Securitization of Loan Assets and the Macroeconomy[1]

A paper prepared for the 14th Conference of the Research Network Macroeconomics and Macroeconomic Policies (FMM), Macroeconomic Policy Institute (IMK) at the Hans Böckler Foundation, Berlin, 29-30 October 2010.

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Abstract: The global financial meltdown triggered by the subprime mortgage crisis in the US can never be considered without reference to the difference between the traditional "originate to hold" model of financial intermediation, where loan assets are held by banks until they mature, and the "originate-to-distribute" model (often referred to as the market-based indirect finance), which is based on the securitization of loan assets. This paper examines how the evolution of a financial system affects the macroeconomy, from the perspective of the shifts in the flow of funds among institutional sectors that arise from the securitization of loan assets, with special attention to the following three points: firstly, the securitization of loan assets and the resulting shifts in the flow of funds among institutional sectors; secondly, the relationship between the securitization of loan assets and the liquidity preference of banks; thirdly, how the shift from the traditional system of financial intermediation to the market-based indirect finance has affected economic policies.

Key words: securitization, liquidity preference, balance sheets

[1] The author acknowledges the financial support of the Grants-in-Aid for Scientific Research (#22530194) provided by the Japan Society for the Promotion of Science.

1. Introduction

The global financial meltdown triggered by the subprime mortgage crisis in the US cannot be discussed without making reference to the differences between the traditional "originate-to-hold" model of financial intermediation, where loan assets are held by banks until they mature, and the "originate-to-distribute" model (often referred to as market-based indirect finance), which is based on the securitization of loan assets. It has often been argued that the relationship-based or bank-centered financial system should evolve into a market-based indirect financial system, in reflection of the Japanese economy's experience since the 1980s, including the credit expansion in the bubble economy of the late 1980s, the collapse of asset prices since the early 1990s and the resulting nonperforming loans in the banking sector, and the financial crisis in the late 1990s.[2] This paper aims to provide basic perspectives on how the evolution of the financial system affects the macroeconomy. It does this by focusing on the shifts in the flow of funds among institutional sectors that arise from the securitization of loan assets.

As will be shown later, the securitization of loan assets involves at least four institutional sectors of the economy: the debtors (e.g., borrowers of mortgage loans); the originators of loan assets, namely, the original creditors such as banks and mortgage companies; the securities-issuing institutions such as the special purpose vehicles (SPVs) and the structured investment vehicles (SIVs), which purchase loan assets from the original creditors (banks) and issue the securities backed by those loan assets; and the investors who purchase and hold those asset-backed securities. Banks (the original creditors) sell part of their loan assets to the SPVs (the securities-issuing institutions), and the SPVs issue the securities backed by those loan assets. The asset-backed securities are purchased and held by the investors. As is well known, in the US, the two government-sponsored enterprises (GSEs), the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac), were the leading institutions that purchased the mortgage loan assets from the financial institutions and issued the residential mortgage-backed securities (RMBS) backed by those loan assets.

In July 2007, the rating agency Moody's downgraded 399 residential mortgage-backed securities due to higher rates of delinquency on the subprime mortgage loans,[3] which triggered a collapse in the prices of the residential mortgage-backed securities backed by subprime mortgage loans and a widening spread between the interest rates on RMBS and the base rate (e.g., the

[2] For more details on the Japanese financial crisis in the late 1990s and the consequent restructuring in the financial sector, see Ishikura (2007) and Ishikura (2008).

[3] See also the article from Reuters news service, "Moody's cuts 399 mortgage bonds, most tied to subprime" (on July 10, 2007: http://www.reuters.com/article/idUSN1036971). For the rates of delinquency on mortgage loans and for housing prices in the US since 2006, see Bank of Japan (2008), p.38.

London Interbank Offered Rate [LIBOR]).[4]

The subprime mortgage crisis in the US has to do with not only the securitized products backed by financial claims, including mortgage loan claims, nonrecourse loan claims, credit card claims, and account receivables, but also with the resecuritized products (such as the collateralized debt obligations [CDOs]) that are issued backed by the RMBS and other asset-backed securities. It is more difficult to estimate the likelihood of the repayment of interest and principal on the underlying claims in the case of resecuritized products than in the case of securitized products. Since July 2007, when the prices of RMBS backed by subprime mortgage loans collapsed, it has been more difficult to conclude deals for resecuritized products such as CDOs,[5] resulting in a widening spread between the interest rates on resecuritized products and the base rate (e.g., the LIBOR).[6]

The collapse in the prices of securitized and resecuritized products backed by subprime mortgage loans led not only to turmoil in financial markets worldwide but also to a decline in employment and production in most economies, through consequences such as the financial distress of institutions that issued securitized products, the erosion of the balance sheets of financial institutions that held those securitized and resecuritized products, and funding problems in the short-term financial markets. Following the US government's decision to bail out the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) under its control on September 7, 2008, and following Lehman Brothers' filing for Chapter 11 bankruptcy protection on September 15, 2008, the world financial crisis and the subsequent economic downturn became deeper.

