

Toward further improvement of the Flow of Funds Accounts

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1. Introduction

The Flow of Funds Accounts (hereafter the FFA) is a statistical record of financial transactions and of the financial assets and liabilities held by various sectors, such as households, corporations and governments. It is universally regarded as one of the most detailed and comprehensive financial statistics. As for the FFA in Japan, domestic sectors are classified into 45 sectors and financial transactions are classified into 53 items.

The FFA is compiled by using numerous source data, such as financial statements and market statistics. These source data are selected carefully by examining their definitions and attributes. They are also reviewed periodically to improve the accuracy of the FFA. Estimation methods are also reviewed periodically. Against the background of rapid changes in financial structures and the accounting standards, those review operations have become increasingly important.

This paper introduces the BOJ's measures to improve the accuracy of the FFA further and also presents some recent examples. The examples include data improvements in the field of so-called "shadow banking" including financial derivatives and securitized products transactions, which attracted attention in the recent financial crisis.

The contents of Sections 2 through 4 are as follows. Section 2 explains the BOJ's basic framework for improving the accuracy of the FFA. Section 3 illustrates recent examples of improvements in the FFA. Section 3.1 describes the revisions of the following as examples of improvement in accuracy of the FFA through reviews of source data: 1) data on the outstanding amount of structured-financing instruments; and 2) data on the outstanding amount of local government securities held by the household sector. Section 3.2 discusses examples of improvement in accuracy by adopting both new source data and new estimation methods. The examples include: 1) the data on the assets and liabilities of the central government sector; and 2) the revision of the treatment of lease transactions. Section 4 concludes.

2. The Basic Framework for Improving the Accuracy of Statistics

The accuracy of the FFA depends greatly on the accuracy of source data and estimation methods. The BOJ takes into account the availability of source data and possible improvements to the estimation methods when conducting periodic reviews. That process can be summarized as the BOJ's basic framework.

The FFA is presented in a matrix of sectors (column) and transaction items (row), and comprises approximately 6,000 data series. Each data series in the FFA is not always

¹ Research and Statistics Department, Bank of Japan. The views expressed here are those of the author and do not necessarily represent the views of the Bank of Japan. The author is responsible for any errors or omissions.

compiled from a single item of source data but from a multiple number of source data. More than 600 source data are used to compile the FFA. For example, “structured-financing instruments” comprises a multiple number of financial instruments, including asset-backed securities (ABS) and asset-backed commercial papers (ABCP). Data for each of these instruments are compiled from aggregated source data or through any kind of estimations, and then they are aggregated further to make up a data series in the FFA for release. One of the outstanding features of the BOJ's compilation procedure is that careful examination of every single item of source data and the aggregation of sectors as well as transaction items is never neglected. The BOJ applies the framework to examine and improve the quality of individual source data and estimation methods efficiently.

2.1 Classification of Data Accuracy

The BOJ classifies the accuracy level of individual data in the FFA into four large categories, depending on the availability of source data and the accuracy of estimation.

The definitions of the four categories are as follows. The data in category [A] do not have problems in the availability of source data or in the accuracy of estimation methods. For example, the data for current deposits, ordinary deposits, etc., which make up the transaction item “transferable deposits,” are compiled using the data directly reported by banks and other deposit-taking financial institutions and data from financial statements as source data. These data appropriately cover the economic entities and financial instruments which are the objects of the “transferable deposits.” These types of data do not have any problems in terms of accuracy or coverage, and are classified as category [A].

The data in category [B] maintain a certain level of accuracy by estimation but their source data have room for improvement. For example, data for asset-backed commercial papers (ABCP) used to be classified as this category. Before the recent improvement, the data for the outstanding amounts of ABCP were not available, and estimation complemented the lack of data to maintain a certain level of accuracy.

