

To: PRA CP 7/19 Team
From: Dean Buckner and Kevin Dowd, EUMAEUS and Durham University
Subject: CP 7/19 Consultation (CP7_19@bankofengland.co.uk)
Date: 27 June 2019
By email

Dear CP 7/19 Team,

Thank you for meeting us on June 19th.

As promised, we send our report 'The Eumaeus Guide to Equity Release Valuation: Restating the Case for a Market Consistent Approach,' together with this covering letter itemising the sections which we feel are appropriate to the CP.

The most relevant sections of the Guide are as follows:

Valuation Basics (Chapter 3)

The keys to NNEG valuation are a put option model and a mortality projection model.

Suitable put option models would be (a) Black' 76 with the forward house price (*not* the expected future house price) as its underlying or (b) Black-Scholes with an underlying that bears a convenience yield equal to the deferment rate or net rental rate.¹ We show that these models are equivalent and yield identical valuations.

Our recommended mortality model is the M5-CBD model which was specifically designed for modelling the mortality rates of older people.²

Net Rental Rate and Deferment Rates: Theory (Chapter 7)

The net rental rate and deferment rate are conceptually different, but we demonstrate that they are equal in value.

At our meeting you raised the question whether the derivation depends on the dividend discount model. The answer is that it does, but the model is not easily rejected, because it and models like it (which determine asset values as the sum of the present values of

¹ See F. Black (1976) "The Pricing of Commodity Contracts," *Journal of Financial Economics* 3: 167-179 and F. Black and M. Scholes (1973) "The Pricing of Options and Corporate Liabilities," *Journal of Political Economy* 81: 637-654.

² See A. J. G. Cairns, D. Blake and K. Dowd (2006) "A Two-Factor Model for Stochastic Mortality with Parameter Uncertainty," *Journal of Risk and Insurance*, 73(4): 687-718; and A. J. G., Cairns, D. Blake, K. Dowd, G. D. Coughlan, D. Epstein, A. Ong, and I. Balevich (2009) "A Quantitative Comparison of Stochastic Mortality Models Using Data from England & Wales and the United States," *North American Actuarial Journal* Volume 13(1): 1-35.

all expected future cashflows) are fundamental to nearly all financial mathematics, such as bond pricing, option valuation, infrastructure cost of capital and so on.

Net Rental Rate and Deferment Rates: Calibration (Chapter 8)

We decompose the net rental rate into its constituent factors, and believe that any plausible market-consistent estimate of this variable should reflect the methodology we propose.

Our recommended net rental rate (of 4.2%) is about 5 times higher than the one proposed in the recent Tunaru ERM report.

We also recommend that the PRA should monitor the empirical net rental rate, and not the real interest rate as proposed in CP 7/19.

Volatility (Chapter 10)

It is a common but incorrect practice to value NNEGs using a single volatility applied to all borrowers.

A second common error to take the volatility as given by the standard deviation of a house price index.

We show that the appropriate volatility input to the NNEG depends, not just on the volatility of a housing index, but also on the volatility of the achievement rate, the interest rate and the deferment rate.

Combining all these four sources of volatility leads to a volatility term structure, implying that different 'NNEGlets' have different volatility calibrations.

Alternative approaches to NNEG and ERM valuation

Chapters 22 and 23 consider alternative approaches to valuation, namely, the Discounted Projection (or 'Real World') approach used by the equity release industry and the approach set out by Professor Radu Tunaru in his recent report jointly sponsored by the ABI and IFoA. Neither approach is suitable for purpose, and both approaches produce NNEG valuations that are much lower than they should be.

Recommendations for Good Valuation Practice

Chapter 27 suggests a set of recommended calibrations for the key ERM valuation parameters.

As noted in Chapter 10, volatility has a term structure, but the use of a single volatility is acceptable, provided one uses a single volatility calibration that is appropriate to the

borrower's age and gender. These age- and gender-specific volatilities are generally higher than those recommended elsewhere.

Recommendations for Governance and Disclosure

The final chapter sets out the actions we believe should be taken by the PRA, the Institute and Faculty of Actuaries, and the audit and accounting profession.

We hope that these suggestions will be helpful to the PRA in its effort to formulate an appropriate Policy Statement regarding valuation practices in the equity release sector.

Please confirm you have received this letter.

Sincerely

Dean Buckner and Kevin Dowd