

Mortgage Securitization, Default Swaps and Financial Guarantees; Who Buys, Who Sells?

by Alexander Batchvarov, PhD, CFA;
Chinatsu Hani; and William Davies

Over the last decade mortgage securitization has migrated from the United States into Europe and the rest of the world, and taken a permanent hold on the fixed-income market. Over the last few years, synthetic mortgage securitization developed in Europe. For many years, probably since the inception of the mortgage market, mortgage insurance has been part of its operations. Credit risk insurance for years has played and currently plays a significant role in the U.S. agency mortgage market. However, it has been only recently that more sophisticated ways of mortgage insurance have been developed, borrowing from techniques used broadly in the securitization markets.

TRADITIONAL SECURITIZATION

Securitization is a funding and risk transfer technique where a bank or finance company

originator of mortgage loans sells and transfers these loans to a special purpose company in return for cash, which represents a payment consideration of the value of the loans. The special purpose company, independent from the originator, bankruptcy-remote and set up with the sole purpose of the securitization transaction, issues notes to investors and uses the proceeds from the issuance to purchase the mortgage loans from the originator. After the initial exchange, the special purpose company has a liability to investors in the form of notes outstanding and assets in the form of the mortgage loans purchased from the mortgage originator. The proceeds from the mortgage loans, in terms of scheduled interest and principal payments, principal prepayments, prepayment penalties, late payment charges, etc., are used to redeem the notes. Hence, the notes are called mortgage-backed securities.

Such a transaction can be carried out only once through a special purpose vehicle—that is, a specific amount of mortgage loans is transferred from day one sufficient to redeem the MBS issued. It may involve a par-

tial substitution of mortgage loans utilizing current loan redemptions for a period of time. Or, alternatively, the special purpose vehicle can be used for multiple issuance, i.e. a master trust. Figure 1 presents a typical master trust structure as used in the United Kingdom.

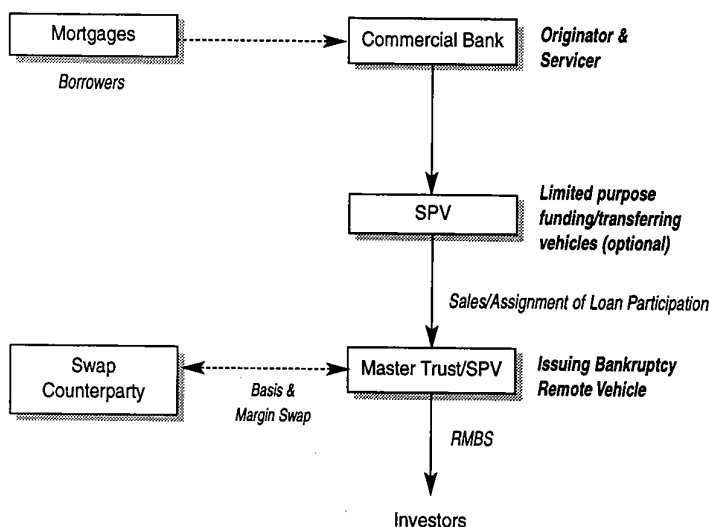
One of the important features of the master trust is that the entire pool of mortgage loans is jointly backing all the notes issued. Or, put in a different way, the credit quality of all the notes issued is identical and a reflection of the credit quality of the entire mortgage pool. There is another type of a multiple issuance vehicle, sometimes used in France and Italy, which issues different notes from defined individual compartments. In that case, the credit quality of each individual note is tied to the credit quality of the defined individual loan pool transferred to the respective compartment of the issuance vehicle, and there is no cross-collateralization across compartments.

So far, we have discussed the predominant mortgage securitization structure—one, which involved the sale and transfer of mortgage loans from their originator to the MBS

Alexander Batchvarov, Chinatsu Hani and William Davies are with Merrill Lynch International Structured Credit Research, London.

MORTGAGE SECURITIZATION

Figure 1. A Typical MBS Master Trust Structure



Source: Merrill Lynch

issuing special purpose vehicle. In market parlance, this is known as a “true sale structure” or traditional securitization. If we look from the perspective of a risk transfer by the mortgage loan originator, it is obvious that the transfer of the mortgages away from its balance sheet should lead to the transfer of all risks associated with those mortgages: credit, interest rate, prepayment, currency, operational, etc.

