

Compiling statistics of shadow banking

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1. Introduction

Shadow banking has attracted increasing public attention since U.S. subprime mortgage crisis became apparent in the latter half of 2007. During the financial crisis in 2008, many large non-bank financial institutions faced financial difficulties as their values of subprime related assets were impaired sharply. More specifically, Bear Stearns, the U.S. fifth largest investment bank and securities companies were sold to JP Morgan Chase in May 2008. Following September, Lehman Brothers, the U.S. fourth largest investment bank, filed for Chapter 11 bankruptcy protection. Furthermore, AIG, which was the world's largest insurer and was rescued by NY Fed's bailout in order to avoid global catastrophe, exerted significant impacts on the financial market.

After experienced the financial crisis in 2008, public voices stressed the importance of enhancing the monitoring of financial flow outside the banking system, i.e. shadow banking activities, in order to grasp systemic risk beforehand. Paul Krugman, professor of Economics and International Affairs at Princeton University, wrote "One thing financial reform must do, then, is bring non-bank banking out of the shadows" in The New York Times' column on June 18, 2009. In April 2011, in response to the G20's request, the Financial Stability Board (FSB) formed a Task Force in order to develop recommendations to strengthen the oversight and regulation of the shadow banking system by 2011. In October 2011, FSB (2011) developed recommendations to strengthen the oversight and regulation of the shadow banking system.

The Flow of Funds Accounts (FFA) is often used to describe behaviour of sectors in financial market including shadow banking. FSB (2011) recognizes the FFA as a useful source for the broad sweep of the scale and trends of non-bank credit intermediation for an appropriate monitoring process. It conducted a monitoring exercise for eleven nations using the FFA, and analyzed historical movements of sectors such as OFIs (other financial intermediaries). It also reaffirmed the importance of compiling the figures for the breakdown of non-bank financial intermediaries such as insurance companies, structured finance vehicles for more detailed analysis. As a result, the remark has motivated statistics compilers to keep refining FFA data about financial flows outside banking system in particular.

Looking at overview of Japan's shadow banking sector with FFA, OFIs' asset is around 10% of the total financial system while depository corporations' asset has still occupied about a half of the total. The share of OFIs peaked in 2007, and gradually declined at the background of financial crisis. In more details, the breakdown of OFIs with FFA presents "securities investment trusts" and "financial dealers and brokers" sectors have dominant shares. Its share is around 70% of the total OFIs.

The Japan's FFA is regarded as one of the most detailed and comprehensive financial statistics. Although it is supposed to cover all shadow banking entities and their transactions in principle, source data are not always available. The BOJ investigated ways to refine the current estimation methods concerning shadow banking entities. This paper introduces

¹ The views expressed here are those of the authors and do not necessarily represent the views of the Bank of Japan. The authors are responsible for any errors or omissions.

BOJ's recent measures to reflect the rapid changes of financial market specifically in the shadow banking field to the FFA.

Section 2 begins by presenting the revision of investment funds. Section 2.1 illustrates the background of its review and section 2.2 and 2.3 introduce the recent 2 revisions regarding to investment funds: (1) Equity Transaction for Investment Funds, (2) Fund-of-funds. Next, section 3 describes the revision of nonbanks. Section 3.1 illustrates the background of its review, and section 3.2 and 3.3 introduce the recent 2 revisions regarding to nonbanks: (1) Life Insurance, (2) Finance Companies. Section 3.4 sets out the conclusion for the revision of nonbanks. The last section, section 4 concludes this paper.

2. Investment Funds²

2.1. Background

The trend of Investment Funds, which is also called collective investment schemes, has been watched with much interest and concern in the financial market. Investment funds take various structures such as hedge funds, venture capital (VC), private investment funds (Table 1), and adopt different strategies.

Typically, hedge funds have had a huge impact on the financial market. For instance, during the middle of European financial crisis in 1992, Quantum Fund broke the Bank of England, forcing it to leave EMS by betting its entire fund in a short sale of the British pounds on the prediction that its currency would depreciate. In 1998, Long Term Capital Management (LTCM) avoided bankruptcy through the FRB's intervention. Moreover, as the subprime crisis occurred in 2006, hedge funds that had much exposure to subprime-backed securities had suffered significantly.³

In this section, we set out the two revisions of data for investment funds that we conducted recently: (1) Revision of equity transaction for investment funds, (2) Revision of fund-of-funds.

² Investment funds or collective investment schemes pool fund from two or more investors and invest the fund into any business or securities. The investors hold a participatory interest in a portfolio of the funds through shares, units or other form of participatory interest.

