

Highlights of Enhanced Japan's Flow of Funds Accounts Based on 2008SNA

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May 2016

In light of an increased importance of statistics related to the nonbanking sector – such as corporate pensions and investment trusts -- with the rapidly ageing of Japan's population and a trend shift "From Saving to Investment" promoted by the government and industries, the Bank of Japan has made substantial revisions to Japan's Flow of Funds Accounts for the first time since 1999. Highlights of the revisions are: (1) regarding corporate pensions, defined benefit schemes and defined contribution schemes are recorded separately as independent sectors, and the discounted present value of future benefits based on the actuarial calculation of pensions is recorded as pension entitlements and (2) regarding investment trusts, distributions from the principal are recorded not as income but as outflows of funds from investment trusts. As a result, issues of the balance between assets and liabilities of pension funds and distribution amounts from the principal of investment trusts are brought to the fore, allowing to capture financial surplus and deficits of households and private nonfinancial corporations in a more accurate fashion. This makes it possible for Japan's Flow of Funds Accounts to produce a more accurate picture of financial activities than those furnished by other advanced countries.

Introduction

Japan's Flow of Funds Accounts (J-FFA) is a matrix of data that shows changes in financial assets and liabilities of economic entities (sectors), including households, corporations, and financial institutions, in terms of each financial instrument (transaction item), such as deposits, loans, and securities. The Bank of Japan (BOJ) compiles and releases the J-FFA on a quarterly basis as statistics that comprehensively capture financial activities in Japan.

Considering the rapidly changing financial and economic environment exemplified by the ongoing globalization and in the wake of the global financial crisis, it is essential to make efforts to improve the accuracy of the J-FFA on an ongoing basis and to make it more accessible and useful for users. The BOJ has taken decisive actions to enhance and expand the J-FFA over the past several years.¹

As part of these efforts, the BOJ has made substantial revisions to the J-FFA and began release of the new J-FFA on March 25, 2016. Revisions were made to conform to the guidelines in the System of National Accounts 2008 (2008SNA), the standard for compiling national accounts statistics, adopted by the

United Nations Statistical Commission in 2009. It was the first substantial revision since 1999 when the J-FFA was revised based on the 1993SNA, updated from the 1968SNA. This paper provides highlights of revisions made to the J-FFA based on the 2008SNA and also shows its quantitative impact.²

Underlying Concept of Revisions to J-FFA

Summary of 2008SNA

The 2008SNA is the new international standard for compiling national accounts statistics, an updated version of the 1993SNA. The main feature of the 2008SNA is to include new items, such as R&D and patent royalties, to the GDP statistics so that it is more aligned to the evolving aspects of the real economy in light of increased knowledge-intensive activities and globalization. Regarding the financial sector, considering that financial transactions have become more intellectual and complex and that the nonbanking sector has increased its significance in recent years, there has been a growing need for refining the methodology of recording existing financial transactions, such as pensions and

investment trusts, and for including new financial transactions.

Basic concept behind revisions made to J-FFA

In line with the standards recommended in the 2008SNA, the BOJ has made revisions to the J-FFA taking into account the following three points.

The first is to maintain and enhance the comparability of the J-FFA with those of other countries. Based on the standards recommended in the 2008SNA, the United States released its updated FFA in July 2013, followed by European countries in September 2014. The G20 Data Gaps Initiative also recommended the FFA to be compiled based on the 2008SNA, factoring in its important role for identifying risks in the financial sector and monitoring the economic and financial vulnerability.³

The second is to keep the J-FFA consistent with Japan's National Accounts (JNA). The Cabinet Office is scheduled to release the updated JNA based on the 2008SNA at the end of 2017. The J-FFA is the most important data source underlying the financial area of the JNA.

The third is to enhance the usefulness of the J-FFA. Improving the accuracy and upgrading statistics related to the nonbanking sector, such as corporate pensions and investment trusts, are important issues with the rapidly ageing of Japan's population and a trend shift "From Saving to Investment" promoted by the government and industries. Revisions made to the J-FFA conforming to the 2008SNA guidelines may act as a solution.

Improvement as a result of revisions made to J-FFA

Three major improvements due to revisions made to the J-FFA are given in this section. The first is to improve the accuracy of the J-FFA by refining the methodology of recording financial transactions. Specifically, the improved recording methodology of corporate pensions and investment trusts provide a more accurate picture of the amounts outstanding of financial assets/liabilities and financial surplus/deficits of households and private nonfinancial corporations.

