Long-term Value Methodologies and Real Estate Lending

A report by the Long-term Value Working Group of the Property Industry Alliance Debt Group.

An initial analysis and reconciliation of the characteristics of three alternative long-term value methodologies; Adjusted Market Value, Investment Value and Mortgage Lending Value, compared to market value.

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- Association of Real Estate Funds (AREF)

- British Council for Offices (BCO)

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Foreword

Secured lending against commercial real estate should be a pretty straightforward banking and financing activity. The asset is tangible, asset values are readily measureable, risks can be identified and assessed and rules of underwriting are relatively easy to establish and follow.

So why do participants in the commercial real estate lending industry, individually and en masse, create a 'lending cliff', every 15 to 20 years over which, with one or two exceptions, they all rush with dire consequences for themselves, the market and (on occasion) the whole UK financial system and economy? Lenders and regulators know that the property market is highly cyclical. Lenders should recognise that if they have their largest book and are competitively underwriting new business when the lending cliff hits its peak, they will almost certainly write off all the profits from their previous 15-20 years of real estate lending. For some reason, the lenders still do this, time (1974), and time (1989) and time (2007) again.

What are the forces that drive this behaviour? Although real estate lenders (banks, debt funds etc.) generally have very considered lending criteria and risk management checks and balances, almost without exception, they fail to put in place a 'market peak mitigation strategy'. Lenders (and regulators) need to articulate at what stage in the cycle they are going to moderate lending and be very clear how they are going to do it. This then must be hard wired into their overall real estate lending strategy. Without this clear commitment, at precisely the time that they should be reducing risk, history demonstrates that there will be an overwhelming stakeholder compulsion to do the opposite (with pressures from shareholders, analysts, the board, profit growth targets, the competition, individual financial incentives, retaining key employees). And a further challenge is that moderation needs to start at least one to two (often very exciting years) before market peak.

So how can lending organisations tackle this challenge with confidence? With determination, it should be possible. Firstly, they must state to all stakeholders (e.g. shareholders, employees, borrowers) that implementing a market peak mitigation strategy well before the top of the cycle is absolutely central to their real estate lending business – and mean it. Given behavioural history, that step should be obvious to all, but surprisingly, it is not. The second step is slightly more difficult; they must put in place and hardwire all the tools needed to identify when the market might be overheating and have a regular (likely quarterly) system that monitors that probability.

This is where this long-term value methodology paper comes in. The findings in this paper are preliminary but the analysis clearly shows that the peaks in the last two cycles were predictable well before they were reached, based on everything that was known up until that point. Real estate lenders could have avoided suffering substantial losses, if they had analysed the data and had hardwired mechanisms in place to respond to the outputs.

Further research and analysis is required. In the meantime, this paper produces enough long-term value insights for real estate lenders and regulators to identify and take steps to mitigate their exposure to the next commercial real estate market crash.

Rupert J Clarke

Chairman, Long-term Value Working Group

Introduction

This paper reports on the technical work carried out so far in pursuance of Recommendation 4 (Use of long-term value measures for risk management) in the 2014 report, *A Vision for Real Estate Finance in the UK*[1]. It describes and assesses the ability of three alternative methodologies (Adjusted Market Value, Investment Value and Mortgage Lending Value) to provide advance signals on when the commercial real estate (CRE) market may be overvalued and face a high risk of a major fall in values.

The work has allowed certain preliminary conclusions to be reached, but it has also identified a number of further pieces of work that are required. Accordingly, this report summarises those preliminary conclusions and invites discussion and feedback from industry and other stakeholders, pending completion of the follow-up analysis and next steps recommended below.

The primary authors of this report are:

- **Charles Cardozo:** Adjusted Market Value

- **Neil Crosby:** Investment Value and Mortgage Lending Value

- **James McTighe:** Mortgage Lending Value

- **Rupert Clarke:** Chairman, Long-term Value Working Group

This report comprises:

- an Executive Summary, which is also available on a standalone basis;

- a more detailed description of the three methodologies;

- a description of the analytical approach and the results of that analysis; and

- conclusions and recommended next steps.

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[1] The *Vision* report is available at http://www.ipf.org.uk/industry-involvement/publications/a-vision-for-real-estate-finance-in-the-uk.html.

Executive Summary

This Executive Summary briefly summarises the 'Long-term Value Methodologies and Real Estate Lending' paper produced by the Long-term Value Working Group (the Working Group) formed by the Property Industry Alliance Debt Group.

The main conclusion of the work is that estimates of long-term valuations can provide useful advance signals on when the commercial real estate (CRE) market may be overvalued and face a high risk of a major fall in values. Lending institutions are encouraged to consider how, in the light of this work, long-term value metrics can be given a central role in risk management systems.

Further work is planned to complete the analysis of the different approaches and look at how they might best be used to inform decision-making by lending institutions and regulators.

Background

In May 2014, the independent cross-industry Real Estate Finance Group published its report, *A Vision for Real Estate Finance in the UK*[2]. The report made seven high-level recommendations for reducing the risk of damage to the UK financial system from the next CRE market crash. The Bank of England has been supportive of industry-led work to implement those recommendations, including the subject of this paper, Recommendation 4 (Use of long-term value measures for risk management).

Figure 1: **Long-run UK CRE capital values***

% change
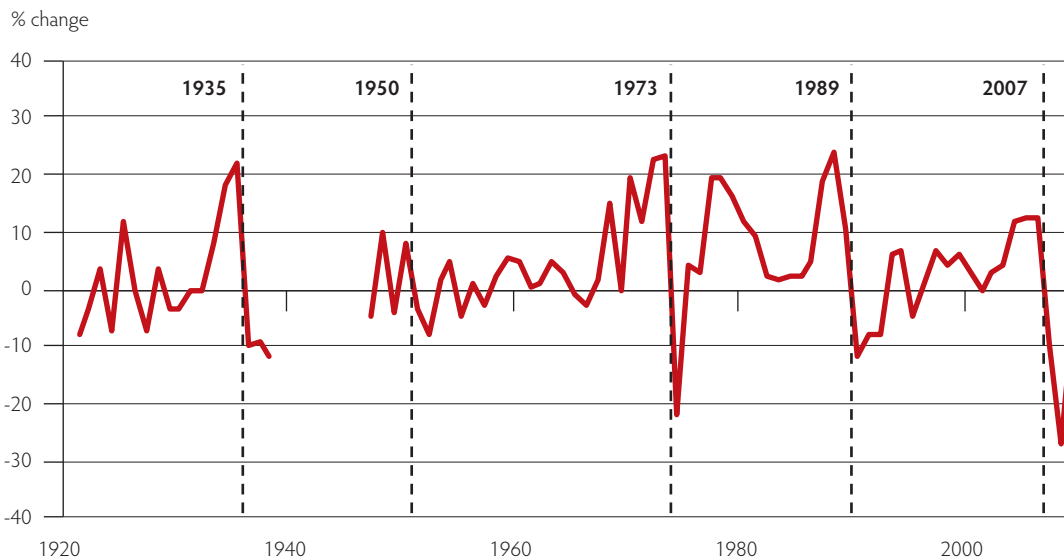
Sources: Bank of England, MSCI and Scott, P. (1996)
*The vertical dotted lines indicate the discernible booms and busts. The attached labels indicate peak years.

Recommendation 4 is predicated on the belief that, although managing risk through the peaks of the CRE cycle is critical to the resilience of individual lenders and the financial system as a whole, historically lender risk management practices have rarely been effective. Banks have often relied on loan-to-value (LTV) ratios

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2 The *Vision* report is available at http://www.ipf.org.uk/industry-involvement/publications/a-vision-for-real-estate-finance-in-the-uk.html.

using market value to guide their lending decisions. This metric tends to encourage pro-cyclical behaviour and makes it difficult to manage risk as the cycle peak approaches. The Vision Recommendation argues that LTV based on a cycle-insensitive measure of collateral value should be adopted as a central indicator in banks' CRE lending risk management systems and relevant regulatory frameworks.

The Working Group's approach

The Working Group has considered three alternative approaches to deriving cycle-insensitive long-term values and assessed them against historical data to see how reliably they give appropriately early warning that the CRE market is overheating. This work has been informed by consultation with industry stakeholders, including significant ongoing engagement with lenders active in the UK CRE market. Further modelling and analytical research need to be completed on the methodologies, including detailed consideration of how they might be used by lenders, investors, regulators and other stakeholders to promote better risk management.

