RMBS Price Discovery & Transparency

Case Study on the Key Aspects of Pricing UK Non-Conforming RMBS
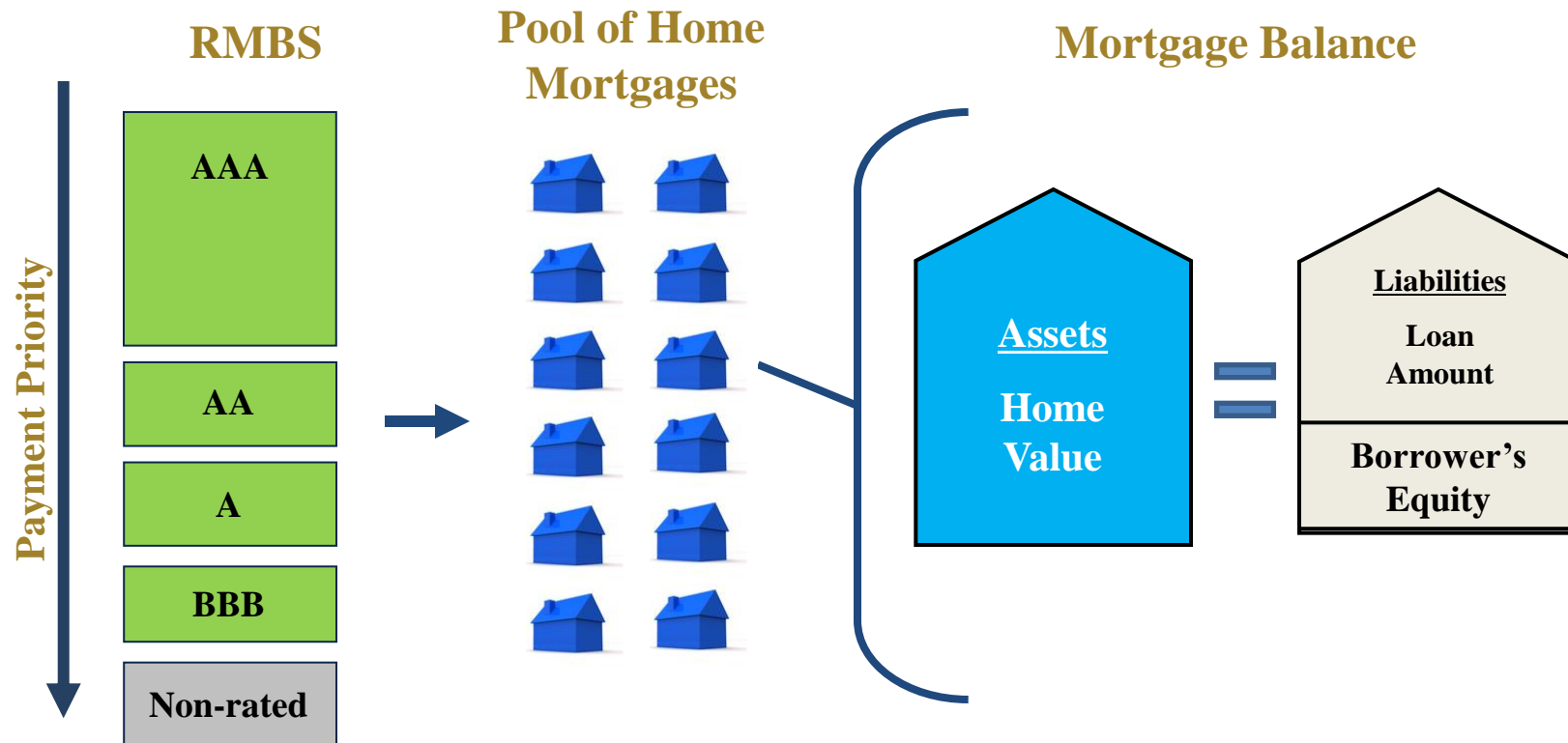
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Brief Introduction to RMBS

Breakdown of a RMBS security

RMBS bonds are backed by a large number of <u>mortgages</u> to home owners

RMBS   UK Market   Valuation

UK MORTGAGE MARKET

Comparison of Typical Mortgage Characteristics

Country	United States	United Kingdom	Netherlands	Spain
Loan Type	Non-Recourse	Full Recourse (Three years)	Full Recourse (Lifetime)	Full Recourse (Lifetime) Third Party Guarantee
Tax Benefits	Tax Deductible Interest	No Interest Tax Benefit	Tax Deductible Interest	15% Tax Deductable
Capital Gains Tax	No Capital Gains Tax on first $250,000 after 2 years	No Capital Gains Tax after 5 years	No Capital Gains Tax	Capital Gains Tax for Non-Residents
Common Mortgage Types	30 Year Amortizing	25 Year Amortizing	30 Year Interest-Only	25 Year Amortizing
Interest Rate Type	Fixed Rate, 5/1 ARM	Variable Rate (with a 2-3 year fixed rate period)	Fixed Rate (with 5-10 year rate resets)	Variable Rate (on 12 months base rate)
Prepayment Penalties	Not Typical	Not Typical	No Penalty on the first 10% of Prepayment (per year)	Low Cancellation Fee
Origination Loan-to-Value (LTV)	<=80%	<=80%	>=90%	<=80%

Source: Dynamic Credit Partners

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UK Prime vs. Non-Conforming Mortgages

Prime Mortgages

– High-quality owner-occupied mortgages to borrowers with good credit records, verified income, incorporating limited to no risk layering

Non-conforming

– Loans to borrowers with a dented payment history
  - *County Court Judgment* - an order to pay a specific sum of money in case of a delayed payment issued by a Country Court
  - *Bankruptcy order* – an order issued by a County Court or a High Court as a result of a bankruptcy petition
  - *Individual voluntary agreement* – legal arrangement between a borrower and his creditors to avoid the consequences of a bankruptcy
– Self-certified income
– Right-to-buy policy in UK for the tenants of the council housing to buy the home they are living in at a discounted price
– Buy-to-let: rental apartments managed by non-specialized rental agencies

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UK Non Conforming Mortgage Characteristics

Market characteristics

- Affordability product and advanced products
  - Non-bank lenders
  - Previously high degree of competition between mortgage providers
  - Supply remains muted with FSA restriction on the background
  - Flexible mortgages (short-term discounts, payment holidays, possibility to redraw mortgage equity

