The Foreign Exchange and Interest Rate Derivatives Markets:

Turnover in the United States, April 2016

Federal Reserve Bank of New York

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Background

The Federal Reserve Bank of New York together with over fifty other central banks conducted a survey of turnover in the over-the-counter (OTC) foreign exchange and interest rate derivatives markets for April 2016. This worldwide, cooperative effort is undertaken every three years and is coordinated by the Bank for International Settlements (BIS).

The "triennial survey" is a comprehensive source of information on the size and structure of the OTC foreign exchange and derivatives markets. To measure the OTC markets, the dealers that make markets in foreign exchange and interest rate derivatives reported trading volumes for April 2016 to the central banks in the countries where they are located. The participants reported separately the volume of trading they conduct with each other to permit adjustments for double reporting. The central banks then compiled national aggregates from the dealers' data and the BIS compiled global totals from the central banks' national data.[1] (See Annex I for a complete description of survey terms and methods.)

In 2016, a total of twenty-three dealers in the United States participated in the foreign exchange part of the survey and nineteen in the interest rate derivatives section, slightly changed from 2013, which had twenty-four and eighteen participating institutions respectively. Participating dealers were commercial banks, U.S. offices of foreign banking organizations, and securities brokers/dealers. These firms were U.S.-owned institutions as well as foreign-owned institutions with dealing operations in the United States. (See Annex II for a list of participating dealers.)

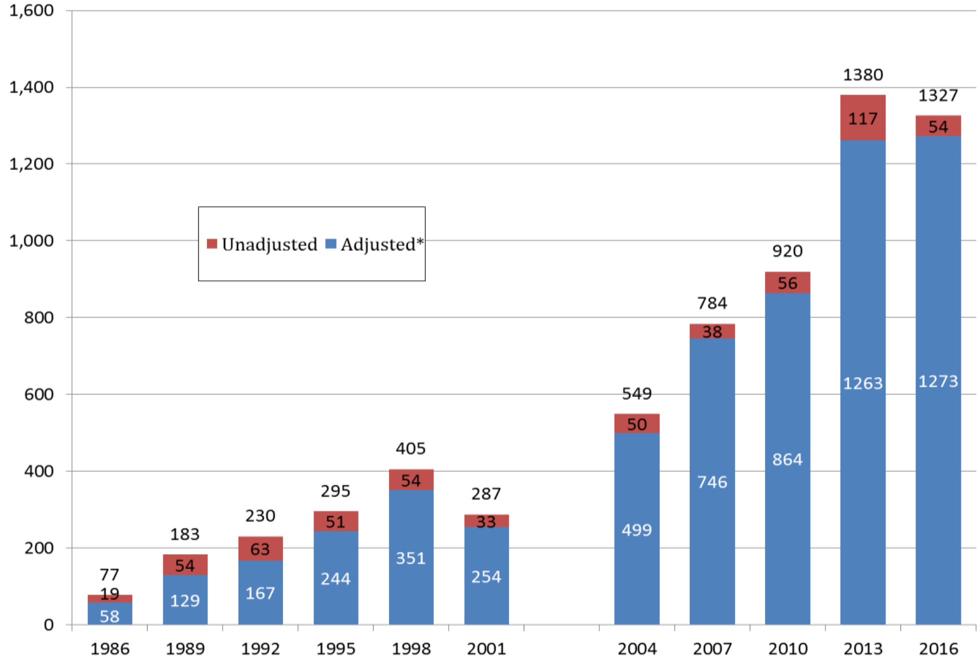
This report discusses turnover in foreign exchange (FX) spot, forwards, FX swaps, FX options, as well as currency swaps as the foreign exchange part of the survey. Trading in forward rate agreements (FRAs), interest rate swaps, and interest rate options are then discussed together as the single-currency interest rate derivatives part of the survey.

After adjusting for double reporting of trades between participating dealers, daily foreign exchange turnover in the United States (spot, forwards, FX swaps, currency swaps, and FX options) averaged $1,273 billion in April 2016, an increase of less than one percent from the 2013 survey. (See Chart 1)

[1] Visit www.bis.org/publ/rpfx16.htm for the BIS report on global turnover and www.newyorkfed.org/markets/foreignex.html for US turnover.

