

The foreign exchange and over-the-counter interest rate derivatives market in the United Kingdom

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- The triennial survey of turnover in the United Kingdom's foreign exchange (FX) and over-the-counter (OTC) interest rate derivatives market showed FX market turnover fell by 12% between April 2013 and April 2016, albeit only 6% in constant exchange rate terms. Turnover in OTC interest rate derivatives also fell 12% over the same period, though just 1% at constant exchange rates.
- Although experiencing a small decline in turnover, the United Kingdom remains the principal location for FX trading, accounting for 37% of total global FX turnover — 17 percentage points greater than the second largest centre, the United States.
- This article analyses some of the factors that are likely to account for the small decrease in UK FX turnover and comments on other aspects of the survey, including changes in the geographical location of trading and the mix of products and investors.

Overview

In April this year, the Bank of England conducted its usual triennial survey of turnover in the United Kingdom's foreign exchange (FX) and over-the-counter (OTC) interest rate derivatives market. This forms part of the latest worldwide survey co-ordinated by the Bank for International Settlements, which has the aim of monitoring the structure of, and developments across, global markets.

Results of the UK FX survey

Average daily turnover in the UK FX market was US\$2,406 billion during April 2016, 12% lower than in April 2013. The decline in the United Kingdom's total market share is consistent with the overall decline in spot turnover and hedge fund activity, which have traditionally been based in London.

The survey also indicated reduced trading in major currencies, an activity traditionally concentrated in London, and

increased appetite in so-called emerging market currencies typically traded most heavily in their respective regions. The rising importance of renminbi within the United Kingdom and global FX markets continued in the 2016 survey, with turnover in the Chinese currency roughly doubling over the past three years. Market intelligence contacts noted that the renminbi benefited from a number of reforms as China relaxed control of the exchange rate as part of a strategy to gain international recognition for the currency.

FX swaps turnover, the largest component of global FX turnover, has increased, with market intelligence suggesting this increase was driven by increased short-dated rolling over of cash positions and asset manager requirements to hedge FX risk across multi-asset portfolios. Again, this benefited centres other than London given higher yield differences in currency pairs traded more heavily elsewhere.

(1) The authors would like to thank Patrick Campbell, Perry Francis, Kieran Jones, John Lowes and James O'Connor for their help in producing this article.

In April this year, central banks and monetary authorities in 52 countries, including the United Kingdom, conducted national surveys of turnover in foreign exchange (FX) markets⁽¹⁾ and in over-the-counter (OTC) interest rate derivatives markets. These surveys have taken place every three years since 1986⁽²⁾ and measure turnover for the whole of April. They are co-ordinated on a global basis by the Bank for International Settlements (BIS), with the aim of obtaining comprehensive and internationally consistent information on the size and structure of the corresponding global markets.

The UK survey was conducted by the Bank of England, covering the business of 43 institutions (both UK-owned and foreign-owned) located in the United Kingdom. See Annex 1 for information on the market concentration and conditions of the UK market during the triennial reporting month and Annex 2 for descriptions of the types of trades captured in the survey.

This article outlines the results⁽³⁾ of the latest UK contribution to the BIS global survey.⁽⁴⁾ The focus is largely on changes in FX markets, exploring the decreases in UK turnover since the previous survey, providing context and explanations for these developments. OTC interest rate derivatives survey results are summarised in the box on page 231.

The following sections will analyse the key changes in the market by comparing the picture from the most recent snapshot and the preceding survey from three years ago. First, the results of the survey and the global market shares of the major FX centres. Second, the composition of the most traded currencies and renminbi trading becoming more mainstream. Third, an investigation into counterparty changes including the shift away from hedge fund trading, tied in with an analysis of the product-specific impacts of these counterparty changes which may account for a decline in spot and increase in swap turnover. Fourth, examining the developments in market infrastructure and the impact that principal trading firms (PTFs) have had on the landscape of the FX market.

The results of the global survey

For the first time since 2001 the reported headline daily turnover figures for the FX market declined. In contrast to the strong growth in volume recorded between 2001 and 2013, the latest survey recorded a 5% fall in global turnover to US\$5,088 billion per day. Yet this figure should be placed in context.

First, the level of turnover recorded in April 2013 was unusually high, owing to the Japanese central bank's monetary and fiscal policy changes during the reporting month.⁽⁵⁾ Second, the level of turnover is still substantially higher (+28%) than recorded volumes in the 2010 survey (US\$3,981 billion). Third, the appreciation of the US dollar over the past three years has impacted reported turnover. As

discussed in the box on page 226, when valued at constant (April 2016) exchange rates, turnover increased slightly (4%) between April 2013 and April 2016.

The main theme of this reporting period has been the geographical shift in market activity, driven by changes in the market share of the most traded currencies and the changing nature of investor activity and appetite. The following sections will look to develop these themes and their impact on FX turnover.

London remains the principal centre for FX trading

Despite the headline figures, concentration of activity in the largest trading centres grew. In April 2016, five markets — the United Kingdom, United States, Singapore, Hong Kong and Japan — intermediated 77% of FX trading, up from 75% in April 2013 and 71% in April 2010.

Average daily turnover in the UK FX market during April 2016 was US\$2,406 billion, 12% lower than in April 2013. Similar to the global level, movements in exchange rates since the 2013 survey have contributed to the decline in turnover, with turnover at constant exchange rates decreasing by just 6% (for further details see the box on page 226). The majority of turnover in the UK FX market was cross-border⁽⁶⁾ — some 69% of total turnover in April 2016 — reflecting London's role as an international financial centre.

Despite the fall in turnover, the United Kingdom remained the single largest centre of FX activity with 37% of global turnover (**Chart 1**). The United Kingdom's share of the global FX market has exceeded 30% in each of the past seven surveys. The next largest centre was the United States, with 19% of global market share in 2016, up marginally from 2013. The fall in UK turnover was almost exactly offset by increases in turnover in Hong Kong and Singapore (**Chart 2**). Singapore as a centre overtook Japan in 2013, and has continued to grow further.

The decline in UK global market share has reversed the 2013 survey rise back to 2010 levels (in percentage terms). Contacts note that far from being a UK exodus, the reduction in turnover is more the result of a shift in the composition of

(1) Unless otherwise stated, turnover figures published here are adjusted to remove double counting of trades between UK principals that will have been reported by both parties (so-called 'local double counting').