The "originate-to-distribute" model of financial intermediation was expected to "develop securitization markets and promote efficient transfer/allocation of credit risk by providing various securitized products that meet investors' risk preferences,"[7] with the effect of diversifying credit risks through the securitization of loan assets. However, in the case of securitized products backed by subprime mortgage loans, the "originate-to-distribute" model of financial intermediation failed to segregate the credit risks of the underlying claims from the balance sheets of financial institutions. In fact, after the collapse in the prices of securitized products backed by subprime mortgage loans in July 2007, some of the securities-issuing institutions (such as SPVs, SIVs, and the conduit for asset-backed commercial papers) faced financial difficulties and drew on "back-up

[4] For the spread on the interest rates on RMBS and the LIBOR from 2006 to 2007, see Bank of Japan (2008), p.40.
[5] See Bank of Japan (2008), p.39.
[6] For the spread between the interest rates on the CDO, which was issued and backed by asset-based securities in the US, and the base rate (LIBOR) from 2006 to 2007, see "Chart II-2-1" on p.39 of Bank of Japan (2008).
[7] Bank of Japan (2008), p.45.

liquidity facilities provided by their sponsoring banks."[8] However, some of the underlying loan claims that their originators (banks or mortgage companies) had once sold to the securities-issuing institutions (e.g., SPVs) were repurchased by the same originators to be put back on their balance sheets; this process was referred to as "reintermediation of risk."[9]

As is suggested by these cases related to the subprime mortgage crisis, it is necessary to investigate the structure of the "originate-to-distribute" model of financial intermediation, which has been considered as a feasible alternative to the traditional "originate-to-hold" model of financial intermediation. This paper examines how the securitization of loan assets affects the flow of funds among institutional sectors, and it provides some perspectives on how the "originate-to-distribute" model of financial intermediation impacts the structure of the macroeconomy[10].

The remainder of this paper is organized as follows. Section 2 shows that the securitization of loan assets allows illiquid loan assets on the balance sheets of banks to be converted into more liquid assets, such as cash or reserves, thus extending flexibility in the banks' management of their assets, using the simplified balance sheet of the "originate-to-distribute" model of financial intermediation. Section 3 shows that the securitization of loan assets requires liquidity of securitized products in the financial markets and investigates the institutional practices that help investors to acquire those securities as stores of value. Section 4 examines the process of endogenous money supply in the financial system with the securitization of loan assets, using balance sheets by institutional sector. Section 5 presents the paper's findings and their implications, and it concludes with preliminary comments on how the securitization of finance will impact economic policies.

2. Securitization of loan assets and the flow of funds

This section shows that the securitization of loan assets allows illiquid assets (i.e., loan assets) on the balance sheets of banks to be converted into more liquid assets like cash or reserves, thus extending flexibility in the banks' management of their assets, using the balance sheets of two models of financial intermediation: the traditional "originate-to-hold" model and the "originate-to-distribute" model.

Twinn (1994) examined how the capital adequacy rules affected the banks' decision to securitize loan assets in the case of the "on-balance sheet securitization," where the banks

[8] Bank of Japan (2008), p.50.
[9] Bank of Japan (2008), p.51.
[10] This paper is also an attempt to extend the perspective of Chick (1986) regarding the relationship between the evolution of the banking system and the theory of saving, investment and interest to the present stage of financial system.