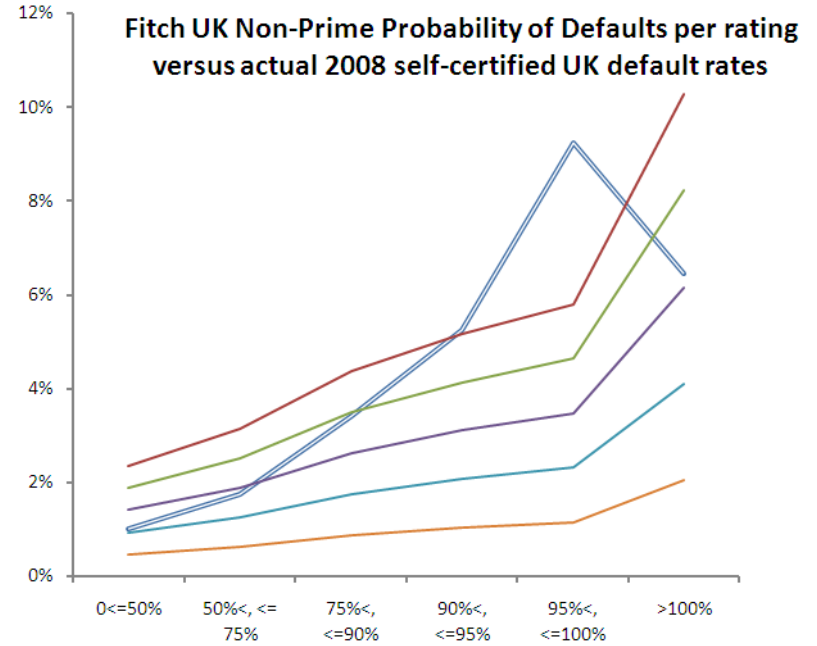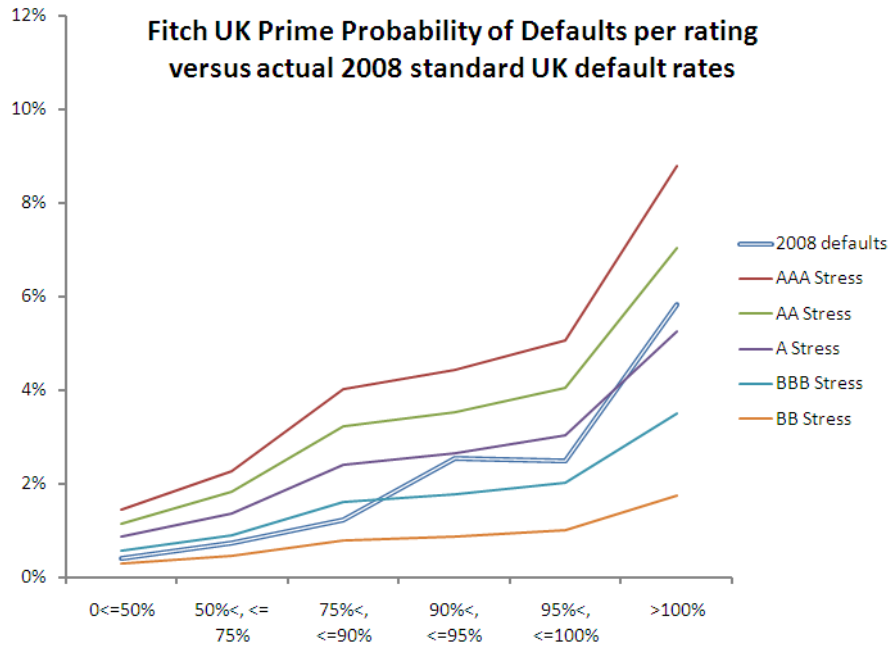## Borrower characteristics

- Higher sensitivity to external factors
  - House prices
  - Unemployment
  - Interest rates, etc.

The market is highly sensitive to changing macroeconomic conditions

Source: Fitch

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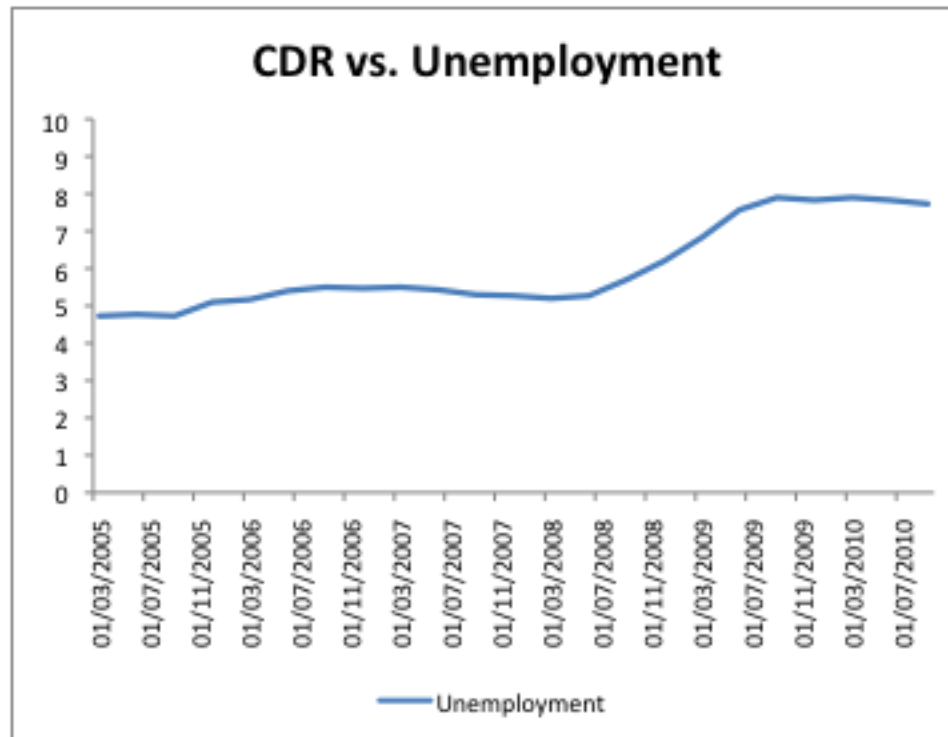# UK Non Conforming Mortgage Characteristics

Rating Agency Assumptions vs. Actual Defaults

Source: Fitch

UK Non Conforming Mortgage Characteristics

## Market Consensus vs. Macroeconomic Comparables

- Consensus CDR jumped above the unemployment rate during its steep increase

- However, once it became clear that the trend halted and rates would remain low, CDR assumptions quickly adjusted downward

