

Complex Financial Products in Japan: Evolution of Structured Products and Regulatory Responses

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Introduction

How did Japan avoid the great credit market boom and bust of the 2000s, which plagued so many other advanced economies? What were the factors that mitigated dangerous excesses in its domestic structured credit markets? What were the factors that limited its investments in foreign structured credit products? Why have Japanese investors had so much appetite for other types of structured products? What are the risks from those non-credit products? Were regulatory responses effective? Did Japan's Basel II implementation contribute to the reduction of systemic risk? These are the questions I will try to address in this paper.

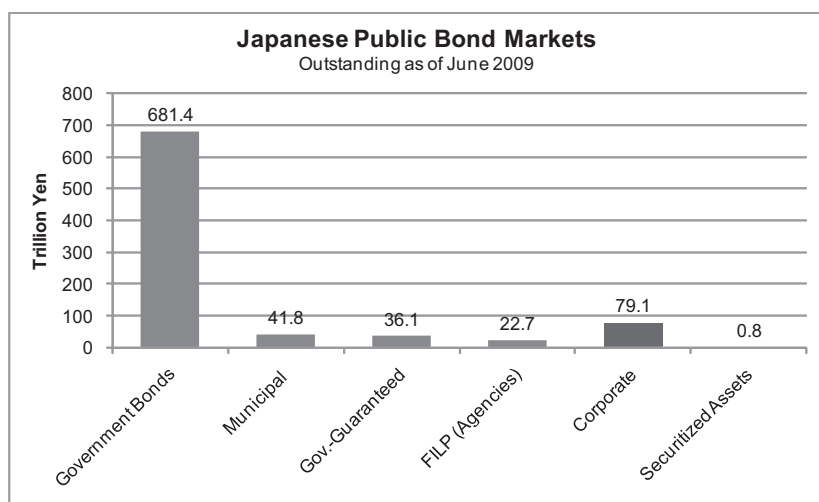
Before focusing on complex structured products, let us briefly review a few basic facts about Japan's broader bond markets. The debt markets in Japan are characterized by two salient features: (1) the dominance of bank loans in the corporate credit markets, and (2) the dominance of government debt in the public bond markets. As of June 2009, Japanese non-financial corporations had an outstanding debt of 250 trillion yen (\$2.8 trillion) through bank loans, while borrowing only 49 trillion yen (\$0.5 trillion) in domestic bond markets.¹ As of the same date, the Japanese government bond (JGB) market comprised 79 percent of the publicly traded bond markets, with outstanding amounts at 681 trillion yen (\$7.5 trillion), while comparable numbers for the U.S. Treasury securities were 22 percent and \$6.9 trillion, respectively. Exhibit 1 illustrates the overwhelming

¹ Flow of funds data. Money market instruments are excluded. Currency conversion is provided at 90 yen/dollar (approximately the prevailing rate as of December 2009).

importance of government and government-related debt in the publicly-traded bond markets in Japan.

The near absence of securitized assets in Exhibit 1, however, is somewhat misleading because most Japanese securitization products are issued privately and are not included in the official bond market statistics. As we shall see later, significantly larger amounts of securitized products have been originated in Japan, although they never came anywhere close to the levels seen in the U.S. and Europe.

Exhibit 1. Publicly Offered Bonds in Japan— Outstanding Amounts



One way to categorize various structured products is to divide them into two groups: **structured credit products** (SCPs) and **structured non-credit products** (SNCPs). Examples of SCPs include ABS (asset-backed securities), CMBS (commercial mortgage-backed securities), RMBS (residential mortgage-backed securities) and CDO (collateralized debt obligations). I refer to other structured products (excluding SCPs) collectively as SNCPs. Examples of popular SNCPs include currency-linked products such as PRDC (power reverse dual currency) notes and FX TARNs (FX-linked target redemption notes), and equity-linked products such as Nikkei-linked notes and reverse convertible bonds.

SCPs can be further classified as either Japanese SCPs or foreign (non-Japanese) SCPs, depending on where their underlying assets are located. Japanese SCPs consist mainly of ABS, CMBS, RMBS, WBS (whole business securitization) and relatively simple types of CDO. Most of them are private placements, with little transparency and low liquidity. Their issuance volume has been modest, having peaked at \$122 billion in 2006.

