

November 2024

FX Market Structure Monthly

CHANGES IN SPREAD AND VOLATILITY FOR MAJOR MARKET PAIRS

Median FX spreads widened across 20 currency pairs in November, reflecting the geopolitical impact of events such as the US election on the FX market. AUD.JPY, EUR.NOK, and USD.NOK saw the most notable increases in spreads during the 12:00-16:00 GMT pre-WMR trading window. Median volatility also rose for 18 currency pairs, mirroring the movement of spreads. Notably, all four Scandinavian pairs exhibited increased volatility.

READING THE RESULTS

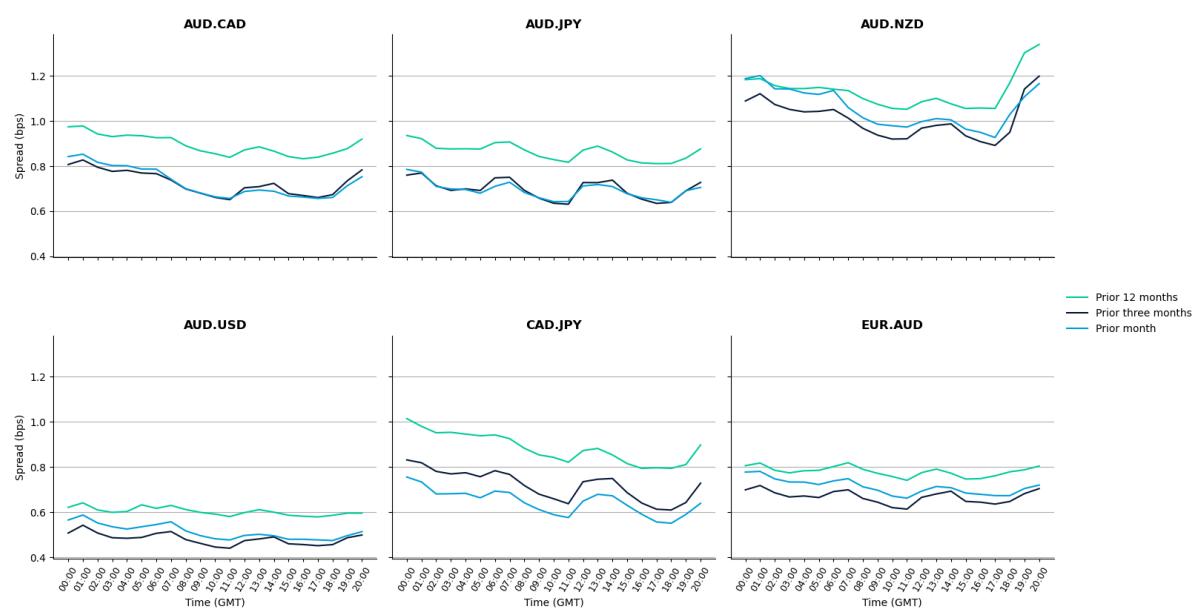
On the intraday charts, the green line represents the average spread or volatility for the past 12 months, the black line represents the past three months, and the blue line represents the past month. On the daily charts, the green area represents the 95th percentile confidence interval for the spread and volatility.