originate loans and issue asset-backed securities backed by those loans, using a model based on the profit-maximizing behavior of the banks.[11] However, the "on-balance sheet securitization" case examined in Twinn (1994) cannot explain the "originate-to-distribute" model of financial intermediation (i.e., the "off-balance sheet securitization") where the loan claims originated by the banks are purchased by the securities-issuing institutions, which then issue asset-backed securities backed by those loan claims. Fukaura (2003) extended the analysis performed by Twinn (1994) to compare the following three models of financial intermediation: the traditional "originate-to-hold" model of financial intermediation, where banks hold loan claims until they mature; the "on-balance sheet securitization" model, where the securities backed by loan claims are issued by the banks that originated them; and the "originate-to-distribute" (the "off-balance sheet securitization") model of financial intermediation, where the loan claims originated by the banks are purchased by the securities-issuing institutions (e.g., the SPVs) which then issue the securities backed by those loan claims.[12] Table 1, following the illustration by Fukaura (2003), shows simplified balance sheets for the institutional sectors in the following three models of financial intermediation: (1) the traditional "originate-to-hold" model of financial intermediation with the banking sector and the remaining sectors; (2) the "on-balance sheet securitization" model of financial intermediation with the banking sector and the remaining sectors; and (3) the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation with four institutional sectors, namely, banks, SPVs, households, and firms. Figures in the table may be denominated in any currency (e.g., billion euros, billion dollars, and trillion yen).[13]

[Table 1 to be inserted here]

In the set of balance sheets for the traditional "originate-to-hold" model of intermediation, the asset column of the banking sector contains the government bonds (G) [10] and the loans (L) [90], and the liability column of the banking sector contains the deposits (D_0) [90] and the capital (K) [10]. Corresponding to the deposits in the liability column of the banking sector, deposits (D_0) [90] are listed in the asset column of the remaining sectors, and corresponding to the loans in the asset column of the banking sector, liabilities to the banks (L) [90] are listed in the liability column of the remaining sectors.[14]

In the set of balance sheets for the "on-balance sheet securitization" model of financial intermediation, the banks issue the securities (S) [20] backed by a part of the loan claims (L) [90]

[11] See also "Modeling the decision to securitize" in Twinn (1994), p.143.
[12] See Fukaura (2003), pp. 83-84.
[13] For simplicity, Table 1 considers neither the required reserve ratio nor the prices of securitized products.
[14] The balance sheets for the traditional "originate-to-hold" model and the "on-balance sheet securitization" model are based on "Figure 6-2" on p.89 of Fukaura (2003).

that they originate, and the remaining sectors (i.e., investors) withdraw part of their deposits to purchase those securities. Following a shift from the traditional "originate-to-hold" model to the "on-balance sheet" model of financial intermediation, the loan claims (*L*) [90] remain in the asset column of the balance sheet of the banking sector, and a part of the deposits is replaced by the securities both in the liability column of the balance sheets of the banking sector and in the asset column of the remaining sectors. In the "on-balance sheet securitization" model of financial intermediation, the loan claims originated by the banks remain in the asset column of the banking sector without being sold to the securities-issuing institutions, unlike in the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation.[15]

In the set of balance sheets for the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation, a part of the loan claims (*L*) [90] originated by the banks in the balance sheets for the traditional "originate-to-hold" model, namely, the loan claims (L_s) [20], is sold to the SPVs, and the SPVs issue the securities (*S*) [20] backed by the loan claims purchased from the banks (L_s) [20]. The households withdraw a part of their deposits to purchase the securities (*S*) [20]. The SPVs hold the proceeds from the sale of the securities as the deposits (D_s) [20]. The banks are assumed to hold the proceeds from the sale of loan claims as cash (*C*) [20]. Following the securitization of loan assets, a part of the liabilities of nonfinancial firms to the banks is replaced by their liabilities to the SPVs in the liability column of the nonfinancial firms. The liabilities of the remaining sectors to the banks (*L*) [90] in the traditional "originate-to-hold" model of financial intermediation equal the sum of the firms' liabilities to the banks (L_b) [70] and the firms' liabilities to the SPVs (L_s) [20] in the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation.[16]

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[15] The "on-balance sheet securitization" model of financial intermediation is exemplified by the covered bonds prevalent in the European bond markets. The basic scheme of the covered bonds is described as follows: "In contrast to securitizations, in case of covered bonds, the assets are usually on the balance sheet of the issuer." (European Covered Bond Council 2010, p.84); "A Covered Bond provides funding to a depository institution ("issuer") that retains a Cover Pool of residential mortgage assets and related credit risk on its balance sheet." (United States Department of the Treasury 2008, p.7). Regarding the difference between covered bonds and mortgage-backed securities, it should be noted that "Covered Bonds provide dual recourse to both the Cover Pool and the issuer, and the overcollateralization of the Cover Pool helps to mitigate the risk that investors would receive less than par in the event of an issuer default" (ibid.).

