Confidential

Asset Backed Securities

Lessons Learned and the Road Ahead for Asset-Backed Securities

2017

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Preface

In the spirit of Jeremy Bentham, we find ourselves defending the seemingly indefensible.

Jeremy Bentham, the 18th century political philosopher (and our Firm's namesake), wrote 13 letters "In Defence of Usury". At the time, a maximum legal interest rate was legislated by government, regardless of the credit risk of the borrower. Jeremy Bentham reasoned against such restriction on lenders, favouring "liberty of making one's own terms in money-bargains"[1]. Today capital markets embrace differentiated, privately negotiated credit pricing according to credit risk as a core tenet of risk management.

Taking up the fight for a similarly unfashionable cause, Bentham Asset Management argues in this White Paper in defence of Asset Backed Securities ('ABS') and Collateralised Debt Obligations ('CDOs').

1 Bentham, Jeremy, *Defence of Usury, 1818*. Library of Economics and Liberty.

1. Introduction

Background

The 2008 'Great Recession' is often characterised as a 'global credit crisis', with many commentators pointing to Asset Backed Securities ('ABS') and Collateralised Debt Obligations ('CDOs') as the root cause.[2] Bentham believes there are many misconceptions and generalisations regarding ABS which are not only misleading, but are factually incorrect and reflect a poor understanding of the attributes of this asset class.

ABS encompass debt securities with a broad range of underlying assets as collateral. The asset class has a long history through many market cycles and comprises a sizeable and integral part of global capital markets. ABS have an important role to play in supporting lending in the real economy and providing access to investors to the risk characteristics of the underlying receivables.

Certainly some sub-sectors such as ABS backed by sub-prime collateral and highly structured synthetic CDOs experienced extreme volatility and principal losses through the 2008 global recession. However, when the wider ABS market is considered, these experiences were largely confined to a narrow type of investments, with the vast majority of ABS securities redeeming at par and paying both principal and interest on schedule. Most ABS sectors suffered only market value volatility, from which they recovered, rather than permanent losses due to credit defaults.

The experience of certain sub-sectors does not invalidate the generic securitisation structure of all ABS.

Summary

Bentham believes the ABS asset class can provide a useful, conservative credit investment with capital stability and regular income. The ABS structure is unique within credit markets, offering valuable rights and protections in favour of creditors and a naturally improving credit profile over time. In addition, many ABS sectors are floating rate, providing defensive positioning for rising interest rates globally.

While problems occurred in securitisation markets in the lead up to 2008, many of these have since been addressed through changes to the origination and rating processes, and regulatory reform to better align investor and originator/manager interests.

As a direct consequence of the Great Recession, structural enhancements have been implemented for most classes of ABS, resulting in materially more robust structures.

Pricing dynamics in global ABS markets have also shifted in favour of investors post crisis. Tighter capital requirements for banks and changes in the investor base have increased target investor credit spreads, leaving the asset class offering good absolute and relative credit risk premium in our assessment.

This White Paper explores these themes in further detail.

Bentham believes investment grade tranches in particular offer an attractive investment opportunity with higher potential returns for lower outright risk when compared with history and equivalently rated corporate debt. In 2016 we established the Bentham Asset Backed Securities Fund to focus on this opportunity.

2 An important note on nomenclature: Bentham uses the terms ABS and CDO to describe a generic financing structure, of which RMBS, CMBS, CLOs and other asset backed securities are forms. In this paper we will use the terms ABS and CDOs to refer to this generic product class. In contrast, we note that some authors use the term "CDO" very narrowly, and in a pejorative manner, to describe a comparatively minor subset of the securitisation market: RMBS backed by subprime mortgages or securitisations of portfolios of ABS bonds.

2. What are ABS? And what are they not?

2.1 Introduction to ABS – the process of Securitisation

Securitisation describes the financial process whereby the credit risk characteristics of a pool of assets or receivables are packaged into debt securities. These securities are then made available to investors.

One key feature of securitisation is the transformation of linear credit risk of the underlying collateral into a number of different debt securities which exhibit non-linear credit risk profiles – this is achieved by tranching the debt into securities of different rank/priority and rating. Tranching of the risk is implemented by defining the priority of the allocation of payments amongst the debt classes. This feature enables investors to acquire the particular tranche which best suits their risk/return preferences.

As the name suggests, Asset Backed Securities are 'backed' (or secured) by the pool of underlying loans, mortgages, leases or other debt-like obligations (the 'collateral'). The collateral is generally sold or otherwise transferred to the debt issuance entity – traditionally a special purpose entity whose sole purpose is the acquisition of the collateral and the issuance of debt secured by the collateral. The cashflows generated by the collateral (e.g. interest and principal, lease payments, royalties or any type of contractual payment obligation) are used to pay the coupons and return principal on the ABS securities.

ABS are generally structured with a single type of underlying collateral, permitting targeted acquisition of underlying risk rather than generic exposure to contractual payment obligations as with corporate debt issued by a financing entity. Debt assets have been proven to offer capital stability through different economic cycles and tend to be more commonly used in ABS.

A key factor that determines the comparative risk of an ABS is the credit quality of the collateral. In this setting, 'credit quality' takes on a wider scope, not only referencing the credit quality of the underlying obligor, but the origination and servicing attributes of the party sourcing the underlying collateral for the ABS security.

Where there have been failures in ABS markets, it is Bentham's belief that the root cause was not the ABS structure per se, but problems with origination processes or servicing standards and, in certain instances, the suitability of the particular form of collateral as a securitisation asset[3].

As an analogy: the dot.com boom/bust of the early 2000s raised questions about the appropriateness and readiness of tech companies to access capital markets, and the IPO/debt raising processes of the time, but did not invalidate the security structure of a share or bond. Similarly for ABS markets, the failures experienced within certain sub-sectors should not invalidate securitisation as a financial process.

