

# Statistics on foreign exchange transactions – new insight into foreign exchange markets

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Norges Bank has published new statistics on the purchase and sale of NOK for foreign currency. The statistics provide information about activity in the market for NOK, and will be an important aid in monitoring and identifying mechanisms in the NOK market. The statistics on foreign exchange transactions show that the average daily turnover in NOK of reporting banks in the period October 2005 - January 2006 was over NOK 63 billion. Foreign banks dominate trading in the spot and swap markets, while non-financial enterprises are the largest operators in forward markets. NOK/EUR trading makes up the bulk of spot transactions, while NOK/USD trading dominates swap transactions. The currency distribution in forward transactions is more even.

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## 1 Introduction

### 1.1 Purpose and application

The statistics on foreign exchange transactions are based on daily transaction data on the purchase and sale of NOK for foreign exchange from the largest banks. The transactions are classified according to counterparty sector, type of contract (instrument) and maturity. The foreign exchange statistics strengthen the information used as a basis for monetary policy by relating activities in the foreign exchange market to developments in the krone exchange rate. The new statistics provide up-to-date information on the customer groups that have been active and what types of contract they have used. Through contact with market participants, Norges Bank will be able to identify the causes of the shifts captured by the statistics. In the future the underlying data will also contribute to research on exchange rate theory. In the surveillance of financial stability, statistics provide

a new source of information on turnover and maturity distribution in the currency hedging market for NOK.

Norges Bank's statistics on foreign exchange transactions have features in common with Sveriges Riksbank's system for collecting transaction data from the foreign exchange market. The Riksbank publishes its turnover statistics on a monthly basis, while the Norwegian statistics are published weekly.<sup>1</sup> Norges Bank's statistics have a more detailed breakdown into customer categories and contract types. Norges Bank has based its breakdown by customer and type of contract on the results of recent research on order flow analyses (see Section 1.2). We are not aware of other central banks that collect microdata from the foreign exchange market with the same frequency and degree of detail.

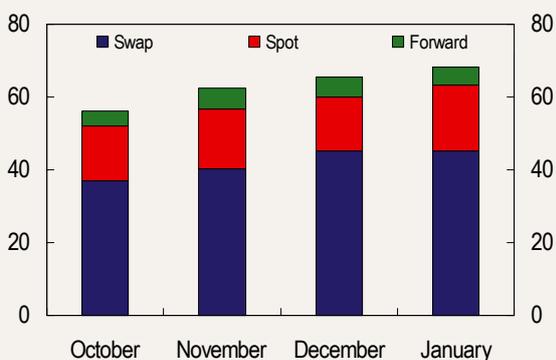
The collection of data for the new foreign exchange transaction statistics started in October 2005. The figures for the period to end-January 2006 show that the average daily turnover of NOK (volume) in the foreign exchange market was over NOK 63 billion for the reporting banks.

The highest turnover was in January 2006, when sales and purchases of NOK averaged NOK 68 billion per day. Swap transactions dominated trading, with a share of 66 per cent of turnover throughout the period October-January, while spot and forward transactions accounted for 26 per cent and 8 per cent respectively. Swap trading is characterised by large volumes, but relatively few trades. Swaps only accounted for 5 per cent of total transactions of all types of contracts. The shares for spot and forward contracts were 79 per cent and 16 per cent, respectively.

### 1.2 Theoretical and empirical background

The foreign exchange transaction statistics are based on an analytical model called order flow analysis. Order flows are defined as the difference between the value of

**Chart 1** Average daily turnover of NOK in the foreign exchange market, by type of contract. October 2005 – January 2006. In billions of NOK

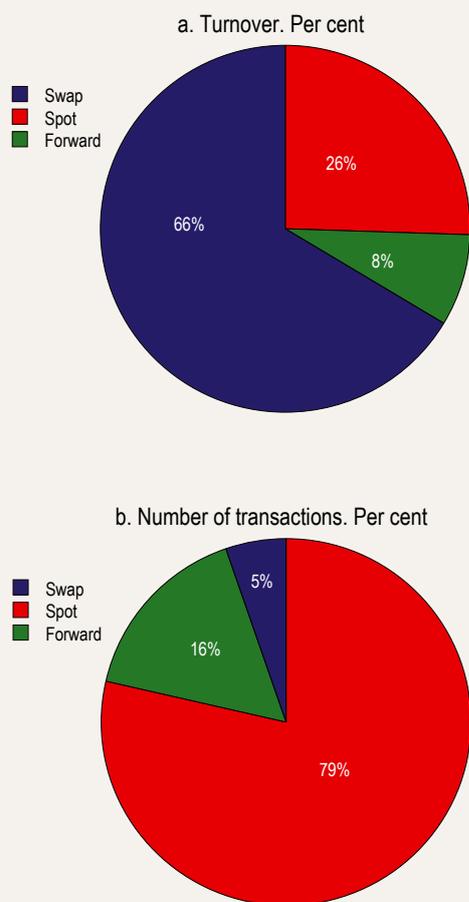


Source: Norges Bank

\*With thanks to our colleagues at Norges Bank for their useful comments.