We believe that this is a key point. Market participants often over-emphasize the credit risk transfer aspect as it is related to the regulatory capital of the respective bank, and neglect the other risk transfers, which can be quite significant albeit varying from country to country, and bank to bank. It is partly due to lack of awareness of the full cost of those other risks to the bank, and partly because it is not linked to regulatory capital requirements. The risk transfer, beyond and

above that of credit risk, achieved by securitization should grow in importance in the future when taking into account the New Basel Accord.

Given the predominant motivation of major banks to achieve credit risk transfer and regulatory capital relief associated with it when undertaking mortgage securitizations, in Figure 2 we illustrate the balance sheet effects of securitization.

This is a generic case illustration for loans with 100% risk weightings; the cost of capital is not reflected in the calculation. We also assume that the retained piece of the securitization capital structure, usually known as the equity piece, is deducted from capital as has been the practice to-date. One can modify the example to include 50% risk-weighted loans, which include mortgage loans with certain loan-to-value characteris-

tics, the cost of capital, the risk weighting of the retained securitization tranche and other considerations.

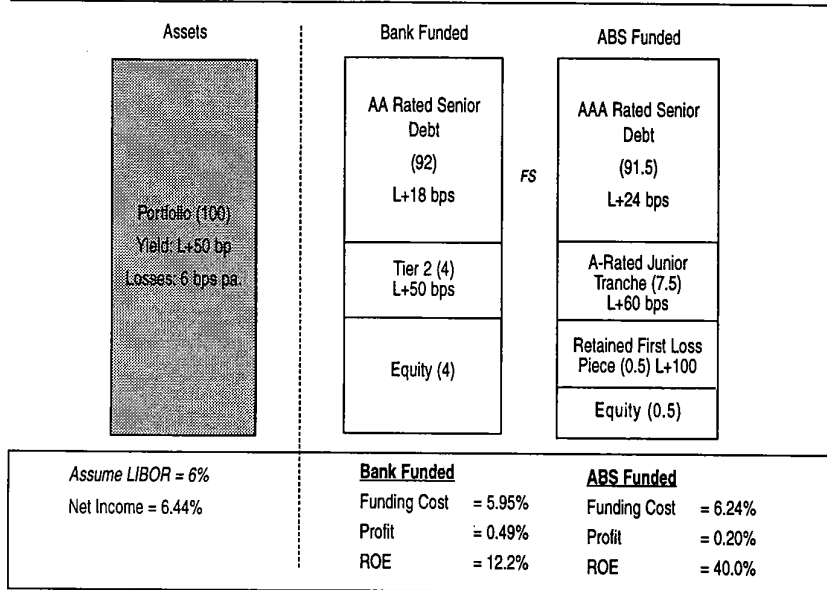
In the future, under the new Basel Accord, one should take into account any other risks that attract regulatory risk capital, e.g., operational, market, etc., as well as the risk weightings—yet to be announced—of a retail mortgage loan portfolio of certain credit quality grades. We emphasize two additional balance sheet effects—potentially higher funding cost (that depends on the rating of the respective bank originator and existing market conditions) and much higher return on equity following the reduction in regulatory capital.

So, to summarize: through the “true sale” securitization of mortgage loans, the mortgage originator—bank or finance company—achieves:

- *Alternative funding.* For highly rated banks it is the alternative aspect of these funding sources that has a bigger attraction, while for low-rated finance companies it is the funding aspect that matters more. Through securitization banks can access additional liquidity by monetizing their assets and can access new funding sources. For the finance companies, securitization is often part of a business model involving a warehousing line of credit to provide a working capital and subsequent securitization as a take-out and repayment source for the warehousing line—all this is done on a revolving basis.
- *Risk transfer* of all the risks associated with the mortgage loans originated by the bank or finance company given that the loans are transferred away from their balance sheets. As a result, the banks can reduce their regulatory capital requirement and improve their financial ratios.

MORTGAGE SECURITIZATION

Figure 2. The Regulatory Economics of a "True Sale" Loan Portfolio Securitization



Source: Merrill Lynch

The prevalence of one or the other benefit depends on the originator's rating, current market conditions, originator's business model and needs (funding, balance sheet management, regulatory capital considerations, etc.).

We assume that the key aspects of "true sale" mortgage securitization have been made clear. From the originator's point of view, though, a few additional questions can be raised:

- *What is of prime importance: funding or risk transfer?* For many highly rated banks with high liquidity, funding through securitization is of secondary importance. Rather, risk transfer and regulatory capital considerations take the front seat.
- *Is traditional securitization legally possible and feasible?* In some European

countries, notably Germany, "true sale" traditional securitization faces several legal and tax hurdles. This is an aspect we have not addressed so far, but it should be sufficient to note the highly legalistic and tax intensive nature of the securitization structures.

