11. Modern Financial Instruments: Securitisation

Contents

11.1 Introduction

Securitisation has become an important feature of modern banking. In the USA it received a massive setback following the GFC when problems with the structure of complex securitisations and inadequate assessment of underlying loans became apparent and lead to major losses for many

participants. In Australia, the GFC resulted in a lack of liquidity in the capital markets although the quality and performance of the underlying collateral continued to be strong. It has gradually recovered from that setback, and is likely to continue in importance. Securitisation involves putting packages of loans (or other assets) into a special purpose vehicle (SPV) which funds its purchase of those assets by issuing securities backed by those loans to investors. Hence it is appropriate to start with discussion of the concept of SPVs.

11.2 Special Purpose Vehicles

Special Purpose Vehicles (SPVs) are a legal entity which is "bankruptcy remote" from the sponsor(s) and undertakes certain specified activities. While the sponsors will benefit from profits generated from the SPV, they benefit from the limited liability associated with their investment (such as a transfer of assets into the SPV). Where the sponsor is an authorised deposit taking institution ("ADI") (such as a licensed bank), there may be regulatory capital advantages by transferring the assets off balance sheet into the SPV. In Australia, the typical form (particularly for securitisation) is a trust vehicle, in other jurisdictions it may be a form of a company or limited partnerships – the relevant legislation determines the possible and desirable forms. The trust structure allows various types of units to be issued to investors with the originator holding some units entitling it to excess income after other obligations are met.

The "bankruptcy remote" nature of the SPV can be achieved by documentation specifying undertakings by creditors not to wind up the SPV and limiting recourse of the SPV's creditors to assets of the SPV (and not the sponsor). While legally, sponsors have no obligations (beyond those contracted) to provide support to an SPV which is in financial difficulty, they may feel a reputational reason for injecting further funds or providing some other form of support.

Gorton and Souleles (2007) argue that SPVs enable a separation of control rights to business decisions and financing decisions. The SPV cannot make business decisions and management control over its specified, limited, range of activities, resides with the sponsoring firm(s). It can raise finance from third parties for the venture, where the legal liability for repayment lies with the SPV, and not with its sponsor (unless some forms of guarantees are given). If, instead, the activities were conducted in the sponsoring firm, failure of the venture and inability to meet payments to external creditors from the proceeds of the venture would expose the sponsor's other assets to that loss. They note that the cost of debt finance via an SPV could conceivably be cheaper than debt raised by the sponsoring firm for two reasons. One is that because the SPV cannot (in theory) face bankruptcy, expected bankruptcy costs are zero and factored into debt pricing. Another is that implicit expected

support for an ailing SPV by a sponsoring firm may enable regulatory arbitrage. They find that SPVs used to securitise credit card receivables which are associated with riskier sponsors need to pay higher yields to investors, and that there is more use of securitisation by riskier sponsors.

To the extent that accounting rules enable SPVs to be off-balance-sheet, and not consolidated with the sponsoring firm's accounts, using an SPV can enable the sponsor to hide the amount of debt financing its overall activities (including the SPV) and its leverage. Enron was a major example of this type of behaviour and its exposure and failure in 2001 helped lead to a change in accounting rules. Generally, for a securitisation SPV to be treated as off-balance-sheet, the transfer of loan assets into the SPV will need to be seen as a "clean sale" (or "true sale") with no recourse to the lender, and the sponsor will need to have only a limited stake in the SPV. These requirements find reflection in APRA's distinction between "funding only" and "risk transfer" securitisations for their treatment in capital requirements for Australian ADIs.

SPVs may be used for property development involving a developer and an investor as sponsors with the former contributing construction and management skills etc and the latter providing cash. In those cases, the SPV will have a limited life, being would up at the completion of the development and net assets (cash from property sales) in the SPV being distributed to the sponsors as per the original agreement. In Australia, if set up as a trust vehicle there may be tax benefits if the ATO can be convinced that the proceeds are a long-term capital gain (and thus getting the 50 per cent CGT concession) rather than business income.

SPVs are an important vehicle used in Public Private Partnerships (PPPs) where the consortium (of construction firms, other contractors, equity investors and debt providers) will create an SPV to enter the PPP contract with the government. The SPV will have specific contracts and agreements with members of the consortium for provision of services and assets and financial arrangements.

11.3 Conduits and SIVs

Conduits and SIVs (Structured Investment Vehicles) are similar to SPVs except that they are not necessarily bankruptcy remote. ABCP structures used prior to the GFC involved the creation of an "SIV" which bought financial assets from its sponsor (or others) and financed this by issues of commercial paper (CP) backed by those assets. (SIVs are not generally used in Australian securitisation).[1] These processes generally involve maturity transformation since the CP is short term whereas the assets are longer term. Since investors in the CP would be concerned about the ability

[1] "Conduits" are similar – and in Australia generally found primarily in use in banking group internal structures where longer term assets are transferred into a special vehicle which is funded by shorter term financing from the bank.

of the conduit to refinance and thus repay existing CP holders when due, there will need to be some form of liquidity enhancement provided by the sponsoring bank. There may also be a capital guarantee provided by the sponsor (which may also ensure a higher credit rating for the CP which is required by some investors). Acharya et al (2013) provide more information. They also refer to the use of extendible commercial paper which was an approach used by RAMS (see appendix) aimed (unsuccessfully) at avoiding the liquidity risk associated with maturity transformation.

11.4 Securitisation and Traditional Banking

The difference between traditional banking, balance sheet, lending and (off-balance sheet) securitisation is seen by comparing Figure 1 and Figure 2 which provide a (highly) simplified depiction of the processes involved. In traditional banking, the loan is originated at a bank branch (or more recently often by a mortgage broker) and funds provided to the borrower by the bank who holds the loan as an asset on the balance sheet which is funded by deposits and equity (or other borrowings).

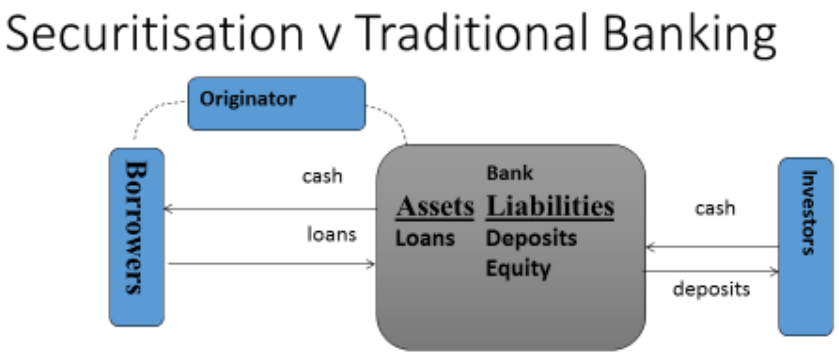


FIGURE 1: TRADITIONAL BALANCE SHEET LENDING

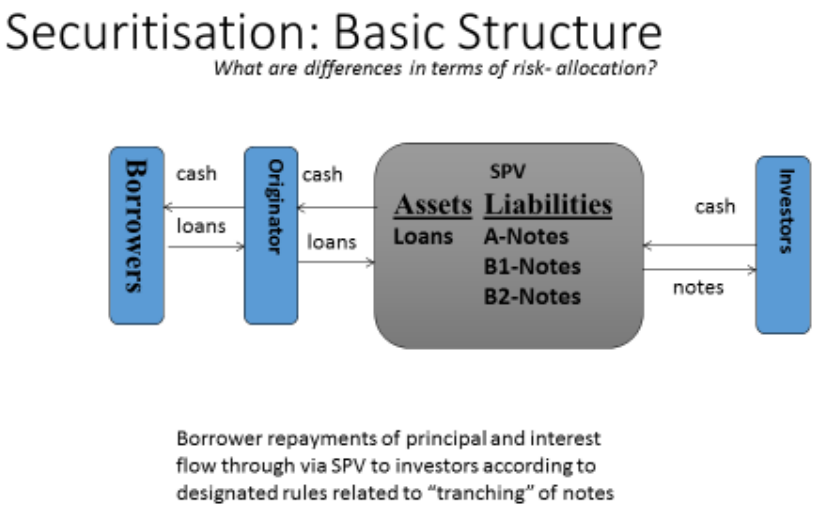


FIGURE 2: SECURITISATION BASIC STRUCTURE

In the case of securitisation, the origination process and initial funding depends on whether it is a bank or non-bank securitiser involved. If it is a bank, funds are provided as in traditional banking, but at some time the loan will be packaged together with other loans and transferred to an SPV which raises funds to buy the loans by issuing securities to investors. If the securitiser is a non-bank, the funds provided to the borrower will come from its use of "warehouse" funding. In this, the securitiser has obtained wholesale funding (from a bank or an investment fund) for an SPV which acts as a warehouse funder/provider, using those funds to acquire loans until the warehouse is "full" or has reached its limit (ie all funds have been used). At that time the loans are transferred to another SPV which purchases them by issuing asset-backed securities to wholesale/sophisticated investors in the capital markets.[2]

The main differences between on-balance-sheet lending and securitisation are fairly clear.[3] Under securitisation, the default risk on the loans is transferred to investors (and in some cases to specialist insurers who, for a fee, take on the default risk of loans held by the SPV). Under securitisation, there is generally no maturity transformation – unlike banking where deposits are of much shorter maturity than loans. (However, some securitisations such as Asset Backed Commercial Paper (ABCP) may involve the SPV/Conduit financing the loans by issuing short term paper which is rolled-over

[2] In Australia, legislation allows for a securitiser not to hold an AFSL as long as the securities are not purchased by retail investors. In principle, there is no reason that retail investors could not participate, although administrative costs and retail investor protection requirements likely explain why wholesale investors are preferred.

[3] For the legal framework surrounding securitization see here.

when it matures). Perhaps less clear is the impact on incentives – on balance sheet financing means that banks are exposed to any deficiencies in their own loan assessment and subsequent borrower monitoring processes. While the structure of securitisations aims to ensure that investors do not need to be concerned with reduced bank incentives for performing these activities well, the originate to distribute (OTD) model was roundly criticised after the GFC for precisely these failings, particularly in the USA.