<sup>1</sup> See <http://www.norges-bank.no/front/statistikk/no/vhandel/> and the box on page 83.

**Chart 2** Turnover of NOK and number of foreign exchange market transactions, by type of contract. October 2005 – January 2006. Percentage



buy and sell orders initiated by customers in a period, i.e. customers' net foreign exchange purchases. Order flow analysis has proved useful in explaining developments in a number of asset prices, including exchange rates.

Exchange rates can be influenced through two information channels – a direct channel and an indirect channel (Evans 2005). The direct channel consists of publicly available information. For example, information on developments in GDP, the CPI, credit or employment can provide unambiguous, simultaneous information to the market makers, and can influence the exchange rate immediately. In traditional macroeconomic models of the exchange rate, it is assumed that all market makers receive the same information simultaneously and have identical expectations of future economic developments.

The indirect channel functions through information that is not generally known (private information). Examples of private information are micro-level knowledge of earnings, buy and sell orders and internal financial analyses that lead to different expectations

with respect to exchange rate developments. Private information reaches the individual market-maker via customer order flows. The order flows provide signals about the direction and strength of any exchange rate adjustments. It can take time for exchange rates to reflect these signals: the information has to be interpreted, the signals have to be distinguished from noise and the information has to be disseminated to the market as a whole via interbank trading. The order flows and the trading process form an integral part of the determination and development of spot prices (Lyons 2001).<sup>2</sup>

Models that take account of order flows to explain exchange rate developments are often called micro-based models. Micro-based models make it possible for exchange rate effects to come through both the direct and the indirect channel. Love and Payne (2002) and Evans and Lyons (2003) find evidence that both channels play a part. In practice, models based on order flow analysis are often used in combination with fundamental and technical analyses. A number of empirical studies show that order flow analyses have good explanatory power in the short and medium term, in contrast to fundamental analyses. Evans and Lyons (2005) show that micro-based models also have better forecasting power than both standard macro-models and random walk models with a horizon of from 1 day to 1 month.

Order flow analyses based on daily transaction data have not previously been carried out for large parts of the Norwegian krone market. In general, customer trades are only observable for the individual bank, and a number of these have so far used their own data in order flow analyses. The information in foreign exchange transaction statistics obtained by grouping microdata from a number of banks may therefore make an important contribution to the development of order flow analyses in the future.

## 2 Description of the statistics

The foreign exchange statistics provide information about the reporting banks' purchase and sale of NOK for foreign exchange, the counterparties in the transactions and the types of contract used. The reporting banks are all the Nordic banks that set prices in NOK. A considerable part of the NOK trading of the reporting banks takes place abroad, through a head office or branches. This applies in particular to interbank trading, options trading and trading with large customers. In order to capture the total activity of the reporting banks, the rule is that all trading in NOK that takes place through the banking section of the conglomerate is reported, irrespective of where in the world the trading takes place.

It is difficult to quantify the total NOK turnover in the foreign exchange market. The Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity conducted by the Bank for International Settlements (BIS) measured daily turnover in April

<sup>2</sup> Here the causality direction is from order flow to exchange rate. In other contexts causality will go the other way, from exchange rate to order flows, for example trading based on technical analyses.

## Definitions and classifications in statistics and classifications used in the article.

### *Contract type/instrument classification and maturity distribution:*

(Indicates type of transaction and the duration of the contract from the time it is made to the expiry date.)

*Spot:* Agreement on purchase or sale of foreign exchange where the contract matures two banking days after the contract is made.

*Forward:* A forward contract is an agreement to buy or sell foreign exchange for future delivery either less than or more than two banking days after the contract is made. The amount, exchange rate and delivery date are agreed when the contract is made and cannot be changed during the contract period.

#### *Maturities in the statistics:*

- 0 to 1 day
- 3 days to 3 months
- 3 months to 6 months
- 6 months to 12 months
- 12 months to 2 years
- Over 2 years

*Swap* Agreement to buy/sell foreign exchange (the short leg) made simultaneously with an agreement to sell/buy back the foreign exchange (the long leg) at a predetermined future date at a rate that is fixed today. In order to avoid double counting, only the long leg is reported to the foreign exchange statistics. This is in line with the recording method used in the BIS Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity and the market standard.