Given a bank's preference for risk transfer, and legal and tax hurdles to traditional securitization, the traditional securitization route described above is not feasible, particularly for German banks. An alternative route is that of synthetic securitization.

SYNTHETIC SECURITIZATIONS AND CREDIT DEFAULT SWAPS

Synthetic securitization is, in effect, a mechanism for credit risk transfer away from the mortgage loan originator to multiple investors through the capital markets or to a single

risk-taker. The mechanism employs credit-linked notes and/or credit default swaps and can be briefly summarized as follows:

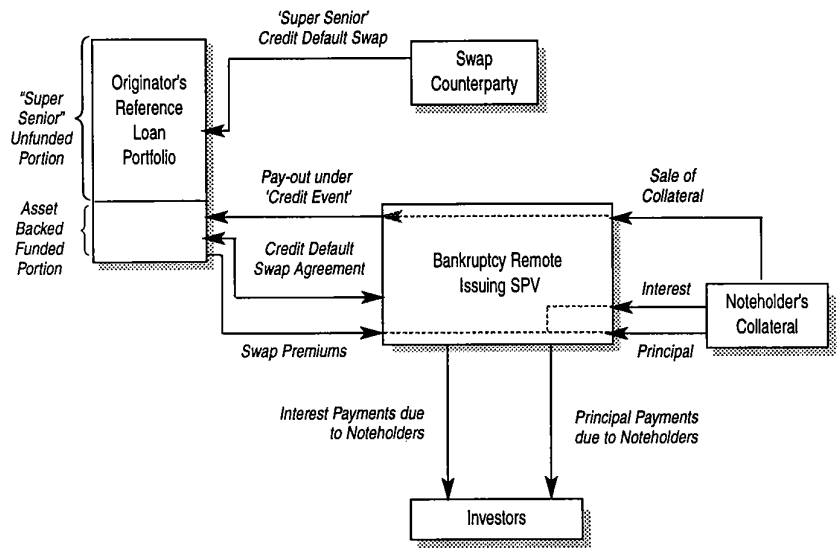
A mortgage loan originator transfers the credit risk associated with a selected mortgage loan portfolio (the reference portfolio) by buying protection from a special purpose vehicle. The special purpose vehicle, in turn, sells notes to the market and uses the proceeds to buy a portfolio of highly rated and liquid obligations (the collateral portfolio). The credit quality of the notes sold by the vehicle reflects the credit quality of the reference portfolio. If the reference portfolio experiences losses, the mortgage loan originator is compensated for those losses using proceeds from the liquidation of the collateral portfolio. The outstanding notes are redeemed at maturity through the liquidation of the residual collateral portfolio, hence the investors in those notes absorb the losses associated with the reference portfolio. Interest payments to noteholders are made from a combination of the interest income from the collateral portfolio and a protection fee payment by the originator to the special purpose vehicle. The mortgage loans, whose risk is transferred, remain in the bank's balance sheet – the bank is, in effect, buying protection against that risk.

Synthetic securitizations can be executed as:

- *Fully funded* (that is, the amount of notes sold to the market corresponds to the value of the reference portfolio);
- *Partially funded* (that is, the amount of the notes sold is significantly less than the value of the reference portfolio, and part of the credit risk of the reference portfolio is off-loaded through a single credit-default swap to a single counterparty, assumed by one risk taker or protection provider); and

MORTGAGE SECURITIZATION

Figure 3. A Typical Partially-Funded Synthetic Securitization



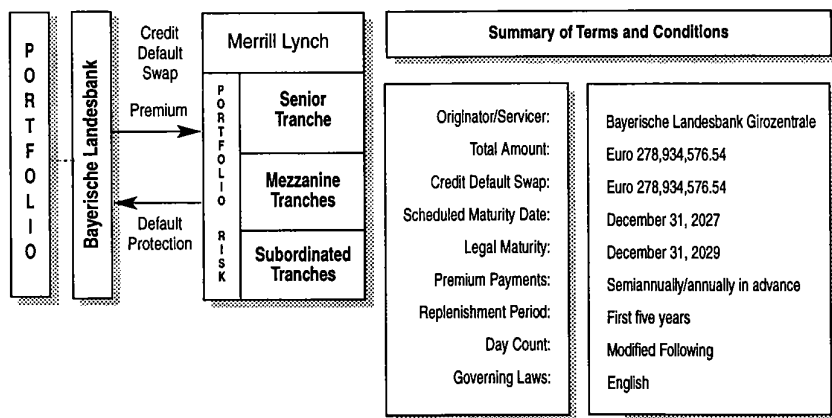
Source: Merrill Lynch

- *Fully unfunded* (that is, there is no note issuance and the credit risk of the reference portfolio is transferred to one or more counterparties through a single or multiple credit default swaps, and there is no public issuance of notes).