One significant feature of securitisation involving mortgages is that these types of loans are subject to "prepayment risk" since the borrower has an option (perhaps involving some cost to exercise) to repay the loan before contractually obligated. This is one reason for securitisation involving "tranches" of securities in which all loan principal repayments flow (subject to some qualifications) to the highest ranking outstanding tranche, until it is paid off. (All tranches receive a specified interest rate on the outstanding principal balance of that tranche, where the interest rate will generally be higher for the lower tranches).

Higher tranches also involve less credit risk, since defaults on the pool of underlying loans (if not offset by insurance from a third party insurer) first reduce the principal amount of the lowest tranche of securities, and only impact upon the principal of higher ranking tranches when lower ranking tranches have been wiped out. The ratings agencies (S&P, Moodys, Fitch) provide ratings for the various tranches, and the structuring of tranches is designed with potential resulting ratings effects in mind.

While securitisation of residential mortgages, creating Residental Mortgage Backed Securities (RMBS) has been the most common form in Australia, securitisation of Commercial Mortgages, Auto Loans, Credit Card, SME (or other) receivables, etc are also common. In general, the term Asset Backed Securities (ABS) is used to describe the overall market. CDOs (CLOs), where CDO (CLO) stands for Collateralised Debt (Loan) Obligations are SPV type entities which purchase, respectively, portfolios of securities which are tranches of ABS or commercial and industrial loans and issue their own tranched securities to finance those purchases. Before the GFC, a significant growth in (what are now termed) "resecuritisations" occurred, whereby various tranches of different ABS were pooled as the assets in an SPV and financed by the issue of tranches of securities by that SPV (such as in a CDO). Further layering of such activities could occur which led to the descriptive terms "CDO squared" or "CLO squared".

The size and composition of the Global Market for Securitisation can be seen from looking at the number of structured finance securitisation programs rated by Moody's Investor Services. At 2017, there were almost 12,000 deals rated, about 50 per cent of which were RMBS, 20 per cent were

CLOs, 12 per cent ABS, and 8 per cent CMBS. Of these around 75 per cent were in the Americas, 15 per cent in EMEA and the remainder in Asia. The number of covered bond programs rated was much less at 334, mostly in EMEA.[4]

11.5 Types of Securitisation

There are two main types of securitisations.

"Traditional" Securitisation

One, sometimes referred to as "traditional" is the type developed in the USA[5] in which a pool of loans is made bankruptcy remote from the originator (bank) via a sale to a SPV and claims issued by the SPV against that specific pool of loans. The investors effectively have ownership (via the SPV) of pool of loans and receive cash flows from the loans (often reflecting a "pass-through" arrangement) according to the terms of the securities they have bought. The time pattern of payments of principal and interest on the securities issued will reflect that of repayments on the stock of loans in the pool, with pre-payments of loans giving rise to uncertain maturity of the securities. There is thus a number of "tranches" of securities issued against the asset pool with lower ranking tranches not receiving principal repayments (generally)[6] until higher ones have been paid out and having greater exposure to loss due to defaults on the underlying loans. The pool of assets declines over time due to such pre-payments or defaults until some point at which a "clean-up" call option is exercised by the creator of the SPV to repurchase the remaining loans and pay out the remaining security holders.

"Traditional" securitisation developed in the USA in the 1970s and has become a major element of banking and capital markets activity around the world, although suffering severe setbacks to its use following the GFC when confidence in the underlying model was shaken.[7] As well as there being major problems with asset quality of underlying mortgages in securitisations, complex structures, and problems from risks arising in "resecuritisations", the credibility of the OTD (Originate to Distribute) model was severely questioned. While the Australian securitisation market suffered a downturn, this reflected primarily wider market liquidity issues, rather than concerns about underlying asset quality (including legal obligations upon borrowers to repay – unlike the "no-recourse" arrangements common in the USA).

[4] Source: Moody's Credit View – Structured Finance, brochure 2017

[5] Even though European securitisation using a different, covered bond, structure long predated the US development of securitisation.

[6] At some point, as the pool of assets declines, the allocation of repayments of principal might switch to one in which lower ranked tranches participate in proportion to size of the tranches.

[7] Gorton and Metrick (2012) note that the asset backed securities market became larger than the corporate bond market in 2002, and that non-mortgage securitisation (student loans, credit card receivables, auto loans etc) exceeded the corporate bond market by 2005 – but then fell markedly in the financial crisis.

The US securitisation market is relatively complex, in part due to the significant role of the government sponsored entities (GSEs) *Fannie Mae, Freddie Mac,* and others who purchase loans from banks and other originators and create mortgage backed securities (MBS) using those loans.

The most common type of securitisation involves residential mortgages (RMBS). It is unusual to see a RMBS issued with less than AUD 300 million of mortgages in the pool, and larger issues can exceed AUD 3,000 million. Figure 3 shows the terms of the Apollo Series 2017-1 Trust securitisation by Suncorp Bank in February 2017.[8] Among non-bank issuers, Pepper Group has been significant, including as the issuer of RMBS involving non-conforming loans. In general, securitisations by non-ADI issuers have grown relative to, and now exceed, those of ADIs

Self-securitisations

In Australia, there has been growth in "self securitisations" by Australian banks. These involve the same steps as in a traditional securitisation, but where the bank retains ownership of all the tranches of securities involved, rather than selling them into the market. The rationale behind this is that such securities are available to be used as collateral in repurchase agreements with the RBA under the terms of the Committed Liquidity Facility (CLF) should the bank need access to liquidity. Because CLF facilities can be used (up to a prescribed limit) to satisfy the LCR requirement, this means that banks can avoid, to some degree, having to hold government securities to meet that requirement. The RBA explains how it values (as at end 2014) such securities here.

Note Class (Pass Through)	Issuance Amount (A$)	Expected Ratings (S&P\Fitch)	Advance Rate	Initial Credit Enhancement	S&P\Fitch Required CE (at Issue Date)	1M BBSW + Margin	Modelled WAL (Years)[1]	Final Maturity Date
A	1,150,000,000	AAA(sf)\AAAsf	92.00%	8.00%	4.88%\4.90%[2]	1.13%	3.3	Sep-2048
AB	48,125,000	AAA(sf)\AAAsf	3.85%	4.15%[3]	3.78%\3.90%	1.90%	5.8	Sep-2048
B	21,250,000	AA(sf)\ --	1.70%	2.45%[3]	2.23%\--	2.35%	5.8	Sep-2048
C	15,625,000	A(sf) \ --	1.25%	1.20%[3]	1.16%\--	3.15%	5.8	Sep-2048
D	6,875,000	BBB(sf)\ --	0.55%	0.65%[3]	0.63%\--	4.00%	5.8	Sep-2048
E	8,125,000	--	0.65%	--	--	6.00%	5.8	Sep-2048
Total	1,250,000,000							

[1] The modelled Weighted Average Life ("**WAL**") at Issue Date assumes a portfolio constant prepayment rate ("**CPR**") of 21%, no defaults, no arrears, no principal draws, the Subordination Conditions are satisfied at the first possible date and that the Notes are repaid on the first possible Call Option Date. No Further Advances are permitted by the Trust.

FIGURE 3: APOLLO SERIES 2017-1 TRUST SECURITISATION (SUNCORP BANK)

[8] More information can be found here. The advance rate corresponds to the proportion of the total of the tranches, and the initial credit enhancement is the total size of tranches subordinate to the specified tranche.

Covered Bonds

The other is the *Covered Bond* model common in Europe (for over 200 years) in which the SPV holding the pool of loans remains on the bank's balance sheet, securities are issued with specified maturity dates, and new loans are added to the pool as existing ones are paid-off to ensure that the promised cash flows on the securities issued can be met. The EMF/ECBC provides information on the covered bond market in Europe and globally. (In Australia, legislation requires that the assets in the cover pool must be at least 103 per cent of the face value of outstanding covered bonds and that the assets allowed for inclusion must comply with a maximum loan to valuation ratio of, effectively, 80 or 60 per cent for residential or commercial mortgages). Unlike traditional RMBS (where a "pass-through" structure means that only the cash flows from the underlying assets are used to meet obligations to bond holders, in a covered bond structure the sponsoring bank is responsible for meeting the cash flows with the cover pool of assets acting as collateral. If the bank fails, the covered bond holders have first claim on the assets in the cover pool and if they are not sufficient to meet the amount owed, the bond holders become unsecured creditors of the bank for the remaining amount.[9]

Covered bonds in Australia were allowed following a December 2010 announcement by then Treasurer Wayne Swan. APRA and others were concerned that deposit safety would fall because covered bond holders, rather than depositors, will have first claim on the bank's assets held in the cover pool. Partly reflecting that concern, a limit on the size of covered bonds outstanding relative to the bank's Australian assets was put in place. But it is important to realise that if some of the banks assets are funded by covered bonds, there is also correspondingly less deposit funding of the bank's assets. So, depositors are no less protected unless the cover pool includes the best quality assets of the bank with depositors (or the FCS) then exposed to larger losses should the bank fail. (And even though covered bond holders have a claim on other bank assets if the cover pool is inadequate, they only rank as unsecured creditors, and thus behind depositors).

Information about covered bond issuance is available on the ASF website. The RBA's Benjamin Watson has an article in the RBA Bulletin (September 2017) providing recent information. Covered Bond issuance (mostly by the major banks) grew rapidly after 2011 such that the amount on issue approached 75 per cent of other asset backed securities in 2017. The average tenor at issuance is around 7 years, the majority of issues have been denominated in USD or EU, and the AUD (hedged)

[9] A requirement to liquidate the SPV in the event of the sponsoring bank failing, and unable to meet promised repayments, could lead to a forced sale of the underlying mortgage assets at a loss, and thus a "soft bullet' structure (allowing for an extension of maturity if the sponsor fails) or use of a pass-through structure mitigate this potential problem.

promised return at issuance has varied but has recently been around 100 basis points above equivalent maturity government bonds.

11.6 Economic Arguments for Securitisation

A number of different reasons are often advanced for why securitisation occurs. But ultimately securitisation can only compete with traditional bank balance sheet lending if securitisers are able to provide loan funding on comparable loan interest rates and loan conditions. Put slightly differently the overall cost of capital when using securitisation must be no more than when using on-balance sheet funding. Elul (2005) provides an overview of explanations for why asset-backed securities exist.

