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Economic commentaries

Liquidity in the foreign exchange market for EUR/NOK

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LIQUIDITY IN THE FOREIGN EXCHANGE MARKET FOR EUR/NOK

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The foreign exchange (FX) market is commonly regarded as the most liquid financial market. However, the degree of liquidity, i.e. the extent to which trades can be executed rapidly with low transaction costs and little impact on prices, can vary substantially across currencies and over time. In contrast to major currency pairs like EUR/USD, GBP/USD and USD/JPY, the EUR/NOK market is relatively small.¹ Lack of liquidity can therefore have a significant impact on prices, making investors more exposed to substantial losses on their foreign investments. This became especially evident in the wake of Lehman's failure towards the end of 2008 when many investors simultaneously tried to unwind their long NOK positions. Liquidity conditions deteriorated radically and the krone depreciated by approximately 25 per cent versus the euro over the next three months. We have also seen similar patterns in other episodes of stress in the financial markets.

On the other hand, some investors have referred to the Norwegian krone as a safe haven currency due to Norway's solid financial position and robust economy. When liquidity is less of an issue, Norway's solid fundamentals may lead to increased demand for Norwegian kroner.

The Swiss franc seems to have been a preferred safe haven currency among investors as concerns about the fiscal situation in the euro area grew. As a result, the Swiss franc appreciated sharply over the summer. But when the Swiss National Bank (SNB) on September 6 announced a minimum exchange rate for the EUR/CHF, many investors seemed to turn their attention to the Norwegian and the Swedish krone as alternatives to the Swiss franc. Within hours of the SNB announcement, the krone appreciated close to 2½ percent versus the euro. In the following days however, uncertainty regarding the European sovereign debt crisis and the European banking sector increased and volatility in foreign exchange markets rose. As liquidity conditions deteriorated and investors became more concerned about liquidity, the krone depreciated to the levels seen before the SNB announcement.

¹ According to the 2010 BIS FX Triennial survey, NOK only accounts for 1.3 per cent of the global foreign exchange market turnover while the equivalent number for USD, EUR and the GBP respectively is 84.9 per cent, 39.1 and 12.9 per cent. Note that because two currencies are involved in each transaction, the sum of percentage shares has to total 200.

In this *Commentary* we will take a closer look at liquidity conditions in the market for the EUR/NOK. We assess the relationship between liquidity conditions and the spot exchange rate and look at liquidity conditions in EUR/NOK compared to other currency pairs, like EUR/SEK.

Historical liquidity conditions in EUR/NOK

Liquidity is a difficult concept to measure. Generally, a market is considered to be liquid if a trade can be executed rapidly, with low transaction costs and little impact on price. We assess the liquidity conditions in EUR/NOK by looking at the bid-ask spread, i.e. the difference between the lowest sell order and the highest buy order.² Conceptually, this can be thought of as a transaction cost. A narrow spread indicates lower costs and will be associated with improved liquidity. The bid-ask spread is just one way to measure liquidity and does not capture all aspects of liquidity, like those related to market depth or resilience. But based on information from our market contacts as well as other measures of liquidity, the average daily bid-ask spread seems to be a good measure of liquidity conditions in the market for Norwegian kroner.

Chart 1 shows the average daily bid-ask spread in EUR/NOK in the period from 2001 and onwards.³ The bid-ask spread has historically widened sharply when events like the 9/11 terror attacks in 2001, the NATO invasion of Iraq in the spring of 2003 and the collapse of Lehman Brothers in the autumn of 2008 led to increased stress in financial markets. As for long-run trends, the bid-ask spread tightened considerably in the years leading up to the 2008/09 financial crisis. The bid-ask spread averaged 0.043 per cent in the period 2001 to 2003, but fell to an average of 0.022 per cent in 2007.