#### *Maturities in the statistics:*

- 0 to 2 days
- 3 days to 3 months
- 3 months to 6 months
- 6 months to 12 months
- 12 months to 2 years
- Over 2 years

*Options:* Agreements that give the owner a right, but not an obligation, to buy (call option) or sell (put option) a particular quantity of an underlying object at a given price (the contract price) on or by a specified date.

#### *Option classification in the statistics:*

- Put – option to sell
- Call – option to buy
- Other – residual item

#### *Counterparty classification:*

(The reporting institution's counterparty in a contract)

#### *Customer classification in the statistics:*

- Other reporting banks
- Other foreign banks
- Other Norwegian banks
- Other Norwegian financial sector customers
- Oil companies
- Norwegian non-financial customers other than oil companies
- Other foreign financial sector customers
- Foreign non-financial customers
- Norges Bank (central bank of Norway)

#### *Customer classification in the article:*

- Financial customers: Norwegian banks other than the reporting banks, other Norwegian financial sector customers, other foreign financial sector customers and Norges Bank
- Non-financial customers: Norwegian non-financial customers excluding oil companies, foreign non-financial customers and oil companies
- Norwegian customers: Norwegian banks other than reporting banks, other Norwegian financial sector customers, Norwegian non-financial customers excl. oil companies, oil companies and Norges Bank
- Foreign customers: other foreign financial sector customers and foreign non-financial sector customers

#### *Currency distribution:*

- EUR/NOK – purchase/sale of euros for Norwegian kroner
- USD/NOK – purchase/sale of US dollars for Norwegian kroner
- OTHERS/NOK – purchase/sale of other currencies for Norwegian kroner