The second is to provide a detailed illustration of transaction items (financial instruments), with the coverage increased up to 57 items from the current 51 items. In addition to the detailed categorization of pension and insurance items, the BOJ now tracks financial transactions which were not covered in the former J-FFA, including provisions for calls under standardized guarantees⁴ and employee stock

options.⁵

The third is to increase the number of sectors (economic entities) -- from the current 45 up to 50 sectors -- to allow for a more detailed description. The BOJ will cater to users' needs through the following modifications: (1) defined benefit schemes and defined contribution schemes in corporation pensions are split into two separate sectors and each recorded as independent sectors, (2) a new category called standardized guarantee institutions is added, (3) financial holding companies, which were previously scattered across various sectors, are all put together and recorded as an independent sector, and (4) government financial institutions are split into public captive financial institutions,⁶ with weaker financial intermediation functions, and government financial institutions other than public captive financial institutions.

With these improvements, while the recording methodology of corporate pensions and investment trusts was changed drastically and these sectors are now estimated using micro data held by private sectors such as those in the financial statements of individual companies or in investment reports of individual funds, the J-FFA can better capture financial activities than the FFAs of other advanced countries such as the United States and European countries.

The following sections look at three points resulting from revisions made to the J-FFA: the two significant impacts -- represented by (1) corporate pensions and (2) investment trusts, and (3) the impact on financial surplus/ deficits of major sectors.

Revisions to Corporate Pensions

Coverage of J-FFA

In the J-FFA, private pensions -- corporate pensions, other pensions, and individual annuity insurance -- are covered as financial assets of households.⁷ Funds, which are accumulated for the purpose of providing corporate pensions and other pensions, are classed in an independent sector "Pension funds."

Points of Revisions

The BOJ has made revisions to the J-FFA regarding corporate pensions, which account for 60% of private pensions in terms of amounts outstanding. The main three points of revisions are described below.

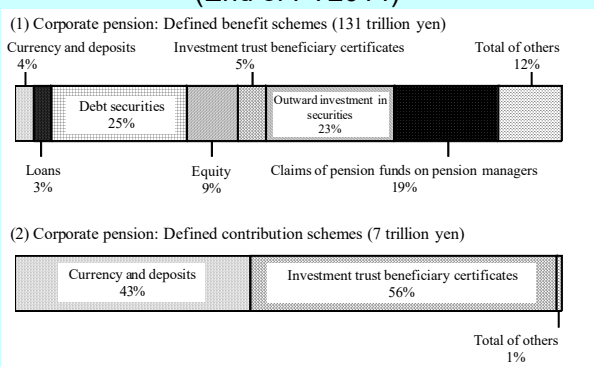
The first point: defined benefit schemes and defined contribution schemes split into two separate sectors and each recorded as independent sectors (Chart 1). This is because their relationship between

[Chart 1] Defined benefit schemes and defined contribution schemes

Pension type	Description	Example
Defined benefit schemes	<ul style="list-style-type: none"> Employee (household) receives the promised benefits following retirement. Employer (company) holds responsible for managing the asset portfolio and in the case when the amount of promised benefits is not achieved, the employer must supplement this shortage. 	<ul style="list-style-type: none"> Employees' pension funds Defined benefit corporate pensions Tax-qualified retirement pension plan
Defined contribution schemes	<ul style="list-style-type: none"> Contributions from employer are fixed. Employee holds responsible for managing the asset portfolio and pension payments change depending on the result. 	<ul style="list-style-type: none"> Defined contribution pension schemes (corporate type)

households as obligees of pension entitlements and companies as obligors of pension liabilities is completely different, and therefore, factoring in these differences, they should be treated separately. In fact, the asset composition of defined benefit schemes greatly differs from that of defined contribution schemes (Chart 2).

[Chart 2] Composition of pension assets (End of FY2014)



Note: "Total of others" includes rounded figures.

The second point: claims (rights to receive pensions and lump-sum retirement benefits) of households are recorded on an accrual basis with respect to pension funds under defined benefit schemes by calculating the amounts of future pensions to be provided by companies to households, instead of managed assets owned by pension funds.⁸ The above amount calculated is recorded as pension entitlements both on the asset side of households and on the liability side of pension funds.