Examples of investible global ABS include, but are not limited to:

- Residential Mortgage Backed Securities ('RMBS')
- Commercial Real Estate Mortgage Backed Securities ('CMBS')
- Collateralised Loan Obligations ('CLO')
- Consumer auto loan backed securities ('Auto ABS')
- Consumer credit card backed securities ('Cards ABS')
- Student loan backed securities ('Student ABS')
- Bank mortgage or cash flow backed securities ('Covered Bonds')
- Aircraft backed securities ('Aircraft ABS')
- Container and rail car backed securities ('Box ABS')

3 An interesting exception where the securitisation structure itself was flawed was synthetic corporate credit CDOs. The asset selection mechanism used in portfolio construction within synthetic corporate CDOs played a material part in the sector's poor performance: underlying obligors needed to be structurally "efficient" to be included in the CDO, that is, they needed to pay a high CDS premium for their rating band and needed to have the appropriate sector/country characteristics to meet the rating agency model criteria. Basically an arbitrage existed between CDS spread and agency model assumptions, resulting in what was an essentially self-selecting portfolio. When combined with investor appetite for the highest spread payable, this sector had serious structural failings.

Examples of ABS that have experienced problems (origination / collateral) include:

- Subprime (low credit quality) mortgage RMBS
- Collateralised Bond Obligations ('CBO', CDO of high yield bonds)
- CDOs of CDO subordinated tranches ('CDO^2')
- Constant Proportion Debt Obligations ('CPDO')
- Home Equity CDOs
- Synthetic CDOs ('SCDO', CDO of credit default swaps)

For a more detailed introduction to the ABS capital formation process, see Appendix A.

2.2 Securitisation as a process provides an integral financial service to the global economy

The development of securitisation markets is of benefit to issuers, investors and the broader economy.

Securitisation supports lending. On one side of the equation, the securitisation process provides access to funding for asset originators who are specialised in lending to their particular market, supporting real economic activity. ABS markets often provide a solution where more traditional market structures (such as bank financing) are not able to intermediate for pricing, regulatory or other reasons.

Securitisation provides access for investors. On the investor side, ABS provide investment opportunities which are otherwise unavailable to institutional investors. The securitisation process aggregates diverse pools of directly-originated assets, providing tailored risk levels and cash flow streams (i.e. tranches with unique attachment points), often in alternative or diversifying asset classes.

Securitisation structures include unique protections for creditors. Bentham, as a credit investor, places value on ABS as an investment structure.

- Securitisation documentation typically includes numerous 'credit enhancements', supporting the timely payment of principal and interest to upper tranches of an ABS. Credit enhancements can include:
  - subordination;
  - cash flow waterfall;
  - interest coverage/overcollateralisation tests;
  - cash reserves;
  - amortisation; and
  - excess spread.
- The credit profile of rated ABS bonds typically improves over time, as structures inherently deleverage.
- ABS reporting is typically data-rich, with frequent, detailed, external reporting.

See Appendix B for a detailed discussion of each of these benefits of the ABS structure.

2.3 What has changed in ABS capital formation – a summary

Capital formation processes for investment grade ABS continue to evolve.

- **Changes in market participants.** Demand for ABS has reduced post crisis as regulatory and rating agency arbitrage-driven demand has left the market (e.g. Banks and SIVs). The reduction in 'artificial' demand has improved the ABS supply/demand imbalance in favour of investors. The current ABS investor pool, including real money investors with limited (if any) leverage, represents a stronger set of hands.
- **Stronger structures and investor protections.** Markets tend to 'cleanse' after a crisis. Post the Great Recession, we see the rating agencies imposing tighter origination standards and structural enhancements (hurdles to achieve a given rating outcome are higher), and continued demands from investors for greater lender protections (for example, more subordination for rated ABS bonds).
- **Pricing.** On an absolute basis, ABS spreads remain elevated post crisis. On a relative basis, ABS post crisis offer higher credit spreads than corporate credit (per equivalent credit rating tier). By comparison, ABS typically traded inside corporate credit pre crisis.

3. Current ABS pricing – is there an opportunity?

We believe a number of investment grade ABS markets currently offer investors attractive spread relative to risk.

Absolute value perspective (ABS spreads vs. history):

Spreads remain elevated post the crisis. Investors are still being paid more now than pre crisis for a given rating band in most ABS sectors, despite improved structures.

Table 1: Credit spreads over Libor bps – Absolute value to 2006

Pre-Crisis Spreads				
30-Jun-06	**AAA**	**AA**	**A**	**BBB**
US Corporates	61	68	87	122
US Financials	60	69	83	117
Global Securitised	49	22	73	106
US MBS	49			
Australian RMBS	45	28		
CMBS	70	82	91	127
CLO	24	37	65	150

Current Spreads				
31-May-17	**AAA**	**AA**	**A**	**BBB**
US Corporates	69	69	91	146
US Financials	n/a	68	94	137
Global Securitised	31	68	92	135
US MBS	26			
Australian RMBS	101	255		
CMBS	80	138	213	465
CLO	129	182	247	372

Current Spreads as % of Pre-Crisis				
	AAA	**AA**	**A**	**BBB**
US Corporates	113%	102%	3%	120%
US Financials		99%	113%	117%
Global Securitised	64%	309%	126%	
US MBS	52%			128%
Australian RMBS	682%	918%		
CMBS	113%	167%	234%	366%
CLO	537%	493%	380%	248%

Source: Bentham, Wells Fargo, Bloomberg, Macquarie, Barclays.

2006 versus 2017: ABS spreads are wider now than in 2006. For example: Current AAA CLO credit spread of 129bps is 537% of the 2006 level of 24bps. The key exception is US MBS, where Quantitative Easing ('QE') has seen US Treasury purchases supporting this market and holding down spreads.

Relative value perspective (ABS spreads vs. corporate):

Pre-crisis, ABS typically priced tighter (less spread) than corporate credit of an equivalent credit rating band. Post-crisis, ABS typically prices wider (more spread) than corporate credit. Again, a key exception is US MBS, which experiences government support through the QE programme.