# Excerpts from the foreign exchange statistics as they are published on Norges Bank's website

**Tabell 1. Valutatransaksjoner. Spot og forward**  
**Table 1. Foreign exchange transactions. Spot and forward**

Millioner kroner/Million NOK

		2 006				
		Uke 7	Uke 8	Uke 9	Uke 10	
		13.02-19.02	20.02-26.02	27.02-05.03	06.03-12.03	
<b>Netto valutakjøp</b>		<b>Net foreign exchange purchase</b>				
Instrument	Spot	-624	4 878	7 236	6 325	
	Forward	3 377	-3 967	-2 683	-8 436	
	<b>Totalt</b>	<b>2 753</b>	<b>911</b>	<b>4 554</b>	<b>-2 111</b>	
Motpartinndeling med fokus på finansielle og utenlandske kunder <i>Counterparty category with focus on financial and non-financial clients</i>	Rapportørbanker	<i>Reporting banks</i>	-95	-441	367	346
	Utenlandske banker	<i>Foreign banks</i>	-4 497	4 117	7 354	3 324
	Finansielle kunder	<i>Financial clients</i>	1 596	-988	-458	-1 446
	Ikke-finansielle kunder	<i>Non-financial clients</i>	6 559	-1 012	-1 605	-3 185
	Norges Bank	<i>Central Bank of Norway</i>	-810	-765	-1 105	-1 150
	<b>Totalt</b>		<b>2 753</b>	<b>911</b>	<b>4 554</b>	<b>-2 111</b>
Motpartinndeling med fokus på norske og utenlandske kunder <i>Counterparty category with focus on Norwegian and foreign clients</i>	Rapportørbanker	<i>Reporting banks</i>	-95	-441	367	346
	Utenlandske banker	<i>Foreign banks</i>	-4 497	4 117	7 354	3 324
	Norske kunder	<i>Norwegian clients</i>	7 806	-884	-3 077	-4 756
	Utenlandske kunder	<i>Foreign clients</i>	350	-1 115	1 014	125
	Norges Bank	<i>Central Bank of Norway</i>	-810	-765	-1 105	-1 150
	<b>Totalt</b>		<b>2 753</b>	<b>911</b>	<b>4 554</b>	<b>-2 111</b>
<b>Valutakjøp</b>		<b>Foreign exchange purchases</b>				
Instrument	Spot	40 368	32 295	45 663	53 484	
	Forward	15 900	10 484	12 411	15 141	
	<b>Totalt</b>	<b>56 268</b>	<b>42 780</b>	<b>58 074</b>	<b>68 626</b>	
Motpartinndeling med fokus på finansielle og ikke-finansielle kunder <i>Counterparty category with focus on financial and non-financial clients</i>	Rapportørbanker	<i>Reporting banks</i>	6 648	5 535	7 580	10 858
	Utenlandske banker	<i>Foreign banks</i>	23 866	18 137	30 810	31 500
	Finansielle kunder	<i>Financial clients</i>	10 025	9 882	5 661	9 176
	Ikke-finansielle kunder	<i>Non-financial clients</i>	15 729	9 225	14 023	17 092
	Norges Bank	<i>Central Bank of Norway</i>				
	<b>Totalt</b>		<b>56 268</b>	<b>42 780</b>	<b>58 074</b>	<b>68 626</b>
Motpartinndeling med fokus på norske og utenlandske kunder <i>Counterparty category with focus on Norwegian and foreign clients</i>	Rapportørbanker	<i>Reporting banks</i>	6 648	5 535	7 580	10 858
	Utenlandske banker	<i>Foreign banks</i>	23 866	18 137	30 810	31 500
	Norske kunder	<i>Norwegian clients</i>	21 463	16 429	14 838	22 045
	Utenlandske kunder	<i>Foreign clients</i>	4 291	2 678	4 845	4 223
	Norges Bank	<i>Central Bank of Norway</i>				
	<b>Totalt</b>		<b>56 268</b>	<b>42 780</b>	<b>58 074</b>	<b>68 626</b>
<b>Valutasalg</b>		<b>Foreign exchange sales</b>				
Instrument	Spot	40 992	27 417	38 426	47 159	
	Forward	12 523	14 451	15 093	23 577	
	<b>Totalt</b>	<b>53 515</b>	<b>41 868</b>	<b>53 520</b>	<b>70 737</b>	
Motpartinndeling med fokus på finansielle og ikke-finansielle kunder <i>Counterparty category with focus on financial and non-financial clients</i>	Rapportørbanker	<i>Reporting banks</i>	6 743	5 976	7 213	10 512
	Utenlandske banker	<i>Foreign banks</i>	28 363	14 020	23 455	28 176
	Finansielle kunder	<i>Financial clients</i>	8 429	10 870	6 119	10 622
	Ikke-finansielle kunder	<i>Non-financial clients</i>	9 170	10 237	15 628	20 276
	Norges Bank	<i>Central Bank of Norway</i>	810	765	1 105	1 150
	<b>Totalt</b>		<b>53 515</b>	<b>41 868</b>	<b>53 520</b>	<b>70 737</b>
Motpartinndeling med fokus på norske og utenlandske kunder <i>Counterparty category with focus on Norwegian and foreign clients</i>	Rapportørbanker	<i>Reporting banks</i>	6 743	5 976	7 213	10 512
	Utenlandske banker	<i>Foreign banks</i>	28 363	14 020	23 455	28 176
	Norske kunder	<i>Norwegian clients</i>	13 657	17 314	17 915	26 800
	Utenlandske kunder	<i>Foreign clients</i>	3 942	3 793	3 831	4 098
	Norges Bank	<i>Central Bank of Norway</i>	810	765	1 105	1 150
	<b>Totalt</b>		<b>53 515</b>	<b>41 868</b>	<b>53 520</b>	<b>70 737</b>
<b>Netto valutakjøp akkumulert</b>		<b>Net foreign exchange purchase accumulated</b>				
Instrument	Spot	7 584	12 462	19 698	26 023	
	Forward	7 231	3 264	581	-7 855	
	<b>Totalt</b>	<b>14 815</b>	<b>15 726</b>	<b>20 280</b>	<b>18 169</b>	
Motpartinndeling med fokus på finansielle og ikke-finansielle kunder <i>Counterparty category with focus on financial and non-financial clients</i>	Rapportørbanker	<i>Reporting banks</i>	6 131	5 690	6 057	6 403
	Utenlandske banker	<i>Foreign banks</i>	4 623	8 740	16 094	19 418
	Finansielle kunder	<i>Financial clients</i>	4 570	3 582	3 124	1 678
	Ikke-finansielle kunder	<i>Non-financial clients</i>	36 693	35 681	34 076	30 891
	Norges Bank	<i>Central Bank of Norway</i>	-37 201	-37 966	-39 071	-40 221
	<b>Totalt</b>		<b>14 815</b>	<b>15 726</b>	<b>20 280</b>	<b>18 169</b>
Motpartinndeling med fokus på norske og utenlandske kunder <i>Counterparty category with focus on Norwegian and foreign clients</i>	Rapportørbanker	<i>Reporting banks</i>	6 131	5 690	6 057	6 403
	Utenlandske banker	<i>Foreign banks</i>	4 623	8 740	16 094	19 418
	Norske kunder	<i>Norwegian clients</i>	38 986	38 102	35 025	30 269
	Utenlandske kunder	<i>Foreign clients</i>	2 277	1 162	2 176	2 301
	Norges Bank	<i>Central Bank of Norway</i>	-37 201	-37 966	-39 071	-40 221
	<b>Totalt</b>		<b>14 815</b>	<b>15 726</b>	<b>20 280</b>	<b>18 169</b>
<b>Antall handler</b>		<b>Number of transactions</b>				
Instrument	Spot	13 655	13 549	16 124	14 216	
	Forward	3 135	2 013	4 051	2 732	
	<b>Totalt</b>	<b>16 790</b>	<b>15 562</b>	<b>20 175</b>	<b>16 948</b>	

2004 of NOK in the foreign exchange market at just over NOK 91 billion. The foreign exchange transaction statistics for the period October 2005 – January 2006 cover 69 per cent of this daily turnover. No adjustment is made here for double counting of figures due to the fact that the reporting banks trade with one another. The main reasons that the foreign exchange trade statistics do not have higher coverage are that the statistics only cover some foreign banks, and that not all reporting banks have complete consolidated reporting.

