Equity Release Mortgages

Regulatory and technical developments

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In this paper we discuss equity release mortgages ("**ERMs**") as an asset class for life insurers. These assets have been the subject of a longstanding and, at times, fractious debate in which their valuations have been questioned and their treatment under Solvency II has been uncertain and subject to evolution.

This paper covers the following areas:

- Regulatory treatment
- Academic research into ERM valuations
- Next steps and conclusions

For the purposes of this paper we assume the reader is familiar with ERMs as both a consumer product and an asset class, including in relation to the no-negative-equity-guarantee ("**NNEG**") that is commonly offered as a product feature. We also assume the reader is familiar with the approach that has typically been taken by UK life insurance companies to transform ERMs into assets that are eligible for inclusion in Matching Adjustment ("**MA**") portfolios under Solvency II.

Regulatory treatment

SS3/17 - Principles

The PRA has, in recent years, issued a number of supervisory statements, consultation papers, letters and speeches that have, in whole or in part, had a bearing on ERMs.

The first iteration of Supervisory Statement 3/17 ("**SS3/17**") was published on 5 July 2017. It contained guidance around investments in illiquid, unrated assets generally, as well as specific guidance on ERMs and their embedded risks insofar as they have an impact on the MA benefit achievable from restructured ERMs.

The original iteration of SS3/17 set out four principles for insurers seeking to include ERMs in MA portfolios against which the PRA stated that it would assess the allowance made for the risks of the NNEG. The principles were:

1. *Securitisations where firms hold all tranches do not result in a reduction of risk to the firm.*

This states that internal securitisations do not change the aggregate level of risk to which the insurance company as a whole is exposed; they merely slice up the risks of the ERMs in a different way and allocate them between different sub-funds of the company. The consequence of this is that the total value of the constituent elements of the securitisation should (after allowance for other assets and liabilities allocated to the securitisation vehicle, and any frictional costs) be the same as the value of the underlying ERMs.

2. *The economic value of ERM cash flows cannot be greater than either the value of an equivalent loan without an NNEG or the present value of deferred possession of the property providing collateral.*

This principle has two components. Firstly, it states that the presence of the NNEG cannot make a positive contribution to the ERM's value; the NNEG must have a zero or negative value. This is because the presence of the NNEG will either have no impact on the loan proceeds or will serve to reduce them; it will never increase them. Secondly, the principle states that the loan value must be no greater than the value of a contract under which the contract-holder gains possession of the property at the end of the contract ("deferred possession"). In other words, the NNEG ensures that the loan proceeds will never exceed the property value at the point of redemption, and therefore a contract in which the property is acquired at the point of redemption must always have equal or greater value than the loan.

3. *The present value of deferred possession of property should be less than the value of immediate possession.*

This third principle builds on the second, stating that the value of deferred possession of the property should be less than the value of immediate possession. This means that, in a hypothetical situation where there are two contracts – one contract gives the contract-holder immediate possession of the property and the other contract only gives the contract-holder possession of the property at a future date – the first contract will have a greater value than the second. This is because deferring possession of the property means the contract-holder misses out on the ability to yield rental income or otherwise gain utility from the property during the period of deferment.

4. *The compensation for the risks retained by a firm as a result of the NNEG must comprise more than the best estimate cost of the NNEG.*

The consequence of this final principle is that the overall allowance for the risk of the NNEG on the insurer's balance sheet should not be restricted to the best estimate cost of the NNEG. The PRA explains that the Fundamental Spread ("**FS**") used in the calculation of the MA is intended to capture more than the expected cost of defaults: it also includes components for the cost of downgrades, as well as a floor to allow for other sources of uncertainty in the cash flows.

The PRA also set out in SS3/17 what is known as "**The Effective Value Test**", which states that the Economic Value of the ERMs must not exceed the Effective Value of the restructured ERMs. In this context:

- **Economic Value** refers to the value of the ERM redemption cash flows discounted at a risk-free rate less the cost of the NNEG, less expenses and less any other deductions (for example, an allowance for the impact of pre-payment risk on the ERM value).

- **Effective Value** refers to the asset-side value of the restructured ERMs, plus the MA benefit arising from the presence of ERMs on the liability side of the balance sheet.

The PRA does not specify in SS3/17 how to calculate the MA benefit arising from the presence of ERMs, and therefore approaches to this may differ.