- The more positive consensus CDR was also fueled by a large appetite for mezz and junior paper during that same period

Source: Office for National Statistics

UK Non Conforming Mortgage Characteristics

## Market Consensus vs. Macroeconomic Comparables
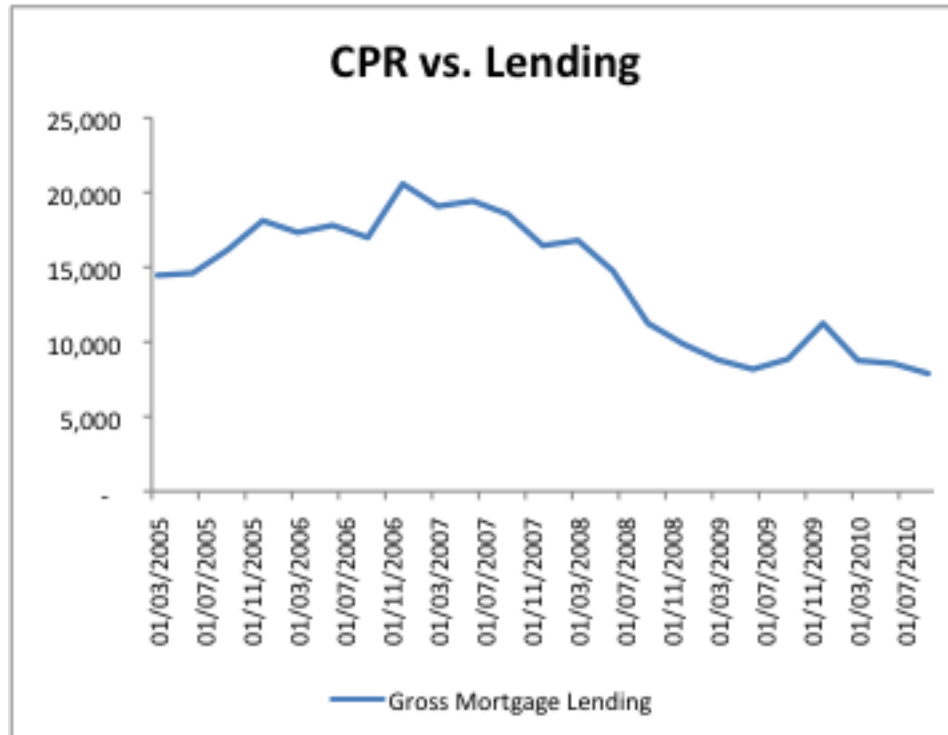
- Although Gross Lending started its decent quite early, Consensus CPR remained elevated on the back of still relatively high actual CPRs
- Once the magnitude of the crisis became clear to both mortgage lenders and borrowers, actual CPR started its decline along with Consensus CPR
- The lag between the two declines (roughly 2 years) was unusually long

Source: CML

UK Non Conforming Mortgage Characteristics

Market Consensus vs. Macroeconomic Comparables
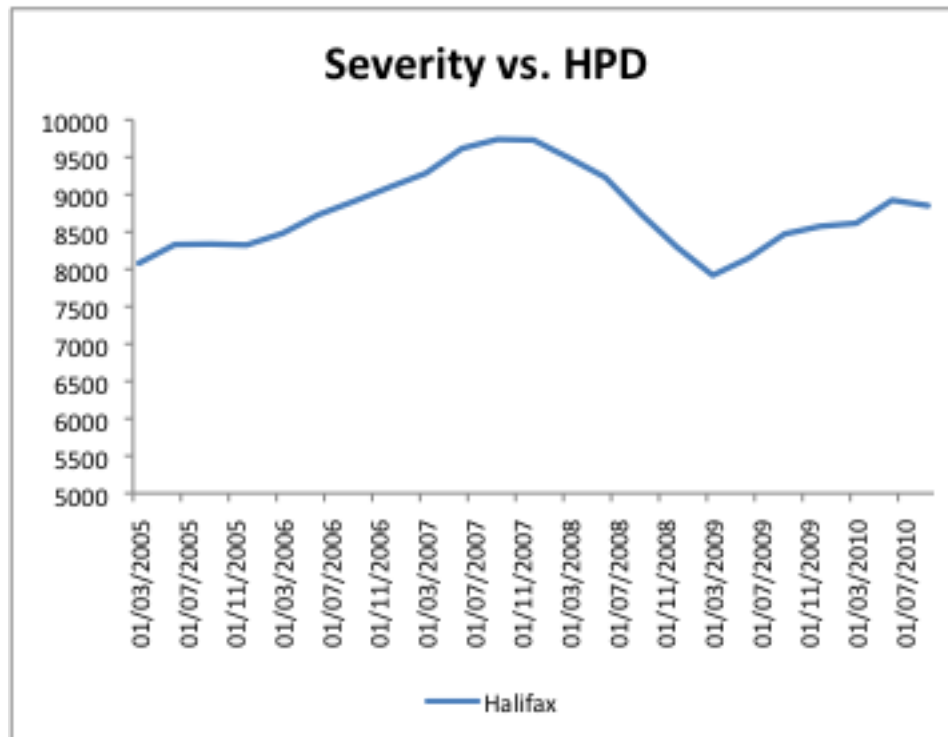
- Consensus SEV jumped significantly during the last stage of the house price decline (at which point the market was fearful of a continuation of the decline)

- However, once it became clear that the trend reversed, SEV assumptions quickly adjusted downward

- Pressure remains though on the UK house prices due to growing stock

- Yet falling demand does not further impact Consensus Severities negatively at this stage

UK NC RMBS Performance

Downgraded Senior UK NC Bonds	
As a percent of outstanding	**42%**

YoY Reserve Fund Change in UK NC	
Percent Unchanged or Improving RF	**70%**
Percent Deals that used RF	**30%**