The three methodologies that the Working Group tested are:

1. Adjusted Market Value (AMV): AMV is derived by comparing current market value, as reflected in an appropriate capital value index, to a long-term trend line. The regression-generated, long-term trend line is drawn dynamically (rather than with historical hindsight) through an inflation-adjusted capital value index such as the Investment Property Databank (IPD) All Property Capital Value Index. AMV is most naturally suited to analysis of the indexed market as a whole. It is extremely simple and inexpensive to use, although this simplicity may also limit its versatility as a tool.

2. Investment Value (IV): IV is based on a traditional discounted cash flow (DCF) model valuation approach. The inputs comprise current rental values (derived from IPD indices), rental growth forecasts, a long-run exit yield (a 15-year backward-looking rolling average of the relevant IPD equivalent yields series) and a target rate of return (comprising a risk-free rate and static, undifferentiated risk premium). IV differs from a standard DCF model because of its use of a 15-year backward-looking rolling average of the relevant IPD equivalent yields series, rather than current yields or forecasts of future yields. IV can be used relatively flexibly at individual property or index levels.

3. Mortgage Lending Value (MLV): MLV is based on *Beleihungswert,* the mortgage lending value approach that forms a key element of the quality control framework for Germany's covered bond market, the Pfandbrief. The German rules aim at a 'prudent valuation' representing the value at which experience suggests a property may be sold at any point throughout the life of a loan, irrespective of speculative or cyclical CRE market fluctuations. The result is almost always below market value, and it is achieved by following a statutory valuation methodology that prescribes, among other things, specified minimum cap rates and rental and operating expenditure inputs. As the characteristics of the UK CRE market (as well as the objective of *Vision* Recommendation 4) differ in important respects, those rules were partially adapted for the purposes of this research, resulting in a simplified methodology. MLV generally was designed to be employed at the individual property level.

The Working Group tested the three methodologies in the following way:

- Each methodology was used to plot long-term value over a period covering at least two cycles (using only information available at each point in time, rather than hindsight).

- An appropriate capital value (i.e. market value) index was then compared to each long-term value line, highlighting how each methodology identified market over- or undervaluation.

- Finally, the relevant capital value index was used to plot the maximum fall in capital values over the next five years, as at each point during the period covered.

- Each methodology was assessed by reference to its ability to show overvaluation in advance of the major CRE market crashes and to do so in a timely manner. A second consideration was the prevalence or otherwise of false negatives and positives.

Other potential methodologies were also considered but eventually dismissed as being insufficiently differentiated, advanced, robust or effective and/or because there was insufficient reliable historic data to allow their effectiveness to be objectively measured.

It has not been the objective of this research to identify a methodology to replace market value nor to recommend any changes to market valuation guidelines. Similarly, at this stage, there is no intent to make detailed recommendations on how any particular methodology should be used by lenders and/or regulators or other stakeholders, such as the valuation industry (although that is plainly an important subsequent stage of work).

Conclusions

1. Long-term value can improve cycle awareness and lender risk management. The work to date clearly supports the premise of Recommendation 4 that long-term valuation methods can be identified that provide useful signals of the degree of under- or overvaluation of the CRE market. For example, all three approaches – based on data available at the time – would have pointed to increased risks of a major fall in CRE prices ahead of 2007. But not all approaches fare equally well in this analysis, as the following paragraphs explain.

2. AMV is the most reliable of the three methodologies, based on the work that has been completed. In particular, the analysis shows that when the IPD All Property Capital Values Index is more than 20% above the long-term trend (as it was most recently in Q2 2004, three years before the peak of the market), the likelihood of a 35% or greater fall in the real value of that index within five years is very high. AMV also signalled similar overvaluation in Q1 1988, six quarters before the Q3 1989 market peak. Figure 2 illustrates this, showing the AMV 'market adjustment' (i.e. the extent to which market value diverges from the long-term trend line) against the IPD Index. Periods of significant overvaluation are clearly mirrored by maximum subsequent falls (over the next five years).

Figure 2: **MV/AMV market adjustment vs maximum subsequent fall**

Source: MSCI

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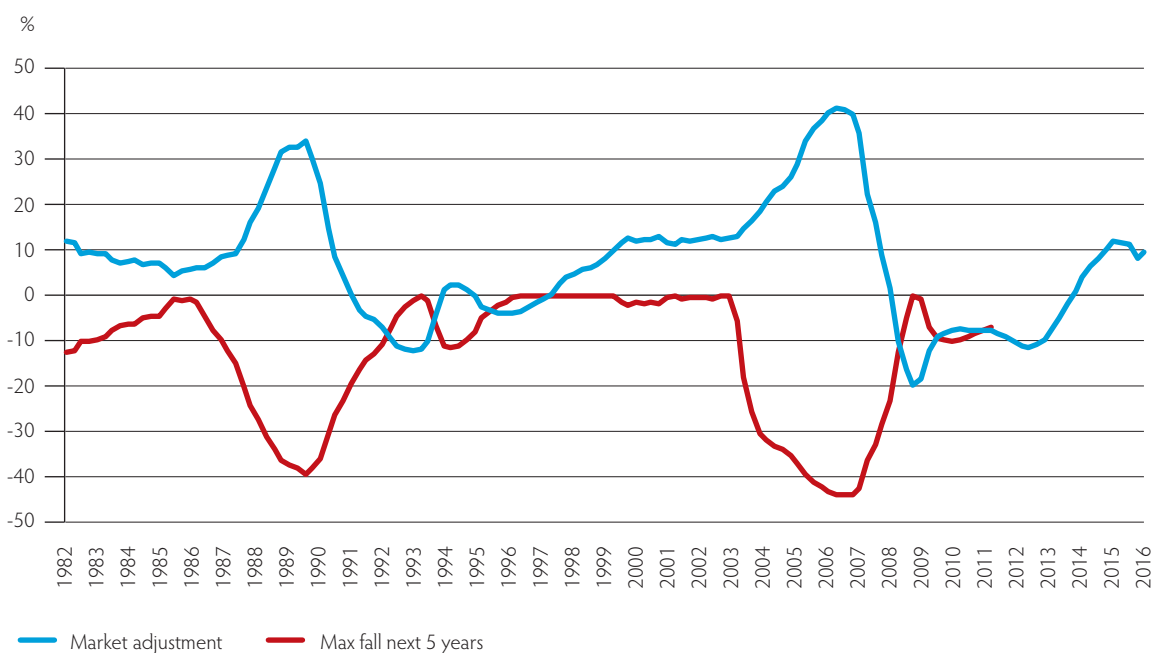
3. IV has potential, but further analysis is required. IV (with rents based on forecasts) successfully identifies the 2007 crash, which followed a boom driven by yield compression, but does not identify the boom before the 1989 crash, which was driven by high rental growth expectations. Preliminary analysis shows that IV could be improved by using a sustainable rent concept rather than rental forecasts, which tend to be a momentum indicator and are bad at anticipating a turn in the rental market. The chart below shows both that weakness[3], and an initial indication of how using a sustainable rent concept might render IV more effective, in particular, better reflecting and anticipating the 1989 market peak.