(2) In the 1986 survey four countries, including the United Kingdom, reported data to the BIS. The first published global data were for the 1989 survey, which also included results of the 1986 survey. OTC derivatives were included for the first time in 1995.

(3) The Bank published a summary of the UK results on 1 September 2016; www.bankofengland.co.uk/publications/Pages/news/2016/064.aspx. The BIS global results can be found on the BIS website; www.bis.org/publ/rpfx16.htm.

(4) Following the publication of the summary of the UK results, the survey figures were revised. As a result there will be some differences in the turnover figures between this article and the summary results, particularly within currency swaps turnover figures.

(5) See Bank of Japan announcement of Quantitative and Qualitative Easing (QQE) from 4 April 2013; www.boj.or.jp/en/announcements/release_2013/k130404a.pdf.

(6) 'Cross-border business' covers transactions with entities located outside of the United Kingdom.

Exchange rate effects on FX turnover

Exchange rate movements since April 2013 have affected turnover reported in the 2016 triennial survey. These exchange rate effects can be stripped out by converting turnover figures for previous surveys to 2016 exchange rates.⁽¹⁾

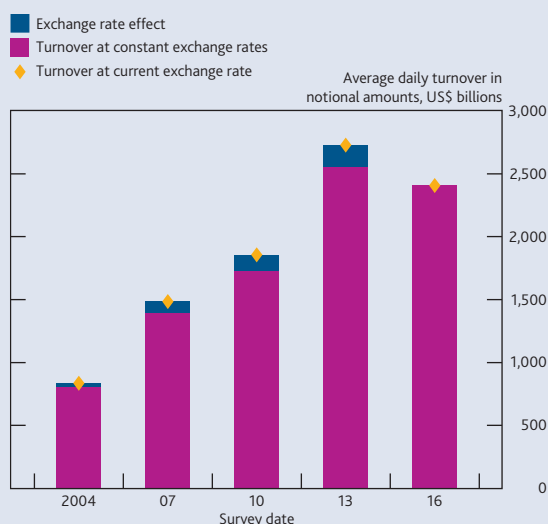
At a global level, when comparing 2016 figures with 2013 figures at constant 2016 exchange rates, turnover actually increased slightly, by about 4% (Table 1). For the United Kingdom, when valued at constant exchange rates, the fall recorded between the two surveys is halved, being reduced to 6% (Chart A). Total FX turnover figures for all triennial surveys back to 2004 are reduced when converted to 2016 exchange rates.

Table 1 Global FX turnover at constant (April 2016) and current exchange rates

Average daily turnover, US\$ trillions	2004	2007	2010	2013	2016
Total FX turnover	1.93	3.32	3.97	5.36	5.10
Turnover at April 2016 exchange rates	1.88	3.12	3.67	4.92	5.10

Source: BIS.

Chart A UK FX turnover at constant (April 2016) and current exchange rates



The driver of these exchange rate impacts has been the strength of the US dollar during the 2016 survey month. When compared with previous surveys the US dollar has appreciated significantly against the most traded currencies within the United Kingdom. This appreciation has caused the US dollar value of turnover in other currencies to reduce, decreasing the total reported turnover when converted into US dollars. Table 2 shows the exchange rates of the most

Table 2 Monthly average spot exchange rate, into US\$

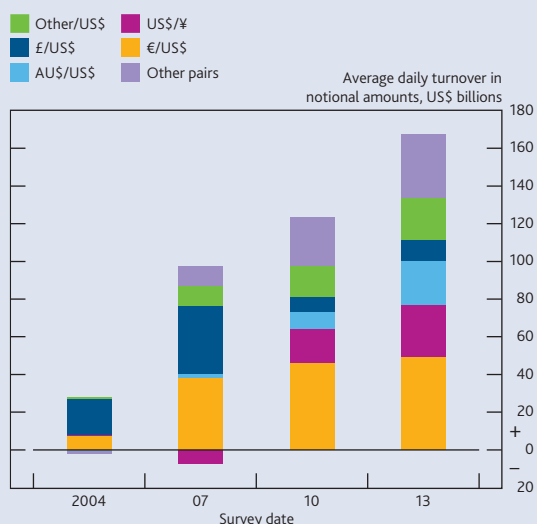
	€	¥	£	AUS\$
April 2004	0.83	107.80	0.56	1.35
April 2007	0.74	118.89	0.50	1.21
April 2010	0.75	93.47	0.65	1.08
April 2013	0.77	97.96	0.65	0.96
April 2016	0.88	109.58	0.70	1.31

traded currencies within the United Kingdom against the US dollar.

The most significant effect on turnover figures derives from the appreciation of the US dollar versus the euro. The euro has depreciated approximately 15% against the US dollar since April 2013, causing the value of euro trades on the 2016 survey to reduce when compared with previous surveys.

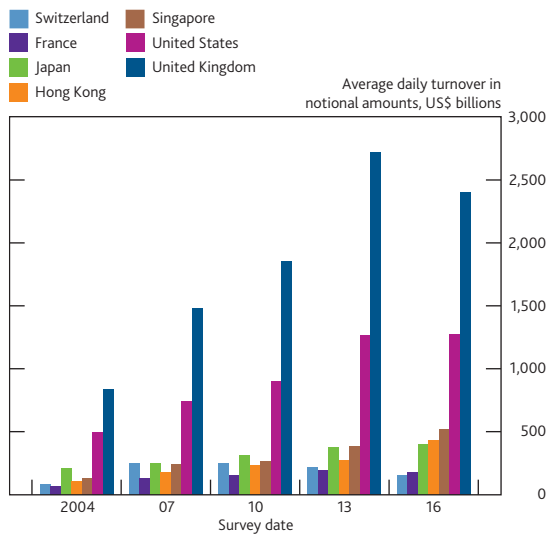
When converting the turnover reported for all US\$/€ trades in the 2013 survey to 2016 exchange rates, the average daily turnover for US\$/€ trades in the United Kingdom falls by US\$49 billion (7%). For 2010, turnover is reduced by US\$46 billion, and for 2007 turnover is reduced by US\$38 billion. Similar effects have been seen across the most traded currencies (Chart B).