Arrears for UK NC RMBS

UK NC RMBS Performance

Legend: ■ 90+ Delinquency ■ Cumulative Defaults
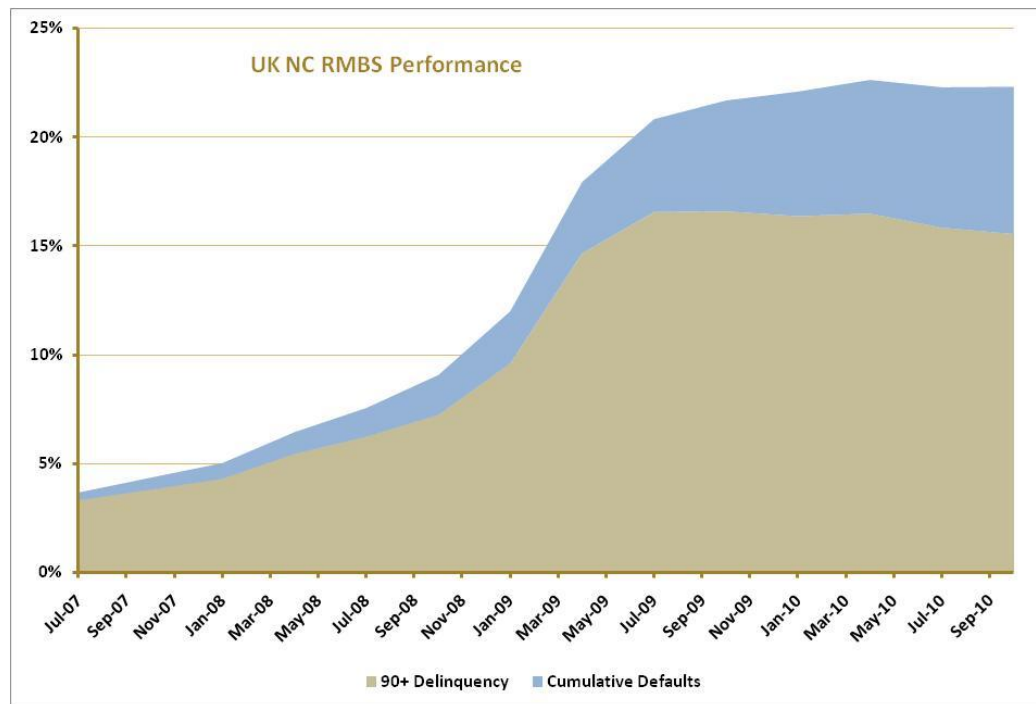
Borrower Level Factors

- Willingness to pay
  - Original Loan to Value (OLTV)/ house prices
  - Credit history of the borrower
  - Recourse

- Ability to pay
  - Loan to Income (LTI)
  - Difference between Loan to Income (LTI) and Debt servicing to Income (DTI)

- Effects of risk-layering on default rates

Source: Dynamic Credit, Fitch

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Borrower Level Factors – Household Indebtedness

Per cent of GDP / Per cent

Legend:
- Other financial liabilities[a] (left-hand scale)
- Unsecured debt[b] (left-hand scale)
- Mortgage debt (left-hand scale)
- Capital gearing[c] (right-hand scale)
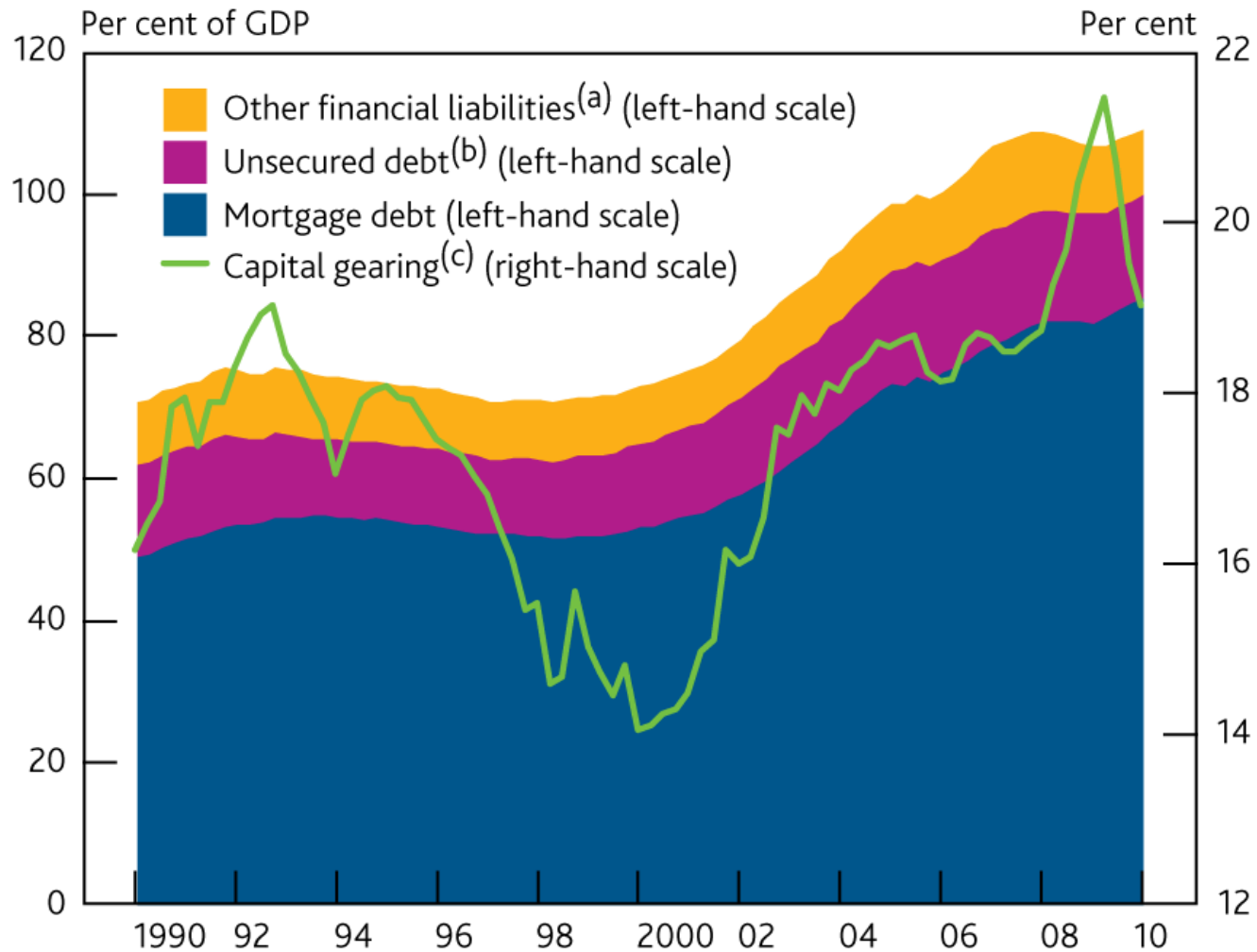
Source: Bank of England, UK National Statistics

