

November 2021

FX Market Structure Monthly

CHANGES IN SPREAD AND VOLATILITY FOR MAJOR MARKET PAIRS

In November, FX spreads widened and volatility increased for nearly all 23 G-10 FX pairs even before the announcement of the Omicron variant at month-end. Spreads widened for 19 of the 23 pairs during the four hours prior to the WMR Fixing trading window, reversing the tightening trend from early Fall. Compared to three months ago, spreads are wider for 18 pairs, and wider for 17 pairs compared to 12 months ago. In November, among the majors, spreads increased for all but USD.CAD while volatility increased for EUR.USD, GBP.USD, NZD.USD and USD.CHF.

Intraday spreads increased consistently during Tokyo, London and New York trading desk hours for all but USD.CAD, EUR.NOK and USD.NOK pairs.

READING THE RESULTS

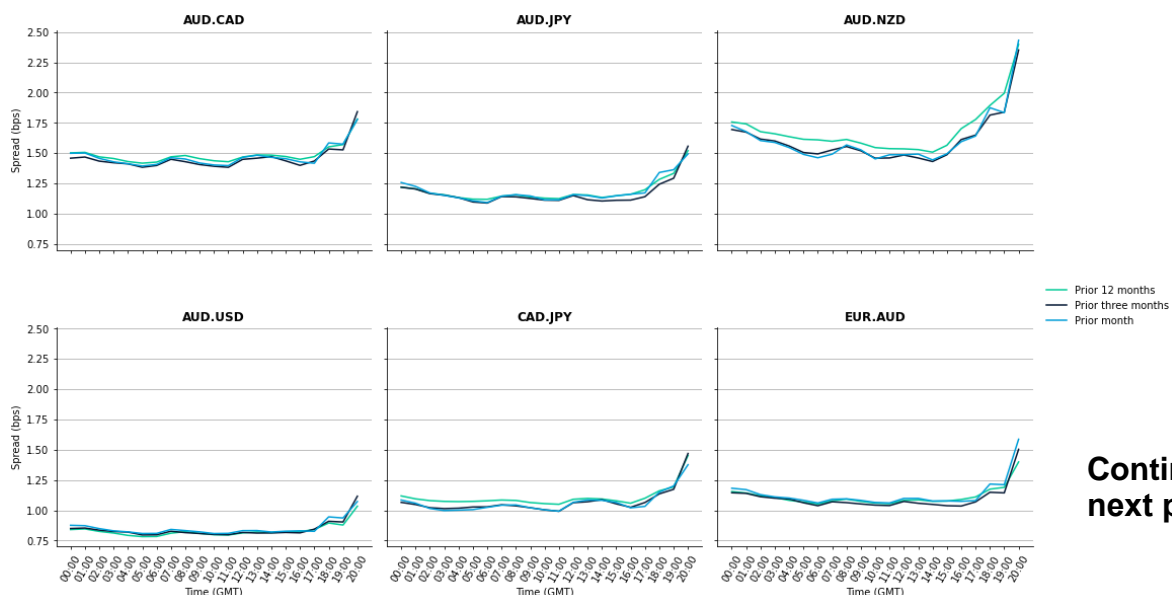
In the intraday charts, the green line presents the average spread or volatility for the past 12 months, the black line is the past three months and the blue line is for the past month. On the daily charts, the green area represents the 95th percentile confidence interval for the spread and volatility,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