One is the potential for a bank to "recycle" funds and earn income from originating further mortgages. Thus, for example, a bank which has limited deposit funding but identifies a large demand for loans and has expertise in the origination process could focus on generating fee income from mortgage origination for subsequent securitisation. (It may also generate fee income from the servicing of the mortgages – collecting repayments etc, although this may also be provided by a third party).

A second is that securitisation may remove liquidity risk (which would otherwise arise from funding long term loans with short term deposits) from the bank balance sheet. Instead, investors in the tranches of the securitisation take on liquidity risk in the form of the uncertainty of the timing of returns of their capital associated with pre-payments of mortgages. Moreover, because long term loans are funded now by marketable securities, holders of those securities have the option of generating liquidity by sale of the securities.

A third argument is that tranching enables the bank/securitiser to sell informationally-insensitive securities (senior tranches) to investors while retaining the informationally sensitive junior tranches itself. This reflects the proposition that when there is asymmetric information, a firm will find it advantageous to issue such securities (obtaining a higher price for the assets sold). Pooling of assets also reduces the idiosyncratic risk which reduces the information asymmetry.

There may be lessons here from the IPO underpricing literature – where underpricing arises from the existence of informed and uninformed investors and the need for a discount to compensate uninformed investors from receiving a larger share of poorer quality issues. By tranching, uninformed and informed investors can separate into different groups investing in different tranches with differing risk.

Regulation is a common explanation for securitisation. Banks, in the past, were to avoid capital requirements and other regulatory imposts which reduced the profitability of funding loans on balance sheet relative to securitisation. However, many securitisers are not banks subject to such regulation, and the major Australian banks were not active participants (probably reflecting low costs of deposit funding for their on-balance sheet funding due to implicit guarantees).

On the investor side, "prudent investor" requirements for institutional investors such as pension funds may create demand for high quality (senior tranche) securities. Gorton and Metrick (2012) also point to the increased demand for collateral associated with derivatives market growth, clearing and settlement activities (involving RTGS) and repo markets, and argue that the information-insensitive nature (of senior tranches) makes these suitable for this purpose.

Avoidance of bankruptcy costs is also relevant. Where an investor purchases bank debt, they may find themselves as a junior creditor with a claim on a bank's assets if the bank fails, factoring this risk into the return they demand. Holding ABS their position is not dependent on the solvency of the bank, removing the premium required for financial distress risk. (Even in the case of covered bonds, which remain on the bank balance sheet, the investor's position is secured against the collateral pool, and if that is inadequate, the investor becomes an unsecured creditor against the bank's assets).

It maybe that taxation is relevant due to capital structure decisions. If loans are held on a bank's balance sheet, funded partially by deposits or debt, there will be company tax payable on the profit accruing to equity, generating double taxation of dividends. However, the SPV through which the assets are held is tax neutral, interest income on loans is paid out to security holders and taxed once in their hands. However, since the securitiser (the bank) will generate profits from the securitisation process (presumably more than from funding the loans on balance sheet), there will be some tax consequencs from that.

Gorton and Seuleles also pose the important question of why did securitisation arise when it did, and not before. Was it due to a decline in the profitability of on-balance sheet banking due to increased competition (reflecting deregulation) within banking and with other types of competitors such as MMMFs, or avoidance of other regulations (such as capital requirements), or growth of an investor market, or technology, or some financial innovation such as developments in design and structure of SPVs enabling funding at a cheaper rate than retaining them on balance sheet.

11.7 Prepayment Modelling and RMBS Pricing

An important feature of RMBS and other securitisations is the potential uncertainty over the timing of cash flows due to the option which borrowers have to make early repayments of principal. There are a range of ways to model prepayment behaviour

In the USA the Public Securities Association model developed in the 1980s was commonly used. It assumed that the prepayment rate = 0.2% p.a. for the first month, increasing by 0.2% per month for 30 months until a 6% rate was reached and remained at. This was based on historical experience. Differences arose in practice due to: (1) coupon effects; (2) age; (3) amortizing characteristics; (4) assumability; (5) size of pool; (6)conventional/nonconventional mortgages; (7) geographic location; (8) mortgagee characteristics.

Mortgage Termination Models: these model expected prepayment rates as function of age, collateral, coupon - market rates, etc. (based on historical data, regression etc) and derive a probability density function of prepayment rate for a specific mortgage pool. It is then possible to calculate expected cash flows

Option pricing : It is possible to conceive of a mortgage backed security (eg, GNMA) as being equivalent to the holder having a straight bond and having written a call option, giving the bond issuer the right to buy back the bond. Then:

P(GNMA) = P(BOND) - P(PREPAYMENT OPTION)

For example, one could assume the early repayments are only due to yield differences between the contractual loan fixed interest rate and current market rates, and use a model of the term structure and make assumptions regarding the resulting contractual cash flows to derive option value.

This is an area of substantial academic and industry research, since better prepayment modelling and forecasting leads to improved pricing estimates of the securities. Thomson-Reuters provides an overview of how prepayment rates can be estimated, while they also provide a very brief explanation of how the prepayment aspect leads to RMBS having a non-convex price-interest rate relationship.

In Australia, RMBS typically refer to a borrower payment rate (BPR), which has in recent years been around 20-25 per cent, down from over 30 per cent in the early 2000's, as well as a conditional prepayment rate (CPR) which is principal payments in excess of the contractual amounts and which contributes most (all but around 2 percentage points) of the BPR. Perpetual Trustees publishes a Best Practice Note on deriving the CPR.

Also important is the design of tranche conditions to affect the impact of loan prepayments on the expected life of a tranche and the uncertainty about the life. Arcidiacono et al (2013) provide a discussion of a range of structures for Agency CMOs which affect these characteristics. (For example, lower tranches may forgo interest due for some period of time which is allocated to faster prepayments of principal of senior tranches. Of course, since those lower tranches then have some features of a zero coupon bond they must be issued at a price below their par value).

A Simpl(istic) illustration of prepayment and valuation

The following discussion demonstrates in a very simple example the impact of prepayments on different tranches of securities issued against (for simplicity) one mortgage loan (or a portfolio of identical loans).

The timing of cash flows (interest I and principal P) on four year mortgage loans of $100 at 15% interest rate is uncertain because of possible mortgage prepayments. They are assumed to be either

- I_1+P_1, I_2+P_2 ,I_3+P_3, I_4+P_4, (eg $31.55 per year) - no prepayment

or

- I_1+P_1, $I_2+P_2+P_3+ P_4$ ($31.55 in year 1 and $86.3 in year 2)

Suppose the mortgage originator issues two securities A and B for $50 each with claims on the loan cash flow involving "tranching" of cash flows (as in securitisation) as follows.

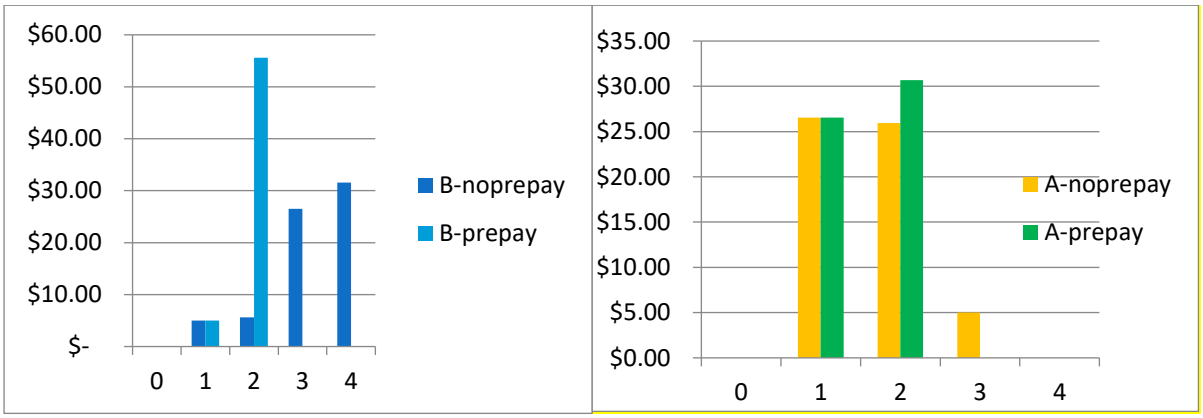
- A receives P_1, P_2 etc plus interest on share of outstanding principal (50, 50-P_1 etc) until $50 repaid,
- B receives rest of interest, and all principal payments after A is fully repaid.
  (note that the assumption that each security costs the same is unrealistic).

The spreadsheet below shows the calculation of the difference in cash flows between the two cases

4 year mortgage, interest 10% p.a.														
equi-probable: no prepay or full prepay at end year 2														
Security A: first claim on principal and interest on A's share of principal outstanding:								Price of A	50					
Security B:last claim on principal and interest on B's share of principal outstanding:								Price of B	50					
Prepayment risk not priced!														
						NoPrepay						Prepay		
	No Prepay Case			PrepayCase		Security A		Security B				Security A		Security B	
Year	Payment	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest			Principal	Interest	Principal	Interest
0	-100														
1	$31.55	$21.55	$ 10.00	$21.55	$ 10.00	$21.55	$ 5.00	0	$ 5.00			$21.55	$ 5.00	0	$ 5.00
2	$31.55	$23.70	$ 7.85	$78.45	$7.85	$23.70	$ 2.23	0	$ 5.61			$28.45	$ 2.23	$50.00	$5.61
3	$31.55	$26.07	$ 5.48			$4.75	$ 0.26	$21.32	$ 5.21						
4	$31.55	$28.68	$ 2.87					$28.68	$ 2.87						
		$100.00		$100.00		$50.00		$50.00				$50.00		50	

	B-noprepa	B-prepay	A-noprepa	A-prepay
0				
1	$ 5.00	$ 5.00	$26.55	$26.55
2	$ 5.61	$ 55.61	$25.93	$30.69
3	$ 26.54	$ -	$5.01	$0.00
4	$ 31.55	$ -	$0.00	$0.00

As the figures below show, the event of prepayment has very little effect on the cash flows of the senior tranche (A), but involves a significant bringing forward of the cash flows of the junior tranche (B). Is this good news for the holder of B? No – consider the circumstances when such a prepayment event is likely to occur. If interest rates have fallen (such that the borrower could refinance the mortgage at less than 10%) the holder of B will now have to reinvest the cash flows at a lower interest rate than was expected.