Table 2: Credit spreads over Libor bps – relative value to corporates

Pre-Crisis Spreads				
30-Jun-06	**AAA**	**AA**	**A**	**BBB**
US Corporates	*61*	*68*	*87*	*122*
US Financials	60	69	83	117
Global Securitised	49	22	73	106
US MBS	49			
Australian RMBS	15	28		
CMBS	70	82	91	127
CLO	24	37	65	150

Spreads as a % of US Corporate Spreads (equiv rating) – Pre-Crisis			
AAA	**AA**	**A**	**BBB**
100%	*100%*	*100%*	*100%*
	102%	95%	96%
80%	33%	84%	87%
80%			
24%	41%		
115%	121%	104%	104%
39%	55%	74%	123%

Current Spreads				
31-May-17	**AAA**	**AA**	**A**	**BBB**
US Corporates	*69*	*69*	*91*	*146*
US Financials	n/a	68	94	137
Global Securitised	31	68	92	135
US MBS	26			
Australian RMBS	101	255		
CMBS	80	138	213	465
CLO	129	182	247	372

Spreads as a % of US Corporate Spreads (equiv rating) – Current			
AAA	**AA**	**A**	**BBB**
100%	*100%*	*100%*	*100%*
	99%	103%	94%
45%	98%	100%	92%
37%			
146%	370%		
115%	199%	233%	318%
187%	264%	270%	255%

Source: Bentham, Wells Fargo, Bloomberg, Macquarie, Barclays.

2006: ABS spreads were much tighter than corporate spreads, except CMBS. E.g. AAA Australian RMBS spread of 15bps in 2006 was only 24% of 2006 US Corporate spread (61bps).

2017: ABS spreads are generally the same or wider than corporate spreads. E.g. AAA Australian RMBS spread of 101bps in 2017 is 146% of current US Corporate spread (69bps).

3.1 How did current pricing levels develop?

Pre-crisis: ABS risk premiums (credit spreads) were *less* than corporate risk premiums

June 2006 was close to the peak (tights) in credit markets before the 2008 crisis. At that stage, almost all ABS markets priced tighter (on a credit spread basis) than the equivalent rating band of corporate or bank debt. The one exception was US CMBS (US Commercial Mortgage Backed Securities) which was already showing some signs of early stress.

That highly rated ABS securities traded at tighter risk premiums than corporate credit largely reflected the ability of financial institutions to 'leverage' their holdings of ABS securities (i.e. borrow a significant amount towards the purchase price of the ABS). Leverage was often provided primarily on the basis of the stated credit rating of ABS securities, with limited credit analysis undertaken on the assets, either at acquisition or on an ongoing basis. Additionally, regulatory risk weights at the time ascribed a favourable treatment to ABS (less capital charge).

In effect, 'ratings arbitrage' was a common rationale for establishing ABS investment programmes. This manifested itself in banks (via off-balance sheet conduits) and SIVs (non-bank Structured Investment Vehicles) that 'leveraged themselves up' into long-dated ABS exposures that were funded primarily with short-term funding instruments such as Asset-Backed Commercial Paper ('ABCP'). In addition, diversification benefits attributed to regional and certain ABS exposures lowered capital requirements for banks.

These factors combined to generate a very large and material demand for rated ABS securities, in turn driving down ABS credit spreads.

Trigger for ABS spread widening during the crisis

The contributing causes of the Great Recession are varied and complex. At a macroeconomic level, US government policies designed to encourage broad-based home ownership, and an unusually low interest rate environment, set the backdrop for excesses in lending at the home loan level and subsequent housing price falls. At a financial markets level, certain features of the pre-2008 capital formation process in ABS markets created and then magnified risks – a theme we explore in detail in Section 4.

The US house price decline caused fundamental pressures in the sub-prime RMBS and sub-prime CDO-squared ('CDO^2') markets. These structures were directly affected by rising homeloan defaults and falling house prices, with losses exacerbated by very high levels of underlying leverage and layered securitisation (i.e. CDO^2 structures which didn't own the underlying mortgages, but contained lower-rated tranches of sub-prime RMBS). This was a key example of inappropriate collateral, as the underlying mortgages were poorly underwritten, which was then exacerbated by layered securitisation.

Early in the Great Recession, as concerns began emerging about the sustainability of US housing prices and the quality of residential mortgage lending to sub-prime borrowers, bank-sponsored conduits and SIVs found it difficult to continue rolling short-term funding. Consequently, these entities became forced sellers of ABS (regardless of underlying fundamentals) into a market which lacked committed alternate buyers, thereby creating a negative feedback loop that damaged asset valuations for ABS.

It is interesting to note that in the event, one of the major risks faced by many ABS sectors was the nature of the investor base, rather than securitisation structure or collateral. The market suffered from concentration of issuance to a narrow type of investors (bank conduits, SIVs, etc.) who were either unable to fund themselves or unwilling to weather material mark to market losses (often in circumstances where the market bid did not reflect, in their view, the intrinsic value of the ABS). As a consequence, asset prices fell and credit spreads widened, independently of the actual fundamental credit risk of many ABS sectors.

In a further round of capital market impacts, where bank-sponsored off-balance sheet conduits were unable to fund through public capital markets or where the liquidation costs were considered unreasonable in context, banks were forced to on-balance sheet the underlying ABS assets, requiring additional funding at the bank level and additional regulatory capital.

Current pricing: ABS risk premiums (credit spreads) remain *greater* than corporate risk premiums (credit spreads)

In 2017, ABS credit spreads (with the exception of US MBS) remain significantly wider than equivalent rating band corporate or financial credit[4]. One key reason for the significantly wider current ABS spreads – in some instances multiples of the previous cycle – is the removal from the market of a number of those investor groups which provided artificially inflated and ultimately temporary support for the market, e.g. bank conduits and balance sheets, SIVs, hedge funds, etc. This support increased asset prices, decreasing the credit risk premium/spread.