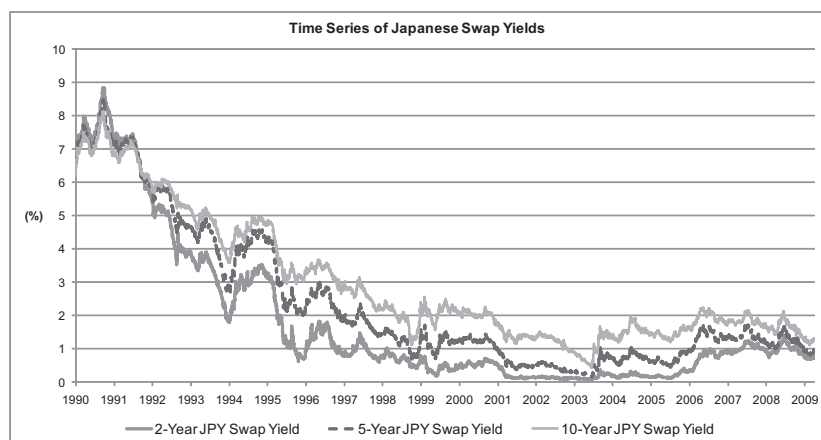
Foreign SCPs typically have U.S. or European underlying assets. Japanese investors, with a few notable exceptions, have never been major buyers of U.S./European SCPs. Thus, most of them have been spared major losses during the global financial crisis of 2007–08. Those investors who did buy foreign SCPs were mostly banks and other financial institutions.

In contrast to the relatively modest size of the SCP market in Japan, the country has long been known for its apparently insatiable appetite for a wide range of exotic SNCPs (structured non-credit products). Japan's SNCP market is older than its credit counterpart, and the complexity of the products has steadily increased over time, with many product innovations reportedly bringing substantial profits to the investment banks involved in structuring and marketing activities. Most of the SNCPs take the form of currency-linked notes or equity-linked notes, and the primary investors are regional banks, municipalities and endowments.

The popularity of SNCPs in Japan can be at least partly explained by the low interest rate environment. As can be seen in Exhibit 2, Japanese bond yields continued to decline throughout the 1990s and then have stayed very low for the subsequent years. For example, the benchmark 10-year JGB and swap rates have been continuously below 3 percent since the second half of 1997. Many regional banks, pension funds, endowments and high-net worth individuals, frustrated with low yields on conventional assets, have aggressively searched for higher returns, often finding SNCPs irresistibly attractive.

Dangers of a low or declining interest rate environment, especially under asymmetric information between ultimate investors and their agents (including financial institutions and hedge funds), have been pointed out by a number of economists and policy makers. A prescient

Exhibit 2. Recent History of Interest Rates in Japan 1990–2009



Source: Bloomberg

article by Rajan (2005), for example, argued that “changes from a high interest rate environment to a low interest rate environment,” when coupled with “the emergence of a whole range of intermediaries,” could form a volatile cocktail. Institutions with long-term fixed-rate liabilities, as well as hedge fund managers with typical performance-based compensations, would be induced to “search for yield” by taking excessive amounts of “tail risks” hidden from their investors.

Most SCPs and SNCPs have substantial tail risks, and their proliferation in the U.S., Europe and Japan can be viewed as manifestations of the phenomenon that Rajan predicted. The main difference, between Japan on the one hand and the U.S. and Europe on the other hand, is that Japan experienced a long period of declining interest rates (after 1991) much earlier than the U.S. and Europe did (after 2000). When Japanese investors started to search for yield, there were no complex SCPs; so they flocked to complex SNCPs that were the only game in town at the time.

It is tempting to conjecture that the limited popularity of SCPs among Japanese investors may be related to their earlier exposure to SNCPs. One possibility is that greater familiarity with SNCPs may have led Japanese investors to favor SNCPs over SCPs even after

various SCPs became available. Another possibility would be that some of them learned the dangers of tail risks through large losses suffered on their earlier investments in SNCPs, and have become averse to (or “immunized” against) complex structured products in general.

There were certainly other factors at work that help explain why Japan did not have the kind of SCP boom and bust as those observed in the U.S. and Europe. The next section examines some of those factors.

Structured Credit Products

Securitization in Japan

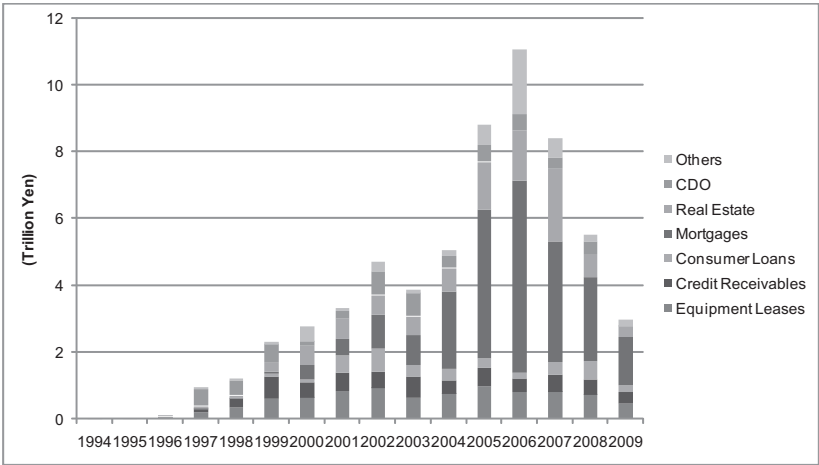
In this section, I first provide a brief historical perspective on the production of Japan-based SCPs (structured credit products), and then an overview of Japanese investments in both Japanese and non-Japanese SCPs. My focus is on securitized products, but I also touch upon credit derivatives along the way. SNCPs (structured non-credit products), such as currency-linked notes and equity-linked notes, will be discussed in the next section.