SPREADS

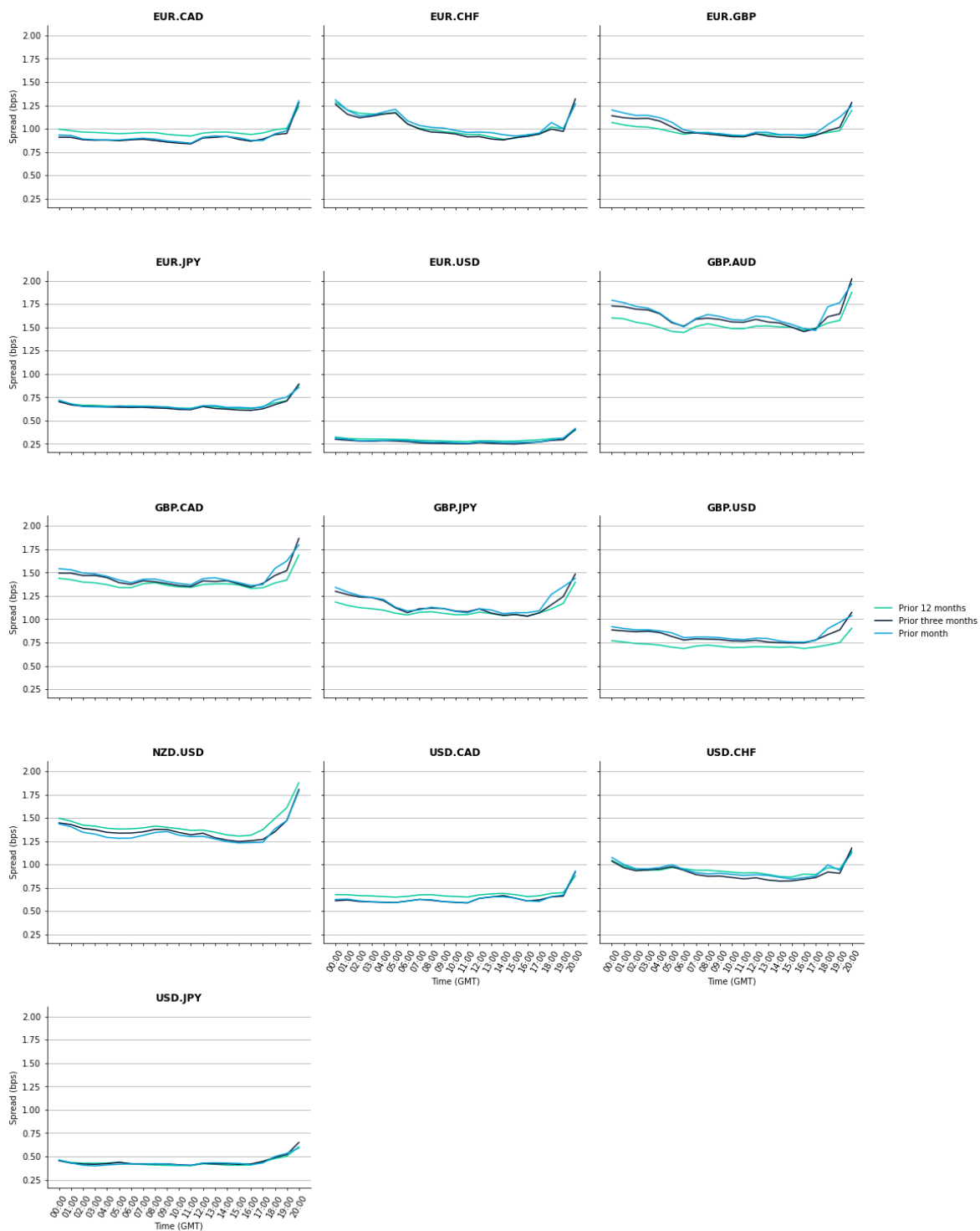
- Average hourly spreads increased consistently for all but USD.CAD, EUR.NOK and USD.NOK.
- In October, four Scandinavian pairs traded at their tightest levels in 12 months. In November, spreads for EUR.NOK and USD.NOK both continued tightening while its Swedish cousins, EUR.SEK and USD.SEK, widened to levels approximately equal to six months ago.