Individual transactions are not reported to Norges Bank. All trading in the course of a day is aggregated under the following classifications: buying and selling, currency, counterparty sectors and type of contract. Forwards and swaps are also divided up into six different maturity bands. For example, all spot NOK/EUR transactions that a reporting bank has with all foreign banks in the course of a day will be aggregated. In addition, the number of transactions is reported for each combination of these classifications. The number of transactions provides information about market liquidity and can explain volatility. Reporting takes place daily, by the end of the following business day at the latest.

The breakdown by customer provides us with a good basis for studying the behaviour of different categories of customer in the market. On the basis of order flow theory, emphasis is placed on the distinction between financial and non-financial customers. The transactions of these two customer groups may reflect different motives relating to the function of the enterprises. The transactions of non-financial enterprises are more strongly related to exports/imports of goods and services and fixed investment, while the transactions of financial enterprises are more strongly linked to financial investments.

Since Norway is a relatively small, open economy, it is also interesting to distinguish between Norwegian and foreign customers. Foreign customers have dominated the NOK market for a long time. Periods of different behaviour among domestic and foreign customers may reflect both asymmetric information and different expectations about economic developments.

### 3 Use of the statistics

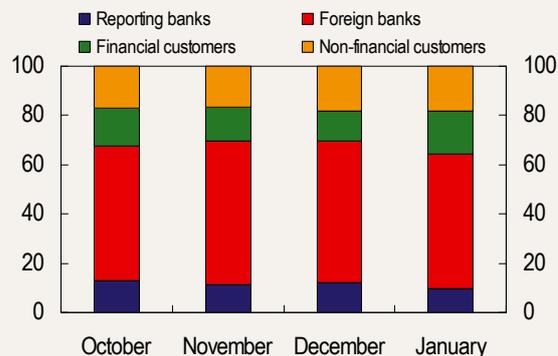
#### 3.1 Market structure analysis

##### Customer groups

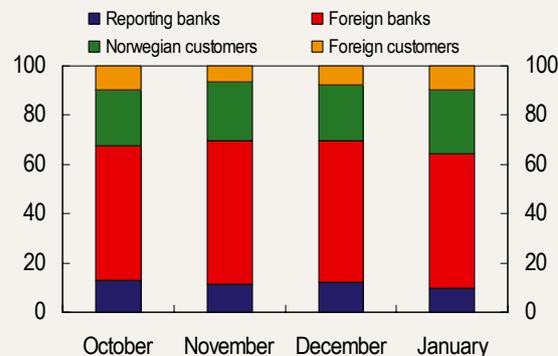
In order to provide a picture of the activity of different participants in the NOK market, in Chart 3 we show turnover distributed among the different customer groups in the statistics. In Chart 3a, the focus is on the distinction between financial and non-financial customers, whereas in Chart 3b it is on foreign and Norwegian customers. Both foreign banks and reporting banks are placed in separate customer groups, although these

**Chart 3** Turnover of NOK in the foreign exchange market, by customer group<sup>1</sup>. October 2005 – January 2006. Percentage

##### a. Financial and non-financial customers



##### b. Foreign and Norwegian customers



<sup>1</sup>Reporting banks' turnover is not adjusted for double counting.

Source: Norges Bank

counterparty sectors can be regarded as financial customers. The charts show that transactions with foreign banks constitute the bulk of trading in NOK: foreign banks were counterparties in a full 56 per cent of transactions. Foreign financial customers probably dominate the transactions of the foreign banks, including different types of fund.

The trading of financial customers accounted for 15 per cent of turnover, while non-financial customers accounted for 18 per cent. Financial customers consist of Norwegian banks excluding the reporting banks, other Norwegian financial sector customers, foreign customers in the financial sector excluding banks, and Norges Bank. Non-financial customers comprise Norwegian and foreign non-financial customers and oil companies. The chart shows that Norwegian customers (incl. Norges Bank) have a larger share of turnover in relation to the reporting banks than foreign customers excluding foreign banks.