Exhibit 3 shows the estimated total issuance of Japanese securitized products from 1994 through September 2009.² Total annual issuance in Japan peaked at 11.1 trillion yen (\$122 billion) in 2006, which included MBS, ABS and CDO.³ In the same year, \$1,988 billion of MBS (RMBS/CMO/CMBS) and \$754 billion of ABS (including CDO of ABS) were issued in the United States. Global CDO issuance in 2006 was \$489 billion, of which Japan accounted for only 0.9 percent (see Exhibit 4). These data tell us that, although production of securitized assets in Japan did increase during the global securitization boom in the mid-2000s, it never approached the levels seen in the U.S. or in Europe. Furthermore, most CDO issues in Japan have had relatively simple schemes, with senior-subordinate structures normally consisting of only 2 to 4 tranches. It appears that no “CDO squared”

² The issuance data are from Deutsche Securities (2009). No data are available for outstanding amounts.

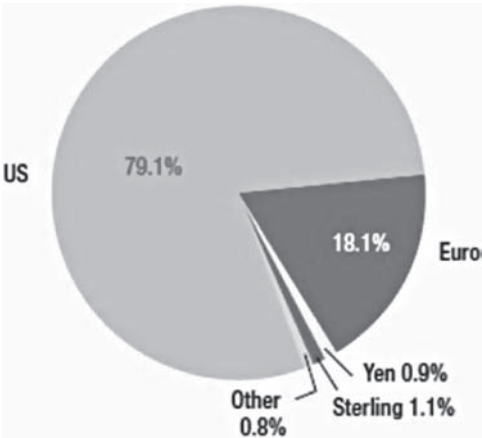
³ ABCP (asset-backed commercial paper) are excluded from discussions in this section.

**Exhibit 3. Issuance of Japanese Securitized Products:
1994 – September 2009**



Source: Deutsche Securities (2009b)

**Exhibit 4. Global CDO Issuance by Currency
(During the Peak Year of 2006)**

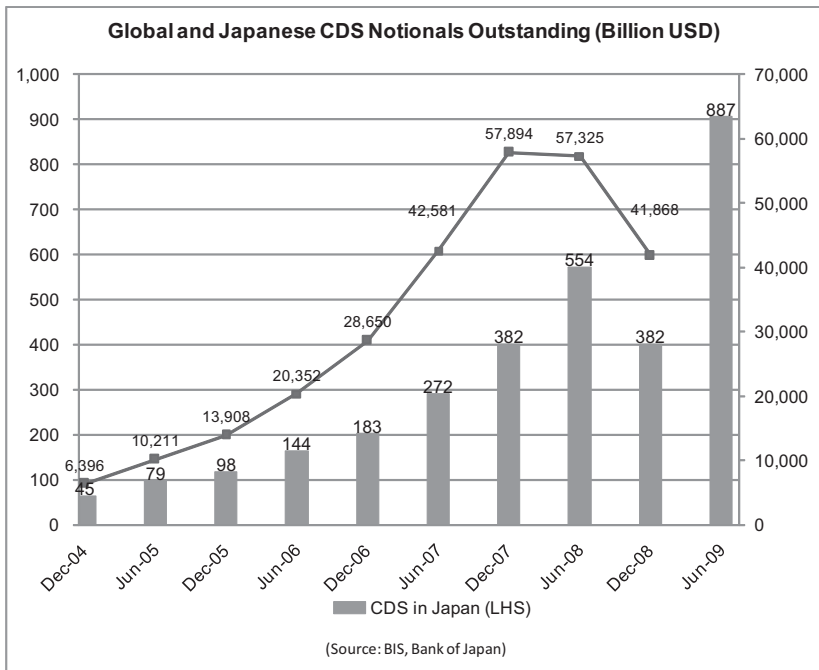


Source: Securities Industry and Financial Markets Association (2007)

products or other types of aggressive re-securitization products have been manufactured in Japan.

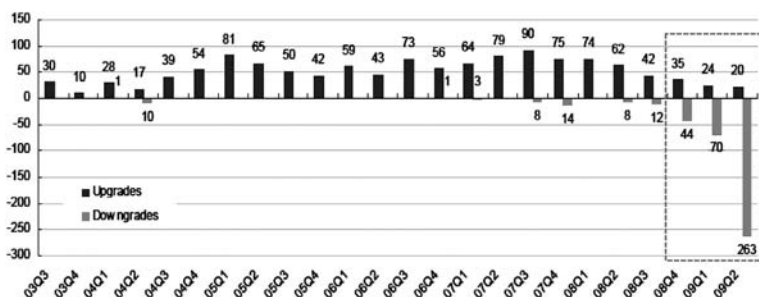
Credit derivative markets, which are closely related to securitized credit markets, are correspondingly small in Japan. According to Exhibit 5, the amount of CDS held by Japanese broker/dealers, in notional terms, is only about 1 percent of the global CDS market. Several explanations can be offered for such “underdevelopment.” First, the small size of Japan’s corporate bond market means that hedging demand from Japanese corporate bond investors has also been small. Second, profit margins on Japanese bank loans tend to be too narrow to pay for CDS-based protection. This factor seems to depress hedging demand from commercial banks. Third, the use of CDS for creating synthetic CDO has also been limited in Japan, where the local CDO market is quite small.