Chart B Contribution to UK exchange rate effect by currency pair



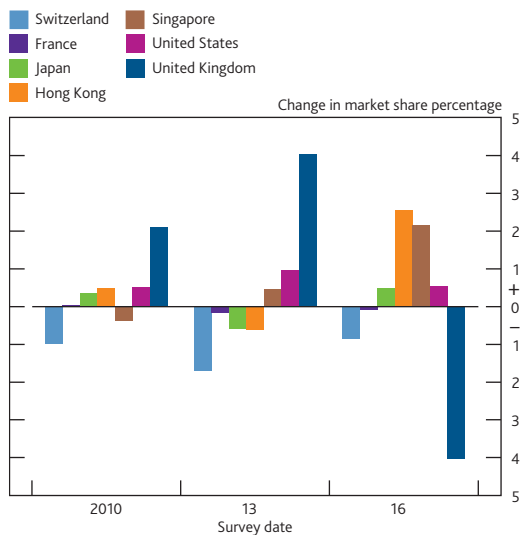
(1) Constant exchange rate measures are constructed by converting each leg of a foreign currency transaction into original currency amounts at the prevailing average April bilateral exchange rates. These amounts are then reconverted into US dollar amounts at average April 2016 exchange rates.

Chart 1 FX turnover in the United Kingdom and other major centres



Source: BIS.

Chart 2 Change in the market share of major FX centres



Sources: BIS and Bank calculations.

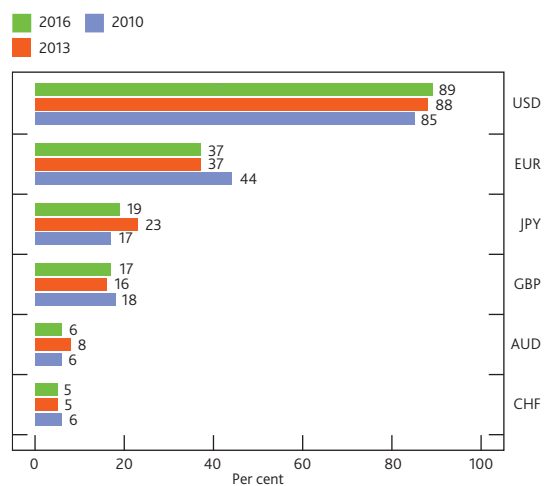
the most traded currencies and a decline in the market share of other financial institutions, who have typically made up a relatively large part of the London market.

In addition to the triennial survey, more frequent Foreign Exchange Joint Standing Committee (FXJSC) data can be used to interpolate the triennial survey results for the United Kingdom. They indicate a marginal new high in UK turnover in October 2014, driven by a rise in spot activity. The general sense is that the rapid growth in activity of recent years has steadied, and turnover remains just below — albeit near — the highs. For further details of the inter-relation between the BIS triennial and FXJSC surveys see the box on page 228.

Currency breakdown of FX turnover and the rise of the renminbi

The US dollar remained the most traded currency in the UK FX market, with 89% of all trades having one side denominated in US dollars in April 2016 (Chart 3). The euro continued to be the second most traded currency, its market share remaining at 37% of total turnover. The proportion of turnover involving the Japanese yen decreased from 23% to 19%, unwinding the large increase in market share recorded in April 2013 that had coincided with the expansionary monetary policy of the Bank of Japan. The proportion of turnover involving sterling has increased marginally from 16% to 17%.

Chart 3 UK FX turnover by currency distribution^(a)



(a) Because two currencies are involved in each transaction, the sum of the percentage shares of individual currencies totals 200% instead of 100%.

Some market intelligence contacts have suggested the reduction in UK turnover is the result of a decline in flow of some major currencies such as the euro, yen, Australian dollar and Swiss franc, compared to emerging currencies whose percentage of total turnover has increased. The importance of other pairs has grown due to the continued relative growth in turnover of several major emerging market currencies, including the Mexican peso, Korean won, and Chinese renminbi (RMB).

The rising importance of renminbi within the United Kingdom and global FX markets continued in the 2016 survey, with turnover in the Chinese currency roughly doubling over the past three years. Outside the Asian centres of Hong Kong, China and Singapore, which naturally are the home to most of this activity, the United Kingdom is now the largest centre for RMB trading. Historically London has been the major centre for FX turnover, perhaps accounting for its standing within RMB turnover. Some contacts of the Bank have suggested it is also the result of steady growth in activity through UK branches of Chinese banks, who have benefited from a clear UK regulatory framework for such operations. The increased importance that some European companies have

BIS triennial survey and the Foreign Exchange Joint Standing Committee survey

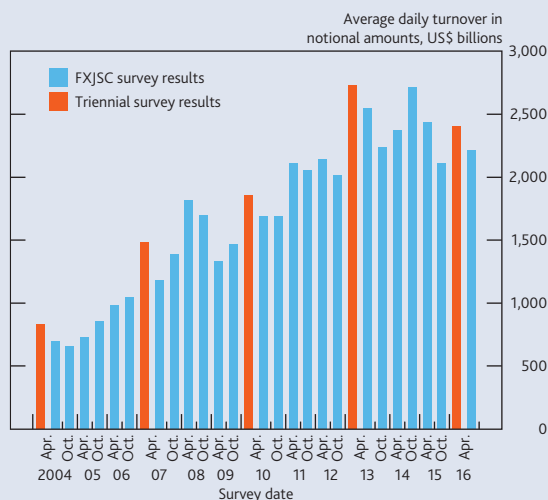
Since October 2004, the Foreign Exchange Joint Standing Committee (FXJSC) has been publishing FX turnover data for the United Kingdom. The FXJSC is a UK market liaison group established by the banks and brokers of the London FX market and is chaired by the Bank of England. Data are published on a six-monthly basis, for April and October.⁽¹⁾

The FXJSC survey collects similar information to the FX section of the BIS triennial survey. However, there are two important differences, in institutional coverage and definition. First, more institutions participate in the BIS survey (43 compared with 30 in the respective April 2016 surveys). Second, the reporting basis for the FXJSC survey is based on the location of the price-setting dealer or trading desk (where transactions are executed), while the BIS triennial survey is based on the location of the sales desk (where transactions are arranged).

Despite these differences the two surveys are broadly comparable. Institutions that participate in both surveys report very similar results and account for 99% of turnover in

the BIS survey. **Chart A** shows the development of UK FX market turnover since 2004 by combining FXJSC and BIS triennial survey results.

Chart A UK FX turnover in FXJSC and triennial surveys



(1) Further details of the FXJSC can be found on the Bank's website; www.bankofengland.co.uk/markets/pages/forex/fxjsc/default.aspx.

placed on their commercial relationships with China and the increasing presence of branches of Chinese corporations may also have been a factor. In addition, both the United Kingdom and Chinese governments have also chosen to issue RMB bonds in London. The rise in turnover means that the renminbi is now the eleventh most traded currency in the United Kingdom, up from 16th in 2013. While this has been a substantial gain, it still only represents 2% of total UK turnover and 4% globally.