The third point: claims of pension funds on pension managers (calculated by deducting the amount of the managed assets owned by pension funds from the amount of future pensions to be provided by companies to households) -- recorded both on the asset side of pension funds and on the liability side of private nonfinancial corporations -- is recorded separately as an independent sector.⁹

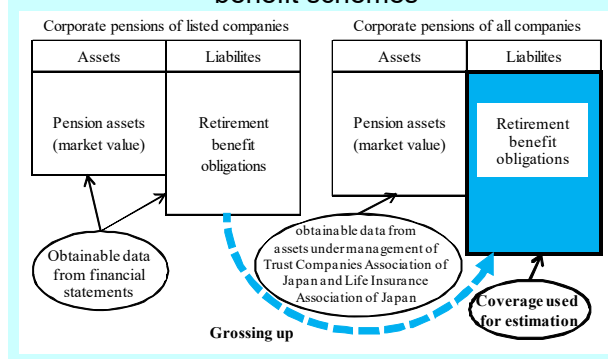
New Recording Methodology of Defined Benefit Schemes

In the new J-FFA, amounts outstanding of pension entitlements are calculated as the discounted present value of future payments based on the actuarial calculation of pensions¹⁰ (outstanding liabilities for retirement benefits). Moreover, transaction flows of pension entitlements are calculated by deducting amounts of pensions paid from amounts of pension entitlements gained based on the actuarial calculation of pensions.

In order to compile these stocks and flows of defined benefit schemes, we need data for pension assets, pension entitlements, and so forth. Regarding pension assets, figures of managed assets of total corporate pensions on a market value basis can be obtained from data on entrusted assets of trustees (trust banks, life insurance companies, etc.). However, for the remaining items, there is no comprehensive data covering the total.

The BOJ estimates stocks and flows of total corporate pensions, including those of unlisted companies, after compiling data based on accounting for retirement benefits disclosed by financial statements of individual companies (outstanding pension assets and retirement benefit liabilities, and pension costs including service costs and interest costs¹¹) and aggregating the total number for listed companies (over 3,000 companies).¹² On estimation, the stock of total corporate pensions, including unlisted companies, is derived by grossing up those of listed companies, using managed assets of pension funds as its basis (Chart 3).¹³

[Chart 3] Estimation method of defined benefit schemes

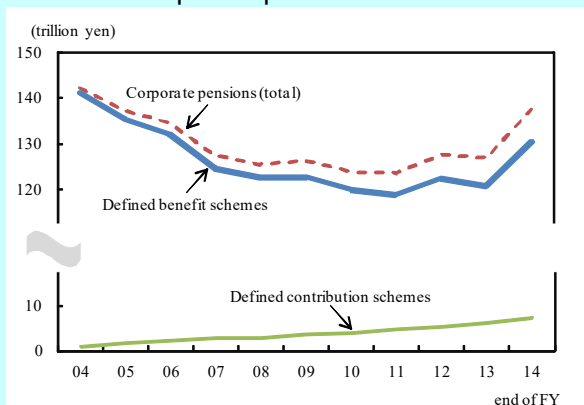


Changes in Pension Entitlements for Corporate Pensions

The total amounts outstanding of pension entitlements under defined benefit schemes is 130 trillion yen as of the end of FY2014, which mostly accounts for corporate pensions (Chart 4). The share of defined

contribution schemes has remained at a low level, although it has trended gradually upward in recent years.

[Chart 4] Pension entitlements for corporate pensions: stock



The amounts outstanding of pension entitlements under defined benefit schemes have been on a gradual declining trend since the end of FY2004 at 141 trillion yen. Such trends in the amounts outstanding are mainly attributable to the following factors: (1) With the retirement of baby boomers, payments for pensions and lump-sum retirement benefits have been increasing, while pension entitlements have been decreasing; (2) an increasing number of companies, mainly small and medium-sized, has abolished their corporate pension schemes; and (3) with lower returns on investment, an increasing number of companies has returned their contracted-out portion of public pensions back to the Japanese Government, and as a result, pension entitlements for that portion have been decreasing.

Subsequently, the amounts outstanding of pension entitlements under defined benefit schemes turned to an increase from FY2013 through the end of FY2014. This is because the considerable decrease in long-term interest rates in recent years has weighed down on the discount rate used for the actuarial calculation of pensions, producing an increase in pension entitlements which are calculated as the discounted present value of future pension payments.

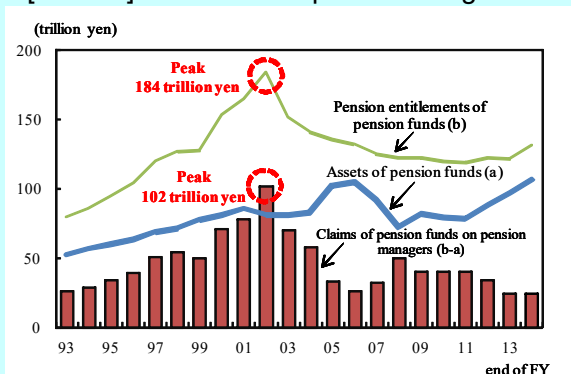
Changes in Claims of Pension Funds on Pension Managers

