Securitization: A Primer on Structures and Credit Enhancement

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The credit risk due to loan default is one of the major risks associated with mortgage loans. New issuers, particularly in emerging economies, have limited historical performance data, making it difficult to predict the probability of default with much confidence. Untested legal procedures (e.g., foreclosure) or lack of default experience make it difficult to forecast loss severity. Originator or third party credit enhancement is used to reduce credit risk of the investor.

All forms of wholesale funding involve credit enhancement. Whole loan sales may be participations where the lender and investor share in any loss, or with recourse or seller repurchase requirements. Liquidity facility lending is on an over-collateralized or recourse purchase basis.

To attract a wider group of qualified investors, the securitisation structures must include highly rated tranches or classes. The amount and type of credit enhancement will be dependent on the desired credit rating (AAA, AA, A, BBB, etc.) for each of the various classes of the security. The basis for the required credit enhancement is the estimated losses for each of the classes under a range of assumptions. The rating agencies will forecast the loss coverage amount as a product of probability of default and loss per default.

Credit enhancement is required to ensure that investors receive timely payment of principal and interest from the securities. This form of cash flow insurance differs from loan loss insurance, typically provided by mortgage insurers, which compensates the insured (typically the lender but possibly the investor) for ultimate loss due to a default. Cash flow insurance is required to make the securities more equivalent to bonds (e.g., government, mortgage or corporate) in their cash flow certainty.

Credit enhancement can come from external or internal sources. External credit enhancement is provided by highly rated third parties, whereas internal credit enhancement comes from structuring and prioritizing the cash flows from the underlying mortgage pool.

External Credit Enhancement

Table 2 shows the various types of guarantees offered on securitization transactions, the entities that offer them and some of their advantages and disadvantages.

Issuer Guarantees: Perhaps the simplest form of credit enhancement is a guarantee of the security issuer (as there are no third parties or structuring). However, the credit enhancement is only effective if the guarantor is highly rated. The most notable examples of issuer guarantees are securities issued by the Government Sponsored Enterprises (GSEs) in the US (Fannie Mae, Freddie Mac and the Federal Home Loan Banks) and the Hong Kong Mortgage Corporation (HKMC). These corporations

provide timely payment guarantees on the securities they issue. Their securities are highly rated primarily due to government backing.[1]

The advantages of issuer guarantees are their simplicity and their relatively low expense (the average guarantee fee charged by the GSEs is around 20 basis points). This structure can work well if the objective is to foster acceptance of the securities of a centralized issuer in the market. Repeat issuers of standardized high quality securities can promote market acceptance of and liquidity in mortgage securities. The GSEs have been instrumental in developing the deep and liquid mortgage securities market in the US.

Corporate guarantees are provided by mortgage and agency bond issuers. Mortgage bonds have additional credit enhancement in the form of a priority claim on the collateral in the event of bankruptcy of the issuer. The priority claim is established in covered bond legislation in most European countries, however recently structured covered bonds have been issued in the Netherlands and the UK without benefit of legislation [Stöcker 2005, Merrill Lynch 2004]. Other than these examples, issuers of mortgage backed securities do not provide guarantees if they want to achieve true sale and capital relief.

Agency bonds issued by liquidity facilities typically have no additional credit enhancement. A liquidity facility is a second tier institution that provides loans to lenders and funds itself through bond issuance. These institutions can reduce liquidity risk inherent in depository lending by allowing lenders to access funds using their housing loans as collateral, tap alternative sources of funds through the capital markets, and create efficiencies in the bond issuance. Credit enhancement on liquidity facility debt comes from the capital of the issuer and the low credit risk of facility assets which are purchased on a recourse basis or are loans provided with over-collateralization.

There are numerous examples of liquidity facilities in developed and emerging markets. The Switzerland Pfandbrief Bank and the US Federal Home Loan Banks are the oldest examples. In emerging markets, liquidity facilities have been created in India, Trinidad, Malaysia, Jordan and South Africa. The most successful example for affordable housing in emerging markets is Cagamas in Malaysia. Their bonds are regarded as very safe reflecting the business practice of taking little or no mortgage credit risk.