SPREADS

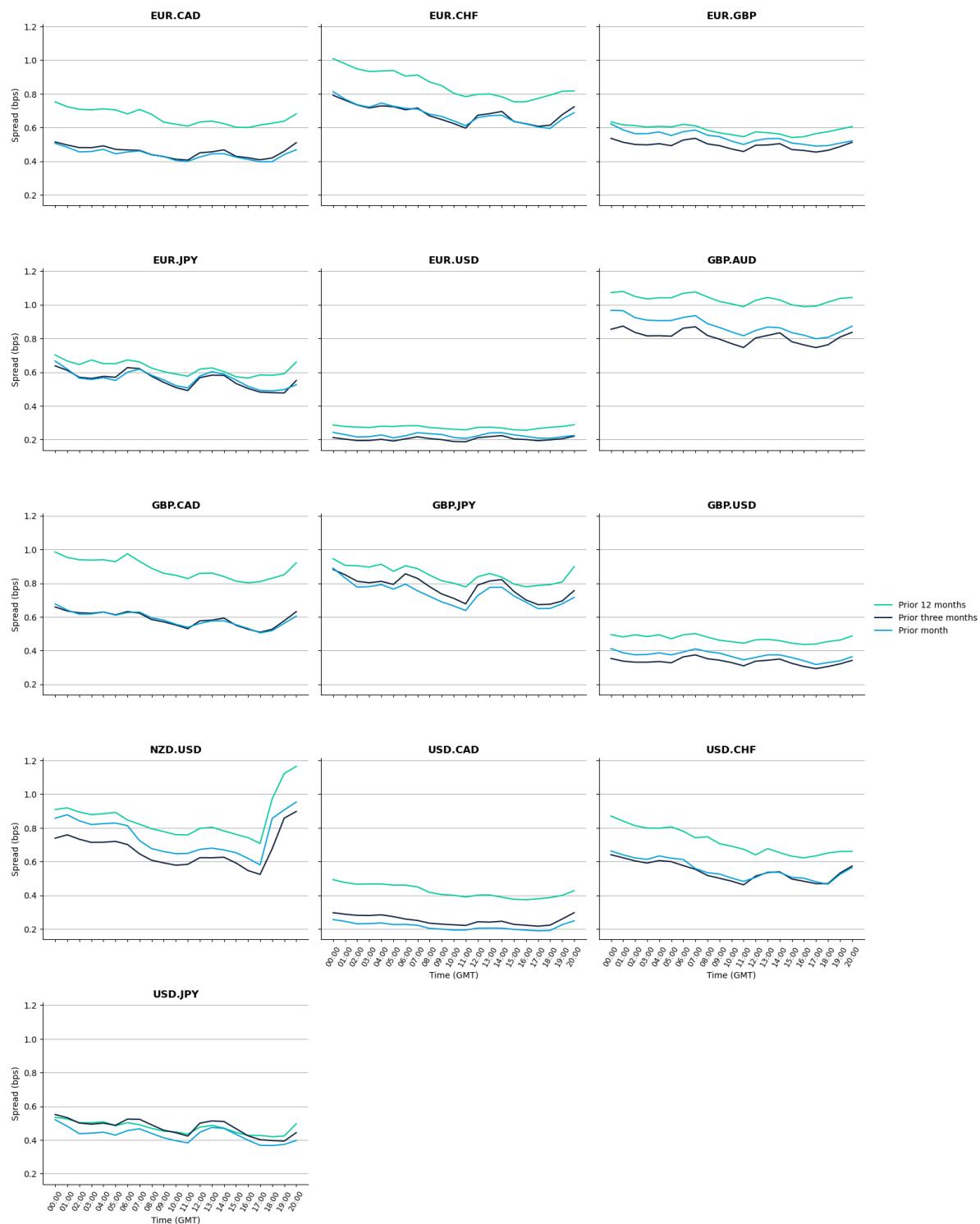
Although spreads widened across most currency pairs, intraday spread patterns remained consistent with historical trends. Typically, spreads narrow between 12:00 and 16:00 GMT as traders prepare for the WMR auction. However, this month, spreads declined slightly during this period and escalated after the WMR auction. Overall, spreads were comparable to or higher than the three-month levels but generally lower than 12-month levels, indicating more activity in FX markets this month.

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

Comparison over the past month, three months, and year



Cont'd. on next page...