The data classified under category [C] maintain satisfactory levels of accuracy by using available source data but still have room for improvement in the accuracy of estimation. For example, unlike data in category [A], financial statements of all enterprises are unavailable in some sectors to compile the outstanding amount of all items in financial assets and liabilities. In such cases, when data on a major item in financial assets and liabilities are available for the sector as a whole, the ratio of major enterprises to the whole sector is taken for the item, and is used to estimate the outstanding amount of other items in financial assets and liabilities of the sector as a whole. This type of estimation method is based on an implicit assumption, and in cases where the composition of assets and liabilities varies by the size or the business format of enterprises in the sector, compilers are required to:

- 1) divide the sector into strata by the size of outstanding amounts or by business format;
- 2) estimate the aggregate amount of each stratum; and
- 3) aggregate the outstanding amounts of assets and liabilities of these strata to obtain the amounts for the sector as a whole.

The data in category [D] have room for improvement both in source data and estimation methods. Data on hedge funds, for example, are neither available nor estimated and fall into this category.

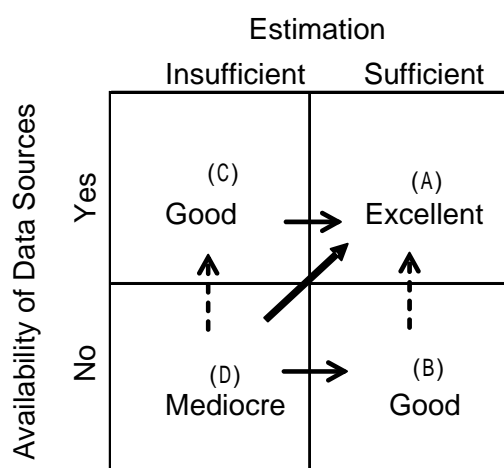
2.2 Three Approaches toward Improving Data Accuracy

Data accuracy of the FFA can be improved through one of the following three approaches (see Chart 1).

- 1) Replace the source data with more accurate data. (A vertical shift which can be represented by [D] → [C] or [B] → [A].) Switching source data to those with a broader coverage and a higher degree of accuracy, for example, falls into this category.
- 2) Improve the accuracy of estimation. (A horizontal shift which can be represented by [C] → [A] or [D] → [B].)
- 3) Improve the accuracy of statistics by combining (1) and (2). (A shift from [D] → [A].)

Chart 1:

The Flow of the Improvement in the FFA



Improving data accuracy under the framework is a continuous effort. Even data which have already been shifted to category [A] are liable to fall to category [D] due to changes in the financial environment, the introduction of new financial instruments, and other developments. When data actually fall from category [A], they are reclassified as [B], [C] or [D], and a new approach is adopted to pull them back to category [A].

2.3 Revisions Conducted in 2009

Table 1 shows six major improvements achieved from the revisions conducted in 2009. In terms of the basic framework of improvement stated above, two cases involved the improvement of source data ([B] → [A]) and four cases involved the improvement of both source data and the estimation methods ([D] → [A].)

Table 1:
Improvements in Statistical Accuracy in 2009

| Order | Type of the Revision | Revision Method | Direction of Improvement |
|-------|--|---|--------------------------|
| 1 | With the increase in foreign exchange margin transactions by individual investors, etc., the margin deposited and appraisal loss and profit from these transactions have been newly included. | Improved the estimation method because of new source data | D → A |
| 2 | Adopted the outstanding amount of Residential Local Gov't Bonds to improve the accuracy of estimation of the outstanding amount of local gov't securities held by the Household sector. | Switched from estimation to highly accurate source data | B → A |
| 3 | Included appraisal profit and loss from interest rate swap transactions, which the government began in 2006 | Reflected new financial transactions to match actual financial activities | D → A |
| 4 | Revised source data for the outstanding amount of ABCP, a securitization product, to more accurately reflect the actual condition of the market | Switched from estimation to highly accurate source data | B → A |
| 5 | Data on the loans, which are initially provided and then securitized by the Fiscal Loan Fund, were relocated between transactions items in order to reflect actual transaction status. | Improved the estimation method due to the adoption of new source data | D → A |
| 6 | As the revised Accounting Standard for Lease Transactions stipulates that all finance lease transactions, including those which do not transfer ownership, be, in principle, treated as financial assets and liabilities in the statements of non-financial corporations, the FFA was revised to reflect their financial assets and liabilities more accurately. | Reflected new financial transactions to match the actual status of corporate accounting | D → A |