Market intelligence contacts have noted that global trade in the renminbi has benefited from a number of reforms as China relaxed control of the exchange rate as part of a strategy to gain international recognition for the currency. This led the International Monetary Fund (IMF) to announce its intention to include the renminbi in the Special Drawing Rights (SDR) basket calculations as of 1 October 2016, widely seen as recognition of the policy reforms implemented to achieve China's transition to an 'increasingly open and market-based economy' with the inclusion also expected to 'support the already increasing use and trading' of the currency internationally.⁽¹⁾⁽²⁾

Elsewhere, there were few material changes in the currency compositions among major currencies, although it is worth noting the decline in Australian dollar turnover in terms of global market share, back to 2007 levels. Market contacts note that the currency had experienced a rise in activity because it was being traded as a proxy for RMB. As the RMB

became more freely tradable, the Australian dollar reverted to more natural, idiosyncratic levels. The April survey months for both 2013 and 2016 were relatively big turnover months for the yen. As highlighted by Lowes and Nenova (2013), April 2013 data were elevated by Japanese quantitative and qualitative easing, with April 2016 figures magnified — albeit to a lesser extent — following investor reaction to the lack of further monetary policy easing from the Bank of Japan, which saw the yen strengthen throughout the survey month.

Fall in hedge fund turnover and product-specific impacts

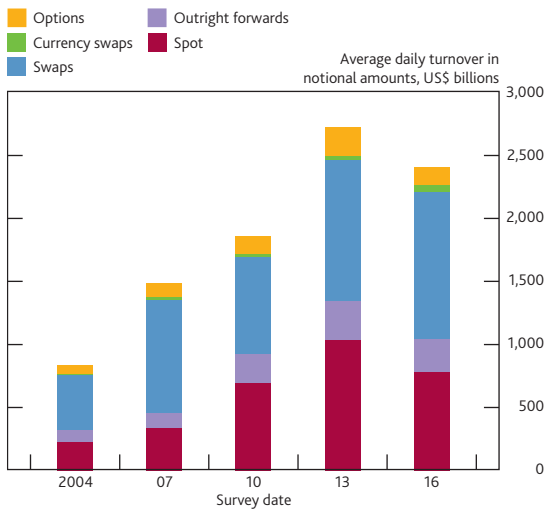
The changes in geographical and currency concentration can be placed in the context of changing counterparty activity, which in turn explains some of the differences in individual product turnover.

FX turnover in spot, outright forwards and options decreased, while turnover in swaps and currency swaps increased, as illustrated in **Chart 4**. Turnover in spot activity displayed the most marked decrease, down 24% to US\$784 billion per day in April 2016, accounting for 77% of the overall decrease in FX market activity. In contrast, turnover in swaps increased by 3% to US\$1,161 billion per day. Swap transactions remain the most traded FX instrument, accounting for 48% of total turnover.

(1) The announcement by the IMF was made in November 2015.

(2) For further information see Zhang, T (2016), '2nd CF40-PIIE China Economic Forum in the US', 5 October; www.imf.org/en/News/Articles/2016/10/05/SP100516-PIIE-China-Economic-Forum.

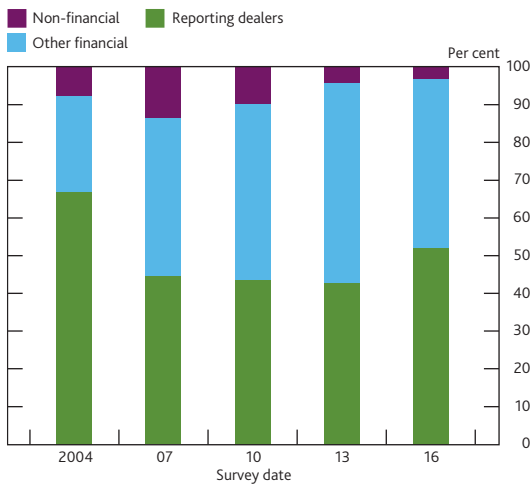
Chart 4 UK FX turnover by instrument type^(a)



(a) For a definition of the different instrument types, see Annex 2.

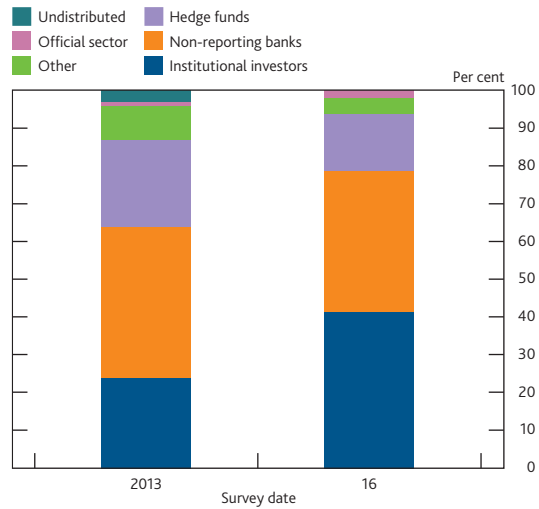
When looking at the data by counterparty the main themes focus on the decline in the proportion of trading by other financial institutions (OFIs), a counterparty category that includes non-reporting banks, security dealers, hedge funds, pension funds, and smaller banks and security houses. Turnover with OFIs fell to US\$1,076 billion per day, a decrease of 25% compared with April 2013, and now accounts for 45% of total turnover (Chart 5).

Chart 5 UK FX turnover by counterparty



Hedge funds now account for a significantly lower share of the UK FX market, down from 12% to 7% (and in terms of OFI data 15% in 2016 compared with 23% in 2013, see Chart 6). Indeed, the reported volume conducted with hedge funds was lower in 2016 than in 2013 for all three of the traditional types of FX volume (spot, outright forward and swaps), with an overall decline of over 50% to US\$164 billion per day. This decline has coincided with the first decline in spot turnover since 2001. Market intelligence contacts have said that hedge funds were previously attributed with having driven spot

Chart 6 UK FX turnover with other financial institutions



turnover higher, especially when market conditions were more supportive of risk-taking.