Figure 3: **MV/IV vs maximum subsequent fall**

MV above IV (Rental forecasts) — MV above IV (Sustainable rent) — Max fall next 5 years
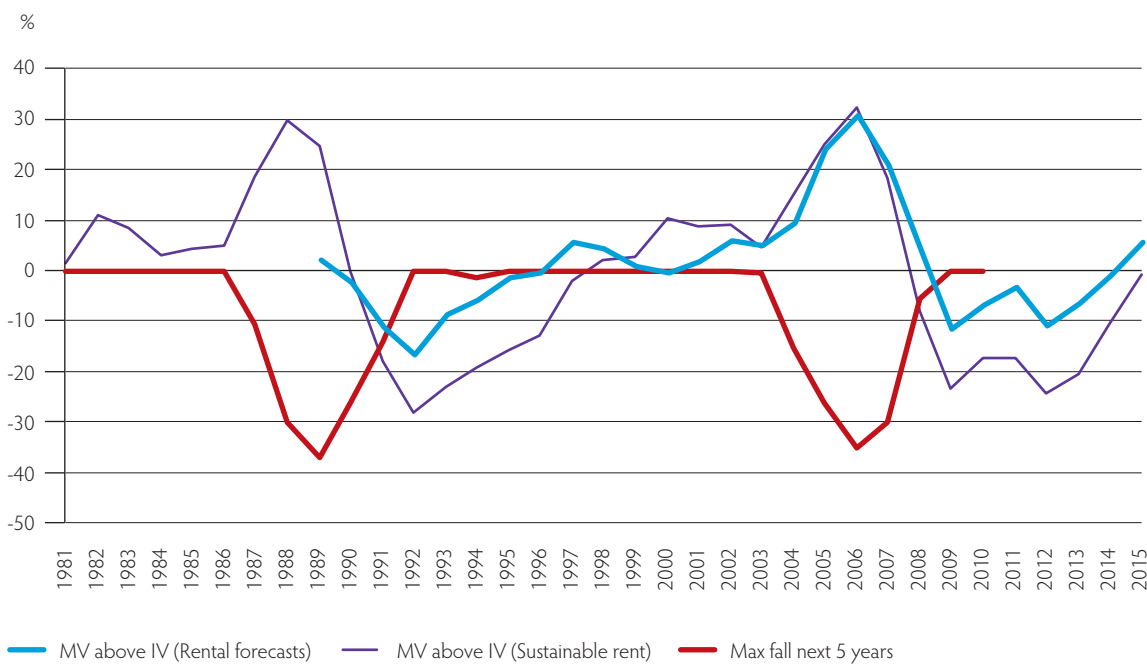
Sources: AREF, Bank of England, CBRE, IPF and MSCI

Here, a moving average of realised rental growth has been used to strip out exuberant rental growth expectations during the boom. A formulation of IV using sustainable rent would be attractive, not least because it would allow exploration of the drivers behind an instance of over- or undervaluation (e.g. changes in yields or rental expectations). In addition, it would also provide sufficiently granular information to better identify correlations between overvaluation levels and the likelihood of subsequent falls.

4. MLV is a practical demonstration of adjusted valuations being used by lenders to promote lower credit risk lending in Germany and elsewhere, but there are problems with applying German MLV to the UK market. Firstly, technical enhancements are required, not only around rental inputs (as for IV), but also to adapt other prescribed German MLV parameters so they are fit for generalised use in the UK market. Secondly, German MLV is specifically designed to produce a conservative, 'safety first' valuation. If it is to meet the *Vision's* goal of a methodology that also identifies cycle troughs when lending might be positively encouraged, additional adaptation may be needed. Figure 4 shows that, based on the work done so far, MLV does what it was originally designed to do (produce a consistently conservative valuation) without reliably anticipating market crashes. However, as in the case of IV, preliminary analysis indicates that the use of sustainable rent improves the performance of MLV in identifying the 1990 crash.

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3 The 'IV using rental forecasts' line shows that the earliest useable forecasts (circa 1989-90) failed to identify the overvaluation that prevailed at that time.

Figure 4: **MV/MLV vs maximum subsequent fall**

MV above MLV (Market rent) — MV above MLV (Sustainable rent) — Max fall next 5 years
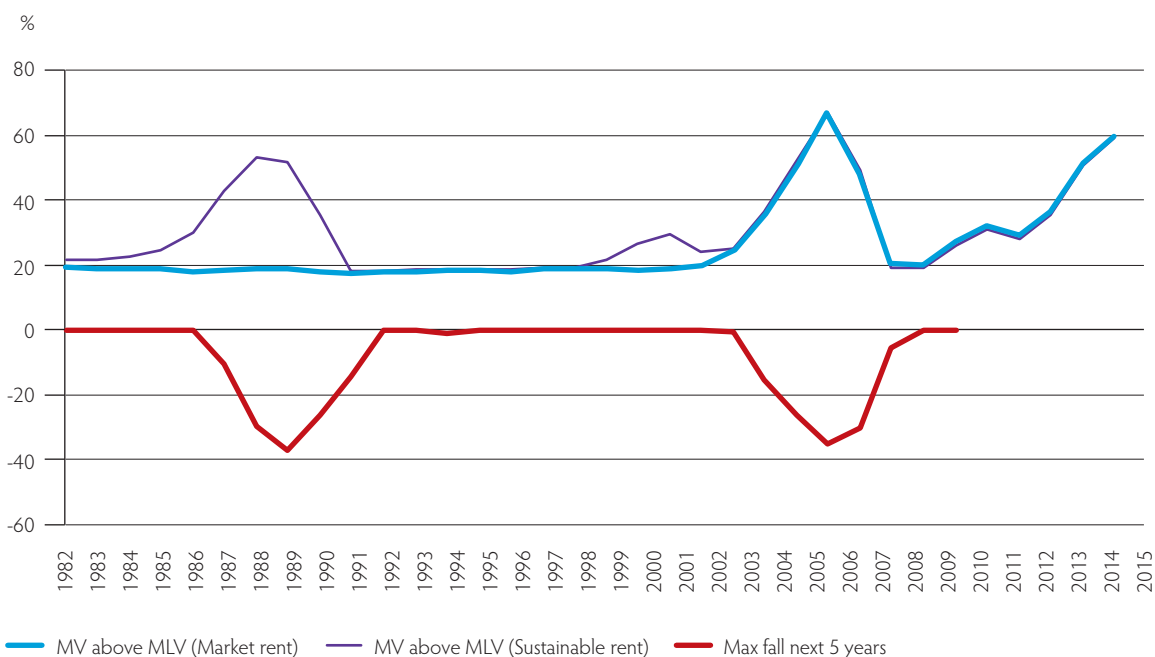
Source: MSCI

5. It has not been possible with any of the methodologies to demonstrate the same level of robustness at a more granular (e.g. sector or subsector) level as at the market level. Further recasting and analysis of the methodologies will explore the scope for better reliability at more granular levels. Latent weaknesses in the underlying property data, particularly subsector indices, also need to be investigated. Further work should explore how differences in lender portfolio composition (relative to market and/or sector and subsector indices) might affect the usefulness of the methodologies for lender risk management.

The Working Group actively encourages lenders to consider how these long-term methodologies might best be built into their risk management systems and what other metrics might usefully complement a long-term value metric. More generally, feedback from all stakeholders on the findings and next steps is welcome.

Please contact Peter Cosmetatos: pcosmetatos@crefceurope.org, by no later than 15 September 2017 with your comments.

The Long-term Value Methodologies

This section provides a more detailed description of the three long-term value methodologies which are the subject of this research. First, a brief description of market value is provided, as that is a key reference point.

Market Value

Market value is the commonly applied model for bank lending valuations, so should be familiar to most market participants. As defined in national and international valuation standards, market value is used in real estate markets to identify the most probable exchange price of an asset at the valuation date. It is usually based on market transactions data and is undertaken at the individual property level, taking into account many property specific characteristics.

Market valuations are used in bank lending decisions where there is no transaction but also to act as a check on the actual transaction price where the latter exists. It does not purport to give anything other than an indication of the current level of prices and provides no indication of the rationality or sustainability of the current level of pricing, or of how that price may change in the near or longer term future.

In the absence in real estate markets of a depth of identical traded assets, market value has also been used in the compilation of property market price indices (such as IPD indices compiled by MSCI).

Market valuation can be applied at an aggregated level using the two main inherent indicators of investment property value; the current market rental value and the cap rate (or yield) of the property. The research adopted this approach, which allowed direct comparison between market value and the outputs of the three long-term value methodologies using identical data sources.

The data sets used are produced by IPD/MSCI and include annual actual rental value change, annual equivalent yield and the capital value change index.

Adjusted Market Value (AMV)

AMV is an empirical approach that assumes commercial real estate (CRE) values follow a trend over the long term. Divergence from this trend is not assumed to *cause* subsequent market corrections but it can be observed to be *highly correlated* with subsequent market corrections.