While the volume of unfunded synthetic securitizations is, we hear, substantial, they remain private in nature. As for public transactions, they are dominated by partially funded synthetic securitizations, whose main features are illustrated in Figure 3.

A key element of a synthetic mortgage securitization is the definition of risks being transferred through the definition of credit events. Elements of that risk are crystallized in the determination of when a default is deemed to have occurred, how is the loss ensuing from that default calculated, when the mortgage originator is reimbursed for the related loss, etc.

Figure 4. Residential Mortgages—Neuschwanstein 2000–1: Credit Default Swap on Second Lien Residential Mortgages



Source: Merrill Lynch

So, from a mortgage originator's point of view, there is a substitution of the risk of the credit risk associated with a mortgage loan with the residual credit risk of the same mortgage loan not captured under the definition of credit events (or risk transferred) and the risk of the counterparty providing protection against the defined credit default risk.

In Figure 4 we illustrate a specific transaction, in which the credit risk of a pool of second lien residential mortgages was transferred partially to the market through funded notes and partially to one swap counterparty through a credit default swap. This is, in some respects, a typical German synthetic mortgage securitization transaction. Given that specialized German banks can get a favorably priced financing through the issuance of Pfandbriefe-covered mortgage bonds, their need is not for alternative funding. Rather, their goal is credit risk transfer of the part of the mortgages not eligible for

MORTGAGE SECURITIZATION

Pfandbriefe financing (e.g., the part of the mortgage loan exceeding 60% LTV) and a related regulatory capital relief. Hence, the application of synthetic securitization to the above 60% LTV portion of the mortgage pool in question, the reference pool.

A typical securitization analysis is applied to the reference pool and its credit risk is tranching in the usual senior, mezzanine and equity tranches. A large portion of the senior tranche is further tranching into a super-senior and senior tranches: the risk of the super-senior tranche is transferred to a single protection provider through super-senior credit default swap, while the risk of the senior and other remaining tranches is transferred to the market through the issuance of notes or through an individual credit default swap.

A synthetic securitization has certain balance sheet and regulatory risk capital implications. Similar to the traditional securitization above, we provide a simplified illustration of those implications in Figure 5. Unlike traditional securitization, though, we do not talk about funding cost, but rather about cost of risk transfer and its effects on regulatory capital. A component of the cost of risk transfer is the price of the super-senior credit default swap in the case of partially funded synthetic securitizations. Some national regulators require hedging of the risk of the super-senior tranche through a credit default swap, which requires the bank to pay a fee. In practical terms, we believe that such hedging is not necessary, given the minimal risk associated with the super-senior tranche, also referred to as a "super triple-A" tranche. The

New Basel Accord is yet to finalize the need, or lack thereof, for such hedging and related unnecessary expense.

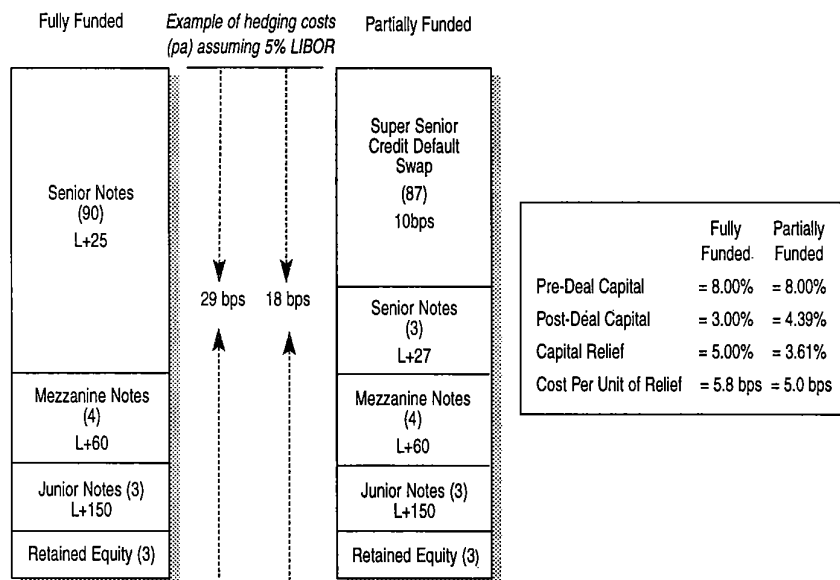
INSURANCE AND FINANCIAL GUARANTEES

The use of insurance to protect originators from the credit risk of the mortgage loans they have originated varies from country to country. In the case of Australia, specialized mortgage insurers are still active in providing primary mortgage insurance on an individual mortgage or mortgage pool basis. Many of the already insured mortgages are subsequently securitized.

