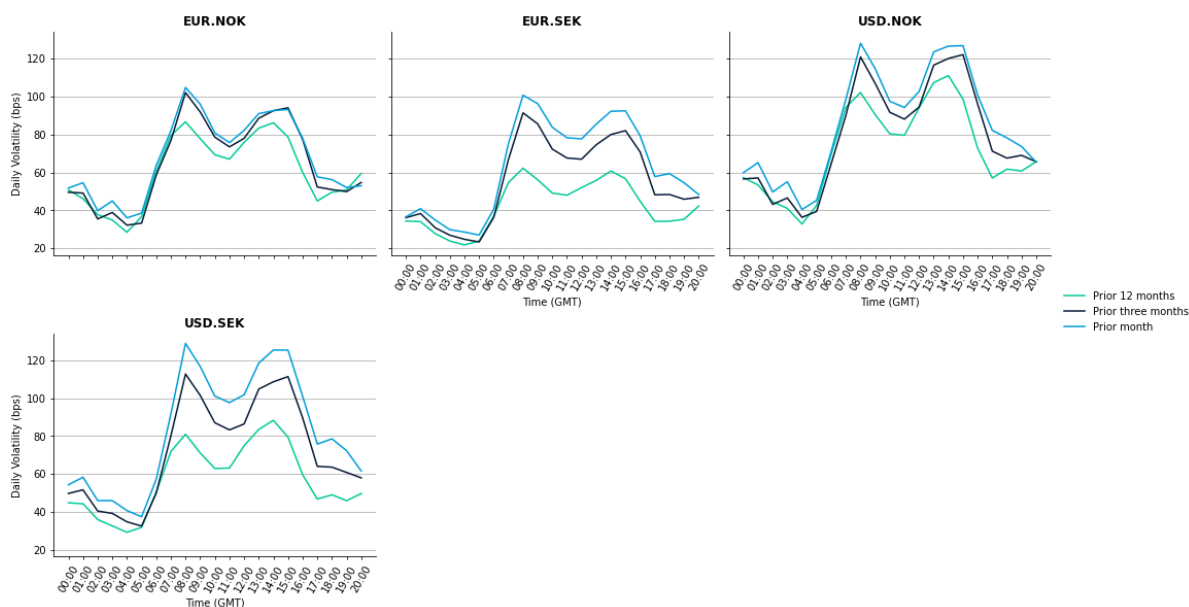


Continued next page...