[1] The US GSEs are implicitly backed by the government. Investors believe the government would not allow default on their securities due to their special status and significance to the market. Thus their debt trades better than AAA but not as well as government securities with full faith and credit backing. The HKMC is owned by the government.

Table 2: External Credit Enhancement

Type	Description	Offered By	Advantages	Disadvantages
Issuer Guarantee	Issuer guarantees of timely payment of P&I	Fannie Mae, Freddie Mac, Hong Kong Mortgage Corp., Federal Home Loan Banks, mortgage bond issuers	Simple, easy to understand, can be relatively cheap (~20 bp in US); stimulates competition by allowing access to a wide range of lenders; offered by gov't. or quasi-gov't institutions with high ratings	Creates contingent liability if gov't., and may be mis-priced (+/-);Not off-balance sheet for corporate issuer;
Government Agency Guarantees	Third party guarantee of timely payment of P&I from government agency	GNMA, CMHC, Colombia, KfW	Simple, easy to understand, can be relatively cheap (6 bp in US, 20 bp in Canada); stimulates competition by allowing access to a wide range of lenders	Explicit liability of the gov't.; subject to agency risk (due to actions of lenders); may be mis-priced; should be properly capitalised and budgeted
Monoline Financial Guarantees	Provides guarantee of timely payment of P&I. Typically covers 100% of loss up to stipulated aggregate loss limit	Bond insurers (AMBAC, MBIA), Private mortgage insurers (PMI, Genworth, UGI)	Insurers typically rated AA or AAA – improves credit quality of securities. Provider may assist in structuring	Cost: 15-45 bp for AAA wrap; Bond insurers provide guarantees only in investment grade countries
Political Risk Insurance	Provides insurance against non-commercial risks such as currency transfer restrictions, certain types of expropriation	Multi-laterals (MIGA, IFC.), Bi-lateral (OPIC)	Applicable for emerging markets with unstable economies and/or legal systems. Allows issuance of securities for international investors	Cost: 8 bp/yr. for 1.5 yrs. In Baltic American transaction
Multi-lateral and Bi-lateral Agency Guarantee	Provides guarantee of timely payment of P&I. up to a specified percentage of the pool or tranche balance.	World Bank (back-stopped by gov't.), IFC, EBRD	AAA + guarantees, will assist in structuring and marketing	Some require gov't. counter-guarantee; cost – e.g., 25 bp for IFC partial guarantee, additional delays and cost for agency approvals
Liquidity Provider	Covers temporary shortfalls in cash flow due to disruption in servicing. Typically limited to a max % of the outstanding balance	Banks, IFC	Steps in before timely payment guarantor if shortfall not due to loss	Cost (10-20 bp commitment fee); Could be covered by reserve fund

Government Agency Guarantees: An alternative to issuer guarantees is the guarantee of a third party government agency. Agency guarantees are provided by third party government agencies to credit enhance securities issued by lenders. These are cash flow guarantees promising timely payment of principal and interest in the event of a disruption or default of the servicer or issuer. If issued by a government agency, such guarantees are full faith and credit of their governments and have a zero capital adequacy risk weight. The best known example of agency guarantees is the Ginnie Mae (Government National Mortgage Association) program. Ginnie Mae provides 100% cash flow insurance on pools of government loss insured (Federal Housing Administration – FHA and Veterans Administration - VA) mortgages. The first pass-through securities, issued in 1970, were issued with Ginnie Mae guarantees. The Canada Mortgage and Housing Corporation (CHMC) has a similar program providing guarantees on securities issued by providers of government insured loans.[2]

Agency guarantees expose the guarantor to the risk of fraud or mis-representation on the part of the originator (re. quality of underwriting) and/or of the servicer (e.g., improper reporting of delinquency and prepayment). This risk can be substantial if the guarantees are provided to thinly capitalized or lightly regulated issuers. Management of the risk is costly requiring extensive quality control and servicing audits. While they have worked well in Canada and the US, their use is problematic in many emerging markets where the ability to monitor the risk and legal sanctions against fraud is weaker.