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Borrower Level Factors – Interest and Mortgage Rates
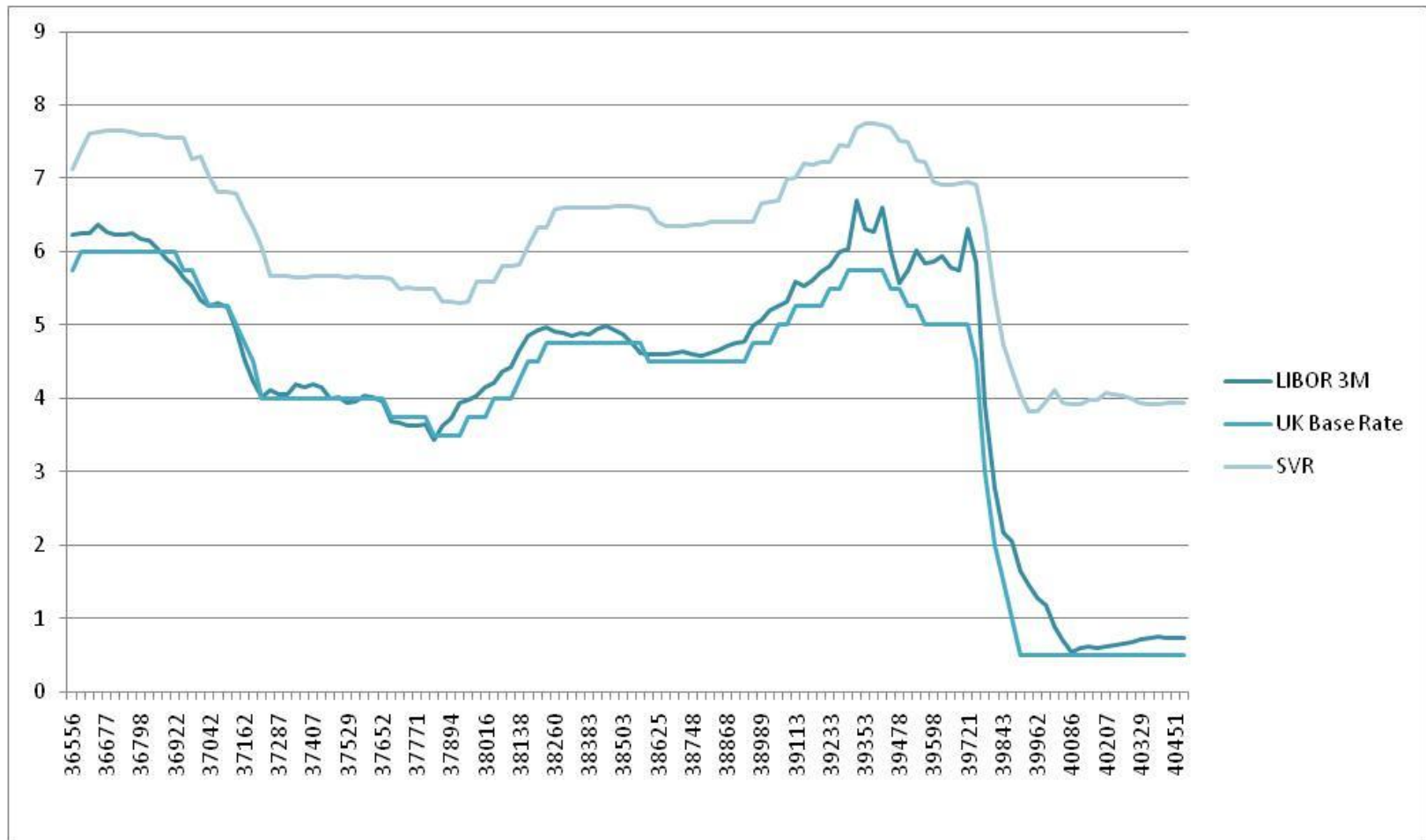
Source: Bank of England

Loan to Income (LTI)

- LTI is calculated as the ratio of outstanding principal amount and a borrower's annual income

- Higher LTI increases the probability of default

- Approximates a *borrower's ability to pay*
  – Borrowers with higher LTI have a lower ability to pay

Difference between LTI and DTI

- FSA on Loan-to-Income:
  - "LTI is not a good predictor of default. We found no compelling evidence to suggest that arrears and possessions increase consistently as the level of LTI increases. This is because LTI is a proportional coefficient that does not take the level of expenditure into account. Household expenditure does not increase in the same pace as the level of income. Therefore, there is no cut-off LTI level that is equally affordable or unaffordable for all. Generally, borrowers on lower incomes can afford lower LTIs and borrowers on higher incomes can afford higher LTIs."

- Instead, the FSA is proposing that lenders apply a 'buffer' to their calculation of these borrowers' free disposable income and invite comment on an appropriate basis for that buffer.
  - This buffer can be gamed though, as happened in the Dutch mortgage market

Source: FSA

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Loan to Income (LTI)