However, this trend turned as the financial turbulence erupted in late summer 2007. The bid-ask spread widened somewhat from its low, but remained low relative to the historical average until the Lehman failure in September 2008. As investors reportedly shunned peripheral currencies, liquidity in the market for EUR/NOK dried up and the bid-ask spread blew out. The spread has steadily fallen back since the beginning of 2009, but increased temporarily in early May 2010 as the debt problems in peripheral Europe came into focus. We have also seen a recent widening of the bid-ask spread as concerns over the euro area sovereign debt situation have grown. Even

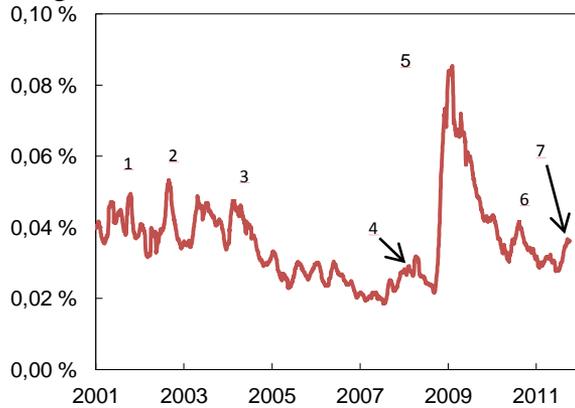
² We use high-frequency data from Thomson Reuters Dealing 3000 Xtra electronic broker platform, where the interdealer trading in EUR/NOK predominantly occurs. Our liquidity indicator is the average daily bid-ask spread as a percentage of the mid-mark exchange rate. By using the ratio of the spread to the mid-mark exchange rate, the indicator will also be comparable across currencies.

³ Liquidity conditions usually deteriorate around the turn of the year. Since we are primarily interested in looking at how liquidity conditions evolve during periods of financial stress, the period between December 25 and January 1 each year is excluded in this *Commentary*.

though the bid-ask spread has fallen significantly from its levels during the first phase of the financial crisis, it has stayed elevated compared to its level prior to the Lehman collapse.

Chart 1: Liquidity in EUR/NOK.

Average daily bid-ask spread divided by the mid-market exchange rate. Per cent. 30 day moving average. 2. Jan. 2001 – 5 Oct. 2011



Sources: Thomson Reuters and Norges Bank

Historical events:

1. 9/11 terror attacks
2. Global equity slide
3. Iraq invasion
4. Bear Stearns is sold to JP Morgan
5. Lehman failure
6. Greece seeks financial aid from EU/IMF
7. The European sovereign debt crisis intensifies.

Relationship between liquidity in EUR/NOK and the EUR/NOK spot exchange rate

The market for the Norwegian krone is relatively small and liquidity can therefore have a significant impact on prices. Chart 2 shows the EUR/NOK spot exchange rate alongside the average daily bid-ask spread. At first glance, deteriorating liquidity conditions seem to have tended to co-move with a weaker krone. Chart 3 shows the relationship (3-week rolling correlation⁴) between the daily change in the EUR/NOK spot exchange rate and the daily average bid-ask spread in EUR/NOK. Over the past decade the correlation between the exchange rate and the bid-ask spread has been positive, i.e. the NOK has tended to depreciate when the bid-ask spread widens (liquidity worsens).

⁴ Changing the correlation window to two or four weeks does not alter the conclusions, see Table 1 for details.

Chart 2: Liquidity in EUR/NOK.
Average daily bid-ask spread divided by the mid-mark exchange rate. Per cent. 30-day moving average. 2 Jan. 2002 – 5 Oct. 2011