Exhibit 5. Credit Default Swaps: Global Outstanding Amounts vs. Amounts Held by Japanese Market Makers



Source: BIS, Bank of Japan

Exhibit 6. Rating Actions on Japanese Securitized Products: 2003Q3–2009Q2



Given the absence of explosive growth in the securitization and credit derivatives areas, it should be no surprise that we did not see a massive credit market implosion in Japan during the financial crisis of 2008–09. Overall ratings of Japanese securitized products remained stable through the early stages of the subprime crisis, until they were hit by the collapse of Lehman Brothers in September 2008 (see Exhibit 6). Obviously, some turmoil was unavoidable in a crisis of that magnitude. The CMBS market, which had grown rapidly during the real estate mini-bubble in the mid-2000s, saw an unprecedented number of defaults in 2009, mostly as a result of severe liquidity squeeze. On balance, however, the damage to the securitization business and to the broader financial industry was relatively limited in Japan.

Structured Credit Investments and Regulatory Responses

Due to data limitations, we do not have a complete picture of Japanese investments in SCPs. However, Japan's Financial Supervisory Agency (FSA) has compiled detailed data on Japanese banks' investments in securitized products, which should give us a good enough approximation.

In Japan, financial institutions (banks and insurance companies) have been the dominant investor group in structured credit products, presumably because of their familiarity with credit risks. Only a small fraction of pension funds have invested in SCPs, as suggested by a survey conducted by the Daiwa Institute of Research (see Exhibit 7). In this survey, conducted shortly before the crisis, less than 10 percent

Exhibit 7. Questionnaire: “Do You Currently Invest in Structured Credit Products?”

	Pension Funds	Financial Institutions
Yes	8.2%	51.9%
No, but currently under consideration	7.6%	11.7%
No Plan to Invest	84.2%	36.4%
Number of Respondents	316	77

Source: Daiwa Institute of Research (2006)

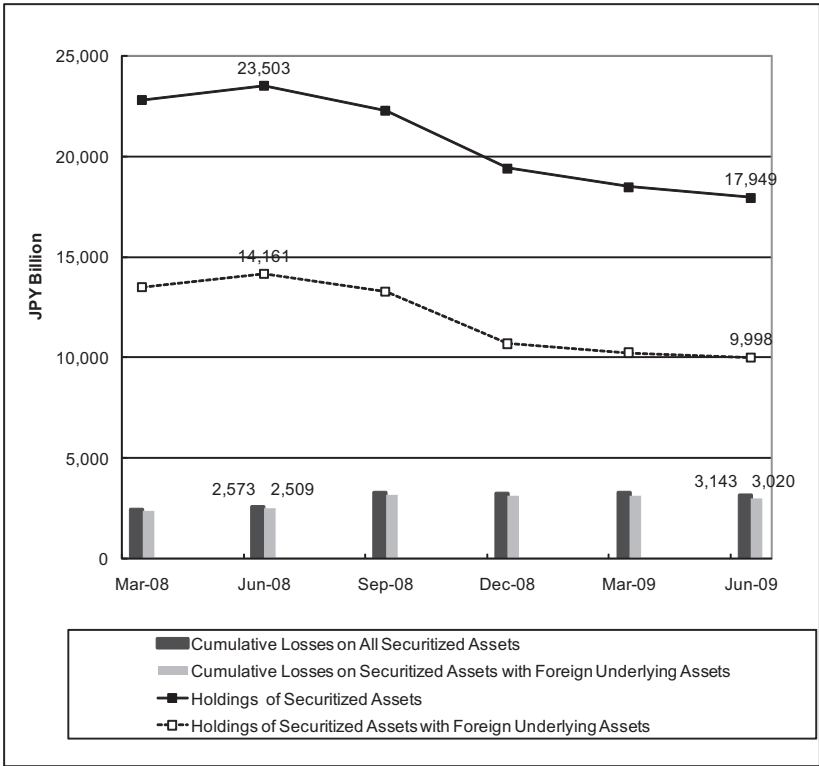
of the pension fund respondents said they invested in structured credit products, as opposed to more than 50 percent of the bank respondents.