[16] The balance sheets for the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation in Table 1 are based on "Figure 6-4" on p.92 of Fukaura (2003). In that figure, the loan claims purchased by the SPVs from the banks are not listed in the asset column of the balance sheet for the SPVs, but the deposits of the SPVs ("*Ds* [20]") are listed in the asset column and the securities ("*Ss* [20]") are listed in the liability column in the balance sheet for the SPVs. The author of this paper added the loan claims (L_s) [20] to the asset column of the balance sheet for the SPVs in the figure on p.92 of Fukaura (2003) and the net worth (NW_s) [20] that corresponded to the proceeds from the sale of the securities to the liability column in the same balance sheet. Following the figure by Fukaura (2003), the tangible assets (*P*) [90] are listed both in the asset column in the balance sheet for the firms and in the liability column in the balance sheet for the households. In most of the balance sheets for institutional sectors, the machinery, equipment, and buildings used in production

Following the shift from the traditional "originate-to-hold" model to the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation, the outstanding deposits remains unchanged in the liability column of the banking sector. The deposits (D_0) [90] in the liability column of the banking sector in the traditional "originate-to-hold" model equal the sum of the deposits of households (D_h) [70] and the deposits of the SPVs (D_s) [20] in the liability column of the banking sector in the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation. Following the securitization of loan assets, a part of the illiquid assets (i.e., the loan claims originated by the banks) can be replaced by the most liquid assets (i.e., cash) in the asset column of the banking sector. The loan claims (L) [90] in the asset column of the banking sector in the traditional "originate-to-hold" model of financial intermediation equal the sum of the cash (C) [20] and the loan claims to firms (L_b) [70] in the asset column of the banks in the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation.[17]

A comparison of the balance sheets for the three models of financial intermediation shows that the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation has the following properties: in the asset column of the banking sector, a part of the illiquid assets (i.e., the loan claims originated by the banks) can be converted into the most liquid assets (i.e., cash or its equivalent), thus extending flexibility in the banks' management of their assets, with the outstanding deposits in the liability column of the banking sector remaining unchanged. This is on the condition that a part of the loan claims originated by the banks is sold to the securities-issuing institutions (such as the SPVs) and that the securities backed by those loan claims are issued and then purchased by the investors.[18]

It should be noted that banks' loan claims can be transformed into more liquid assets such as cash or its equivalent only when the securities backed by those loan claims are issued by the SPVs

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activities are listed both as tangible assets in the asset column and as net worth in the liability column in the balance sheet for the sector of tangible assets. In the figure by Fukaura (2003), the balance sheet for the sector of tangible assets and that for the non-financial sectors (i.e. households and firms) can be considered to be consolidated.

[17] The cash in the asset column of the banking sector in Table 1 corresponds to the "cash and due from banks" listed in the asset column of the balance sheets for the banks.

[18] The interpretation that the securitization of loan assets extends flexibility in the bank's management of its assets owes to the following remarks by Fukaura (2003): "the off-balance sheet securitization is the financial method to provide the originators of the underlying loan claims with opportunities for more profitable asset management by transforming the underlying claims into the new money. The bottom line is that the off-balance sheet securitization extends the discretion of the originators on their asset management (namely, converting the underlying loan claims into more liquid assets such as the "new money"), with the structure of liabilities remaining unchanged." (p.98 of Fukaura 2003), originally in Japanese, translated into English by the author of this paper). The "new money" referred to in the above quotation is the "cash and due from banks" that was converted from a part of the loan claims in the asset column of the banks' balance sheets through the sale of those loan claims, rather than the deposits that are created by the banks' new loans.

and those securities are purchased by the investors. In case the loan claims originated by the banks are sold to other institutions without the issuance of securities backed by those claims, the illiquid assets (i.e., the loan claims) can never be converted into more liquid assets (i.e., cash or its equivalent) in the asset column of the banks' balance sheets. To see this point, consider the changes in balance sheets in the case of the banks' loan claims being purchased by the asset-purchasing entities. Table 2 illustrates the balance sheets for the banks and the asset-purchasing entities in the following two cases: (*a*) the case in which the asset-purchasing entities purchase the loan claims with their own funds; and (*b*) the case in which the asset-purchasing entities purchase the loan claims with borrowed funds.[19]

[Table 2 to be inserted here]

As shown in Table 2 (*a*), if the asset-purchasing entities purchase the loan claims to the firms (L) [20] with their own funds (i.e., their deposits (D_f) [20]), then both the loan claims in the asset column and the deposits in the liability column decrease by the same amount in the balance sheet for the banks. As shown in Table 2 (*b*), if the asset-purchasing entities purchase the loan claims to the firms (L) [20] with funds borrowed from the banks (i.e., the liabilities of the asset-purchasing entities to the banks (L_f) [20]), then the loan claims to the firms (L) [20] are replaced by the loan claims to the asset-purchasing entities (L_f) [20] in the asset column of the banks' balance sheet.