Thus to the extent that declines in interest rates lead to higher than usual prepayment rates, the value of B will not necessarily increase as interest rates fall. The price-interest rate relationship can look as in Figure 4. Rather than the usual concave price-interest rate shape, there may be a convex part as interest rates approach low levels, reflecting the increasing risk of prepayment and loss of interest payments based on a higher interest rate.

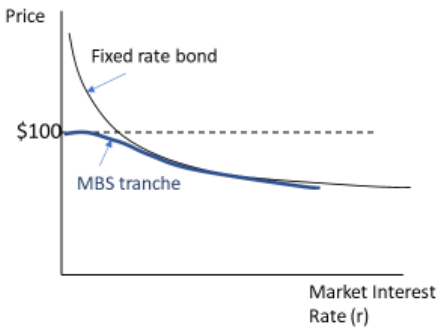


FIGURE 4: PREPAYMENT RISK AND RMBS INTEREST RATE SENSITIVITY

11.8 History of Australian Securitised Products

There was much discussion of the potential for securitisation in Australia from the late 1970s, but it took quite some time before securitisation commenced. Among the impediments discussed at the

time, which illustrate the sorts of complex issues involved in developing new financial products, were:

- Stamp duty - on mortgage transfer (abolished in Victoria and NSW in 1984)
- Regulation of housing loan interest rates – finally abolished in 1986
- Non standardisation of mortgages - an RMBS pool can involve diversification across mortgage types, so that this can be overcome by the securitiser
- Less need with national banking markets, but growth of superannuation funds with investment funds may encourage banks to securitise
- inconsistent state legislation, objectives
- companies code treatment including prospectuses
- uncertainty regarding accounting treatment
- non exemption from withholding tax for unit trusts used as mortgage securitisation vehicles
- lack of trustee status
- variable interest rates and unpredictable cash flows
- lack of information on prepayment probabilities
- need for mortgage pool insurance (no longer generally needed nor used due to cost)
- credit enhancement/assessment methods absent - ratings, guarantees etc.
- lack of other financial markets suitable for hedging risks associated with creation of instrument
- adequate supply of other "bond" instruments

These impediments were gradually overcome and the securitisation market began to develop.

Initial Issuers

The Australian securitisation market began slowly in the mid 1980s. Among the first securitisers were institutions established by, or involving, governments. These included :

- *NMMC (National Mortgage Market Corporation)* formed 1984, and owned by the Vic & SA governments and private financial institutions etc. It issued *Aussie Macs* (short dated promissory notes) in 1985 and also issued National Mortgage Bonds and Victorian Housing Bonds. (Now part of Bendigo and Adelaide Bank)
- FANMAC was formed in 1985 and name changed to FANMAC in 1987. The NSW Government owned 26%, and the remainder private. It issued Premier Trust Bonds starting in 1986 involving mortgages originated under the Department of Housing, State Home Loans Programme (Home Fund). State government guaranteed the mortgage loans to low income borrowers. (Ferris provides an overview of the massive problems associated with the scheme) Rebranded in 2001 as RESIMAC. RESIMAC is an ASX listed company after merger with HomeLoans in mid 2016.
- Other early entrants were: MGICA Securities Ltd; Security Pacific Securities Australia Ltd; State Bank of NSW; Macquarie Bank (with a BEST (Billings of Essential Services Trust) issuing promissory notes for fund receivables of the MMBW) and the PUMA Trust; Societe Generale; County NatWest.

Australian ABS Growth and Size

Figure 5 shows the dramatic growth of the long term ABS market in Australia during the first part of the century up until the GFC. Although Australian securitisations were well collateralised with (generally) good quality mortgages having low default rates, the international GFC experience was contagious.

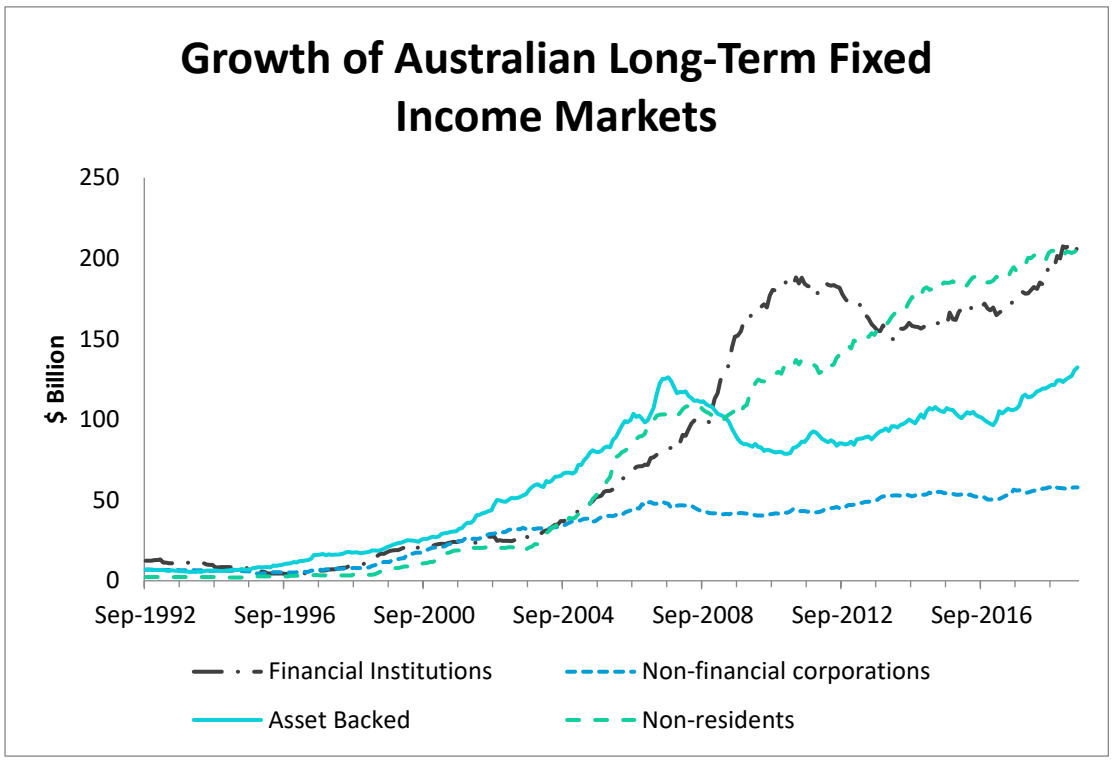


FIGURE 5: AUSTRALIAN ABS MARKET GROWTH (SOURCE: RBA TABLE D4)

The GFC had even greater effects on issues of Australian ABS into international markets as shown in Figure 6. Both figures are for the stock of ABS on issue and thus understate the decline in new issuance, which was clearly well below what was required to replace maturing issues.

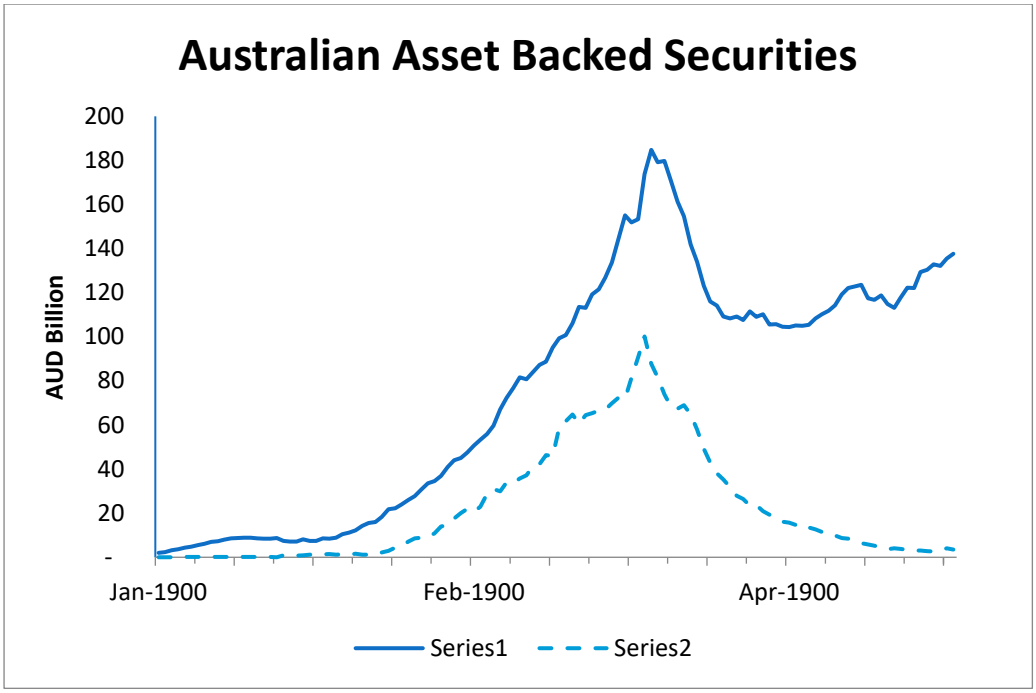


FIGURE 6: AUSTRALIAN ABS: DOMESTIC AND OFFSHORE (SOURCE: RBA TABLE B19)

One consequence of the virtual closure of the securitisation market at the time of the GFC was the decision by the Federal Government to allocate funds to the Australian Office of Financial Management to act as a cornerstone investor in new securitisations of (primarily) smaller securitisers to enable the survival of their business models.

The impact of the GFC on the Australian securitisation market is also apparent in Figure 7 which shows the margins (to 30 day BBSW) of residential mortgage back securities. (They refer to the margins on the senior AAA tranche and the revaluation margins are based on market prices for previously issued securities with a remaining weighted average life of around two years). From a margin of around 25 basis points just prior to the GFC, the margins required by investors jumped to over 150 basis points before returning to a level of around 100 basis points.