In the new J-FFA, pension entitlements, as a result of converting to an accrual basis, may exceed assets owned by pension funds. In such a case, the difference between the two is recorded on the asset side of pension funds as claims of pension funds on pension managers. These are the claims on pension funds made to employers (companies), and on the company

side, they are liabilities promised to be paid in the form of pension funds in the future. These liabilities are referred, hereinafter, to "underfunded pension obligations" in accordance with customary practice. However, among claims of pension funds on pension managers, since there is a type of reserve shortage which is treated as expenses in the profit and loss statement of companies, it is debatable whether the term "underfunded pension obligations" should be used here.¹⁴

With this point in mind, underfunded pension obligations increased substantially from 26 trillion yen at the end of FY1993 to a peak of 102 trillion yen at the end of FY2002, since managed assets of pension funds did not increase, partly due to their deteriorating performance as a result of stagnant stock prices and other factors, despite the rapid increase in pension entitlements during the 1990s (Chart 5).¹⁵ In the early 2000s, a reserve shortage for corporate pensions became a major topic with the introduction of the retirement benefit accounting system, and the new J-FFA revealed its magnitude for the first time.

[Chart 5] Underfunded pension obligations



Note: "Pension entitlements of pension funds (b)" is a liability of defined benefit schemes and includes financial derivatives.

Subsequently, with reduced pension entitlements due to the retirement of baby boomers since the second half of the 2000s and improved performance of managed assets, shortage of reserves for corporate pensions turned to a substantial decrease and stood at 25 trillion yen at the end of FY2014. From FY2013 and onward, while the amounts outstanding of pension entitlements turned to an increase with the decrease in the discount rate as mentioned above, the amounts outstanding of underfunded pension obligations have remained almost flat with an increase of managed assets owned by pension funds.¹⁶

Merits of Revisions

The new J-FFA allows us to analyze effects on underfunded pension obligations by changes in the financial environment, including interest rates,

through shifts in the balance between assets and liabilities of pension funds on the back of the difference in the composition and/or the duration mismatch between assets and liabilities. For example, when a monetary easing policy is implemented, both a decrease in interest rates and a rise in stock prices lead to increases in assets and liabilities of pension funds, creating marginal impact on underfunded pension obligations. However, in a situation where interest rates fall but expected growth rates of companies and stock prices do not rise, underfunded pension obligations become larger since liabilities of pension funds increase with marginal increases in assets. Where maturities of managed assets owned by pension funds do not match the term until the time pension beneficiaries are in receipt of pension benefits, underfunded pension obligations are influenced by changes in discount rates through shifts in the balance between assets and liabilities of pension funds.

The new J-FFA makes it possible -- through recording assets and liabilities of pensions more accurately and in more detail -- to provide useful information to analyze influences on pensions from changes in the financial environment including interest rates. This is one of merits brought on by the revisions to corporate pensions.

Revisions to Investment Trusts

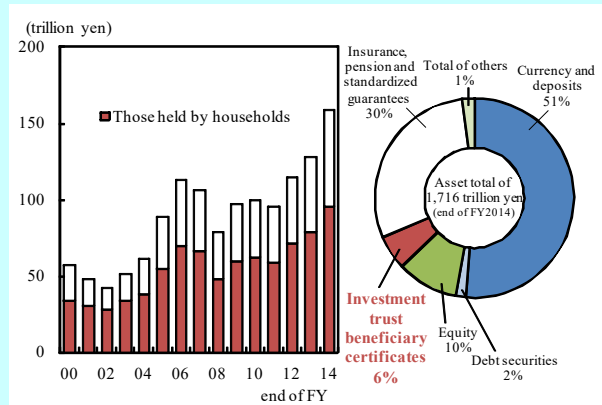
Significance of Investment Trusts on Household Assets

While the presence of investment trusts in Japan was smaller than those in the United States and European countries, paired with the growing trend "From Saving to Investment," the amounts outstanding of investment trusts have been increasing substantially since the beginning of the 2000s. Their significance has increased gradually, particularly in the household sector where the amounts outstanding nearly tripled from 34 trillion yen at the end of FY2000 to 95 trillion yen at the end of FY2014, and their increased share of household assets reaching 6% (Chart 6). The increase in the amounts outstanding is reflected by the fact that households -- in the face of persistently low interest rates -- have come to prefer investment trusts, with a certain amount paid out in the form of distributions every month, investing in foreign stocks or bonds with higher yields denominated in foreign currencies.