3. Cases of Improvements

3.1 Cases of Improvement in Statistical Accuracy through Revisions of Source Data

In these cases, compiling the statistics through estimation with a low degree of accuracy has been replaced by the use of new source data; this is an example of a shift from category [B] to [A] in Chart 1.

3.1.1 Revision of “Structured-Financing Instruments” Data

a) Definition of “Structured-Financing Instruments”

“Structured-financing instruments” refers to financial instruments issued by structured-financing SPCs and trusts. These instruments are also part of the so-called “shadow banking.” They involve various risks, including credit risk, and it is important that they are reflected properly in the FFA. However, it is difficult to identify their transactions or holders completely because these instruments are largely issued through private placements and their market size was unknown.

In the Japanese FFA, “structured-financing instruments” comprises asset-backed securities (ABS) and monetary claim trust beneficiary rights. Asset-backed securities, in turn, comprise asset-backed domestic corporate bonds, asset-backed *samurai* bonds or yen denominated

bonds issued by non-residents in the Japanese market and domestically-issued asset-backed commercial paper (ABCP).

The outstanding amounts of publicly-issued asset-backed domestic corporate bonds and asset-backed *samurai* bonds are available from the market data released by the Japan Securities Dealers Association. Figures for monetary claim trust beneficiary rights are also available through direct reporting. Source data on the outstanding amounts of privately-placed bonds and ABCP were unavailable and their outstanding amounts were estimated.

b) Features of the Revision

In the recent revision, the BOJ adopted “Outstanding Amounts of CP by Issuer’s Category” released by the Japan Securities Depository Center, Inc.² as source data to obtain the outstanding amounts of ABCP in the “structured-financing instruments” category.

Previously, data on the outstanding amount of ABCP were estimated based on the assumption that ABCP accounted for a certain percentage of other structured-financing instruments.

In March 2003, the Book-Entry Transfer System for CP was launched in Japan. By using this system, which is operated by the Japan Securities Depository Center, Inc., rights can be transferred by recording CP transactions in the Transfer Account Books electronically. Since the launching of the Book-Entry Transfer System for CP, the issuing amount of CP recorded electronically on the system, i.e. dematerialized CP, has risen. Since 2006, dematerialized CP has accounted for more than 99 percent of the total amount of new CP issued, and now accounts for the greater part of CP.

The BOJ examined the category of the “Special Purpose Company” in the “Outstanding Amounts of CP by Issuer’s Category” statistics. It turned out that this category comprises various types of SPC that were established to carry out securitization and that data for this category reflect the outstanding amount of ABCP that matches the definition of the FFA. The BOJ decided to replace the estimation with the data available from the statistics.

c) Impact of the Revision

The data on ABCP were revised retroactively from the end of June 2007, when the new source data became available. A comparison between the previous and revised data revealed that the gap between the two sets of data was approximately 1–5 percent of the outstanding amount of ABCP (after revision) and that previous figures had been overestimated; the difference was approximately 0.3–1.7 trillion yen (equivalent to 3.3–18.9 billion US dollars). As a result, the liabilities of the issuing sectors, i.e. “structured-financing special purpose companies and trusts,” and the assets of the sectors holding the ABCP, were revised downward by the amount of difference accordingly.

d) Remaining Tasks Related to Data on the Outstanding Amounts of “Structured-Financing Instruments”

The outstanding amount of ABCP held by various sectors is estimated based on some assumptions whose validity may change over time. If the information about a holder’s category of ABCP becomes available as source data for the FFA, it should help to identify the locations where risks are accumulating in the financial markets.