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

Comparison over the past month, three months and year



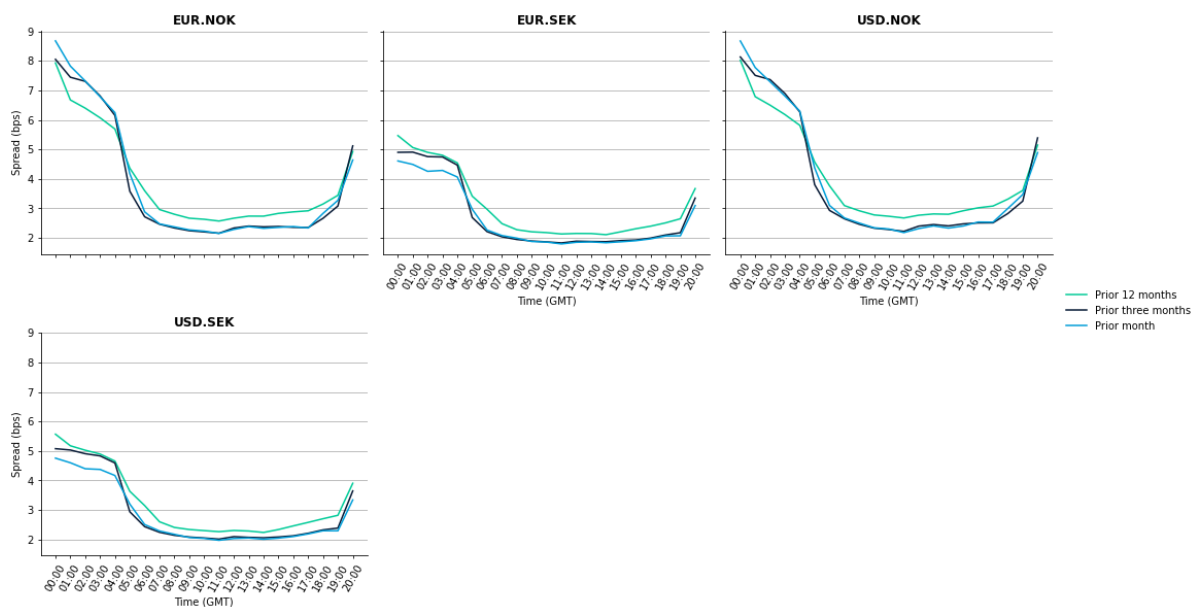
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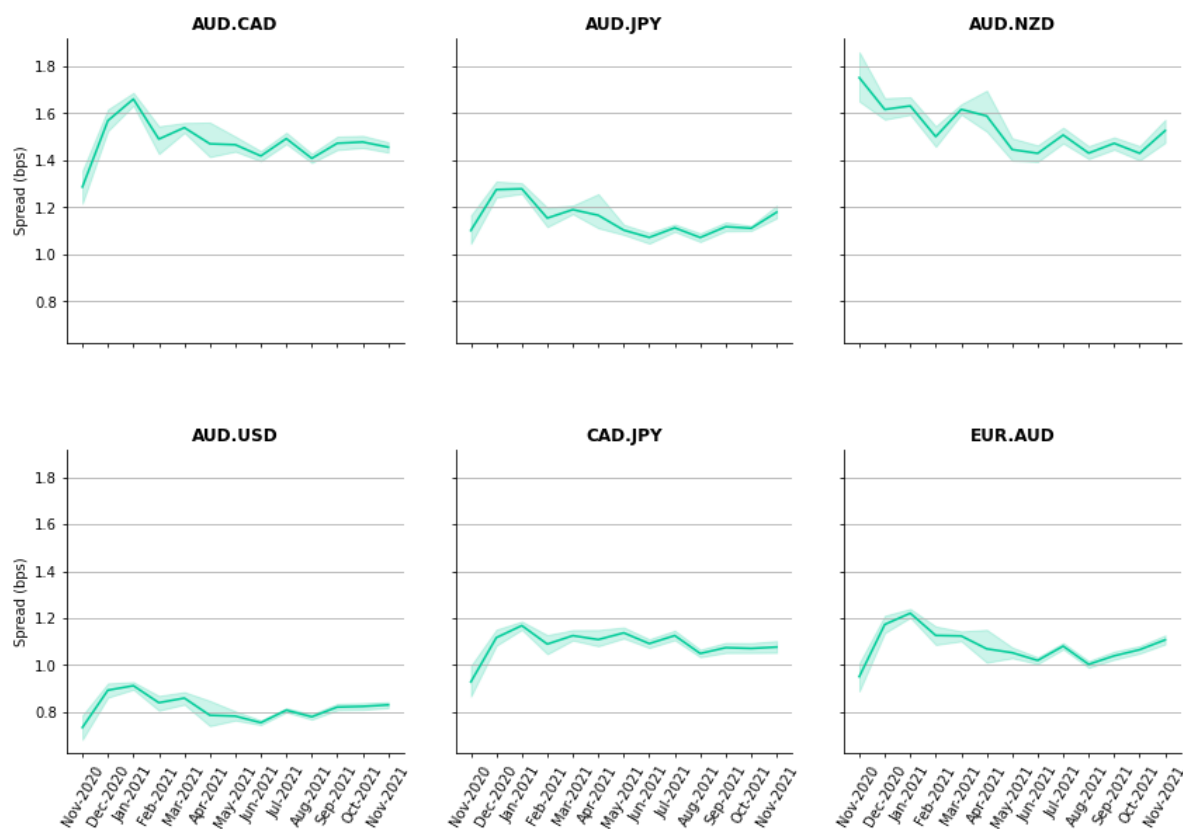
All chart sources: Virtu Financial, 2021. Spread and volatility calculations are derived from sources that Virtu believes to be reliable, but Virtu does not make any claims to its accuracy. USD.NOK, USD.SEK, EUR.NOK and EUR.SEK are shown in separate exhibits.



