

# Development of derivatives statistics: challenges for the Bank of Japan

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## 1. Introduction

Since the activities of the Bank of Japan have been diversified, different departments have engaged in the development of derivatives statistics at the Bank. Specifically, the following departments have played key roles: Financial Markets, Financial System and Bank Examination, International, and Research and Statistics.

The directions in the development of derivatives statistics have varied. The Financial Markets and Financial System and Bank Examination departments have been interested in derivatives data on a consolidated basis for monitoring the financial market and financial institutions. The International and Research and Statistics departments have focused on derivatives data on a residency basis for the compilation of sectoral accounts statistics.

The Financial Markets Department has compiled BIS derivatives statistics semiannually and every three years for market monitoring and macroprudential purposes. The department has strengthened the data for credit default swaps (CDS).

The Financial System and Bank Examination Department collects derivatives data as a way of monitoring the financial system and individual banks. For microprudential purposes, it collects data on exposures of derivatives transactions by major counterparties.

The International Department compiles settlements data of financial derivatives for the balance of payments statistics (BOP) and their market value data for the annual International Investment Position (IIP). These statistics represent flows and positions of resident entities vis-à-vis nonresidents and classify residents into public, banks, and other sectors.

The Research and Statistics Department compiles flow, stock, and revaluation data of financial derivatives for the flow of funds accounts (FFA). In the FFA, residents are classified into financial institutions, nonfinancial corporations, general government, households, and nonprofit institutions serving household sectors. Nonresidents are represented as the overseas sector.

## 2. Regular Derivatives Market Statistics in Japan

The Regular Derivatives Market Statistics consist of data on consolidated outstanding derivatives positions, measured in notional amounts as well as on gross positive and negative market values, compiled based on data from reporting institutions.

### 2-A. History of statistics development

The central banks of the Group of Ten countries<sup>2</sup> and the Bank for International Settlements (BIS) worked together to introduce a new statistical survey on the global derivatives markets

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<sup>1</sup> The views expressed herein are those of the author, and should not be attributed to the Bank of Japan.

based on the *Proposals for Improving Global Derivatives Market Statistics* (Yoshikuni Report) published by the BIS in July 1996.

The BIS has implemented the survey on the global derivatives markets through two reporting frameworks: (1) the Regular Derivatives Market Statistics, a set of semiannual derivatives statistics on the amounts outstanding of derivatives transactions covering only major dealers, first conducted at the end of June 1998, and (2) the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, a survey on the amounts of foreign exchange and derivatives turnover and outstanding, which covers a wider range of dealers.

For the Regular Derivatives Market Statistics, 59 financial institutions worldwide take part voluntarily and report semiannually their derivatives positions to the central banks of their respective countries. Of those, 18 institutions<sup>3</sup> are based in Japan and report to the Bank of Japan.

The Regular Derivatives Market Statistics show the breakdown of the aggregated derivatives positions classified into four risk categories: foreign exchange, interest rates, equity prices, and commodity prices (on a U.S. dollar basis). With regard to each of these risk categories, the statistics give further details by type of instrument, currency, counterparty, and maturity. Since the release of the end-December 2004 statistics, a breakdown of credit default swaps has been included. In addition, the Bank of Japan has been making public data on credit derivatives based on data from reporting institutions in Japan since the release of the end-June 1999 statistics.

The Financial Markets Department has cooperated with the BIS and other central banks on developing further the Regular Derivatives Market Statistics. Specifically, it strengthened CDS data in June 2010 by creating an item for index CDS. It is considering adding the central counterparty sector in addition to the current sectors of reporting dealers, other financial institutions (banks and securities firms, insurance firms, SPVs, other), nonfinancial customers, trust accounts, and others.

## **2-B. Recent development of Japan's derivatives market**

According to the Regular Derivatives Market Statistics, the notional amounts outstanding of derivatives transactions by major Japanese financial institutions at end-June 2010 were equivalent to 38.0 trillion U.S. dollars for over-the-counter (OTC) contracts<sup>4</sup> and 3.8 trillion U.S. dollars for exchange-traded contracts, an increase of 10.4 percent and a decrease of 4.6 percent, respectively, from the previous survey as of end-December 2009.

A breakdown by risk category shows that the amount outstanding of single currency interest rate (IR) contracts was 33.1 trillion U.S. dollars for OTC contracts, representing an increase of 9.5 percent. That of foreign exchange (FX) contracts was 4.7 trillion U.S. dollars, an increase of 16.6 percent. Equity contracts increased by 19.1 percent to 180.5 billion U.S. dollars. Commodity contracts decreased by 0.1 percent to 39.1 billion U.S. dollars.