A major issue with both government-backed institution and third party agency guarantees is their continued existence long after their market development mission is accomplished. There are many critics of the GSEs in the US who point out that nearly all their activities are now undertaken by the private sector. Thus the public policy benefit of implicitly backing these institutions is questionable. As their securities issuance and guarantees total more than $3 trillion, they expose the US government to a large contingent liability and the financial markets to systemic risk. It is notable that the SHF charter in Mexico requires the institution to stop issuing government –guaranteed debt by 2009 and providing government-backed guarantees by 2013. This was done out of concern that a government-backed institution could come to dominate the Mexican market much the same way that the GSEs dominate the US market.

A major advantage of agency guarantees is that they facilitate issuance by any qualified lender (in the US many Ginnie Mae lenders are small mortgage banks with limited capital and ability to access the capital markets) thus promoting competition. However, the Canadian and US programs only work with government insured mortgages – they provide cash flow insurance on top of government provided loss insurance, covering the risk of payment disruption due to servicer problems (e.g., bankruptcy and need to transfer servicing).

[2] There are more than $600 billion in Ginnie Mae securities and $96 billion in CMHC securities outstanding. In both countries the government mortgage insurance programs they support are designed to facilitate homeownership by lower and moderate income households by lowering the down-payment requirement.

There have been government guarantee programs focused on affordable housing in Colombia and Mexico. In Colombia, the government deposit insurance agency, FOGAFIN - Fondo de Garantías de Instituciones Financieras, provides 100% cash flow guarantees on social interest housing loans – defined in terms of borrower income (2 minimum wages or less) and loan size) included in residential mortgage-backed securities. The FOGAFIN guarantee is on the performance of loans in the securitized pool. It comes prior to internal credit enhancement on the entire pool. The guaranteed and non-guaranteed pools are merged into a single trust, and then a waterfall structure is developed. FOGAFIN (also the deposit insurance agency) charges a premium based on estimated loss from default. The issuer pays either a one-time fee of 3.22 percent of the principal of the insured bonds or 0.81 percent of the capital balance as annual fee. The presence of VIS loans provides scale and liquidity to the issues. According to the World Bank, the guarantees have not resulted in an overall increase in social housing lending, however, which is constrained by interest rate caps and on-going judicial uncertainty about the structure and enforcement of the loans.

In Mexico, the Sociedad Hipotecaria Federal (SHF) provides several guarantee products to support the refinance of Sofols (mortgage companies). SHF issues bonds and provides loans to Sofols, provides partial default loss insurance on individual loans, enhances bank lines of credit to developers and provides partial guarantees of mortgage-backed securities. As a national development bank, SHF has a full faith and credit guarantee of the Mexican government. The Sofols have focused on the moderate-middle portion of the income distribution (6 to 15 times the minimum wage). Their ability to access the capital markets with SHF partial guarantees, and more recently through internal credit enhancement, represents a clear example of how wholesale markets can fund affordable housing. Importantly, the government does not take all the risk in these transactions, thus leaving issuers with the incentive to properly underwrite and service the loans.

SHF provides top loss mortgage insurance on individual loans covering up to 35% of exposure. The insurance is priced from extensive data on default experience and is paid up front by the borrower. SHF recently signed contracts with two US private mortgage insurers to reinsure 70% of its risk. The companies intend to become primary insurers in the future with SHF focusing on social interest housing loans and special risks.

SHF provides guarantees to protect commercial banks from payment default on construction loans to Sofols. The guarantee covers up to 85% of the lines of credit used for construction. The premium on the guarantee is negotiated individually with each Sofol. In case of default by the Sofol, SHF pays the commercial bank the unpaid balance in the two days following the bank's claim.