In the case of the U.S., the agencies (Fannie Mae, Ginnie Mae, and Freddie Mac) provide liquidity and credit support for the mortgage market. Ginnie Mae MBS are backed by mortgages that benefit from a government guarantee and, furthermore, the MBS themselves are guaranteed by Ginnie Mae (and the U.S. government) regarding timely payment of interest and principal. Fannie Mae and Freddie Mac MBS are backed by mortgages with private insurance (referred to as conventional mortgages), while the originators guarantee the MBS notes. Fannie Mae and Freddie Mac are privately-owned entities, but the market considers their MBS as having "quasi-government" support given the agencies' status as government-sponsored enterprises. In either case, the agencies' support of the credit quality of the MBS mitigates the credit concerns associated with the mortgage pools and establish the basis for mortgage securitization and the market for collateralized mortgage obligations (CMOs).

The primary mortgage insurers were active in the U.K. market in the late 1980s and early 1990s, but their role subsequently waned as they failed to honor claims submitted to them during the real estate crisis of the early 1990s.

Figure 5. The Regulatory Economics of a Synthetic Securitization



Source: Merrill Lynch

MORTGAGE SECURITIZATION

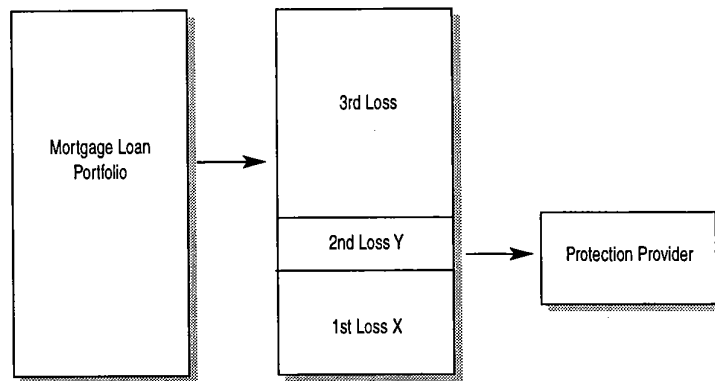
Japanese residential mortgages are also supported by insurance on an individual basis and these are usually provided by mortgage guarantee subsidiaries of the originating banks. A similar situation exists with mortgages extended by the Government Housing Loan Corporation (GHLC). We should also mention that unlike the MBS programs launched by the private sector banks, GHLC MBS program provides additional credit support for the MBS by adopting a scheme where GHLC replaces defaulted loans within the securitized mortgage pools with performing loans. A big question mark hangs over the GHLC MBS program and it is related to the future status of GHLC as a government or private entity.

Notably, all of the above insurance policies are applied either to an individual mortgage loan or to a pool of mortgage loans, assuming the risk of default and subsequent loss in full or up to a specified amount.

In fact, from the point of view of the mortgage originator, the credit risk of the mortgage borrower is substituted for the credit risk of the mortgage insurer. Additionally, the mortgage insurer, if covering the net loss in case of a borrower default (that is, loss after recovery from the sale of the property), is also assuming the market risk of housing price volatility. Depending on when the loss is calculated and reimbursed, the mortgage insurer may also be assuming the risk of a prolonged repossession and liquidation process.

As mentioned above, the mortgage originator substitutes the risk of the mortgage obligor for the risk of the insurance provider, or so does the conventional market wisdom go. In reality, though, the insurer steps in only in case of default of the underlying mortgage obligor. It is reasonable to assume that often it is difficult to establish the credit quality of that obligor as a direct comparable of the credit quality of the mortgage insurer.

Figure 6. Third-Party Second Loss Protection for Mortgage Loan Portfolios



Source: Merrill Lynch

Furthermore, it is reasonable to assume that the risk exposure of the mortgage originator is now a dual exposure to that of the mortgage insurer contingent upon a default of the mortgage obligor, hence it is lower than that either of the two.