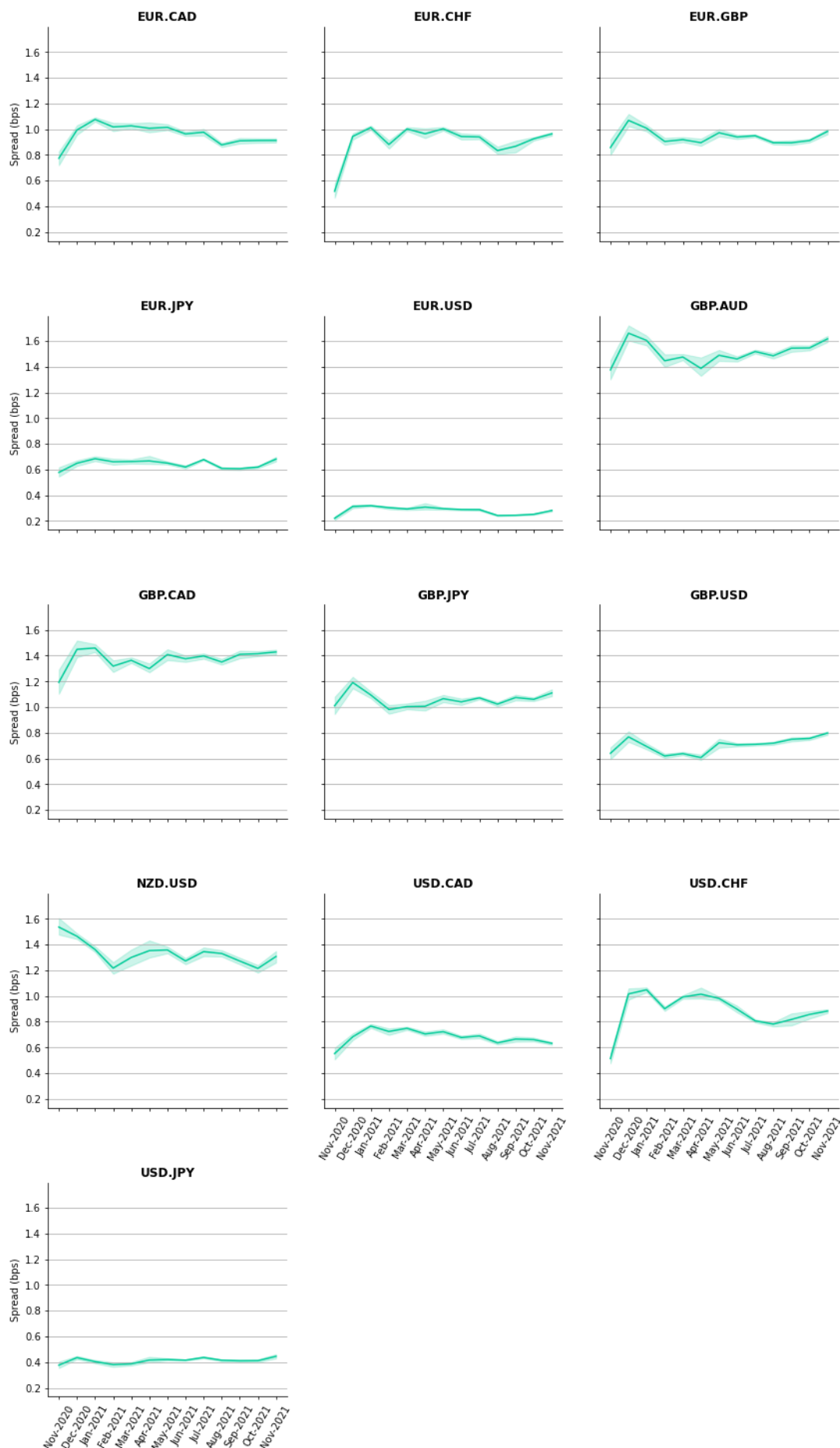
Scandinavian G-10 Currencies: Average Hourly Spread, 00:00-20:00 GMT Comparison over the past month, three months and year



G-10 Currencies: Average Daily Spread, 12:00-16:00 GMT November 2020-November 2021