Bentham is pleased to see a reduction in investment by those participants (predominantly geared investors), and welcomes the development of a broader audience of real money ABS investors (pension funds, mutual funds, insurance companies and the like) as compared to the pre-crisis investor base. Importantly, we believe the current investor base represents a stronger set of hands, creating a more stable investment environment for the broader ABS asset class.

While progress has been made, we believe the emergence of a new, real money ABS investor base remains underdeveloped, given lingering concerns that many investors hold about the ABS asset class. This leads to a general underivestment in ABS, creating investment opportunities for a specialist manager with the appropriate skills, experience and systems to fully analyse asset backed securities and sectors. Bentham does not shy away from structural complexity in investments – we like understanding the detail of the investor protections embedded in ABS and are happy to be paid for this, for illiquidity (which continues to improve with a broader investment base), and for taking on unfashionable assets.

4 Bentham believes US MBS is currently expensive due to the artificial support this sector receives from the US Quantitative Easing programme. For context, the US Federal Reserve currently holds US$1.8 trillion face value of MBS securities. https://fred.stlouisfed.org/series/MBST, 3 Aug 2017

4. Improvements in ABS markets in 2017 when compared to pre-2008

In Bentham's view, many of the problems that occurred in securitisation markets in the lead up to 2008 have been addressed by regulators and the market. These changes in the capital formation process have led to an improved investment opportunity with higher potential returns for lower outright risk.

Table 3: Improvements in ABS markets in 2017 when compared to pre-2008?

What were the major problems pre 2008?	What has changed?
Gearing by prime brokers and investment banks: • Cheap and inappropriately structured funding was available for leverage and CDO warehouses • Extraordinary leverage was provided to hedge funds by prime brokers • Gearing created artificial/excess demand, pushing down spreads • 'Market value' triggers on facilities created a lack of safe hands	**Less gearing and higher cost:** • Warehouses charges are now material • The cost of leverage is higher, and the level of leverage available to hedge funds is lower • The lack of availability of leverage at pre crisis levels means rated tranches of ABS are unlikely to meet hedge fund return hurdles
Mismatched asset funding, off balance sheet financing and regulatory arbitrage: • SIV and conduit short-term funding (e.g. ABCP) of longer dated assets. Asset/liability mismatches created forced asset sales when short-term funding could not be rolled • Bank cost of capital was too low (regulated Risk Weighted Assets and internal models), creating regulatory arbitrage/artificial demand	**Off balance sheet – banking regulation:** • Basel III has increased capital charges for banks holding ABS assets • Higher bank capital requirements reduce bank investor appetite • Both external (e.g. Basel) and internal controls are stricter. Transaction due diligence (initial and on-going) is improved • Bank cost of capital and cost of funding have increased – raising return hurdles on ABS investments for banks • No SIVs exist post crisis
Rating agency behaviour: • Conflict exists between agencies and issuers, and agencies and Investment Banks. Ratings paid for by issuers. • Model issues and collateral problems • Inappropriate performance metrics	**Rating agency behaviour:** • Formal communication channels only • Physical barriers, many law suits • Improved rating criteria and tougher standards
Agency risk in origination and management: • The 'originate to distribute' model, in US sub-prime housing in particular, meant volume and fees were goals – not quality origination • Managers, originators and other key parties lacked 'skin in the game'	**Agency risk in origination and management:** • More attention paid at origination • Managers and/or originators with skin in the game • Risk retention rules at ABS level • Remuneration changes at investment banks (bonus claw back, etc.)

What were the major problems pre 2008?	What has changed?
Aggressive marketing and Investor inappropriateness: • Marketing to unsophisticated investors with little capacity (or desire) to analyse the inherent risk • Investor reliance on issuer/originator/rating agency-provided analysis • In Australia, the middle market 3C's – Churches, Councils and Charities	**Investor inappropriateness:** • Improved Know Your Client ('KYC') at ABS distributor level (Investment Banks) • Greater participation from real money investors – more fundamental analysis and ongoing due diligence
Counterparty risk: • Financials exposure via derivative transactions is often poorly understood	**Focus on derivative clearing houses and collateralisation of exposures:** • Move towards clearing of derivatives (including credit derivatives) via exchanges • Tighter collateralisation requirements for OTC derivatives
Liquidity / price volatility: • Price volatility was one of the major challenges for ABS holders. Many sub-sectors avoided capital impairment but suffered significant price falls before recovering. We note that volatility is not entirely negative – as price volatility during the crisis demonstrated price discovery	**Liquidity remains a valid consideration:** • Liquidity and pricing volatility remain valid considerations • A change in the ABS investor base towards 'stronger hands' (more real money, less leveraged investors) is supportive of orderly markets • While increased regulation (e.g. the Volcker Rule) may see less Investment Bank trading support in secondary markets, we question the degree of 'support' those institutions really provided in the crisis

5. Conclusions

In Bentham's view, ABS are fundamentally sound structures and positive contributors to global markets. The basic principles underlying securitisation have not changed post the Great Recession of 2008 in which securitisation methodology was tried, tested, and generally proven robust through the crisis and beyond. Structurally, ABS generally operated as expected given the market backdrop: apportioning risk/losses to lower rated tranches first, thereby protecting upper tranches, and invoking self-righting features where applicable. It is largely from a market pricing volatility (mark-to-market) perspective that many areas of ABS markets underperformed expectations, however this was a transient experience only, due largely to a narrow investor base which was geared.

Criticism of ABS sector performance over the past decade should rightfully focus on the suitability of underlying collateral, the appropriateness of the origination/distribution processes, and the composition of the investor base. Our belief is that many of the issues in capital formation have been addressed post-crisis, to the benefit of the investors.

ABS structures have evolved for the better post crisis, with tighter protections (terms and conditions) demanded by the investor base and higher origination standards (ratings criteria) enforced by rating agencies. This is enhanced by higher regulatory oversight, improvements in transaction reporting and monitoring standards.

Securitisation structures should be inherently attractive to credit investors: incorporating credit enhancements, natural deleveraging, and offering detailed regular reporting.