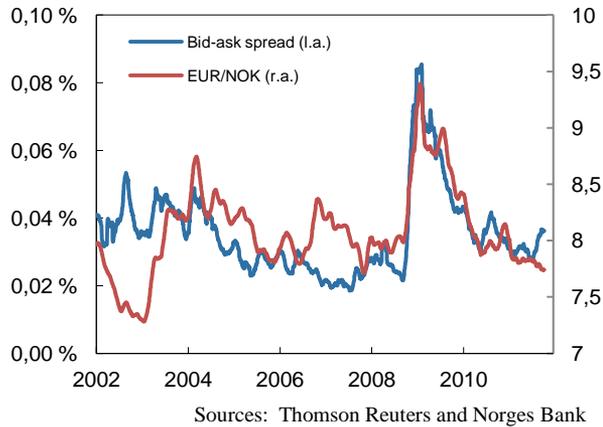
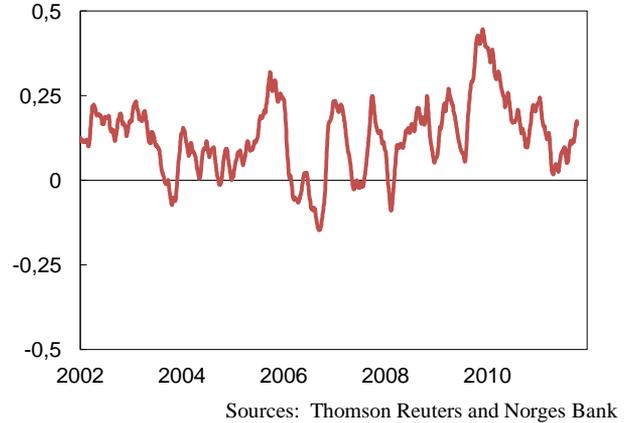


Chart 3: Three-week rolling correlation between the daily changes in the EUR/NOK spot exchange rate and average daily bid-ask spread in EUR/NOK. 90-day moving average. 2 Jan. 2002 – 5 Oct. 2011



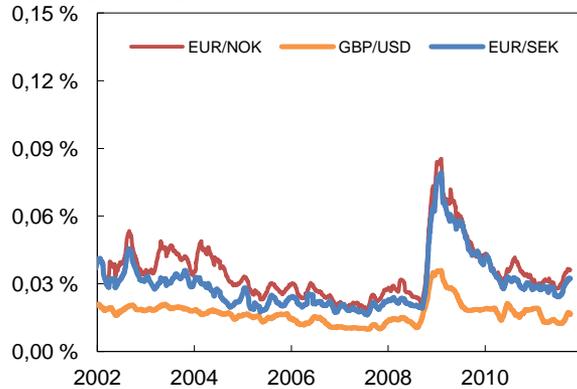
Comparisons with other currencies

Below we follow the same procedure for EUR/SEK, GBP/USD, AUD/USD, NZD/USD and USD/CAD⁵ in order to compare the degree of liquidity across the currencies. Charts 4 and 5 show the average daily bid-ask spreads for the respective currency pairs. Clearly, liquidity in the market for the New Zealand dollar looks to be the worst. And although the bid-ask spread in NZD/USD narrowed markedly in the years prior to the financial crisis, the spread blew out during the crisis. The bid-ask spreads in EUR/NOK, EUR/SEK, AUD/USD and USD/CAD behave similarly until the Lehman Brothers default in September 2008. During the crisis however, bid-ask spreads in the Scandinavian currencies widened significantly more than in the other two currencies and have stayed higher over the past 3 years. Liquidity conditions thus seem to be more volatile in the Scandinavian currencies. For GBP/USD, the bid-ask spread was distinctly lower than the other spreads up until the financial crisis, but is now in line with the bid-ask spread in AUD/USD and USD/CAD.

⁵ These currency pairs are primarily traded on Thomson Reuters Dealing 3000 Xtra.

Chart 4: Liquidity in EUR/NOK, EUR/SEK and GBP/USD.

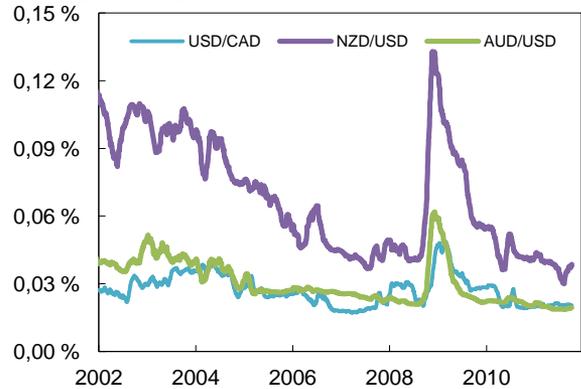
Average daily bid-ask spread divided by the mid-market exchange rate. Per cent. 30-day moving average. 2 Jan. 2002 – 5 Oct. 2011



Sources: Thomson Reuters and Norges Bank

Chart 5: Liquidity in USD/CAD, AUD/USD and NZD/USD.

