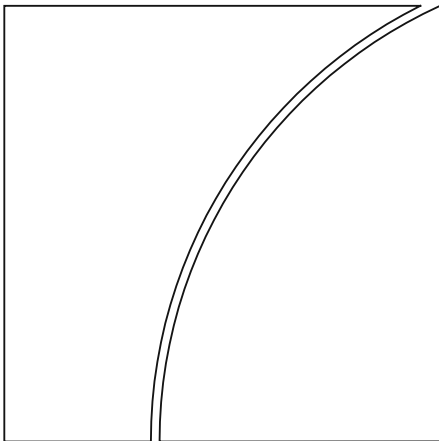




BANK FOR INTERNATIONAL SETTLEMENTS



Triennial Central Bank Survey

Foreign exchange turnover in April 2016

Monetary and Economic Department

September 2016

Tools to access and download the results of the BIS Triennial Central Bank Survey:

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Questions about the BIS Triennial Central Bank Survey may be addressed to statistics@bis.org.

This publication is available on the BIS website (www.bis.org/publ/rpfx16.htm).

Foreign exchange turnover in April 2016

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This publication presents the global results of the 2016 BIS Triennial Central Bank Survey of turnover in foreign exchange markets. A separate publication presents the results of turnover in over-the-counter interest rate derivatives markets (www.bis.org/publ/rpfx16.htm). Many participating authorities also publish their national results, links to which are available on the BIS website (www.bis.org/statistics/triennialrep/national.htm). The global results for a companion survey on amounts outstanding in OTC derivatives markets will be published in November 2016.

Data are subject to change. Revised data will be released concurrently with the *BIS Quarterly Review* in December 2016. The December 2016 *BIS Quarterly Review* will include several special feature articles that analyse the results of the 2016 Triennial Survey.

Notations

| | |
|----------|--------------------------------------|
| billion | thousand million |
| trillion | thousand billion |
| e | estimated |
| lhs | left-hand scale |
| rhs | right-hand scale |
| \$ | US dollar unless specified otherwise |
| ... | not available |
| . | not applicable |
| – | nil or negligible |

Differences in totals are due to rounding.

The term “country” as used in this publication also covers territorial entities that are not states as understood by international law and practice but for which data are separately and independently maintained.

Abbreviations

| | | | |
|-----|-------------------------|-----|--------------------|
| ARS | Argentine peso | LTL | Lithuanian litas |
| AUD | Australian dollar | LVL | Latvian lats |
| BGN | Bulgarian lev | MXN | Mexican peso |
| BHD | Bahraini dinar | MYR | Malaysian ringgit |
| BRL | Brazilian real | NOK | Norwegian krone |
| CAD | Canadian dollar | NZD | New Zealand dollar |
| CHF | Swiss franc | OTH | other currencies |
| CLP | Chilean peso | PEN | Peruvian new sol |
| CNY | Chinese yuan (renminbi) | PHP | Philippine peso |
| COP | Colombian peso | PLN | Polish zloty |
| CZK | Czech koruna | RMB | renminbi; see CNY |
| DKK | Danish krone | RON | new Romanian leu |
| EUR | euro | RUB | Russian rouble |
| GBP | pound sterling | SAR | Saudi riyal |
| HKD | Hong Kong dollar | SEK | Swedish krona |
| HUF | Hungarian forint | SGD | Singapore dollar |
| IDR | Indonesian rupiah | THB | Thai baht |
| ILS | Israeli new shekel | TRY | Turkish lira |
| INR | Indian rupee | TWD | new Taiwan dollar |
| JPY | yen | USD | US dollar |
| KRW | Korean won | ZAR | South African rand |

1. BIS Triennial Central Bank Survey

The BIS Triennial Central Bank Survey is the most comprehensive source of information on the size and structure of global foreign exchange (FX) and over-the-counter (OTC) derivatives markets. The Triennial Survey aims to increase the transparency of OTC markets and to help central banks, other authorities and market participants monitor developments in global financial markets. It also helps to inform discussions on reforms to OTC markets.

FX market activity has been surveyed every three years since 1986, and OTC interest rate derivatives market activity since 1995.¹ The Triennial Survey is coordinated by the BIS under the auspices of the Markets Committee (for the FX part) and the Committee on the Global Financial System (for the interest rate derivatives part). It is supported through the Data Gaps Initiative endorsed by the G20.

The latest survey of turnover took place in April 2016. Central banks and other authorities in 52 jurisdictions participated in the 2016 survey (see page 15). They collected data from close to 1,300 banks and other dealers in their jurisdictions and reported national aggregates to the BIS, which then calculated global aggregates. Turnover data are reported by the sales desks of reporting dealers, regardless of where a trade is booked, and are reported on an unconsolidated basis, ie including trades between related entities that are part of the same group.

Highlights

Highlights from the 2016 Triennial Survey of turnover in OTC foreign exchange markets:

- Trading in foreign exchange markets averaged \$5.1 trillion per day in April 2016. This is down from \$5.4 trillion in April 2013, a month which had seen heightened activity in Japanese yen against the background of monetary policy developments at that time.
- For first time since 2001, spot turnover declined. Spot transactions fell to \$1.7 trillion per day in April 2016 from \$2.0 trillion in 2013. In contrast, the turnover of FX swaps rose further, reaching \$2.4 trillion per day in April 2016. This rise was driven in large part by increased trading of FX swaps involving yen.
- The US dollar remained the dominant vehicle currency, being on one side of 88% of all trades in April 2016. The euro, yen and Australian dollar all lost market share. In contrast, many emerging market currencies increased their share. The renminbi doubled its share, to 4%, to become the world's eighth most actively traded currency and the most actively traded emerging market currency, overtaking the Mexican peso. The rise in the share of renminbi was primarily due to the increase in trading against the US dollar. In April 2016, as much as 95% of renminbi trading volume was against the US dollar.
- The share of trading between reporting dealers grew over the three-year period, accounting for 42% of turnover in April 2016, compared with 39% in April 2013. Banks other than reporting dealers accounted for a further 22% of turnover. Institutional investors were the third largest group of counterparties in FX markets, at 16%.
- In April 2016, sales desks in five countries – the United Kingdom, the United States, Singapore, Hong Kong SAR and Japan – intermediated 77% of foreign exchange trading, up from 75% in April 2013 and 71% in April 2010.

¹ More frequent regional surveys are conducted by local foreign exchange committees in Australia, Canada, London, New York, Singapore and Tokyo. These semiannual surveys focus on the structure of local FX markets, and there are some methodological differences compared with the Triennial Survey. In particular, the Triennial Survey collects data based on the location of the sales desk, whereas some regional surveys are based on the location of the trading desk.

2. Turnover in foreign exchange markets

According to the 2016 Triennial Survey, turnover in global FX markets averaged \$5.1 trillion per day in 2016 (Table 1). This is down from \$5.4 trillion in April 2013, a month which had seen heightened activity in Japanese yen against the background of monetary policy developments at that time.² In addition, exchange rate movements influence comparisons with previous surveys. In particular, the appreciation of the US dollar between 2013 and 2016 reduced the US dollar value of turnover in currencies other than the US dollar. When valued at constant (April 2016) exchange rates, turnover increased slightly, by about 4% between April 2016 and April 2013 (Table 1). Nevertheless, the latest developments contrast with the strong growth in turnover observed between Triennial Surveys since 2001.

Turnover by currencies and currency pairs

The US dollar remained the world's dominant vehicle currency. It was on one side of 88% of all trades in April 2016, up slightly from 87% in April 2013 (Graph 1, left-hand panel). In contrast, trading in the next eight most liquid currencies has shifted notably.

The role of the euro in FX markets has continued to decline since the beginning of the euro area sovereign debt crisis in 2010. The market share of the currency declined to 31% in April 2016 from 33% in April 2013 and 39% in April 2010 (Graph 1, left-hand panel, and Table 2). Trading in the four most actively traded euro currency pairs – USD/EUR, EUR/GBP, EUR/JPY and EUR/CHF – fell. USD/EUR average daily turnover declined by \$119 billion, while the relative declines were most pronounced for the EUR/JPY and EUR/CHF pairs (Table 3). In contrast, trading in the EUR/SEK and EUR/NOK currency pairs increased.

The share of the yen in global FX trading also declined, by 1 percentage point to 22% by April 2016 (Graph 1, left-hand panel, and Table 2). This contrasts sharply with the currency's 4 percentage point expansion reported in the previous survey, which coincided with the expansionary monetary policy shift of the Bank of Japan in April 2013. Trading in the three most actively traded yen cross rates – USD/JPY, EUR/JPY and JPY/AUD – contracted significantly from 2013 to 2016.

Among the other heavily traded advanced economy currencies, the Australian dollar and Swiss franc also lost market share, from 8.6% to 6.9% and 5.2% to 4.8%, respectively; in contrast, the pound sterling, Canadian dollar, Swedish krona and Norwegian krone gained shares in global FX turnover.

The 2016 Triennial Survey shows a further significant rise in the global importance of several emerging market currencies. The renminbi became the most actively traded emerging market currency, overtaking the Mexican peso to become the world's eighth most actively traded currency (Table 2). The average daily turnover of renminbi almost doubled, from \$120 billion to \$202 billion, between April 2013 and April 2016, representing a rise in the share in global FX turnover from 2% to 4%. Ninety-five per cent of renminbi turnover is due to trading against the US dollar. The average turnover of USD/CNY rose from \$113 billion to \$192 billion over the three-year period, with that pair moving up from ninth to sixth place among the most traded currency pairs (Table 3).