³ The amount invested by domestic investors was 7,438 billion yen as of March 31, 2006 based on "Hedge Fund Survey Results (2006)" conducted by Japan's Financial Services Agency (FSA). The breakdown of type of investors shows that 26% was invested by life and non-life insurance companies, 15% by trust banks, 24% by major banks and other banks, 15% by regional banks and 20% by other financial institutions, including cooperative banks. Financial institutions sold a total of 3.0 trillion yen in hedge funds to their clients, of which 23% is to individuals. 53% of hedge funds are launched outside of Japan, mainly in the Cayman Islands. The survey was conducted by sending questionnaires to the 1,252 financial institutions regulated by the FSA, including banks, insurance companies, securities companies, investment trust management companies, etc.

(Table1) Types of Investment Funds

Types	Asset Values of Funds	Main Investing Assets	Overview of Business Operations	Main Investors
Hedge Fund	about 7.4 trillion yen (2006 Fiscal Year End)	General financial asset in a high liquidity	Hedge funds are established under relaxed rules and the main purpose is to obtain the absolute returns while conducting a certain risk-hedge.	Banks, Insurance companies, financial institutions such as trusts are main investors. Some of pension funds, corporations, individuals in a wealthy class also participate.
Activist Fund	--	Posted shares	Activist funds buy posted shares aiming to raise the income gains as shareholders and obtain capital gains through participation in the management and decision making.	Institutional Investors are main players, but some individuals are also participating.
Buyout Fund	3.0 trillion yen (2009 Annual Year End)	Minority interest of shares	A buyout is the purchase of more than 50% of a company's shares and control over the company. It is aiming to receive capital gains through the improvement of company's values.	Mainly Institutional investors are such as pension funds, including foreign investors (Rarely individuals).
Venture Capital Fund	1.9 trillion yen (2006 Fiscal Year End)	Minority equity stake of Venture Enterprise	An investment fund that manages money from investors seeking private equity stakes in startup and small- and medium-size enterprises with strong growth potential. It is aiming to obtain the capital gains by selling stock at IPO after the enterprise's values are heightened by management supports. These investments are generally characterized as high-risk/high return opportunities.	Institutional Investors are main players, but some individuals are also participating.
Content Fund	about a few billion to tens of billion yen	Copyright, Patent Right, etc.	An investment fund invests its funds in content production such as films, games, animated cartoon, etc and obtain intellectual property rights. It is aiming to receive investment returns from business profits.	Industry officials and financial institutions are main investors.
Real Estate Fund	--	Real Estate	Real Estate Fund is aiming to obtain the investment returns from rentals on property owned by them, develop and sell property and capital appreciation on the sale of property.	Institutional Investors are main players.
Commodity Fund	about 400 billion yen (2005 annual year end)	Commodity (commodity goods, futures, options)	Commodity Fund is aiming to obtain the investment returns by investing its funds mainly into commodities.	Individuals, corporations.
Other Funds (Emission Rights Funds, Wine Funds)	Unknown	Various Assets	Other Funds are aiming to secure profits by investing its funds into possible assets to produce economic benefits.	Unknown

Source: Financial Services Agency, Venture Enterprise Center

2.2. Equity transaction for Investment Funds

2.2.1. Coverage of the Investment Funds

Investment Funds usually take one of the forms on Table 2, i.e. investment trusts, trusts, SPC and kumiai (i.e. partnerships or unincorporated cooperatives).

Currently Japan's FFA captures fund raising and financial investment by "Investment Trusts", "Trusts" and "Special Purpose Companies (SPC)" sectors in both flow and stock bases.⁴ Source data for those forms of investment funds are included in existing statistics compiled by industrial associations and a central securities depository.

⁴ In the FFA participation into the funds are recorded as "Investment trust beneficiary certificates", and "Structured-financing instruments" transaction items.

(Table2) Forms of Collective Investment Scheme

	Main Forms	Main Investment Assets	Sectors in the FFA	(Reference) Treatment in Financial Instruments and Exchange Law
Investment Trusts	Securities Investment Trusts Real Estate Investment Trusts Investment Corporation	Securities Real Estate	Securities Investment Trusts	Securities
Kumiai	Nini-Kumiai (Associations) Tokumei-Kumiai (Anonymous Associations) LPS (Limited Partnership) LLP (Limited Liability Partnership)	Unrestricted *Exceptions: LPS's investment is restricted to shares, etc.	Not Specified **Outward / Inward Portfolio Investment Securities" in the Balance of Payments includes deemed securities.	Some securities that fill a certain requirement are deemed securities
Trusts	Trusts	Property Rights in general Money, Securities, Monetary Claims, Personal Estate, Real Estate, Intellectual Property Rights, etc.	Collectively Managed Trusts *Consolidated with the original investing entities SPC·Trusts	Securities or Deemed Securities
SPC	SPC	Monetary Claims, Real Estate, etc. *Includes equity investment in a partnership agreement and excludes beneficial interest in Money Trusts	Structured-Financing Special Purpose Companies and Trusts	Securities

2.2.2. Data availability for Kumiai (unincorporated cooperatives)

Several types of domestic kumiai are used for investment funds. Typical structures include the follows: (1) nini-kumiai (Associations), (2) limited partnership (LPS), (3) limited liability partnership (LLP), and (4) tokumei-kumiai (Anonymous Associations). (Table 3).