Average daily bid-ask spread divided by the mid-market exchange rate. Per cent. 30-day moving average. 2 Jan. 2002 – 5 Oct. 2011

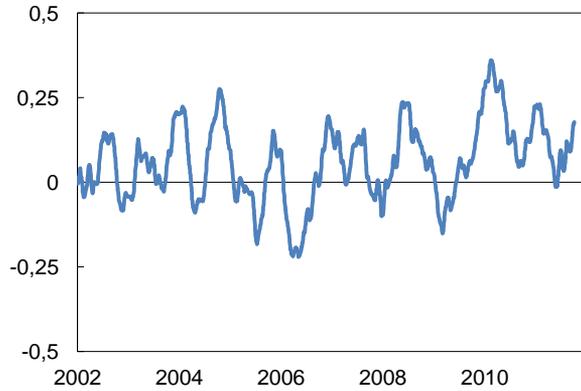


Sources: Thomson Reuters and Norges Bank

Chart 6 shows the correlation between the bid-ask spread in EUR/SEK and the EUR/SEK spot exchange rate, while Charts 7 to 10 show similar for GBP/USD, AUD/USD, NZD/USD and USD/CAD.⁶ A positive correlation indicates that a widening of the bid-ask spread corresponds to a depreciation of respectively Swedish kroner versus the euro and a depreciation of pound sterling, the Australian, the New Zealand and the Canadian dollar against the US dollar. In contrast to the Norwegian krone, there does not seem to be a systematic relationship between liquidity conditions and the exchange rate for sterling, the Canadian dollar or the New Zealand dollar. There seems to be a positive correlation between liquidity conditions and the exchange rate for both the Swedish krone and the Australian dollar however, but the relationship is weaker than for the Norwegian krone. Table 1 provides details of the correlations.

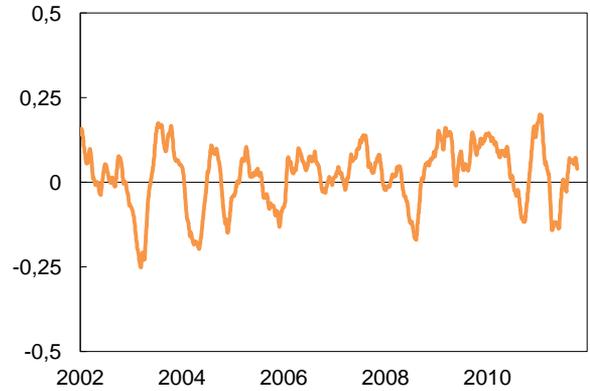
⁶ Again, changing the rolling correlation window to two or four weeks does not alter the conclusions, see table 1.

Chart 6: Three-week rolling correlation between the EUR/SEK spot exchange rate and average daily bid-ask spread in EUR/SEK. 90-day moving average. 2 Jan. 2002 – 5 Oct. 2011



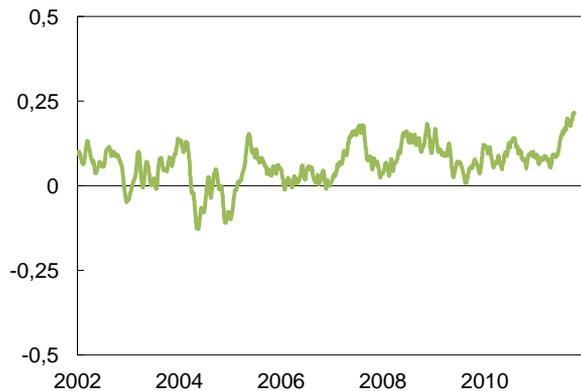
Sources: Bloomberg, Thomson Reuters and Norges Bank