Chart 1 Daily U.S. Foreign Exchange Turnover

In $ billions equivalent



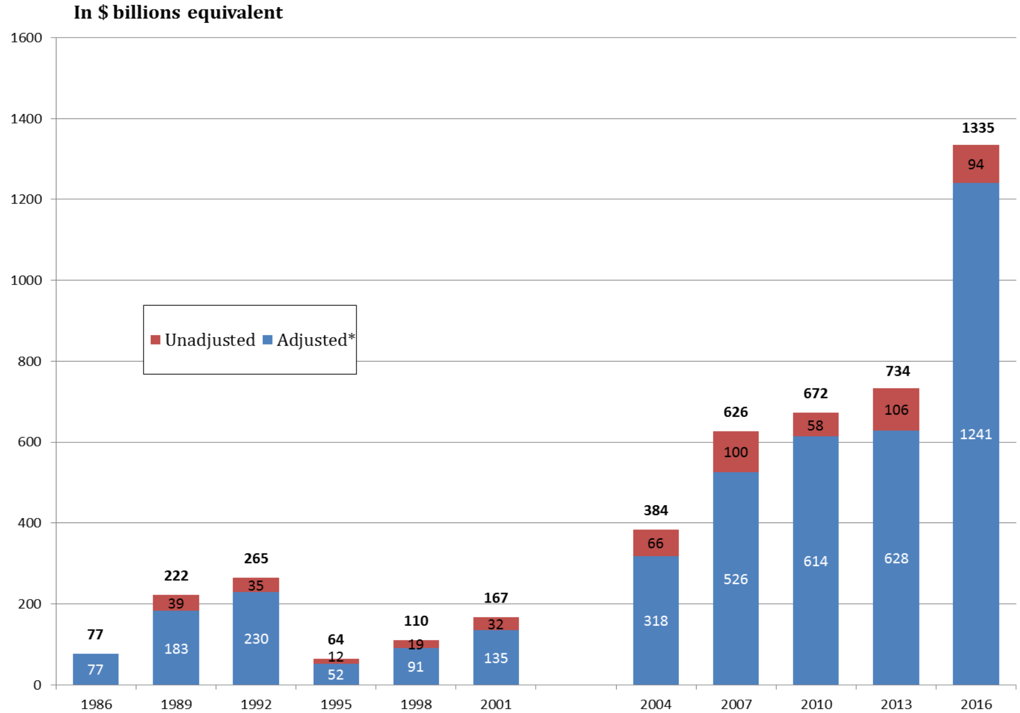
1986 to 2001 Includes currency swaps, currency options, FRA's, interest rate swaps and options.
2004 to 2016 Includes FRA's, interest rate swaps and options.
* Adjusted for double reporting by participating dealers

Instruments

Daily turnover for the other derivatives markets covered by the survey (FRAs, interest rate swaps, interest rate options, and other interest rate derivative products) averaged $1,241 billion, an increase of 98 percent.

Chart 2 Daily U.S. Interest Rate Derivatives Turnover

In $ billions equivalent



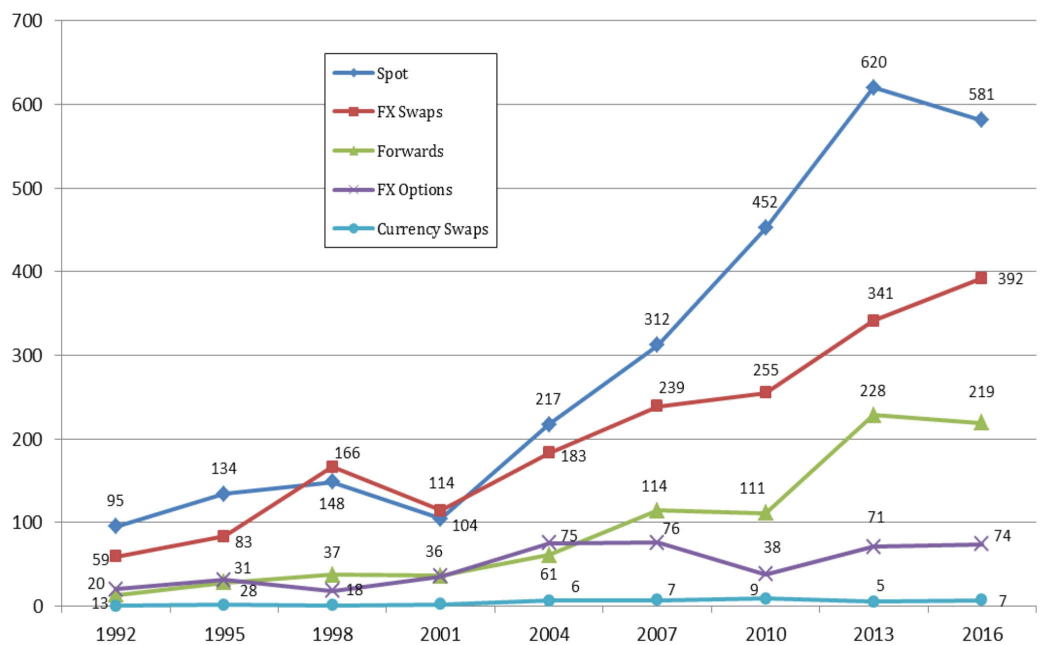
1986 to 2001 Includes currency swaps, currency options, FRA's, interest rate swaps and options.
2004 to 2016 Includes FRA's, interest rate swaps and options.
* Adjusted for double reporting by participating dealers