In the period October 2005 to January 2006, oil companies' purchase and sale of NOK accounted for 1.6 per cent of total turnover; NOK purchases alone accounted for 1.2 per cent. The explanation for this relatively

low share may be that the period falls between two oil tax payments. Oil taxes are payable on 1 October and 1 April each year. This means that the oil companies must buy NOK before these two due dates, but there is a growing tendency for them to spread their NOK purchases over the year. In isolation, the payment of oil taxes may contribute to a strengthening of the krone exchange rate, but the effect is counteracted by Norges Bank's purchases of foreign exchange for the Government Pension Fund – Global (former Petroleum Fund). Norges Bank's foreign exchange purchases amounted to just over 0.6 per cent of total turnover in the period, against the oil companies' net sales of 0.9 per cent of total turnover.

### Contract type

It is important to distinguish between spots, forward and swaps, as they have different functions and are used to different degrees by the different customer groups. There may be many reasons for spot transactions, such as purchase of goods and services, investment in securities or pure speculation. Forwards are used extensively by non-financial enterprises to hedge against exchange rate movements for future payments

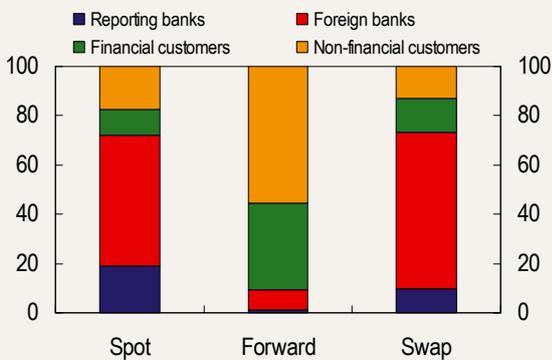
to/from other countries. Swaps are used most in the interbank market, and play an important part in liquidity management. Swap transactions have no direct effect on the krone exchange rate, but may affect it indirectly through liquidity effects. For swaps, only the “long leg” is reported, in line with the triennial BIS survey. Swaps are agreements to buy/sell foreign exchange made simultaneously with an agreement to sell/buy back the foreign exchange at a predetermined future date at a rate that is fixed today. The “long leg” is the re-sale (buy-back) of the foreign exchange.

Chart 4 shows turnover in NOK by type of contract and counterparty sector. Forward contracts are used most by non-financial customers. This category accounted for just 56 per cent of the turnover of forward contracts in the period. Non-financial customers' forward contract trading was the same size as their spot trading, at 26 per cent of this group's turnover. Swap turnover dominates the trading of all customer groups. The swap turnover of foreign banks accounted for 75 per cent of their total turnover, and 63 per cent of total swap turnover.

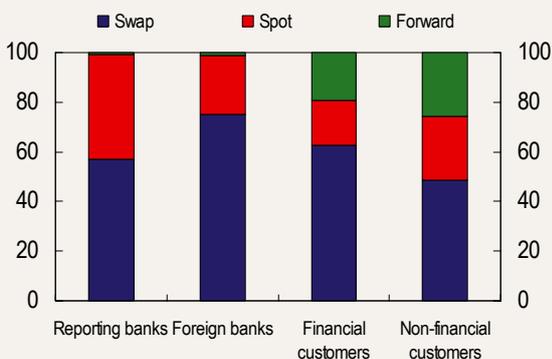
The reporting banks' option transactions with various customer groups are also reported to the foreign exchange trading statistics. Large option maturities can contribute to exchange rate movements. The Norwegian foreign exchange options market has grown rapidly in recent years, but is still relatively small and transparent. All data collected is therefore only used internally in Norges Bank at present.

**Chart 4** Turnover of NOK in the foreign exchange market, by type of contract and by customer group. October 2005 – January 2006. Percentage

a. Type of contract by customer group



b. Customer group by type of contract

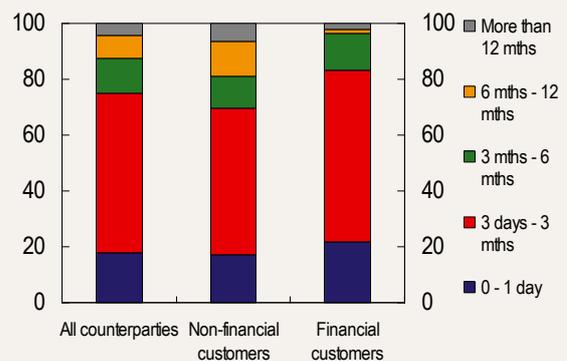


Source: Norges Bank

### Maturity

The maturity distribution in the foreign exchange transaction statistics provides an overview of the hedging behaviour of customer groups. Chart 5 shows the distribution of maturities for forward contracts entered into in the period October 2005 – January 2006. Short maturities dominate the trading. Over 75 per cent of contracts had maturities of less than 3 months, while almost 88 per cent had maturities of less than 6 months.