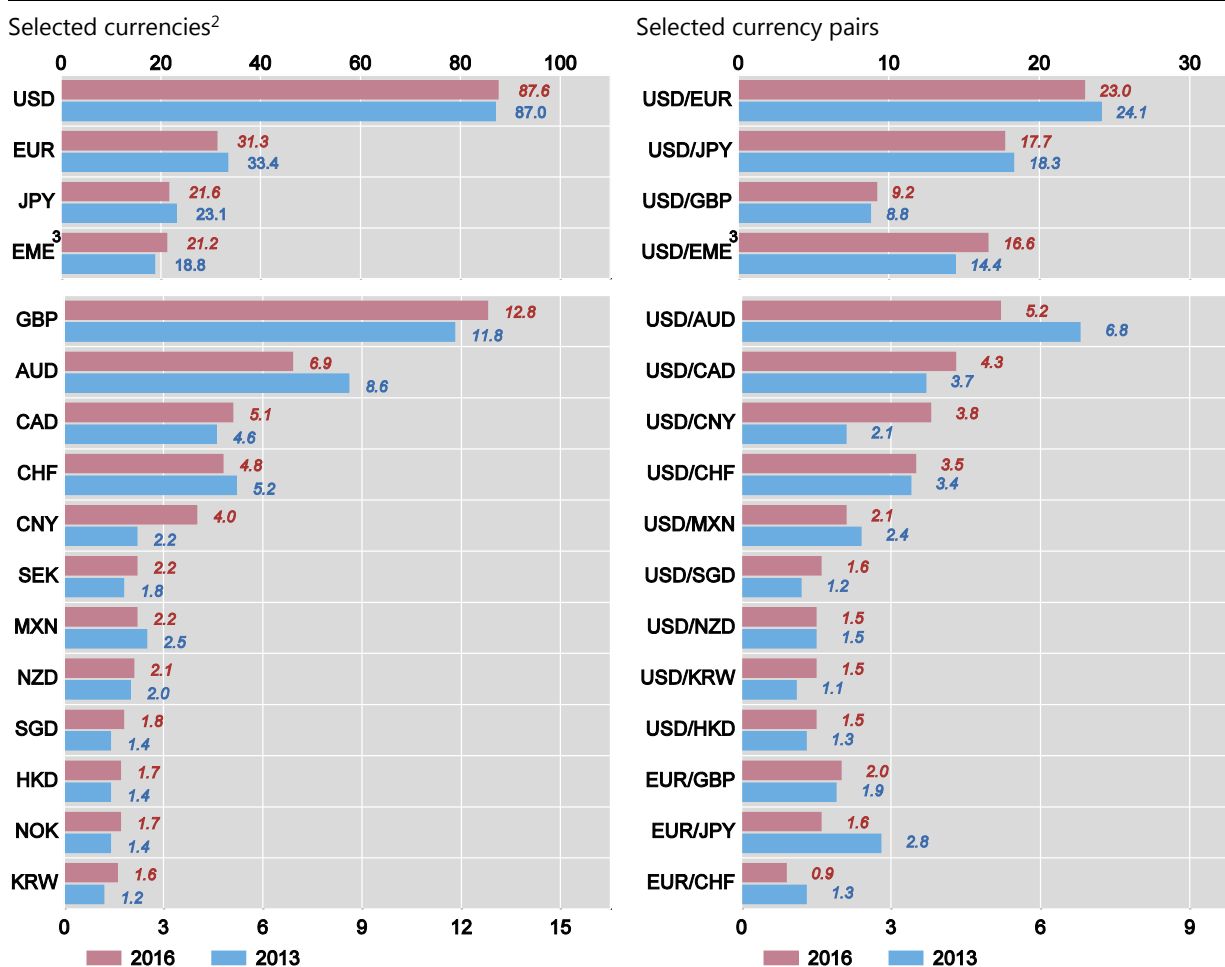
Several other emerging market currencies, particularly from the Asia-Pacific region, gained market share: the Korean won, Indian rupee and Thai baht were among the currencies that advanced in the ranking by two or three places (Table 2). In contrast, the turnover of some emerging market currencies peaked in 2013 and has since exhibited a significant decline (eg the Mexican peso and Russian rouble).

² For a discussion of drivers of trading volumes in April 2013, see D Rime and A Schrimpf, "The anatomy of the global FX market through the lens of the 2013 Triennial Survey", *BIS Quarterly Review*, December 2013, pp 27–43, www.bis.org/publ/qtrpdf/r_qt1312e.htm.

Foreign exchange market turnover by currency and currency pairs

Net-net basis,¹ daily averages in April, in per cent

Graph 1



¹ Adjusted for local and cross-border inter-dealer double-counting. ² As two currencies are involved in each transaction, the sum of shares in individual currencies will total 200%. ³ Emerging market currencies.

Source: BIS Triennial Central Bank Survey. For additional data by currency and currency pairs, see Tables 2 and 3 on pages 10 and 11.

Turnover by instrument and maturity

Trading activity has changed unevenly across the main FX instrument categories. In particular, trading volumes of spot trades and FX swaps, the two largest instrument categories, have evolved in opposite directions.

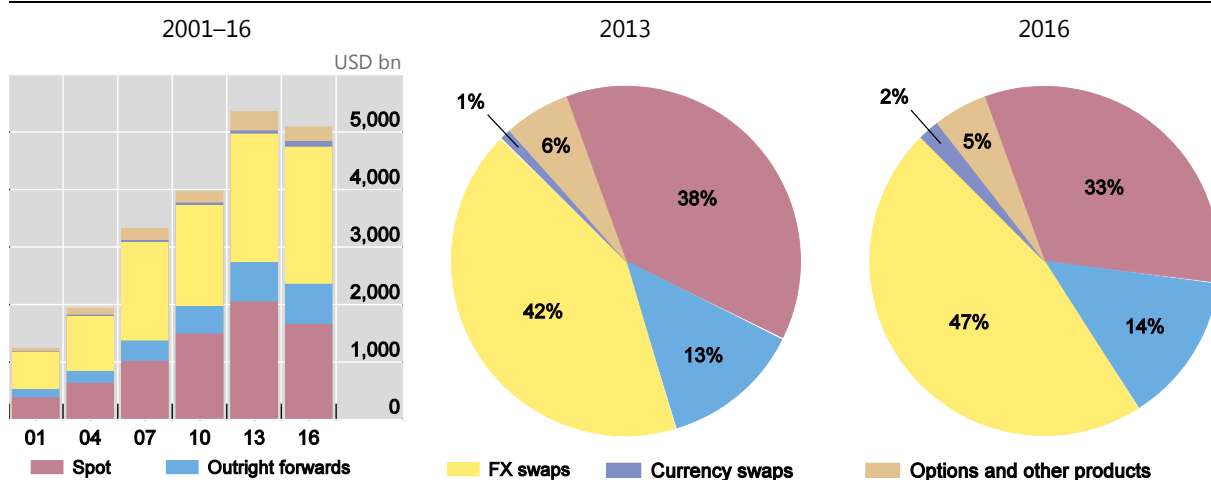
Spot market trading activity fell by 19% to \$1.7 trillion per day in April 2016. This is the first time since 2001 that spot turnover has fallen compared with a previous survey (Table 1). The share of spot transactions in total foreign exchange market turnover declined by 5 percentage points between April 2013 and April 2016 to 33% (Graph 2). This decline in spot trading was the main driver behind the overall fall in global FX turnover compared with 2013.

In contrast, turnover in FX swaps rose by 6% to \$2.4 trillion per day in April 2016. FX swaps remained the most traded instrument, with their share in turnover rising 5 percentage points to 47% (Table 3). Still, the growth in FX swap turnover was significantly lower than the 27% growth rate between April 2010 and April 2013.

Foreign exchange market turnover by instrument

Net-net basis,¹ daily averages in April

Graph 2



¹ Adjusted for local and cross-border inter-dealer double-counting.

Source: BIS Triennial Central Bank Survey. For additional data by instrument, see Table 1 on page 9.

The US dollar continues to be on one side of 91% of FX swap transactions, a share virtually unchanged compared with previous surveys. The euro was on one side of 34% of FX swap transactions, also a virtually unchanged share since 2013. The share of the yen in total FX swap turnover rose to 19% in April 2016, compared with 15% in 2013.³

Trading activity changed unevenly in other parts of the FX OTC derivatives market. Trading volume of outright forwards rose to \$700 billion in 2016, a 3% increase from \$679 billion in 2013. Trading volume of currency swaps grew much faster than in any other part of the FX market, although this instrument still remains the least traded, owing in part to the long maturity of the contracts. Turnover in currency swaps rose to \$96 billion in 2016, a 79% increase from \$54 billion in 2013.

In contrast, trading volume of FX options declined to \$254 billion in 2016, 24% lower than in 2013. The largest decline took place in yen cross rates, which declined to \$74 billion in 2016 (ie by 52% from 2013).⁴

The 2016 survey shows a tendency towards slightly longer maturities of FX swaps and outright forwards. For instance, 30% of FX swaps initiated in April 2016 had a contractual maturity of between seven days and one year, compared with 26% in 2013 (Table 4). Similarly, 59% of outright forwards initiated in April 2016 had a contractual maturity of between seven days and one year, compared with 56% in April 2013.

³ For an analysis of investor positioning in yen FX swaps and related FX derivatives, see C Borio, R McCauley, P McGuire and V Sushko, "Covered interest parity lost: understanding the cross-currency basis", *BIS Quarterly Review*, September 2016 (forthcoming).

⁴ These changes have to be interpreted in the context of the surge in yen options trading in April 2013, when players such as hedge funds used the options market to express their directional views on the yen given the expansionary shift in Japanese monetary policy in April 2013; for a more detailed discussion, see D Rime and A Schrimpf (2013), *op cit*.