Total daily foreign exchange turnover during April 2016 in the United States was \$1,273 billion,[2] ending a series of steady increases reported in the past several surveys.

The U.S. Foreign Exchange Market

Decreases in turnover in spot and outright forwards were partially offset by increases in FX swaps and FX options. Spot turnover decreased six percent while outright forwards decreased four percent. FX swaps increased 15 percent and FX options increased four percent. Turnover in currency swaps increased 40 percent from the 2013 survey but this may have been at least partially attributable to increased participation rates by respondents in this category. Currency swaps make up less than one percent of total foreign exchange turnover. (See Chart 3)

Chart 3 Daily Foreign Exchange Turnover by Instrument
In \$ billions equivalent



- Spot trading represented 46 percent of total foreign exchange turnover, down from 49 percent in 2013.

- FX swaps trading represented 31 percent of turnover, up from 27 percent in the prior survey.

- Outright forward transactions decreased slightly to 17 percent of turnover, from 18 percent in the 2013 survey. Participating firms reported \$42 billion turnover in non-deliverable forward contracts or 19 percent of the total volume in forwards.

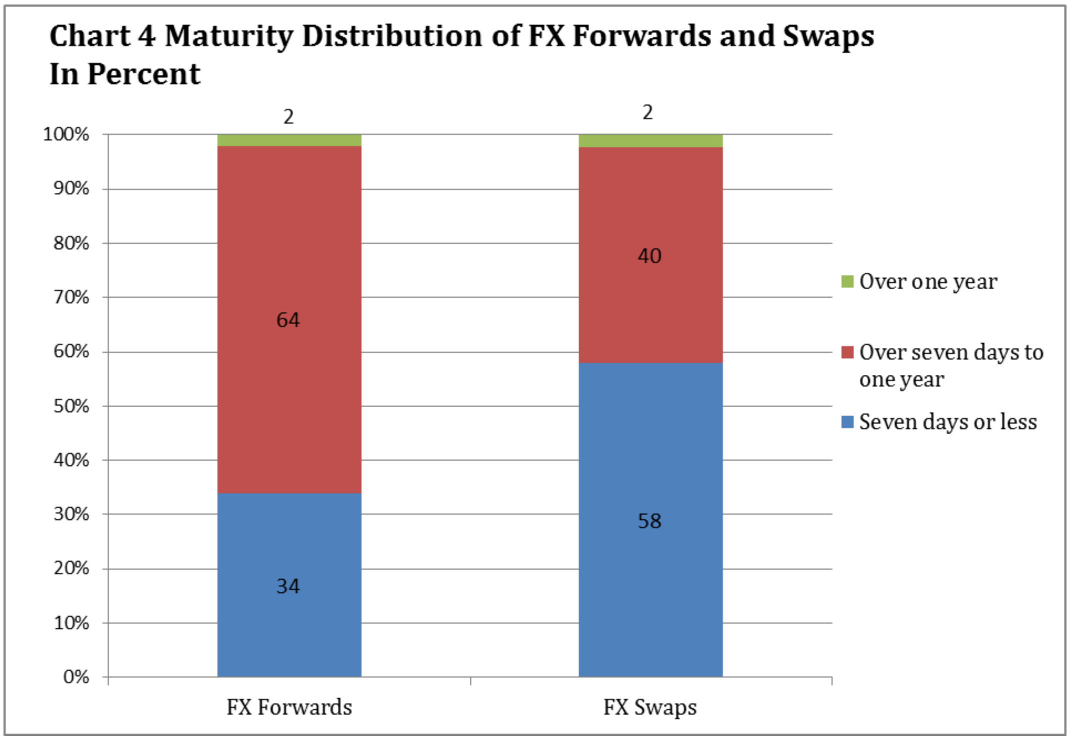
[2] This total is adjusted for the double reporting of transactions between participating dealers in the U.S.

