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Securitized-Product Investment: Risk Management Perspectives *

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1. Introduction

The market for securitized products has expanded around the globe. Two factors in particular have supported this expansion: advances in financial engineering have enabled a wide range of products to be synthesized for the purpose of transforming and reselling the risks and returns on portfolios of underlying assets; and investors with various risk preferences have begun to invest and invest more actively according to their individual needs. In Japan, issuances of securitized products are on the rise,[1] and are held primarily by financial institutions. Basically, these securitized products are being utilized by investors as an investment choice for effectively controlling the risk and return on an investment portfolio. They also could contribute to improving the efficiency of financial markets by providing economic entities requiring funds with a new means for fund-raising.

Because securitized products, as described above, transform the risks and returns on a portfolio of underlying assets and resell all or parts of them to investors, the products generally have a risk/return structure that is different from the portfolio of underlying assets on which they are based, and have a relatively complex product feature.

In addition, because most securitized products tend to be quite distinctive and their trading volumes on secondary markets are usually limited,[2] it is not necessarily easy to measure their trading prices.

Therefore, given the nature of securitized products and their current trading circumstances, investors must accurately recognize the risks associated with securitized-product investments and will be required to have a considerable amount of expertise and ingenuity in order to appropriately identify and manage those risks.

Against this backdrop, the current instability in the markets triggered by the U.S. subprime mortgage problem reaffirms the importance of investors accurately recognizing and appropriately managing the various risks inherent in investments and financial products with complex risk profiles, particularly securitized products.

It is from this perspective that this paper presents an overview of the basic points to be considered when attempting to identify and manage the risks inherent in securitized-product investments and, as an aid to understanding, provides an introduction to several basic measures considered useful at this time.[3] This paper is based on studies of the theory and practice of risk management for securitized products and on dialogues between the Bank of Japan's Financial Systems and Bank Examination Department and financial institutions and other market participants. Given the extremely wide variety of securitized products available, it is important that investors develop and improve their own risk management measures to suit the risk profiles of the products in which they invest.

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[1] Total issuance of securitized products in Japan has increased steadily from 5.3 trillion yen in FY 2004 to 8.2 trillion yen in FY 2005 and to 9.8 trillion yen in FY 2006 (figures through FY 2005 are from the Bank of Japan; figure for FY 2006 is from a study conducted by the Japan Securities Dealers Association).

[2] In some cases, there are securitized products that are actively traded on the market.

[3] There are many different types of securitized products and many different ways to categorize their risk monitoring and management methodologies. The purpose of this paper is not to provide an exhaustive overview.

It should go without saying that there are no definitive measures for identifying and managing risks, either for securitized products or for any other financial product. Indeed, at the current point in time, measures for identifying and managing risk are still under development in some areas. In addition, when investing in new forms of securitized products, there is the potential for exposure to new risks not found in conventional securitized products. For this reason, individual investors need to carefully monitor the conditions and developments in markets for securitized products, and must continually strive to devise ways to appropriately identify and manage securitized-product investment risks.

2. Identifying and Managing Risk Exposure in Securitized-Product Investment

This section examines several different risks associated with securitized-product investment and provides examples of measures that are considered effective at the current point in time in identifying and managing them. The risks that we consider are: (1) risk associated with the portfolio of underlying assets, (2) risk associated with the structure of the product, (3) price risk, (4) market liquidity risk, (5) model risk associated with the pricing model, and (6) risk associated with the entire portfolio held.

- The nature of the product and market environment varies for different securitized products. Therefore, the risks associated with securitized-product investments are not necessarily limited to those discussed in this paper. In addition, risks (3), (4), (5), and (6) also need to be identified and managed for many different financial products, not just securitized products.
- The costs investors need to assume in the risk management of securitized products will depend on the scale of their investments and the magnitude of the risks. It is expected that investors will develop and customize their own management systems reflecting individual situations based on the risk management perspectives and measures discussed in this section.
- Securitized products range from ones whose risks are relatively easy to identify to ones whose risks are extremely difficult to identify due to their complex structure. Because of this, the measures discussed below might be readily applicable to investment in securitized products whose structures and portfolios of underlying assets are easy to identify, while the hurdles to application might increase the more complex the product becomes. If the investor's ability to identify and manage risk is insufficient in comparison with the actual risks entailed in the product, it is important to make investment decisions more cautiously the greater the degree of that insufficiency. In addition to caution, the investor should also hold a larger cushion of capital as a risk buffer.