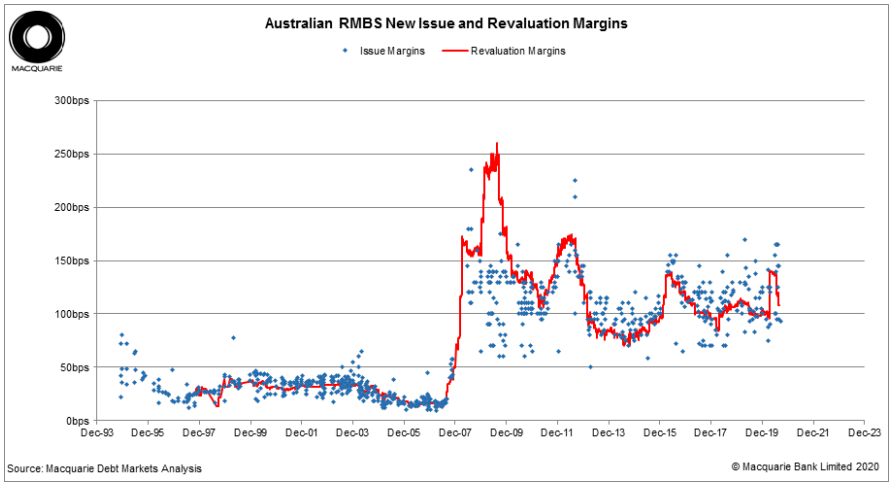


FIGURE 7: RMBS INTEREST RATE SPREADS: SOURCE: ASF AND MACQUARIE BANK

There is a secondary market in asset backed securities, and the market conventions are available from AFMA as part of the Credit Product Conventions. There is little publicly available information on the volume of secondary market transactions. Data from Austraclear provided on the AFMA website suggest relatively limited turnover with the turnover rate (turnover/stock on issue) in the order of 1.4 times p.a. This is comparable to that for corporate bonds (1.8) but much less than for bank debt securities (9.6), semi-government debt (11.2) and government debt (29.8).

An important consideration for investors in both the primary and secondary markets is the quality of the underlying loans, and the ASF has developed a framework on disclosure arrangements regarding the loan portfolio which meets relevant privacy considerations.

Securitisation Design and Costs

In creating a new securitisation, a number of important considerations need to be taken into account. First, there is the accumulation of a sufficiently large stock of loans to make the issue of a scale which is both cost effective and attractive to investors. In Australia, there are few issues of a size less than $500 million. For non-bank originator/lenders, obtaining access to funding for a "warehouse" (an SPV into which loans are placed until sufficiently large in volume to securitise is necessary. For banks, loans can be held on balance sheet, funded by deposits and other borrowings until a decision is made to securitise a parcel of loans. The resulting "seasoning" (aging) of loans is one characteristic of a RMBS offer, where greater seasoning of loans is suggestive of lesser loan risk.

There is then the issue of determining the tranching structure for the issue. The ratings agencies play an important role here since they provide criteria for the credit support (percentage of issue size made up of lower rated tranches) required to achieve particular ratings. For a AAA rating for the senior tranch(es), credit support would need to be in the order of 10 per cent or more (ie at least 10

per cent of the issue in lower tranches). (The ASF estimated in 2016 that the fees (up-front and ongoing) for a rating for a 5 year transaction is in the order of $200,000). The average number of tranches has increased slightly since around 2014 and in 2018 was just over 6 (8) for bank (non-bank) securitisers. Senior tranches have an expected weighted average life in the order of 2.5 years, while for junior tranches it is more like 5 years. In the three years 2016-2018, senior tranches paid a spread of around 130 bp over the 1 month BBSW, with mezzanine tranches (around 10-15 per cent as large as senior) paying around a 230 bp spread and junior tranches (much smaller in size) paid a spread of close to 600 bp.

There are a large number of securitisers (around fifty) in the Australian RMBS market. Some will make several RMBS issues per year, others less than one per year. In the first half of 2021 there were only 12 issuers of 13 prime RMBS with a value of $11.4 billion. The same is true in the ABS market (where issues are mostly in the $300-500 million size range). Flexi and Pepper, for example, each made three issues in the 2019-2021 period, while most of the other 17 issuers made one issue only in that period. Recent overviews of the market can be found in:

- https://www.securitisation.com.au/market-statistics
- https://www.perpetual.com.au/insights/the-australian-securitisation-issuer-report-2019

The RBA has also set up a Securitisation portal on its website. This provides information on conditions required for securitisations to meet the requirements of eligibility for use as collateral in repurchase agreements with the RBA under the Committed Liquidity Facility (CLF). A spreadsheet list of eligible securities for the CLF (which is broader than ABS) is accessible from here.

Some of those securitisations eligible for use as collateral for the CLF are *Internal Securitisations.* This occurs when a bank creates an SPV using mortgages it has made and associated tranches of securities, but does not make them available to investors. In effect the bank has taken individual loans and included them in an internal pool the claims on which could be used as collateral for repos with the RBA.

As part of its broadening of repo arrangements at the time of the GFC to include RMBS and subsequently with the development of the CLF, the RBA has required securitisers to provide increased information on the quality and characteristics of the underlying pool of loans. The reason is to enable the bank to ensure that any loans it makes under repo arrangements involve high quality collateral. These requirements announced in 2012 also required that access to such underlying data should be readily available to researchers and analysts – but little progress has been made on that front (although data and analytics are available for professional investors via Perpetual Limited).

Market participants cite concerns about privacy associated with loan level data as a reason for unwillingness to disclose such information (which is reflected in ASF market guidelines).

11.9 The structure of Securitisation

There are several aspects to the structure of a securitisation. One is the form of the SPV and allocation of responsibilities etc. We examine that by reference to the *Puma Fund* established by Macquarie Bank. The nature of the various important arrangements involving allocations of cash flows and risk is well explained in Arsov, Kim and Stacey (Reserve Bank Bulletin, March 2015).

An Australian Securitisation Example: The Puma Fund

The Puma Fund was established by Macquarie Bank and is an umbrella term which comprises a number of separate trust funds which can issue bonds created from the securitisation of authorised investments and approved mortgages. The first fund issued under the master trust (created in 1990) was in 1994 (*PUMA Masterfund P-1*) and the last "P series" was P-17 in April 2011.[10] (Other offerings were made as USD denominated issues with somewhat different legal arrangements). The AUD offer designated PUMA 2015-1 was made in February 2015.

Participants and Fund Structure

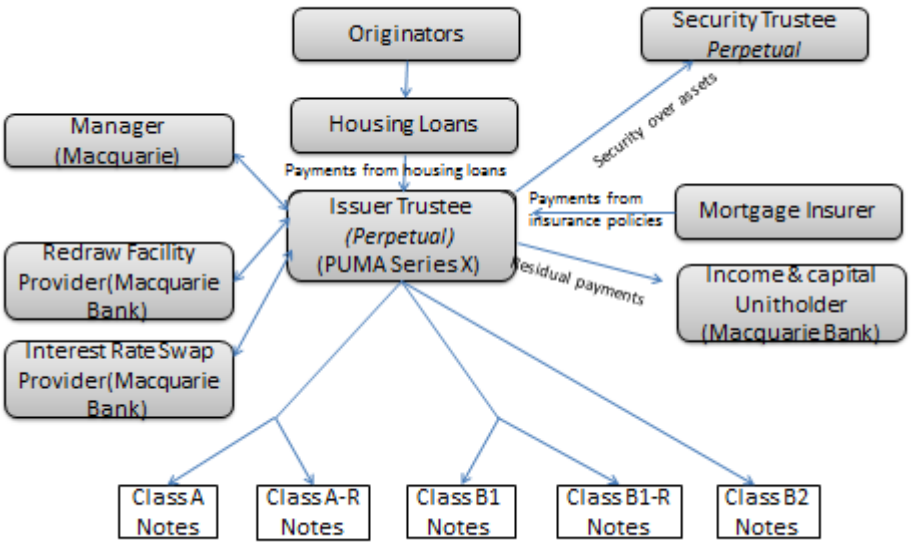


FIGURE 8: PUMA FUND STRUCTURE

Characteristics of the Notes

[10] In mid 2021 Macquarie announced it is marketing a 'funding only' AUD denominated RMBS transaction, PUMA 2021-2 RMBS, with an indicative volume of AUD $750m.

There were three classes of notes (AUD denominated) issued by the Fund (Class A Notes (1,840 mill), Class B1 (120 mill), Class B2 40 mill), and refinancing notes Class A-R, Class B1-R) with S&P giving a rating of AAA to class A and AA+ to class B1. The notes were floating rate at (differing) margins over 1 month bank bill rate. Macquarie Bank (via wholly owned SPVs) will retain at least 5 % interest in notes (essentially at least all of class B2). Principal payments accrue first to class A (and A-R), then Class B1 (and B1-R), then B2. A Call for redemption of any outstanding A and B1 would be made when mortgage loan principal outstanding falls to 10% of initial amount, with an initial maturity date for A and B1 expected to be February 2020. Losses on housing loans (in excess of available income amount) charged initially to B2 notes

Loans were underwritten by mortgage brokers and aggregators etc in the name of Perpetual as trustee, subject to the manager's credit policies etc. There were 6,367 housing loans with average LVR of 65.9% and average term to maturity of around 127 years, in the pool, which had a total size of $1,974 million. Around 72 per cent of the loans were owner-occupier, and a third of loans were interest only. Investors received more granular information on loan characteristics, including a breakdown by region.

The legal structure involved an SPV (the PUMA Masterfund) whose sole purpose s to acquire and hold the securitised mortgages. It is an 'umbrella' trust, which allows for the creation of any number of separate trusts (for other securitisations such as P- I to P-17) under the one trust deed. The different trusts are legally separate (and importantly - bankruptcy remote) entities established under the PUMA trust deed.

The Trustee of the PUMA Masterfund is Perpetual Trustees Australia Ltd and is the issuer of the PUMA bonds, using the proceeds of the bonds to purchase the pool of mortgages that forms the trust property. The Trustee is also responsible for maintaining the register of bondholders and payment of principal and interest to bondholders, as well as enforcing terms of credit enhancements (such as mortgage insurance) and hedge arrangements (which arrangements include the interest rate swap contracts described below).

The Fund Manager, a wholly owned subsidiary of Macquarie Bank Limited, appoints originators of loans (such as Aussie Home Loans), co-ordinates the fund raising process through the initial offering of the bonds, and creates and manages credit enhancement facilities. The Trustee delegates all of the day-to-day management and administration to the Manager.