- <u>FX options</u> trading held 6 percent of total foreign exchange turnover, unchanged from 2013.

<u>Average Maturity</u> FX swaps and forwards were reported by original term to maturity, with three categories of maturity buckets (seven days or less, over seven days and up to one year, and over one year).

- Nearly 98 percent of the outright forward transactions were reported in the one-year-or-less maturity buckets. The majority of reported outright forward transactions, 64 percent, had an original maturity of more than seven days but no more than one year. (See Chart 4)

- More than 97 percent of the FX swaps reported in the survey were arranged with a maturity of less than one year. The majority of foreign exchange swaps, 58 percent, were reported within the seven-days-or-less maturity bucket. (See Chart 4)



<u>Currencies</u>

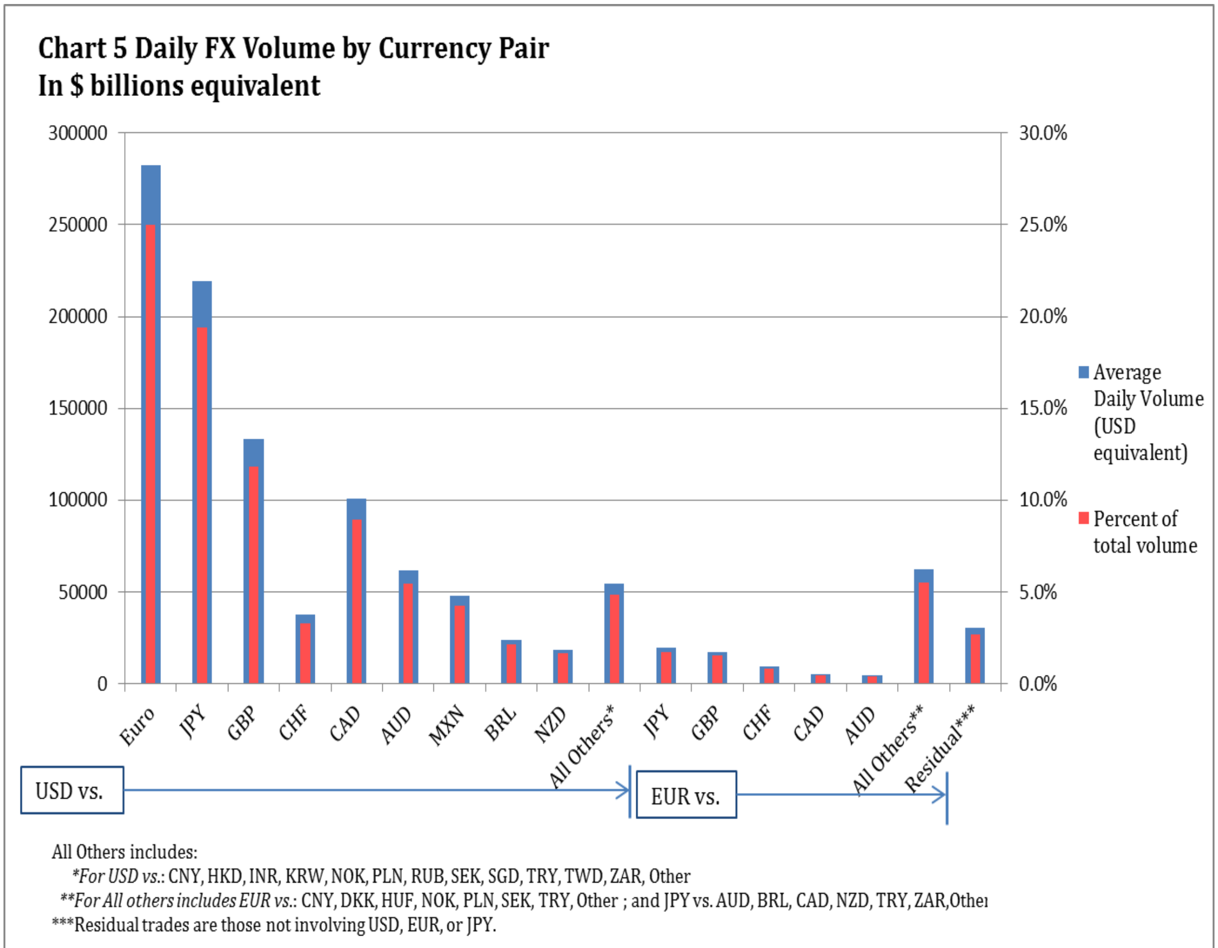
- The U.S. dollar was traded in 87 percent of all transactions, down from 89 percent in the last survey.