Points of Revisions

In the former J-FFA, the recording methodology of transaction flows of investment trusts had some problems in terms of accuracy. Transaction flows of

[Chart 6] Stock of investment trusts and household assets



Note: 1. Figures through FY2003 are those of the Former FFA
 2. "Total of others" includes rounded figures.
 3. (1) and (2) include real estate investment trusts and privately placed stock investment trusts.

investment trusts were calculated by deducting outflows of funds (amounts of cancellation and redemption) from inflows of funds (amounts purchased by investors), using aggregate data published by the Investment Trusts Association in Japan and other institutions. Investment trusts, with a certain amount paid out in the form of distributions every month, continued to pay distributions despite their deteriorating performance to reduce customer attrition. In some cases, distributions made by investment trusts exceeded interest and dividend income from the principal (the so-called "refunds of principal"). Distributions from the principal should have been recorded as withdrawal (outflow of funds) of investment trust beneficiary certificates. However they were not included in transaction flows in the former J-FFA.

In the new J-FFA, distributions from the principal and capital gains have been newly recorded as outflows of funds from investment trusts to improve the accuracy in recording transaction flows using the following estimation method.¹⁷

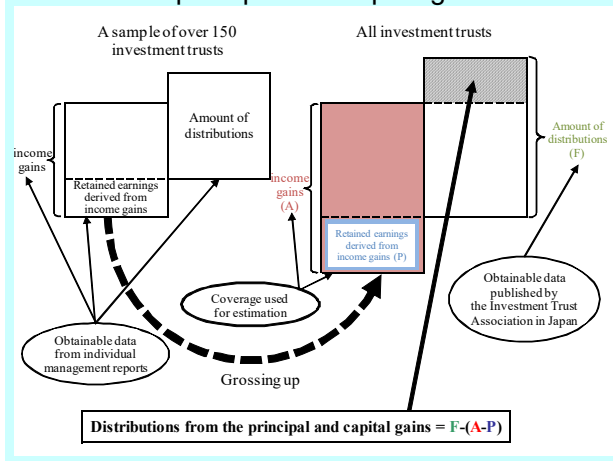
New Recording Methodology of Investment Trusts

In order to record distributions from the principal and capital gains as transaction flows, we need source data for interest and dividend income (income gains), capital gains, and the principal. However, existing data published by the Investment Trusts Association in Japan and other institutions do not include aggregate data for distributions sorted by source.

The BOJ -- sampling the top 150 or more investment trusts which account for 70% in total net assets value among publicly offered stock investment trusts excluding certain funds such as ETFs --

estimates distributions from the principal and capital gains of all investment trusts, making use of data including distributions and income gains in the reports of individual funds. On estimation, distribution amounts from the principal and capital gains of all investment trusts are derived by grossing up using the whole amounts of distributions as its basis (Chart 7).¹⁸

[Chart 7] Estimation method for distributions from the principal and capital gains



Changes in Distributions from Principal and Capital Gains

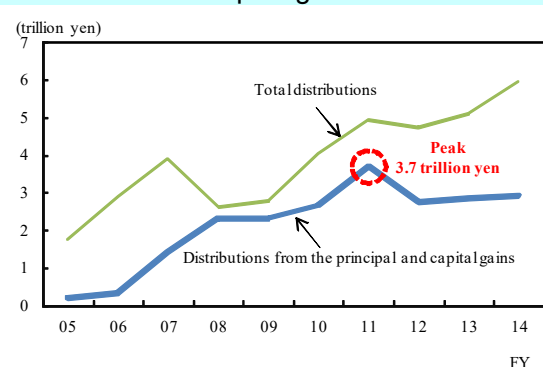
In the new J-FFA, regarding distributions from the principal and capital gains, it can be pointed out that: (1) With the plunge in prices of stocks and bonds in the United States, Europe, and emerging countries in the aftermath of the Collapse of Lehman Brothers as well as the rapid appreciation of the yen, interest and dividend income decreased substantially and in order to compensate for this, distributions from the principal (refund of principal) increased drastically from around FY2007, reaching a peak of 3.7 trillion yen (annually) in FY2011 and (2) during this period, over 70% of distributions from investment trusts were generated from the principal (Chart 8). Despite their deteriorating performance, investment trusts, mainly among those managing assets in foreign currencies, continued their payments each month to reduce customer attrition, thereby pushing down their working assets considerably.

While "proper" distributions from interest and dividend income have gradually increased since FY2012, assisted by improved performance, distributions from the principal and capital gains still account for half the amount of total distributions even now (around 3 trillion yen).