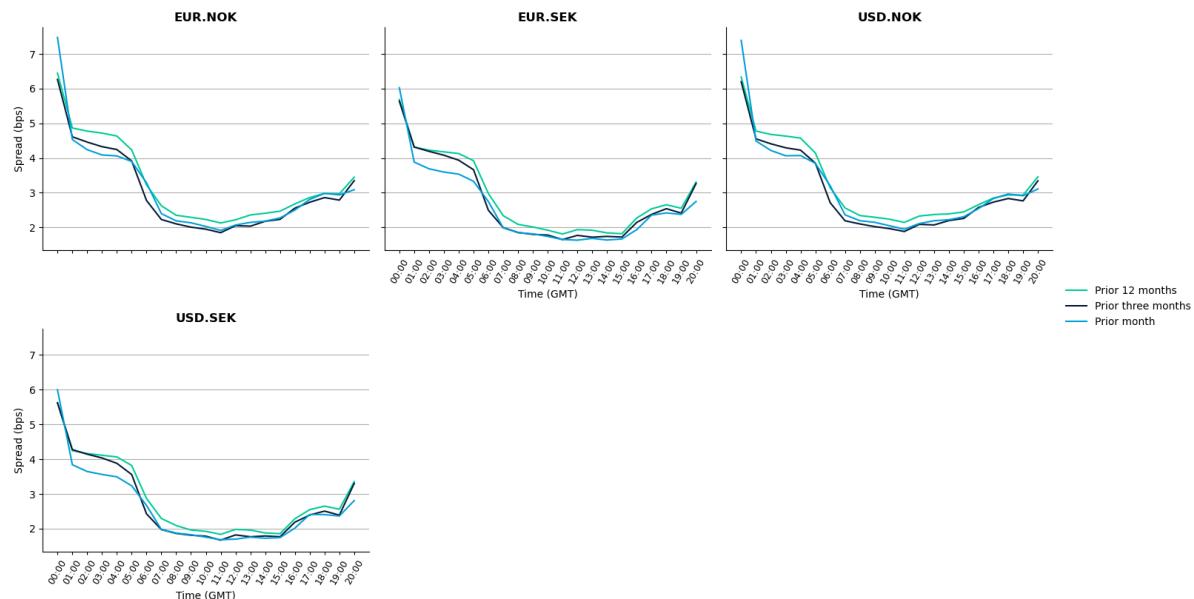


All chart sources: Virtu Financial, 2024. Spread and volatility calculations are derived from sources that Virtu believes to be reliable, but Virtu does not make any claims to its accuracy. USD.NOK, USD.SEK, EUR.NOK and EUR.SEK are shown in separate exhibits.



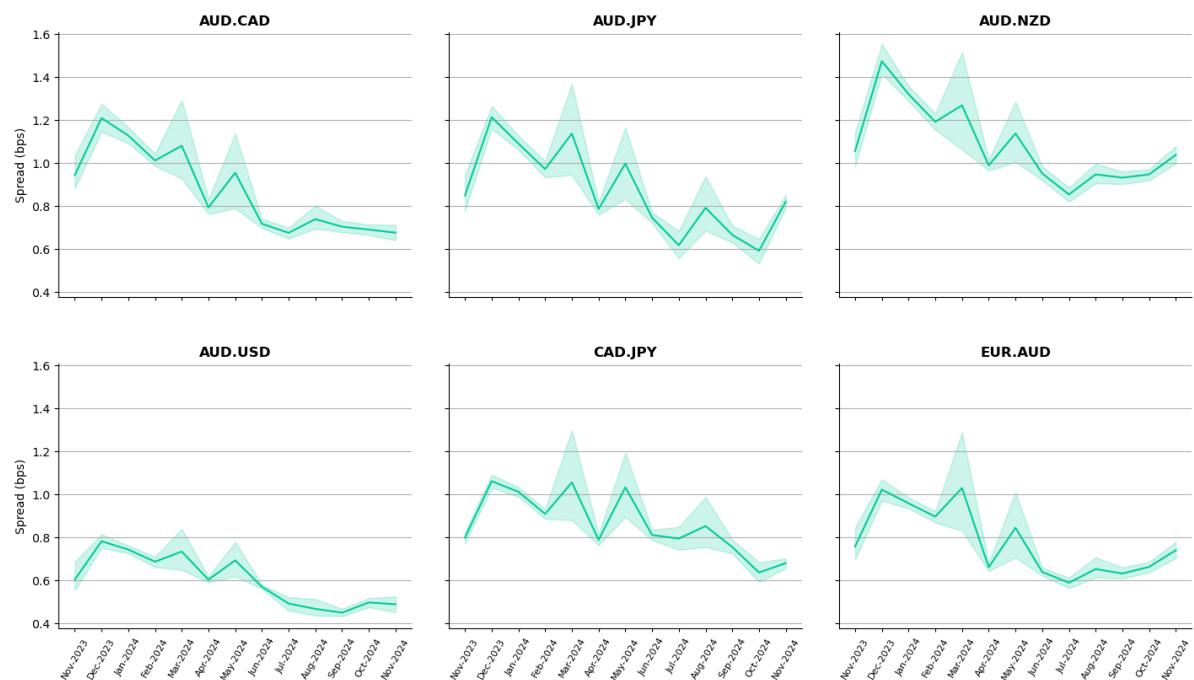
Scandinavian G-10 Currencies: Average Hourly Spread, 00:00-20:00 GMT