- The euro was the second most actively traded currency and was on one side of 31 percent of all trades in the U.S. market, unchanged from 31 percent in April 2013.

- The dollar/euro pair accounted for the largest share of U.S. market turnover at 26 percent, up slightly from 24 percent in April 2013.

- The dollar/yen currency pair accounted for 19 percent of U.S. market turnover, unchanged from 2013. (See Chart 5)

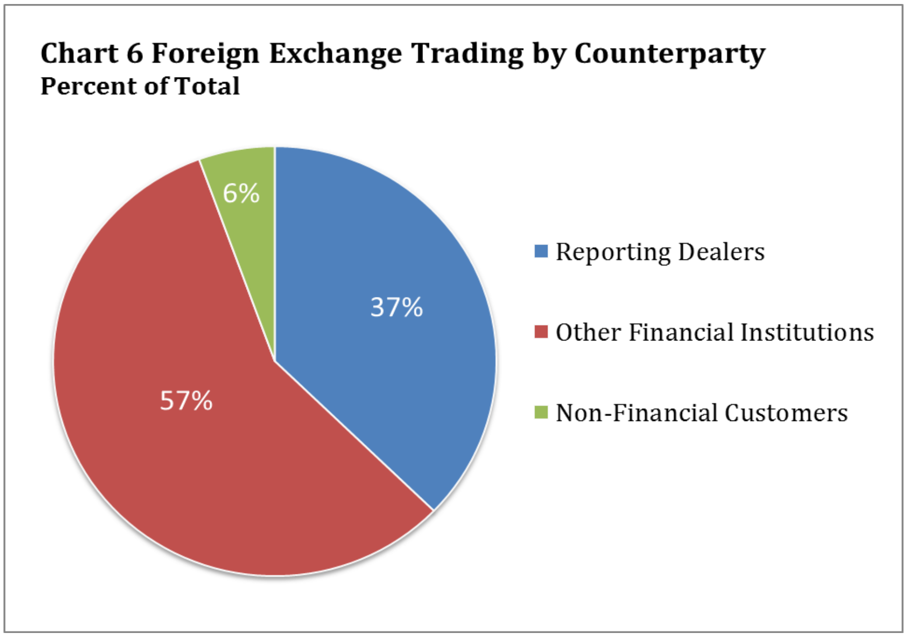
- British pound trading was 13.3 percent of U.S. market turnover and the fourth most actively traded currency. (See Chart 5)



Market Structure

Participating dealers also reported their trading activity according to type and location of counterparties.

- Counterparty Type: Over half of all reported trades were undertaken with other financial institutions at 57 percent, while 37 percent were conducted with other reporting dealers and the remaining 6 percent were with non-financial customers. (See Chart 6)



- Counterparty Location: Highlighting the international nature of foreign exchange trading, 73 percent of FX turnover was conducted with market participants outside the United States, compared to 61 percent in 2013.

Execution Method

Survey participants were also asked to categorize reported FX turnover during April 2016 by four basic categories of execution method.

- Voice-Direct
- Voice-Indirect
- Electronic-Direct
- Electronic-Indirect

To continue to capture turnover on different types of electronic platforms, the latter two categories are further broken down into additional sub-categories; single-bank proprietary trading systems, other direct electronic means, Reuters Matching/EBS, Dark Pools, and Other electronic communications networks (ECNs).

For spot turnover, 68 percent was conducted via electronic methods (51 percent via electronic-direct and 17 percent via electronic-indirect methods). Voice-direct accounted for 29 percent of reported turnover.

For FX swaps turnover, 49 percent was conducted via electronic methods (30 percent via electronic-direct and 19 percent via electronic-indirect methods). Voice methods accounted for 50 percent of FX swaps turnover.