As depicted in Exhibit 8, FSA data show that Japanese banks’ holdings of all structured credit products peaked at 23.5 trillion yen (\$261 billion) in June 2008. Their holdings of foreign structured credit products peaked at 14.2 trillion yen (\$158 billion) in June 2008. Reported cumulative losses of 3.1 trillion yen (\$35 billion) mostly came from non-Japanese SCPs. These numbers, though not trivial, are nowhere close to what we see in U.S. and European banks, where total SCP-related losses have been estimated to be well in excess of two trillion dollars.⁴

Part of the relative insulation of Japanese institutions from the global credit crisis may be attributed to regulatory actions by the government. Japan’s FSA moved relatively early to implement “Basel II,” the revised capital adequacy rules for internationally active banks. The FSA published a consultation paper on new rules in October 2004, followed by the publication of draft rules (March 2005) and of revised draft rules (December 2005). The new rules, finalized and published in February 2006, became effective in March 2007. The point of this chronology is that the Basel II implementation in Japan was planned and announced well before the credit/liquidity crisis of 2007–2008. Thus, Japanese

⁴ For example, IMF (2009) estimated that write-downs on U.S.-originated assets by all financial institutions over the period 2007–10 would be \$2.7 trillion.

**Exhibit 8. Japanese Banks' Investments
in Securitized Products**



Source: Financial Supervisory Agency of Japan

banks had plenty of time to adjust their portfolios, reducing their structured credit exposures before the onset of the global credit/liquidity crisis.

There are a few survey results that support this view. In a DIR survey in June 2006, 62 percent of deposit-taking institutions said that they were reconsidering their investments in securitized products, explicitly in response to the planned Basel II implementation.⁵ Another survey in 2008 (by AIMA Japan) showed that, in response to the new regulations, the majority of Japanese banks had reduced their investments in hedge

⁵ Daiwa Institute of Research (2006).

funds, especially in those that do not allow investors to “look-through” their portfolios. The survey also showed that much of the exposure reduction took place before the final implementation in March 2007.⁶

The Basel II implementation in Japan had two important consequences: (1) banks were discouraged from taking leveraged credit risk through investments in securitized products, and (2) banks were also discouraged from investing in opaque hedge funds, some of which took doubly leveraged credit risk. Credit-oriented hedge funds were gaining popularity at the time, but many of them held financially leveraged portfolios of concentrated credit risks (such as CDO equity) and tended to be less transparent than many other hedge funds. Thus, whether it was entirely intentional or not, the new regulations almost certainly had the effect of reducing Japanese financial institutions’ losses from structured credit products.

Lessons and Caveats

I have noted above that the Basel II implementation in Japan, with its speed and rigor, had significant effects on banks’ behavior. Even though it was no small accomplishment, it is unlikely to be the primary explanation for the relative insulation of Japanese institutions from the global credit crisis. The forces of credit market booms and busts were simply too different between the US/Europe on the one hand and Japan on the other.

Why did Japan avoid the great credit market boom and bust of the 2000s, which plagued so many other advanced economies? I would offer four simple, mutually non-exclusive, explanations: (1) the dominance of traditional bank loans in the credit markets, (2) the low degree of complexity in many SCPs, (3) generally cautious views on real estate valuations, and (4) the near absence of highly leveraged arbitrage activities.

A few comments are in order on each of the explanations:

- (1) Traditional bank loans still dominate Japan’s credit markets and crowd out corporate bonds and structured credit products. The

⁶ Alternative Investment Management Association Japan (2008).

structured credit market was finally about to take off in 2007, when the subprime crisis hit.

- (2) Most Japanese investors, who were familiar with currency-linked notes and other non-credit products but unfamiliar with credit products, were naturally averse to complex products linked to credit. Thus, Japanese SCPs tended to have simple senior-subordinate structures, which reduced vulnerability to model risks and parameter risks.
- (3) For many Japanese investors, the memories of the great real estate bubble in the 1980s and its collapse in the 1990s were still too vivid to forget. Their generally cautious views on real estate valuations made them rather skeptical of the global real estate boom (and associated securitizations), and probably had the effect of containing the Japanese real estate mini-bubble in the mid-2000s, limiting the scope for aggressive domestic securitization.
- (4) Highly leveraged institutions with wholesale funding (hedge funds and investment banks) did not have large positions in Japanese credit products. Thus, the domestic credit markets were not seriously damaged by a severe deleveraging cycle during the crisis, even after the Lehman failure.

Even though Japan did not experience dangerous overgrowth of SCPs, it would be unwise to say that all is well. In fact, there are reasons to be seriously concerned about the current state of its securitization markets. One distinct feature of the Japanese securitization markets is that most private-label products take the form of private placements. While the public RMBS market is dominated by the Japan Housing Finance Agency (a GSE-like entity), privately placed trusts comprise 80 to 90 percent of private-label (non-GSE) issues, with little or no public disclosure to other market participants.

Primary data sources for privately placed MBS and ABS, especially those issued by non-resident SPCs, are nearly non-existent.⁷ Some data

⁷ Working Party on Financial Statistics (2009).

on specific private placements are provided via Bloomberg, but only to those involved in the deal. Aggregate information (compiled by the Japan Securities Dealers Association on a voluntary basis) suffers from missing data since certain important items such as coupon rates are overwhelmingly unreported. The resulting informational asymmetry (between “insiders” and “outsiders”) explains the low liquidity of most securitized products in Japan. Such opacity not only fails to lower funding costs, but also raises concerns about what would happen to market liquidity if, for example, the arranger (who is usually the only market maker) were to disappear.