We believe that misconceptions about ABS lead to underinvestment in the asset class, which in turn contributes to persistent underpricing. We measure 'value' in absolute terms (pre/post crisis), and relative terms (ABS vs. corporate credit). On both measures we see opportunities, and Bentham continues to make allocations to global ABS. We see particular value in the investment grade tranches, and in 2016 established the Bentham Asset Backed Securities Fund to focus on this opportunity.

5.1 Where do investment grade ABS fit into a portfolio?

The ABS asset class can be utilised in portfolios in a variety of contexts:

- **Strategic floating rate credit:** a high credit quality substitute for investment grade and government bonds, providing investors floating rate exposure to help protect against the risk of a rising interest rate environment.
- **Defensive credit/income**: a conservative format for gaining global credit exposure – allowing diversification by collateral type/sector, and focusing on upper tranches of the capital structure.
- **Defensive alternative:** the structural protections embedded within securitization structures should lead to certain ABS tranches delivering better performance in a normal recessionary environment than other credit instruments, supporting a characterisation as 'defensive alternative'.
- **Strategic cash:** as a complement to cash/TDs, a portfolio of highly rated ABS can provide a high credit quality floating rate exposure, generating a regular income stream, particularly where daily liquidity is not required. ABS should not be viewed as a cash replacement.

Appendix A: Introduction to the ABS capital formation process

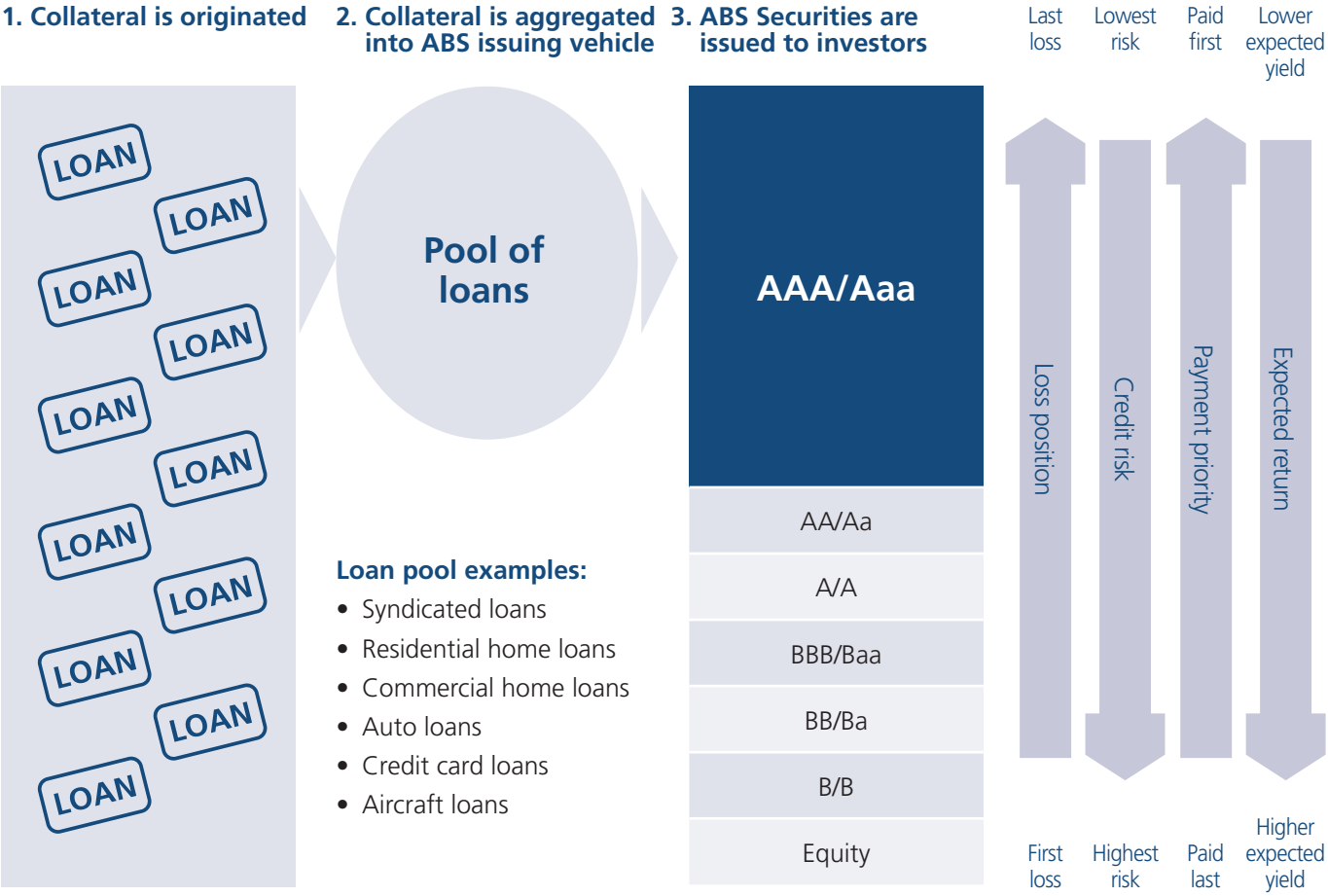
A.1 The securitisation process

Table 4: The securitisation process involves three key steps

1.	**Loans/receivables are originated**	• Loans/receivables are usually originated through a specialist lender/financier.
2.	**A pool of loans/ receivables with certain characteristics is identified and transferred into the ABS issuing vehicle**	• This transfer process ensures that the securitisation collateral assets are not comingled with the assets of the originator, i.e. it separates the credit risk of the underlying asset pool from the credit risk of the originator of those assets – relevant for sponsored transactions[5]. • e.g. a mortgage originator transacts a true sale of home loans into an SPV, or a CLO manager purchases syndicated loans into a 'warehouse' (temporary investment facility) ahead of transfer into the issuance SPV.
3.	**The issuing ABS vehicle issues newly created debt securities which are sold to investors**	• The newly issued debt securities are backed by the underlying pool of assets – coupon and principal payments are sourced from the cash flows generated by these collateral assets. • These new securities are typically structured into classes ('tranches') of varying seniority, which are rated by the external rating agencies. The exception is the lowest tranche, the 'Equity' or subordinated class, which is unrated, and may be wholly or partially retained by the originator or a related entity. • Generally, the most senior tranches are first to receive coupon payments and have a priority as to return ofprincipal. They are the last to suffer losses/impairments, making them the highest credit quality securities in the transaction. Accordingly, the most senior tranche will hold the highest credit rating and offer the lowest return. • These debt securities constitute term funding for the underlying pool of collateral assets.