(Table3) 4 types of Kumiai used for Collective Investment Scheme

	Nini-Kumiai (Associations)	LPS (Limited Partnership)	LLP (Limited Liability Partnership)	Tokumei-Kumiai (Anonymous Associations)
Laws to authorize	Civil Code	Limited Partnership Act for Investment	Limited Liability Partnership Act	Commercial Code
Constituent Members	General partners	- General partners - Limited partners	All LLP partners have limited liability.	- Manager - Anonymous Partners
Contract	Agreement among partners	Agreement among partners	Agreement among partners	Bilateral agreement between manager and anonymous partners.
Scope of Business Operations	No restrictions	Business pertaining to investments. Business activities are stipulated in the Act.	There are certain restrictions*.	No restrictions
Liability	All partners have unlimited liability.	-General partners have unlimited liabilities. -Limited partners have limited liabilities.	All partners have limited liabilities.	- Managers have unlimited liabilities. - Anonymous partners have limited liabilities.
Corporate Entity	No	No	No	No
Tax Treatment	pass-through entities	pass-through entities	pass-through entities	pass-through entities

*eg. Businesses that could incur liabilities exceeding the amount of capital of a LLP cannot be undertaken.

Reliable source data for kumiai's domestic transactions are difficult to obtain. Their domestic transactions are not captured as for other forms of investment funds. Kumiai can be set up wherever a contract among members exists and financial statements are neither disclosed nor filed to authorities.⁵

On the other hand, Japan's FFA captures kumiai's cross border transaction flows. It is included in "Outward / Inward Portfolio Investment" in Balance of Payments statistics, which is used as one of source data of Japan's FFA (Table 4). Data for cross-border's transactions by kumiais are submitted to the BOJ as required by Foreign Exchange and Foreign Trade Act.

(Table 4) Transaction Items in FFA for the Cross-Border's Transactions by Kumiai

Transaction Items in FFA	From-Whom-to-Whom	Source Data
Outward investments in securities	domestic kumiai to overseas	Outward / Inward Portfolio Investment in Balance of Payments
Shares and other equities	overseas investors to domestic kumiai	Outward / Inward Portfolio Investment in Balance of Payments

Two issues need to be considered with regard to the cross-border's transactions by kumiai (Table 5):

- (1) Is it appropriate to compile the outstanding amounts of kumiai's equity investment?
- (2) Are there any rooms to refine the estimation method of the flow data for kumiai's equity investment?

(Table 5) Cross-Border's Figures for Kumiai's Equity Investment

	FFA	Issues
Stock Data	×	Is it appropriate to add the outstanding amounts of kumiai's equity investment to FFA?
Flow Data		Are there any leeway for further improvement in estimation method?

2.2.3. Revision of flow data for Kumiai

In the FFA, capital investment from overseas' investors to domestic sectors are included in "Shares and other equities" item. The item is defined as the sum of "Of which: shares", i.e. listed shares, and other types of equities such as unlisted and participating shares. Prior to the revision, the FFA recorded the same data on both items due to the limited availability of source data.

⁵ Kumiai is not required to register under Financial Instruments and Exchange Law in case it conducts private placement for qualified institutional investors, etc.

By this revision, we started to apply new source data, i.e. statistics for listed shares compiled by Tokyo Stock Exchange, to item “Of which: shares”. We also apply Balance of Payments data, which include all types of shares, to item “Shares and other equities”. The revision made it possible to take the difference between the two items “Shares and other equities” and “Of which: shares”. The difference includes investment in Kumiai or unincorporated cooperatives.

2.2.4. Remaining task

The source data of outstanding amount of cross border transactions, i.e. International Investment Position (IIP) does not include Kumiai’s stock data. When the Balance of Payments statistics starts to include stock figures of Kumiai’s equity investment in future revision, then the FFA will also be able to reflect that data. So far our sample study suggested that accumulated amount of transaction flows of Kumiai would be minimal.