As seen from Table 2 (*a*) and Table 2 (*b*), the loan claims can never be converted into more liquid assets (i.e., cash or its equivalent) in the asset column of the banks' balance sheet, in the case where the banks' loan claims are purchased by the asset-purchasing entities without issuance of the securities backed by those loan claims. The loan claims can be converted into more liquid assets (i.e., cash or its equivalent) in the asset column of the banks only in the case of the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation, where the banks' loan claims are sold to the securities-issuing institutions (such as the SPVs) and the securities backed by those loan claims are issued by the SPVs and then purchased by the investors.

3. Securitization of loan assets and the liquidity of securitized products

As was seen from the above illustration regarding the securitization of loan assets, the loan claims in the asset column of the banks can be converted into more liquid assets only when there exist institutional settings to ensure the liquidity of the securities backed by those loan claims. The

[19] The asset-purchasing entities purchase the loan claims from the banks and collect the receivables, without issuance of the securities backed by those loan claims. For simplicity, Table 2 assumes that the banks' loan claims are purchased at face value.

market liquidity[20] of the securitized products is supported by the institutional practices that help investors to acquire those financial assets as stores of value. In order to ensure the liquidity of assets traded in financial markets, there needs to be "a well-organized, continuous spot market"[21] for those assets. The existence of well-organized spot markets requires institutional settings, including the "market makers" who trade on their own accounts to maintain orderly markets for financial assets.[22] In general, the liquidity of traded assets in financial markets requires specific market institutions.[23] According to recent studies regarding the securitized and resecuritized products backed by subprime mortgage loans, appropriate institutional structures to ensure the liquidity of traded assets were not put in place,[24] and in many cases the investors were insufficiently informed concerning the liquidity of traded assets.[25] Financial technologies, including the diffusion of risks and the senior/sub structure, as well as the security rating scheme and the credit enhancement scheme, were expected to lead to more liquidity in the market for the securitized products backed by loan claims.[26] The existence of institutional practices for supporting the liquidity of the securities backed by the banks' loan claims enables the banks to

[20] Keynes defined the "liquidity-premium" of assets as "The amount (measured in terms of itself) which they [people] are willing to pay for the potential convenience or security given by this power of disposal (exclusive of yield or carrying cost attaching to the asset)" (Keynes 1936), p.226. The words in parentheses are added by the author of this paper). From the viewpoint of the capacity of assets to be exchanged for money in the spot markets, Paul Davidson provided the following interpretation regarding Keynes's concept of "the power of disposal over an asset" (Ibid., p.226): "The power of disposal over an asset involves, in a monetary economy, the expectation of being able to exchange the asset for the medium of exchange cheaply and readily in a continuous spot market at a money price which is never very different from the well-published spot prices of the last few transactions" (Davidson 1978, p.62).

[21] Davidson 1978, p.62.

[22] "To ensure that the market price of securities changed in an orderly manner, specialists were expected to act as "market makers" to prevent a disorderly change in the transaction price from the previous price. If, for example, the number of sellers heavily outweighed the number of buyers at any time during the trading day, the specialists were required to buy on their own account in order to try to maintain orderliness in any market price changes" (Davidson 2009, p.86). Davidson also described the institutional practices to ensure the liquidity of traded assets as "the existence of financial institutions whose primary function is to make an orderly spot market and operate as a residual buyer and seller" (Davidson 1978, p.63).

[23] "Liquidity is not a natural quality but results from the creation of specific market institutions" (Carvalho 1999, p.133).

[24] Regarding the absence of institutional practices that would ensure the liquidity of the securitized products, Davidson provided the following remarks: "With the failure of thousands of mortgage-backed security markets and auction-rate security markets in the first weeks of February 2008, it is clear that the computers failed to find sufficient buyers to maintain orderliness in these markets. Moreover, computers are not programmed to automatically enter into failing markets and begin purchasing when almost everyone wants to sell at, or near, the last market price. The investment bankers who organize and sponsor the auction-rate securities markets (and the many other securitized markets) will not act as market makers" (Davidson 2009, p.92).

[25] "[T]here are many reports that representatives of these investment bankers have told clients that these securitized financial assets "were 'cash equivalents'" (Davidson 2009, p.92).