The opacity of the SCP markets hinders research and inhibits its growth. The market’s extreme overgrowth has its risks, as has been amply demonstrated, but its underdevelopment also has its costs. Japan’s infrastructure for mainstream SCP products clearly has room for significant improvement.

Structured Non-Credit Products

Structured Non-Credit Products in Japan

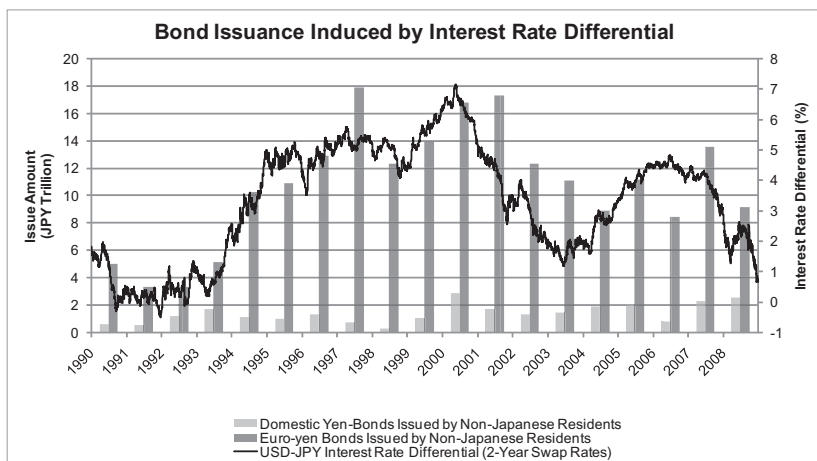
In contrast to the slow development of the structured credit markets, a variety of other structured products evolved and proliferated in Japan long before the subprime crisis. Those structured products have typically been linked to currency, equity and fixed income markets, and some of them were specifically developed and/or tailored to meet the requirements of the Japanese institutional market. I refer to those products collectively as Structured Non-Credit Products (SNCPs). SNCPs have typically been issued by sovereign and supranational entities under the Euro-MTN program, which has provided issuers with a quicker, cheaper, more flexible and more discreet way of accessing various groups of investors than traditional bonds.

The most popular SNCPs in Japan have been currency-linked and equity-linked notes. With a typical currency-linked note, the investor receives high coupons by essentially selling currency options on higher yielding currencies, which often meant the U.S. dollar or the Australian dollar. So-called “power reverse dual currency” (PRDC) notes and “FX-linked target redemption” notes (FX TARNs) have been particularly popular. With a typical equity-linked note, the investor receives

high coupons by selling equity index puts (e.g., Nikkei-linked notes) or individual stock puts (e.g., reverse convertible bonds).

Many structured currency products take advantage of international interest rate differentials, offering attractive current coupons (in Japanese yen) based on higher foreign yields, while simultaneously exposing the investor to significant currency risk. As such, the attractiveness of many structured products depends crucially on current interest rate differentials. Exhibit 9 demonstrates that the Euro-yen bond issuance volume (a significant portion of which is thought to be structured product origination) has historically been strongly correlated with the interest rate differential between the U.S. dollar (USD) and the Japanese yen (JPY).

Exhibit 9. Euro-Yen Bond Issuance and Interest Rate Differentials



Source: Japan's Ministry of Finance, Bloomberg

Let me illustrate the mechanics and risks of structured currency products by taking PRDC (power reverse dual currency) notes as an example. PRDC products have been among the most successful SNCPs that have ever been introduced into Japan. Barclays Capital estimates that approximately \$44 billion of callable PRDC notes were issued to Japanese investors between 2001 and 2009.⁸ Among the notes for which

⁸ Barclays Capital (2010).

information was available, roughly 70 percent had coupons linked to the USD, 20 percent to the Australian dollar (AUD), and 10 percent to the Euro. The main currency for PRDC structures shifted from the USD to the AUD around 2007 with the narrowing of the USD-JPY interest rate differential.

PRDC Mechanics and Risks

A typical callable PRDC note, with a maturity of 30 years, can be characterized as follows: (1) it pays coupons in a foreign currency and the principal in the domestic currency; (2) the coupon fluctuates depending on the prevailing exchange rate, but is never negative; (3) the principal amount is “protected” in the domestic currency, but the timing of the principal payment could be anytime between today and 30 years from today.