For AMV, the market value of a property is adjusted down (or up) to reflect the extent to which the CRE market is above (or below) the long-term market trend – this is the 'market adjustment'. The market trend line is based on the history of the IPD data set, adjusted for inflation. Its premise is that, adjusted for inflation, analysis of past trends in the fluctuation of capital values through the cycle can be used to identify and anticipate future trends. Although AMV is most normally analysed and articulated at the

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Calculation of AMV

$$AMV = MV \times (Ae^{(-bt)} / (CVI_{(t)}/RPI_{(t)}))$$

where:

MV = market value;

A and b = parameters for an exponential best fit;

$CVI_{(t)}$ = the IPD All Property Capital Value Index (at time t); and

$RPI_{(t)}$ = the retail price index (at time t).

Or more simply:

$$AMV = MV \times (1 - MA)$$

where MA is a market adjustment factor, reflecting the difference between market value and the long-term trend of capital values adjusted for inflation, calculated quarterly.

macro, market level rather than the individual property level, it can just as easily operate at the individual property level in tandem with an individual property market value.

To establish an effective AMV measure requires a long-run market price index or data set. Fortunately, this exists in the UK for a number of market segments. A regression analysis can therefore be undertaken covering a number of the major cycles, primarily through the IPD Capital Value Index (from 1972 quarterly for All Commercial and 1981 quarterly for the portfolio analysis service (PAS) subsectors), but also using earlier data sets (Scott, All Commercial from 1921[4]). The availability of this granular data makes AMV the easiest to test for historic ability to predict market over- and undervaluation, covering market cycles for almost a century and, with quarterly data, clearly showing the period of advance warning.

The specific definitions are as follows:

- **Capital Value Index Real:** The relevant index (IPD etc.) adjusted for inflation.

- **Long-term trend:** The best fit line for the historic Capital Value Index, adjusted for inflation, up until the point of measurement (i.e. the trend does not take advantage of hindsight to use future data and is instead recalculated at each point of the analysis based on the historic data points then available).

- **Market adjustment:** The differential between market value at any point in time and the long-term trend.

Investment Value (IV)

Investment Value (IV) is defined in International Valuation Standards (IVS) and is commonly interpreted as the price that an investor *should* pay for an investment, as distinct from the price the investor is *required* by the market to pay (market value). In the current IVS definition, the IV price is identified by reference to the circumstances of the individual investor who may be purchasing the property ("worth to the individual"). Previous IVS definitions have included the concept of "worth to the market".

IV is usually undertaken at an individual property level, although in this research the principles have been applied to the market as a whole and (to the extent possible) to IPD sectors and subsectors. The worth of the investment is a function of the net cash flow the property will generate and the returns required by investors. The normal approach in property markets is to use a standard discounted cash flow (DCF) model using current and future expectations of rental value and rent passing and exit yields/values at the end of an assumed holding period. The net cash flow is discounted over that period at target rates of return.

Calculation of IV

$$IV = R\left(\frac{1-(1+r)^{-n}}{r}\right) + \frac{R(1+g)^{\wedge n}}{k(1+r)^{\wedge n}}$$

where:

R = Rental value year 0

n = Holding period

k = Exit cap rate

r = Discount rate

g = Annual forecast of rental value change

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4 'The Property Masters' by Peter Scott, published 1996

The specific input assumptions used in this paper are as follows:

- **Holding period:** The holding period is five years, which works best for this research because it is also the period of the rental value forecasts used.

- **Rental value:** Current market rental values are derived from the IPD rental value change index, which is also used for market value and MLV.

- **Rental growth forecasts:** Five-year rental growth forecasts were difficult to obtain prior to 1990 so the analysis of IV prior to that date misses the lead up to the 1989-90 peak. From 1990 to 2009, forecasts for the three main sectors (office, retail & industrial) were made available by IPD, with the Investment Property Forum (IPF) Consensus Forecasts[5] being available from 2005. JLL also made available forecasts of the main sectors with some additional disaggregation from 2006 and more substantial disaggregation from 2010 onwards and these were used for the more disaggregated sample.

- **Exit yield:** The exit yield is a 15-year backward-looking rolling average of IPD Equivalent Yields for the appropriate segment; the same yield series is used for market value. This input has a relatively high weighting (approximately 50%) among the factors that influence the end output, given the short holding period.

- **Target rate of return:** The target rate of return is the combination of a risk-free rate (RFR) and a static risk premium (RP). The RFR is a 10-year UK Government bond redemption yield at the valuation date and the RP (for all CRE) is 3.5%, based on the IPF and AREF Survey of Financial Advisors[6].

Mortgage Lending Value (MLV)

MLV is not currently defined in IVS but definitions of it appear in a number of places, including European Valuation Standards and EU legislation. For example, according to Article 4.1(74) of the Capital Requirements Regulation, MLV is the value "as determined by a prudent assessment of the future marketability of the property taking into account long-term sustainable aspects of the property, the normal and local market conditions, the current use and alternative appropriate uses of the property".

MLV is often characterised as a value that is sustainable through the cycle. In the German market, MLV is used as a conservative valuation approach for German mortgage banks wishing to access Germany's Pfandbrief covered bond market for funding purposes. It uses sustainable rental levels and yields so as to provide a very conservative assessment of collateral value that should always fall below market value[7]. The German approach has served as the primary model for MLV in this research.

The purpose of MLV is to ascertain a value the asset is likely to maintain, with a high degree of certainty, over the period considered (usually the period of a loan), in order to provide a high level of confidence that the loan will be able to be repaid out of the value of the asset. Although MLV fluctuates through the cycle, it generally retains its conservatively low value level through time. Accordingly, the gap between market value and MLV tends to increase substantially in a market boom, while MLV is likely to be at or slightly below market value at the bottom of the cycle. Its methodology is extremely prescriptive, being intentionally constrained by conservative historic norms, particularly for yields, and requires the valuer to:

- use a 'sustainable' rental value that ignores any over-rents, hope value or marriage value;

- allow for a minimum of 15% non-recoverable costs deducted from the sustainable rent;

- split the land element from the building element;

- identify life cycles and depreciation of the value ascribed to the buildings; and

- use 'sustainable' cap rates which cannot fall below prescribed levels.

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5 The IPF UK Consensus Forecasts are published quarterly and available to download from www.ipf.org.uk.

6 The 'Survey of Independent Financial Advisors' was conducted by the IPF on a four-monthly basis up until 2013 and is now conducted quarterly by AREF. For further details contact: ipfoffice@ipf.org.uk or info@aref.org.uk.

7 More information about MLV as used for the purposes of Germany's Pfandbrief covered bond market is available at https://www.pfandbrief.de/cms/_internet.nsf/tindex/en_24.htm and https://www.pfandbrief.de/cms/_internet.nsf/0/F7C6F80C139F0924C1257AB700540658/$FILE/vdp_Broschuere_BelWert_2011_11_04_EN.pdf.

MLV is normally applied at the individual property level. However, adopting similar basic value inputs to market value and IV means MLV can be compared with them and also be assessed at the aggregate market or portfolio level. In order to adapt the prescriptions of German MLV for broad application in the UK, some of the inputs require modification, as discussed below.

- **Sustainable rent:** The German approach allows current market rental value to be used as a proxy for the sustainable rent. This is not entirely satisfactory in the UK for a number of reasons. In Germany, the majority of CRE markets have traditionally been less volatile than UK markets and therefore adopting current market rents is reasonably considered as using 'sustainable' rents. Adoption of this methodology in the UK requires some additional detailed work (recommended as a next step, below) to identify an alternative, more appropriate, approach to acsertaining sustainable rental values. In the meantime, a second 'wrong' for the UK market (see next bullet point) has been used to make a workable 'right'.

- **Irrecoverable costs:** The Pfandbrief methodology requires a minimum deduction of 15% of market rent in respect of irrecoverable outgoings. In the UK context, this minimum is hard to justify given the net basis of rental values in many UK leases and the transfer of repairing and insuring liabilities to tenants. Nevertheless, this element has been retained, despite its tendency to underestimate rents in the UK, because it partially offsets the overestimation arising from the use of current rents (as outlined in the bullet point above).

- **Land values:** In Germany, land values have remained relatively stable and are available in a database, making the split between the value of the land and that of the building straightforward. That is not the case in the UK, where land values are more volatile and no database of their current market value exists. Based on research by Crosby, Devaney and Wyatt[8], the assumptions made in this analysis on the land:building ratio are 50:50 for Retail, 30:70 for Offices and 10:90 for Industrial.