Merits of Revisions

The new J-FFA, as mentioned above, allows us to record distribution amounts of the principal and

[Chart 8] Distributions from the principal and capital gains

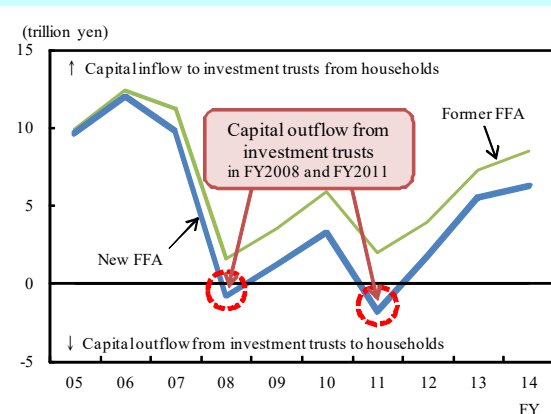


Note: 1. Regarding total distributions, figures from FY2010 onward are distributions of securities investment trusts published by Investment Trusts Association in Japan, and figures up until FY2009 are distributions of publicly offered "open-type" stock investment trusts aggregated by the Bank of Japan.
2. Up until 2012/Q2, distributions from the principal and capital gains are approximates using distributions paid out from investment trusts when the net asset value is below the purchase cost.

capital gains which are not available from existing data. Therefore it can capture inflows and outflows of funds from/to investment trusts (investors' stances on investment) more accurately as it reflects outflows of funds from investment trusts by distributions from the principal and capital gains.

In the new J-FFA, inflows of funds to investment trusts from households are revised downward by 1.9 trillion yen on average between FYs 2005 and 2014. Especially in FY 2008 and FY2011, it turned out that the outflow of funds from investment trusts (net sales of investment trust beneficiary certificates) occurred (Chart 9).

[Chart 9] Transaction flow from households to investment trusts

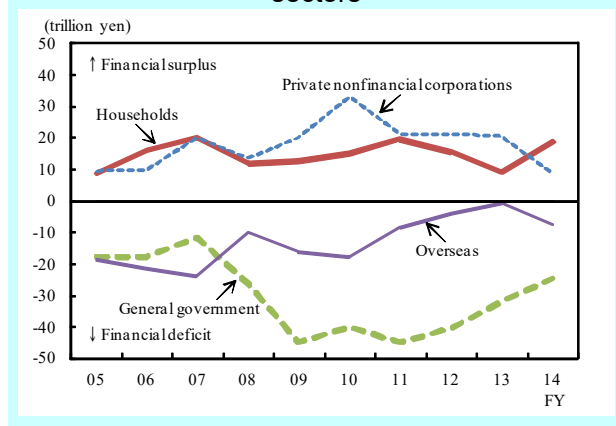


Impact of Revisions on Financial Surplus/Deficits of Major Sectors

Regarding financial surplus/deficits of major sectors, households and private nonfinancial corporations remain as entities with financial surplus, while general

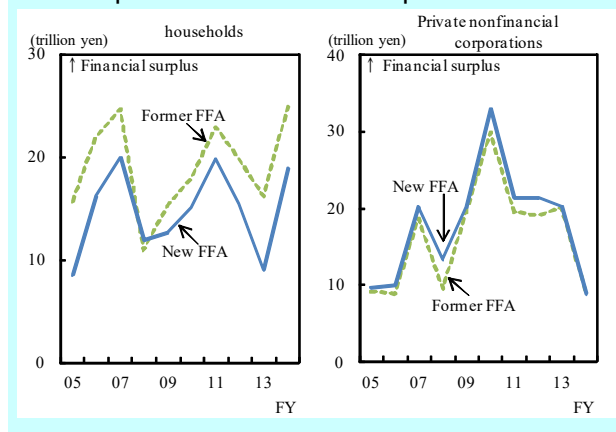
government and overseas are entities with financial deficits; this tendency is observed in the new J-FFA as well as in the former J-FFA (Chart 10).

[Chart 10] Financial surplus/deficits of major sectors



Nonetheless, the impact on households and private nonfinancial corporations is significant due to the above-mentioned changes in the methodology of recording transaction flows of defined benefit schemes and investment trusts (Chart 11).

[Chart 11] Financial surplus of households and private nonfinancial corporations



As a result, the financial surplus of households was revised downward by about 4 trillion yen from 19 trillion yen to 15 trillion yen for the FY 2005-FY2014 average. This was because, for the FY 2005-FY2014 average, outflows of funds concerning pension entitlements were increased by 2.3 trillion yen and those of investment trust beneficiary certificates -- due to distributions from the principal and capital gains -- by 1.9 trillion yen respectively, exerting downward pressure on the financial surplus of households.