Actual 2008 UK default rates per LTI Bucket
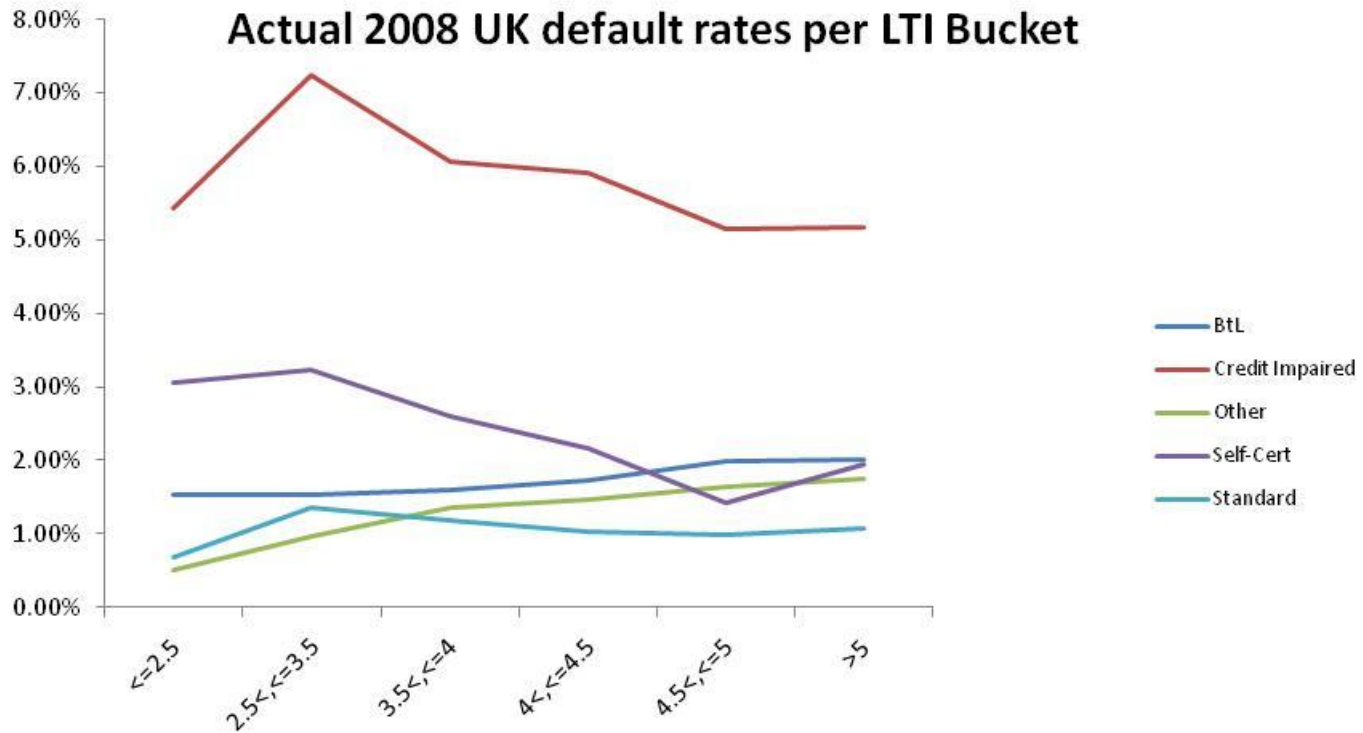
Rating Dutch RMBS

Note that the default probability for the IO borrower was lower before the reset date!

Borrower	#1	#2
DTI Characteristics		
Mortgage Coupon before reset	5.5%	3.80%
Repayment Type	**Linear**	**Interest Only**
Annual Payment	8.8%	3.8%
Loan-to-Income	4.0	7.5
Debt-to-Income before reset	**35%**	**29%**
LTV	**110%**	**110%**
Employment Status	**Employed**	**Employed**
Fitch BBB Cumulative Default Probability	8.6%	7.1%
Mortgage Coupon after reset	6.00%	6.00%
Debt-to-Income after reset	37%	45%
Fitch BBB Cumulative Default Probability if new DTI available	8.6%	12.6%
Increase in Default Probability due to reset	**0.0%**	**77.6%**

- Borrower #2: Coupon: 3.8% → 5.5%, LTI: 7.5x, DTI: 27% → 42%,
  - BBB Default Probability: 7.1% → 12.6%
    - Fitch Default Probability increases by 77.6% <u>and downgrades will follow</u>
  - Take into account :
    - High unemployment, lack of credit flexibility for an over 7x levered borrower and mildly increasing interest rates
    - that borrower #2 earns EUR30,000 annually and has to pay 45% for his/her mortgage and support a family
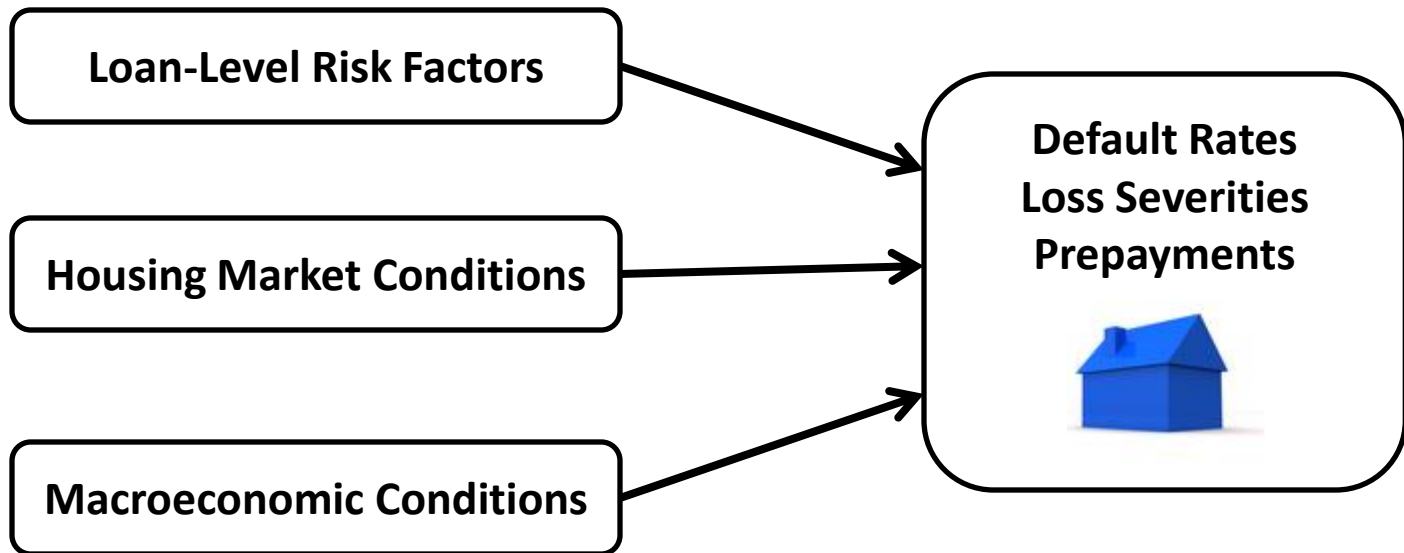   - then this borrower will not survive... Default probability 80%? 90%?