One acceptable way of carrying out this calculation could be to evaluate the liabilities of the MA fund assuming that the restructured ERMs contribute zero to the MA, and compare this to the liability value where full credit is taken for the MA contribution of the restructured ERMs. However, there may be other approaches that are equally or more acceptable to the PRA.

The purpose of the Effective Value Test is to ensure that the value of the restructured ERMs plus the value of the resulting MA benefit does not exceed the risk-free value of the loan less a suitable allowance for the NNEG. By comparing the Effective Value to a risk-free loan less the NNEG cost (i.e. the compensation for default risk), the Effective Value Test ensures that the MA benefit achieved only reflects allowance for the illiquidity of the asset, and does not take credit for any returns that would be expected to be unachievable due to the default risk brought about by the NNEG. An equivalent test for a corporate bond would ensure that the MA does not exceed the portion of the bond's spread that relates to its illiquidity.

SS3/17 – Minimum Calibration

In July 2018, the PRA issued consultation paper 13/18 ("**CP13/18**"), which proposed various changes to SS3/17, the most significant of which was a proposal to move away from a principles-based approach to assessing the allowance made for NNEG risk, and instead to prescribe a minimum calibration for the calculation of the NNEG in the Effective Value Test.

Whilst some of the proposals in CP13/18 were ultimately amended or did not get carried through into the final version of SS3/17, the fundamental concept of a prescribed minimum calibration for NNEG risk in the Effective Value Test was carried through into SS3/17, and this minimum calibration will become partially effective from 31 December 2019, and fully effective from 31 December 2021.

In particular, the PRA proposed a minimum calibration for the value of the NNEG based on the Black-Scholes option pricing formula for the value of a put option:

$$e^{-rT}[KN(-d_2) - Se^{(r-q)T}N(-d_1)]$$

where:

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r - q + \frac{1}{2}\sigma^2\right)T}{\sigma\sqrt{T}}$$

$$d_2 = d_1 - \sigma\sqrt{T}$$

The inputs to the PRA's formula are:

- Estimated current value of the property (S)

- Term to maturity[1] (T)

- Loan principal and expected accrued interest at maturity (K)

- Risk-free interest rate applicable between the valuation date and the option maturity, taken from the Solvency II basic risk-free curve (r)

- Property price volatility (σ)

- Deferment rate (q)

The deferment rate relates to the concept of deferred possession described above, and is the annualised rate at which the value of deferred possession of the property diverges from the value of immediate possession. In other words, if the property's current value is S, then the value of deferred possession in T years' time is Se^{-qT}, where q is the deferment rate. This can then be converted into a forward price[2] of $Se^{(r-q)T}$. This forward price can be seen in the Black-Scholes formula above.

The PRA stated that, for the purposes of the NNEG value used in this minimum calibration, q should be assumed to be 0% p.a. in assessing the Effective Value Test from 31 December 2019, and should be assumed to be 1% p.a. from 31 December 2021.

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[1] In practice, the NNEG will be valued as the weighted average value of a series of options, each with a different term to maturity. The weights used will be the best estimate exit probability applicable to that term.

[2] The difference between a deferred possession contract and a forward contract is that, under a forward contract, the buyer pays the price (agreed at outset) at the point at which they gain possession of the property, rather than at the outset of the contract.

The PRA also stated that the property price volatility parameter used in this minimum calibration for the Black-Scholes formula should be 13% p.a.

The consequence of the PRA's minimum calibration is that firms' allowance for default risk in the calculation of the contribution of ERMs to the MA should be based, at a minimum, on a Black-Scholes formula with the PRA's prescribed parameters for the deferment rate and property volatility. This is likely to mean that, in situations where firms' internal asset valuation assumptions place a significantly lower value on the NNEG than under the PRA's minimum calibration, it is likely that the Effective Value Test will result in a restriction to the MA benefit available to those firms from their ERMs.

It is relatively common for insurers to use real world, rather than risk-neutral, assumptions in their balance sheet NNEG valuations. In a real world version of the Black-Scholes formula, the "forward price" (i.e. the price agreed now for deferred possession of the property) Black-Scholes formula would be replaced by an estimate of the property value at the maturity of the option, assuming the value of the property grows in line with some real world property growth assumption. This approach has been criticised by some academics and industry practitioners as being a theoretically incorrect misuse of the Black-Scholes formula, and is likely to result in an NNEG value that is significantly lower than would be given by a risk-neutral application of the Black-Scholes formula (although the use of the Black-Scholes formula is not a necessary condition to achieve risk-neutrality).