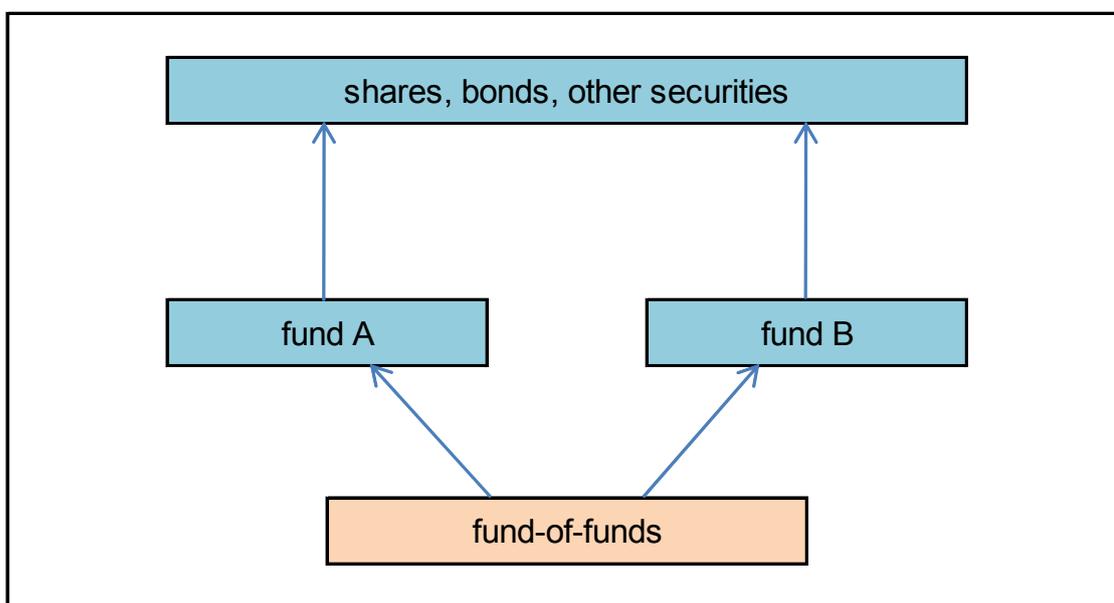
2.3. Fund-of-funds

2.3.1. Definition of fund-of-funds

“Fund-of-funds (here after FOFs)” is investment funds which invest in other investment funds instead of investing in securities directly (Chart 1). Thus FOFs diversifies their portfolio effectively. They are classified as “Stock investment trusts” sector in Japan’s FFA.⁶ Total net assets of FOFs increased rapidly in recent years.⁷

(Chart 1)

Example of fund-of-fund’s structure



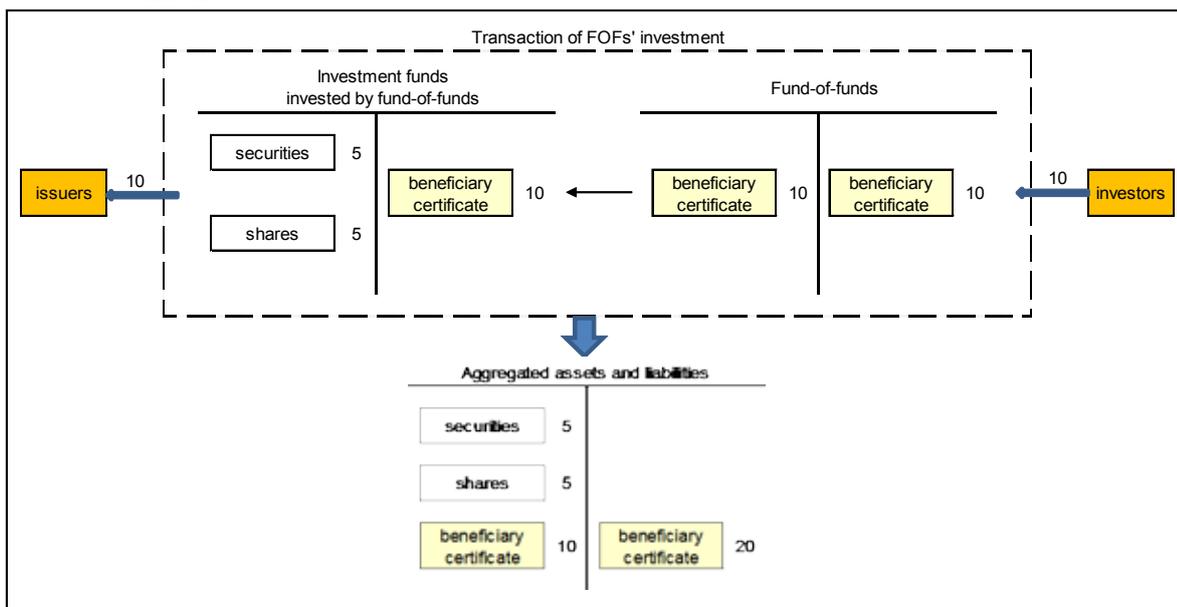
⁶ “Stock investment trusts” sector is classified as a subsector within “Securities investment trusts”. The investment trusts can include stocks as investment targets. Even those investment trusts whose primary investment targets are bonds and short-term money market instruments are assigned in this category if they can include stocks to some extent.