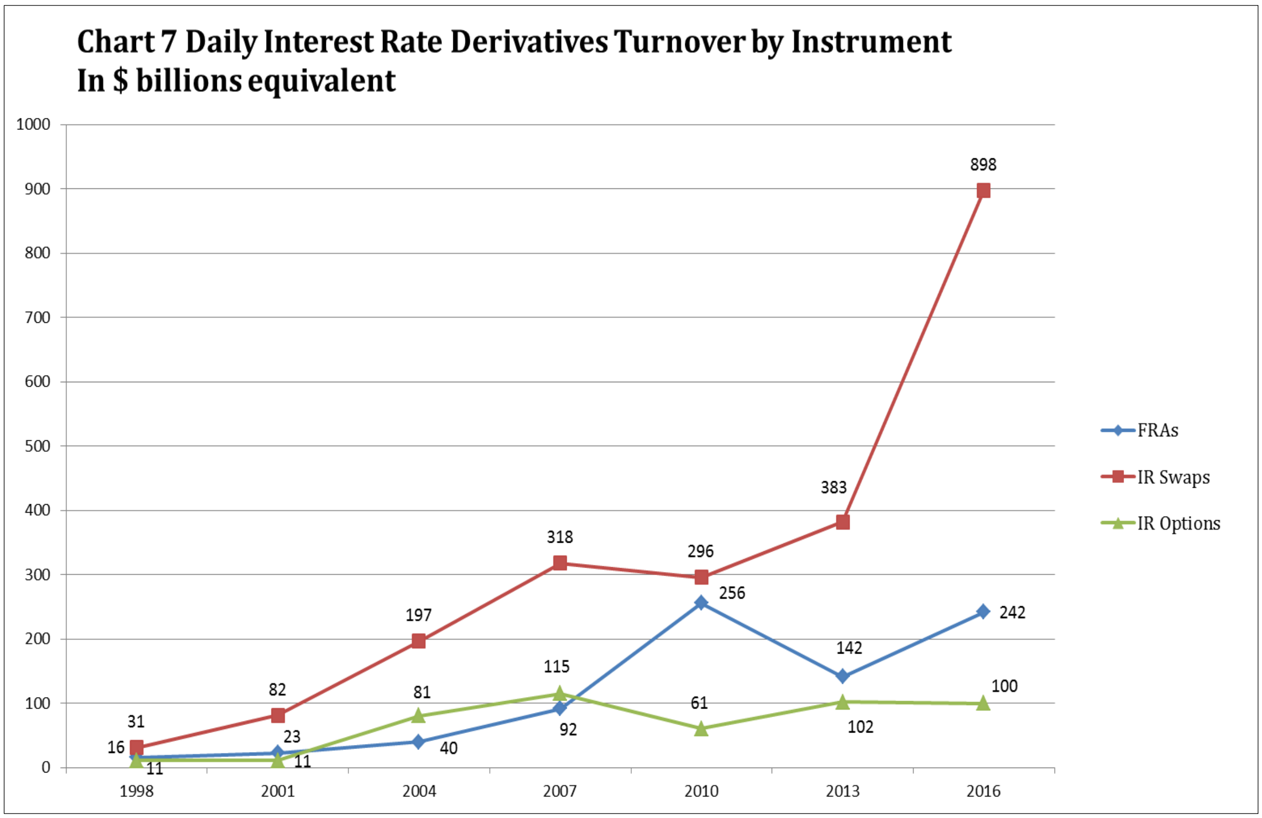
Execution of forwards turnover was 63 percent electronic (electronic-direct was 45 percent and electronic-indirect was 18 percent). Voice execution accounted for 36 percent of forwards activity.

Single Currency Interest Rate Derivatives Markets

Daily turnover in single-currency interest rate derivatives markets increased significantly since the prior survey. Turnover in these instruments, including forward rate agreements (FRAs), interest rate swaps, and interest rate options averaged $1,241 billion per day in the United States during April 2016. (See Chart 2)

- Daily turnover for interest rate swaps was $898 billion, an increase of 134 percent since the last survey. (See Chart 7)

- Turnover in FRAs increased by 71 percent to $242 billion per day, up $100 billion since the 2013 survey while remaining the second most active trading instrument among these contracts. Turnover in interest rate options decreased to $100 billion per day from $102 billion three years ago.



U.S.-dollar-denominated contracts accounted for 94 percent of the month's turnover in these instruments, compared with 87 percent in 2013.