(1) Risk associated with the portfolio of underlying assets

The portfolio of underlying assets provides the basis for the risks and returns of a securitized product. Therefore, when considering an investment in a securitized product, it is important to obtain information on the nature of the portfolio of underlying assets (obviously returns, but also degree of diversification, default rate, delinquency rate, recovery rate, correlations and other risk information) and determine whether, as an investor, you are sufficiently capable of identifying and managing the risks and returns of the product.

- When credit ratings are referred to in evaluating the portfolio of underlying assets, the investor must accurately understand in advance the methodology and meaning of the credit rating, which should be considered the "opinion of a credit rating company." It is also useful to refer not only to the credit rating itself, but also to the analysis and information that the credit rating company provides about the portfolio of underlying assets.

Ex. If the portfolio of underlying assets is a large pool, obtain and check information necessary for the management of the portfolio's pool; if the underlying assets are few in number, information is required on the individual underlying assets. In both cases, the information should be obtained from the arranger of the securitized product.[4] Likewise, when investing in re-securitized products, every effort should be made to "look through" the portfolios of underlying assets of the securitized products included in the product by using information provided by the credit rating company and others.

Ex. If the portfolio of underlying assets includes assets in which you have no previous investment experience, then assessment, management methods and responses to crystallized risks should be examined in a meeting, such as a committee, in which the risk management department and other relevant business units participate.

Ex. In the case of managed securitized products, the collateral manager has discretion within the scope of the contract over the selection of underlying assets and the timing of trades, and this discretion may lead to frequent changes in the portfolio of underlying assets. Because of this, when considering an investment in these products, you should conduct interviews, etc. with the collateral manager in order to check management policy and performances as well as the investment guidelines (contractual constraints on the collateral manager) and responses in the event of violations. After investment, regularly check any changes in the management policy and factors affecting investment performance. As appropriate, also check the content of the portfolio of underlying assets.

[4] For synthetic securitization that have credit derivatives as underlying assets, also perform a similar confirmation of the underlying assets used as reference.

(2) Risk associated with the structure of the securitized product

The structure of the securitized product will have an impact on the collectibility of the principal and interest as well as on the stability of collections. When deciding to invest, it is important to check the details of the structural risk, including the operational risk and legal risk, and to determine whether as an investor you are fully able to identify and manage the risks associated with the product in which you wish to invest.

- Because securitized-product investments depend on multiple entities, including the originator, servicer, and collateral manager, to administer and manage the portfolio of underlying assets (for example, selection of underlying assets, administration and reporting, and collection of cash flow), it is important for you as an investor to understand their individual capabilities and systems and to monitor them.[5]
- Within a given structure, credit enhancement will have a significant influence on the collectibility of principal and interest. Because of this, it is important that investors either make their own independent assessment of the effectiveness of credit enhancements or verify in detail the credit enhancement assessments performed by credit rating companies (including the analytical methodology, assumptions and scenarios used in evaluation).

Ex. With respect to structure, you should check not only the content of the credit enhancements, but also, according to the nature of the product, the following matters: the certainty of bankruptcy remoteness and true sale; the creditworthiness[6] and independence of the originator, servicer, arranger, swap counterparty, trustee, custodian, and the bank holding the accounts; the nomination of a backup servicer; the scope of the guarantee provided by the guarantee company (in the case of home mortgages, etc.); liquidity enhancements (for ABCPs, etc.); cash reserve levels; leverage ratios; and the impact on the product's investment and fundraising, etc. from declines in market prices of the portfolio of underlying assets (for SIVs,[7] etc.).

Ex. For credit enhancements, check the content and terms of the agreement, and verify the collectibility of the principal and interest of the tranche to be invested in by analyzing cash flow under multiple scenarios, including stress scenarios, and by using the pricing models. When creating your own scenarios for the cash flow analysis, etc., take into account the various factors that could impact cash

[5] Although the type of investment is different, investors may find helpful information on this aspect in "Hedge Fund Investments: Risk Management Perspectives" published by the Bank of Japan Financial Systems and Bank Examination Department in December 2007 (available from the Bank of Japan website).

[6] In addition to creditworthiness, the originator's screening ability and the servicer's collections ability can have a significant impact on the quality of the portfolio of underlying assets.

[7] For SIVs, declines in the market price of the portfolio of underlying assets below a certain threshold (i.e. enforcement event) trigger the mandatory sale of the underlying assets and can expand losses for investors holding the subordinated portion.

flow from the portfolio of underlying assets (default rate for the underlying assets, timing of default, recovery rate, timing of recovery, prepayment rate, interest rates, expenses, waterfalls, etc.). Use the default rate and expected loss rate calculated in the process of verifying the tranche to be invested in to assess the validity of the credit rating given to the tranche and the price.