Comparison over the past month, three months, and year



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

November 2023 – November 2024

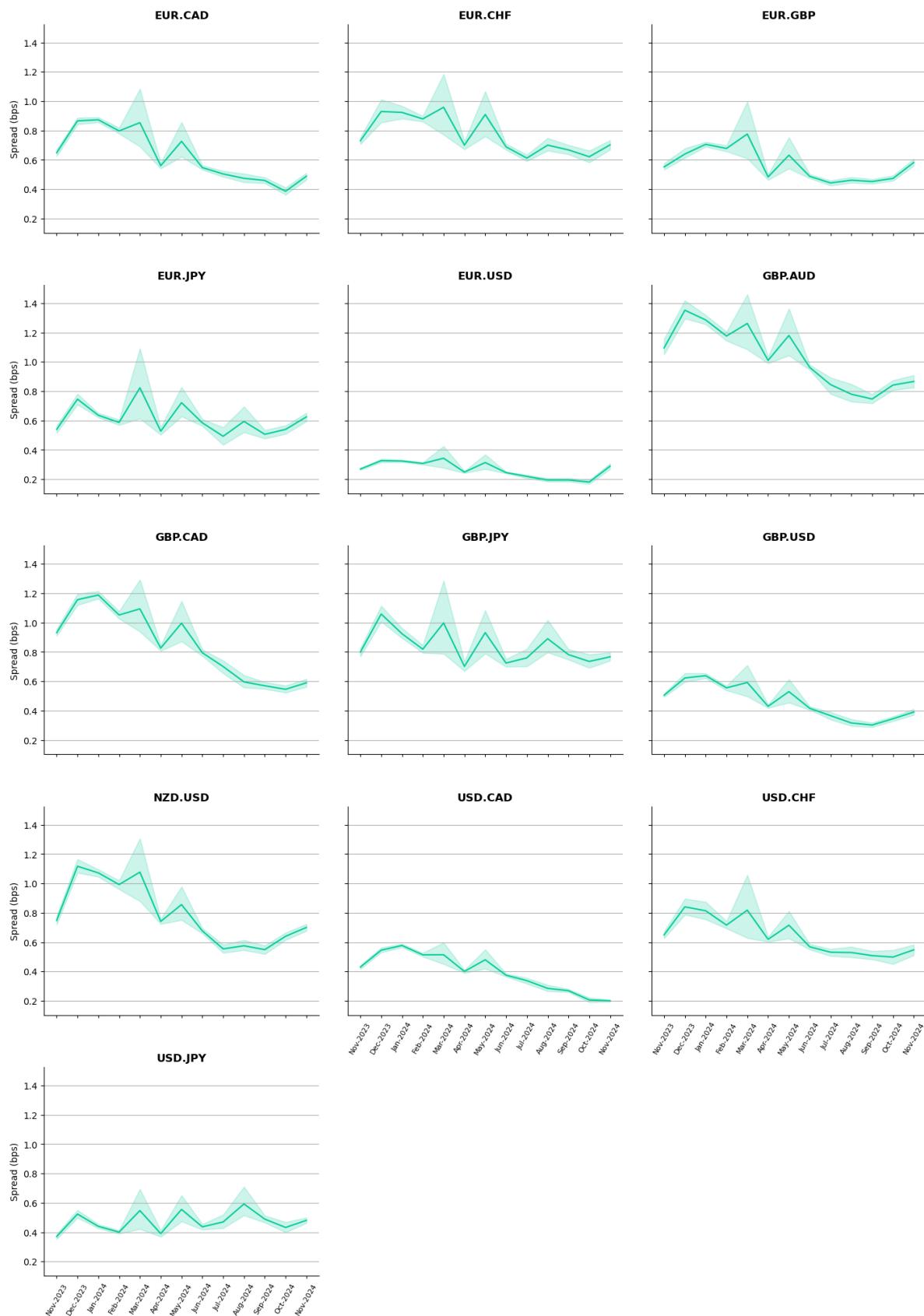


All chart sources: Virtu Financial, 2024. Spread and volatility calculations are derived from sources that Virtu believes to be reliable, but Virtu does not make any claims to its accuracy. USD.NOK, USD.SEK, EUR.NOK and EUR.SEK are shown in separate exhibits.