On the other hand, the financial surplus of private nonfinancial corporations was revised upward by 1.5 trillion yen for FYs2005-2014 on average. This is due to revisions made to transaction flows of claims of pension funds on pension managers (a liability of private nonfinancial corporations) in response to the

downward revision of the financial surplus concerning pension entitlements of households.

Increased outflows of funds concerning pension entitlements in view of lowering the financial surplus of households were caused by the following two factors. The first factor is that the drawdown of pension entitlements accelerated from increased payments of pensions and lump-sum retirement benefits brought on by the retirement of baby boomers since the second half of the 2000s.

The second factor is the earlier recognition of the inflow of funds from companies to households through the channel of granting pension entitlements as a result of the converting to an accrual basis. In the new J-FFA, the inflow of funds (grants of pension entitlements) to households is recorded at the time when companies promise to provide pension benefits in the future (the 1990s), not the time when companies actually grant pension benefits (the 2000s).

Concluding Remarks

This paper provides highlights resulting from revisions made to the recording methodology of the J-FFA, which have had both significant qualitative and quantitative impacts on the statistics, with the following three points in view: (1) changes in the methodology of recording corporate pensions and (2) investment trusts, and (3) their impact on financial surplus/deficits of major sectors.

Revisions to the J-FFA -- conforming to standards recommended in the 2008SNA -- were made taking more time than the United States and European countries. The recording methodology of corporate pensions and investment trusts was changed drastically and these sectors are now estimated using micro data held by private sectors such as those in the financial statements of individual companies or in investment reports of individual funds. As a result, the J-FFA can better capture financial transactions than the FFAs of other advanced countries such as the United States and European countries.

For example, regarding corporate pensions, the new J-FFA revealed the magnitude of a reserve shortage for corporate pensions (underfunded pension obligations) for the first time. Regarding investment trusts, the new J-FFA shed light on the distribution amounts from the principal and capital gains for the first time. By recording the amount, outflows of funds from investment trusts are reflected in the statistics -- which are regarded, in practice, as withdrawal of investment trust beneficiary certificates -- allowing to capture inflows and outflows of funds to/from

investment trusts more accurately, and thereby, the overall picture of financial surplus/deficits of households as well.

Revisions to the J-FFA this time were made in response to many valuable comments and suggestions, to which the BOJ would like to express its sincere gratitude. The BOJ will continue making efforts on an ongoing basis in order to provide more accessible and useful statistics to all our users.

¹ As part of enhancing and expanding the J-FFA, the BOJ has started release of (1) "From-whom-to-whom data of debt securities and loans" (from September 2011 for debt securities and from December 2013 for loans), (2) "Loans, debt securities, and deposits by maturity" (from December 2013), and (3) "Amounts outstanding of securitized products" (from December 2011). This was done in response to international requests for more detailed statistics on debt securities. For further details, see:

Shuji Kobayakawa and Ryoichi Okuma, "Japan's Flow of Funds Accounts: Main Characteristics and Measures for Enhancement," Bank of Japan Review, No. 2012-E-4, April 2012.

Sayako Konno, "Enhancement and Expansion of Japan's Flow of Funds Accounts in Response to International Recommendations after the Financial Crisis," Bank of Japan Review, No. 2015-E-1, January 2015.

² For further details, see: "Results of Revision to the Flow of Funds Accounts Based on 2008SNA," BOJ Reports & Research Papers, Research and Statistics Department, March 31, 2016.

³ The J-FFA is an important underlying source data for Debt securities and Other financial corporations survey in the Special Data Dissemination Standard Plus (SDDS Plus), the new standard for economic and financial data dissemination established by the IMF, to which Japan has declared its adherence in April 2016.

⁴ Traditionally, guarantees were not regarded as financial assets or liabilities in the SNA due to their contingent nature, that is one or more conditions should be fulfilled for transactions to take place. However, the 2008SNA recommends standardized guarantees, guarantees issued in large numbers for fairly small amounts along identical lines, to be recorded as financial assets and liabilities, since the expected value of calls under guarantees can be estimated rationally by combining a certain amount of cases and since they can be seen as financial transactions similar to insurance transactions. In the new J-FFA, standardized guarantees include not only public credit guarantee programs for companies and individuals, but also loan guarantees for individuals -- of which housing loan guarantees account for a major part -- provided by private financial institutions. This makes it possible to analyze standardized guarantees from a macroeconomic viewpoint.