- **Building depreciation:** The Pfandbrief Act sets a maximum write-off period of 60 years for Offices and Retail (as 'Commercial'). For the purposes of this research, 50 years is used for Offices, 30 years for Industrial and 70 years for Retail. The long period for Retail is justified by the predominance of high street retail in the IPD Index. At the All Property level, the analysis uses 50 years. Analysis has also been undertaken without using a land:building split and, interestingly, it does not make a significant difference to the level or shape of MLV through time.

- **Yields:** Cap rates are prescribed in the Pfandbrief Act, which requires Offices and Retail to be in the 6% to 7.5% band and Industrial to be in the 7% to 9% band. Prime assets (which are however narrowly defined) can attract a discount of up to 0.5% below the normal applicable minimum. Given the nature of the IPD index, the MLV model in this research adopts the higher of (i) the actual cap rate and (ii) the maximum range value of 7.5% for Offices and Retail and 9% for Industrial. It uses 7.5% for the All Property analysis.

- **Duration and weighting:** The land is capitalised into perpetuity, the building is capitalised for the unexpired building life as indicated. The values are then weighted by the land:building ratio (as above) and added together to get to MLV.

For the purposes of this research, MLV has been adapted and applied to All Property, sectors and subsectors using the same IPD Rental Value and Equivalent Yield data sets as for market value and IV. As a result, this approach to MLV ignores the 'second pillar' of the German MLV approach, which is cost based and is quite property specific (and therefore not applicable to the market value and IV data series).

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8 This research is ongoing and as yet unpublished. Preliminary work was discussed at the European Real Estate Society meeting in Istanbul in 2015: http://www.eres2015.itu.edu.tr/Book_of_Abstracts.pdf.

Analytical Approach and Results

The analytical approach adopted in the research was tailored to meet the demands of the CRE lender and regulator wishing to accurately assess the potential vulnerability of a loan portfolio, or the market as a whole, to significant falls in value. The typical loan is assumed to be a non-amortising five-year loan, reflecting the dominance of such loans on UK bank balance sheets in recent years.

Firstly, the most appropriate inputs into the different models were identified, covering principally IPD indices and, where available, other data sets (rental forecasts, the RFR and RP, together with relevant prescribed metrics in the case of MLV). These inputs were then used to generate AMV, IV and MLV historic values and trends from the largely common historic data set.

These outputs and trends were then compared with market value to establish the level of over- (or under-) valuation indicated by each methodology.

Then, in order to assess the accuracy of each methodology in predicting overvaluation and the degree of advance warning provided ahead of a correction, the overvaluation identified was compared with the maximum actual fall in market value over the next five years. If a methodology accurately identified overvaluation, a graph showing overvaluation should be mirrored by comparable maximum five-year falls in market value from that point.

This analysis is particularly relevant for the proposed use of the methodology in the CRE lending context because lending by systemically important institutions is commonly made for terms of between three and seven years, with little or no scheduled amortisation. For lending institutions with a materially different strategy (e.g. insurers writing long-term amortising loans), the testing that has been conducted may be less directly relevant.

The core of the analysis has been to use the IPD All Property Capital Value index to assess each methodology's ability to anticipate the major market crashes (particularly 1989-90 and 2007-08).

Additional analysis has been undertaken to explore how the methodologies perform at a more granular level, recognising that different parts of the CRE market may not always behave in the same way. This analysis has focused on the Office, Retail and Industrial sector levels (to assess the ability to identify when sectors are out of line) and a similar exercise has been run on the property subsectors, where relevant information was available.

It should be noted that, whilst these UK data sets are almost certainly more representative of CRE performance than most comparable data sets in other countries, they are still not a perfect reflection of the whole market, sectors or subsectors. Similarly, the exposure of any CRE lending institution (and of CRE lenders collectively) to the UK CRE market is unlikely to ever match perfectly the weighting of any IPD data set, regardless of what parameters are tested. More fundamentally, any CRE index is an average of a wide range of individual property performances, and the total universe constituting the index changes over time. Where such underlying data issues are thought to give rise to material anomalies, this has been highlighted, but they should also be remembered as a general matter.

Analysis of the Methodologies at the All Property Level

The core analysis in this paper has been undertaken at the IPD All Property level where data sets are available from:

- 1971 (quarterly Capital Value series used in AMV which, in order to establish a real Capital Value trend over 10 years, allows AMV analysis to commence from 1982).

- 1982 (annual Rent and Yield series, used for both IV and MLV, with the primary IV analysis starting in 1990 because rental forecasts are not available prior to that date).

In addition, it has been possible to test the AMV methodology using the Scott Capital Value series[9] from 1920 and covering the crashes in 1934-35 and 1973-74: IV and MLV cannot be derived from this data, as they require other data inputs (such as rental growth forecasts and land values) that the Scott series does not provide and that were not available from other published sources at the time.

The methodologies have been compared at each point in time against then current market value and the maximum fall in the capital values index over the next five years, principally to:

- test whether a methodology is able to successfully anticipate a fall (and its potential magnitude); and

- assess the potential benefits of the methodology for managing cycle risk for CRE lending by illustrating its effectiveness over a typical (five-year) loan term.

The results of this analysis for the three methodologies are outlined below.

Adjusted Market Value (AMV)

The AMV approach is the only one accurately to anticipate both the 1989-90 and 2007-08 crashes. The graph below shows that where AMV identifies a 20% overvaluation at the All Property level, that is a reliable indication of an impending major crash. Lower levels of overvaluation (e.g. 10%) do not necessarily mean a major crash is imminent (see below for commentary on application).

Figure 5: **MV/AMV vs maximum subsequent fall**
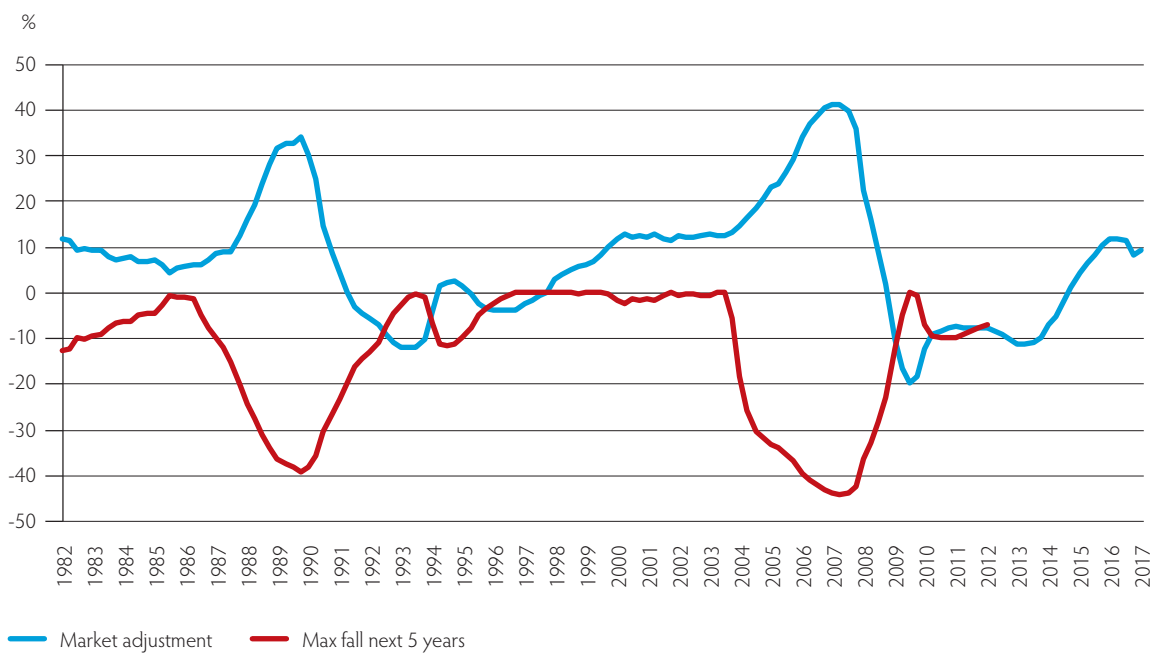
Source: MSCI

The ability of AMV to anticipate major crashes is confirmed by analysis using the historic Scott data (referenced above), which shows it successfully anticipating and mirroring both the 1934-35 crash and the 1973-74 crash – see Figure 6.