² The Japan Securities Depository Center, Inc. has the custody of securities, including shares, and makes delivery through changes in records on the books rather than physical delivery of certificates. In March 2003, it introduced the Book-Entry Transfer System for Short-Term Corporate Bonds (CP) designed to handle the processing of short-term corporate bonds completely in dematerialized form (paperless) using the Transfer Account Books. The system is explained in detail by JASDEC (2009).

The outstanding amount of some other financial instruments such as asset-backed securities is also estimated based on some assumptions. One of the areas on which the BOJ focuses is the outstanding amount of privately-placed asset-backed securities. At present, the amount is estimated by using the growth rate of publicly-issued asset-backed securities, but the present assumption may not be appropriate.

The BOJ has started discussions with a central securities depository in Japan to explore the possibilities of obtaining more appropriate source data.³

3.1.2 Revision of “Local Government Securities” Data held by the Household Sector

a) Definition of “Local Government Securities”

The transaction item “local government securities” comprises local government bonds and local public corporate bonds. Local government bonds are issued by the ordinary account, which is classified under “local governments” in the FFA, and by the local public enterprises accounts of local governments, which are classified under “public non-financial corporations.” Local public corporate bonds are issued by local public corporations, and are classified under “public non-financial corporations.” Both local government bonds and local public corporate bonds comprise three types of bonds: registered bonds,⁴ book-entry bonds and bearer bonds.

b) Features of the Revision

Before the revision, the outstanding amount of “local government securities” held by the household sector was estimated assuming that all bearer bonds were held by the household sector and that the bearer bonds were the only bonds held by the household sector.

In the recent revision, the BOJ adopted the outstanding amount of publicly-issued Residential Local Government Bonds as source data for the outstanding amount of “local government securities” held by the household sector.

Residential Local Government Bonds are a type of publicly-issued municipal bond that local governments issue to local residents to finance their activities. They have been issued since fiscal 2001. The annual amount of issue of these bonds has stood at approximately 200–300 billion yen, and their outstanding amount now exceeds 1 trillion yen.

c) Impact of the Revision

As a result of the above-mentioned revision, the outstanding amount of “local government securities” held by the household sector has been revised upward. As its secondary impact, the amounts of “local government securities” held by the “private non-financial corporations,” “local governments” and “private non-profit institutions serving households” have also been revised. The secondary impact is caused when the holding amount of residual sectors is calculated. The holding amount of those sectors is obtained by subtracting the holding

³ Sato (2010) describes further efforts to identify holders of securities.

⁴ Registered bonds are bonds the holders of which are registered with registering organizations or registering financial institutions. Since January 2007, new issuance of registered bonds has not been allowed due to a change in the settlement system, and book-entry bonds have been issued in their place. The Japan Securities Depository Center, Inc. serves as the central securities depository for book-entry bonds, transactions of which are settled electronically.

amount of the household sector, which reflects the primary impact, and other sectors from the total outstanding amount.⁵

d) *Remaining Tasks Related to Data on the Outstanding Amount of “Local Government Securities”*

As in the case for ABCP, improving the availability of data by holder’s category is a priority for the outstanding amount of “local government securities.”⁶ At present, data on the holding amount are not available from financial statements of “private non-financial corporations,” “local governments” and “private non-profit institutions serving households.” The BOJ has started discussions with a central securities depository in Japan to obtain more appropriate source data.