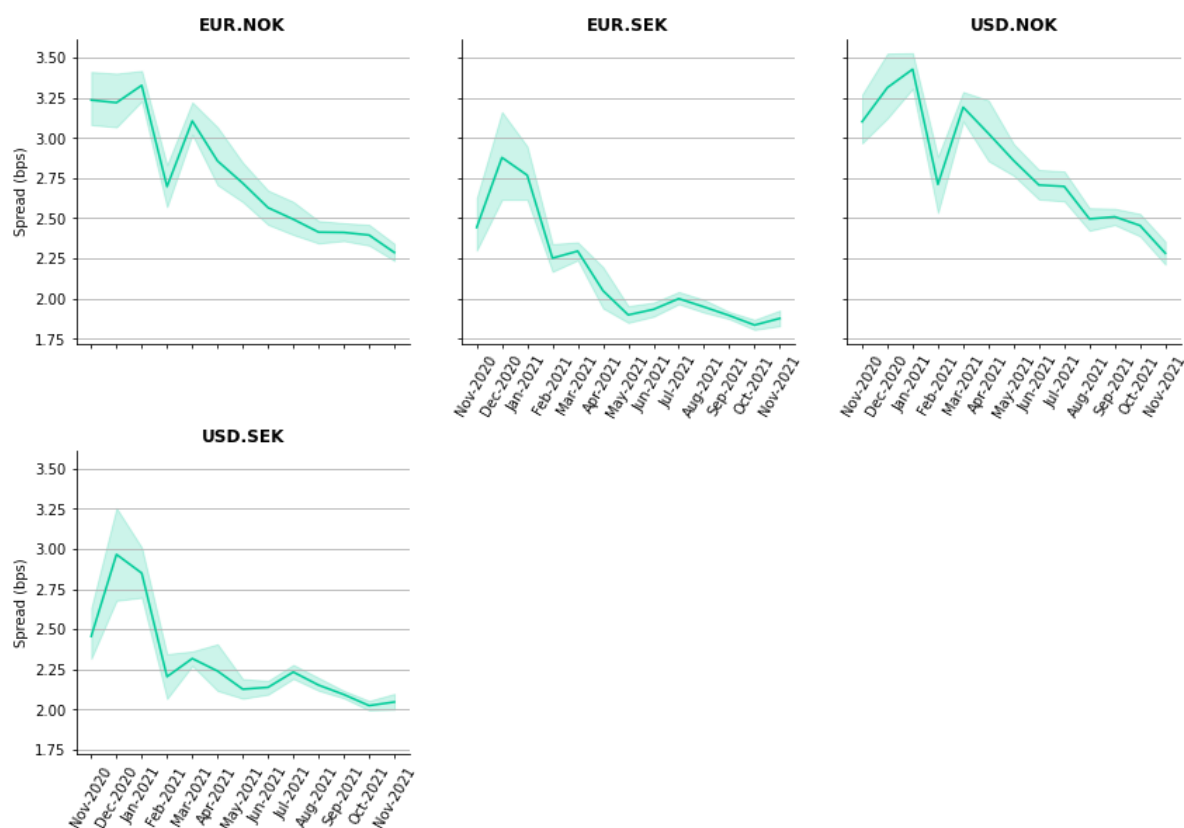
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Scandinavian G-10 Currencies: Average Daily Spread, 12:00-16:00 GMT November 2020-November 2021