The bondholders however do not have any specific rights to the trust property but their rights are protected by a first ranking floating charge over the assets of the trust in favour of the Security

Trustee (Perpetual Trustee Company Ltd). Its duty is to ensure compliance of the Trustee with bondholder rights in the event of default by the Trustee.

The priority (or "waterfall") of payments under the bonds prior to an event of default and crystallisation of the security is as follows:

- Payment of the trustee's fees and expenses;
- Payments to interest rate swap counterparties;
- Coupon interest on senior bonds;
- Coupon interest on subordinated bonds;
- The manager's fees;
- Net income amounts;
- Principal to senior bondholders;
- Principal to subordinated bondholders;
- Deferred manager's fee (if any); and
- Surplus to the fund beneficiary.

Arsov, Kim and Stacey (Reserve Bank Bulletin, March 2015) provide information on a number of important features of securitisations including:

a. How a "self-securitisation" differs from a standard RMBS and why are they created.
b. What is meant by a "waterfall" in the context of RMBS
c. Complications created by mortgage prepayments and redraws.
d. How some RMBS notes have a high credit rating even if the mortgages involved are high risk
e. What is meant by a "clean-up" call and why it is incorporated into RMBS design
f. Why the weighted average life (WAL) of senior RMBS notes so low, and how the risk that the actual WAL could differ from the expected WAL might be reflected in RMBS pricing
g. Techniques used to ensure that the RMBS vehicle does not default on its obligations
h. How Australian securitisations deal with the fact that mortgages are generally variable rate (eg variable at the bank's discretion) whereas RMBS notes are linked to some indicator rate (or are fixed rate)
i. How a "yield strain" arises in an RMBS and how is it managed
j. How APRA approached the question of what tranches of an RMBS an originating ADI (bank) can/should hold
k. Complications created by use of a "bullet" structure rather than an amortising pass-through structure for RMBS
l. The role lenders mortgage insurance (LMI) plays in the design of RMBS
m. The relevance of master-trusts for securitisations
n. The impact of APS 120 on bank warehousing facilities

11.10 Securitisation and the Financial Crisis

Many have blamed securitisation as one of the causes of the Global Financial Crisis. There is little doubt that poor quality mortgage lending, often attributed to failings in the OTD (Originate to Distribute) model, and creation of complex asset backed securities whose risks were not appreciated

were important elements of the crisis. There were thus a number of deficiencies in the practice of securitisation, which have led to subsequent regulatory changes, but the principle of securitisation itself should not be held responsible for creating financial instability. As Shin notes the ability of the financial sector as a whole (banks and securitisers) to make mortgage loans to end-users depends on their ability to also obtain funds from other end-users in the form of equity, deposits, or capital market instruments. Whether the shadow-banking sector (securitisation) is more easily to expand lending via increasing leverage is a relevant consideration. Shin suggests that the increased supply of funds at lower risk premia to the financial sector induced greater supply of loans involving greater leverage and lower quality lending. (He models this by assuming that a perceived decline in value at risk (VaR) of bank balance sheets means they have excess economic capital (which is based on VaR) and in practice seek to restore their situation by increasing leverage). While non-bank investors in securitised products suffered losses due to the poor loan quality underpinning those products, banks also suffered significant losses due to exposures to securitisation vehicles (such as via liquidity facilities) and holdings of CDOs and RMBs as they "levered up' their balance sheets. Shin notes that a given level of overall financial system leverage can be consistent with virtually any level of leverage for individual financial sector participants because of inter-sectoral borrowing and lending. (When aggregated, there is a lot of netting). The nature of those inter-sectoral arrangements can give rise to systemic instability.

Gorton and Metrick (JFE, 2012) attribute a key role in the cause of the GFC to the use of repo financing for holdings of securitised assets by investment banks and others. They note that the introduction of the ABX indices in early 2007 providing the first public information on market valuations of the complex resecuritisations was associated with declines in market value and demands for increased collateral (via way of increased haircuts) for repo financing.

Acharya et al (2013) provide evidence of the problems arising from use of ABCP conduits, which banks established to arbitrage regulation, but while not really removing risk from their balance sheets. They conclude that banks suffered losses from support given to the conduits they had established to avoid regulation, raising the question of the appropriate choice between ensuring bank regulation can be strengthened to prevent such activities versus extending regulation to the shadow banking sector. Kacperczyk and Schnabl (JEP, 2010) examine the disruption to the US CP market during the GFC.

As well as the concerns about the incentive effects for due diligence on loan underwriting of the OTD model, another major concern raised by the GFC experience was the role of the credit rating agencies. Many pointed to the conflicts of interest associated with their provision of information

regarding how to structure securitisations to maximise ratings for various tranches and being paid to also provide the ratings.

Generally, there have been many authors pointing to the changes in the nature of intermediation involving securitisation which creates interlinkages between participants in the financial sector and leads to different responses to shocks than in the case of on-balance sheet bank intermediation. Figure 9 and Figure 10 provide illustrations of those relationships which highlight the inter-linkages created between various participants in the financial system. (The source articles provide detail on the nature of the various links in the chains).

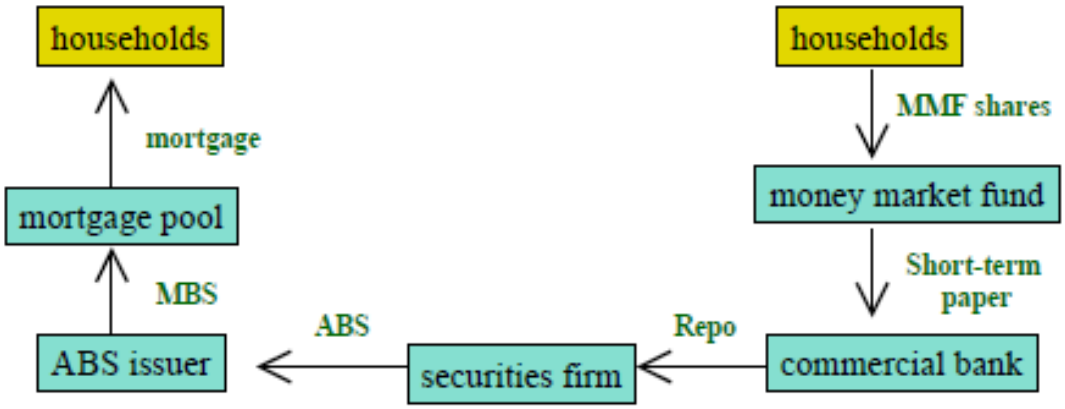


FIGURE 9: LONG INTERMEDIATION CHAIN (SOURCE: ADRIAN &SHIN, (ARE,2010)

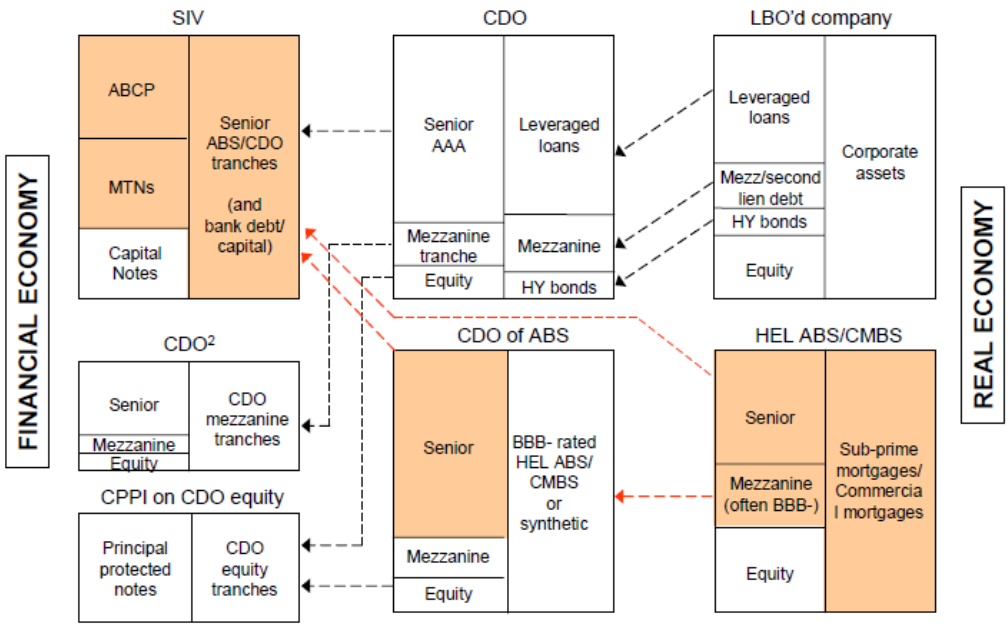


FIGURE 10 FINANCIAL CONTRACT DESIGN (SOURCE - HALDANE, BOE, 2009)

11.11 Regulation of Securitisation

There has been much attention paid to regulation of securitisation since the GFC, with a push (particularly in Europe for STS (Simple, transparent, standardised) securitisation structures. However, much of the regulation of securitisation is essentially indirect via various requirements laid down by prudential regulators for bank capital and other regulatory requirements or via Central Bank conditions for acceptability of ABS in repurchase agreements. For non-bank securitisers, the main regulation is the need to comply with disclosure and other requirements associated with the issuance of securities. To date securitised products have only been sold to wholesale / sophisticated investors.

In Australia, after a long consultation process, APRA released in November 2016 its revised Prudential Standard APS 120 Securitisation to take effect in 2018. A final revised standard was released in May 2018, effective January 2018. The Standard makes a distinction between *funding only securitisations* and *capital relief securitisations* where the latter requires that there is effective risk transfer to other investors. The former (funding only) involves the bank maintaining the residual risk of the underlying mortgage pool through holding the most junior tranches of the securitisation. Securitisation of revolving credit facilities (eg credit cards), and ABCP securitisations (and self-securitisations), must be treated as a funding only securitisation.