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VALUATION

Two Sample UK Non-Conforming Transactions

	RMACS 2007-NS1		NGATE 2007-2	
Issuer	RMAC SECURITIES PLC		NEWGATE FUNDING PLC	
Loan Originator	GMAC-RFC		Mortgages 1 Limited	
Maturity	6/12/2044		12/15/2050	
Issuance Date	6/27/2007		6/13/2007	
Date	**September-07**	**June-10**	**September-07**	**June-10**
Balance (£mm)	511.27	381.68	443.15	347.40
Pool Factor	0.974	0.727	0.985	0.772
# of Loans	4,884	3,633	3,847	3,054
Delinq 30 days	4.40%	2.99%	10.11%	6.32%
Delinq 60 days	2.22%	3.12%	4.45%	4.08%
Delinq 90 days	2.55%	24.57%	4.04%	26.55%
Foreclosure/REO	0.06%	0.55%	0.00%	1.26%
Cumulative Loss	0.00%	2.03%	0.00%	2.25%
Excess Spread	1.44%	0.00%	1.57%	0.00%
Reserve Fund (£mm)	5.78	4.05	3.15	1.93

Based on aggregate statistics, it is difficult to distinguish the relative value between two apparently similar deals…

Source: Bloomberg

RMBS   **UK Market**   **Valuation**

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Drivers of Mortgage Performance

Loan-Level Risk Factors

Housing Market Conditions

Macroeconomic Conditions

Default Rates
Loss Severities
Prepayments

A combination of macro and micro factors determine expected cash flows of the collateral pool as a group…

Increased Default Rates as a Result of Risk Layering

Risk Factors

- Credit Impaired
- LTV >= 80
- Self-Employed
- Debt Consolidation
- Right-to-Buy

Risk Layers	90+ DQ Rate	Multiple of Base
4 of 5 Risks	31.85%	53.08x
3 of 5 Risks	21.77%	36.28x
2 of 5 Risk	13.06%	21.77x
1 of 5 Risk	4.76%	7.93x
0 of 5 Risk	0.60%	1.00x

It is clear that risk layering results in a significant increase in default probability across the board…

RMBS   UK Market   Valuation   Loan Level Analysis

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Impact of Risk Layering on Performance To Date

NGATE 2007-2 (% of Risk Group > 90 Days Delinquent)
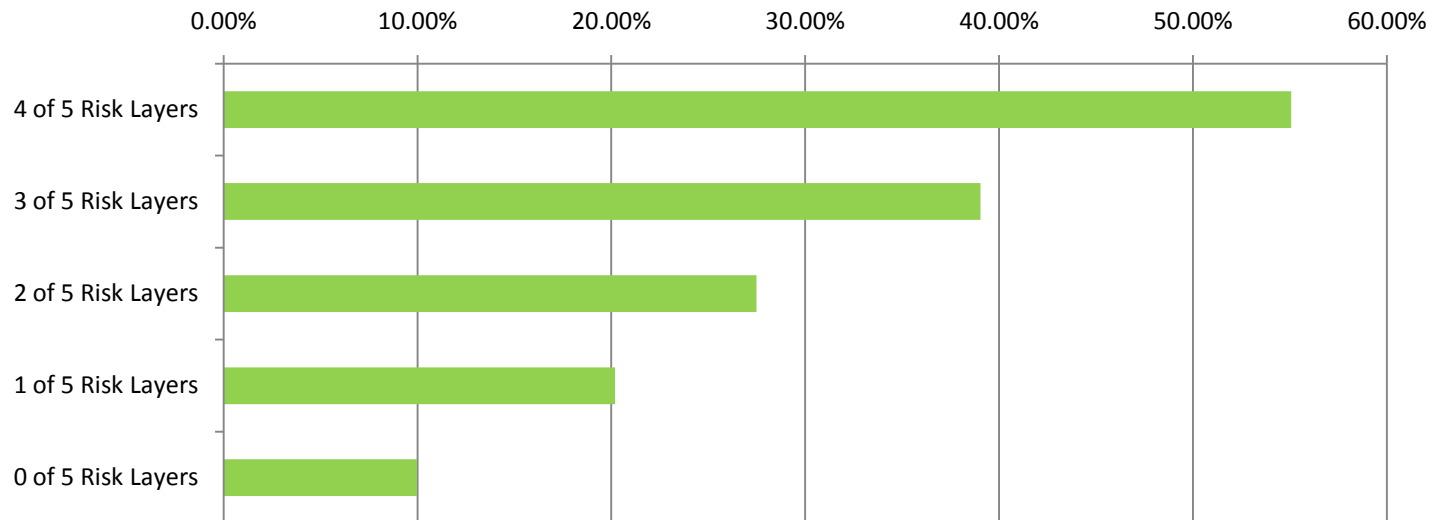
Risk layering also results in a significant increase in default probability for non-conforming loans at higher nominal levels…
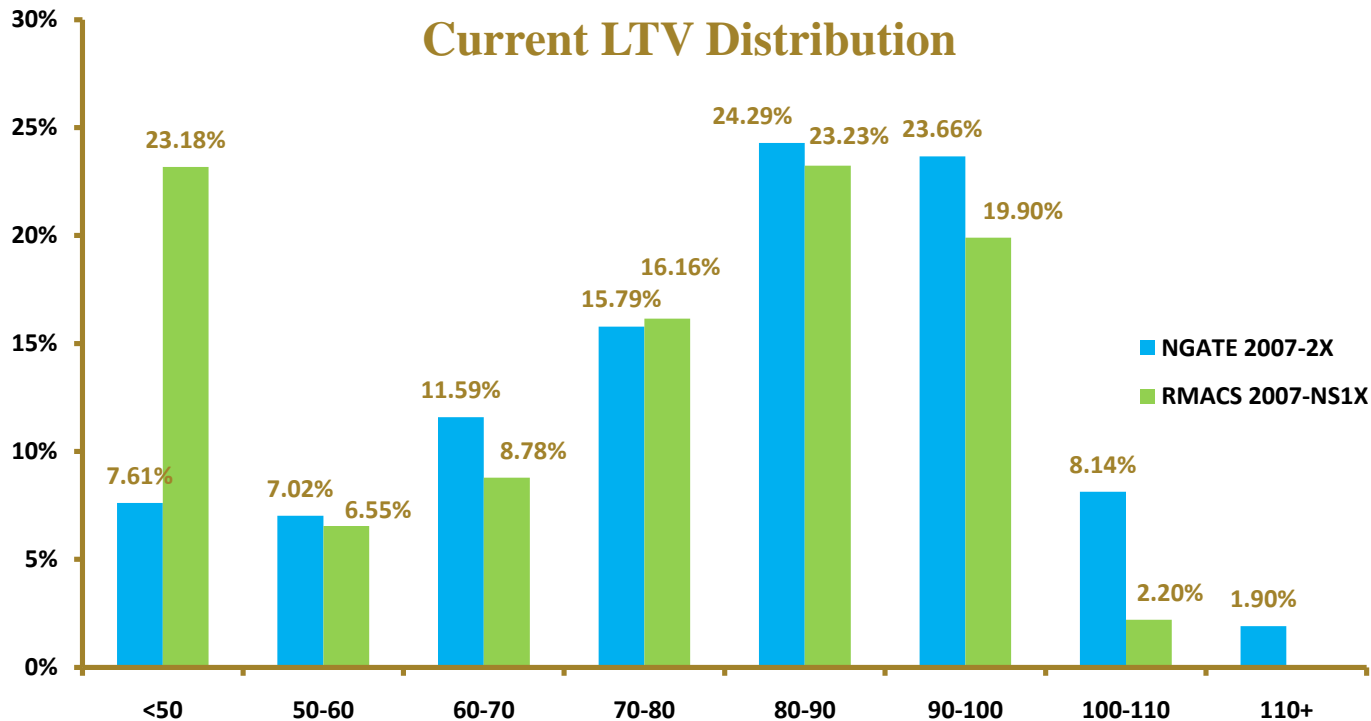
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Dynamic Loan Level Analysis vs. Generic Market Assumptions