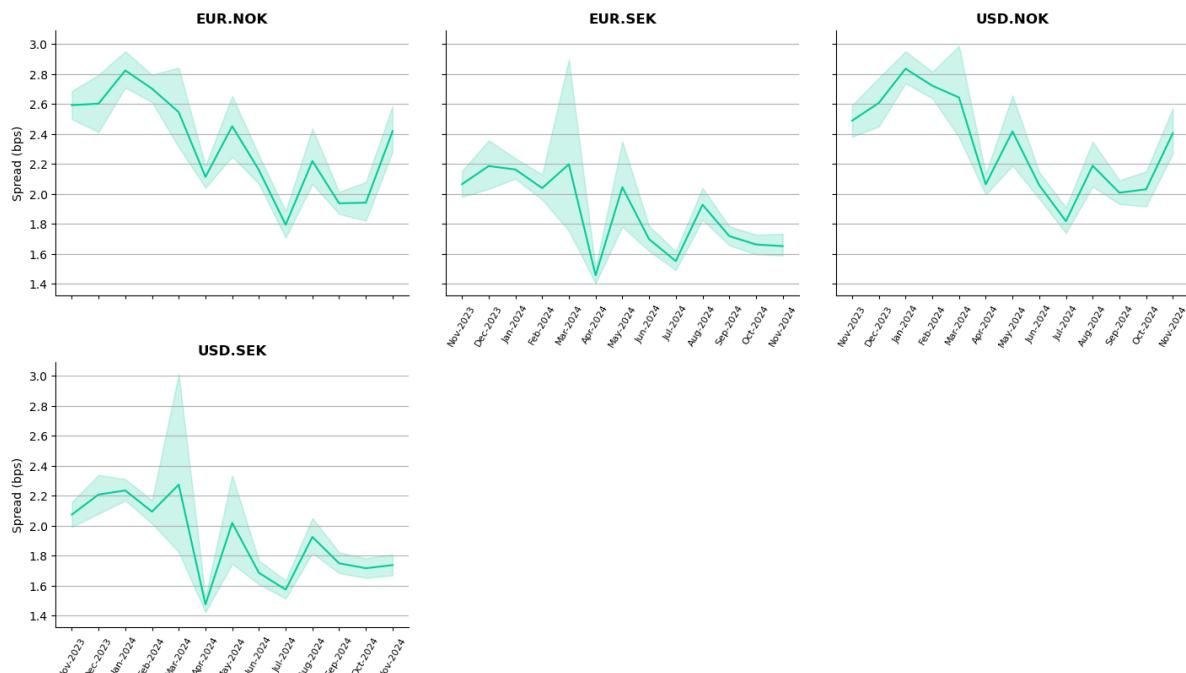


Scandinavian G-10 Currencies: Average Daily Spread, 12:00-16:00 GMT

November 2023 – November 2024



Cont'd. on next page...



All chart sources: Virtu Financial, 2024. 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.



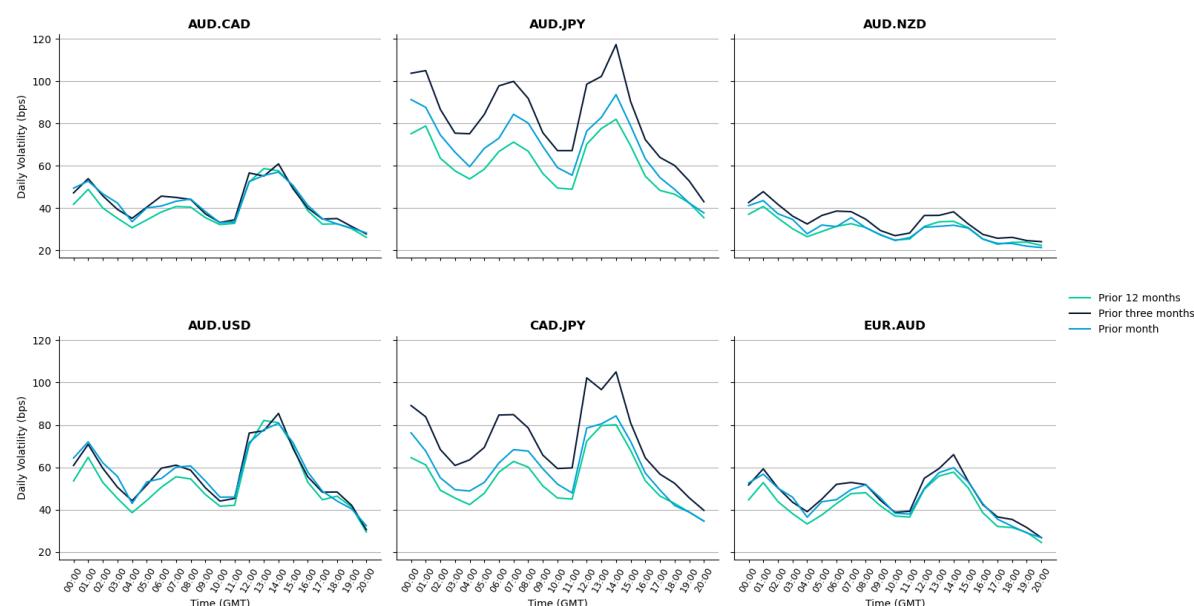
VOLATILITY

FX volatility has increased for most currency pairs over the last six months, with this trend continuing into November as 18 pairs experienced increased volatility. The most significant increases over the past year have been in JPY currency pairs, with volatility peaking in August following the Bank of Japan's decision to end its Quantitative and Qualitative Monetary Easing with Yield Curve Control. Since then, JPY volatility gradually decreased. For other currency pairs, volatility remained relatively consistent with previous records.