SHF also provides partial guarantees on mortgage backed securities with the issuer taking a first loss (subordination or over-collateralization) position.[3] In an example

[3] The **GPO** (Garantia de Pago Oportuno, or Timely Payment Guarantee) is a credit enhancement at the deal level of the structure. Sometimes referred to as a partial guarantee (PG), the GPO is similar to a credit line. If the trust does not have sufficient cash to make a given payment, the line of credit can be drawn to pay both interest and principal. Once the line of credit is repaid, it can be drawn down again,

transaction, SHF provided a guaranty on a Metrofinanceria construction (bridge) loan securitization [Asset Securitization Report 2005]. The bridge loans backing the transaction had an average maturity of 18 months. Among the deal's enhancements, SHF provided a 14.2% partial guaranty on the original note balance, and Metrofinanceria provided 5% over-collateralization. The transaction was denominated in pesos with Credit Suisse providing a peso-US dollar currency swap out to 3 years final maturity. An AMBAC monoline wrap brought the senior bonds to US AAA allowing US bank investors to participate.

Through 2005 SHF had provided guarantees on 16 issues for more than $1 billion [Babatz 2005]. However, it is required by charter to stop lending by 2009, and it will lose its government guarantee by 2013. As a result it is working with private sector insurers and guarantors to bring them to the market. The private market has taken off with several Sofols issuing securities using only internal credit enhancement. Hipotecaria Su Casita has issued 3 mortgage securities without external guarantees. Notably they have issued the first peso denominated security and have sold portions of two issues in the US. While the larger Sofols have proven that they can access the market on their own, smaller lenders may not have sufficient scale to economically access the wholesale market. Also the market need for loans to lower-income households (over ½ of the Mexican population) suggests a role for government credit support to this segment.

Multi-lateral and Bi-lateral Guarantees: A number of multi-lateral and bi-lateral agencies provide various forms of credit enhancement to catalyze the development of wholesale funding in emerging markets. They can provide cash flow insurance, purchase subordinate securities, create liquidity facilities and provide political risk insurance.

The International Finance Corporation (IFC) offers the widest range of credit enhancement products for securitisation transactions among the multi-laterals. They provide partial cash flow guarantees up to a specified amount of a tranche on issues of majority private sector owned companies. They will also purchase the mezzanine or subordinated tranches of internally enhanced transactions (examples below). The IFC also provides liquidity facilities and structured credit lines. Through 2005 the IFC has conducted 58 structured finance transactions in 22 countries for more than $5.2 billion, a significant portion of which were backed by housing loans. [Dowers 2005]. The IFC also assists in structuring and placement. The transactions are generally non-standard and can be time consuming due to the need to get IFC Board approval. However, they bring the name of a global AAA entity to the transaction, which can have significant value for investors, particularly for first time or early stage transactions in under-developed markets.

The Overseas Private Investment Corporation (OPIC), a US bi-lateral agency, has provided guarantees on mortgage securities issued by emerging markets lenders sold in the US. In April 2005, OPIC provided a $7.5 million partial guarantee on securities issued by the Guatemala Mortgage Corporation, which amassed mortgage loans from four Guatemalan banks for the project. OPIC's guaranty enable the sale of the notes in