9 Scott, P., The Property Masters: A history of the British commercial property sector (1996). Investment Property Database from 1972.

Figure 6: **MV/AMV market adjustment vs maximum subsequent fall (using best fit from 1920 and from 1947)**
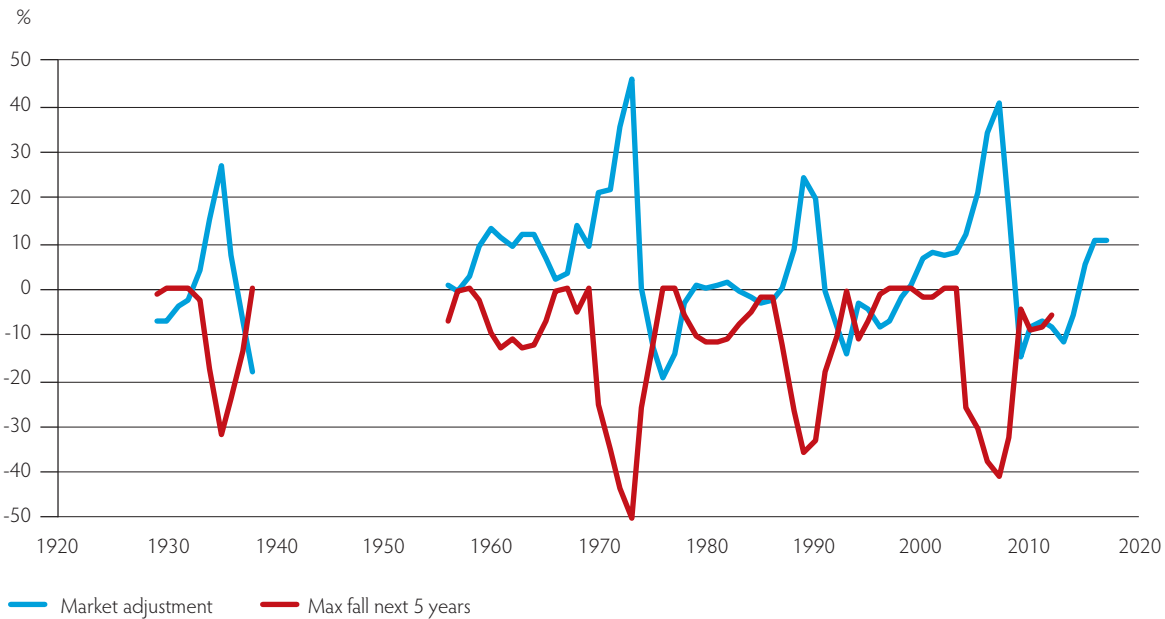

Sources: MSCI and Scott, P. (1996)

Investment Value (IV)

The IV methodology identifies the overvaluation preceeding the 2007-08 crash. However, at the start point in 1990, the primary IV analysis (based on rental growth forecasts) fails to identify the overvaluation at that time and to anticipate the crash which continued to play out during 1991-93. Preliminary analysis of the inputs indicates that the market forecasts of rental growth (which are key inputs) at that time were too optimistic. They failed to anticipate the rental crash that occurred following a period of excessive (and leveraged) speculative development and in the face of a collapse in demand due to economic recession.

Figure 7: **MV/IV vs maximum subsequent fall**
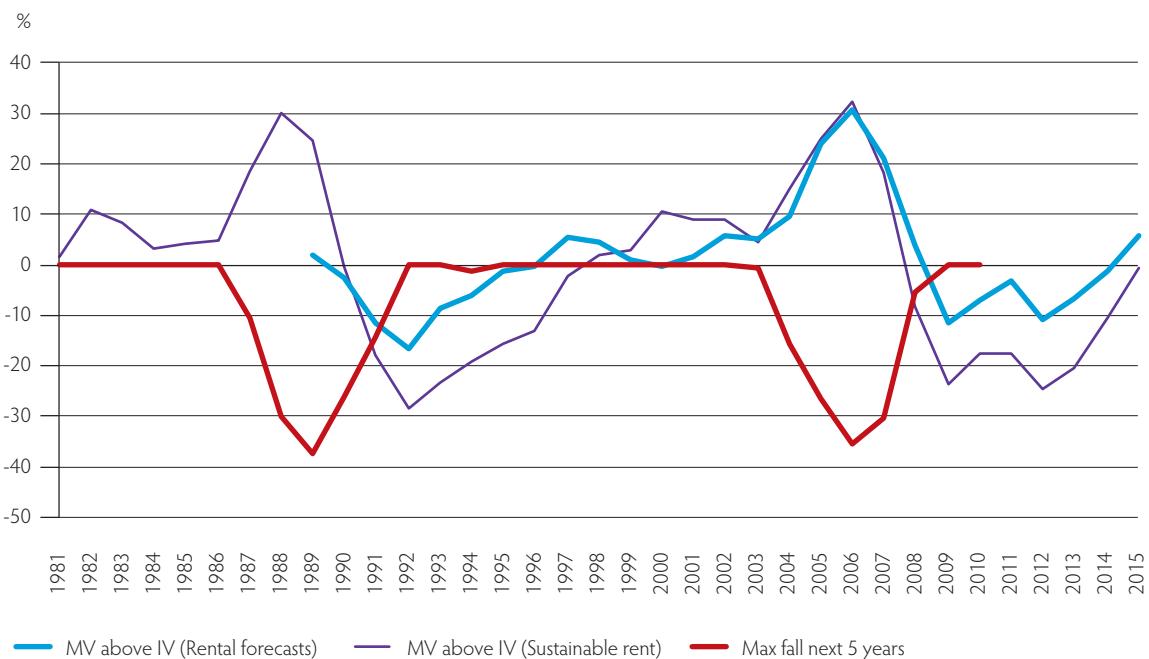
Sources: AREF, Bank of England, CBRE, IPF and MSCI

As rental growth forecasts appear to be a weak link in the IV approach, other approaches to rent and rental value change need to be assessed. One possibility is a 'sustainable rent' concept. Preliminary work using a moving average of realised rental growth instead of forecasts suggests that IV could be improved so as to identify overvaluation driven by excessively high expectations for rental growth. Notably, using this approach, IV identifies overvaluation of around 20% by the end of 1987 and around 30% by the end of 1988. In order to pursue the use of IV as a potentially effective long-term value methodology, significantly more modelling and analysis of the derivation of sustainable rent and related backtesting needs to be undertaken. This is recommended as a next step of the research, to preserve the scope for the IV method to be used by lenders and regulators.

Mortgage Lending Value (MLV)

An important reason for including MLV in this analysis is that it is a well-established long-term value methodology, with a long track record of being applied to reduce CRE lending risk (in the context of Germany's Pfandbrief covered bond market). However, its design is intended to provide a consistently conservative valuation, rather than a comparator for market value across the cycle. In the analysis undertaken, the MLV methodology runs fairly consistently at a 19% discount to market (partly because of prescribed German MLV parameters that are not fit for generalised use in the UK market), increasing only to anticipate and recognise the 2007-08 crash. It does not provide any reliable market leading information. As a result of the simplified market rent assumption (prescribed under the relevant German rules) in the application of MLV to the UK market, the analysis misses the 1989-90 crash. As in the case of IV, preliminary work using a more appropriate sustainable rent concept suggests that this weakness can be addressed.

MLV requires refinement if it is to be used as a reliable leading indicator of a market crash. Inputs, assumptions and parameters would need to be better aligned with the UK market than those derived from the German rules, which were used in the research. As in the case of IV, the single most important focus for further research is probably whether market rent can be replaced as an input by some form of genuinely sustainable rent (in terms of the UK CRE market). Further modifications (touched on below) are also likely to be required if MLV is to meet the objectives of *Vision* Recommendation 4[10].