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<sup>2</sup> Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States.

<sup>3</sup> They are Aozora Bank, Ltd., The Bank of Tokyo-Mitsubishi UFJ, Ltd., The Chuo Mitsui Trust and Banking Co., Ltd., Daiwa Securities Capital Markets Co. Ltd., Japan Post Bank Co., Ltd., Mitsubishi UFJ Securities Co., Ltd., Mitsubishi UFJ Trust and Banking Corporation, Mizuho Bank, Ltd., Mizuho Corporate Bank, Ltd., Mizuho Securities.

<sup>4</sup> The figures of total OTC contracts do not include CDS and other credit derivatives.

A breakdown by instrument type shows that IR swaps continued to represent the largest share of OTC contracts, accounting for 72.8 percent. In terms of exchange-traded contracts, IR futures accounted for a dominant share of 81.4 percent.

From end-December 2009 to end-June 2010, the gross positive and negative market values of OTC derivatives contracts increased by 29.6 percent to 698.2 billion U.S. dollars, and by 29.3 percent to 653.8 billion U.S. dollars, respectively.

After taking account of bilateral netting agreements, the positive market value was 198.4 billion U.S. dollars (up 15.6 percent), and the negative market value was 154.0 billion U.S. dollars (up 11.4 percent). The ratio of the net positive market value to the notional amount outstanding was 0.5 percent.

With regard to IR contracts of OTC derivatives, the U.S. dollar and the Japanese yen taken together continue to be dominant, with a market share of 79.2 percent of notional amounts, as compared with 79.6 percent at end-December 2009. The Japanese yen accounted for 56.9 percent, decreasing from 58.8 percent at end-December 2009. As for FX contracts of OTC derivatives, the U.S. dollar and the Japanese yen taken together accounted for 81.9, decreasing from 83.9, percent.

Transactions between reporting dealers<sup>5</sup> accounted for 79.9 percent and 64.2 percent of notional amounts outstanding in OTC IR and FX contracts, respectively.

Among OTC contracts, IR derivatives with remaining maturities of over one year and up to five years continued to occupy the largest share, at 45.5 percent. With respect to FX derivatives, contracts with remaining maturities of over one year and up to five years continued to be dominant, accounting for 47.3 percent.

The notional amount outstanding of CDS was 1,110.4 billion U.S. dollars. By counterparty, transactions between reporting dealers continued to be dominant, accounting for 89.0 percent of CDS contracts. By remaining maturity, contracts with remaining maturities of over one year and up to five years were dominant at 64.9 percent, followed by those with remaining maturities of over five years, accounting for 25.0 percent of notional amounts outstanding.

### **3. Japan's BOP, IIP AND FFA**

Information on financial derivative flows and positions of domestic financial institutions and nonfinancial sectors is important for financial stability as well as sectoral analysis. Recently, some local governments such as municipalities, and some NPIs such as universities have suffered significant losses on financial derivatives. Source data for their derivatives positions are not yet fully available.

The central government's derivatives position became available and was incorporated into the FFA in 2010. Meanwhile, the BOP has recorded flow data for the public sector, and the IIP has recorded position data for the public sector. This typically represents the differences in the source data of the FFA, BOP, and IIP. Although these sectoral accounts have a common presentation framework – based on the 1993 System of National Accounts (SNA) – they complement one another other in practice due to the differences in the source data.

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<sup>5</sup> Transactions between major Japanese institutions and institutions that participated in the statistics released by the BIS.

### **3-A. BOP and IIP**

Japan's BOP currently represents financial derivatives transactions, covering realized profits or loss on options, futures and forward agreements, warrants, and currency swaps. Interest accruing on interest-rate swaps is also recorded under this component. Source data are based on reports on payments/receipts, and on reports concerning derivatives transactions and securities transactions. Japan's IIP represents financial derivatives positions (market value), except for swaps. Interest-rate swaps were classified as property income rather than financial instruments under the original version of the 1993 SNA, which was then revised so that interest-rate swaps could be treated as financial instruments.