Contacts have noted two main connected factors for this decline. First, the decline in activity was the result of the fact that hedge funds have found fewer profitable opportunities in major FX currencies, which have been defined by low-yield environments and, since early 2015, the dollar having traded in a relatively narrow range. This may also account for the possible shift in risk appetite towards non-G10 currency pairs, particularly emerging market currency pairs. The decline in returns (and emergence of losses in some cases) forms the basis for the second reason: significant outflows (mainly cash from large institutional investors). Contacts have noted that declines in assets under management negatively impact hedge fund risk appetite, encouraging them to participate less with the funds they have maintained.⁽¹⁾

The declines reported by hedge funds contrast with so-called real money institutional investors (such as insurance companies and pension funds) who showed increased volumes across FX markets with a total increase to US\$444 billion per day — more than double that of hedge funds and proprietary trading desks (Chart 6). As noted by the BIS, 'the rise in the share of trading by institutional investors is mostly due to an increase in their use of FX swaps'.⁽²⁾ Contacts have suggested that short-dated rolling over of cash positions and asset manager requirements to hedge FX risk across multi-asset portfolios, constructed taking into account relative yields, were likely drivers for this shift in activity.

In terms of product specifics, FX swaps turnover increased to a record-high US\$1,161 billion per day from US\$1,127 billion per

(1) One contact noted assets under management for one client hedge fund reducing from US\$5 billion to US\$1 billion in the space of twelve months.
 (2) 'Triennial Central Bank Survey: Foreign exchange turnover in April 2016', September 2016, page 9; www.bis.org/publ/rpfx16fx.pdf.

day in 2013. A significant proportion of this growth was due to swaps involving yen, as investors looked to avoid negative Japanese yields by moving into other global assets, notably those with higher yields, eg US Treasuries. From 2010 to 2016 Japanese yen FX swaps has had the largest percentage growth at 73%. US dollar was the next largest with an increase of 53%. In nominal amounts US dollar has grown the most (US\$379 billion per day) then euro (US\$135 billion) then Japanese yen (US\$69 billion).

Market intelligence from Bank contacts, and trends from other surveys (including the Bank's FXJSC survey), confirm institutional investors raised their hedging requirements to protect themselves from potentially sharp currency fluctuations, during a period when the Bank of Japan and the European Central Bank embarked on fresh monetary policy easing programmes while the Federal Reserve started to tighten policy.

Similarly, market intelligence contacts suggest increased FX swap volume may be the result of greater global search for yield (ie a low interest rate environment prevails in a number of jurisdictions and therefore there is an increasing need for investors to purchase bonds from jurisdictions with higher prevailing yields, leading to a funding requirement to obtain the currency of the bond). In some jurisdictions this has been in the face of reduced long-term funding supply in the sought-after currencies; following developments such as money market reform in the United States, for example. This resulted in an increased requirement for short-term funding, with shorter-dated swaps subsequently requiring more active and frequent management: the notion is that short-dated rolling over of cash positions leads to increased volume. This is corroborated by FXJSC data which showed 70% of swap turnover was made up from sub-one month trades.

A small but growing sector of the market is retail FX trading, which (on a global scale) has increased since 2013, and has most notably increased in FX swaps. The use of the swap market is consistent with retail investors holding open cash positions that retail brokers then have to roll over via FX swaps, transactions that are traditionally done through prime brokers (PBs). A high number of retail platforms exist to serve the retail market. Many of those gain market access via PB relationships, with activity characterised typically by very high volumes of low-value tickets. While most contacts of the Bank confirmed retail trading was still a very small aspect of the market, and therefore unlikely to have any meaningful impact on overall key themes, it was a notable development.

Developments in market structure

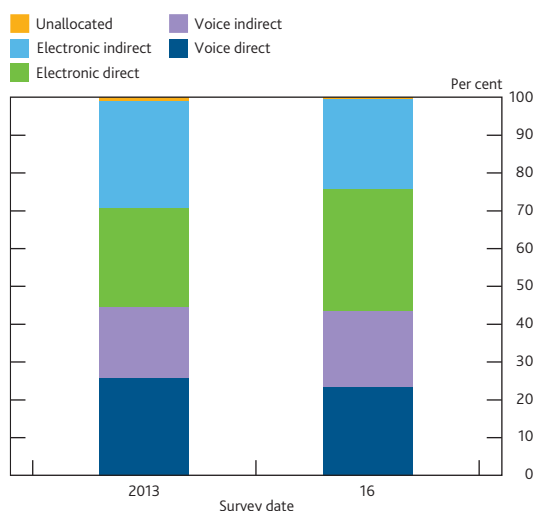
Trends in 2016 data signal a continuation of observations made by Lowes and Nenova (2013) particularly in terms of the fragmentation of available liquidity requiring continued technological advances. Electronic trading and advances in

technology are not new in FX and remain key in the development of market activity. A continuing trend, outlined in the 2015 Q1 *Quarterly Bulletin*,⁽¹⁾ has been the increasing prevalence of electronic trading in the FX market over recent years, which now accounts for more than half of all spot currency trades.

Electronic market-making has continued to evolve to be faster, potentially driving greater efficiency in the processing of transactions and the recycling of risk. Since 2013, traditional market makers, such as banks, are said to have reduced their risk appetite in response to broader regulatory changes. And PTFs have grown their presence as non-bank market makers. Additionally, the Swiss National Bank's decision to suspend the franc peg brought into sharp relief how market liquidity and structure had evolved. That event, together with a number of flash events (short bouts of exceptional volatility which may not have a fundamental trigger and which typically self-correct), led to further recalibration of electronic pricing and risk management tools. For example, electronic pricing tools are now faster to react and to potentially cease quoting altogether during periods of heightened volatility. Separately, there has been less activity on multilateral platforms, with banks seeking to internalise more of their client trades, in order to capture market spreads.

These trends could be seen within the UK survey with business conducted via an electronic medium the most common method of trade execution, accounting for 56% of total turnover at US\$1,350 billion per day. Trades executed directly by voice decreased slightly to US\$566 billion, now accounting for 24% of all trades, while trades executed by a voice broker comprised 20% of all trades, up slightly from the 19% recorded in April 2013 (Chart 7). Within these data, there has

Chart 7 UK FX turnover by execution method



(1) See 'Markets and operations', *Bank of England Quarterly Bulletin*, Vol. 55, No. 1, pages 76–83; www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2015/q107.pdf.