Figure 8: **MV/MLV vs maximum subsequent fall**
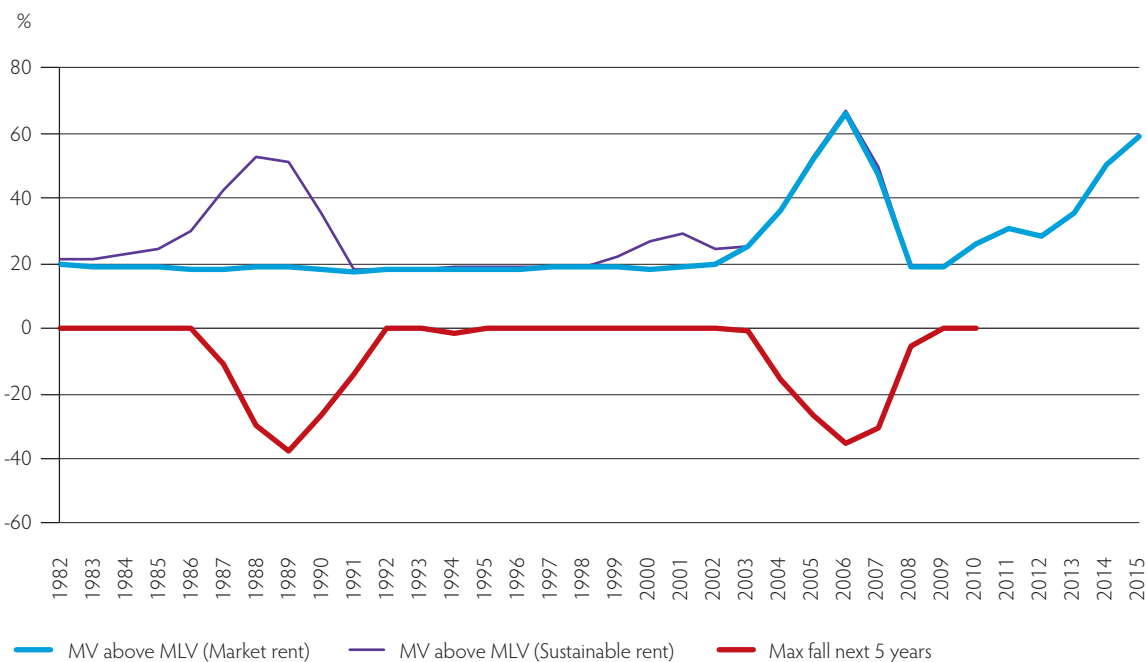
Source: MSCI

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10 It may be possible to collaborate with a separate industry initiative to develop a more 'internationally applicable version of MLV to help address many of the problems identified in this report.

Application of Methodologies at the All Property Level

The fact that a particular methodology is indicating some level of overvaluation does not in itself mean, on the basis of historical experience, that there is going to be a crash or even that the market is definitely overvalued. That is clear (and intended) in the case of MLV, which is almost always pegged at below market value because of the purpose it is designed to serve for the German Pfandbrief market. However, AMV and IV also indicate overvaluation at certain times without a subsequent major fall in prices.

Is it possible to apply the methodologies with a reasonably high degree of confidence that an overvaluation warning reflects a very high probability of an impending major fall in values? To some extent, this depends on the way the methodology is applied; the two principal uses of the methodology at the All Property level are:

• as a macro tool to flag potential major overvaluation points and periods; and/or

• as a cycle-informed comparator against market value in assessing an appropriate loan amount on individual loans.

As significant further work has been identified as being necessary to improve the reliability of IV and MLV, these approaches are considered below only in relation to AMV. This is because AMV seems a more reliable lead indicator and the AMV analysis allows confidence levels to be derived from the granular historical data, unlike IV and MLV as tested. Until IV incorporates a fully validated sustainable rent input, it is not possible to produce the granular and statistical correlation and probability analysis to link particular IV overvaluation levels with subsequent maximum falls. It has only been possible to conduct such an analysis of percentage maximum fall probabilities for AMV, the results of which are outlined below.

Using AMV as a Macro Indicator

The approach would be to monitor quarterly AMV outputs relative to market value and identify the percentage overvalue (the market adjustment), which indicates, based on historic experience, that there is an unacceptably high risk of a material downturn in values. Figure 9, which is based purely on the historic IPD data set from 1972, plots the percentage of identified overvalue against the maximum actual fall in values over the next five years. The percentages in the table show the correlations and thus the probability that a given level of overvaluation will result in a given fall. It can be seen that at 10% overvalue, there is a 50% chance of a fall of up to 30% and a 34% probability of a fall of 35%. At 20% overvalue there is a very high probability of a major fall.

Figure 9: **Correlation between AMV overvalue signals and actual subsequent five-year value falls**

| Overvalue indicated by AMV (Market adjustment)	Probability of value fall of specified percentages over next five years				
	-20%	-25%	-30%	-35%	-40%
10%	56%	54%	50%	34%	14%
15%	100%	96%	88%	65%	27%
20%	100%	100%	100%	81%	33%
25%	100%	100%	100%	94%	44%
30%	100%	100%	100%	100%	54%
35%	100%	100%	100%	100%	100%

Sources: MSCI and LTSV Group Analysis

In line with the principles behind the *Vision* report and particularly Recommendation 7 (Regulatory governors, not switches, operating consistently across the cycle), the goal should not be to arrive at an on/off threshold – compelling though the 20% overvalue signal may appear. AMV would work best if an incremental approach were adopted to managing and reducing risk, ideally also using other key indicators

alongside it (the identification of which is a recommended next step). LTVs could gradually be reduced, and greater regulatory scrutiny of underwriting standards or thorough stress-tests could be applied. A more gradual approach along those lines may also make it easier for lending institutions and/or regulators to manage the risk and consequences of possible false positives.

However, it is interesting to see the effect of adopting a 20% overvalue signal for evasive action in relation to the 2007-08 crash. The warning would have sounded in Q3 2004 (see Figure 10), in good time for a market peak mitigation strategy to be implemented. Lending institutions or regulators could have used AMV in this way to limit risk build-up late in the cycle when the temptation to compete to lend at high volumes and thin margins, and with modest covenant protection, can be strong. The equivalent Q2 1988 warning in advance of the 1989-90 crash was not quite so early, coming six quarters before the market peaked. Nevertheless, prompt action could have limited exuberant lending at a point when there was still 24% of market value growth to come.

Figure 10: **Nominal All Property Index and market adjustment, 2001-11**
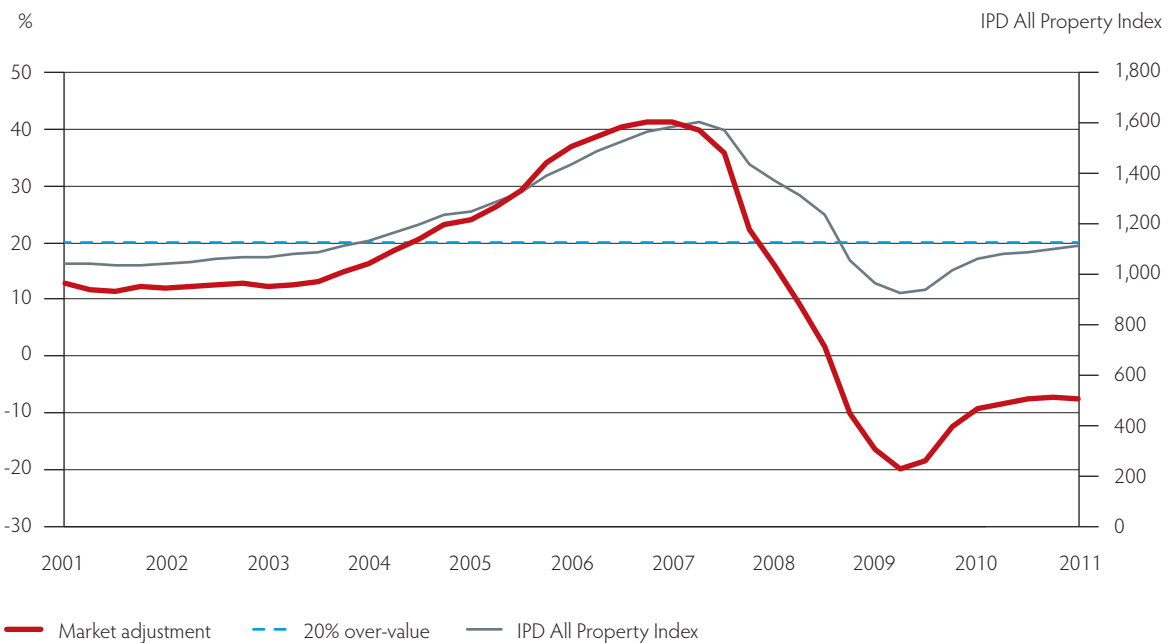
Source: MSCI

Using AMV as a Comparator against Market Value

AMV can be used alongside market value to give a sense of cycle risk when determining the appropriate amount to lend, encouraging a reduction in initial LTVs as the top of the cycle approaches (and reducing the extent to which higher LTVs after a major fall in capital values seem unattractive). For each property, the current market valuation is adjusted up or down by the market adjustment factor, which reflects the divergence of market value from the relevant AMV long-term trend.