Turnover by counterparty

FX trading continued to be dominated by financial institutions other than reporting dealers, which accounted for 51% of turnover in April 2016 (Graph 3 and Table 4). However, the share of trading between reporting dealers increased for the first time since 1995. Inter-dealer trading, which averaged \$2.1 trillion in April 2016, increased from 39% of FX turnover in April 2013 to 42% in April 2016. The rise in inter-dealer trading was primarily driven by the increased trading in FX swaps, an 11% rise since 2013 to \$1.2 trillion in April 2016. Turnover in spot activity among reporting dealers declined in absolute terms (Table 4).

Trading between reporting dealers and other financial institutions fell slightly between 2013 and 2016, to \$2.6 trillion. Non-reporting banks – smaller and regional banks that serve as clients of the large FX dealing banks but do not engage in market-making – accounted for roughly 22% of global FX turnover in April 2016 (Graph 3), down from a 24% share in April 2013. At the same time, institutional investors, such as insurance companies and pension funds, further increased their share of FX trading relative to hedge funds and proprietary trading firms: institutional investors were on one side of 16% of daily turnover in April 2016, up from 11% in 2013, whereas the corresponding share of FX trading by hedge funds and proprietary trading firms decreased from 11% to 8%.

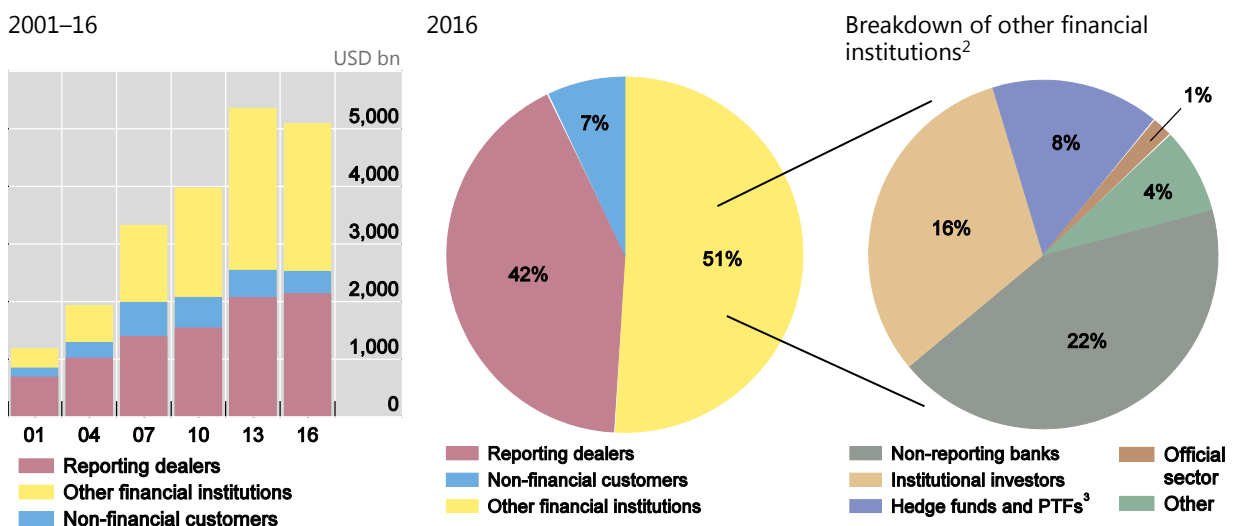
The rise in the share of trading by institutional investors is mostly due to an increase in their use of FX swaps. Average daily FX swap turnover with institutional investors as a counterparty rose to \$278 billion by April 2016 (Table 5), a 79% increase compared with the 2013 survey.

The fall in the share of trading by non-reporting banks is primarily due to a decline in their activity in the spot market, followed by a decline in their use of FX swaps. Average daily spot turnover with non-reporting banks as a counterparty stood at \$354 billion in April 2016, a 30% decline compared with the 2013 survey; and average daily FX swap turnover stood at \$564 billion (a 7% decline).

Foreign exchange market turnover by counterparty

Net-net basis,¹ daily averages in April

Graph 3



¹ Adjusted for local and cross-border inter-dealer double-counting. ² For definitions of counterparties, see page 18. ³ Proprietary trading firms.

Source: BIS Triennial Central Bank Survey. For additional data by counterparty, see Tables 4 and 5 on pages 12 and 13.

The fall in the share of trading by hedge funds and proprietary trading firms was due to a decline in this sector's activity in all three of the main market segments. Average daily spot turnover with hedge funds and proprietary trading firms as a counterparty stood at \$200 billion in April 2016, a 29% decline compared with the 2013 survey; trading in outright forwards and FX swaps with this counterparty sector also declined, by 29% and 37%, respectively.

Trading with non-financial customers, such as corporations and governments, contracted, accounting for only 7% of global FX turnover, a continuation of the trend captured in previous surveys.

Geographical distribution of turnover

Trading continues to be concentrated in the largest financial centres. In April 2016, sales desks in five countries – the United Kingdom, the United States, Singapore, Hong Kong SAR and Japan – intermediated 77% of all foreign exchange trading (Table 6). The share of foreign exchange trading taking place in the United States was virtually unchanged relative to the previous survey, at 19% in 2016. Asian financial centres, namely Tokyo, Hong Kong SAR and Singapore, increased their combined share of intermediation to 21%, from 15%.

The share of foreign exchange trading in the United Kingdom declined to 37% in April 2016, from 41%. The decline was broad-based across currency pairs. The market share of the euro area continued to decline, falling to 8% in April 2016 from 9% in 2013, although France maintained its 3% share. The trend decline in the share of trading activity taking place in Switzerland and Australia also continued, to 2% in each country in 2016 compared with 3% in 2013.

Annexes

A Tables

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OTC foreign exchange turnover

Net-net basis,¹ daily averages in April, in billions of US dollars

Table 1

| Instrument | 2001 | 2004 | 2007 | 2010 | 2013 | 2016 |
|--|-------|-------|-------|-------|-------|--------------|
| Foreign exchange instruments | 1,239 | 1,934 | 3,324 | 3,971 | 5,355 | 5,088 |
| Spot transactions | 386 | 631 | 1,005 | 1,488 | 2,046 | 1,654 |
| Outright forwards | 130 | 209 | 362 | 475 | 679 | 700 |
| Foreign exchange swaps | 656 | 954 | 1,714 | 1,759 | 2,239 | 2,383 |
| Currency swaps | 7 | 21 | 31 | 43 | 54 | 96 |
| Options and other products ² | 60 | 119 | 212 | 207 | 337 | 254 |
| <i>Memo:</i> | | | | | | |
| Turnover at April 2016 exchange rates ³ | 1,381 | 1,884 | 3,123 | 3,665 | 4,915 | 5,088 |
| Exchange-traded derivatives ⁴ | 12 | 25 | 77 | 145 | 145 | 115 |

¹ Adjusted for local and cross-border inter-dealer double-counting (ie "net-net" basis). ² The category "other FX products" covers highly leveraged transactions and/or trades whose notional amount is variable and where a decomposition into individual plain vanilla components was impractical or impossible. ³ Non-US dollar legs of foreign currency transactions were converted into original currency amounts at average exchange rates for April of each survey year and then reconverted into US dollar amounts at average April 2016 exchange rates. ⁴ Sources: Euromoney Tradedata; Futures Industry Association; The Options Clearing Corporation; BIS derivatives statistics. Foreign exchange futures and options traded worldwide.