Over-the-counter interest rate derivatives turnover in the United Kingdom

Average daily turnover for over-the-counter (OTC) interest rate derivatives in the United Kingdom was US\$1,181 billion in April 2016, a 12% decrease on April 2013. Within this, turnover in forward rate agreements recorded the largest decrease, down by 21% to US\$375 billion a day. Turnover in interest rate swaps decreased by 5% to US\$757 billion per day, although it still accounted for over half (64%) of the OTC interest rate derivatives market. Turnover in interest rate options also declined, down by 39% to US\$48 billion per day.

For the first time since the inception of the triennial survey, the United Kingdom was not the largest centre for OTC interest rate derivatives activity, being surpassed by the United States.⁽¹⁾ The market share of the United Kingdom has fallen from 50% in April 2013 to 39% in April 2016. In contrast 41% of all OTC interest rate derivatives activity now takes place in the United States (Chart A).⁽²⁾

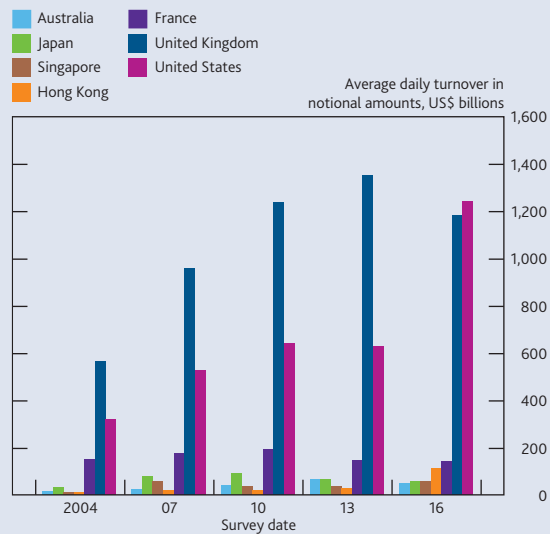
The fall in UK global share can largely be explained by the weakness of euro-related activity, where the United Kingdom remained the main centre (75% of all trades in euro-denominated derivatives were executed in the United Kingdom). Euro-denominated contracts have historically been the most actively traded segment of global turnover; however, the 2016 survey saw US dollar-denominated contracts supersede euro instruments to become the most actively traded OTC interest rate derivatives globally.

The fall in euro-related activity countered the sharp rise in US dollar-related activity, specifically US dollar contracts with short-term maturities. As noted by the Bank for International Settlements, these changes likely reflect the monetary policies of the Federal Reserve Bank and the European Central Bank. Negative and expected stable interest rates within the euro market may have been a factor dampening the demand for euro-denominated swaps, while the rise in turnover in short-term swaps in the United States is consistent with expectations of increasing short-term rates.⁽³⁾

Within the United Kingdom, the falling share of the euro is particularly pronounced, with the proportion of OTC interest rate derivatives denominated in euro decreasing from 69% in April 2013 to 49% in April 2016. In contrast, over the same period, the proportion of turnover attributable to sterling increased from 14% to 21%, and the proportion attributable to US dollar also increased, up from 8% to 18% (Chart B).

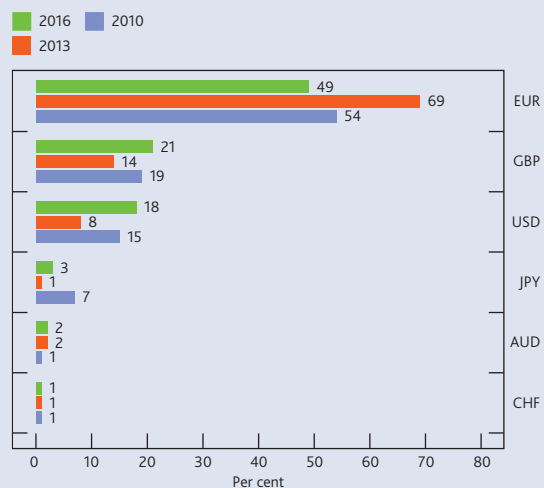
Movements within the counterparty breakdown were less marked. Daily turnover with 'other financial institutions' decreased by US\$100 billion but maintained the same 54% share of total turnover as in April 2013. Business with reporting dealers and non-financial institutions also fell, down by 5% and 63% between 2013 and 2016, and now account for 44% and 2% of the total OTC interest rate derivatives activity in the United Kingdom respectively.

Chart A Interest rate derivatives turnover in the United Kingdom and other major centres



Source: BIS.

Chart B Interest rate derivatives turnover in the United Kingdom by currency



(1) OTC interest rate derivatives activity was first collected on the triennial survey in 1995.
 (2) Increased turnover in the United States is, in part, the result of more comprehensive reporting by dealers.
 (3) For further information on global trends in the OTC interest rate derivatives market see analysis provided by BIS; www.bis.org/publ/qtrpdf/r_qt1612f.htm.

been a reduction in turnover recorded across traditional multilateral platforms, and an increase in relationship-based trading via direct electronic channels. This is consistent with major firms providing specific pricing streams directly to clients, together with internalising a greater proportion of activity, thereby avoiding dealing in public markets where their activity is potentially revealing.

The latest survey was the first time participants were asked to estimate their rates of internalisation. Internalisation is pursued by firms as part of their market-making activity, typically through automation, to improve efficiency and maintain market spread while reducing the need to transact actively in the external market. In recent years, market contacts have suggested that internalisation ratios had risen markedly — particularly in liquid, spot FX trading pairs among the largest dealers — consistent with the marked growth of electronic trading and automation of market-making. Survey data⁽¹⁾ supports this, showing that internalisation was highest in spot FX, with 72% being warehoused internally. More recently, internalisation growth is thought to have steadied.

Over the past three years PTFs have become increasingly important given their technological sophistication and relative nimbleness in building the necessary tools to grow market presence. Largely evolving from high speed or high-frequency trading backgrounds, their models tend to conform to real-time analysis of market data to inform price making and any resulting management of risk. Although typically lightly capitalised, they perform price making in a similar way to banks but differ in that their appetite to hold risk is typically very short term. Market contacts have also suggested that non-bank liquidity providers are more active in providing prices in non-major currency pairs where bid-offer spreads are generally wider than those typically seen in the major currencies. Their technological edge and cross-market presence is said to enable them to make continuous pricing.