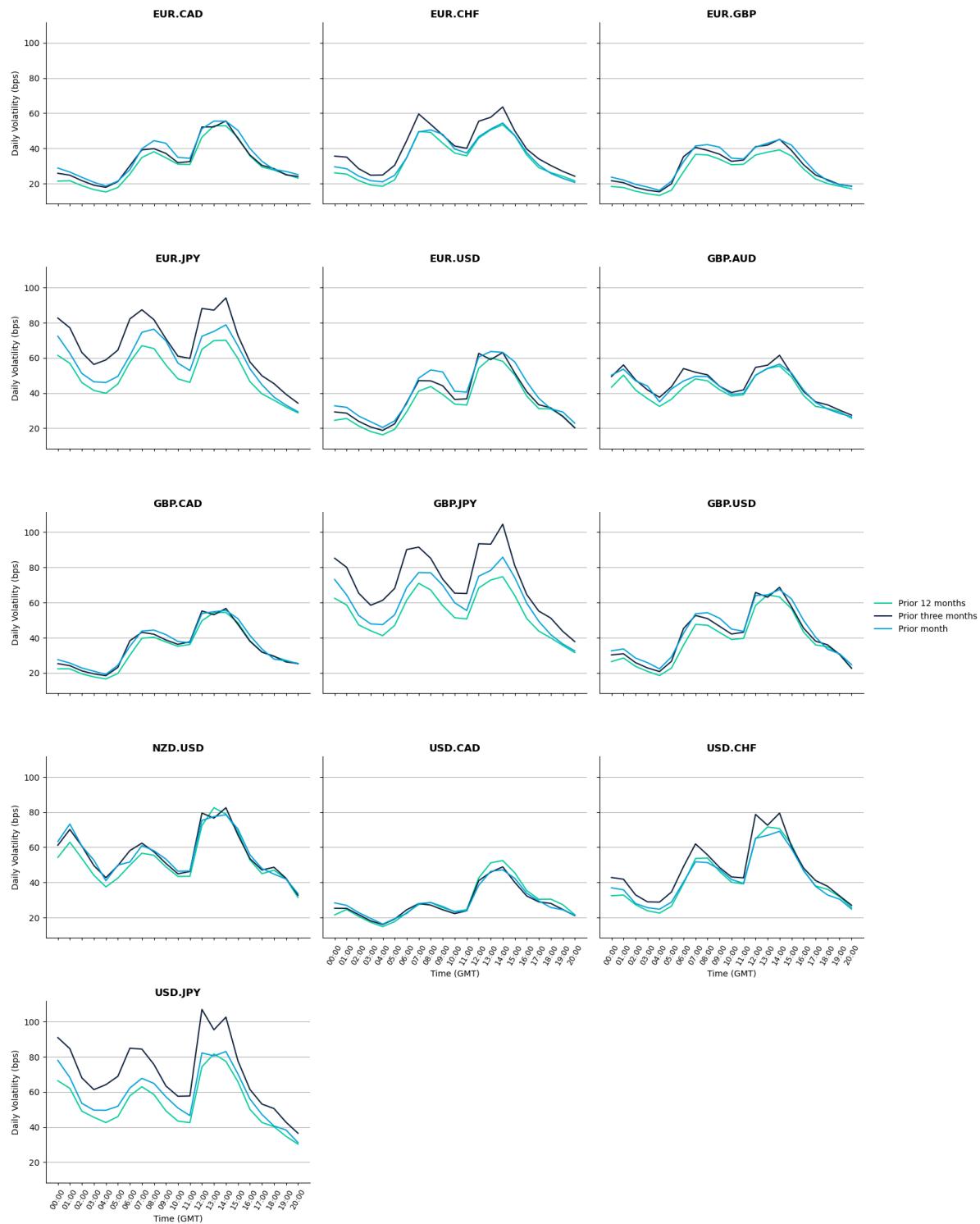
A closer analysis of average hourly volatility reveals a steady daily pattern, with heightened activity between the hours of 4:00–10:00 GMT and 12:00–17:00 GMT. While the scale of movement varies across currency pairs, the most drastic movement seen in JPY currency pairs.

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

Comparison over the past month, three months, and year



Cont'd. on next page...