To illustrate this, the table below compares indicative NNEG values (expressed as a percentage of the loan balance) using the Black-Scholes formula for a range of loan-to-value ("**LTV**") ratios under illustrative risk-neutral and real-world approaches to the NNEG[3]. In all cases the figures assume the customer is aged 65 and the customer interest rate is 5% p.a. It also shows indicative Economic Values[4] of the loan, i.e. the present value of future redemption payments, discounted at the risk-free rate, less the risk-neutral cost of the NNEG, as defined by the Effective Value Test (expressed as a percentage of the loan balance). These indicative Economic Values are an approximation to the PRA's upper limit on the overall value that can be derived from ERMs as a result of restructuring them and achieving MA benefit.

The table shows very significant differences in the NNEG values given by the two approaches, with the risk-neutral approach giving NNEG values that are many multiples of the real world

approach for low LTV ratios, and giving values that are more than double those from the real world approach at higher LTV ratios.

INDICATIVE NNEG AND ECONOMIC VALUES (AS A PERCENTAGE OF LOAN AMOUNT) UNDER REAL WORLD AND RISK-NEUTRAL APPROACHES

LTV ratio	NNEG value (real world)	NNEG value (risk-neutral, 1% deferment rate)	Economic Value
10%	0.2%	3.5%	182.6%
15%	0.8%	8.3%	177.8%
20%	1.9%	14.0%	172.1%
25%	3.4%	19.9%	166.2%
30%	5.4%	25.7%	160.4%
35%	7.7%	31.3%	154.9%
40%	10.3%	36.5%	149.7%
45%	13.0%	41.3%	144.8%
50%	15.9%	45.7%	140.4%
55%	18.8%	49.9%	136.3%
60%	21.8%	53.6%	132.5%
65%	24.8%	57.1%	129.0%
70%	27.7%	60.3%	125.8%

The Economic Values show the approximate upper limit on the value that may be obtained from restructured ERMs and the associated MA benefit. Clearly, loans with lower LTV ratios will, all else being equal, have a higher Economic Value, and this is shown in the table[5].

CP7/19

On 3 April 2019 the PRA issued CP7/19: "Solvency II: Equity Release Mortgages – Part 2". This consultation covered the following areas:

1. *Reviewing and updating the deferment rate and volatility parameters*

CP7/19 proposes a framework for a regular review of the deferment rate and volatility parameters set out in the Effective Value Test, that must be applied from no later than 31 December 2021. In summary:

- It is proposed that SS3/17 be amended to remove references to the specific deferment rate and volatility parameters of 1% p.a. and 13% p.a. respectively. Instead, these parameters will be published on the PRA's website, with the first publications being posted on or before 30 September 2019.

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[3] The indicative NNEG values are calculated assuming the customer is aged 65 and the mortgage interest rate is 5% p.a. It uses illustrative decrement assumptions and does not explicitly allow for maintenance expenses, dilapidation, property sales costs or a property sales delay upon redemption. Both approaches assume property price volatility of 13% p.a. The real world approach uses a property growth assumption equal to the market-implied RPI curve at 31 March 2019. The risk-neutral approach assumes a forward price calculated using the EIOPA risk-free curve at end-March 2019 and a deferment rate of 1%.

[4] The indicative Economic Values use the same assumptions as used by the risk-neutral NNEG estimates, and in particular do not allow for expenses or for non-NNEG risks, and therefore are likely to be overestimates of the allowable Economic Value under the Effective Value Test

[5] The modelling does not take into account the fact that, at issue, loans with lower LTV ratios at inception will be likely to have a lower customer interest rate than loans with high LTV ratios at inception. All else being equal, a lower customer interest rate will normally result in a lower Economic Value.

- A review of the deferment rate will take place twice a year (in March and September) and a review of the volatility parameter will take place annually (by the end of September).