Capital relief securitisations involve a number of conditions and requirements for eligibility and for calculating the capital requirement for the remaining exposure of the ADI. For example, no more than 20% of non-senior securities (or tranches thereof) can be held and remainder must be sold to third parties with no recourse for repurchase back to the ADI (other than a ”clean up call”. Because the ADI may provide other risk mitigation services to senior securities in the securitisation (such as by way of credit enhancements etc), there is also a limit on holdings or other positions which represent more than 20% of loss cover provided to senior securities. The SPV must issue securities which ensure that it is funded until the underlying pool matures (or the SPV is terminated via a “clean up call”). If the ADI retains some part of the securities, its capital requirement is based on the external ratings for that tranche or a specific supervisory formula (reflecting the underlying asset pool risk weighting, delinquency status, and position of the securities in the overall priority structure. Senior securities could have a risk weight of as low as 15% while non senior securities risk weights could be up to 140% (or the exposure could be required to be deducted from calculation of CET1 capital)[11].

Other features of APS 120 of note include:

[11] This would be equivalent to an implied risk weight of 100/k where k is the CET1/RWA minimum ratio. Thus if k = 0.1, the implied risk weight is 1,000.

- Contrary to most of the discussion after the GFC about desirable requirements, it does not require securitisers to have "skin in the game" (SITG). In practice a capital relief securitisation could involve 100 per cent of the risk being shifted to third parties. SITG has been argued by many to be desirable to ensure that incentives for appropriate due diligence in the OTD model exist.
- Contrary to earlier suggestions in its discussion papers, APRA has not attempted to enforce "simpler securitisation" requirements, such as limiting the number of tranches and types of priority structures. The Basel Securitisation Standard incorporates allowance for "simple, transparent and comparable" (STC) securitisations (but this is not obligatory on member jurisdictions). Holdings of STC securitisations by banks (investors or originators) will have lower capital requirement than non-STC securitisations.
- APRA has approved the use of master trust structures which enable the same set of assets to underpin securitisation in different currencies

11.12 Australian Government Securitisation Interventions

The development of securitization in Australia was, with one important exception, led by the private sector with government involvement primarily by way of removing regulatory and tax impediments. The exception was the use of securitization by several State governments based on housing loans under low-income/affordable/welfare housing programs they operated. This is quite different to the USA where government sponsored enterprises (GSEs) such as Fannie Mae and Freddie Mac were critical to the development of securitization, through purchasing loans from mortgage originators and issuing RMBS based on those assets.

However, the Australian government has since intervened in the securitization market in a number of ways. First, in October 2008, the Treasurer directed the Australian Office of Financial Management (AOFM) to invest in residential mortgage-backed securities (RMBS) as a temporary measure in response to the Global Financial Crisis (GFC). Second, the government announced in November 2018 an Australian Business Securitisation Fund (ABSF) to be operated by the AOFM. Third, in March 2020, responding to the Covid-19 Pandemic, the government announced a Structured Finance Support Fund (SFSF) with $15 billion to be operated by the AOFM to support continued access to funding markets for small and medium enterprises (SMEs) impacted by the economic effects of the COVID-19 pandemic and to mitigate impacts on competition in consumer and business lending markets.

AOFM and the GFC

Following the enabling legislation in June 2008, the AOFM proceeded to participate in 62 different securitisation issues, purchasing 99 separate tranches over the period November 2008 to September 2012. (Details are here). The AOFM investment scheme was limited to AAA securitizations by institutions who do not have a credit rating of at least AA and thus could not access cheap government guaranteed on-balance sheet funding under the wholesale funding guarantee put in place at that time. It thus provided something of an offset to the competitive balance effects of the guarantee scheme. None of the major banks participated as issuers, with all of the supported issues involving other domestic banks (including Macquarie), credit unions and building societies, and other securitisers including FirstMac, RESIMAC, Challenger, and Liberty Financial. (The major banks were involved as managers/arrangers of the issues for the securitisers).

In the initial stages, AOFM investments accounted for 75 per cent of the total value of the RMBS issues supported. There were virtually no other RMBS issues (neither domestic nor international) over that period. The coupon interest rate on these AOFM investments averaged approximately 133 basis points above the one month Bank Bill Swap (BBSW) rate, which was roughly the same margin over BBSW as for the small number of other AAA rated issues in 2008 (but well above earlier times).

Ultimately, the AOFM exited all of its RMBS investments either via the issuer exercising a clean-up call option, or via a sale of the investment under a series of auctions commencing in mid 2015 and finishing in 2018. (Details are here). The AOFM transactions appear to have been profitable for it, with clean prices in the auctions being all above face value and the implied trade margins well below the issue margin.[12] That reflects the general decline in margins occurring in the years after the GFC, rather than implying anything about investment performance of the AOFM (other than being able to invest in an undervalued asset and hold it until more normal market conditions returned).

So, was the scheme beneficial? The rate of new RMBS issues (all supported by the AOFM) was somewhat higher than in 2008, although well below previous levels. But private sector investment in those issues (at around $2 billion) was very small. Thus, the scheme didn't bring private sector investors back into the market for new issues. That possibly reflected the secondary market overhang of RMBS disgorged at high margins by the winding down of SIVs etc. New issues at high yields competitive with secondary market prices, can't be created profitably from new mortgages made at sufficiently low interest rates to attract borrowers.

[12] The "clean price" is the price not inclusive of accrued interest since the last coupon date. The "trade margin" is the spread over the current value of the indicator rate (generally BBSW30) implied by the sale price.

It may be that the AOFM simply substituted for private sector investors who took up government (or government guaranteed ADI) debt instead (some part of which is funding AOFM purchases of RMBS).

Bank housing lending increased compared to that of securitisers – which fell in the initial years after the GFC. The increasing dominance of the four major banks suggests no improvement in competition in the housing mortgage market. The AOFM scheme has, however, assisted some (but not all) mortgage originators dependent on securitization to maintain some level of lending over this period.

If anything, the major banks were able to increase the spread on mortgage interest rates over this period, given reduced competition from securitisers

Who benefitted most – borrowers, securitisers, or the large banks acting as lead managers/ arrangers of successful RMBS issues? Desperate mortgage originators wanting to participate and a ready investor (the AOFM) hopefully meant that fierce competition between potential lead managers for mandates has meant low fees! Smaller home lenders were able to continue some scale of activities which may otherwise have not been possible. Whether borrowers gained any benefit is hard to assess.

The winding down of AOFM involvement as market conditions returned toward normality, suggests that securitisation can provide a valuable competitor to major bank dominance of lending markets in "normal times". But in crisis periods, temporary government intervention may have merits. But structuring the nature of that intervention appropriately is important. It is not obvious what policy lessons were learnt from the GFC intervention to help guide the most recent government securitisation market interventions. Would, for example, some form of government guarantees over senior tranches of new securitisations have been preferable to direct investments by the AOFM?

The Covid Crisis Response, the Australian Business Securitisation Fund (ABSF) and the Structured Finance Support Fund (SFSF)

Announced in November 2018, the ABSF had not really got underway when the Covid 19 Crisis struck. Originally publicised as a $2 billion fund to support lending by securitisers to SMEs. It had made one investment in April 2020, an investment of $250 in securities issued by a warehouse vehicle sponsored by Judo Bank which focuses on SME lending, before it was postponed. (There appears to be no readily available public information on the terms and conditions associated with this investment, even though the ABSF could involve a subsidy element aimed at promoting market growth). In January 2021, the AOFM announced a further call for applications for investment, and four of sixteen applications have been chosen for consideration for funding.

In March 2020, a Structured Finance Support Fund (SFSF) of $15 billion was announced. Large ADIs who have the ability to self-securitise were precluded from applying. (They also have benefitted from cheap funding via the RBA's Term Funding Facility – which has also meant that they have had no reason nor incentive to undertake new securitisations). It is not clear how this scheme differs in potential practical operation from the ABSF, other than one stream of its activities having a special focus on establishing "arrangements to assist small lenders to provide forbearance for borrowers experiencing Covid-19 related hardship" (AOFM). By March 2021, $3.8 billion had been committed ($1.36 billion investment in public markets, $2.3 billion in investments in private warehouse facilities, and only $47 million on support under the forbearance arrangements). However, the AOFM's June 2021 update indicates that not all commitments have been taken up, and private investors have replaced the AOFM role in a number of warehouse facilities. Details of the investments made can be found here. While public market investments provide information on the likely yields on investments (such as the estimated traded margin)[13], there is no such information on the terms of the private investments.

Appendix 1: Case Study: The ABACUS Deal

In 2010, Goldman Sachs agreed to pay $550 million to settle SEC charges that it misled investors in a synthetic CDO known as ABACUS 2007-AC1. The nature of the transactions involved is complex, and is best explained by a simple illustration based around the credit rating of a simple company rather than the portfolio of securities involved. But see here for a brief explanation of the deal

Example Illustration. Suppose Client A of an Investment Bank (IB) wants to bet on Company X failing, and thus wants to buy a Credit Default Swap (CDS) on X. He would pay a fee to the protection writer of such a CDS and would receive a payout if Company X did fail. However, there are no sellers of CDS on X in the market. So the IB needs to find some way to write such a CDS for A and to find some way of hedging (passing on to others) the resulting exposure. It thus creates an SPV which sells a credit linked note to clients B, with a high promised interest rate, but for which there is a loss of principal if X fails.

As shown in Figure 11 the SPV issues securities (the credit linked notes) to investor clients (B) for an amount $(G-P). It also sells a CDS (which has risk characteristics exactly matching those in the credit linked notes) to IB for a premium amount of $P. it invests the total proceeds of $G in Government Debt and the interest received is to be paid to investors (B) giving them an enhanced return on their

[13] The traded margin is (approximately) derived from the internal rate of return from the expected flow of coupon and principal repayments from purchasing the security at its current market price. (If the security is trading at a clean price equal to (or above/below) its par value, the traded margin should equal (or be below/above) the coupon margin over BBSW.

invested amount of $(G-P). The SPV has hedged the risk associated with X failing (the investors would not receive their principal back, and the SPV can use the amount $G invested in government debt to make the required payment to IB under the terms of the CDS. IB has hedged its position by selling a CDS with the same properties of the one it has bought from the SPV to Client A.

In the actual ABACUS case, the investor (client A) wanted to make a bet on a decline in the value of a portfolio of RMBS chosen by IB to suit client A's preferences. So IB created exposures to such a portfolio synthetically (rather than buying the actual securities to be held by the SPV) enabling A to take the desired bet, with the other side of the bet being held by the investors B.

There are clearly some ethical questions which can be asked about the nature of the dealings between IB and its clients.