⁵ Employee stock options are rights given by companies to their executives and employees to purchase existing shares. As part of clarifying their treatment in corporate accounting, the 2008SNA recommends employee stock options to be recorded as income and financial transactions. In the new J-FFA, employee stock options are regarded as compensation paid to executives and employees during the vesting period, and that amount is recorded as financial assets. When recording them as financial assets, given that employee stock options in the vesting period are subject to various requirements -- including the need to continue working up until the vesting date -- they

are recorded in the transaction item "others" and not regarded as financial derivatives. On the other hand, during the exercise period leading up to the expiration date, they are recorded in the transaction item "employee stock options," which is a sub-item of financial derivatives and employee stock options.

⁶ Captive financial institutions are defined as "entities providing financial services, where most of either their assets or liabilities are not transacted in open financial markets." These institutions are classified independently with the aim of including those which have weaker financial intermediation functions than other financial institutions, such as those transacting only within a limited group for financial investment, fund raising, and so forth, even if they externally resemble other financial institutions such as in terms of the balance-sheet structure. When applying this concept to the J-FFA, some financial institutions that would have been classified as "government financial institutions" now fall into the definition of "captive financial institutions." Specifically, these institutions include the Japan Expressway Holding and the Debt Repayment Agency and Japan Finance Organization for Municipalities among others. They are thus separated from "government financial institutions" and included into a new sub-sector of "public captive financial institutions."

⁷ As for public pensions in Japan -- including national pension, employees' pension, and mutual aid pension -- contributions and benefits are not linked, nor are source data needed to calculate pension entitlements sufficiently available. Consequently, public pensions, like the former J-FFA, are excluded from pension entitlements in the new J-FFA as well.

⁸ Since actual payments of funds occur at the same time when the claim-and-obligation relationship is formed for defined contribution schemes, the calculation method for defined contribution schemes in the new J-FFA is the same as that in the former J-FFA.

⁹ Alongside private nonfinancial corporations, claims of pension funds on pension managers are also recorded on the liability side for domestically licensed banks that employ a corporate pension system.

¹⁰ The actuarial calculation of pensions is derived from factors such as working years and wages of employees under a certain formula.

¹¹ Service costs are costs that increase reflecting working years and increased wages since employees in this period have worked one additional term. Interest costs are costs that increase in terms of the discounted present value since the period of future pension payments becomes closer by one term.

¹² Strictly speaking, data are compiled not only from listed companies, but also from some unlisted companies for which data concerning corporate pensions are available.

¹³ In this estimation, the ratio of pension assets to retirement benefit obligations is implicitly assumed to be the same for both listed and unlisted companies. For further details, see: "Results of Revision to the Flow of Funds Accounts Based on 2008SNA," BOJ Reports & Research Papers, Research and Statistics Department, March 2016.

¹⁴ Under the current accounting standard ("Accounting Standard for Retirement Benefits," ASBJ Statement No.25, May 2012), among underfunded pension obligations, there are two types of reserve shortages: one treated as expenses in the profit and loss statements of companies and also as liabilities in their balance sheets; and the other not treated as expenses.

The latter is generally called "unrecognized liabilities." However, whether this term is suitable or not deserves scrutiny. In fact, since it is treated as liabilities as well as net assets (minus) in corporate balance sheets, unrecognized liabilities are

"recognized" as liabilities of companies to be paid to corporate pensions (pension funds).

¹⁵ Stock data for pension entitlements of defined benefit schemes and claims of pension funds on pension managers are provided as reference series on a fiscal-year basis from FY1993 to cater to the needs of users. Figures for these data, however, should be regarded with some latitude as the accuracy for early vintages of these data tends to fall because limited availability of source data.

¹⁶ In this regard, however, the effects on the discounted present value stemming from changes in the discount rate are not reflected in the J-FFA for a certain period of time, during periods when source data needed for calculating pension entitlements are unavailable, the BOJ estimates flows and stocks of pension entitlements on the assumption that the transaction flow is the same amount as the latest term of data available and the amount outstanding of the current term is calculated by adding the transaction flow of the current term to the amount outstanding of the previous term. Users should bear in mind that this period may count seven quarters at the most when analyzing the effects on pensions brought by changes in the financial environment including interest rates.

¹⁷ In addition, retained earnings -- a fraction of income gains that investment trusts keep and reinvest in stocks and bonds instead of distributing them -- are first recorded as distributions to investors and then recorded as reinvestment by investors in the new J-FFA. Annual retained earnings from income gains reached around 1.5 trillion yen between FYs2013-2014.

¹⁸ For further details, see appendix of "Results of Revision to the Flow of Funds Accounts Based on 2008SNA," BOJ Reports & Research Papers, Research and Statistics Department, March 2016.

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