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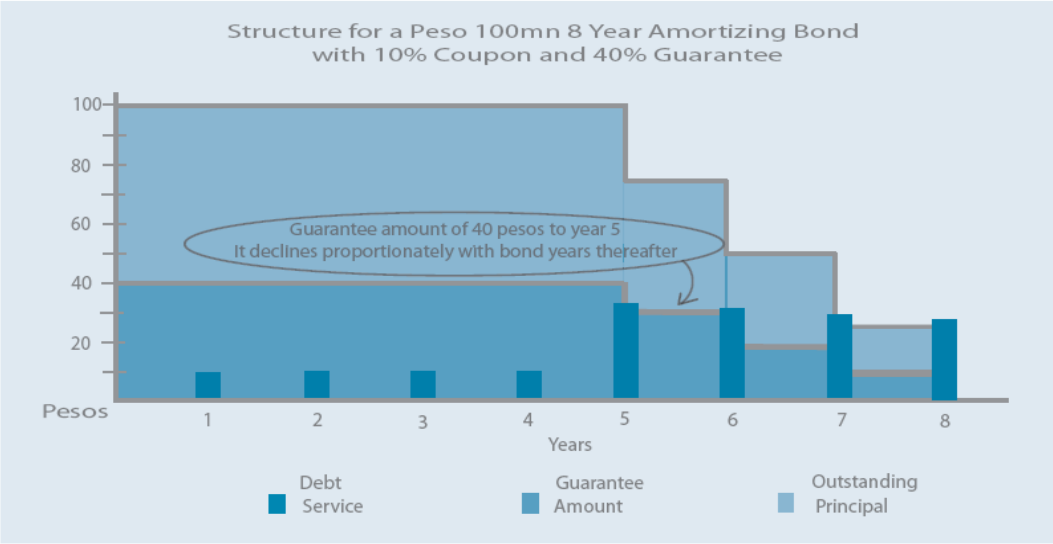
if the need arises. The fee to the provider of the GPO is part of the expenses of the trust. Credit Suisse 2006.

the U.S. market, which has a larger pool of long-term funding than the local investor market. This was the first mortgage securitization in Central America.

A typical product offered by these guarantors is a partial guarantee covering between 10-90% of the credit risk. A partial guarantee can provide liquidity or absorb a certain level of losses on an underlying pool of assets and reduce the probability of default on note payments. The guarantor may be senior, subordinated or pari passu with investors. The guarantee can cover principal and interest or principal only. The partial nature of the guarantee properly aligns incentives between the loan originator and guarantor, which share the default risk. According to Fitch Ratings [2005] there had been over 30 partial guarantee transactions in emerging markets through mid-September 2005.

An example of an IFC partial guarantee is shown in Figure 1. The guarantee covers 40% of the outstanding amount to year 5 after which it declines proportionately over the remaining 3 year bond life. IFC has provided partial credit guarantees on securities issued by lenders in Mexico (GMAC Patriminio), and Colombia (Titularizadora Colombiana) [Dowers 2005].

Figure 1: Partial Credit Guarantees



Source: IFC

The German KfW Banking Group provides credit enhancement on pools of mortgage and small and medium enterprise (SME) loans in Germany. KfW's domestic securitization programs are typically synthetic involving no loan transfer, true sale or funding. Loan originators conclude credit default swap (CDS) contracts with KfW to transfer credit risk of a pool of loans (typically they retain a small first loss position). KfW in turn negotiates a CDS with one or more highly rated banks. The transaction boosts the credit quality of the portfolio to sovereign level, reducing the capital risk weight for investors. The credit enhanced loans are included in jumbo Pfandbrief (German covered bond) issues. Obtaining the guarantee allows the mortgage bank to avoid the 60% limit on LTVs in the collateral portfolio backing the mortgage bond. The major advantages are in liquidity and regulatory capital relief. KfW has been

involved in a number of securitization transactions in emerging and transforming markets, although none involving mortgage collateral to date.

Monoline Financial Guarantees: Private mortgage insurers and bond insurers (mono-lines) provide guarantees (sometimes referred to as wraps) to improve the rating on certain tranches of securitisation transactions. Financial guaranty insurance offers unconditional and irrevocable guaranties of principal and interest on mortgage-backed securities. Pool insurance provides supplemental coverage to holders of mortgage debt by providing first- or second-loss protection on loans in aggregate. Pool policies call for the guarantor to pay all credit-related losses, subject to an aggregate limit of claims paid. To date the mono-lines have been mainly active in investment grade countries. Genworth, Ambac and UGI are active in Mexico, and Genworth has recently been approved to offer insurance in India.