Currency distribution of OTC foreign exchange turnover

Net-net basis,¹ percentage shares of average daily turnover in April²

Table 2

| Currency | 2001 | | 2004 | | 2007 | | 2010 | | 2013 | | 2016 | |
|------------------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|-----------|
| | Share | Rank | Share | Rank | Share | Rank | Share | Rank | Share | Rank | Share | Rank |
| USD | 89.9 | 1 | 88.0 | 1 | 85.6 | 1 | 84.9 | 1 | 87.0 | 1 | 87.6 | 1 |
| EUR | 37.9 | 2 | 37.4 | 2 | 37.0 | 2 | 39.1 | 2 | 33.4 | 2 | 31.3 | 2 |
| JPY | 23.5 | 3 | 20.8 | 3 | 17.2 | 3 | 19.0 | 3 | 23.1 | 3 | 21.6 | 3 |
| GBP | 13.0 | 4 | 16.5 | 4 | 14.9 | 4 | 12.9 | 4 | 11.8 | 4 | 12.8 | 4 |
| AUD | 4.3 | 7 | 6.0 | 6 | 6.6 | 6 | 7.6 | 5 | 8.6 | 5 | 6.9 | 5 |
| CAD | 4.5 | 6 | 4.2 | 7 | 4.3 | 7 | 5.3 | 7 | 4.6 | 7 | 5.1 | 6 |
| CHF | 6.0 | 5 | 6.0 | 5 | 6.8 | 5 | 6.3 | 6 | 5.2 | 6 | 4.8 | 7 |
| CNY ³ | 0.0 | 35 | 0.1 | 29 | 0.5 | 20 | 0.9 | 17 | 2.2 | 9 | 4.0 | 8 |
| SEK | 2.5 | 8 | 2.2 | 8 | 2.7 | 9 | 2.2 | 9 | 1.8 | 11 | 2.2 | 9 |
| MXN ³ | 0.8 | 14 | 1.1 | 12 | 1.3 | 12 | 1.3 | 14 | 2.5 | 8 | 2.2 | 10 |
| NZD ³ | 0.6 | 16 | 1.1 | 13 | 1.9 | 11 | 1.6 | 10 | 2.0 | 10 | 2.1 | 11 |
| SGD ³ | 1.1 | 12 | 0.9 | 14 | 1.2 | 13 | 1.4 | 12 | 1.4 | 15 | 1.8 | 12 |
| HKD ³ | 2.2 | 9 | 1.8 | 9 | 2.7 | 8 | 2.4 | 8 | 1.4 | 13 | 1.7 | 13 |
| NOK ³ | 1.5 | 10 | 1.4 | 10 | 2.1 | 10 | 1.3 | 13 | 1.4 | 14 | 1.7 | 14 |
| KRW ³ | 0.8 | 15 | 1.1 | 11 | 1.2 | 14 | 1.5 | 11 | 1.2 | 17 | 1.6 | 15 |
| TRY ³ | 0.0 | 30 | 0.1 | 28 | 0.2 | 26 | 0.7 | 19 | 1.3 | 16 | 1.4 | 16 |
| INR ³ | 0.2 | 21 | 0.3 | 20 | 0.7 | 19 | 1.0 | 15 | 1.0 | 20 | 1.1 | 17 |
| RUB ³ | 0.3 | 19 | 0.6 | 17 | 0.7 | 18 | 0.9 | 16 | 1.6 | 12 | 1.1 | 18 |
| BRL ³ | 0.5 | 17 | 0.3 | 21 | 0.4 | 21 | 0.7 | 21 | 1.1 | 19 | 1.0 | 19 |
| ZAR ³ | 0.9 | 13 | 0.7 | 16 | 0.9 | 15 | 0.7 | 20 | 1.1 | 18 | 1.0 | 20 |
| DKK ³ | 1.2 | 11 | 0.9 | 15 | 0.8 | 16 | 0.6 | 22 | 0.8 | 21 | 0.8 | 21 |
| PLN ³ | 0.5 | 18 | 0.4 | 19 | 0.8 | 17 | 0.8 | 18 | 0.7 | 22 | 0.7 | 22 |
| TWD ³ | 0.3 | 20 | 0.4 | 18 | 0.4 | 22 | 0.5 | 23 | 0.5 | 23 | 0.6 | 23 |
| THB ⁴ | 0.2 | 24 | 0.2 | 22 | 0.2 | 25 | 0.2 | 26 | 0.3 | 27 | 0.4 | 24 |
| MYR ⁴ | 0.1 | 26 | 0.1 | 30 | 0.1 | 28 | 0.3 | 25 | 0.4 | 25 | 0.4 | 25 |
| HUF ³ | 0.0 | 33 | 0.2 | 23 | 0.3 | 23 | 0.4 | 24 | 0.4 | 24 | 0.3 | 26 |
| CZK ⁴ | 0.2 | 22 | 0.2 | 24 | 0.2 | 24 | 0.2 | 27 | 0.4 | 26 | 0.3 | 27 |
| ILS ⁴ | 0.1 | 25 | 0.1 | 26 | 0.2 | 27 | 0.2 | 31 | 0.2 | 29 | 0.3 | 28 |
| SAR ⁴ | 0.1 | 27 | 0.0 | 32 | 0.1 | 32 | 0.1 | 34 | 0.1 | 34 | 0.3 | 29 |
| CLP ⁴ | 0.2 | 23 | 0.1 | 25 | 0.1 | 30 | 0.2 | 29 | 0.3 | 28 | 0.2 | 30 |
| IDR ⁴ | 0.0 | 28 | 0.1 | 27 | 0.1 | 29 | 0.2 | 30 | 0.2 | 30 | 0.2 | 31 |
| COP ⁴ | 0.0 | 31 | 0.0 | 33 | 0.1 | 33 | 0.1 | 32 | 0.1 | 33 | 0.2 | 32 |
| PHP ⁴ | 0.0 | 29 | 0.0 | 31 | 0.1 | 31 | 0.2 | 28 | 0.1 | 31 | 0.1 | 33 |
| RON ⁴ | ... | 37 | ... | 40 | 0.0 | 34 | 0.1 | 33 | 0.1 | 32 | 0.1 | 34 |
| PEN ⁴ | 0.0 | 32 | 0.0 | 35 | 0.0 | 36 | 0.0 | 36 | 0.1 | 35 | 0.1 | 35 |
| OTH | 6.6 | | 6.6 | | 7.7 | | 4.7 | | 1.6 | | 2.1 | |
| Total | 200.0 | | 200.0 | | 200.0 | | 200.0 | | 200.0 | | 200.0 | |

¹ Adjusted for local and cross-border inter-dealer double-counting (ie "net-net" basis). ² Because two currencies are involved in each transaction, the sum of the percentage shares of individual currencies totals 200% instead of 100%. ³ Turnover for years prior to 2013 may be underestimated owing to incomplete reporting of offshore trading in previous surveys. Methodological changes in the 2013 survey ensured more complete coverage of activity in emerging market and other currencies. ⁴ Turnover may be underestimated owing to incomplete reporting of offshore trading.

OTC foreign exchange turnover by currency pair

Net-net basis,¹ daily averages in April, in billions of US dollars and percentages

Table 3

| Currency pair | 2001 | | 2004 | | 2007 | | 2010 | | 2013 | | 2016 | |
|----------------------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------------|--------------|
| | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % |
| USD / EUR | 372 | 30.0 | 541 | 28.0 | 892 | 26.8 | 1,098 | 27.7 | 1,292 | 24.1 | 1,173 | 23.0 |
| USD / JPY | 250 | 20.2 | 328 | 17.0 | 438 | 13.2 | 567 | 14.3 | 980 | 18.3 | 902 | 17.7 |
| USD / GBP | 129 | 10.4 | 259 | 13.4 | 384 | 11.6 | 360 | 9.1 | 473 | 8.8 | 470 | 9.2 |
| USD / AUD | 51 | 4.1 | 107 | 5.5 | 185 | 5.6 | 248 | 6.3 | 364 | 6.8 | 266 | 5.2 |
| USD / CAD | 54 | 4.3 | 77 | 4.0 | 126 | 3.8 | 182 | 4.6 | 200 | 3.7 | 218 | 4.3 |
| USD / CNY | ... | ... | ... | ... | ... | ... | 31 | 0.8 | 113 | 2.1 | 192 | 3.8 |
| USD / CHF | 59 | 4.8 | 83 | 4.3 | 151 | 4.5 | 166 | 4.2 | 184 | 3.4 | 180 | 3.5 |
| USD / MXN | ... | ... | ... | ... | ... | ... | ... | ... | 128 | 2.4 | 105 | 2.1 |
| USD / SGD | ... | ... | ... | ... | ... | ... | ... | ... | 65 | 1.2 | 81 | 1.6 |
| USD / NZD | ... | ... | ... | ... | ... | ... | ... | ... | 82 | 1.5 | 78 | 1.5 |
| USD / KRW | ... | ... | ... | ... | ... | ... | 58 | 1.5 | 60 | 1.1 | 78 | 1.5 |
| USD / HKD | ... | ... | ... | ... | ... | ... | 85 | 2.1 | 69 | 1.3 | 77 | 1.5 |
| USD / SEK | ... | ... | ... | ... | 57 | 1.7 | 45 | 1.1 | 55 | 1.0 | 66 | 1.3 |
| USD / TRY | ... | ... | ... | ... | ... | ... | ... | ... | 63 | 1.2 | 63 | 1.2 |
| USD / INR | ... | ... | ... | ... | ... | ... | 36 | 0.9 | 50 | 0.9 | 56 | 1.1 |
| USD / RUB | ... | ... | ... | ... | ... | ... | ... | ... | 79 | 1.5 | 53 | 1.0 |
| USD / NOK | ... | ... | ... | ... | ... | ... | ... | ... | 49 | 0.9 | 48 | 0.9 |
| USD / BRL | ... | ... | ... | ... | ... | ... | 25 | 0.6 | 48 | 0.9 | 45 | 0.9 |
| USD / ZAR | ... | ... | ... | ... | ... | ... | 24 | 0.6 | 51 | 1.0 | 41 | 0.8 |
| USD / TWD | ... | ... | ... | ... | ... | ... | ... | ... | 22 | 0.4 | 31 | 0.6 |
| USD / PLN | ... | ... | ... | ... | ... | ... | ... | ... | 22 | 0.4 | 19 | 0.4 |
| USD / OTH | 199 | 16.0 | 307 | 15.9 | 612 | 18.4 | 445 | 11.2 | 213 | 4.0 | 213 | 4.2 |
| EUR / GBP | 27 | 2.1 | 47 | 2.4 | 69 | 2.1 | 109 | 2.7 | 102 | 1.9 | 100 | 2.0 |
| EUR / JPY | 36 | 2.9 | 61 | 3.2 | 86 | 2.6 | 111 | 2.8 | 148 | 2.8 | 79 | 1.6 |
| EUR / CHF | 13 | 1.1 | 30 | 1.6 | 62 | 1.9 | 71 | 1.8 | 71 | 1.3 | 44 | 0.9 |
| EUR / SEK | ... | ... | ... | ... | 24 | 0.7 | 35 | 0.9 | 28 | 0.5 | 36 | 0.7 |
| EUR / NOK | ... | ... | ... | ... | ... | ... | ... | ... | 20 | 0.4 | 28 | 0.6 |
| EUR / AUD | 1 | 0.1 | 4 | 0.2 | 9 | 0.3 | 12 | 0.3 | 21 | 0.4 | 16 | 0.3 |
| EUR / CAD | 1 | 0.1 | 2 | 0.1 | 7 | 0.2 | 14 | 0.3 | 15 | 0.3 | 14 | 0.3 |
| EUR / PLN | ... | ... | ... | ... | ... | ... | ... | ... | 14 | 0.3 | 13 | 0.3 |
| EUR / DKK | ... | ... | ... | ... | ... | ... | ... | ... | 13 | 0.2 | 13 | 0.2 |
| EUR / HUF | ... | ... | ... | ... | ... | ... | ... | ... | 10 | 0.2 | 5 | 0.1 |
| EUR / TRY | ... | ... | ... | ... | ... | ... | ... | ... | 6 | 0.1 | 4 | 0.1 |
| EUR / CNY | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 0.0 | 2 | 0.0 |
| EUR / OTH | 20 | 1.6 | 38 | 1.9 | 83 | 2.5 | 102 | 2.6 | 51 | 0.9 | 65 | 1.3 |
| JPY / AUD | ... | ... | ... | ... | ... | ... | 24 | 0.6 | 46 | 0.9 | 31 | 0.6 |
| JPY / CAD | ... | ... | ... | ... | ... | ... | ... | ... | 6 | 0.1 | 7 | 0.1 |
| JPY / NZD | ... | ... | ... | ... | ... | ... | 4 | 0.1 | 5 | 0.1 | 5 | 0.1 |
| JPY / TRY | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 0.0 | 3 | 0.1 |
| JPY / ZAR | ... | ... | ... | ... | ... | ... | ... | ... | 4 | 0.1 | 3 | 0.1 |
| JPY / BRL | ... | ... | ... | ... | ... | ... | ... | ... | 3 | 0.1 | 1 | 0.0 |
| JPY / OTH | 15 | 1.2 | 28 | 1.4 | 66 | 2.0 | 50 | 1.3 | 88 | 1.6 | 45 | 0.9 |
| Other currency pairs | 13 | 1.1 | 22 | 1.1 | 74 | 2.2 | 70 | 1.8 | 44 | 0.8 | 116 | 2.3 |
| All currency pairs | 1,239 | 100.0 | 1,934 | 100.0 | 3,324 | 100.0 | 3,971 | 100.0 | 5,355 | 100.0 | 5,088 | 100.0 |