⁷ As of the end of March 2003, the total net assets of FOFs (publicly offered) was 481 billion yen. As of the end of March 2012, that has increased up to 22 trillion yen.

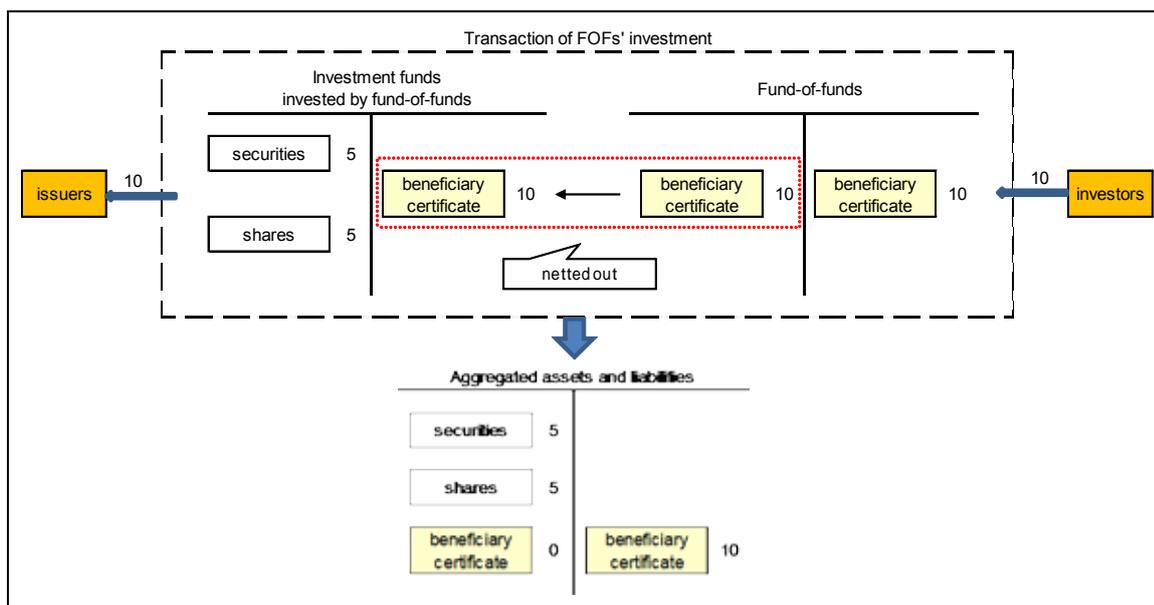
2.3.2. Treatment of fund-of-funds

In the framework of FFA, FOFs' investments are regarded as intra-sector transactions. In principle, Japan's FFA records both intra- and inter-sector transactions on gross basis. The principle, however, is not applied to the treatment of FOFs. FOFs is one of collective investment schemes and plays a role as a financial intermediary, which raises funds and holds financial assets as an investment. To record its activities vis-à-vis other sectors and to avoid double-counting of the same source of fund, we do not apply the principle and cancel intra-sector transactions in the FFA (Charts 2 and 3).

(Chart 2) Aggregated assets and liabilities of FOFs' investment



(Chart 3) How to compile FOFs' investment in the FFA



2.3.3. Fund-of-funds data

In the recent revision, we adopted new source data and estimation methods for FOFs' investment, which is deducted from the assets and liabilities of "Stock investment trusts" sector. The amount deducted is the sum of investment trust beneficiary certificates held by publicly offered FOFs and privately placed FOFs. Estimation process is as follows.

The amount of beneficiary certificates held by FOFs can be obtained from the data released by the Investment Trusts Association.⁸ The source data for publicly offered FOFs cover beneficiary certificates issued by both domestic and overseas investment funds. We estimate the amount of beneficiary certificates issued by domestic funds by using the ratio of domestic funds to the total amount,⁹ which can be calculated based on the BOJ's research.

Then the sum of the figures calculated as stated above is deducted from the assets and liabilities of "Stock investment trusts" sector.

2.3.4. Impact on the outstanding amounts

The data and estimation method above are applied from the data for the end of March 2004.

As a result of the above-mentioned revision, the amounts of "Investment trust beneficiary certificates" issued by "Stock investment trusts" sector, from which investment of FOFs are deducted, were revised upward.