3.2 Cases of Improvements in the Accuracy of Statistics through the Adoption of New Source Data and Improvement in the Accuracy of Estimation Methods

3.2.1 *Improvement in the Accuracy of Outstanding Amounts of Assets and Liabilities of the Central Government Sector*

(Chart 1: Example of improvement via [D] → [A])

a) *Definition of “Financial Derivatives”*

“Financial derivatives” in the FFA refers to a financial instrument that derives from a specific financial instrument (the “underlying asset”) but does not involve transfers of funds in connection with the principal (notional principal) of the underlying assets. In the FFA, the figures posted under financial derivatives are the market prices (unrealized gains and losses) of forward-type financial derivatives and the market prices (current prices of option premiums) of option-type financial derivatives. The former includes such transactions as forward rate agreements, interest rate swaps, currency swaps and exchange forward contracts.

b) *Features of the Revision*

In 2006, the central government (the Ministry of Finance) began interest rate swap transactions in order to manage risk that may arise from the change in interest rates when it refinances the government securities of short duration. The outstanding amount of such transactions has increased and, as of the end of March 2010, reached 430 billion yen for the

⁵ The following is a brief explanation of the concept of “residual sectors” for the FFA. The FFA is compiled in such a way that in the end the assets and liabilities of all sectors and all transaction items are balanced in order to make the matrix consistent. However, since not all figures for assets and liabilities of all sectors are always available, figures for some transaction items in some sectors are estimated by subtracting figures for other sectors from the total outstanding amount of the transaction item concerned. For “local government securities,” the source data on the holding amount of “private non-financial corporations,” “local governments” and “private non-profit institutions serving households” are not available. Accordingly, the outstanding amount of “local government securities” held by these sectors is obtained by subtracting the amounts held by the household and other sectors for which the figures are available from financial statements, etc., and then by allocating the amount to each of these sectors. To the extent to which the recent revision has improved the accuracy of data for the household sector, the accuracy of statistics for “private non-financial corporations,” “local governments” and “private non-profit institutions serving households” has also improved.

⁶ Evidence in late 2008 suggests that, in the U.S., yield spreads of local government securities widened against the government securities, and that their market cannot remain immune from financial market instability. It is inferred from this evidence, that the information on holders of local government securities should be reflected in the FFA appropriately.

receiving side and 2,050 billion yen for the payment side of fixed interest rate transactions (in terms of notional amounts). The FFA did not include those transactions.

In the recent revision, the BOJ decided to record the value gains and losses of the interest rate swap transactions conducted by the central government on the “financial derivatives” (forward-type instruments) of the “central government” sector. Its source data is based on the “General Account Financial Statements” released by the Ministry of Finance.

c) *Impact of the Revision*

The value gains and losses have been posted as assets and liabilities, respectively, on “financial derivatives” (forward-type instruments) in the “central government” sector from the first quarter of 2006, when interest rate swap transactions by the central government began. Since the source data for interest rate swap transactions are shown on a net basis, the net value is recorded on the outstanding amount of either assets or liabilities. At present, the net value (loss) is relatively small at approximately 38.0 billion yen (recorded on the liabilities side of the FFA). Nevertheless, the new source data will allow the BOJ to record data on financial derivatives transactions by the central government and to trace the development of the transactions in the FFA.

d) *Remaining Tasks Related to the Outstanding Amount of “Financial Derivatives”*

In addition to those included in the FFA, there are other types of financial derivatives. One of them is credit default swaps (hereafter CDS).⁷ The System of National Accounts 2008 (2008 SNA) stipulates that standardized guarantees should be recognized as assets or liabilities, and it classifies CDS in the category of the first class of guarantees (2008 SNA, Paragraph 17.210). As is shown in the “Regular Derivatives Market Statistics in Japan” released by the Bank of Japan, as of the end of December 2009, their gross positive market value amounted to 2.8 trillion yen while the gross negative market value amounted to 2.4 trillion yen.⁸ Their transactions have increased sharply since the latter half of 2008. Based on the development of the CDS market, the BOJ plans to consider including CDS in the “financial derivatives” category to capture the status of financial derivatives more accurately in the FFA.