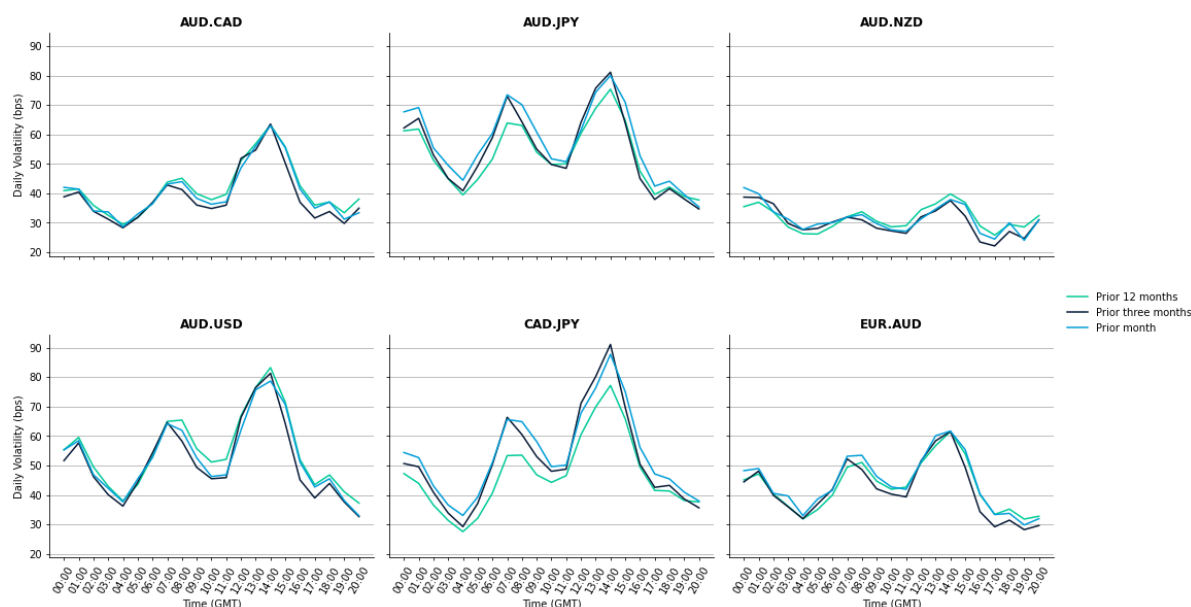


VOLATILITY

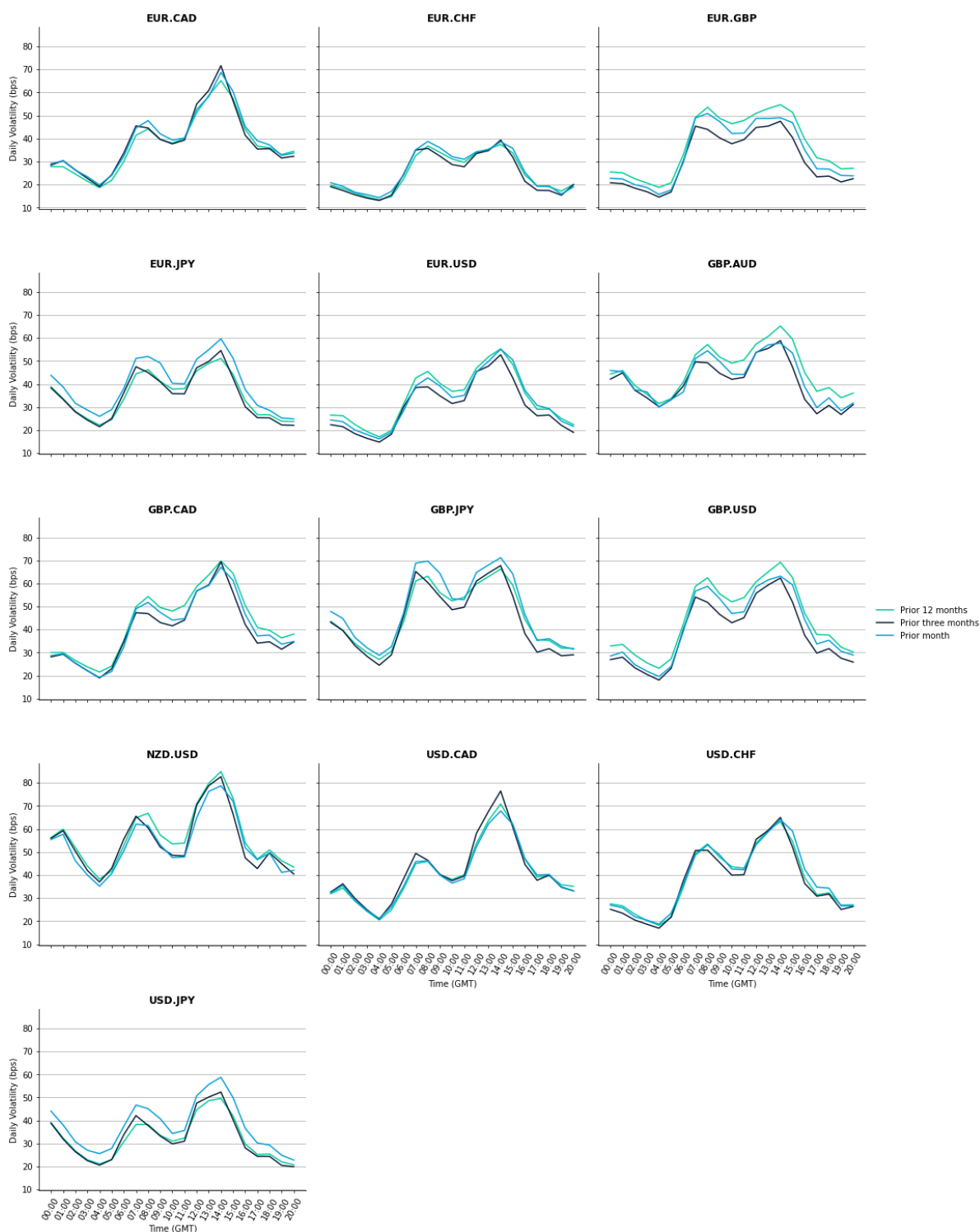
- Intraday volatility increased for all 23 pairs during London and New York desk hours and decreased for AUD and CAD pairs during Tokyo hours. This marks the third month of increasing intraday volatility.
- Hourly volatility increased uniformly during both the New York and Tokyo desk hours. During London's nine-hour trading window, average volatility increased for four or more hours for every pair, except for USD.CAD. During New York's eight-hour trading day, all currencies recorded higher average volatility in at least four hours.
- Over the 12:00-16:00 GMT pre-WMR Fixing trading window, volatility increased for 13 of 23 pairs and was higher than three months ago for 20 pairs. Compared to 12 months ago, volatility was higher for only eight of the G-10 pairs.
- Among the Scandinavian pairs, volatility fell for the EUR.NOK and EUR.SEK during pre-WMR Fixing trading. However, volatility has increased for all pairs compared to three months ago.
- In November, from 08:00-10:00 GMT and later, after 15:00 GMT, volatility rose for all 23 pairs. In an unusual V-pattern, the number of pairs with wider spreads dropped to two from 12:00-13:00 GMT before increasing as the WMR Fixing time approached.