[26] Actually, in the financial markets, there were often cases in which the likelihood for the repayment of principal and interest from the underlying loan claims of the securitized products failed to be reflected in the rating of securities, disproving the validity of the "efficient market paradigm" (Grauwe 2008, p.11).

convert their loan assets into more liquid assets in the asset column of their balance sheets, and to extend flexibility in their asset management.

In order to examine the extended flexibility in the banks' asset management, the behavior of banks under the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation must be investigated, taking into account the banks' liquidity preference. Whether the rate of profit in the banking sector in the case of the securitization of loan claims exceeds that in the case of no securitization depends on the return on the investment of the proceeds from the sale of loan claims. The rate of profit in the banking sector in the case of the securitization of loan claims may be less than in the case of no securitization, depending on how the funds from the sale of loan assets are invested.[27] Why the banks are willing to hold the proceeds from the sale of loan claims in liquid assets (i.e. cash or its equivalent) at the cost of their interest revenue from lending can be explained from the perspective of the liquidity preference of banks. Banks are expected to be more motivated to hold the proceeds from the sale of loan claims in liquid assets (i.e. cash or its equivalent), at the expense of interest revenue from lending, the more doubts they have about future earnings from their illiquid assets (i.e. loan claims)[28].

As seen in the case of the "reintermediation of risk,"[29] in which the loan claims are put back on the balance sheets of banks due to the irrecoverability of the loan claims purchased by the securities-issuing institutions (such as the SPVs), or due to the financial difficulties of the SPVs that purchased loan claims from the banks, the banks may face the risks inherent in the securitization, after their loan assets are converted into more liquid assets (i.e., cash or its equivalent). If the banking sector evaluated the borrowers' capacity to repay the underlying debts in less strict way, on the assumption of the sale of loan assets to the security-issuing institutions and the liquidity of securitized products backed by those loan assets, there could be credit expansion with the deteriorated quality of banks' loan assets.

In order to examine the behavior of the banking sector under the "originate-to-distribute" model of financial intermediation, the concept of liquidity preference needs to be elaborated, taking into account the securitization of loan assets. This problem must be addressed in future research.

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[27] Regarding the possibility that the securitization of loan assets could lead to reduced profits in the banking sector, Fukaura (2003) provided the following remarks: "The securitization, which seems to be an emblem of the superiority of direct finance over indirect finance, and the function of the banks serving as leading agents in the system of indirect finance, are the two sides of the same coin. There exist possibilities that the securitization could lead to reduced profits in the banking sector" (p.83 of Fukaura (2003), originally in Japanese, translated into English by the author of this paper).

[28] "The liquidity premium of liquid assets reflects the decision maker's *general* confidence in his/her estimates of returns from other, less liquid assets." (Dequech (2000), p.164).

[29] See Bank of Japan (2008), p.51.

4. Securitization of loan assets and the balance sheets by institutional sectors

In order to examine how the shift from the traditional "originate-to-hold" model to the "originate-to-distribute" model of financial intermediation impacts the macroeconomy, it must be investigated how the securitization of loan assets affects credit creation in the banking system. As a preparation for further research on this issue, this section constructs the balance sheets by institutional sector under the "originate-to-distribute" (i.e., the "off-balance sheet securitization") model of financial intermediation.

In order to capture the flow of funds in the economy as a whole, it is necessary to construct balance sheets by institutional sectors, and to see the relationship between the asset and liability columns of the balance sheets for each item. This section extends slightly the simplified balance sheets for the traditional "originate-to-hold" and the "originate-to-distribute" models of financial intermediation shown in Table 1, to build up the balance sheets by institutional sectors.

[Tables 3 and 4 to be inserted here]

Tables 3 and 4 illustrate the balance sheets by institutional sectors for the traditional "originate-to-hold" model and the "originate-to-distribute" (i.e. the "off-balance sheet securitization") model of financial intermediation, respectively. Each column of these tables represents each institutional sector (including households, firms, banks, the securities-issuing institutions [such as the SPVs], the government, and tangible assets). Each row represents an item of the balance sheets (including tangible assets, loans, government bonds, deposits, securities, high-powered money, and net worth [with a reverse sign]). Figures with a positive sign (+) and those with a negative sign (–) indicate the items in the asset column and in the liability column of the balance sheets, respectively. As the total of the asset columns equals the total of the liability columns in the balance sheets, the total of each column equals zero in Table 3 and Table 4. As each item of the balance sheets is listed both in the asset columns and in the liability columns in the balance sheets, the total of each row equals zero in those tables.

Table 3 illustrates the balance sheet for the traditional "originate-to-hold" model of financial intermediation. In this table, the tangible assets in the column of the "firms" ($+K$) correspond to the counterpart ($-K$) in the column of the "tangible assets."