The insurers' involvement in the mortgage market has become more sophisticated recently with the application of securitization techniques of determining the risk of a mortgage portfolio and its subsequent tranching. A mortgage insurer could assume any tranche of the risk—usually noted as first, second or third loss. Say the insurer assumes the second tranche of the potential loss and it is sized at Y amount of euros above X amount of euros of first loss. The originator is assuming the first loss to occur in the portfolio up to level X. For any loss exceeding X but less than Y, the mortgage loan originator will be reimbursed by the insurer. Losses above level Y will again be absorbed by the originator. So, the originator is substituting the risk of second loss for the risk of the mortgage insurers.

A dedicated mortgage insurance provider is usually a credit-worthy company, which in addition is dedicated to this line of business—mortgage insurance is their lifeline and any suspect rejection of claims would be detrimental to their business. Hence the need to differentiate between dedicated mortgage insurance providers and those for whom mortgage insurance is a side business.

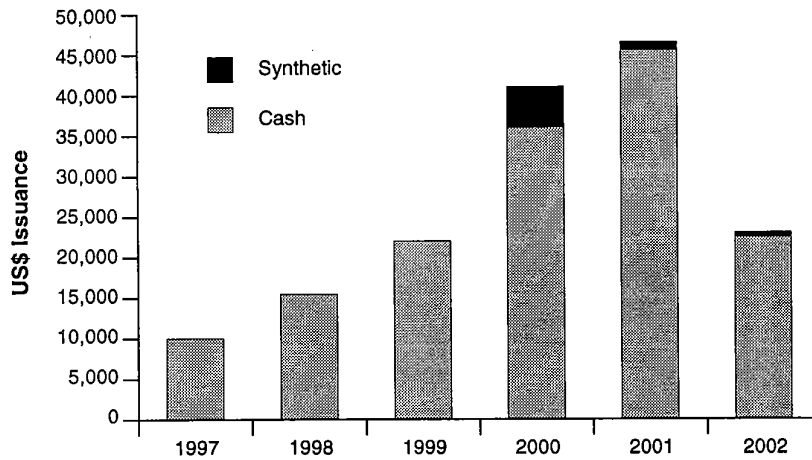
MORTGAGE RISK: BUYERS AND SELLERS, AND VOLUMES

The preceding sections clarified different aspects of credit risk transfers for residential mortgage portfolios. As the following graphs demonstrate, these techniques are widely used in practice:

- Figure 7 shows the annual European new issuance volume and delineates the cash and synthetic formats of the risk transfer and deal execution. As can be seen, synthetic execution dates back to year 2000 and still presents a relatively

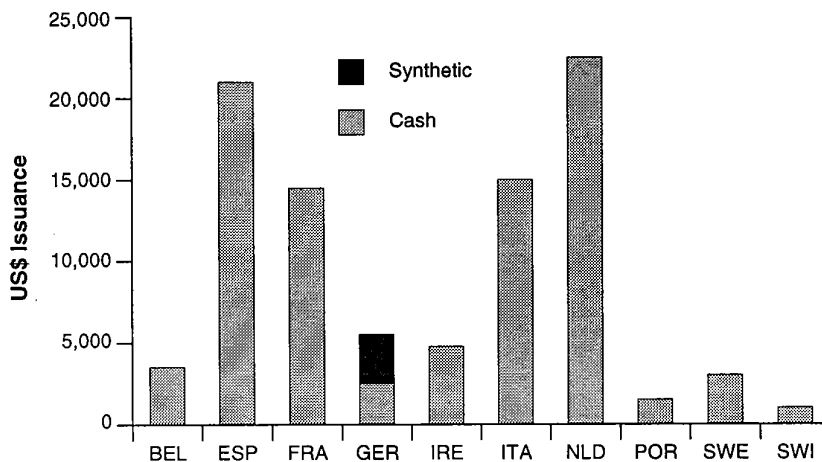
MORTGAGE SECURITIZATION

Figure 7. European Annual RMBS Issuance 1997–2002 (Year-to-Date) (\$1,000 US\$)



Source: Merrill Lynch

Figure 8. European RMBS, 1997–2002 (Year-to-Date) (\$1,000 US\$)



Source: Merrill Lynch

small portion of the overall European RMBS market;