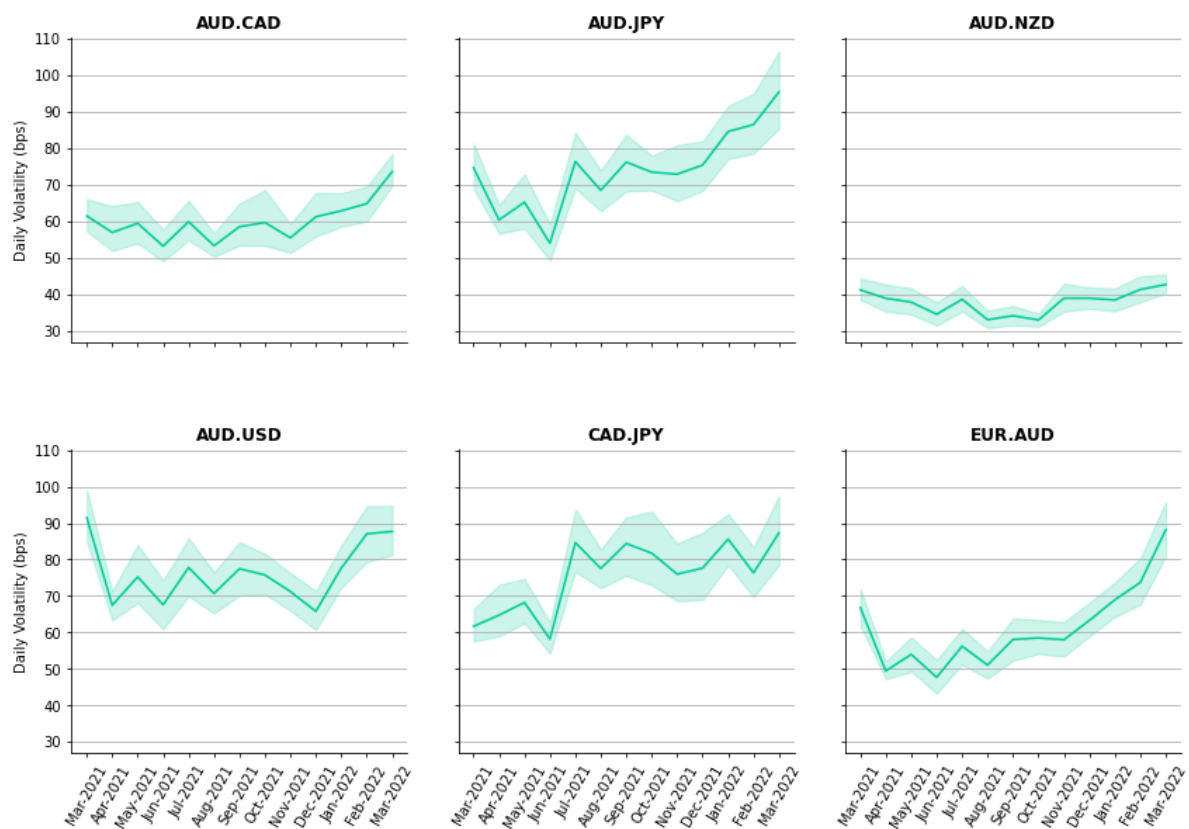




Scandinavian G-10 Currencies: Average Daily Volatility, 00:00-20:00 GMT Past month, three months and year



G-10 Currencies: Average Daily Volatility, 12:00-16:00 GMT March 2021-March 2022



Continued next page...



All chart sources: Virtu Financial, 2022. Spread and volatility calculations are derived from sources that Virtu believes to be reliable, but Virtu does not make any claims to its accuracy. USD.NOK, USD.SEK, EUR.NOK and EUR.SEK are shown in separate exhibits.



Scandinavian G-10 Currencies: Average Daily Volatility, 12:00-16:00 GMT March 2021-March 2022



Have questions? To learn more, contact your regional Virtu Analytics representative.
AMERICAS +1.866.265.4519 | **APAC** +852.3405.3755 | **EMEA** +44.20.7670.4000
analytics@virtu.com | www.virtu.com

© 2022 Virtu Financial, Inc. All rights reserved. Not to be reproduced or retransmitted without permission. These materials are for informational purposes and are not intended to be used to make trading or investment decisions, they are not intended as an offer to sell or the solicitation of an offer to buy any security or financial product, and are not intended as advice (investment, tax or legal). The information contained herein includes Virtu proprietary information and/or has been taken from sources we believe to be reliable, but we do not represent or warrant that such information is accurate or complete and it should not be relied upon as such.

Analytics products and services referenced herein may not be subject to oversight by regulatory authorities in one or more jurisdictions, including in Europe, where such products and services are offered by Virtu ITG Ventures Limited, registered in Ireland No. 295549 ("VIVL"). VIVL does not engage in regulated activity.

Securities products and services are offered by the following subsidiaries of Virtu Financial, Inc. In the U.S., Virtu Americas LLC, member FINRA and SIPC; in Canada, Virtu ITG Canada Corp., member Canadian Investor Protection Fund and Investment Industry Regulatory Organization of Canada; in Europe, Virtu ITG Europe Limited, registered in Ireland No. 283940 ("VIEL") (VIEL is authorized and regulated by the Central Bank of Ireland), and Virtu Financial Ireland Limited, registered in Ireland No. 471719 ("VFIL") (VFIL is authorized and regulated by the Central Bank of Ireland). The registered office of VIEL and VFIL is Whitaker Court, Whitaker Square, Sir John Rogerson's Quay, Dublin 2, Ireland; in Asia, Virtu ITG Hong Kong Limited (SFC License No. AHD810), Virtu ITG Singapore Pte Limited (CMS License No. 100138-1), and Virtu ITG Australia Limited (AFS License No. 219582).

All chart sources: Virtu Financial, 2022. Spread and volatility calculations are derived from sources that Virtu believes to be reliable, but Virtu does not make any claims to its accuracy. USD.NOK, USD.SEK, EUR.NOK and EUR.SEK are shown in separate exhibits.