¹ Adjusted for local and cross-border inter-dealer double-counting (ie "net-net" basis).

OTC foreign exchange turnover by instrument, counterparty and maturity

Net-net basis,¹ daily averages in April, in billions of US dollars and percentages

Table 4

| Instrument/counterparty/maturity | 2001 | | 2004 | | 2007 | | 2010 | | 2013 | | 2016 | |
|--|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------------|--------------|
| | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % |
| Spot transactions | 386 | 31.2 | 631 | 32.6 | 1,005 | 30.2 | 1,488 | 37.5 | 2,046 | 38.2 | 1,654 | 32.5 |
| with reporting dealers | 216 | 56.0 | 310 | 49.2 | 426 | 42.4 | 517 | 34.7 | 675 | 33.0 | 607 | 36.7 |
| with other financial institutions | 111 | 28.9 | 212 | 33.7 | 394 | 39.2 | 754 | 50.7 | 1,183 | 57.8 | 930 | 56.2 |
| with non-financial customers | 58 | 15.0 | 108 | 17.0 | 184 | 18.3 | 217 | 14.6 | 188 | 9.2 | 117 | 7.1 |
| Outright forwards | 130 | 10.5 | 209 | 10.8 | 362 | 10.9 | 475 | 11.9 | 679 | 12.7 | 700 | 13.8 |
| with reporting dealers | 52 | 40.0 | 73 | 35.1 | 96 | 26.5 | 112 | 23.7 | 181 | 26.6 | 189 | 27.1 |
| with other financial institutions | 41 | 31.3 | 80 | 38.3 | 159 | 43.9 | 254 | 53.5 | 402 | 59.2 | 431 | 61.5 |
| with non-financial customers | 37 | 28.7 | 56 | 26.6 | 107 | 29.6 | 108 | 22.8 | 96 | 14.2 | 80 | 11.4 |
| Up to 7 days | 51 | 38.8 | 92 | 44.3 | 154 | 42.6 | 219 | 46.1 | 270 | 39.7 | 270 | 38.6 |
| Over 7 days and up to 1 year | 76 | 58.4 | 111 | 53.2 | 200 | 55.4 | 245 | 51.5 | 378 | 55.6 | 412 | 58.9 |
| Over 1 year | 4 | 2.7 | 5 | 2.6 | 7 | 2.0 | 11 | 2.4 | 31 | 4.6 | 17 | 2.5 |
| Foreign exchange swaps | 656 | 52.9 | 954 | 49.3 | 1,714 | 51.6 | 1,759 | 44.3 | 2,239 | 41.8 | 2,383 | 46.8 |
| with reporting dealers | 419 | 63.9 | 573 | 60.0 | 796 | 46.4 | 834 | 47.4 | 1,088 | 48.6 | 1,209 | 50.7 |
| with other financial institutions | 177 | 27.0 | 293 | 30.7 | 682 | 39.8 | 755 | 42.9 | 1,002 | 44.7 | 1,027 | 43.1 |
| with non-financial customers | 60 | 9.1 | 89 | 9.3 | 236 | 13.8 | 170 | 9.7 | 150 | 6.7 | 147 | 6.2 |
| Up to 7 days | 451 | 68.7 | 700 | 73.4 | 1,329 | 77.5 | 1,299 | 73.9 | 1,573 | 70.2 | 1,640 | 68.8 |
| Over 7 days and up to 1 year | 196 | 29.9 | 242 | 25.3 | 365 | 21.3 | 442 | 25.1 | 579 | 25.9 | 713 | 29.9 |
| Over 1 year | 8 | 1.2 | 10 | 1.0 | 18 | 1.0 | 14 | 0.8 | 87 | 3.9 | 30 | 1.3 |
| Currency swaps | 7 | 0.6 | 21 | 1.1 | 31 | 0.9 | 43 | 1.1 | 54 | 1.0 | 96 | 1.9 |
| with reporting dealers | 4 | 53.5 | 12 | 57.7 | 12 | 38.6 | 20 | 46.8 | 29 | 53.7 | 46 | 48.2 |
| with other financial institutions | 2 | 21.3 | 5 | 23.4 | 13 | 41.1 | 19 | 45.0 | 19 | 34.7 | 43 | 44.6 |
| with non-financial customers | 2 | 25.2 | 3 | 14.2 | 6 | 20.4 | 4 | 8.2 | 6 | 11.6 | 7 | 7.2 |
| FX options and other products ² | 60 | 4.8 | 119 | 6.2 | 212 | 6.4 | 207 | 5.2 | 337 | 6.3 | 254 | 5.0 |
| with reporting dealers | 28 | 47.1 | 49 | 41.4 | 62 | 29.2 | 60 | 29.1 | 99 | 29.4 | 83 | 32.8 |
| with other financial institutions | 15 | 26.0 | 44 | 36.6 | 91 | 42.8 | 113 | 54.7 | 207 | 61.3 | 141 | 55.3 |
| with non-financial customers | 16 | 26.8 | 21 | 17.9 | 59 | 28.0 | 33 | 16.1 | 31 | 9.3 | 30 | 11.9 |
| Total | 1,239 | 100.0 | 1,934 | 100.0 | 3,324 | 100.0 | 3,971 | 100.0 | 5,355 | 100.0 | 5,088 | 100.0 |
| with reporting dealers | 719 | 58.1 | 1,018 | 52.6 | 1,392 | 41.9 | 1,544 | 38.9 | 2,072 | 38.7 | 2,136 | 42.0 |
| with other financial institutions | 346 | 27.9 | 634 | 32.8 | 1,339 | 40.3 | 1,896 | 47.7 | 2,812 | 52.5 | 2,571 | 50.5 |
| with non-financial customers | 173 | 14.0 | 276 | 14.3 | 593 | 17.8 | 532 | 13.4 | 472 | 8.8 | 381 | 7.5 |
| Local | 525 | 42.4 | 743 | 38.4 | 1,274 | 38.3 | 1,393 | 35.1 | 2,259 | 42.2 | 1,803 | 35.4 |
| Cross-border | 713 | 57.5 | 1,185 | 61.2 | 2,051 | 61.7 | 2,578 | 64.9 | 3,096 | 57.8 | 3,285 | 64.6 |

¹ Adjusted for local and cross-border inter-dealer double-counting (ie "net-net" basis). ² The category "other FX products" covers highly leveraged transactions and/or trades whose notional amount is variable and where a decomposition into individual plain vanilla components was impractical or impossible.