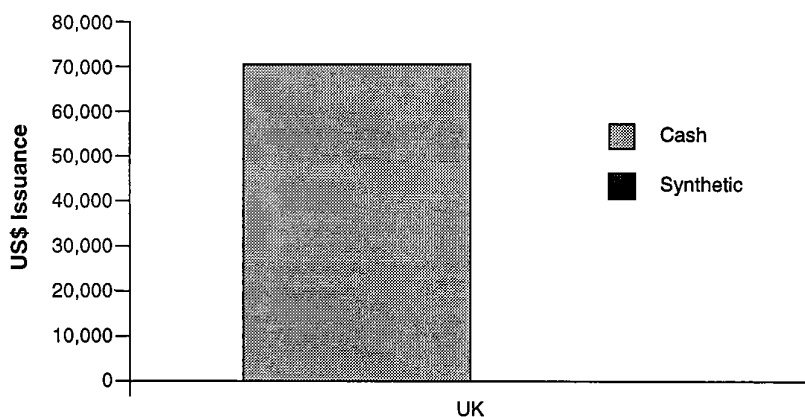
- Figures 8 and 9 show the cumulative issuance by country in Europe and the U.K. (please note the different scale used) for the period 1997–July 2002. It is noteworthy that synthetic mortgage securitization has been executed so far in Germany
- Figure 10 delves into the type of mortgages securitized in the U.K., which so far has demonstrated the widest range of RMBS products. In fact, under the category “non-conforming” we include buy-to-let mortgages, sub-prime mortgages and other mortgage products, excluded from the “prime” category. Shared appreciation mortgages and equity release mortgages are two other sectors of declining (the former) and increasing (the latter) share in the market.
- Figure 11 shows Japanese RMBS issuance in terms of transactions from GHLC and from other entities such as banks and insurance companies.
- Figure 12 illustrates the issuance of Australian RMBS, which are backed by mortgages, insured on an individual or pool basis. Issuance of MBS backed by non-insured and sub-prime mortgages has been small and relatively recent.
- We are not aware of any public data showing the volumes of mortgage insurance related to first and second loss pieces of tranching mortgage pools, although we are aware of the execution of such transactions.

Behind this substantial traditional and synthetic securitization volume stand a wide range of mortgage originators:

- Banks, active in the mortgage markets,

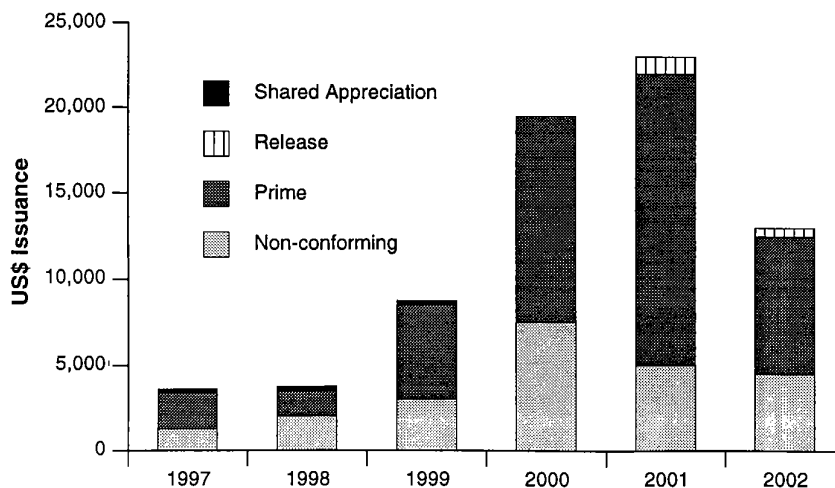
MORTGAGE SECURITIZATION

Figure 9. U.K. RMBS Supply, 1997–2002 (Year-to-Date) (\$1,000 US\$)



Source: Merrill Lynch

Figure 10. U.K. RMBS Issuance by Mortgage Type, 1997–2002 (Year-to-Date) (\$1,000 US\$)



Source: Merrill Lynch

seek risk transfer, funding or both. For example, using the volume charts above, prime mortgage securitization in the U.K. is associated primarily with large banks, while on the European continent the dominant sponsor of mortgage securitization are the banks. Many banks in Germany use synthetic securitization to dispose of the risk of second line mortgages as explained above.