- The deferment rate will change if there has been a material change in long-term real risk-free interest rates since the last update, with a change to the deferment rate only taking place if it is deemed to move by at least 0.5 percentage points. The PRA states that its aim is to reduce the sensitivity of the Effective Value Test to changes in nominal risk-free rates; the PRA views nominal rates as driven by inflation expectations plus real risk-free rates, and aims to reduce volatility arising from changes in the second of these, leaving the NNEG value primarily driven by changes in inflation expectations.

- The deferment rate will always remain positive, in line with Principle 3 of SS3/17.

- The review of the volatility parameter will have regard to new data on property price returns and advances in techniques for estimating volatility for ERMs. A change will only take place if the parameter is deemed to move by at least 1 percentage point.

- Ad hoc reviews of both parameters will take place in appropriate circumstances, e.g., material changes in long-term real risk-free interest rates.

Whilst we expect that, assuming no material change in long-term economic conditions, the deferment rate will remain at 1% p.a., the proposal that it may not remain fixed will be a relief to insurers who worried about the potential level of interest rate sensitivity of the NNEG, and in particular the potential for the NNEG value to rise significantly if interest rates fall. This is likely to result in the interest rate sensitivity of the NNEG being dampened. In fact, the proposal has the practical effect that the NNEG will no longer be as sensitive to long-term nominal yields, and will instead be linked to long-term inflation expectations. Notwithstanding this, a strict interpretation of CP7/19 could imply that 0.5% p.a. can be assumed to be a practical floor on the level of the deferment rate, so there is limited scope to absorb further falls in real yields. Furthermore long-term real yields are negative and at historic lows, and any increases to real yields would likely lead to an increase in the calibrated deferment rate.

2. *The treatment of assets other than ERMs held by special purposes vehicles ("SPVs") used to restructure ERMs*

CP7/19 sets out how non-ERM assets in the SPV should be taken into account in the Effective Value Test. In summary:

- The Effective Value Test should only take into account non-ERM assets to the extent that those assets are held to support the restructuring of the ERMs, e.g., to improve the credit quality of the notes, or to support risk/liquidity management.

- In the Economic Value calculation, the balance sheet value of the non-ERM assets should be added to the Economic Value of the ERM cash flows.

- In the Effective Value calculation, the balance sheet value of the non-ERM assets should be apportioned between the balance sheet value of the notes, allowing for the consequent impact on the security, valuation, spread and credit rating of the senior tranches.

- The CP states that it would be difficult to justify an outcome in which the non-ERM assets have no impact on the value or credit quality of the senior tranches, and are allocated in full to the junior tranches.

- Any basis and counterparty risk associated with non-ERM assets should be allowed for, as should any costs associated with the non-ERM assets.

In relation to the final point on basis and counterparty risk, the PRA gives the example of a derivative that hedges movements in a residential property index, noting that such a contract would be subject to basis risk between the underlying index and the individual properties underlying the ERMs. The PRA does not elaborate on the areas in which basis and counterparty risk associated with such exposures should be allowed for, but a likely interpretation is that the credit ratings assigned to the senior tranches should reflect these risks, and that capital requirements should also consider these risks.

3. *The treatment of ERM loans where the amount of principal and/or accrued interest at a given future date is uncertain*

CP7/19 sets out how ERM products where either the principal or interest payments are uncertain should be treated, e.g., where further advances may be taken, or where the customer may elect to pay some or all of the interest accruing. In summary:

- Given the range of product features, the PRA proposes an overarching framework that the Economic Value should not recognise future principal amounts (and associated interest) unless the timing and amounts of future principal are known and certain in advance.

- The assessment of NNEG risk should include the possibility of future lending, as further advances may increase the overall risk that the NNEG bites. In this case, best estimate views of future borrower behaviour should be used, but firms should also recognise risks beyond best estimate expectations in the allowance for other risks within the Economic Value. CP7/19 provides an example of how such calculations might work in practice, depending on the legal basis around the recourse to the property value. In some cases, the PRA suggests using notional property values applied to each advance.

- The CP states that firms should discuss with their supervisors their approach to NNEG risk where there are potentially multiple advances that are not fixed in time or amount.