As its secondary impact, the amounts of "Investment trust beneficiary certificates" held by "Household" and "Private nonfinancial corporations" sectors were also revised.^{10, 11}

3. Nonbanks

3.1. Background

"Finance companies" sector in the FFA includes institutions that raise funds by methods other than deposits and deposit-like instruments and make investments through lending or similar activities. As the number of money lending companies, i.e. main players in "Finance companies" sector, decreased sharply in recent years due to the change in the legislation of

⁸ Data for holding by publicly offered FOFs: "Benefiting Certificate" and "Investment Securities issued by Investment Companies" held by Stock Investment Trust in "*Distribution of Assets of Publicly Offered Investment Trusts of Contractual Type*". Data for privately placed FOFs: Total net assets (excludes the amount invested in FoFs) of Privately Placed Stock Investment in "*Changes in Assets of Privately Placed Investment Trusts*".

⁹ "Securities investment trusts" sector in the FFA does not include overseas investment trusts (investment trusts established overseas). When domestic FOFs acquire or dispose of overseas funds, they are treated as "Outward investment securities". Thus only domestic FOFs' investment in domestic investment funds corresponds to a double counting and needs to be identified for deducting.

¹⁰ Revision of publicly offered FOFs' investment affects the holding amount of "Households". In the FFA, "Investment trust beneficiary certificates" held by the "Household" sector are estimated on the assumption that all small scale publicly offered investment funds are held by retail investors. More specifically, holding amount of "Household" is estimated to be equal to the issued total of small scale publicly offered investments funds. Almost all publicly offered "Stock investment trusts", from which publicly offered FOFs' investment is excluded, are small scale. Therefore this revision affects the amount of investment funds held by "Households".

¹¹ Revision of privately placed FOFs' investment has an impact on the holding amounts of "Private nonfinancial corporations". Privately placed stock investment funds are supposed to be owned by institutional investors. Holding amount of "Private nonfinancial corporations" sector is estimated as residuals by deducting holding amount of other sectors from the issue total of "Securities investment funds", from which FOFs' investment are excluded. Consequently, this revision affects the amount of investment funds held by "Private nonfinancial corporations".

money lending industry, it became more likely that we cannot (or will not be able to) grasp the actual situation of this industry without revising our estimation method. Therefore we reconsidered estimation methods. Also as shadow banking attracted more public attention after the financial crisis, we considered whether we could add extra data of shadow banking to the FFA.

3.2. Life Insurance

Life insurance companies are large institutional investors and play an important role in financial flow outside the banking system. Their investment strategy is different from other sectors. They tend to hold long-term bonds to match assets' maturity to that of liabilities, i.e. life insurance contracts.

3.2.1. Transaction flow data

In the FFA, transaction flow is recorded separately from changes in price and in definitions etc. We calculate transaction flows of bonds held by life insurance companies by taking term-on-term difference of the outstanding amounts on a book value basis.

This raises an issue of discrepancy in evaluating values of bonds between financial statistics and financial statements. In financial statements, bonds are evaluated on various evaluation methods depending on the purpose of holding. Typical evaluation methods include market value method, historical cost method, and amortized cost method.¹² Among those, only historical cost method¹³ is consistent with the definition of transaction flow in the FFA.¹⁴

In the revision, we replaced financial statements data, from which we previously estimated book values, with the aggregated data of life insurance companies' assets on a book value basis. The new source data are based on book-keeping journals that apply historical cost method to the evaluation of bonds.

3.2.2. Stock data

In the FFA, amount outstanding is recorded on a market value basis. Previously we calculate the market value of bonds held by life insurance companies by multiplying the amount outstanding on a book value basis by market price indices. The method was not accurate enough to measure the market value because market price indices are the weighted average of market prices of constituent bonds. Compared to the market average, life insurance companies tend to hold long-term bonds. The accuracy of the previous method is lost further when the slope of yield curve changes.

In this revision, the method of using market price indices was abandoned. Instead, we adopted the summary data of investment bonds on a market value basis, which are calculated separately from financial statements. In the data, bonds held by each life insurance are aggregated, and all marketable securities are completely evaluated on a market value basis.

¹² Which evaluation methods are applied is dependent on the property of the purpose of holding of the securities. In principle, "trading securities" and "other securities" are evaluated on a market value method, and "securities to be held until maturity" are evaluated on an amortized cost method.

¹³ Historical cost is the price of assets based on original cost when they are acquired by company.

¹⁴ For transaction flows of "Shares" and "Outward investments in securities", on the other hand, appropriate figures can be estimated with existing method. Therefore, this revision does not apply to transaction flows of them. Specifically, transaction flow of "Shares" are estimated based on the data for trading in the Stock Exchange market (*the Trading Volume & Value by Types of Investors*), and transaction flow of "outward investments in securities" is estimated by using the data of outward portfolio investment by type of investors (*Balance of Payments Statistics*).