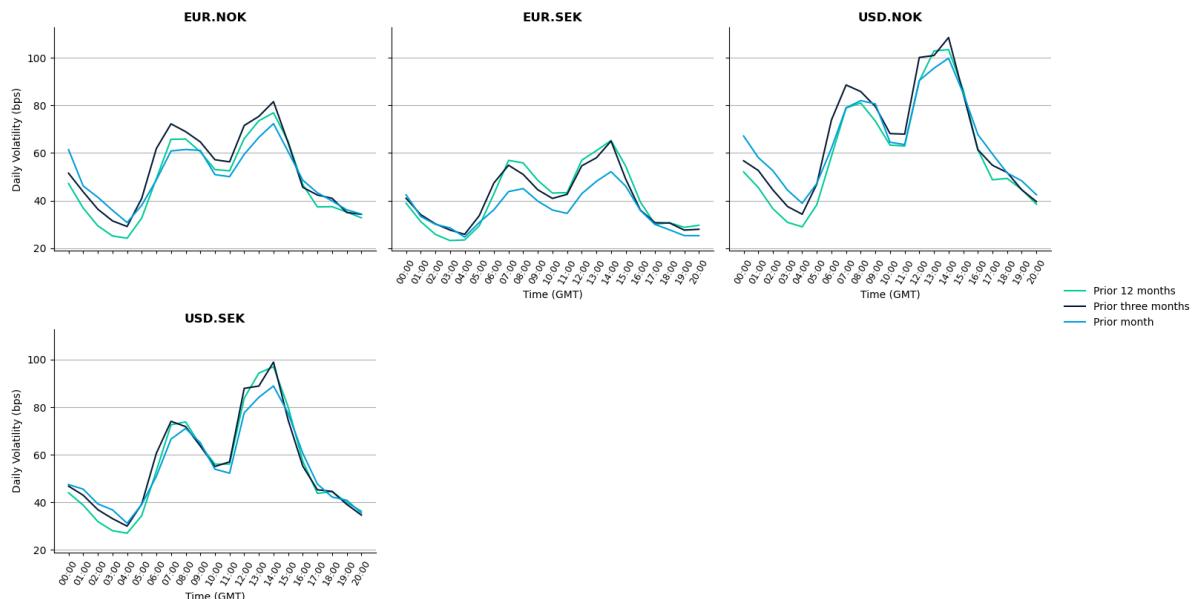


All chart sources: Virtu Financial, 2024. Spread and volatility calculations are derived from sources that Virtu believes to be reliable, but Virtu does not make any claims to its accuracy. USD.NOK, USD.SEK, EUR.NOK and EUR.SEK are shown in separate exhibits.



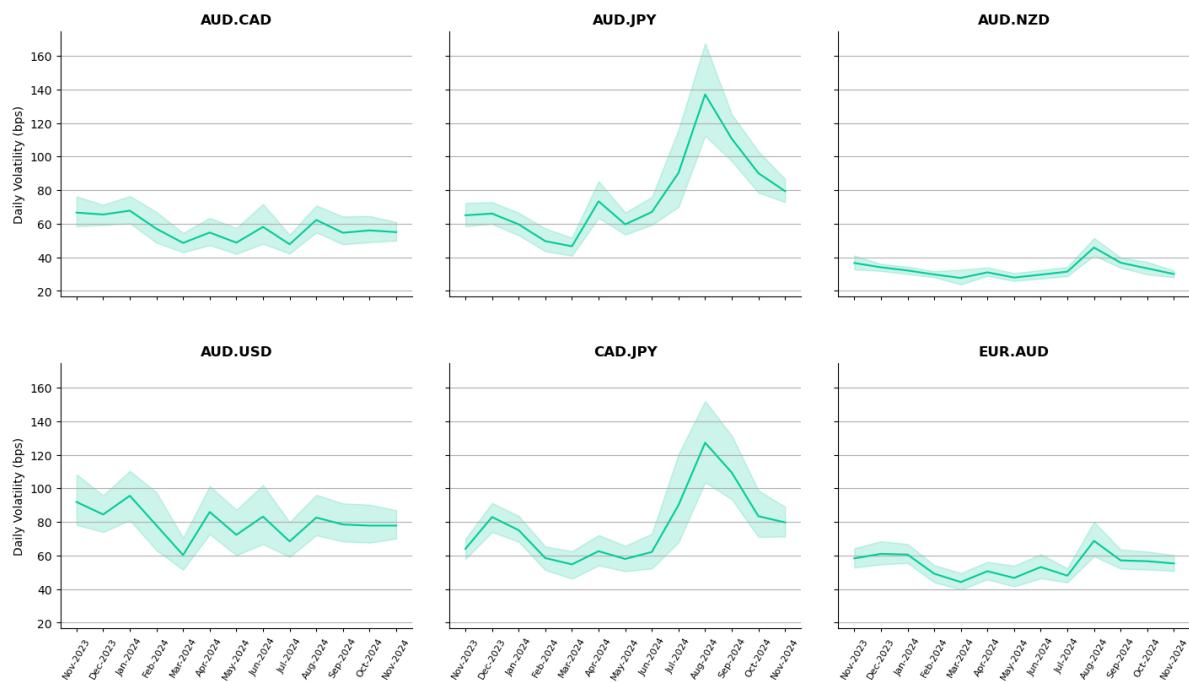
Scandinavian G-10 Currencies: Average Hourly Volatility, 00:00-20:00 GMT