Ex. When investing in securitized products in which you have no investment experiences, such as those incorporating new structures, it is imperative to create a framework to constantly assess the product in a committee comprised of members of the risk management department and other relevant units, and to examine the locus of risks and how they can be managed from a variety of perspectives.[8]

(3) Price risk for securitized products

The prices of securitized products may be subject to large swings. Because of this, when making investment decisions, it is important to take into account the possibility of price fluctuations in the product. It is also important to gauge and manage properly and in a timely manner the profit/loss and amount of risk during the holding period. In addition, because there is a risk of failing to take necessary steps in a timely manner when sources of price information for securitized products are limited or if the product is such that the investor is unable to independently calculate its price, it is important to check the availability of price information and strive for obtaining price information at the frequencies necessary for the investor's own risk management.

- Securitized products might be exposed to large price swings resulting from changes in the market's view on the quality of the underlying assets portfolio or changes in supply-demand situation in the securitized product market, even though they show only small price movements under normal circumstances.[9] Because of this, it is insufficient to conduct risk management based on the assumption of ordinary price movements only; rather, risk management should take into account possible volatile price movements during times of stress.

Ex. To evaluate the price risk of a product, use cash flow analysis and pricing models to check the degree of price movement of the tranche to be invested in when the assumed conditions for the portfolio of underlying assets are placed under stress.

[8] In such a framework, it is also important to examine and understand what risks are assumed in the risk premium that is incorporated into the price of the securitized product.

[9] The prices of securitized products can be driven by many different factors. These include factors caused by changes in market liquidity (described in Subsection 4 below). However, changes in market liquidity result not only in price fluctuations but also in potential impediments to trading itself. This paper has therefore dealt with price risk and market liquidity risk separately.

Ex. Create scenarios based on stress phenomena of past large price movements and other events and use them to perform regular stress testing. In doing so, there may be cases in which historical data does not provide sufficient coverage of the credit cycle. This will require the identification of potential risks affecting the underlying assets (home mortgages, lending to non-financial enterprises, etc.) included in the portfolio—for example, risks associated with the lending and trading behaviour of financial institutions, market conditions, and macroeconomic circumstances—and the incorporation of these as stress phenomena that may potentially occur in the future. Use the results of stress testing to verify the adequacy of your capital and also to make continued assessments of capital allocations, investment ceilings, loss limits, and other aspects of the risk management framework.

Ex. The profit/loss and amount of risk should be measured as frequently as possible. For example, the amount of price risk can be measured by value-at-risk (VaR) based on historical data[10] and monitored to ensure that the risk is within the scope of predetermined risk capital. There are different ways to measure VaR according to the availability of data: use the spread on the securitized product as well as the market interest rate as a risk factor; use a proxy risk factor (such as the spread on corporate bonds) if there are constraints on the availability of spread data; or use the price fluctuation of the securitized product as a risk factor.[11, 12] A holding period for risk measurement should be set to reflect the market liquidity of the product invested in.

Ex. If it is difficult to obtain price information or identify the amount of risk, consider ways to restrain risk by, for example, setting conservative investment ceilings or avoiding a concentration of investments in similar products.

(4) Market liquidity risk for securitized products

Securitized products are also exposed to market liquidity risk.[13] Generally, securitized products have lower market liquidity than government bonds, corporate bonds, or equities. Therefore, trading prices and other variables are subject to the

10 It is not necessarily easy to obtain and organize all of the risk factors necessary to measure risk in an exhaustive and frequent manner, and there may therefore be some limits to the scope, precision, and frequency of measurement.

11 When using alternative methods, verify in advance whether it is possible to appropriately monitor and manage risk with those methods.

12 If sufficient data is available, it is conceivable to measure the amount of risk including the price fluctuations caused by rating transitions.

13 Market liquidity risk differs from fund liquidity risk associated with fund-raising. Generally, when market liquidity is low, there is a large difference between the prices presented by sellers and buyers (bid/offer spread), and prices will undergo large swings (market impact) if high-volume trades are attempted. It may also require time before a trade can be completed, during which the investor is exposed to price risk. In addition, during times of market stress, it may be extremely difficult to trade at all.

impact of market liquidity.[14] Thus, when making investment decisions, it is important to gauge the market liquidity of the securitized product, analyze the impact on investor's capital when such risks manifest themselves, and examine possible responses in advance. Likewise, it is essential that changes in market liquidity be monitored throughout the investment period.

- It is important to prepare measures to cope with situations where the market liquidity risks of a securitized product manifest themselves. Such measures should reflect the purposes of the individual investor and the nature of the securitized products held.