OTC foreign exchange turnover by instrument, currency and counterparty

Net-net basis,¹ daily averages in April 2016, in billions of US dollars

Table 5

| Instrument/currency/counterparty | Total | Spot transactions | Outright forwards | Foreign exchange swaps | Currency swaps | FX options |
|------------------------------------|-------|-------------------|-------------------|------------------------|----------------|------------|
| Total | 5,088 | 1,654 | 700 | 2,383 | 96 | 254 |
| <i>By currency</i> | | | | | | |
| USD | 4,458 | 1,387 | 600 | 2,165 | 88 | 218 |
| EUR | 1,591 | 520 | 178 | 807 | 22 | 64 |
| JPY | 1,097 | 395 | 151 | 459 | 18 | 74 |
| GBP | 650 | 212 | 92 | 305 | 10 | 30 |
| AUD | 353 | 144 | 41 | 142 | 7 | 20 |
| CAD | 261 | 105 | 34 | 103 | 4 | 14 |
| CHF | 243 | 57 | 30 | 150 | 2 | 5 |
| CNY | 202 | 68 | 28 | 86 | 3 | 18 |
| MXN | 112 | 43 | 12 | 36 | 15 | 6 |
| SEK | 113 | 34 | 13 | 59 | 2 | 5 |
| NZD | 105 | 40 | 11 | 44 | 1 | 8 |
| SGD | 91 | 28 | 8 | 51 | 2 | 3 |
| HKD | 88 | 23 | 6 | 57 | 1 | 1 |
| NOK | 85 | 29 | 8 | 44 | 0 | 3 |
| KRW | 84 | 29 | 35 | 14 | 1 | 5 |
| TRY | 71 | 20 | 6 | 40 | 3 | 4 |
| INR | 58 | 19 | 23 | 13 | 1 | 3 |
| RUB | 58 | 24 | 6 | 27 | 1 | 1 |
| ZAR | 51 | 16 | 4 | 24 | 5 | 2 |
| BRL | 51 | 13 | 27 | 1 | 2 | 8 |
| DKK | 42 | 7 | 5 | 30 | 0 | 0 |
| PLN | 35 | 12 | 4 | 18 | 0 | 1 |
| TWD | 32 | 9 | 13 | 8 | 0 | 1 |
| HUF | 15 | 4 | 2 | 8 | 0 | 1 |
| OTH | 230 | 71 | 61 | 77 | 6 | 15 |
| <i>By counterparty³</i> | | | | | | |
| with reporting dealers | 2,136 | 607 | 189 | 1,209 | 46 | 83 |
| local | 678 | 204 | 59 | 376 | 17 | 23 |
| cross-border | 1,457 | 403 | 130 | 833 | 29 | 61 |
| with other financial institutions | 2,571 | 930 | 431 | 1,027 | 43 | 141 |
| local | 901 | 334 | 158 | 344 | 14 | 52 |
| cross-border | 1,670 | 596 | 273 | 683 | 29 | 89 |
| non-reporting banks | 1,120 | 354 | 136 | 564 | 24 | 42 |
| institutional investors | 798 | 290 | 171 | 278 | 6 | 52 |
| hedge funds and PTFs ² | 389 | 200 | 82 | 66 | 9 | 32 |
| official sector | 74 | 14 | 14 | 43 | 2 | 1 |
| other | 191 | 71 | 27 | 76 | 3 | 14 |
| with non-financial customers | 381 | 117 | 80 | 147 | 7 | 30 |
| local | 224 | 82 | 55 | 66 | 3 | 17 |
| cross-border | 157 | 35 | 25 | 81 | 4 | 13 |
| <i>Of which: prime brokered</i> | 887 | 564 | 119 | 143 | 3 | 58 |
| <i>Of which: retail-driven</i> | 282 | 60 | 22 | 178 | 3 | 19 |

¹Adjusted for local and cross-border inter-dealer double-counting (ie "net-net" basis). ² Proprietary trading firms. ³ See explanatory notes for definitions of counterparties.

Geographical distribution of OTC foreign exchange turnover¹

Net-gross basis,² daily averages in April, in billions of US dollars and percentages

Table 6

| Country | 2001 | | 2004 | | 2007 | | 2010 | | 2013 | | 2016 | |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % |
| Argentina | ... | ... | 1 | 0.0 | 1 | 0.0 | 2 | 0.0 | 1 | 0.0 | 1 | 0.0 |
| Australia | 54 | 3.2 | 107 | 4.1 | 176 | 4.1 | 192 | 3.8 | 182 | 2.7 | 135 | 2.1 |
| Austria | 8 | 0.5 | 15 | 0.6 | 19 | 0.4 | 20 | 0.4 | 15 | 0.2 | 19 | 0.3 |
| Bahrain | 3 | 0.2 | 3 | 0.1 | 3 | 0.1 | 5 | 0.1 | 9 | 0.1 | 6 | 0.1 |
| Belgium | 10 | 0.6 | 21 | 0.8 | 50 | 1.2 | 33 | 0.6 | 22 | 0.3 | 23 | 0.4 |
| Brazil | 6 | 0.3 | 4 | 0.1 | 6 | 0.1 | 14 | 0.3 | 17 | 0.3 | 20 | 0.3 |
| Bulgaria | ... | ... | ... | ... | 1 | 0.0 | 1 | 0.0 | 2 | 0.0 | 2 | 0.0 |
| Canada | 44 | 2.6 | 59 | 2.3 | 64 | 1.5 | 62 | 1.2 | 65 | 1.0 | 86 | 1.3 |
| Chile | 2 | 0.1 | 2 | 0.1 | 4 | 0.1 | 6 | 0.1 | 12 | 0.2 | 7 | 0.1 |
| China | ... | ... | 1 | 0.0 | 9 | 0.2 | 20 | 0.4 | 44 | 0.7 | 73 | 1.1 |
| Chinese Taipei | 5 | 0.3 | 9 | 0.4 | 16 | 0.4 | 18 | 0.4 | 26 | 0.4 | 27 | 0.4 |
| Colombia | 0 | 0.0 | 1 | 0.0 | 2 | 0.0 | 3 | 0.1 | 3 | 0.1 | 4 | 0.1 |
| Czech Republic | 2 | 0.1 | 2 | 0.1 | 5 | 0.1 | 5 | 0.1 | 5 | 0.1 | 4 | 0.1 |
| Denmark | 24 | 1.4 | 42 | 1.6 | 88 | 2.1 | 120 | 2.4 | 117 | 1.8 | 101 | 1.5 |
| Estonia | ... | ... | 0 | 0.0 | 1 | 0.0 | 1 | 0.0 | 0 | 0.0 | ... | ... |
| Finland | 2 | 0.1 | 2 | 0.1 | 8 | 0.2 | 31 | 0.6 | 15 | 0.2 | 14 | 0.2 |
| France | 50 | 2.9 | 67 | 2.6 | 127 | 3.0 | 152 | 3.0 | 190 | 2.8 | 181 | 2.8 |
| Germany | 91 | 5.4 | 120 | 4.6 | 101 | 2.4 | 109 | 2.2 | 111 | 1.7 | 116 | 1.8 |
| Greece | 5 | 0.3 | 4 | 0.2 | 5 | 0.1 | 5 | 0.1 | 3 | 0.0 | 1 | 0.0 |
| Hong Kong SAR | 68 | 4.0 | 106 | 4.1 | 181 | 4.2 | 238 | 4.7 | 275 | 4.1 | 437 | 6.7 |
| Hungary | 1 | 0.0 | 3 | 0.1 | 7 | 0.2 | 4 | 0.1 | 4 | 0.1 | 3 | 0.1 |
| India | 3 | 0.2 | 7 | 0.3 | 38 | 0.9 | 27 | 0.5 | 31 | 0.5 | 34 | 0.5 |
| Indonesia | 4 | 0.2 | 2 | 0.1 | 3 | 0.1 | 3 | 0.1 | 5 | 0.1 | 5 | 0.1 |
| Ireland | 9 | 0.5 | 7 | 0.3 | 11 | 0.3 | 15 | 0.3 | 11 | 0.2 | 2 | 0.0 |
| Israel | 1 | 0.1 | 5 | 0.2 | 8 | 0.2 | 10 | 0.2 | 8 | 0.1 | 8 | 0.1 |
| Italy | 18 | 1.0 | 23 | 0.9 | 38 | 0.9 | 29 | 0.6 | 24 | 0.4 | 18 | 0.3 |
| Japan | 153 | 9.0 | 207 | 8.0 | 250 | 5.8 | 312 | 6.2 | 374 | 5.6 | 399 | 6.1 |
| Korea | 10 | 0.6 | 21 | 0.8 | 35 | 0.8 | 44 | 0.9 | 48 | 0.7 | 48 | 0.7 |
| Latvia | ... | ... | 2 | 0.1 | 3 | 0.1 | 2 | 0.0 | 2 | 0.0 | 1 | 0.0 |
| Lithuania | ... | ... | 1 | 0.0 | 1 | 0.0 | 1 | 0.0 | 1 | 0.0 | 0 | 0.0 |
| Luxembourg | 13 | 0.8 | 15 | 0.6 | 44 | 1.0 | 33 | 0.7 | 51 | 0.8 | 37 | 0.6 |
| Malaysia | 1 | 0.1 | 2 | 0.1 | 3 | 0.1 | 7 | 0.1 | 11 | 0.2 | 8 | 0.1 |
| Mexico | 9 | 0.5 | 15 | 0.6 | 15 | 0.4 | 17 | 0.3 | 32 | 0.5 | 20 | 0.3 |
| Netherlands | 31 | 1.8 | 52 | 2.0 | 25 | 0.6 | 18 | 0.4 | 112 | 1.7 | 85 | 1.3 |
| New Zealand | 4 | 0.2 | 7 | 0.3 | 13 | 0.3 | 9 | 0.2 | 12 | 0.2 | 10 | 0.2 |
| Norway | 13 | 0.8 | 14 | 0.6 | 32 | 0.7 | 22 | 0.4 | 21 | 0.3 | 40 | 0.6 |
| Peru | 0 | 0.0 | 0 | 0.0 | 1 | 0.0 | 1 | 0.0 | 2 | 0.0 | 1 | 0.0 |
| Philippines | 1 | 0.1 | 1 | 0.0 | 2 | 0.1 | 5 | 0.1 | 4 | 0.1 | 3 | 0.0 |
| Poland | 5 | 0.3 | 7 | 0.3 | 9 | 0.2 | 8 | 0.2 | 8 | 0.1 | 9 | 0.1 |
| Portugal | 2 | 0.1 | 2 | 0.1 | 4 | 0.1 | 4 | 0.1 | 4 | 0.1 | 2 | 0.0 |
| Romania | ... | ... | ... | ... | 3 | 0.1 | 3 | 0.1 | 3 | 0.1 | 3 | 0.0 |
| Russia | 10 | 0.6 | 30 | 1.1 | 50 | 1.2 | 42 | 0.8 | 61 | 0.9 | 45 | 0.7 |
| Saudi Arabia | 2 | 0.1 | 2 | 0.1 | 4 | 0.1 | 5 | 0.1 | 5 | 0.1 | 5 | 0.1 |
| Singapore | 104 | 6.1 | 134 | 5.1 | 242 | 5.6 | 266 | 5.3 | 383 | 5.7 | 517 | 7.9 |
| Slovakia | 1 | 0.0 | 2 | 0.1 | 3 | 0.1 | 0 | 0.0 | 1 | 0.0 | 2 | 0.0 |
| Slovenia | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | ... | ... | ... | ... | ... | ... |
| South Africa | 10 | 0.6 | 10 | 0.4 | 14 | 0.3 | 14 | 0.3 | 21 | 0.3 | 21 | 0.3 |
| Spain | 8 | 0.5 | 14 | 0.5 | 17 | 0.4 | 29 | 0.6 | 43 | 0.6 | 33 | 0.5 |
| Sweden | 25 | 1.5 | 32 | 1.2 | 44 | 1.0 | 45 | 0.9 | 44 | 0.7 | 42 | 0.6 |
| Switzerland | 76 | 4.5 | 85 | 3.3 | 254 | 5.9 | 249 | 4.9 | 216 | 3.2 | 156 | 2.4 |
| Thailand | 2 | 0.1 | 3 | 0.1 | 6 | 0.1 | 7 | 0.1 | 13 | 0.2 | 11 | 0.2 |
| Turkey | 1 | 0.1 | 3 | 0.1 | 4 | 0.1 | 17 | 0.3 | 27 | 0.4 | 22 | 0.3 |
| United Kingdom | 542 | 31.8 | 835 | 32.0 | 1,483 | 34.6 | 1,854 | 36.8 | 2,726 | 40.8 | 2,426 | 37.1 |
| United States | 273 | 16.0 | 499 | 19.1 | 745 | 17.4 | 904 | 17.9 | 1,263 | 18.9 | 1,272 | 19.4 |
| Total | 1,705 | 100.0 | 2,608 | 100.0 | 4,281 | 100.0 | 5,043 | 100.0 | 6,684 | 100.0 | 6,546 | 100.0 |