5 Note: Investors in the debt securities have a claim only over the collateral and other assets within the ABS issuance entity, not against the originator of those assets (e.g. an RMBS investor has a claim over the mortgage loans within the RMBS, not against the bank/financier which originated those mortgages). Conversely, creditors of the originator do not have any claim over this asset pool (e.g. a bank creditor does not have recourse to the mortgage loan assets originated by the bank which have been sold into an RMBS structure).

Chart 1: Generic ABS Structure



Investors can choose which tranche of the ABS suits their risk/return targets

The seniority of the tranche in which the investor participates (their 'position in the capital stack') is important, as it defines the investor's risk profile, including:

- degree of credit risk assumption;
- priority of payment for coupons and return of principal;
- cushion against loss ('subordination'); and
- overall expected return.

A.2 Key participants in the ABS capital formation process

Table 5: Key participants in the ABS capital formation process

Participant	Examples
Asset Originator: the originator sources the underlying assets (ABS collateral) by extending loans to its customers	• e.g. a 'Big 4' bank or non-bank lender (Pepper, RAMS, La Trobe) lends to a homebuyer, taking mortgage security over the property.
Arranger/Structurer/Underwriter/Lead Manager: an ABS transaction is typically 'arranged' by an investment bank, which may also have responsibility for structuring the transaction, underwriting the transaction (or funding the warehouse) and distributing the ABS securities to investors.	• e.g. Citi, JPMorgan, Bank of America, Wells Fargo. The asset originator may also act in this capacity, e.g. CBA is "Arranger, Bookrunner, Lead Manager and Structural Advisor" to CBA's RMBS Medallion Trust Series 2017-1.
ABS Issuing Entity: generally a special purpose entity which may be constituted as a company or Trust.	• e.g. in 2016 NAB issued an RMBS via the trust "National RMBS Trust 2016-1".
Portfolio Manager: The pool of underlying assets within an ABS may be managed by an investment manager in accordance with a set of ABS transaction investment rules, including rules defining the permissible credit quality and diversity of the underlying assets. Alternatively, the pool may be static rather than actively managed.	• e.g. Voya and CIFC are specialist CLO managers
Rating Agencies: the Rating Agencies assign a credit rating to tranches of the ABS (save for designated 'unrated' tranches such as equity/ subordinated). In rating a tranche, the rating agency provides an assessment of the likelihood the Issuer will be able to make principal and interest payments in a timely manner as specified in transaction documents. We note that the Rating Agencies are paid by the transaction originators.	• The major rating houses are Standard & Poors, Moody's, and Fitch. Others include Kroll Bond Rating Agency and Morningstar Credit Ratings.
Servicer/Collateral Administrator: this party is responsible for administrative services associated with the underlying collateral pool including collection and aggregation of payments. The servicer may also be responsible for the management of delinquent borrowers, however this aspect may be undertaken by a specialist provider. The servicer is often the same entity as the originator, or an associated entity (e.g. NAB is the servicer on National RMBS Trust 2016-1). A third party may also act as Servicer.	• e.g. Pepper, Perpetual.
Trustee: the Trustee provides administrative oversight and support to the Issuing Entity, determining distributions in accordance with transaction documentation, ensuring the servicer complies with transaction documentation requirements and distributing regular transaction reports to ABS investors.	• e.g. Perpetual, BONY, JP Morgan, Wells Fargo.
Investors: investor types vary depending upon the ABS sector, but commonly include: insurers, asset managers, pension funds, central banks/ government-related entities, hedge funds and, to a limited extent, banks.	• e.g. Banks (JP Morgan, Citi), insurers (e.g. Suncorp), large industry funds (e.g. IFM).

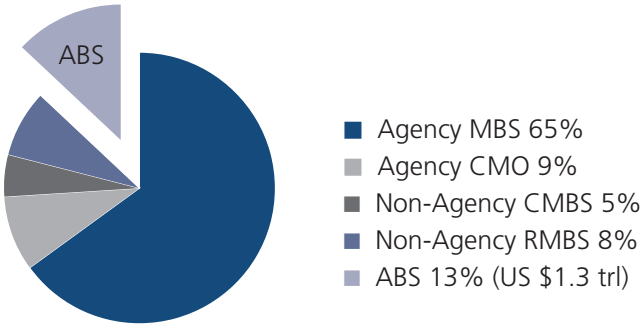
A.3 Composition of ABS markets

A long history, a large market

Modern securitisation markets have their origins in the 1970's, when residential mortgage backed securities were first issued by the US Government National Mortgage Association ("Ginnie Mae").

Markets have since grown enormously in size, geography and diversity of underlying collateral. The US securitisation market alone totalled US$10.5 trillion of issuance outstanding as at 2Q2017. This is dominated by mortgage-related securitisation issuance, representing >85% of the market.

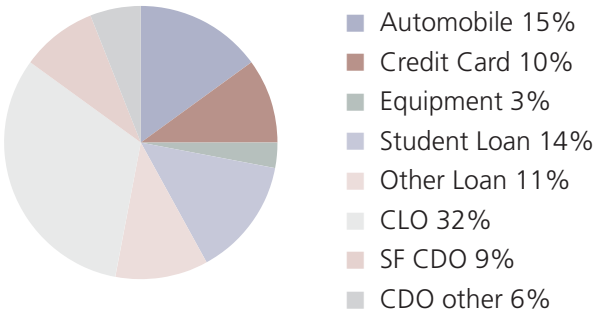
Chart 2: US Securitisations Outstanding 2Q2017 (US$10.5trn total)



Source: SIFMA

The US non-mortgage securitisation market stands at > US$1.3 trillion of outstanding issuance, and offers significant diversity of collateral type.