	Dynamic Loan-Level Assumptions	Generic Assumptions
RMACS 2007-NS1X	Expected Defaults: 36.41%	Expected Defaults: 40.97%
	Expected LGD: 39.63%	Expected LGD: 35%
	Expected Loss: **14.43%**	Expected Loss: **14.34%**
NGATE 2007-2X	Expected Defaults: 41.97%	Expected Defaults: 42.46%
	Expected LGD: 49.24%	Expected LGD: 35%
	Expected Loss: **20.66%**	Expected Loss: **14.86%**

Lower expected defaults for RMACS due to fewer risk layers while a higher expected LGD for NGATE drives higher expected losses…

All indicators are computed as of the current balance.
Source: Loan tapes, Dynamic Credit

DYNAMIC **C**REDIT

Current LTV Distributions

Current LTV Distribution

Legend: NGATE 2007-2X (blue), RMACS 2007-NS1X (green)

LTV	NGATE 2007-2X	RMACS 2007-NS1X
<50	7.61%	23.18%
50-60	7.02%	6.55%
60-70	11.59%	8.78%
70-80	15.79%	16.16%
80-90	24.29%	23.23%
90-100	23.66%	19.90%
100-110	8.14%	2.20%
110+	1.90%	

Weighted Average LTV (Current Balance and Original LTV)

RMACS 2007-2X: 76.0% | NGATE 2007-2: 78.7%

RMBS   UK Market   Valuation

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Drivers of RMBS Performance

**Default Rates
Loss Severities
Prepayments**

**Deal Payment
Structure**

**Bond Credit
Enhancement**
➢ **Excess Spread**
➢ **Subordination**
➢ **Reserve Fund**

**Potential Issuer
Support**

**RMBS
Tranche Cash
flows**
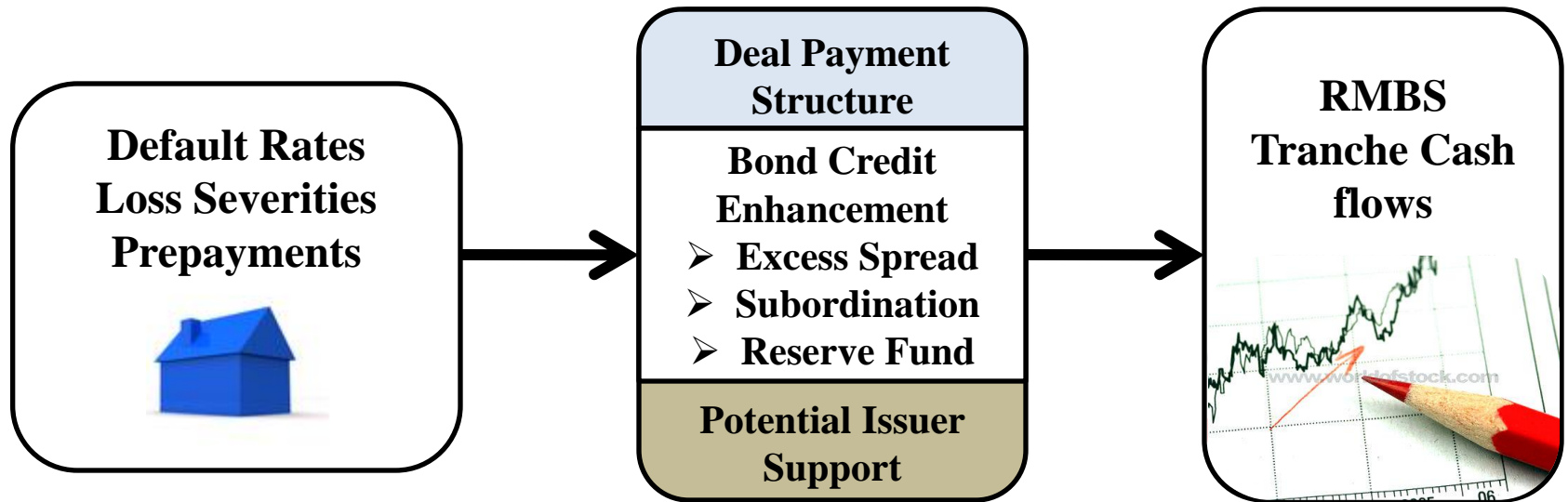
The expected collateral cash flows are distributed according to the deal structure to determine performance of a specific RMBS security…

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Dynamic Loan Level Analysis vs. Generic Market Assumptions

	Dynamic Expected Yields	Generic Market Expected Yields
RMACS 2007-NS1X	Senior AAA: 199 DM	Senior AAA: 207 DM
	Junior AAA: 386 DM	Junior AAA: 388 DM
	Mezz/Junior: Loss	Mezz/Junior: 500 DM+
NGATE 2007-2X	Senior AAA: 238 DM	Senior AAA: 236 DM
	Junior AAA: 431 DM	Junior AAA: 425 DM
	Mezz/Junior: Loss	Mezz/Junior: 500 DM+

The difference in assumptions result in small deviations in yield for senior tranches, but have implications for mezz and junior tranches

Using senior tranche assumptions result achieve a lower than advertised yield, but Dynamic's assumptions will result in a loss…

All indicators are computed as of the current balance.
Source: Loan Tapes, Dynamic Credit

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