G-10 Currencies: Average Daily Volatility, 00:00-20:00 GMT

Comparison over the past month, three months and year

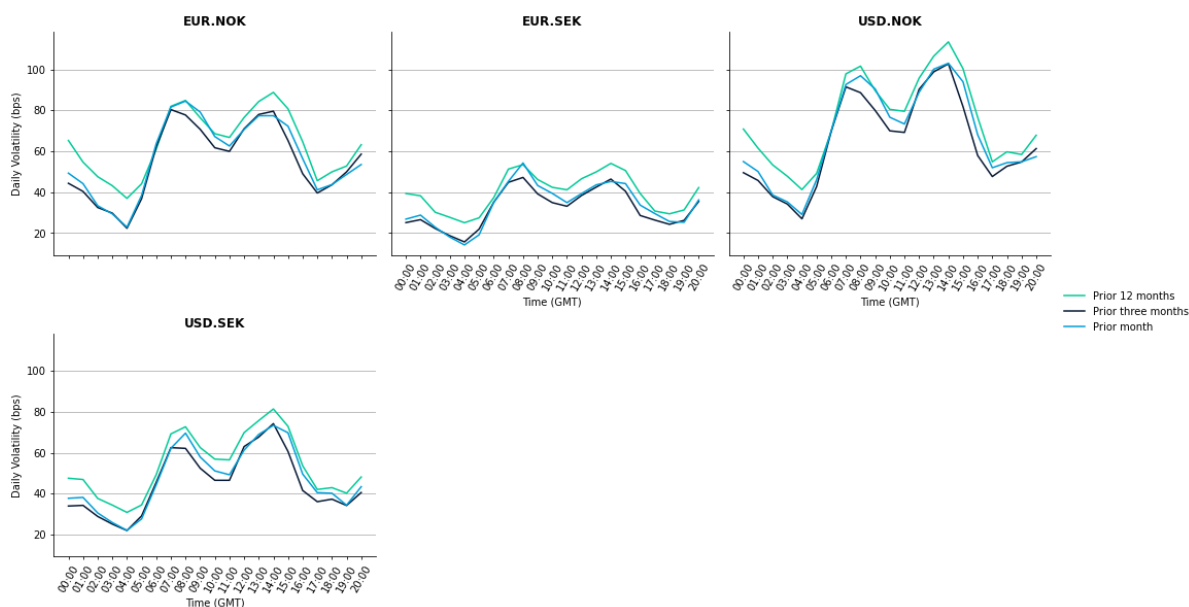


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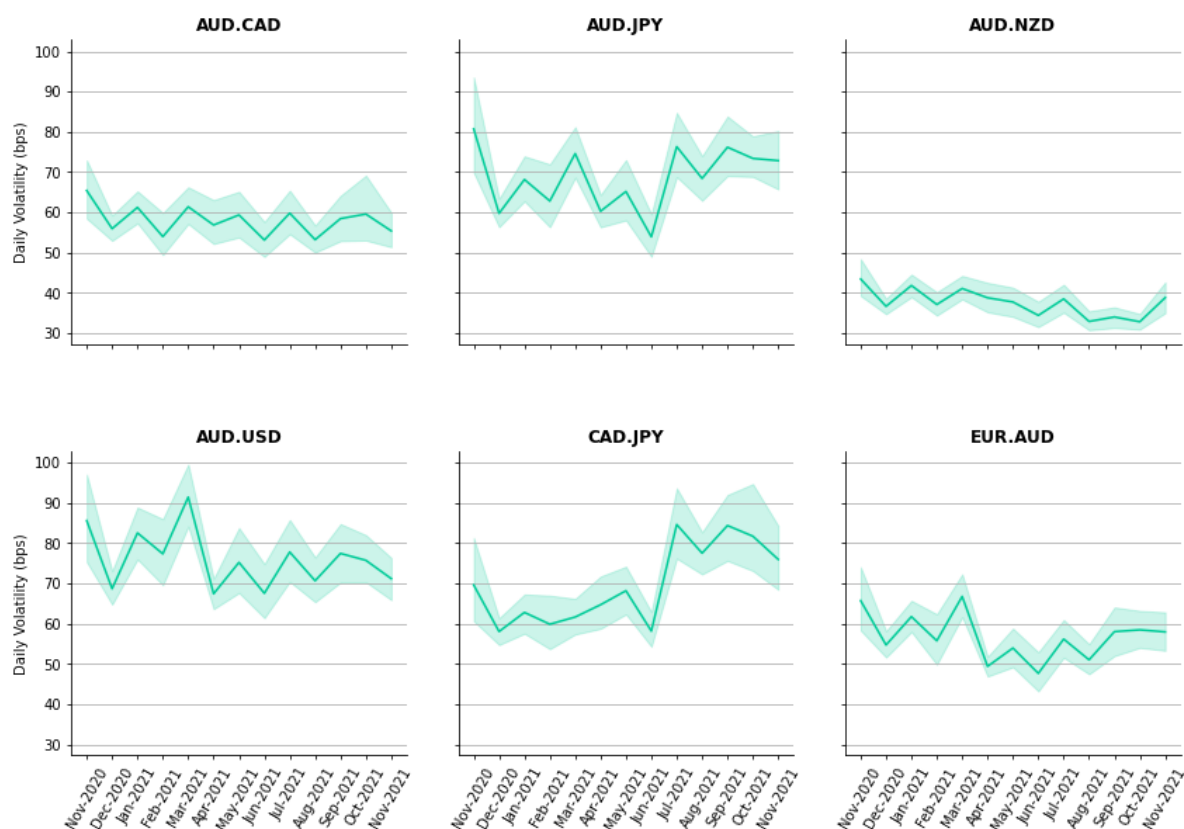