Liquidity Provider: A liquidity provider will temporarily make payments in the event of a disruption to servicing. Disruptions can occur through financial difficulties of a servicer, servicing transfers or a servicer system failure. Typically, transaction liquidity support is provided domestic or international banks but may also be obtained from the IFC or World Bank. A reserve fund as described below is an alternative to a liquidity facility.

Internal Credit Enhancement

While external guarantees provided by domestic government backed institutions or international guarantors have been instrumental in developing wholesale finance in several countries, in most cases in emerging markets the channel has been developed using internal sources of credit enhancement.

There are various internal credit enhancement techniques used in securitisation transactions (Table 3). Generally these techniques involve prioritizing the payments made to various security holders and other interests (e.g., servicer, issuer) and/or adding excess collateral to support the transaction. One or more of the internal enhancement techniques have been used on most transactions.

Excess Interest/Spread: The difference between the coupon or interest rate paid by the borrowers and the coupon or interest rate paid to the certificate holders is deposited into an account that accumulates over time to cover any losses that occur during a specified time period. Thus, if a loan defaults, the excess interest could be used to make payments to the certificate holders. Once a deal has reached its target level, any remaining excess spread is distributed to the residual holders. This form of credit enhancement provides an incentive for good servicing.

Over-collateralisation (OC): This involves transferring to the issuing vehicle receivables in amounts greater than required to pay the securities if the proceeds of the receivables were received as anticipated. The amount of over-collateralisation (usually 5% to 10%) is determined by the rating agencies and the underwriters/placement agents, and this in turn will depend upon the quality of the receivables, other credit enhancement that may be available, the risk of the structure (such as the possible bankruptcy of the originator/servicer), the nature and condition of the industry in which the receivables are generated, general economic conditions

and, in the case of cross-border securitisation, the sovereign risk. If all goes well, it is repurchased at the end of the transaction as the receivables are returned as part of the residual interest. This form of credit enhancement is present in virtually all securitisation transactions.

Senior/Subordinated Structure: In this form of credit enhancement, subordinated or secondary classes of securities, which are lower rated (and bear higher interest rates) are sold to other investors or held by the originator. In the event of payment problems, the higher rated (senior) securities receive payments prior to the lower rated (subordinated) securities. It is not uncommon for there to be a number of classes of securities that are each subordinated to the more highly rated, resulting in a complex "waterfall" of payments of principal and interest. In the common structure, senior and subordinated classes of notes would be paid, in order of priority, prior to any equity securities or to any residual interest to the issuer. This form of credit enhancement is routine.

Cash Collateral Account/Reserve Fund: In this form of credit enhancement, the originator deposits funds in account with a trustee to be used if proceeds from receivables are not sufficient to make required bond payments. The amount may be adjustable depending upon events.

Early Amortisation: If certain negative events occur, all payments from underlying assets are applied to the more senior securities until they are paid. This type of credit enhancement is very common. Another version, a “turbo”, is used to reach and maintain the target level of over-collateralisation. In general, the term turbo refers to the use of the excess spread (the difference between the interest paid on the underlying mortgages and that paid out on the MBS) to pay down bond principal.