Their technological advantages have led PTFs to provide more pricing to FX markets, in part displacing traditional sources which have continued to retreat. Some of these firms have entered into partnering agreements to provide traditional market makers, such as banks, with either streaming pricing or the necessary technology to improve market access. There is some debate whether the emergence of PTFs, while having a positive impact on bid-ask spreads and efficiency, has negatively impacted on the ability of big institutional investors to trade in size. But the overall trend, both in banks and non-banks, is that pricing and liquidity provision has become more short term in nature and that could, at times, limit the capacity of the market to absorb large flows.

The use of prime brokerage services remains a key part of the structure of the FX market. Smaller participants, such as those categorised under OFIs, may utilise the credit of a sponsoring

prime broker to enable them to trade with a broader array of FX market participants than they otherwise could under bilateral arrangements. The major banks tend to be the most significant providers of PB services, and London is the major centre. It is therefore unsurprising that the reduction in hedge fund activity is consistent with the falls in prime brokered spot volume, particularly in the major currency pairs. The data do not break down PTFs distinctly, but PB proportions of activity across some non-major pairs has risen, which is consistent with the themes of both increased focus on those currencies and potentially increased PTF activity in them.

Higher capital costs for trading OTC products (particularly FX spot) and firms' responses to regulatory change in recent years are likely to have impacted FX markets; contacts have suggested that there may have been a reduction in available liquidity. Processing FX trades has become heavily automated and more efficient, which can have the effect of reducing banks' need to warehouse risk for longer periods of time — particularly during traditional liquid trading periods (such as London trading hours). Banks are said to have reduced their risk appetite; that, together with increased volatility in FX spot markets (such as recent 'flash' events), may have led them to be more cautious in providing liquidity. Non-banks, including PTFs, who have been less affected by regulatory capital requirements have the ability to fill these liquidity gaps. Furthermore, there are high costs associated with maintaining the necessary technological infrastructure and speed where non-banks may have an advantage due to their relative size and specialism. Most contacts expect this trend to continue and to signal a long-term change in the industry.

Conclusion

Overall global FX turnover has steadied during the past three years following exponential growth in the past decade and a half, and remains close to 2013 record highs. The headline figure for global FX spot turnover has fallen by around a fifth in the past three years, driven by a fall in OFI activity particularly among hedge funds, while FX swap turnover has offset some of this decline as institutional investors increased their swapping activity. PB turnover growth has stabilised, replicating the moves in both spot and swap activity.

Other trends have extended further: concentration continues to rise, and liquidity seemingly continues to decline and fragment across venues. FX market activity remains concentrated in the largest centres, with the United Kingdom maintaining its position as the global hub for trading FX. The decline in the United Kingdom's total market share is consistent with the decline in spot turnover and hedge fund activity, which have traditionally been based in London.

(1) With no definitive method for measuring internalisation rates, and a limited number of responses from reporting, the data were somewhat limited.

Annex 1

Market concentration and conditions

Market concentration

The UK FX market concentration has increased slightly since April 2013. The combined market share of the ten institutions with highest turnover increased from 76% to 77%, while the share of the top 20 institutions increased slightly from 94% in April 2013 to 95% in April 2016. **Table 1A** shows how concentration varied by instrument. Four institutions appear in the top ten for all five instruments.

Table 1A UK FX turnover — market concentration

Per cent share	Instrument					Total
	Spot	Forwards	FX swaps	Currency swaps	Options	
Top 5 institutions	69	54	43	71	68	52
Top 10 institutions	87	77	70	93	91	77
Top 20 institutions	98	96	93	100	100	95

Market conditions

Participants were asked whether they regarded the level of turnover in April 2016 as normal. The responses, summarised in **Table 1B**, suggest that the survey results can be regarded as representative of FX turnover at the time of the survey.

The aggregate responses (adjusted for double counting) for the 2016 questionnaire and previous years are shown in **Tables 3A** and **3B** (see Annex 3).⁽¹⁾ The BIS published a report on FX activity on 1 September 2016⁽²⁾ and further analysis of the global survey results in its December *Quarterly Review*.⁽³⁾

Table 1B UK survey participants' estimates for FX turnover levels

	Number of reporters	Percentage of turnover ^(a)
In April 2016		
Below normal	10	20
Normal	32	79
Above normal	1	1
In preceding six months		
Decreasing	5	10
Steady	32	84
Increasing	6	6

(a) Percentages may not sum to 100% due to rounding.

A survey of global outstanding positions in the derivatives market (measured at the end of June 2016) was also undertaken, and global results for this survey were published in November.⁽⁴⁾

(1) A full breakdown of aggregate responses for the 2016 questionnaire can be found at www.bankofengland.co.uk/statistics/Documents/bis-survey/breakdown2016.xls.

(2) There have been revisions to global figures since publication of the BIS report on 1 September 2016. As a result there will be some discrepancies between the figures published in this article and those within the BIS report.

(3) The report on FX activity can be found on the BIS website; www.bis.org/publ/qtrpdf/r_qt1612.htm.

(4) Results on the BIS amounts outstanding global survey can be found on the BIS website; www.bis.org/publ/rpfx16.htm.

Annex 2 BIS triennial survey definitional issues

Participants

Forty-three institutions, mainly commercial and investment banks, participated in the UK survey. Others active in the UK market were not directly involved in the survey, but their transactions with participating principals will have been recorded by those institutions.

The questionnaire

Survey participants completed a questionnaire prepared by the Bank of England, based on a standard format agreed with other central banks and the Bank for International Settlements (BIS). Participants were asked to provide details of their gross turnover for the 21 business days in April 2016. Gross turnover (measured in notional values) is defined as the absolute total value of all deals contracted; there was no netting of purchases against sales. Data were requested in terms of US dollar equivalents, rounded to the nearest million. The basis of reporting was the location of the sales desk of the trade. The questionnaire asked for data broken down by currency, instrument and type of counterparty.

The survey distinguished the following types of transaction:

Foreign exchange

- *Spot transaction*: single outright transaction involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) usually within two business days. The spot legs of FX swaps and FX swaps that were for settlement within two days (ie 'tomorrow/next day' swap transactions) were excluded from this category.
- *Outright forward*: transaction 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). Also included in this category were forward FX agreement transactions, non-deliverable forwards, and other forward contracts for difference.
- *FX swap*: simultaneous transaction that involves the exchange of two currencies, first the near leg and then, subsequently, a reverse transaction at a forward date, the far leg. Short-term swaps carried out as overnight and 'tomorrow/next day' transactions are included in this category.
- *Currency swap*: contract which commits two counterparties to exchange streams of interest payments in different currencies for an agreed period of time, and to exchange principal amounts in different currencies at a pre-agreed exchange rate at maturity.