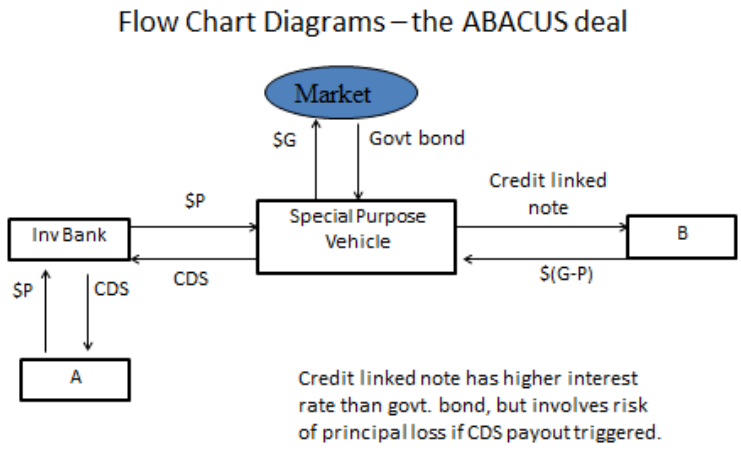


FIGURE 11: THE ABACUS DEAL

Appendix 2 RAMS Case Study

RAMs was established in 1991, by John Kinghorn, as specialist provider of wholesale funding for loans. In 1995 it launched the "RAMS Home Loan" through its retail distribution network. The business model involved: providing home loans through its franchisees and through third party mortgage broker networks; funding these loans through Special Purpose Entities (SPEs) involving

- warehouse funding (using bank loans etc) – of home loans made but yet to be placed into the other SPEs
- RMBS – securitisations
- extendible commercial paper facilities

and with loans serviced (repayments collected etc) by a third party.

The profits of the business result from the difference between the home loan interest rates and their funding costs and other operational costs including commissions to brokers etc., and were received by the parent company as transfers of surpluses from the SPEs (who hold and fund the loan portfolios).

The company was floated in mid 2007 (prospectus issued 27 June and company listed on 27 July) raising $695 million at $2.50 per share via a sale of shares by the original founder. It failed following events in August 2007 when it was unable to roll over extendible commercial paper issue by an SPE and was forced to extend the maturity of that paper for 180 days on 15 August at a higher interest rate (LIBOR plus 25 bp compared to a margin of 13 bp before) and with no prospect of subsequent rollovers available. The share price dropped to below 50 cents by end September and subsequently to below 20 cents.

At the time of its crisis it was funding loans of approximately A$14 bill by approximately A$6 bill in extendible commercial paper, A$4 bill via warehouse funding, and A$4 bill in RMBS.

In January 2008, Westpac bought the brand and distribution business (and RAMS name) for $140 million which it has used for new lending activities. (So investors in the equity of RAMs lost almost $700 million within less than six months). The existing assets remained with the listed RHG company which was put into "run-off" mode and had to find $9 billion funding, some part of which was to be provided by Westpac as part of a syndicated loan facility. RHG managed to extend the maturity of its warehouse loans (most due before mid 2008) and obtain loans to repay the CP on issue (but at a higher spread).

Prospectus Information (27 June 2007)
Offer Price $2.50
Number of Shares available under the Offer 278.1 million
Gross proceeds of the Offer $695.3 million
Total number of Shares on issue following the Offer 353.8 million
Market capitalisation $884.6 million
Net Corporate debt $136.6 million
Enterprise value $1,021.2 million

Forecasts FY 2008

Net profit after tax ($) $58.6 million
Earnings per Share 16.6 cents
Price earnings ratio[6] 15.1 times
Dividend per Share (fully franked) 13.2 cents
Dividend yield (%)[7] 5.3 %

Prospectus Information (27 June 2007)

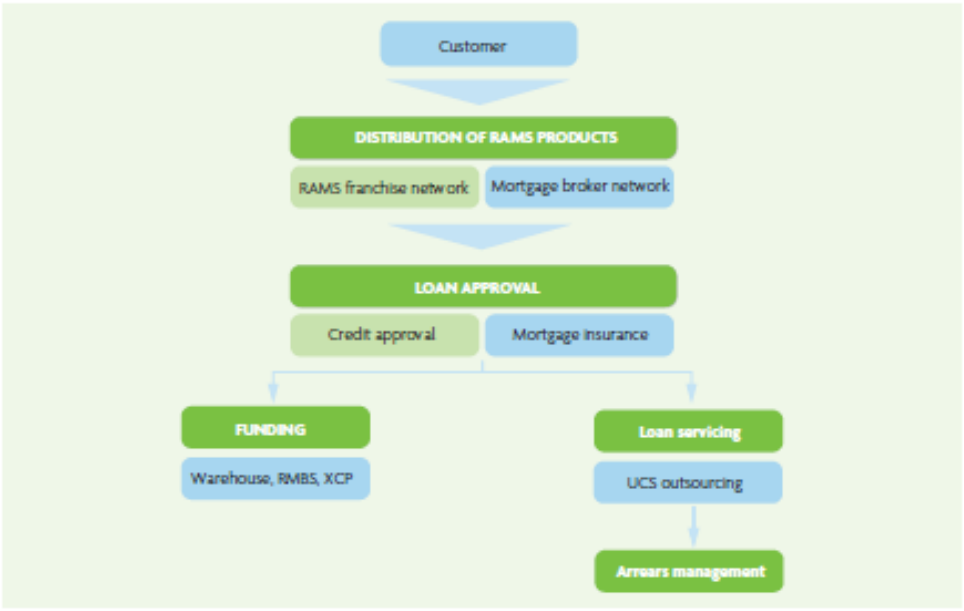
RAMS' Loan Book of $13.3 billion (as at 31 May 2007) is owned and funded by special purpose entities ('SPEs') which are managed, but not owned, by RAMS. This structure allows RAMS:

To conduct highly rated asset-backed funding transactions; and
To structure funding transactions where investors' recourse is to specific pools of housing loans, with only limited recourse to RAMS.
The three sources of funding accessed by RAMS through the SPEs are:
Warehouses:
RAMS has five warehouse facilities available with current total capacity of $4.65 billion;
Residential Mortgage Backed Securities ('RMBS'):
RAMS securitises loans through RMBS which have a maturity date of approximately 30 years, but which allow funds to be repaid to note holders prior to the maturity date; and
Extendible Commercial Paper ('XCP'):
RAMS achieves cost efficient funding through an XCP issuance program into the US debt markets.

RAMS primarily earns its revenue from the Loan Book in the following manner:
The SPEs earn regular revenue from the home loans originated by RAMS over the life of the loans;
A portion of this revenue is used to meet the funding costs and other fees and expenses of the SPEs; and
RAMS receives distributions of net income and origination fees from the SPEs.

RAMS operates through two distinct groups of entities:
The RAMS "Corporate" entities, being the entities responsible for the origination of new home loans, the servicing of the Loan Book and the management of the special purpose entities. The main operating entity is RAMS Home Loans Pty Limited; and
The RAMS SPEs, being the entities that hold the mortgages and issue the securities that fund those mortgages. The net income (primarily the net interest margin less SPE specific costs) earned by these entities is distributed to the Corporate entities. The SPEs are managed, but not owned, by RAMS.
Although under AIFRS the RAMS consolidated accounts include the gross income, expenses, assets and liabilities of the SPEs, the profits and cashflows available to RAMS' shareholders include only the net income earned in the SPEs. The net income is distributed to the Corporate entities, typically monthly, in line with the relevant SPE documentation.

DIAGRAM 2 THE RAMS BUSINESS MODEL



Source: RAMS Prospectus

APPENDIX 3: Mortgage Strips: IO's and PO's

While not a form of securitisation, dividing claims on a mortgage cash flow into a claim on interest only (IO) and one on principal only (PO), shares some common features.

This was a popular form of innovation developed in the 1980s in the US where cash flows on mortgage pools were stripped into two separate claims. The IO was a claim on interest only and a PO a claim on principal only. Note that the stream of interest cash flows will be initially large and decline over time as the loan repayments gradually reduce the principal. With the regular loan repayment fixed, the principal repayments would gradually increase.

If the mortgages were fixed rate, and there was no risk of prepayment, the IO cash flow pattern would follow a concave pattern descending to zero at the loan maturity date. The PO cash flow pattern would follow a convex pattern increasing to a maximum when the last loan payment is due. If market interest rates increased, each of these fixed cash flow streams would fall in present value – with a much greater effect on the PO given its longer duration.

Suppose there is prepayment risk, such that a reduction in market rates prompts higher prepayments as borrowers shift to an alternative lender offering lower rates (although prepayment penalties are designed to inhibit this). Consider, for simplicity, the extreme case where the borrower repays in full when market rates fall. The holder of the IO will receive no further interest cash flows, while the PO holder will receive the outstanding principal at that time rather than gradually over the life of the loan. Thus the reduction in interest rates dramatically reduces the value of the IO, but increases the value of the PO (it is now the amount of principal which was outstanding rather than the present value of that amount.

Of course investors in such securities would (should!) be aware of such risks, and thus the prices that would be paid for IOs and POs in the market would reflect that risk. But nevertheless, the same result that the value of IOs would be significantly positively related to market interest rates, while that of POs would be significantly inversely related. Because the IO and PO add up to the underlying mortgage, the changes in value add up to the change in the value of the underlying mortgage.

Purchase of a PO could reduce the overall exposure of a mortgage servicing provider to a reduction in interest rates. Such a company gets a stream of income from fees (related to interest payments) for managing the collection of mortgage repayments. The increase in the value of the PO offsets the lower fee income.

In the US, some banks offer mortgage borrowers an option of paying higher up-front "points" (ie a fee) and having a lower loan interest rate. Agarwal et al (Journal of Financial Economics 123 (2017) 42–58) argue that for such banks, purchase of an IO might be a useful hedge.

Note: there are other types of IO's such as CMBS IO's discussed in this Prudential Fixed Income paper where (a) there is little prepayment risk and (b) a number of IO's are issued each linked to one of the tranches in the CMBS. Each tranche IO pays an income stream equal to the "excess interest" (the difference between the weighted average coupon of the loan pool (net of fees) backing all tranches and the coupon on that tranche), on a notional principal equal to the amount of that tranche outstanding. (Even junior tranches may have a low coupon, but are issued at a significant discount to par value).