Ex. Below are some methods that can be used to help in gauging the market liquidity of a securitized product.

1. Conduct interviews with the arrangers and others to confirm that the size of one's investment does not represent an excessively large share in comparison with the size of the market (amount issued, transaction volume) for the product.
2. Use information from interviews and present actual terms of sale to brokers to monitor the market's bid/offer spreads and to check levels of realistic sellable prices.
3. Analyze indexes and other data for the securitized product to monitor changes in the market environment.

Ex. Create stress scenarios based on historical stress events, such as a dry-up in market liquidity, difficulty in discovering trading prices or prolongation of the holding period, and use these scenarios to regularly check the impact on the profit/loss of the securitized product portfolio and on investor's capital. Regularly review the stress scenarios in light of changes in market environment.

Ex. If there are concerns about the market liquidity of a securitized product, implement such measures as setting a ceiling on investment amount, setting stricter loss-cutting rules and alarm points, and providing larger capital allocations. In addition, prepare a framework to determine how to enforce loss-cutting rules and how the organization will respond in the event of difficulty in selling the product due to market liquidity problems.

(5) Model risk associated with the pricing model for securitized products

Pricing models used to calculate prices for securitized products are built on the basis of certain assumptions and therefore contain model risk. Because of this, it is important to regularly check the assumptions and logic of the model as well as the

[14] When an investor sells his/her securitized product, the actual sellable price in the market may not be the same as the regularly indicated price by arrangers or calculated by a model, and the degree of divergence may be affected by market liquidity, etc.

model's overall appropriateness. It is also essential to improve or modify the model quickly if there are questions about the model's appropriateness.

- There are two conceivable types of pricing models: models developed independently by the investor and models furnished by outside vendors. In the latter case, the details of the model's logic are not fully disclosed in certain instances. However, it is important to seek as detailed information as possible from vendors to ascertain the model's assumptions, characteristics, and limits and to use these in appropriate assessment and management.
- It should also be noted that the price of a securitized product may change as a result of changes in the risk premium demanded by the market as compensation for uncertainty, even though there has been no significant change in the quality of the portfolio of underlying assets for the securitized product. Generally, pricing models use a variety of parameters that are estimated from historical data. This means that there are limits to a pricing model's ability to forecast and provide advance responses to price fluctuations of a securitized product and significant changes in the risk premium for which there are no historical precedents.

Ex. Regularly verify the appropriateness of the data and methodologies used to estimate various parameters in the model, such as default rates, recovery rates, and correlations. Also, review the model as necessary if there are significant environmental changes or when additional information becomes available with respect to the portfolio of underlying assets.

(6) Risk associated with the entire portfolio held

In addition to the risks and returns of individual securitized products, it is also important to identify and manage the risks and returns for the entire portfolio of securitized products held.[15]

- In certain cases, securitized-product investments will be made by multiple business units for multiple objectives, such as purchases made as part of bond investments or purchases made to adjust the risks and returns on the overall lending portfolio. In such cases, it is important to have systems and mechanisms in place to identify and manage, in a timely and appropriate manner, the entire scope of securitized-product investment and the overall risks and returns of the portfolio of securitized products.

Ex. Regularly monitor developments (by type of underlying asset, rating, vintage, geographical region, currency, and originator/servicer, etc.) for the entire portfolio held and check whether there have been any changes in the risk/return structure or whether there is any concentration of risk. Also, perform a "look through" and check for concentration risk to the extent possible for the portfolio of underlying assets.

[15] It would be desirable in the future for investors to identify and manage the risks and returns of their entire portfolio by appraising the economic value of non-securitized products, such as loans and credit investments.

3. Conclusion

This paper has reviewed the various risks associated with securitized-product investments and has outlined various methods for identifying and managing these risks, which are considered effective at the current point in time, based on dialogues with financial institutions and market participants held at many different junctures by the Financial Systems and Bank Examination Department of the Bank of Japan. Obviously, different investors will require different risk management levels and frameworks according to the size of investment and risk profile of the securitized products. It is conceivable, in addition, that changes will occur in the types of risk inherent in these products as the market environment and products continue to evolve. Because of this, individual investors are expected to constantly devise ways to pursue accurate recognition and appropriate management of the risks associated with securitized-product investment.

These efforts by individual investors to enhance their risk management framework and to collect and utilize the information necessary for risk management will increase market discipline on the origination and trading of securitized products, and will thereby contribute to sound market development.

The Financial Systems and Bank Examination Department of the Bank of Japan looks forward to continued opportunities to deepen its dialogue with financial institutions and market participants and to contribute to the improvement of risk management for securitized-product investments.