¹Data may differ slightly from national survey data owing to differences in aggregation procedures and rounding. The data for the Netherlands are not fully comparable over time due to reporting improvements in 2013. ²Adjusted for local inter-dealer double-counting (ie "net-gross" basis).

B Explanatory notes

The methodology and structure of the foreign exchange turnover part of the 2016 Triennial Central Bank Survey was unchanged from 2013.

Participating authorities

Central banks and other authorities in 52 jurisdictions participated in the 2016 Triennial Survey. Authorities in the same jurisdictions, plus Estonia, participated in the 2013 survey.

| | | | |
|-----------------------|--|-----------------------|--|
| Argentina | Central Bank of Argentina | Korea | Bank of Korea |
| Australia | Reserve Bank of Australia | Latvia | Bank of Latvia |
| Austria | Central Bank of the Republic of Austria | Lithuania | Bank of Lithuania |
| Bahrain | Bahrain Monetary Agency | Luxembourg | Central Bank of Luxembourg |
| Belgium | National Bank of Belgium | Malaysia | Central Bank of Malaysia |
| Brazil | Central Bank of Brazil | Mexico | Bank of Mexico |
| Bulgaria | Bulgarian National Bank | Netherlands | Netherlands Bank |
| Canada | Bank of Canada | New Zealand | Reserve Bank of New Zealand |
| Chile | Central Bank of Chile | Norway | Central Bank of Norway |
| China | People's Bank of China State Administration of Foreign Exchange | Peru | Central Reserve Bank of Peru |
| Chinese Taipei | Central Bank of China | Philippines | Bangko Sentral ng Pilipinas |
| Colombia | Bank of the Republic | Poland | National Bank of Poland |
| Czech Republic | Czech National Bank | Portugal | Bank of Portugal |
| Denmark | Danmarks Nationalbank | Romania | National Bank of Romania |
| Finland | Bank of Finland | Russia | Central Bank of the Russian Federation |
| France | Bank of France | Saudi Arabia | Saudi Arabian Monetary Agency |
| Germany | Deutsche Bundesbank | Singapore | Monetary Authority of Singapore |
| Greece | Bank of Greece | Slovakia | National Bank of Slovakia |
| Hong Kong SAR | Hong Kong Monetary Authority | South Africa | South African Reserve Bank |
| Hungary | Magyar Nemzeti Bank | Spain | Bank of Spain |
| India | Reserve Bank of India | Sweden | Sveriges Riksbank Statistics Sweden |
| Indonesia | Bank Indonesia | Switzerland | Swiss National Bank |
| Ireland | Central Bank of Ireland | Thailand | Bank of Thailand |
| Israel | Bank of Israel | Turkey | Central Bank of the Republic of Turkey |
| Italy | Bank of Italy | United Kingdom | Bank of England |
| Japan | Bank of Japan | United States | Federal Reserve Bank of New York |

Coverage

The Triennial Survey of foreign exchange turnover covers spot transactions, outright forwards, foreign exchange swaps, currency swaps, currency options and other OTC foreign exchange transactions with exposure to more than one currency.

The basis for reporting was in principle the location of the sales desk of any trade, even if deals entered into in different locations were booked in a central location. Thus, transactions concluded by offices located abroad were not reported by the country of location of the head office, but by that of the office abroad (insofar as the latter was a reporting institution in one of the other reporting countries). Where no sales desk was involved in a deal, the trading desk was used to determine the location of deals.

The survey collected turnover data for both proprietary and commissioned business of the reporting institutions. Commissioned business refers to reporting institutions' transactions as a result of deals as an agent or trustee in their own name, but on behalf of third parties, such as customers or other entities.

Turnover data

Turnover data provide a measure of market activity, and can also be seen as a rough proxy for market liquidity. Turnover is defined as the gross value of all new deals entered into during a given period, and is measured in terms of the nominal or notional amount of the contracts.

No distinction was made between sales and purchases (eg a purchase of \$5 million against sterling and a sale of \$7 million against sterling would amount to a gross turnover of \$12 million). Direct cross-currency transactions were counted as single transactions (eg if a bank sold \$5 million of Swiss francs against the Swedish krona, the reported turnover would be \$5 million); however, cross-currency transactions passing through a vehicle currency were recorded as two separate deals against the vehicle currency (eg if a bank sold \$5 million of Swiss francs against euros first and then used the euros to purchase kronor, the reported turnover would be \$10 million). The gross amount of each transaction was recorded once, and netting arrangements and offsets were ignored.

OTC derivatives transactions that are centrally cleared via central counterparties (CCPs) were reported on a pre-novation basis (ie with the original execution counterpart as counterparty). Any post-trade transaction records that arise from central clearing via CCPs (eg through novation) were not reported as additional transactions.

As in the previous foreign exchange surveys, turnover data were collected over a one-month period, the month of April, in order to reduce the likelihood of very short-term variations in activity contaminating the data. The data collected for the survey reflected all transactions entered into during the calendar month of April 2016, regardless of whether delivery or settlement was made during that month. In order to allow comparison across countries, daily averages of turnover were computed by dividing aggregate monthly turnover for the country in question by the number of days in April on which the foreign exchange and derivatives markets in that country were open.

Transactions are reported to the BIS in US dollar equivalents, with non-dollar amounts generally converted into US dollars using the exchange rate prevailing on the date of the trade.

Instruments

The instruments covered in the foreign exchange turnover part of the survey are defined as follows:

| | |
|-------------------------------|--|
| Spot transactions | Single outright transactions involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) within two business days. The spot legs of swaps are not included among spot transactions but are reported as swap transactions even when they are due for settlement within two days. This means that spot transactions are exclusive of overnight swaps and spot next swaps, as well as other "tomorrow/next day" transactions. |
| Outright forwards | Transactions involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) at some time in the future (more than two business days later). This category also includes forward foreign exchange agreement transactions (FXAs), non-deliverable forwards (NDFs) and other forward contracts for differences. Outright forwards are generally not traded on organised exchanges, and their contractual terms are not standardised. |
| Foreign exchange swaps | Transactions involving the actual exchange of two currencies (principal amount only) on a specific date at a rate agreed at the time of the conclusion of the contract (the short leg), and a reverse exchange of the same two currencies at a date further in the future at a rate (generally different from the rate applied to the short leg) agreed at the time of the contract (the long leg). Both spot/forward and forward/forward swaps are included. For <i>turnover</i> , only the forward leg is reported as such. The spot leg is not reported at all, ie neither as a spot nor as a foreign exchange swap transaction. Short-term swaps carried out as "tomorrow/next day" transactions are also included in this category. |
| Currency swaps | Contracts which commit two counterparties to exchange streams of interest payments in different currencies for an agreed period of time and/or to exchange principal amounts in different currencies at a pre-agreed exchange rate at maturity. |
| OTC options | Option contracts that give the right to buy or sell a currency with another currency at a specified exchange rate during a specified period. This category also includes exotic foreign exchange options such as average rate options and barrier options. OTC options include: <ul style="list-style-type: none">• The currency swaption: an OTC option to enter into a currency swap contract.• The currency warrant: a long-dated (over one year) OTC currency option. |
| Other products | Other derivative products are instruments where decomposition into individual plain vanilla instruments such as forwards, swaps or options is impractical or impossible. An example of "other" products is swaps with underlying notional principal in one currency and fixed or floating interest rate payments based on interest rates in currencies other than the notional (differential swaps or "diff swaps"). |

Counterparties

Reporting institutions were requested to provide for each instrument a breakdown of contracts by counterparty, as follows: reporting dealers, other financial institutions and non-financial customers, with separate information on local and cross-border transactions. The distinction between local and cross-border was determined according to the location of the counterparty and not its nationality. Starting with the 2013 survey of foreign exchange turnover, other financial institutions were further broken down into five subsectors.