The sources of derivatives data in the BOP and IIP are based on reports on derivatives transactions from financial corporations as well as payments and receipts from nonfinancial corporations, individuals, and other entities (991 is the specific code for financial derivatives). The report on derivatives transactions contains items for monthly flows and annual positions data for options as well as for futures and forward transactions, while it only contains an item for monthly flows for swap transactions. Thus, in future updates, an item for positions of swap transactions needs to be added and position data need to be collected on a quarterly basis so that the quarterly IIP can include derivatives data.

### **3-B. FFA**

The FFA represents flows and positions of all types of financial derivatives except for positions of exchange-traded derivatives in Japan, which are measured and settled on a daily basis. In the FFA, flows are further disaggregated into transactions and revaluations. Although settlement payments of derivatives' market value and initial payments of option premia of the option-type instruments are recorded as transactions, these are posted as reconciliation amounts together with the change in market price, due to the limitations of source data. While payments for derivatives between residents and nonresidents are available from the BOP, they are not posted as transactions in the FFA so that the treatment of transactions among residents and that between residents and nonresidents could be consistent with each other.

The FFA uses a variety of methods to estimate derivatives flows and positions, drawing on various source data and many assumptions. Specifically, the estimation is conducted in such a manner that amounts outstanding of domestically licensed banks are allocated proportionally to insurance and pension funds, securities investment trusts, nonbanks, securities companies, private nonfinancial corporations, and overseas (to specify the holders of assets/liabilities in banks), assuming that OTC derivatives transactions are carried out mainly via domestically licensed banks.

Holding amounts of domestically licensed banks are based on the financial statements and the results of the Regular Derivatives Market Statistics in Japan, while the holding amounts of insurance companies, nonbanks, securities companies, and the central government are based on the financial statements of individual institutions. Holding amounts of other financial institutions and overseas are estimated using the outstanding ratio by counterparties acquired from the Central Bank Survey of Foreign Exchange and Derivatives Market Activity. Residuals are regarded as the portion held by private nonfinancial institutions. The amount outstanding of foreign exchange margin transactions is estimated using the financial statements of major foreign exchange margin trading firms, etc., and is allocated to households and private nonfinancial corporations.

Exchange-traded derivatives are based on the financial statements of the institutions stated above and on exchange market data.<sup>6</sup> The amount outstanding in this category is evaluated at the market price. Settlements of market value that cause changes in cash should be posted as transaction flows, but due to the limitations of the source data, they are not posted for forward and option types, and all term-on-term differences in amounts outstanding are posted as reconciliation amounts. However, until the second quarter of 2000, only the term-on-term difference in the acquisition cost of the option premium (the outstanding amount not reflected in the fluctuation of the market price) is posted as a transaction flow.

One shortcoming of the source data is related to its scope. For OTC derivatives, data organized on a residency basis (in which the transaction parties are classified as residents/nonresidents) are unavailable, while the only available source data are those on a consolidated basis (in which overseas sectors are consolidated into the sectors in Japan, where transaction parties are not classified as residents or nonresidents). Accordingly, the resident/nonresident ratio from the Central Bank Survey of Foreign Exchange and Derivatives Market Activity is used as a benchmark.

Another shortcoming relates to the frequency of the source data. Financial statement data are used to estimate the amounts outstanding of forward- and option-type instruments. In many cases, however, only half-yearly data (end of March and September) are available. For the unavailable quarters (end of June and December), data are estimated based on changes in the total amount at market value and changes in contractual obligations related to financial derivatives transactions.

#### **4. Concluding remarks**

We would like to present some concluding remarks. The compiling experience of the Bank of Japan suggests three efficient ways for introducing new statistics on derivatives transactions.

First, the latest Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, conducted in 2010, shows that the aggregated share of both the top 10 and the top 20 institutions in terms of amounts of derivatives transactions had continued to rise since the previous survey to reach more than 90 percent in Japan. This implies that for collecting derivatives data, central bankers should have close contact with major financial institutions in their countries.

Second, when preparing reporting forms from financial institutions, it should be noted that transactions of financial derivatives in statistical terms always accompany cash movements, and thus differ from holding gains/losses in accounting terms. Also, counterparties need to be classified according to analytical needs. In recognition of these caveats, central bankers should communicate well with their respondents.

Third, the most efficient way of developing derivatives and other statistics is to learn about the practices of other central banks. As a neighboring central bank, the Bank of Japan is always willing to cooperate with the People's Bank of China.

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<sup>6</sup> Statistics for government bond futures, trading of Nikkei 225 options by type of investor, the trading volume and open interest of options on three-month euroyen futures.

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