- Where firms have contractual terms in place that allow them to cease future advances in certain circumstances, CP7/19 suggests that firms should not assume they can rely on such terms unless they are both:
    - Consistent with their business plans (with due consideration given to the franchise risk associated with enforcing the terms)
    - Enforceable in light of legal and conduct requirements, having consideration to how a court might view the terms, specifically their fairness under the Unfair Terms in Consumer Contracts Regulations 1999 and the Consumer Rights Act 2015

It is common for ERMs, particularly ones sold in recent years, to include a drawdown facility which allows the customer to take additional loan advances on guaranteed terms up to a stated limit. The PRA's proposed approach to the Economic Value, whereby expected future drawdowns are not recognised, could be at odds with the base valuation approach taken by some firms, in which it is likely that the value of future drawdowns is reflected based on a best estimate pattern of such future drawdowns.

Notwithstanding the point above, the PRA proposes that the assessment of NNEG risk should include the possibility of future lending, particularly where future lending would rank pari passu with the initial lending in terms of security over the underlying property. In this case, the PRA proposes notionally adjusting the property value downwards to create an LTV ratio that is consistent with the customer drawing down on their entire facility. For example, if a customer initially draws down on 25% of their agreed loan facility and a restructured note is created based on this advance, then the PRA's approach would involve assigning a notional property value to this note of 25% of the actual property value. A future drawdown of 30% of the loan facility would then be allocated 30% of the property value in the NNEG assessment, and so on. This approach avoids understating the NNEG risk associated with the first drawdown. This approach will potentially result in a prudent allowance for NNEG as it implicitly assumes the customer will always draw down on their facility in full. Moreover, it will require firms to allow for the NNEG risks associated with expected future lending, but will not permit firms to take credit for the value of future margins that will arise if that additional lending takes place as expected.

The PRA acknowledges that there may be alternative approaches that are equally satisfactory, but this may be an area where further clarity may be given or a change of approach may take place when the proposals in CP7/19 are finalised.

4. The frequency with which the Effective Value Test would be assessed

The CP proposes that firms would be expected to conduct the Effective Value Test in the following circumstances:

- When restructured ERM notes are established or amended.
- Where appropriate to support the supervisory review process, which should be at least annually at firms' financial year-end dates. Where firms' exposures to restructured ERMs are more material in proportion to the value of the assets in the MA portfolio, or where the PRA judges that there is a risk of an inappropriately large MA benefit, the PRA may require firms to carry out testing more frequently.
- When recalculating the Transitional Measure on Technical Provisions ("**TMTP**"), whether at the regular two-year recalculation point or as a result of a relevant change in risk profile.
- Where a firm has reason to believe the Effective Value Test is no longer met, or on request by their supervisor.
- The results of any new Effective Value Test assessment should be communicated promptly to firms' supervisors, and as soon as possible where the result indicates there may be an inappropriately large MA benefit.

Most of the proposals around the frequency of assessment of the Effective Value Test are unsurprising, but the proposal that a TMTP recalculation should also trigger an updated assessment of the Effective Value Test may be more surprising, particularly in situations where ERMs are not assigned to back liabilities incepted prior to 2016. The PRA points out that the TMTP is a function of the Solvency II Technical Provisions, which in turn is a function of the MA benefit of ERMs, and therefore any TMTP recalculation will need to be carried out with an updated assessment of the appropriateness of the ERMs' MA benefit. Additionally the TMTP is subject to a cap based on the overall financial resources requirements of the firm under Solvency I and Solvency II, which will also take account of assets allocated to business written after 1 January 2016.

5. The principles for assessing ERM risks in internal model Solvency Capital Requirements ("**SCRs**")

CP7/19 sets out expectations for how firms validate the level of MA benefit assumed in the SCR calculation. In summary:

- The PRA considers that an assessment of the "Effective Value Test in stress" is an appropriate validation technique.
- The Effective Value Test in stress would compare the stressed economic value of ERMs to the stressed Effective Value, having regard to changes in note spreads and credit ratings.

- The Effective Value Test in stress is intended to be part of the processes firms may use to meet validation tests/standards, and not to replace firms' primary methodologies or existing validation techniques, or to determine the internal model SCR.

- All relevant inputs to the Effective Value Test should be stressed appropriately and in line with a 99.5% confidence level. In particular, firms should derive their own stresses to the deferment rate and volatility parameter. The PRA states that it would be appropriate to have regard to the linkage between the deferment rate and real interest rates, and relevant historical data and prospective scenarios around property market downturns, both in the UK and internationally.

- Firms should consider the risk that individual properties do not behave consistently with a diversified index of property prices.