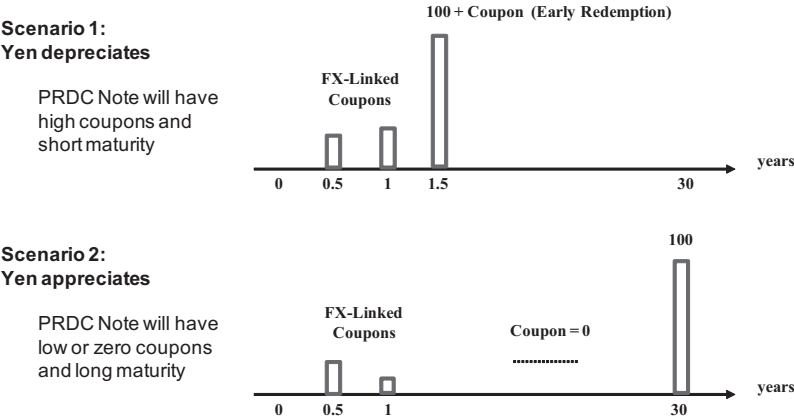
The terms of a PRDC note would include a formula for semiannual coupons such as

$$\text{Coupon Rate at Time } t = \text{Greater of } \left[14.0\% \times \frac{FX(t)}{120} - 11.0\% \right] \text{ or } 0,$$

where $FX(t)$ is the JPY/USD exchange rate at time t . It can be seen from the equation that an appreciation of the yen would reduce the coupons until the linear function in the right-hand side bracket becomes zero, which, in this case, means a JPY/USD exchange rate of approximately 94.286. Conversely, a depreciation of the yen would increase the coupons. Redemption will be at par, but the issuer retains a Bermudan option to call the note. It means that the optimal strategy for the issuer is to redeem the note early if the coupon rate becomes high, and to postpone redemption until the final maturity (30 years from the issue date) if the coupon rate becomes zero. In the latter scenario, the investor would wind up holding a 30-year zero-coupon bond with very low liquidity, with a current market value far below par. (See Exhibit 10.)

Most PRDC notes have been issued by highly rated entities including some sovereign and supranational names, but no issuer would want to bear the risks associated with the notes’ idiosyncratic features as described above. The risks are highly “nonlinear” in the sense that

Exhibit 10. Two Scenarios for PRDC Note Cash Flows



necessary hedge positions can change drastically depending on the exchange rate and the yield curve. “Modeling risk” and “parameter risk” also present difficult challenges. Thus, the issuer almost always hedges PRDC-specific risks through a derivatives transaction with the dealer who structured and sold the note. (See Exhibit 11.) The derivatives dealer in turn needs to dynamically hedge the PRDC’s nonlinear risk exposures in the currency and fixed income markets. An appreciation of the yen, for example, would lengthen the duration of PRDC notes, forcing the dealer to receive large amounts of long-dated yen interest rate swaps.

SNCP-Related Market Disruptions

Beginning in September 2008, a rapid AUD depreciation led to a dramatic extension of AUD-based structured note duration, leading to

Exhibit 11. Simplified Diagram for a Structured Note Scheme

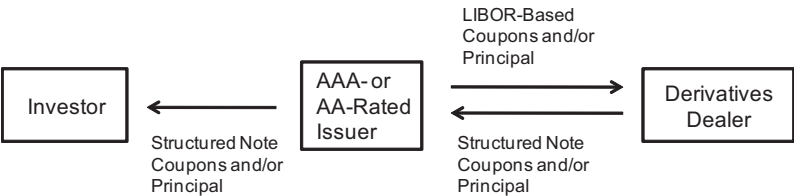
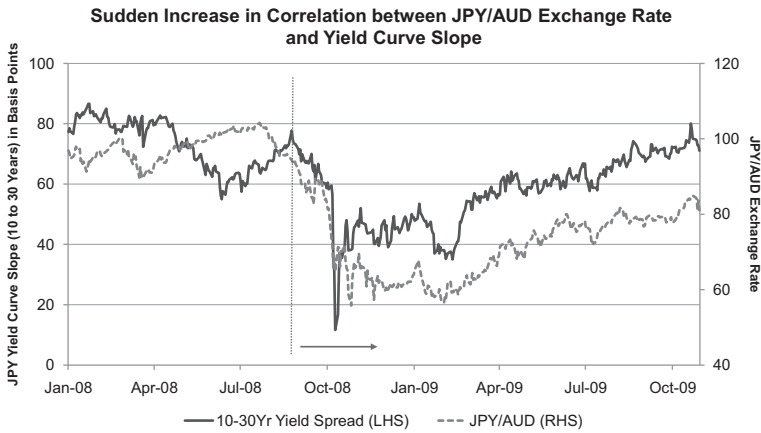


Exhibit 12. Impact of Structured Note Hedging on the Yield Curve Slope



Source: Bloomberg

a sharply increased demand for hedging against Japanese yield curve movements. At the same time, the long end of the JPY swap yield curve suddenly flattened, compressing the 10-year/30-year yield curve slope as shown in Exhibit 12. Correlation between the JPY/AUD exchange rate and the yen yield curve slope increased significantly after this event. Dynamic hedging activity by the derivatives dealers seems to be the only plausible explanation for the emergence of strong correlation that we see in the graph.