| | |
|--|---|
| Reporting dealers | <p>Financial institutions that participate as reporters in the Triennial Survey.</p> <p>These are mainly large commercial and investment banks and securities houses that (i) participate in the inter-dealer market and/or (ii) have an active business with large customers, such as large corporate firms, governments and non-reporting financial institutions; in other words, reporting dealers are institutions that actively buy and sell currency and OTC derivatives both for their own account and/or in meeting customer demand.</p> <p>In practice, reporting dealers are often those institutions that actively or regularly deal through electronic platforms, such as EBS or Reuters dealing facilities.</p> <p>This category also includes the branches and subsidiaries of institutions operating in multiple locations that do not have a trading desk but do have a sales desk in those locations that conducts active business with large customers.</p> <p>The identification of transactions with reporting dealers allows the BIS to adjust for double-counting in inter-dealer trades.</p> |
| Other financial institutions | <p>Financial institutions that are not classified as "reporting dealers" in the survey.</p> <p>These are typically regarded as foreign exchange and interest rate derivatives market end users. They mainly cover all other financial institutions, such as smaller commercial banks, investment banks and securities houses, and mutual funds, pension funds, hedge funds, currency funds, money market funds, building societies, leasing companies, insurance companies, other financial subsidiaries of corporate firms and central banks.</p> |
| Non-reporting banks | <p>Smaller or regional commercial banks, publicly owned banks, securities firms or investment banks not directly participating as reporting dealers.</p> |
| Institutional investors | <p>Institutional investors such as mutual funds, pension funds, insurance and reinsurance companies and endowments. Primary motives for market participation are to trade FX instruments eg for hedging, investing and risk management purposes. A common label for this counterparty category is "real money investors".</p> |
| Hedge funds and proprietary trading firms | <p>(i) Investment funds and various types of money managers, including commodity trading advisers (CTAs), which share (a combination of) the following characteristics: they often follow a relatively broad range of investment strategies that are not subject to borrowing and leverage restrictions, with many of them using high levels of leverage; they often have a different regulatory mandate than "institutional investors" and typically cater to sophisticated investors such as high net worth individuals or institutions; and they often hold long and short positions in various markets, asset classes and instruments, with frequent use of derivatives for speculative purposes.</p> <p>(ii) Proprietary trading firms that invest, hedge or speculate for their own account. This category may include specialised high-frequency trading (HFT) firms that employ high-speed algorithmic trading strategies characterised by numerous frequent trades and very short holding periods.</p> |
| Official sector financial institutions | <p>Central banks, sovereign wealth funds, international financial institutions in the public sector (BIS, IMF etc), development banks and agencies.</p> |
| Other | <p>All remaining financial institutions (eg retail aggregators) that cannot be classified in any of the four above-mentioned subcategories for other financial institutions.</p> |
| Non-financial customers | <p>Any counterparty other than those described above, ie mainly non-financial end users, such as corporations and non-financial government entities. May also include private individuals who directly transact with reporting dealers for investment purposes, either on the online retail trading platforms operated by the reporting dealers or by other means (eg giving trading instructions by phone).</p> |

Trading relationships

Reporting dealers were requested to identify how much of their total turnover for each instrument and currency pair was attributed to: (i) transactions conducted in a foreign exchange prime brokerage relationship (with the reporting dealer in the role of FX prime broker); and (ii) transactions that are directly or indirectly generated by retail investors. As in previous surveys, reporting dealers were requested to identify how much of their grand total of foreign exchange turnover was attributed to “related party” transactions.

| | |
|-----------------------------------|--|
| Prime brokers | Institutions (usually large and highly rated banks) facilitating trades for their clients (often institutional funds, hedge funds and other proprietary trading firms). Prime brokers enable their clients to conduct trades, subject to credit limits, with a group of predetermined third-party banks in the prime broker’s name. This may also involve granting the client access to electronic platforms that are traditionally available only to large dealers. In an FX prime brokerage relationship, the client trade is normally “given up” to the prime broker, which is interposed between the third-party bank and the client and therefore becomes the counterparty to both legs of the trade. |
| Retail-driven transactions | Reporting dealers’ (i) transactions with “wholesale” financial counterparties that cater to retail investors (ie electronic retail trading platforms and retail margin brokerage firms), and (ii) direct transactions with “non-wholesale” investors (ie private individuals) executed online or by other means (eg phone), if applicable. |
| Related party trades | Transactions between desks and offices, transactions with branches and subsidiaries, and transactions between affiliated firms. These trades are included regardless of whether the counterparty is resident in the same country as the reporting dealer or in another country. However, trades conducted as back-to-back deals and trades to facilitate internal bookkeeping and internal risk management within a given reporting dealer are excluded, be they on a local or a cross-border basis. |

Currencies and currency pairs

All foreign exchange transactions involving the 24 currencies listed in the table below were collected in the survey. This list of currencies for which reporting is compulsory and consistent across all jurisdictions was expanded from eight currencies in the 2010 survey to 24 in the 2013 survey, the latter total being retained for the 2016 survey.⁵ These changes in the reporting setup were introduced to better capture offshore trading in non-major currencies, most of which are emerging market currencies.⁶

Currencies collected in the 2016 survey

| | | | | | | | |
|-----|------------------|-----|-----|-----|-----|-----|-----|
| AUD | CHF | EUR | HUF | KRW | NZD | SEK | TWD |
| BRL | CNY ¹ | GBP | INR | MXN | PLN | SGD | USD |
| CAD | DKK | HKD | JPY | NOK | RUB | TRY | ZAR |

¹ Includes offshore transactions commonly denoted by CNH.

⁵ In the past, several technical features in its reporting setup had limited the Triennial Survey’s capacity to capture turnover in non-major currencies in a consistent manner globally. This was less of an issue in the past when non-major currencies were mainly traded onshore, but offshore trading of many non-major currencies has expanded significantly. Given the global nature of the Triennial Survey, it is crucial to have consistent reporting of these currencies across all participating jurisdictions.

⁶ In previous surveys, only eight “major” currencies were subject to compulsory reporting on a global basis. Reporting of the other “non-major” currencies was only compulsory in the currencies’ “home” jurisdictions, whereas the reporting of these currencies’ offshore turnover was left to the discretion of the offshore jurisdictions. Potentially inconsistent treatment of non-major currencies across jurisdictions is known to be associated with problems such as “overnetting”, which affects the accuracy of the turnover aggregates.

Data were collected for the following 47 currency pairs. Turnover in currency pairs that are not listed was recorded in aggregate under "other" and "residual".

| Currency pairs collected in the 2016 survey | | | | | |
|---|--|--|------------------------------|--------------------|-----------------------|
| | Domestic currency against | USD against | EUR against | JPY against | Residual ¹ |
| G8 currencies | AUD, CAD, CHF, EUR, GBP, JPY, SEK, USD | AUD, CAD, CHF, EUR, GBP, JPY, SEK, | AUD, CAD, CHF, GBP, JPY, SEK | AUD, CAD | |
| Non-G8 currencies | | BRL, CNY, HKD, INR, KRW, MXN, NOK, NZD, PLN, RUB, SGD, TRY, TWD, ZAR | CNY, DKK, HUF, NOK, PLN, TRY | BRL, NZD, TRY, ZAR | |
| Other | Other ² | Other ² | Other ² | Other ² | |

¹ Transactions that do not involve the domestic currency, USD, EUR or JPY in one leg. ² Currencies not explicitly listed in the table.

Given the interest in identifying turnover in all reporting countries' currencies, supplementary information for currencies recorded in aggregate under "other" and "residual" was also collected for the following 35 currencies: ARS, AUD, BGN, BHD, BRL, CAD, CHF, CLP, CNY, COP, CZK, DKK, GBP, HKD, HUF, IDR, ILS, INR, KRW, MXN, MYR, NOK, NZD, PEN, PHP, PLN, RON, RUB, SAR, SEK, SGD, THB, TRY, TWD and ZAR.

Transactions conducted in a special unit of account adjusted to inflation (like CLF, COU and MXV) were treated as having been done in the main currency (respectively, CLP, COP and MXN).

Maturities

Transactions in outright forwards and foreign exchange swaps were broken down between the following original maturity bands: seven days or less; over seven days and up to one year; over one year.

For outright forward contracts, the maturity band for the transaction is determined by the difference between the delivery date and the date of the initiation of the contract. For both spot/forward and forward/forward foreign exchange swaps, the maturity band for the contract is determined by the difference between the due date of the second or long leg of the swap and the date of the initiation of the contract.

Elimination of double-counting

Double-counting arises because transactions between two reporting entities are recorded by each of them, ie twice. In order to derive meaningful measures of overall market size, it is therefore necessary to halve the data on transactions between reporting dealers. To permit this, reporters are asked to distinguish deals contracted with other reporters (dealers).

The following methods of adjustment were applied: data on local deals with other reporters were first divided by two, and this figure was subtracted from total gross data to arrive at so-called "net-gross" figures, ie business net of local inter-dealer double-counting. In a second step, data on cross-border deals with other reporters were also divided by two, and this figure was subtracted from total "net-gross" data to obtain so-called "net-net" figures, ie business net of local and cross-border inter-dealer double-counting.

| Gross turnover | Minus | = Net-gross turnover | Minus | = Net-net turnover |
|--|---|--|--|---|
| Not adjusted for inter-dealer double-counting (ie "gross-gross" basis) | half of the turnover with local reporting dealers | Adjusted for local inter-dealer double-counting (ie "net-gross" basis) | half of the turnover with reporting dealers abroad | Adjusted for local and cross-border inter-dealer double-counting (ie "net-net" basis) |