- The CP states that firms should consider the dependency structure between risk factors, in particular between nominal risk-free interest rates and the deferment rate.

- The PRA suggests that firms could elect to stress the risk-free rate r and the deferment rate q, or apply stresses to r and $r - q$. It suggests that firms may wish to regard changes to $r - q$ as being broadly linked to implied inflation.

- The CP states that firms should consider any management actions they may wish to take under stress.

The Effective Value Test under stress will not be part of firms' internal models in the sense that it will not directly determine any component of firms' SCRs; rather it will be a validation tool. However, the proposals in CP7/19 will require firms to develop a stressed approach to the Effective Value Test, including developing suitable allowances for dependencies between the components of the test, which could require a material amount of development work to the extent that this has not already been undertaken within firms' internal models. The CP does not state whether the approaches firms develop to undertake the Effective Value Test in stress will need to be subject to explicit PRA approval, but it is likely that the PRA will wish to understand in detail firms' approaches to this important diagnostic validation tool.

David Rule speech

On 10 April 2019, following the publication of CP7/19, David Rule (Executive Director of Insurance Supervision at the PRA) gave a speech: "An annuity is a very serious business: Part two", which covered a number of areas, including ERMs.

The speech highlighted the risk to ERM providers of excessive reliance on the behaviour of house price indices in assessing the level of NNEG risk. In particular, there has been widely varying levels of house price growth across different regions of the national housing market, and ageing owners with limited equity may not properly maintain properties; this might suggest that modelling based on house price indices does not capture all of the inherent risks.

The speech also focused on the impact of climate change on residential property values, noting that increased incidence of flooding and drought in the future will have an impact that varies significantly by region, with coastal regions being worst affected, which could cause individual property prices to diverge further from a national index, particularly if the availability of flood insurance becomes constrained. It also cited ERMs as an example of where banks and life insurers have a direct exposure to the physical risks of climate change through long-dated property lending exposures, noting that these risks are not limited

Academic research into ERM valuations

IFoA/ABI research by the University of Kent

On 22 February 2019, an independent research report ("**the Research Report**") authored by Professor Radu S. Tunaru and Enoch Quaye of the University of Kent was published. The research was entitled "UK Equity Release Mortgages: a review of the No Negative Equity Guarantee", and was jointly commissioned by the Institute and Faculty of Actuaries ("**IFoA**") and the Association of British Insurers ("**ABI**").

The Research Report investigates an alternative methodology for the valuation of the NNEG, and suggests some approaches for determining some of the parameter inputs that might be required in any NNEG valuation.

The Research Report's alternative NNEG methodology involves the use of the "ARMA-EGARCH" (Autoregressive Moving Average, Exponential Generalised Autoregressive Conditional Heteroscedastic) model to forecast real world future property prices. The paper then proposes to use the conditional Esscher measure to "risk-neutralise" the ARMA-EGARCH model.

In summary:

- Unlike the Geometric Brownian Motion ("**GBM**") model upon which the Black-Scholes formula is based, the ARMA-EGARCH model incorporates an element of mean-reversion in its forecasts of property prices.

- The Research Report claims that the ARMA-EGARCH model provides equal or superior forecasting capability of property price changes compared to GBM over short-to-medium forecasting periods.

- The NNEG values presented in the Research Report are 50% to 70% of those evaluated using GBM with consistent parameters.

The ARMA-EGARCH model is very complex to implement and it is unlikely that insurers have the expertise to implement the model without significant external support. If the model's use for NNEG valuation became accepted by the industry and the PRA, then it is possible that ARMA-EGARCH could be used to reverse-engineer an equivalent calibration of the Black-Scholes model (e.g. an implied volatility of property prices) that could be used for day-to-day valuations. However, the Research Report is likely to be a starting point rather than a comprehensive solution to the NNEG problem, and therefore it is unlikely that this model will be widely adopted without further work being carried out.

The Research Report also discusses assumptions that might be relevant in the NNEG calculation. The Report's suggested approach to a suitable rental yield assumption (as a potential proxy for the deferment rate) has been much discussed. In summary, the report argues that a suitable rental yield can be derived by multiplying the average net rental yield for a rented property by the proportion of UK properties that are rented out. This results in a net rental yield of approximately 0.66% p.a.