**Chart 5** Turnover of NOK in the forward market, by maturity. October 2005 – January 2006. Percentage



Source: Norges Bank

It is primarily non-financial customers that have entered into contracts with maturities of over six months. Over 19 per cent of the forward contracts of this group had maturities of over 6 months, and a third of these 19 per cent had maturities of over 12 months.

### Currency pairs

In spot transactions, forwards and swaps viewed as a whole, USD is the currency for which NOK is traded most. Chart 6 shows that 63 per cent of the transactions in the period in question were for USD. The currency share varies across contract types. USD were only involved in 14 per cent of spot transactions, as opposed to no less than 84 per cent of swap transactions. In the spot market, trading of NOK for euro dominated with a share of 71 per cent. In the forward market, there is a more even distribution among USD, EUR and other currencies.

The differences in currency shares among the different types of contract reflects the use of the electronic trading system Reuters. Reuters quotes continuous two-way prices for EUR/ NOK in the spot market and for USD/NOK in the swap market.<sup>3</sup> As a result, NOK is mainly traded for EUR in the spot market, while in the swap market it is mainly traded for USD.

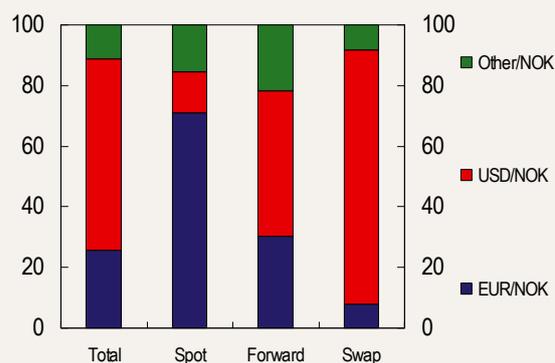
### 3.2 Order flow analyses

The results of a number of studies show that information from order flows makes an important contribution to explaining exchange rate developments (see Lyons (2001) and Rime (2001)). In the event of pressure to buy a currency, a market with private information will conclude that some customers have received positive signals about the value of the currency, and will want to adjust the price/exchange rate accordingly. It is trading with potentially better informed operators that causes market makers to adjust their expectations and prices.

The same surveys show that not all customer groups' orders contain the same amount of information. The price impact of financial customers' orders is considerably larger than the price impact of non-financial customers' orders. This may be because customer groups have different roles (Lyons 2001). Bjønnes et al. (2005) show that it is financial customers that drive exchange rate developments. Foreign exchange banks offer short-term liquidity, while non-financial customers are important suppliers of liquidity (clear the market) in the slightly longer term.

Chart 7 shows that there is a relatively high positive correlation between the order flows of financial customers and developments in the krone exchange rate. A possible explanation may be that a large portion of financial customers' transactions are associated with portfolio investments in other markets. The equity market is particularly important, with high volatility and wide price variations. The potential return is normally greater in

**Chart 6** Turnover of NOK in the foreign exchange market, by currency pairs. October 2005 – January 2006. Percentage



Source: Norges Bank

**Chart 7** Financial customers' net purchases of NOK (spot and forward) from reporting banks, and krone exchange rate developments. Daily figures over the period 3 October 2005 - 17 February 2006 In billions of NOK and as an index



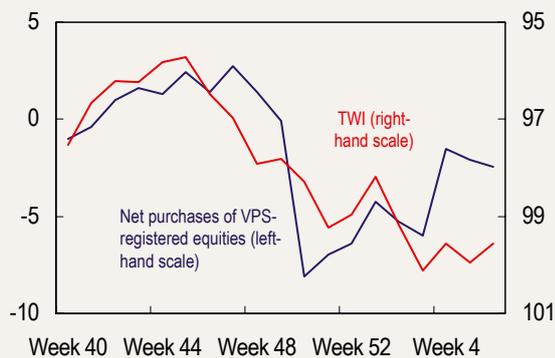
<sup>1</sup>Financial customers include foreign banks and reporting banks

the equity market than in the foreign exchange market. It may therefore be more important to find the right time to enter the equity market than to wait for a favourable exchange rate. Financial customers may therefore be willing to buy foreign exchange at a high price, which will drive the exchange rate up, as investors in the equity market do not normally hedge their foreign exchange positions. Investors are uncertain in advance of when they will enter and exit the exchange rate market, and they may consider the exchange rate risk to be relatively small compared to the total risk (Bjønnes et al. 2005). Chart 8 shows that in the period from Week 40 2005 to Week 6 2006 there was a high correlation between foreigners' net purchases of VPS-registered equities and movements in the krone exchange rate.