Table 4 illustrates the balance sheet for the "originate-to-distribute" (i.e. the "off-balance sheet securitization") model of financial intermediation. The banks sell a part of their loan claims to the SPVs, and the SPVs issue the securities backed by those loan claims. The households withdraw a part of their deposits to purchase the securities from the SPVs, and the SPVs deposit the sale proceeds in their account. As a result, the net worth corresponding to the sale of securities is listed in the liability column of the balance sheet for the SPVs. In the liability column of the balance sheet for the banks, the amount of the sale of securities is transferred from the deposit account of

the households to the deposit account of the SPVs. Consequently, in the asset column for the banks, a part of the loan assets is converted into more liquid assets (i.e., the high-powered money).

Recently, some post-Keynesian economists have attempted to investigate the "financialization" of contemporary economies, using balance sheets by institutional sectors under the "originate-to-distribute" model of financial intermediation with the securitization of loan assets. The simulation analysis of the interaction between the real and financial sectors of the economy has been performed by post-Keynesian economists, as seen in the recent studies based on the "stock-flow consistent model," including Godley and Lavoie (2007) and Dos Santos and Zezza (2008). However, in most of the previous studies, the traditional "originate-to-hold" model of financial intermediation is assumed, and the securitization of loan assets under the "originate-to-distribute" model of financial intermediation has not been examined. In order to investigate the "financialization" of contemporary economies, it is necessary to incorporate the factors related to the securitization of loan assets into the "stock-flow consistent model." Recently, Pilkington (2008) and Pilkington (2009) made an important contribution in his attempt to investigate the "originate-to-distribute" model of financial intermediation, using balance sheets by institutional sector including the "shadow financial system."[30]

The problems to be addressed include how the securitization of loan assets affects the behavior of the banks under the "originate-to-distribute" type of financial system, and how the liquidity of securitized products impacts the process of endogenous money supply.

5. Concluding remarks

This paper examined how the evolution of a financial system affects the macroeconomy from the perspective of the securitization of loan assets and the resulting shifts in the flow of funds among institutional sectors. The examination yielded the following findings and implications.

First, the sale of loan assets from banks to securities-issuing institutions (represented by the special purpose vehicles, or the structured investment vehicles) and the issuance of securities backed by those loan assets allow illiquid loan assets on the balance sheets of banks to be converted into more liquid assets, such as cash or reserves, thus extending flexibility in the banks' management of their assets.

Second, in case loan assets should be sold by banks to the asset-purchasing entities without the issuance of securities backed by those loan assets, there can be no conversion from the loan assets to more liquid assets like cash or reserves in the asset column of the banks' balance sheets.

[30] Pilkington (2008) and Pilkington (2009) provided both the current transactions matrix and the flows of funds for the institutional sectors including the "shadow financial system."

Third, the institutional practices aimed at enhancing the market liquidity of the securities backed by loan assets and the institutional practices that help investors to acquire those securities as stores of value can be considered to lead to greater flexibility in the banks' management of their assets.

Fourth, if the banking sector evaluated the borrowers' capacity to repay the underlying debts in less strict way, on the assumption of the sale of loan assets to the security-issuing institutions and the liquidity of securitized products backed by those loan assets, there could be credit expansion with the deteriorated quality of banks' loan assets.

Fifth, the liquidity preference of banks can provide relevant perspectives for the reason why banks will sell their loan assets to security-issuing institutions and hold the proceeds from the sale of those assets in liquid form at the cost of interest revenues from loan repayments.

From the perspective of this paper, those policies that facilitate securitization of loan assets and, more broadly, securitization of finance, will cause making financial assets more liquid and extending flexibility in the asset management of financial sectors to become higher priorities than supporting aggregate demand to restore growth in production and in employment. These insights can help identify the policy problems that contributed to the current world financial crisis: on the one hand, the soundness and fairness of the institutional practices to enhance the liquidity of financial assets have not been well examined by regulatory authorities; on the other hand, in the course of the financial deregulation carried out since the 1980s, a higher priority has been placed on extending flexibility in the asset management of financial sectors than on sustaining growth in production and employment.

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Table 1 Simplified balance sheets for the institutional sectors in three models of financial intermediation: (1) the traditional "originate-to-hold" model; (2) the "on-balance sheet securitization" model; and (3) the "originate-to-distribute" (i.e. the "off-balance sheet securitization") model.