Generally speaking, hedging activity for a large supply of highly nonlinear products tends to create distortions in less liquid markets. Such distortions could be cause for concern to policymakers since they could potentially affect a wide range of market participants. However, at least in this instance, it seems reasonable to suppose that the direct costs of such distortions have largely been borne by the derivatives dealers themselves. Having paid higher-than-expected transaction costs, the dealers would likely be somewhat more cautious in supplying similar structured products in the future.

Sizable losses have been reported, especially since 2008, on structured notes held by relatively unsophisticated investors, such as small and medium banks, municipalities, endowments and foundations.

Those incidents obviously raise the issue of investor protection, and the primary regulatory response has been education of less sophisticated banks through seminars and lectures (such as those offered by the Bank of Japan). It should be noted, however, that the popularity of PRDC notes (and FX TARNs) primarily comes from the fact that those products quite effectively exploit the investors' misplaced emphasis on "principal protection." And the apparently irrational emphasis on principal protection, at least among municipalities, foundations and endowments, is a result of the accounting and regulatory constraints under which they operate. In view of their incentives to secure the principal at almost any cost, it seems clear that education alone will not deter certain investor groups from acquiring risky structured products.

Despite the swap market disruptions and the investors' losses, however, SNCs have not posed significant risks to the financial system in Japan. There are only a limited number of large players participating in the disrupted long end of the interest rate swap market, and they could easily absorb any losses in that small segment of the vast fixed income markets. The investors with the largest losses from PRDC notes and FX TRNs were mostly unleveraged long-term investors who did not have to unwind their positions in the middle of market turmoil. Thus, no deleveraging cycle was triggered.

Concluding Remarks

How did Japan avoid the great credit market boom and bust of the 2000s, which plagued so many other advanced economies? What were the factors that mitigated dangerous excesses in its domestic structured credit markets? What were the factors that limited its investments in foreign structured credit products?

This paper offers four simple explanations: (1) traditional bank loans still dominate Japan's credit markets and crowd out corporate bonds and structured credit products; (2) investors unfamiliar with credit products favored relatively simple structures, which reduced vulnerability to model risks and parameter risks; (3) the painful memories of the great real estate bubble in the 1980s and its collapse in the 1990s made Japanese investors skeptical of the global real estate boom (and associated securitizations), and probably had the effect of containing the Japanese real estate mini-bubble in the mid-2000s,

limiting the scope for aggressive domestic securitization; (4) highly leveraged institutions did not have large positions in Japanese credit products, and thus, the domestic credit markets were not seriously damaged by a severe deleveraging cycle during the global liquidity crisis.

I also note that the Basel II implementation in Japan was planned and announced well before the credit/liquidity crisis of 2007–2008. Japanese banks were discouraged from taking leveraged credit risk through investments in securitized products, and they were also discouraged from investing in opaque hedge funds, some of which took doubly leveraged credit risk. Since they had plenty of time to adjust their portfolios before the crisis, the new regulations almost certainly had the effect of reducing Japanese financial institutions' losses from structured credit products.

In contrast to the relatively modest size of the structured credit markets in Japan, the country has long been known for its appetite for a wide range of complex non-credit products, such as currency-linked notes and equity-linked notes. Why have Japanese investors had so much appetite for those types of structured products? What are the risks from those non-credit products?

The popularity of structured non-credit products in Japan can be at least partly explained by the low interest rate environment that Japan experienced much earlier than the U.S. and Europe did. It is well known by now that in a low yield environment, certain investor groups are strongly induced to “search for yield” by taking excessive amounts of tail risks. When Japanese investors started to aggressively search for yield in the 1990s, there were no structured credit products; so they flocked to structured non-credit products that were “the only game in town” at the time.

Some swap market disruptions have been caused by hedging activities associated with those products, but they have been relatively minor, at least from the policymaker's point of view. The investors with the largest losses from structured non-credit products have mostly been unleveraged long-term investors who do not have to unwind their positions at a time when such actions could trigger a damaging deleveraging cycle. Thus, it seems safe to say that structured non-credit

products have not posed, and currently do not pose, significant risks to the financial system in Japan.

References

Alternative Investment Management Association Japan (2008). *Hedge Fund Investments after Basel II* (in Japanese), March 2008.

Barclays Capital (2010). *Market Strategy Americas*, September 16, 2010.

Daiwa Institute of Research (2006). *Alternative Investments Survey* (in Japanese), June 2006.

Deutsche Securities Inc. (2009a). *Securitization Market Japan*, July 14, 2009.

Deutsche Securities Inc. (2009b). *Securitization Market Japan*, October 14, 2009.

International Monetary Fund (2009). *Global Financial Stability Report*, April 2009.

Rajan, Raghuram (2005). “Has Financial Development Made the World Riskier?” Proceedings of the 2005 Jackson Hole Conference, Federal Reserve Bank of Kansas City, 2005.

Securities Industry and Financial Markets Association (2007). *Research Quarterly*, February 2007.

Working Party on Financial Statistics (2009). “Measuring Securitization in the Flow of Funds Accounts in Japan,” OECD, 2009.