Comparison over the past month, three months and year



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

November 2023 – November 2024



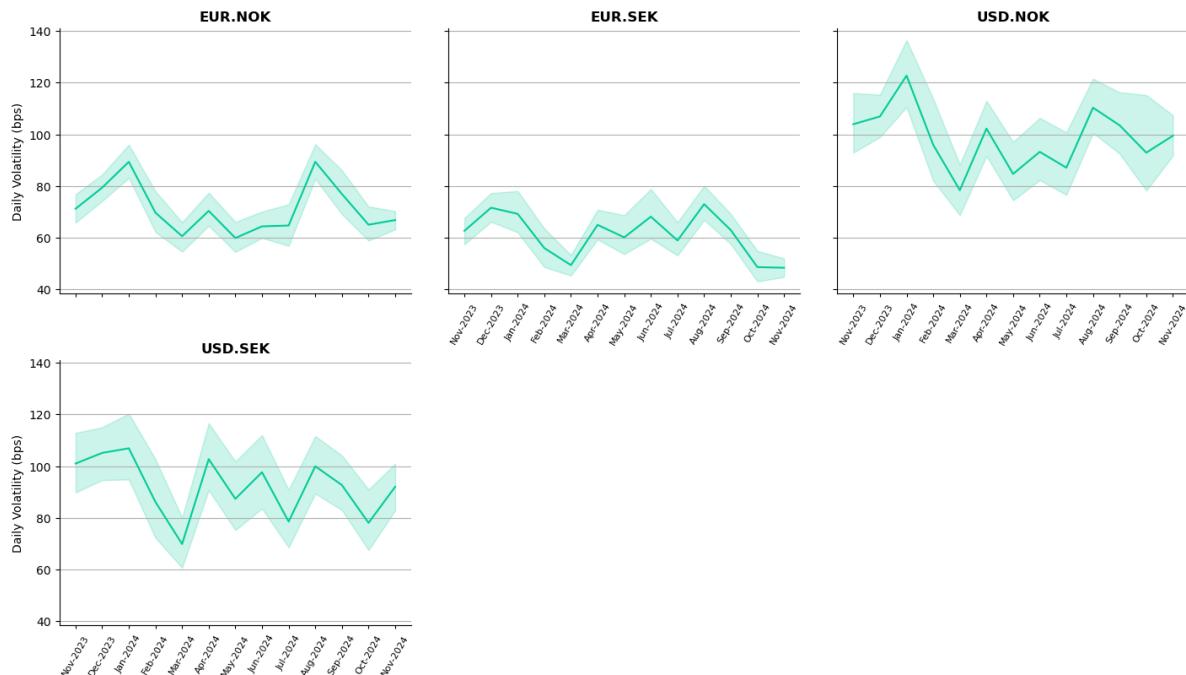


Scandinavian G-10 Currencies: Average Daily Volatility, 12:00-16:00 GMT

November 2023 – November 2024



Cont'd. on next page...



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

© 2024 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, Hong Kong or Australia, where such products and services are offered by Virtu ITG Ventures Limited, registered in Ireland No. 295549 ("VIVL"), Virtu ITG Hong Kong Limited registered in Hong Kong CE No. AHD810 ("VIHK") or Virtu ITG Australia Limited, registered in Australia AFSL No. 219582 ("VIAU"). 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 Canada Corp., member Canadian Investor Protection Fund and Canadian Investment Regulatory Organization; in Europe, Virtu Europe Trading Limited, registered in Ireland No. 283940 ("VETL") (VETL 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 VETL and VFIL is North Dock One, Fifth Floor, 91-92 North Wall Quay, Dublin 1, Ireland, D01 H7V7; 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, 2024. 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.