(1) The traditional "originate-to-hold" model of financial intermediation

The balance sheet for the banking sector

Government bonds (G)	10	Deposits (D_0)	90
Loans (L)	90	Capital (K)	10

The balance sheet for the remaining sectors

Deposits (D_0)	90	Liabilities to the banks (L)	90

(2) The "on-balance sheet securitization" model, where the securities backed by loan claims are issued by the banks that originate those claims.

The balance sheet for the banking sector

Government bonds (G)	10	Securities (S)	20
Loans (L)	90	Deposits (D_1)	70
		Capital (K)	10

The balance sheet for the remaining sectors

Deposits (D_0)	70	Liabilities to the banks (L)	90
Securities (S)	20		

(3) The “originate-to-distribute” (i.e., the “off-balance sheet securitization”) model of financial intermediation, where the SPVs purchase the loan claims originated by the banks, and the SPVs issue the securities backed by those loan claims.

The balance sheet for the banking sector

Government bonds (G)	10	Deposits of the households (D_h)	70
Cash (C)	20	Deposits of the SPVs (D_s)	20
Loans to the firms (L_b)	70	Capital (K)	10

The balance sheet for the SPVs

Deposits (D_s)	20	Securities (S)	20
Loan claims purchased from the banks (L_s)	20	Net worth (NW_s)	20

The balance sheet for the households

Securities (S)	20	Tangible assets (P)	90
Deposits (D_h)	70		

The balance sheet for the firms

Tangible assets (P)	90	Liabilities to the banks (L_b)	70
	70	Liabilities to the SPVs (L_s)	20

Table 2 (*a*) The case in which the asset-purchasing entities purchase the loan claims of banks with their own funds.

(Before the sale of loan claims) The balance sheet for the banks

Loan claims to the firms (L)	20	Deposits of the asset-purchasing entities (D_f)	20

(Before the purchase of loan claims) The balance sheet for the asset-purchasing entities

Deposits (D_f)	20	Net worth (NW_f)	20

(After the sale of loan claims) The balance sheet for the banks

Loan claims to the firms (L)	0	Deposits of the asset-purchasing entities (D_f)	0

(After the purchase of loan claims) The balance sheet for the asset-purchasing entities

Deposits (D_f)	0	Net worth (NW_f)	20
Loan claims to the firms (L)	20		

Table 2 (*b*) The case in which the asset-purchasing entities purchase the loan claims of banks with funds borrowed from the banks.

(Before the sales of loan claims) The balance sheet for the banks

Loan claims to the firms (L)	20	Net worth (NW_B)	20

(Before the purchase of loan claims) The balance sheet for the asset-purchasing entities

Deposits (D_f)	0	Net worth (NW_f)	0

(After the sales of loan claims) The balance sheet for the banks

Loan claims to the firms (L)	0	Net worth (NW_B)	20
Loan claims to the asset-purchasing entities (L_f)	20		

(After the purchase of loan claims) The balance sheet for the asset-purchasing entities

Deposits (D_f)	0	Liabilities to the banks (L)	20
Loan claims to the firms (L)	20	Net worth (NW_f)	0

Table 3 The balance sheet by institutional sector under the traditional “originate-to-hold” model of financial intermediation

	Households	Firms	Banks	Government	Tangible assets	Total
Tangible assets		$+K$			K	0
Loans		$-L$	$+L$			0
Government bonds			$+G$	$-G$		0
Deposits	$+D$		$-D$			0
Net worth	$-NW_h$	$-NW_f$	$-NW_b$	$-NW_g$	$-NW_k$	0
Total	0	0	0	0	0	0

(Note) Figures with a positive sign (+) indicate the asset column of the balance sheets, and those with a negative sign (–) indicate the liability column of the balance sheets.

Table 4 The balance sheet by institutional sector under the “originate-to-distribute” (i.e., the “off-balance sheet securitization”) model of financial intermediation

	Households	Firms	Banks	SPV	Government	Central Bank	Tangible assets	Total
Tangible assets		$+K$					$-K$	0
Loans		$-L_b-L_s$	$+L_b$	$+L_s$				0
Government bonds			$+G$		$-G$			0
Deposits	$+D_h$		$-D$	$+D_s$				0
Securities	$+S$			$-S$				0
High-Powered Money			$+H$			$-H$		0
Net worth	$-NW_h$	$-NW_f$	$-NW_b$	$-NW_s$	$-NW_g$	$-NW_c$	$-NW_k$	0
Total	0	0	0	0	0	0	0	0

(Note) “SPV” indicates the special purpose vehicles, and “HPM” indicates high-powered money.