Table 3: Internal Credit Enhancement

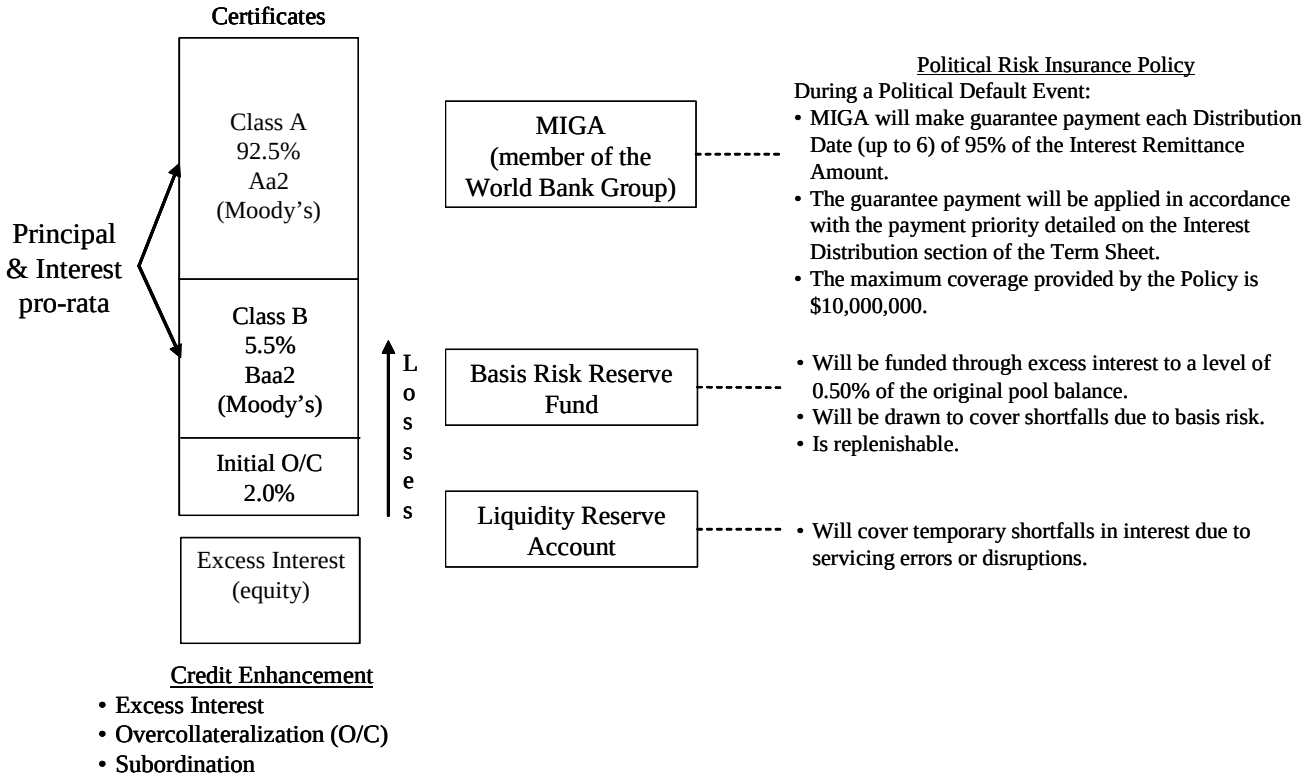
Type	Description	Advantages	Disadvantages
Excess Interest/Spread	Difference between interest rate on mortgages and interest rate on securities, net of servicing fees and other expenses, is reserved and paid to cover loss	Provides incentive for aggressive servicing as issuer can "earn out" the excess; No need for additional funding	Reduces income earned by issuer, particularly in early years of issue
Over-collateralisation	Balance of loans is greater than balance of securities. Excess is used to absorb losses on collateral pool.	Simple	Opportunity cost of foregone interest on collateral (typically around 2%); Issuer needs funding source for collateral
Subordination	Rights of junior class subordinated to that of senior class of security holders. Junior class(es) are in first loss position and shield senior security holders from losses in collateral pool.	More complex, need to find investors to buy subordinated tranches. Sometimes held by issuer (no capital relief) for a period (seasoning) over which performance can be assessed	Higher yield requirements of junior security investors (B class yields 180-280 bp over index in Baltic, S. Africa); potential large size of junior class if lack of loss experience history and/or volatile environment (can range between 2-25%)
Reserve Fund/Cash Collateral Account	Funds (securities) deposited with trustee to be used if proceeds from pool are insufficient to make required bond payments	Simple, robust (cash or securities easy to value, very safe)	Opportunity cost on funds. Issuer needs funding source for collateral if pledged up front. May be built from excess spread.
Early Amortisation	If certain negative events occur, all payments from assets are applied to the more senior securities until they are paid. Turbo feature uses excess spread to pay down principal until target O/C level reached.	Contractual; protects senior bond holders	Delays or eliminates payments to other security holders