3.2.2 Revision of the Treatment of Lease Transactions

(Chart 1: Example of improvement via [D] → [A])

Lease transactions that can be regarded as loans ought to be recognized as “installment credit” in the FFA. Some of such lease transactions have not been included in the “installment credit” category of the FFA due to the lack of source data. The relevant data have become available recently, with the introduction of a new accounting standard for lease transactions (“Accounting Standard for Lease Transactions”) since April 2008. The BOJ has started to use these data and has revised the estimation method.

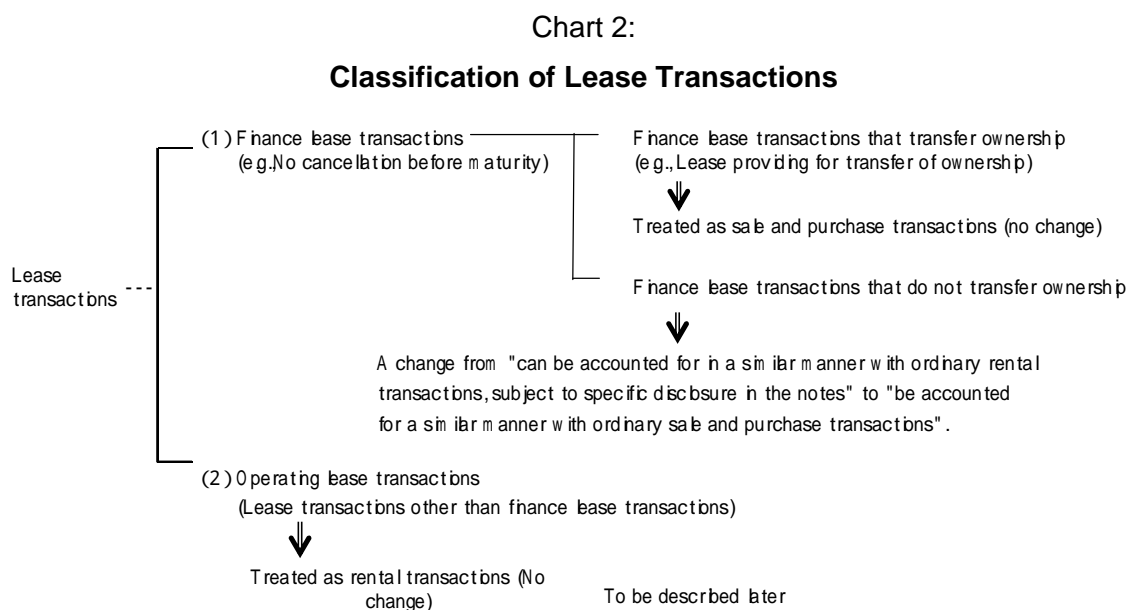
a) *Classification of Lease Transactions and Principles under the 1993 SNA*

Lease transactions comprise finance lease transactions and operating lease transactions. The former are leasing contracts under which: 1) the users use up the leased assets in effect; and 2) users cannot cancel the contracts during the contract period. All other lease transactions are categorized as operating lease transactions. Finance lease transactions, in

⁷ CDS are a type of credit derivative. CDS transactions transfer only credit risks without transferring claims themselves.

⁸ Calculated on the basis of the exchange rate of the yen at the end of December 2009 (93.61¥/\$.)

turn, comprise transactions that transfer ownership and those that do not, which depends on the terms of the contracts shown in Chart 2 below.



The treatment of lease transactions in statistics depends on their classification. Operating lease transactions are treated as ordinary rental transactions, while finance lease transactions can be treated as either ordinary rental transactions or financial transactions (i.e. “loans”). Depending on whether emphasis is placed on the legal owner (ownership principle) or the actual user (user principle) a different outlook can be created. From the standpoint of the legal owner of the leased item (the ownership principle), they are treated as ordinary rental transactions. From the standpoint of the actual user (the user principle), on the other hand, they are treated as financial transactions.