Scandinavian G-10 Currencies: Average Daily Volatility, 00:00-20:00 GMT Past month, three months and year



G-10 Currencies: Average Daily Volatility, 12:00-16:00 GMT November 2020-November 2021



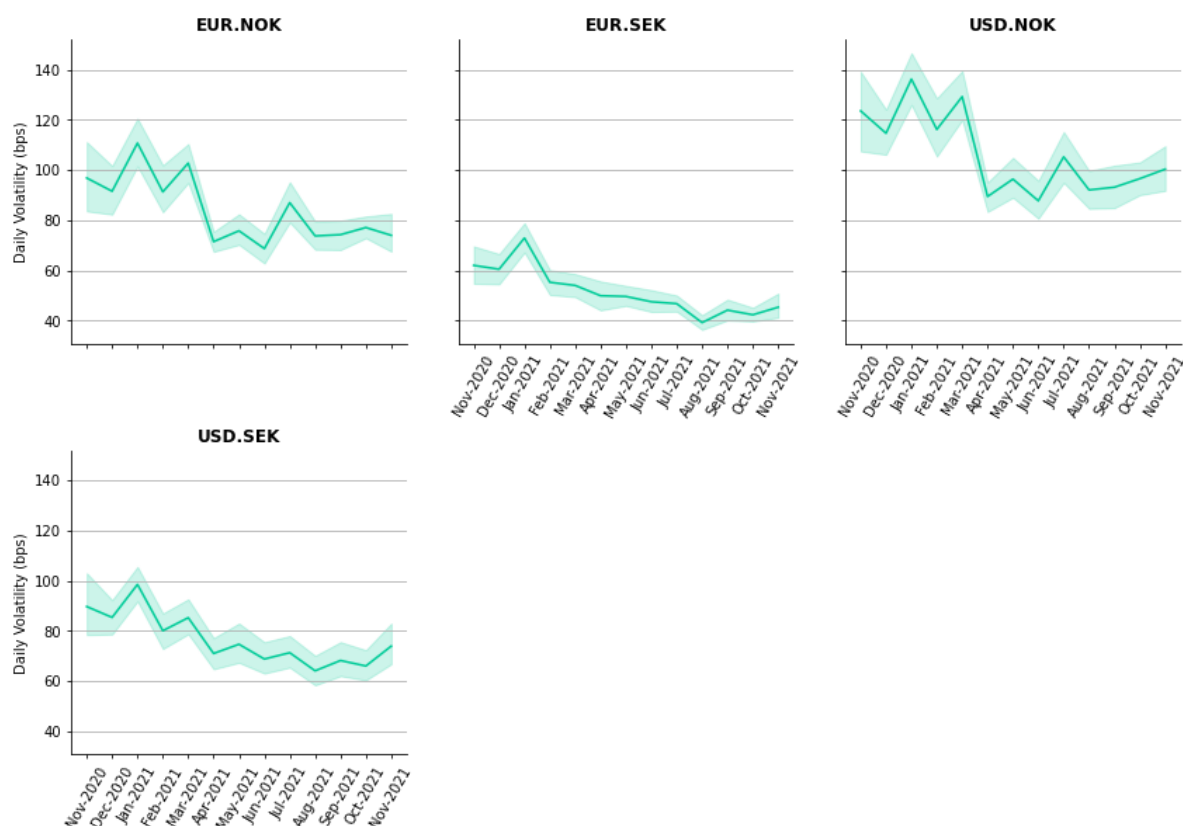
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Scandinavian G-10 Currencies: Average Daily Volatility, 12:00-16:00 GMT November 2020-November 2021



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

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