3.2.3. Impact of the revision

The data were revised retroactively from the end of March 2009. Major impacts of this revision are as follows.

The outstanding amounts of “Central government securities and FILP bonds” and “Investment trust beneficiary certificates” held by “Life insurance” were revised upward. As its secondary impact, the holding amounts of residual sectors were also revised. For “Central government securities and FILP bonds”, the holding amount of “Domestically licensed banks” decreased. Regarding “Investment trust beneficiary certificates”, the holding amount of “Private nonfinancial corporations” also decreased.

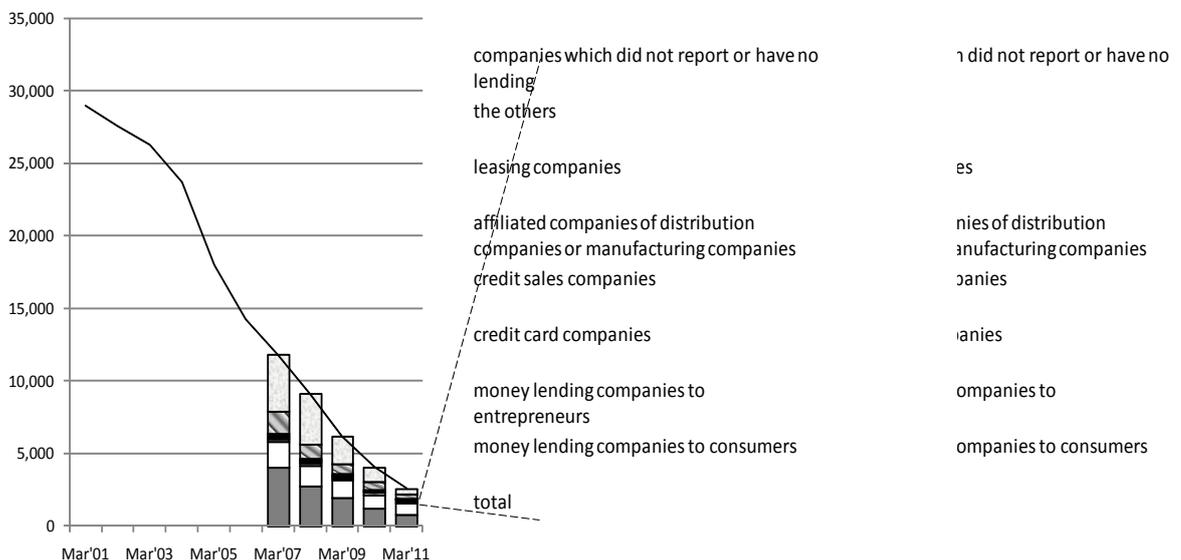
3.3. Finance companies

3.3.1. Money lending companies

Money lending companies are the main players in “Finance companies” sector. Their number decreased sharply in recent years because the regulation on lending conditions was strengthened by the amendment of Money Lending Business Act. The number of companies decreased from 28,986 at the end of March 2001 to 2,589 at the end of March 2011 (Chart 4). The amount of lending by money lending companies also decreased from 45 trillion yen at the end of March 2001 to 26 trillion yen at the end of March 2011 (Chart 5). The changes in the industry forced us to check the robustness of the previous compilation method that was based on estimation from sample data.

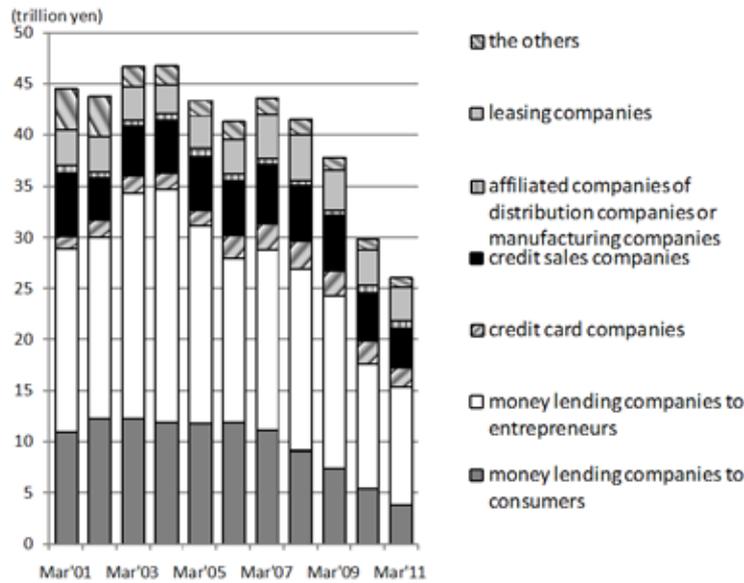
(Chart 4)