The System of National Accounts 1993 (1993 SNA) recommends that lease transactions are recorded according to their economic characteristics, regardless of their legal status. When a lease transaction can be viewed as an extension of credit by the lessor to the lessee to finance the purchase of the leased item, it is treated as a “loan.”

b) New Accounting Standard for Lease Transactions

The pre-revision standard stipulated that the assets and liabilities pertaining to finance lease transactions are to be treated as financial assets and liabilities in their accounting treatment. However, it also permitted exceptions. In case certain information is disclosed in the footnotes to financial statements, finance lease transactions that do not transfer ownership could be accounted for in a manner similar to the accounting treatment for ordinary rental transactions. In this accounting treatment, such lease transactions are not recorded as financial assets and liabilities (i.e. not to be included in the balance sheets). For this reason, data on the outstanding amount of finance leases that do not transfer ownership could not be collected from financial statements, although they should basically be included in the FFA under the provisions of the 1993 SNA. The new Accounting Standard for Lease Transactions⁹ that came into effect in April 2008 repealed the exception. As a result, finance

⁹ ASBJ (2007) explains the new standard in detail.

lease transactions that do not transfer ownership are no longer treated off the balance sheets but are treated as financial assets and liabilities.

c) *Features of the Revision*

Under the pre-revision accounting standard, data on finance lease transactions that do not transfer ownership could not be reflected in the FFA due to source data constraints. The change in the accounting standard enabled the BOJ to obtain data on finance lease transactions that do not transfer ownership and to record them in the “installment credit” category from the second quarter of 2008. At the same time, the BOJ also revised the estimation method for the outstanding liabilities of lessees in accordance with the change in source data.

d) *Impact of the Revision*

The outstanding amount of the assets in the “installment credit” category of the “finance companies” sector, which includes leasing companies, was revised upward. On the side of liabilities (lessees of finance lease transactions that do not transfer ownership), the outstanding amounts of “installment credit” (liabilities) of the relevant sectors were also revised upward.

e) *Remaining Tasks Related to the Outstanding Amount of “Installment Credit”*

At present, the holding amount of each sector is estimated assuming that the relative amount held by each sector does not change among types of lease transactions. Accordingly, the same ratio is applied to allocate the total outstanding amount to each holding sector for the lease transactions that do not transfer ownership and for “installment credit,” which is the upper category of the lease transactions. In case the assumption does not hold true, and the ratio applied to calculate the holding amount of each sector varies by the type of lease transactions included in the “installment credit” category, then it would be necessary to examine the possibility of further improvement to the accuracy.

Moreover, reliable statistics on the whole industry, compiled by the government or industrial organizations, are not available for the “finance companies” sector, which holds “installment credit” as assets. Therefore, the BOJ conducts independent surveys of major finance companies, leasing companies, credit companies, etc. with their cooperation, and estimates the figures for “finance companies” based on the survey data.

4. Concluding Remarks

This paper presented the Bank of Japan's framework and its efforts to improve the accuracy of the FFA. The FFA comprises approximately 6,000 data series. Each of the data series is compiled by aggregating some individual source data or by estimation. The BOJ pays careful attention to both every single item of source data and aggregated data series. It follows the framework described in this paper to examine and improve the accuracy of the FFA efficiently. Under the framework those individual data are classified into four large categories depending on the availability of source data and the accuracy of estimation, by which the direction of improvement is clarified for individual data. It helps the BOJ to prioritize the focus of work on the FFA. Among the revisions conducted in 2009, this paper showed some examples of major improvements.

The rapid evolution of new financial markets and instruments is a challenging issue for the FFA. It requires the BOJ to identify and collect missing data promptly and also to improve the accuracy of existing data. Tasks for further improvement remain. The BOJ will continue improving the FFA under the framework to capture new developments of financial

transactions and outstanding amounts more accurately, and to make the FFA more useful for its users.

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