Typically, a transaction will include several credit enhancement structures sequentially applied ("a waterfall"). An example waterfall structure with external credit enhancement is shown in Figure 2 taken from the 2004 Baltic American transaction (the first Central-Eastern European securitization):

- Losses come first from a reserve fund funded through accumulation of excess interest;
- Second loss position through 2% over-collateralization (balance of assets in excess of securities)
- Third loss position from holders of subordinate (junior) notes equal to 5% of the initial balances.
- Additional credit enhancement came from a liquidity provider (local bank) covering temporary cash flow shortfalls and from a political risk insurance policy from MIGA.

The structure is designed to maximize the size of the Class A securities which have the lowest rates and are the easiest class to sell to investors.

Figure 2: Credit Enhancement Waterfall



Source: Schaub 2005

As can be seen from this diagram, the structure is complex, which increases the cost and required size of the issue. As each transaction is likely to be different, it is difficult to achieve liquidity through repeated issuance of standardized securities. This structure was necessary for the issuer to get off-balance sheet treatment for accounting and capital

purposes and to tap the large US investor market (the securities and the loan collateral are denominated in US dollars). Structured transactions using internal credit enhancement are the norm in countries without government-backed conduits or liquidity facilities. With the exceptions of Colombia and Mexico noted above, the loans being sold are representative of the market without a low-income focus. However, once the precedent has been set for securitisation, the channel can be used by low-income lenders if the loan and servicing pre-requisites have been met.

There are numerous additional examples of structured finance in emerging markets. Mortgage structured finance transactions have been done in countries as diverse as Russia, Morocco and Korea. Hipotecaria Su Casita (Mexico) has securitized construction loans (3 issues through 6/30/06) using internal credit enhancement and permanent loans (4 issues using IFI and domestic partial guarantees and internal credit enhancement). They issued the first cross-border mortgage-backed securities in 2005 with bonds issued in dollars swapped to pesos with mono-line wrap. Banco Hipotecario in Argentina was the first Latin American MBS issuer to sell bonds in the US. They broke the sovereign ceiling using internal credit enhancement. Issues were restructured after pesification and continue to perform. BH has issued several domestic MBS since the crisis.

There have been several MBS issued in South Africa with pension-backed housing loans (Absa Bank, HomePlan Financial, Standard Bank). Borrowers obtain loans for the purchase or improvement of housing without mortgaging the property. Instead they can use a portion of their pension as collateral. Typically these loans go to lower income formal sector workers living in townships. Difficulties in foreclosure and repossession have led lenders to use pensions as alternative collateral for housing borrowers. These were structured finance transactions using several forms of internal credit enhancement.

Cash flow risk and structuring

Securitisation frequently includes cash flow as well as credit enhancing structuring. Mortgages have uneven cash flows due to amortisation and prepayment that may make them unattractive to investors. Cash flow structuring involves the creation of bond like securities from mortgage cash flows.

One example of cash flow structuring is the sequential CMO (Collateralized Mortgage Obligation). Sequential CMOs create bonds that tend to narrow the time over which principal payments are received, creating a more bullet-like structure. The structuring creates bonds with different expected durations which can broaden the investor base (e.g., short duration bonds may be favoured by banks whereas longer duration bonds may be favoured by pension funds).

In the example figure below, classes A, B, C, and Z are sequential bonds. Class A receives all of the principal payments first. Once class A is completely paid off, then class B begins to receive principal payments. Once class B is paid off, then C begins principal payments, and so on until class Z is paid off. Note that each bond receives principal payments over a relatively narrow time period. Structuring re-allocates cash

flows to create greater stability in bond payments. It does not, however, eliminate the risk of uncertain cash flows. The timing of the receipt of payments will depend on when and how they are made by borrowers.

Figure 6: Sequential CMO Cash Flows