Chart 7: Three-week rolling correlation between the GBP/USD spot exchange rate and average daily bid-ask spread in GBP/USD. 90-day moving average. 2 Jan. 2002 – 5 Oct. 2011



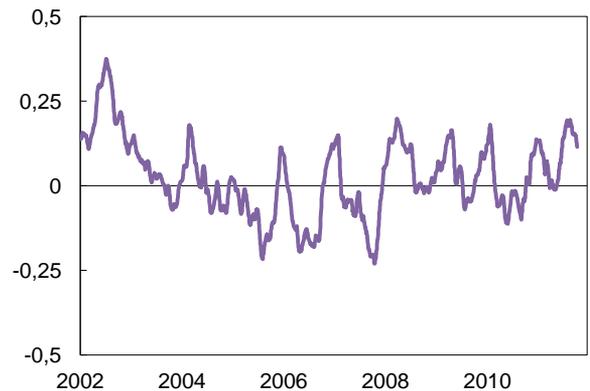
Sources: Bloomberg, Thomson Reuters and Norges Bank

Chart 8: Three-week rolling correlation between the AUD/USD spot exchange rate and average daily bid-ask spread in AUD/USD. 90-day moving average. 2 Jan. 2002 – 5 Oct. 2011



Sources: Bloomberg, Thomson Reuters and Norges Bank

Chart 9: Three-week rolling correlation between the NZD/USD spot exchange rate and average daily bid-ask spread in NZD/USD. 90-day moving average. 2 Jan. 2002 – 5 Oct. 2011



Sources: Bloomberg, Thomson Reuters and Norges Bank

Chart 10: Three-week rolling correlation between the USD/CAD spot exchange rate and average daily bid-ask spread in USD/CAD.

90-day moving average.

2 Jan. 2002 – 5 Oct. 2011

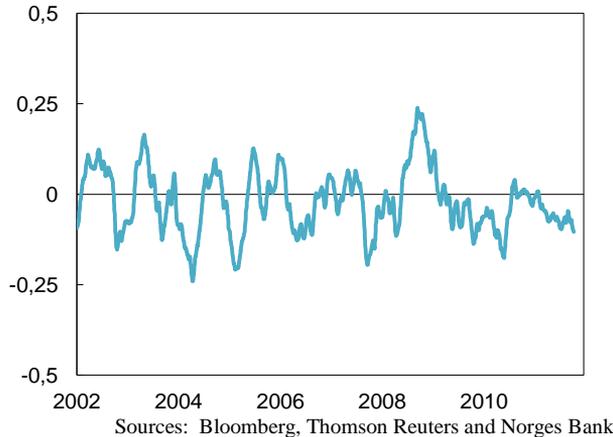


Table 1: Correlation between the spot exchange rate and the average daily bid-ask spread. Average correlation over the period. 1 Jan. 2002 – 5 Oct. 2011

	EUR/NOK	EUR/SEK	GBP/USD	AUD/USD	NZD/USD	USD/CAD
2-week rolling correlation	0.131	0.061	0.024	0.079	0.036	-0.031
3-week rolling correlation	0.128	0.062	0.017	0.067	0.022	-0.022
4-week rolling correlation	0.127	0.061	0.012	0.060	0.015	-0.016

Sources: Bloomberg, Thomson Reuters and Norges Bank

Conclusion

The market for Norwegian kroner is relatively small and liquidity can vary substantially over time. Historically, liquidity conditions in EUR/NOK have deteriorated during periods of increased stress in financial markets. In particular since the collapse of Lehman Brothers in September 2008, the market for Norwegian kroner has been less liquid than the market for sterling and the Australian and the Canadian dollar. Liquidity conditions in the market for Norwegian kroner are also more volatile than in the other three currencies and seem to be more exposed to general stress in the financial markets.

Increased financial stress and lower liquidity have often led to a depreciation of the Norwegian krone. Among the currencies we have looked at, the Norwegian krone seems to be the currency with the strongest systematic correlation between liquidity and the exchange rate, implying that deteriorating liquidity conditions correspond to a weaker currency.