The Research Report's approach to the rental yield has met with a degree of controversy amongst readers. In particular, the approach results in owner-occupied properties contributing zero to the rental yield calculation, which arguably does not recognise the financial utility of owner-occupation.

The Research Report also computes the implied property price volatilities given by the ARMA-EGARCH model, which are generally around 3%-4% p.a. Volatilities at this level are significantly lower than would typically be used by practitioners in NNEG valuations, and are obviously significantly lower than the PRA's Effective Value Test volatility parameter of 13% p.a.

The implied volatility levels of 3%-4% are based on fitting the ARMA-EGARCH model to a house price index, and practitioners have argued that observed index volatility is likely to be significantly lower than individual property price volatility.

PRA reaction to the Research Report

In parallel with the publication of CP7/19, the PRA published a "Dear CEO" letter from David Rule which included the PRA's initial response to the Research Report.

In the letter, he stated that the PRA welcomed the advocacy of risk-neutral valuation techniques, and believed the research merited serious consideration by firms and auditors. However, he stated that the research needed to be developed further before

the approach could be generally adopted by firms. He highlighted some areas of potential further development, in particular the letter noted that:

- the valuation technique proposed is complex, and questioned whether it is clearly explained and accessible to challenge. It also pointed out that parameters of complex models are generally more difficult to estimate, interpret and validate with high confidence.

- the research does not allow for individual property risk and only examines the statistical behaviour of property indices.

- the dataset used to calibrate the model in the research is from 1991, and that datasets covering longer periods and a wider range of economic conditions are available.

- the deferment rate used, which was estimated using rental yields, was subject to significant industry challenge (as noted above), and stated that the PRA thought these challenges were well-founded.

The PRA's challenges to aspects of the Research Report are likely to mean that it will be difficult for insurers to adopt the ARMA-EGARCH approach without significant modification. However, many of the PRA's challenges appear to be surmountable and therefore it may be possible for the Research Report to evolve into something that can be both used in practice and with regulatory blessing.

Jeffery/Smith paper

On 28 March 2019, a paper by Tony Jeffery and Andrew D Smith entitled "Equity Release Mortgages: Irish & UK Experience" was published in advance of a Society of Actuaries in Ireland event. This paper gave detailed and useful background to the UK's experiences of ERMs, including:

- A summary of the product

- An overview of the ERM market

- Valuation issues

- The prudential regulatory environment

- Potential societal benefits and costs of ERMs

- Their suitability as an asset to back annuity liabilities.

The paper also noted the authors' grave concerns that the ERM market links the solvency of insurance companies to a historically cyclical residential property market, a point also touched on by David Rule in his speech.

Next steps and conclusions

The popularity of ERMs as an asset class seems to be unaffected by the emerging regulatory developments that affect its capital treatment. This popularity is principally a function of the relatively high risk-adjusted yields available on ERMs, and the continued ability of insurers to capitalise the value of this yield in excess of the risk-free rate upfront through the use of the MA. However, the PRA's Effective Value Test may result in the size of some firms' MA benefit reducing, and other factors may also be at play that could put pressure on the amount of MA benefit available on ERMs. In particular, customer interest rates on ERMs have reduced significantly in recent years as the market has become more competitive. Additionally, as life insurers become the predominant funders of ERMs, the risk-adjusted yields will, in effect, be increasingly set by annuity providers who do not require a premium for investing in illiquid assets. This could provide further downward pressure on the available MA benefit from ERMs.

The PRA appears now to be reaching the point where it has completed its initial thinking around the appropriate prudential treatment of ERMs, but there remain unanswered questions around how some of the PRA's more recent proposals will work in practice, particularly the calculation of an Effective Value in stress.

In the absence of a deep and liquid market in residential property-linked derivatives, new and novel approaches to modelling property prices and pricing the NNEG will continue to emerge, but will remain somewhat theoretical now that the Black-Scholes formula is enshrined in PRA regulations; in particular, it is likely to be difficult to get away from Black-Scholes as a validation tool for NNEG risk.

We anticipate that research into valuation and capital issues for ERMs will continue, with areas such as:

- best estimate voluntary redemption rates and appropriate adjustments for voluntary redemption risk
- modelling of, and data on, dilapidation risk
- individual property volatility vs. index volatility

being areas that we see as being particularly ripe for further work.

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