- *Currency option*: option contract that gives the right to buy or sell a currency against another currency at a specified exchange rate during a specified period. This category includes currency swaptions, currency warrants and exotic FX options such as average rate options and barrier options.

Single-currency OTC interest rate derivatives

- *Forward rate agreement (FRA)*: interest rate forward contract in which the rate to be paid or received on a specific obligation for a set period of time, beginning at some time in the future, is determined at contract initiation.
- *Interest rate swap*: agreement to exchange periodic payments related to interest rates on a single currency. Can be fixed for floating, or floating for floating based on different indices. This category includes those swaps whose notional principal is amortised according to a fixed schedule independent of interest rates.
- *Interest rate option*: option contract that gives the right to pay or receive a specific interest rate on a predetermined principal for a set period of time. Included in this category are interest rate caps, floors, collars, corridors, swaptions and warrants.

Reporting institutions were asked to distinguish between transactions with:

- *Reporting dealers*: financial institutions that are participating in the globally co-ordinated survey. These institutions actively participate in local and global FX and derivatives markets.
- *Other financial institutions*: financial institutions that are not classified as reporting dealers. This category includes:
 - *Non-reporting banks* — covers smaller banks and securities houses, not directly participating as a reporting dealer.
 - *Institutional investors* — includes mutual funds, pension funds, insurance companies and endowments.
 - *Hedge funds and proprietary trading firms* — covers investment funds, money managers and proprietary trading firms that invest, hedge or speculate on their own account.
 - *Official sector financial institutions* — comprises central banks, sovereign wealth funds, international financial institutions of the public sector, development banks and agencies.
 - *Other* — all remaining financial institutions that cannot be classified to any of the above categories.

- *Non-financial customers*: covers any counterparty other than those described above, ie mainly non-financial end-users, such as businesses and governments.

In each case reporters were asked to separate local and cross-border transactions (determined according to the location, rather than the nationality of the counterparty) to permit adjustment for double counting.

Annex 3

Table 3A FX market turnover by instrument, counterparty and maturity^(a)

Daily averages in April, in US\$ billions and percentages

Instrument/counterparty	2007		2010		2013		2016	
	Amount	Per cent	Amount	Per cent	Amount	Per cent	Amount	Per cent
Spot	335	23	697	38	1,032	38	784	33
with reporting dealers	158	11	293	16	385	14	341	14
with other financial institutions	135	9	344	19	614	23	423	18
with non-financial customers	43	3	60	3	32	1	20	1
Outright forwards	124	8	228	12	309	11	266	11
with reporting dealers	37	2	63	3	114	4	119	5
with other financial institutions	62	4	124	7	173	6	134	6
with non-financial customers	26	2	40	2	21	1	13	1
Foreign exchange swaps	899	61	775	42	1,127	41	1,161	48
with reporting dealers	419	28	399	22	574	21	709	29
with other financial institutions	375	25	309	17	503	18	409	17
with non-financial customers	105	7	67	4	50	2	43	2
Currency swaps	18	1	18	1	32	1	53	2
with reporting dealers	9	1	7	0	21	1	30	1
with other financial institutions	6	0	11	1	10	0	22	1
with non-financial customers	2	0	1	0	1	0	1	0
Options and other instruments^(b)	106	7	135	7	227	8	142	6
with reporting dealers	39	3	47	3	76	3	51	2
with other financial institutions	44	3	79	4	141	5	88	4
with non-financial customers	23	2	10	1	9	0	3	0
Total	1,483	100	1,854	100	2,726	100	2,406	100
with reporting dealers	663	45	809	44	1,170	43	1,250	52
with other financial institutions	622	42	866	47	1,442	53	1,076	45
with non-financial customers	199	13	178	10	113	4	81	3
Local	465	31	547	29	1,095	40	758	31
Cross-border	1,019	69	1,307	71	1,631	60	1,648	69
Outright forwards^(c)	126	100	241	100	329	100	307	100
Up to seven days	61	49	144	60	167	51	120	39
Over seven days and up to one year	62	49	94	39	138	42	178	58
Over one year	3	2	3	1	24	7	9	3
Foreign exchange swaps^(c)	966	100	873	100	1,318	100	1,355	100
Up to seven days	792	82	653	75	932	71	941	69
Over seven days and up to one year	167	17	215	25	302	23	402	30
Over one year	7	1	6	1	84	6	12	1

(a) Adjusted for local double counting.

(b) The category 'other instruments' 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.

(c) Data for maturity breakdown cannot be adjusted for local reporting dealers, so maturity values will not be equal to product totals.

Table 3B OTC interest rate derivatives turnover by instrument and counterparty^(a)

Daily averages in April, in US\$ billions and percentages

Instrument/counterparty	2007		2010		2013		2016	
	Amount	Per cent	Amount	Per cent	Amount	Per cent	Amount	Per cent
Forward rate agreements	154	16	382	31	473	35	375	32
with reporting dealers	100	10	233	19	203	15	169	14
with other financial institutions	36	4	125	10	263	20	204	17
with non-financial customers	18	2	25	2	7	1	2	0
Swaps	710	74	739	60	796	59	757	64
with reporting dealers	329	34	377	31	314	23	338	29
with other financial institutions	347	36	268	22	431	32	399	34
with non-financial customers	34	4	93	8	50	4	20	2
Options and other instruments^(b)	93	10	114	9	80	6	48	4
with reporting dealers	52	5	57	5	36	3	16	1
with other financial institutions	33	3	47	4	40	3	31	3
with non-financial customers	7	1	10	1	4	0	1	0
Total	957	100	1,235	100	1,348	100	1,181	100
with reporting dealers	481	50	668	54	552	41	523	44
with other financial institutions	417	44	440	36	734	54	635	54
with non-financial customers	59	6	127	10	61	5	23	2
Local	242	25	427	35	731	54	497	42
Cross-border	715	75	808	65	617	46	684	58

(a) Adjusted for local double counting. Single-currency interest rate contracts only.

(b) The category 'other instruments' 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.

Reference

Lowes, J and Nenova, T (2013), 'The foreign exchange and over-the-counter interest rate derivatives market in the United Kingdom', *Bank of England Quarterly Bulletin*, Vol. 53, No. 4, pages 394–404, available at www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2013/qb130410.pdf.