Chart 3: US ABS Outstanding 2Q2017 (ex-Mortgage Related Securities) US$1.3trl total)



Source: SIFMA

Table 6: US ABS Outstanding 2Q2017 – Detailed Breakdown

Sector	Sub-Sector	US$bn	% of Total ABS
Automobile	Fleet	10.0	0.8%
	Floorplan	32.3	2.5%
	Leases	26.2	2.0%
	Motorcycle	0.8	0.1%
	Near Prime	5.2	0.4%
	Other	2.3	0.2%
	Prime	70.3	5.4%
	Rental	10.0	0.8%
	RV	0.1	0.0%
	Subprime	43.8	3.3%
Credit Card	Bank	116.9	8.9%
	Charge	1.3	0.1%
	Retail	15.0	1.1%
Equipment	Floorplan	2.2	0.2%
	Leases	9.6	0.7%
	Transportation	29.4	2.2%
Student Loan	Public	141.6	10.8%
	Mixed	1.4	0.1%
	Other	2.2	0.2%
	Private	36.5	2.8%
Other	Cell Phone Contracts	3.9	0.3%
	Cell Tower Leases	6.9	0.5%
	Consumer	19.9	1.5%
	Franchise	16.3	1.2%
	Insurance	37.3	2.8%
	PACE (Property Assessed Clean Energy)	3.4	0.3%
	SBA (Small Business Administration)	35.9	2.7%
	Servicing Advances	5.1	0.4%
	Solar	1.3	0.1%
	Structured Settlements	3.9	0.3%
	Timeshare	5.7	0.4%
	Utility / Stranded Costs	6.8	0.5%
CLO		420.74	32.1%
SF CDO		113.7156	8.7%
CDO Other		72.7649	5.6%
Total		**1,310.7**	**100.0%**

Source: SIFMA

Appendix B: ABS structural benefits

Certain structural features of ABS make them particularly attractive to credit investors. As discussed above, ABS can provide investors with access to collateral with unique performance and risk characteristics. The securitisation structure then allows investors to select their preferred risk/return exposures by way of tranche selection.

In addition, the rated tranches of ABS typically offer:

- enhanced investor protections;
- improving credit quality (as a consequence of deleveraging over time); and
- high quality reporting permitting detailed analysis of performance over time.

We discuss each of these in turn below.

B.1 Investor protections in ABS structures

Additional investor protections, referred to as 'credit enhancements' are embedded in ABS structures and are specified in issuance documentation (e.g. Prospectus or Offering Memorandum). These protections are a unique feature of ABS structures and are generally not available in a typical corporate debt security. These structural credit enhancements are crucial to the designated rating of a particular tranche as they are designed to ensure timely payment of interest and principal, with creditor priority to higher rated tranches.

Examples include (but are not limited to):

- **Subordination:** the lowest tranches (equity and sub-investment grade) provide credit enhancement to the higher tranches (investment grade), by absorbing losses on the underlying collateral pool before any losses are applied to senior tranches.
- **Cashflow waterfall:** cashflows received on the underlying collateral pool (e.g. interest or principal repayment on loans) flow to the ABS tranches in order of priority. For example, the most senior tranches of an ABS receive interest and principal payments ahead of the more junior tranches.
- **Interest Coverage/Overcollateralisation Ratio tests:** these tests ensure that interest payments and principal amounts due on the ABS tranches are more than covered by the cash flow payments and principal value generated by the underlying collateral pool. Where transaction metrics result in the failure of one or more of these tests, contractual remedial actions are initiated whereby cash flows otherwise payable to junior classes of the ABS securities are instead diverted to payment of the principal of higher-rated classes. This results in a reduction in the credit risk of the higher-rated tranche. These tests, which are remedial in nature, are designed to spring into action prior to the structure coming under stress.
- **Cash Reserve:** an ABS may feature a cash reserve account to absorb losses before investors in the ABS incur loss. This Reserve is typically provided by the Originator.
- **Amortisation/deleveraging:** any repayment of principal on the underlying collateral over time is generally passed through as redemptions on the ABS debt securities. These redemptions are allocated to ABS debt securities as specified in the transaction documentation, generally in line with tranche seniority. Unambiguously this improves the tranche's credit risk profile. (Note that some ABS may incorporate a specified period of time where principal repayments on collateral are able to be reinvested in additional collateral assets of defined credit qualities/metrics.)
- **Excess Spread:** excess spread is generated when income earned on the pool of collateral assets is greater than is required to pay ABS coupon payments and transaction expenses. Excess spread may be applied to offset any losses on underlying collateral assets, captured in a cash reserve account, or distributed to the holder of the subordinated note/equity.

B.2 Deleveraging: ABS rated tranches tend to *improve* in credit quality over time

The credit quality of investment grade ABS tranches is designed to naturally improve over time – this is a unique characteristic vs. broader credit and fixed income markets, and is of particular interest to an investor building a more defensive portfolio.

The issued debt securities of an ABS delever over their term; either

- through the natural course of the ABS life, as the vehicle ceases reinvesting into new collateral assets and commences redeeming the most senior tranches with funds sourced from repayments on collateral ('amortisation'); or
- in the situation where the structure is experiencing stress, a breach of covenants triggers a change in the priority of payments such that cash flows are directed to the early redemption of the most senior tranches. This action is generally triggered by the failure of one or more of the coverage ratio tests. We refer to this acceleration of deleverage in times of stress as a 'self-righting mechanism'.