Transition of Number of Companies



(Chart 5)

Transition of Amounts of Lending



Source of Chart 4 and 5: Financial Services Agency, "Data on Money Lending Industry"

The outstanding amount of each transaction item in the FFA is estimated by using outstanding amounts of loans of the whole money lending industry (*"Outstanding amounts of loans by each classes"* published by the Financial Services Agency). The estimation method of whole balance sheets of money lending companies before revision was based on the six categories of money lending companies that were set up by Financial Services Agency (FSA): (1) money lending companies to consumers, (2) money lending companies to entrepreneurs, (3) credit card companies, (4) credit sales companies, (5) affiliated companies of distribution companies or manufacturing companies, and (6) leasing companies. For each category we take the ratio of sample companies to all companies in terms of loan outstanding and apply it to other transaction items to estimate the whole balance sheet of the category. The sum of six categories' balance sheet presents the whole balance sheet of money lending companies.

Our revision of compilation method focused on the estimation procedure using samples. Evidence suggested that enough number of samples could not be maintained to make robust estimation due to the decreased number of companies in the industry. In some categories all sample companies ceased operations. Then we checked whether the six categories could be reclassified and reduced with little impact on estimation by combining those with common factors. As a result we combined "(3) credit card companies" and "(4) credit sales companies" and "(5) affiliated companies of distribution companies or manufacturing companies", all of which conducted sales credit business.

The reclassification was reinforced by the increased number of sample companies. The added samples were about 160, which had not been used fully in estimation because limited items were available. Our latest study about the characteristics of the samples also suggested that their balance sheet composition was not significantly different from those in use. The finding led us to add the samples.

(Table 6)

Classes Before / After Revision

Before Revision		After Revision	
	No. of sample		No. of sample
(1) money lending companies to consumers	8	(1) money lending companies to consumers	12
(2) money lending companies to entrepreneurs	7	(2) money lending companies to entrepreneurs	21
(3) credit card companies	1	(3+4+5) credit card companies, credit sales companies, and affiliated companies of distribution companies or manufacturing companies	78
(4) credit sales companies	5		
(5) affiliated companies of distribution companies or manufacturing companies	6		
(6) leasing companies	7	(6) leasing companies	82

3.3.2. Venture capital

As increasing attention was paid to financial flow outside the banking system, i.e. shadow banking, we worked on extending the data coverage of “Finance companies” sector. In particular, source data were found available for “venture capital”. The market size of venture capital was also relatively large (about 1 trillion yen in 2011). We classified it as “Financing companies” in the FFA. Note that 2008SNA suggests that the principal part of venture capital belongs to “Specialized financial corporations” and the venture capital fund part belongs to “Captive financial institutions and money lenders” or “Non-MMF investment funds”, but Japan’s FFA has not moved to 2008SNA yet.

Source data include “*Survey Results on Trends in Venture Capital Investment*” published by the Venture Enterprise Center and the financial statements of listed companies.

3.3.3. Impact on outstanding amounts

By revising the estimation method of the money lending company, the amounts of loans on the assets/liabilities side of “Finance companies” sector turned out to be overestimated and were revised downward. The amounts of bond issues (Industrial securities mainly) and bond possessions (Commercial paper and Industrial securities mainly) by this sector turned out to be underestimated and were revised upward. And by adding venture capital, the amounts of Shares and other equities increased.

3.4. Conclusion for revision of nonbanks

In the revisions of “Life insurance” sector and money lending companies of “Finance companies” sector, we encountered typical issues that statisticians have to solve when they compile financial statistics.

Selection of source data for life insurance companies involved discrepancies between statistics and accounting standards. Primarily we need to rely on accounting data that are disclosed and are readily available. In order to evaluate financial assets more accurately, we were required to go beyond accounting data, under which different evaluation methods are applied to bonds according to the types of holding purposes. With a cooperation of reporters we were able to obtain appropriate data for statistics, i.e. book value data for transaction flow and market-to-market data for amount outstanding.

The robustness of estimation is vulnerable to sample size. When the number of samples for “Finance companies” sector decreased, we checked whether we could improve stratification process. We scrutinised common factors of each group of samples and found that we could combine some groups to enlarge sample size. Further we utilised existing sample data more efficiently.

4. Concluding remarks

This paper introduced BOJ’s recent attempt to reflect the rapid changes of financial market with a focus on the shadow banking field. As a result the FFA now shows financial flow outside banking system more accurately. We will continue examining the ways to improve estimation accuracy of the FFA to make it more useful for its users.

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