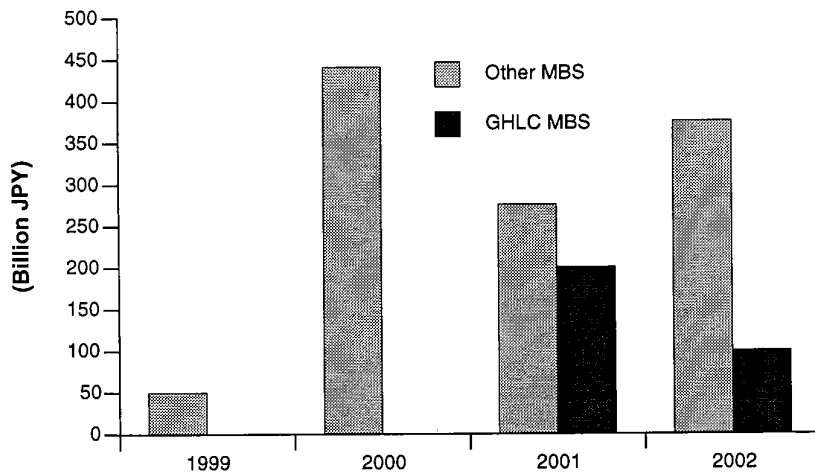
- Finance companies use securitization as part of their model primarily as a funding source. On the chart of U.K. RMBS issuance, non-conforming mortgage securitization is primarily associated with finance companies, also known as specialized lenders.
- Insurance companies usually use securitization to dispose of mortgage portfolios, which are not their main line of business, but underwriting mortgages is viewed as a key for distributing their main insurance products.
- A series of other institutions (savings banks, co-operatives, building societies) with a range of interests in mortgage products use securitization for a variety of reasons.

On the other side of the securitization equation stands a range of investors and protection providers. They choose among buying a mortgage exposure in accessible format, buying desirable risk profile, buying exposures in another geography, buying desirable bond profile, buying combined exposure—mortgage loan obligor and mortgage insurer:

- Banks, who look to diversify their own mortgage exposures geographically or by product type, or take a specific exposure in terms of maturity or risk profile. In this case, the risk associated with the mortgage pools does not leave the bank-

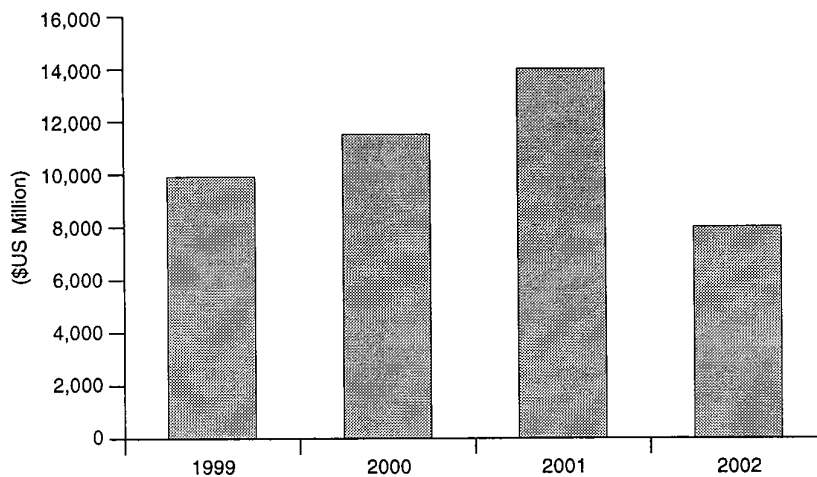
MORTGAGE SECURITIZATION

Figure 11. Japanese Annual MBS Issuance, 1999–2002 (Year-to-Date)



Source: Merrill Lynch

Figure 12. Australian Annual MBS Issuance, 1999–2002 (Year-to-Date)



Source: Merrill Lynch

ing system, but is rather redistributed within. Banks can act as investors in mortgage-backed securities or as buyers of mortgage pools or as sellers of protection for mortgage pools. Given the capital structure of traditional and synthetic MBS, a bank investor can choose the desirable level of risk.

- Pension funds and financial advisors, usually participate as investors in mortgage-backed securities along the entire risk spectrum of their capital structure. In this case, the credit risk associated with mortgage portfolios leaves the banking system.
- Conduits and in particular the asset-backed commercial paper conduits who invest in ABS and MBS are active investors in RMBS. These investments are viewed as off-balance-sheet ones.
- Insurance companies act as both investors in MBS and protection providers for synthetic MBS. The risk is leaving the banking system.
- Monoline insurers may provide credit risk protection for an existing MBS through a monoline wrap or provide protection for super-senior pieces of synthetic securitizations.
- Specialized mortgage insurers may absorb the risk of individual mortgages or provide protection of a slice of mortgage portfolio risk (first, second or third loss).