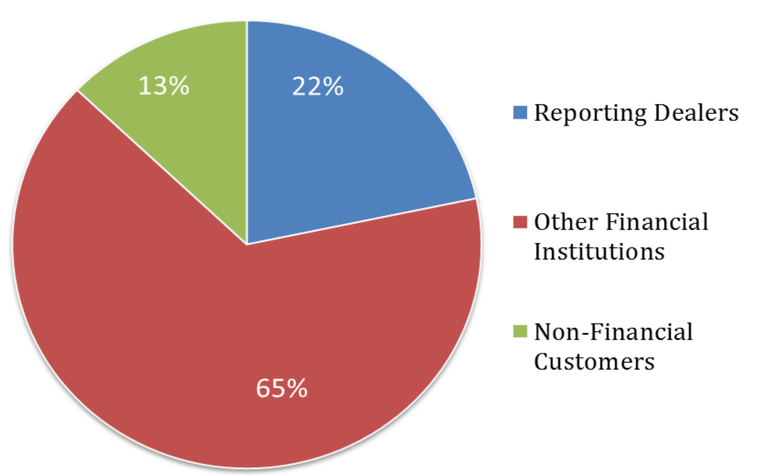
- U.S. dollar contracts represented 92 percent of single-currency interest rate swaps, up from 83 percent in 2013. Trading in the Euro, Canadian dollar, and Mexican peso combined for four percent of the total.

There was variability across the three instruments in terms of location and type of counterparty.

- Counterparty location: For all contracts, 76 percent of trading during April was conducted with market participation outside the United States. Among instruments, this percentage varied between 54 percent for interest rate options, 76 percent for interest rate swaps, and 85 percent for FRAs

- Counterparty type: In contrast to the 2013 survey which showed a balance of activity with reporting dealers and other financial institutions; in 2016 nearly two-thirds of all reported trades were undertaken with other financial institutions, with reporting dealers making up 22 percent. Non-financial customers made up the remaining 13 percent. (See Chart 8)

Chart 8 Single Currency Interest Rate Derivative Trading by Counterparty



Additional Information: Recent Trend in Turnover

Since the survey only covers one month every three years, dealers are also asked about the trading patterns and trends of their business. Their responses help to assess whether the survey month's turnover should be considered normal and whether turnover had been increasing or decreasing over the previous six months.

- Most dealers considered turnover during the month as normal, though some indicated that activity was above normal.

- Nearly all dealers viewed their business as steady over the prior six months.

ANNEX I

Survey Terms and Methods

1. Turnover

a) *Turnover* is the volume of transactions during April 2016 in U.S. dollar equivalents. The amount of each transaction is reported before the effects of any netting arrangements. In the case of swap transactions, only one leg is reported.

b) The survey covered three types of counterparties:

1) *reporting dealers* participating in the survey,
2) *other financial institutions*, and
3) *non-financial customers*.

Each type of counterparty was further identified as either *local* or *cross-border,* resulting in a total of six categories for counterparties.

Other financial institutions for FX turnover only is further broken down into six sub-categories: *non-reporting banks*, *institutional investors*, *hedge funds and proprietary trading firms*, *official sector financial institutions*, *others*, and *undistributed*.

c) *Market totals.* Transactions between two participating dealers were reported twice, once by each dealer. Survey figures for market totals are therefore adjusted to avoid double reporting of such trades. *Adjusted* figures are market totals after adjusting for double reporting by participating dealers. *Unadjusted* figures are gross totals without adjusting for double reporting. The data in this report are adjusted figures unless otherwise noted.

- Since transactions between *local reporting dealers* were reported twice, the total of local dealer transactions is divided by two for the *adjusted total.*

d) *Average daily turnover* was obtained by dividing total volume by twenty-one trading days in April 2016.

e) Turnover for *non-U.S.-dollar transactions* was reported in U.S. dollar equivalents using exchange rates at the time of the transactions.

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2. Location

Trade versus book location. Transactions were reported on the basis of the location of the dealer agreeing to conduct the transaction. For example, a dealer in New York might engage in a trade that is booked at a London affiliate. In this case, the trade location is New York and the book location is London. This transaction would be included in the turnover figures in the U.S. survey. If a trader in London entered into a trade but the trader's firm booked the trade in its New York affiliate, the transaction would be included in the institution's survey report to the Bank of England.

3. Participating firms

A total of twenty-three dealers participated in the foreign exchange part of the survey (see Annex II). Twenty-four dealers participated in this part of the survey in 2010 and 2007. For the single currency interest rate derivatives part of the survey a total of nineteen dealers participated, compared with eighteen in 2013, and nineteen in 2010. The dealers included U.S. institutions as well as foreign institutions with dealing operations in the United States. Participation is voluntary.