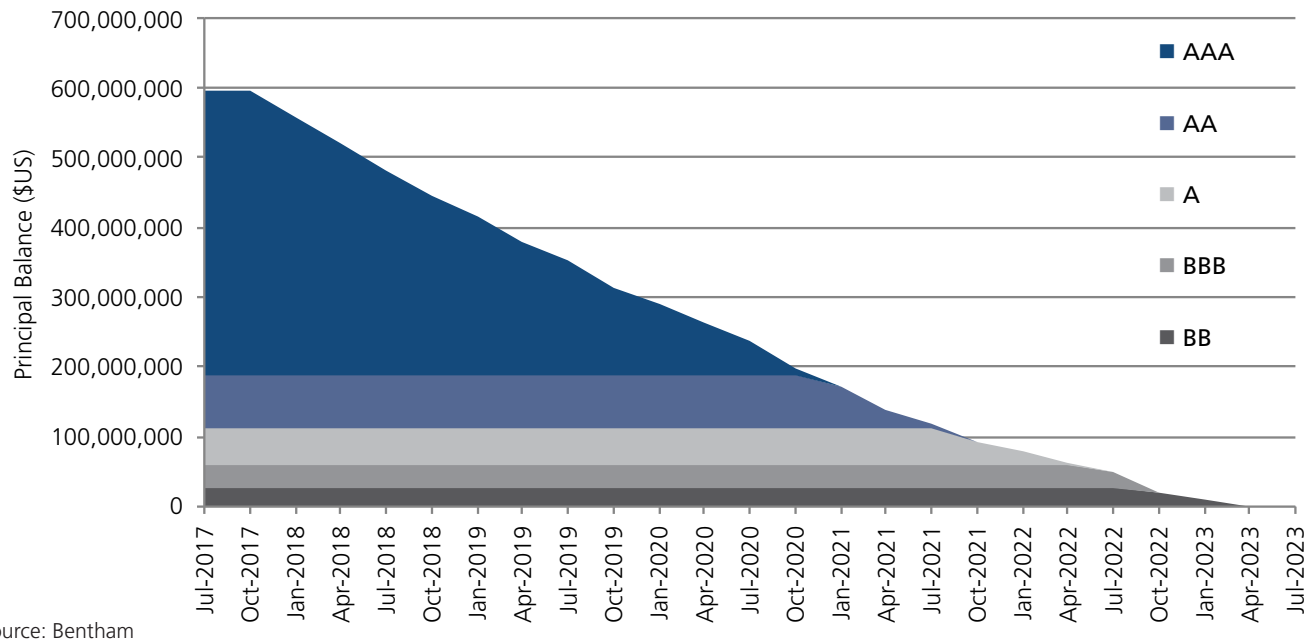
In essence, this means that the 'current balance' of the rated ABS bond (i.e. the investor's exposure) is falling over time as it amortises, while the outstanding value of the subordinated tranches below remains intact – proportionally increasing the 'support' for the senior tranches.

An example of an ABS amortisation profile is below. The y-axis shows the principal amount outstanding of each of the tranches (coded by colour).

By comparison, the quality of investment grade corporate credit can be changed as a company evolves and as the competitive environment around it changes. The key risk in investment grade corporate credit is the risk of a company being downgraded to sub-investment grade, significantly increasing the credit risk premium. Importantly, investment grade corporate credit quality can be impacted by actions of management who may be incentivised to benefit themselves or equity holders over credit investors, for example by increasing leverage to undertake corporate activity (within the limits of any debt covenants).

The tendency of corporate credit ratings to transition lower over time is evident in S&P's annually-published 'Transition Matrices'.

Chart 4: CLO Paydown profile example: Atrium x CLO



Source: Bentham

Financial issuers have faced unique downward rating pressures, as post-crisis changes in financial regulation (including the non-viability regime and subsequent risk of bail-in for creditors) led to a phase of downgrades for financial institutions. The defensive characteristics of bank senior debt have changed, as senior bonds may be forced to incur losses (i.e. via bail-in) in times of extreme bank stress.

B.3 Data rich asset class

The richness of data in ABS reporting allows investors to perform quantitative analysis at initial investment and over the full life-cycle of the investment.

Investors in ABS receive regular transaction reporting (monthly or quarterly), typically provided by an independent party (i.e. Trustee) or the Servicer, in a consistent format.

Detailed data is provided on both the performance of the ABS transaction and the underlying collateral itself.

For example, data fields in an RMBS investor report may include: mortgage size, original LTV, arrears status, property location (State/region), and property type. Data fields in a CLO investor report may include: issuer name, issuer industry, loan position in capital structure (i.e. senior or second lien), loan ratings, and loan price.

Appendix C: Addressing misconceptions – CLO case study

It is important to differentiate between sectors which incurred actual and substantial losses during the crisis (i.e. US Subprime RMBS CDOs) and most other forms of ABS which generally suffered mark-to-market volatility only, and redeemed at scheduled maturity (or earlier) without loss. There is significant variation in long-term loss rates across different credit categories, including corporate debt and ABS sub-sectors. This is perhaps the area where Bentham finds there are the most misconceptions – particularly around the CLO sub-sector.

Case study: CLO rated tranche default rates vs. corporate default rates

In 2015, Wells Fargo's research team compared the cumulative default rate on CLO notes from 1994-2013 to historical 10-year cumulative default rates on equivalently-rated corporate bonds[7]. It is important to note that cumulative (not annual) default rates are used in this analysis. The results may surprise readers:

- AAA-rated CLO note default rate – 0%;
  AAA-rated corporate bond default rate – 0.87%
- AA-rated CLO note default rate – 0%;
  AA-rated corporate bond default rate – 1.13%
- A-rated CLO note default rate – 0.45%;
  A-rated corporate bond default rate – 2.07%
- BBB-rated CLO note default rate – 0.47%;
  BBB-rated corporate bond default rate – 5.06%
- BB-rated CLO note default rate – 2.26%;
  BB-rated corporate bond default rate – 15.96%

7 Source: http://www.lsta.org/news-and-resources/news/clos-the-big-long

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