Chart 3 shows that a considerable share of trading in the market takes place between reporting banks and foreign banks. This interbank trading reduces and distributes exchange rate risk. As a rule, banks are only intermediaries in the transactions and do not usually take large overnight positions (short-term suppliers of

<sup>3</sup> Two-way prices means that prices are quoted for both purchase and sale of the currency.

**Chart 8** Foreigners' net purchases of VPS-registered equities, and krone exchange rate developments. Weekly figures over the period 3 October 2005 -10 February 2006 In billions of NOK and as an index



Sources: Norwegian Central Securities Depository and Norges Bank

**Chart 9** Non-financial customers<sup>1</sup> net purchases of NOK (spot and forward) from reporting banks, and krone exchange rate developments. Daily figures over the period 3 October 2005 - 17 February 2006 In billions of NOK and as an index



<sup>1</sup> Non-financial customers comprise Norwegian and foreign non-financial customers and oil companies

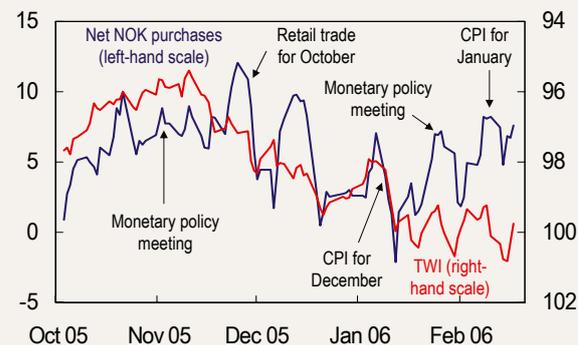
Source: Norges Bank

liquidity). If banks have outstanding positions after interbank transactions, they will try to transfer the position and the risk to their customers by compensating them with a risk premium. Suppose the bank has an uncovered currency position, and wants to buy foreign exchange and sell NOK. In order to "tempt" customers to buy NOK, the price must be reduced. The krone will depreciate, and the customer's order flow shows purchase of NOK. This may be an explanation for the negative correlation in Chart 9 between non-financial customers' order flows and the trade-weighted exchange rate index (TWI).

According to the order flow theory, the reason that non-financial customers are banks' counterparties to a greater extent than financial customers when they want to cover their positions is related to the customer groups' motives for trading. Non-financial customers will trade foreign exchange more as a result of trade in goods and services with foreign countries or because of

<sup>4</sup> See the discussion of the direct channel in 1.2.

**Chart 10** All customers' net purchases of NOK spot from reporting banks, and krone exchange rate developments. Daily figures over the period 3 October 2005 - 17 February 2006 In billions of NOK and as an index



Source: Norges Bank

direct investment abroad. In contrast to many other asset prices, prices for most commodities change slowly. The exchange rate will be of relatively greater importance to non-financial customers, and they will want to wait until the exchange rate is sufficiently attractive before they trade.

In addition to looking at the relationship between exchange rate movements and customer behaviour, it is also interesting to look at the impact of individual events on the statistics. These may be the publication of new information or of statistics that the market perceives as potentially important for developments in the exchange rate.<sup>4</sup> Chart 10 shows customers' net spot purchases of NOK, the krone exchange rate and some dates for the publication of new information.

At Norges Bank's monetary policy meeting on 2 November it was decided to raise the key rate by 0.25 percentage point. Both the decision to raise the interest rate and the communication from Norges Bank were as expected by the market, and caused only a limited impact on the krone exchange rate and order flows. On 25 January 2006 it was decided at the monetary policy meeting to keep the key rate unchanged. This was in line with market expectations, but there were also expectations of a signal that the interest rate would be increased at the next monetary policy meeting on 16 March. These expectations were not fulfilled, and in the days following the monetary policy meeting on 25 January, the krone exchange rate weakened, and customer groups as a whole had net spot sales of NOK. Figures for retail turnover for October were published on 29 November 2005. Surprisingly weak retail trade figures led to large net sales of NOK and a weakening of the krone in the days following. The CPI published for December and January was in both cases lower than the market expected, and the krone depreciated. At the same time, the foreign exchange trade statistics showed net sales of NOK for all customer groups combined.

## 4 Summary

The use of banks' order flows in analytical work is a relatively new approach to explaining developments in exchange rates. Up to the present, order flow research has yielded promising results, and foreign exchange transaction statistics will contribute to further empirical research in this field. With the aid of daily data we will be able to study how individual events influence market participants, and in the event of changes in the krone exchange rate we will quickly see which customer groups have been most active. When we look at spot and forward transactions combined, we see a positive correlation between financial customers' net krone purchases and the TWI, while there is a negative correlation between non-financial customers' net krone purchases and the TWI.

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