Dealers were asked to participate based on several criteria, including participation in the last BIS triennial survey or in the Foreign Exchange Committee's semi-annual survey; the firm's outstanding contracts reported in bank call reports; or, in the case of non-banks, outstanding contracts reported in published financial statements.

4. Instrument definitions

In each risk category, OTC derivatives were broken down into three types of plain-vanilla instruments (forwards, swaps, and options). Plain-vanilla instruments are those traded in generally liquid markets using standardized contracts and market conventions. If a transaction comprised several plain-vanilla components, dealers were asked to report each one separately. Foreign exchange spot and OTC derivatives transactions should be defined as follows:

<u>Spot transaction</u>
Single outright transaction involving the exchange of two currencies at a rate agreed upon on the date of the contract for value or delivery (cash settlement) within two business days. The spot legs of swaps do not belong to spot transactions but are to be reported as swap transactions even when they are for settlement within two days (that is, spot transactions should exclude "tomorrow/next-day" transactions).

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Outright forward
Transaction involving the exchange of two currencies at a rate agreed upon 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, non-deliverable forwards, and other forward contracts for differences.

Foreign exchange swap
Transaction involving the actual exchange of two currencies (principal amount only) on a specific date at a rate agreed upon 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 upon at the time of the contract (the long leg). Both spot/forward and forward/forward swaps should be included. For *turnover*, only the forward leg should be reported as such. The spot leg should not be reported at all, that is, neither as spot nor as foreign exchange swap transactions. Short-term swaps carried out as "tomorrow/next-day" transactions should also be included in this category.

Currency swap
Contract that commits two counterparties to exchange streams of interest payments in different currencies for an agreed-upon period of time and to exchange principal amounts in different currencies at an agreed-upon exchange rate at maturity.

Currency option
Option contract that gives 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.

Currency swaption
OTC option to enter into a currency swap contract.

Currency warrant
OTC option; long-dated (over one year) currency option.

Forward rate agreement
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 group includes those swaps whose notional principal is amortized according to a fixed schedule independent of interest rates.

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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.

Interest rate cap
OTC option that pays the difference between a floating interest rate and the cap rate.

Interest rate floor
OTC option that pays the difference between the floor rate and a floating interest rate.

Interest rate collar
Combination of cap and floor.

Interest rate corridor
1) A combination of two caps, one purchased by a borrower at a set strike and the other sold by the borrower at a higher strike to, in effect, offset part of the premium of the first cap. 2) A collar on a swap created with two swaptions – the structure and participation interval is determined by the strikes and types of swaptions. 3) A digital knockout option with two barriers bracketing the current level of a long-term interest rate.

Interest rate swaption
OTC option to enter into an interest rate swap contract, purchasing the right to pay or receive a certain fixed rate.

Interest rate warrant
OTC option; long-dated (over one year) interest rate option.

Forward contracts for differences (including non-deliverable forwards)
Contracts in which only the difference between the contracted forward outright rate and the prevailing spot rate is settled at maturity.

Annex II

Turnover Survey Participants: Foreign Exchange Dealers

Bank of America
Bank of Montreal
The Bank of New York
Bank of Tokyo-Mitsubishi
Barclays Capital
BNP Paribas
Citigroup
Crédit Agricole Corporate and Investment Bank
Credit Suisse
Deutsche Bank AG
Goldman Sachs & Co.
HSBC Bank USA
JP Morgan Chase Bank
Mizuho Corporate Bank
Morgan Stanley
Royal Bank of Scotland
Skandinaviska Enskilda Bank
Société Générale
Standard Chartered
State Street Corporation
Sumitomo Mitsui Banking Corporation
UBS Bank
Wells Fargo Bank N.A.

Annex III

Turnover Survey Participants: Interest Rate Derivatives Dealers

Bank of Montreal
The Bank of New York
Bank of Tokyo-Mitsubishi
Barclays Capital
BNP Paribas
Crédit Agricole Corporate and Investment Bank
Citigroup
Credit Suisse
Deutsche Bank AG
Goldman Sachs & Co.
HSBC Bank USA
JP Morgan Chase Bank
Mizuho Corporate Bank
Morgan Stanley
Royal Bank of Scotland
Société Générale
Sumitomo Mitsui Banking Corporation
UBS Bank
Wells Fargo Bank N.A.