A loan-by-loan approach is a relatively blunt instrument at the All Property level, not least because the index is an average and the performance of individual sectors and properties (and thus CRE loan portfolios) diverges from the mean. Some sectors and properties will be more (or less) overvalued and perform far worse (or better) than the All Property Index and different CRE loan portfolios will be differently weighted against different parts of that index. However, the analysis does illustrate how AMV might be used to substantially reduce portfolio risk, even if the approach would almost certainly miss outliers.

The results are compelling. In the context of the 2007-08 crash, the maximum fall of market value below the AMV long-term value over the next five years did not exceed 4%, compared to a maximum market value fall of 42% (see Figure 11).

Figure 11: **Comparison of market adjustment and fall in AMV index**

Date	All Property Index	Market adjustment	AMV long-term trend 'index'	Maximum fall in IPD Index over subsequent five years	Maximum fall in IPD Index against AMV long-term trend 'index' over subsequent five years
Jun-04	1,198	21%	950	-23%	-2%
Sep-04	1,236	23%	950	-25%	-2%
Dec-04	1,250	24%	950	-26%	-2%
Mar-05	1,287	26%	950	-28%	-2%
Jun-05	1,326	29%	941	-30%	-1%
Sep-05	1,390	34%	917	-33%	1%
Dec-05	1,434	37%	904	-35%	3%
Mar-06	1,485	39%	912	-38%	2%
Jun-06	1,525	40%	909	-39%	2%
Sep-06	1,563	41%	919	-41%	1%
Dec-06	1,584	41%	933	-41%	-1%
Mar-07	1,602	40%	963	-42%	-4%

Source: MSCI

A similar picture emerges for the period leading up to the 1989-90 crash, when despite significant falls in market value this does not fall below the AMV long-term trend value at all. On that basis, cycle-related risks could have been very substantially mitigated by a lending institution using AMV (rather than market value) to guide its assessment of lending risk at the portfolio level and to moderate its lending over the last two cycles.

Clearly, there are various different ways in which a lender could use AMV and it need not be (almost certainly should not be) the sole determinant of lending behaviour. The key point is that historical analysis demonstrates that AMV can be used to sound a reliable and timely warning ahead of a major fall in CRE prices. The methodology also lends itself to an incremental approach as AMV reflects a growing probability of a major fall. It should be deployed based on a clear market peak mitigation strategy and those using must take care not to fall victim to 'boiling frog' syndrome.

This approach is still based on a portfolio analysis – actual properties perform differently to the data series average and so, whilst granular application of AMV would be effective to significantly reduce portfolio risks, it could not be relied upon to prevent individual loan losses. However, on the basis that the primary objective is to anticipate and reduce market or portfolio level CRE lending distress, exposure to outlying individual loan losses is not a particularly material problem.

Two additional points are worth noting:

● First, this approach does not require or propose the adoption of AMV in loan agreements or loan covenants. For example, the LTV loan covenant would in all likelihood remain linked to market value. The goal is to influence the initial lending decision by highlighting the divergence between market value and AMV.

● Secondly, a lending institution using AMV to inform its lending policy leading up to the peak of a cycle would find it difficult to compete against other lenders that are focused on market value and therefore less attuned to cycle risk. The premise is that this is precisely the point of a market peak mitigation strategy as lending institutions that win a lot of business at the top of the CRE cycle usually end up regretting it.

There would be additional market benefits if either or both of these approaches were widely adopted by lenders. As recommended in the *Vision* report, the regulator could encourage this by incorporating risk assessment, using an approved long-term value methodology, into the regulatory risk assessment framework. One of the next steps recommended in this paper is to develop the thinking about how that might best be done. Applying this approach to all (or at least most) lenders, the net effect on the market place as a whole would be to moderate lending activity and liquidity leading up to the peak of the market. That would likely reduce the amplitude of the CRE cycle and the losses suffered by lenders as a result of the crash. Lenders might also find it easier to lend again after the crash.

Analysis and Application of the Methodologies at the Sector and Subsector Levels

The All Property analysis is particularly well suited to identifying when the market as a whole is overvalued but more granular analysis could enable more accurate insight into CRE risk for lending institutions individually or collectively. For example, one reason for exploring more granular approaches could be to recognise the difference between volatile (if perhaps more resilient), highly internationalised central London, on the one hand, and the rest of the market on the other. Testing the methodologies at the IPD sector and subsector levels is potentially worthwhile, given that a particular sector or subsector may be overheated when the All Property indicators seem relatively benign, but data availability has limited the extent to which it has been possible to do this. Furthermore, the exposure of different lending institutions to different parts of the market may differ in significant ways.

AMV Subsector Analysis

Using AMV (and the simple 20% overvalue / 35% subsequent fall measure derived from the All Property analysis) at the subsector level and 141 quarters of available data history, AMV can be seen to be reasonably effective, but less consistently than for All Property (see Figure 12). Five subsectors have a higher than 80% success rate, while the other five have a success rate of between 57% and 68%. A more sophisticated and graduated use of AMV-based triggers, perhaps differentiated to reflect the characteristics of different subsectors) may lead to more reliable granular results.

In Figure 12, a 'warning quarter' is a quarter in which the index is 20% or more above the long-term trend and a 'correction quarter' is any quarter which was followed by a subsequent fall of 35% or more in the next five years.

Figure 12: **Analysis of 'warning' and 'correction' quarters by market sector**

	All Property	Retail RoUK	Shopping Centres	Retail Whse	Retail SE	Industrial RoUK	Industrial SE	Office RoUK	Office SE	Office WE & Midtown	Office City
Total Qs	141	141	141	141	141	141	141	141	141	141	141
Correction Qs	17	10	23	14	10	15	14	14	25	20	31
% of total	12	7	16	10	21	11	10	10	18	14	22
Warning Qs (positives)	22	20	14	62	30	31	32	16	25	50	32
% of total	16	14	10	44	21	22	23	11	18	36	23
Predicted (%)	100	90	61	100	100	67	100	57	60	90	68
Missed (%)	**0**	**10**	**39**	**0**	**0**	**33**	**0**	**43**	**40**	**10**	**32**

Source: MSCI

The AMV method works best at the All Property level, with some good and some less good results at subsector level. The correlation between the market overvaluation metric (MA, as defined above) and the maximum fall in the subsequent five years for each subsector, as shown in Figure 13, supports this conclusion:

Figure 13: **Correlation between market overvaluation and maximum fall in the subsequent five years**

PAS subsector	Correlation	PAS subsector	Correlation
All Property	-75%	Office Rest of UK	-50%
Retail Southeast	-63%	Industrial Southeast	-60%
Retail Rest of UK	-57%	Industrial Rest of UK	-32%
Shopping Centres	-61%	Office West End and Midtown	-54%
Retail Warehouse	-52%	City Office	-34%
Office Southeast	-49%		

Source: MSCI

IV Subsector Analysis

For a number of reasons already mentioned (principally availability and frequency of data as well as availability and accuracy of rental growth forecasts), a similar quarterly subsector by subsector analysis could not be undertaken using the IV methodology. Aside from the lack of quarterly data, it is likely that rental forecast-based IV predictions would have been less reliable than for the AMV approach. For example, by applying rental forecast-based IV to the data for the City Offices subsector leading up to 2007-08, it can be seen that the relatively strong rental growth forecasts in 2005-06 conceal overvalue, which only emerges at the beginning of 2007 when the market is already approaching its peak (see Figure 14).

Figure 14: **City of London Offices – MV/IV vs maximum subsequent fall**
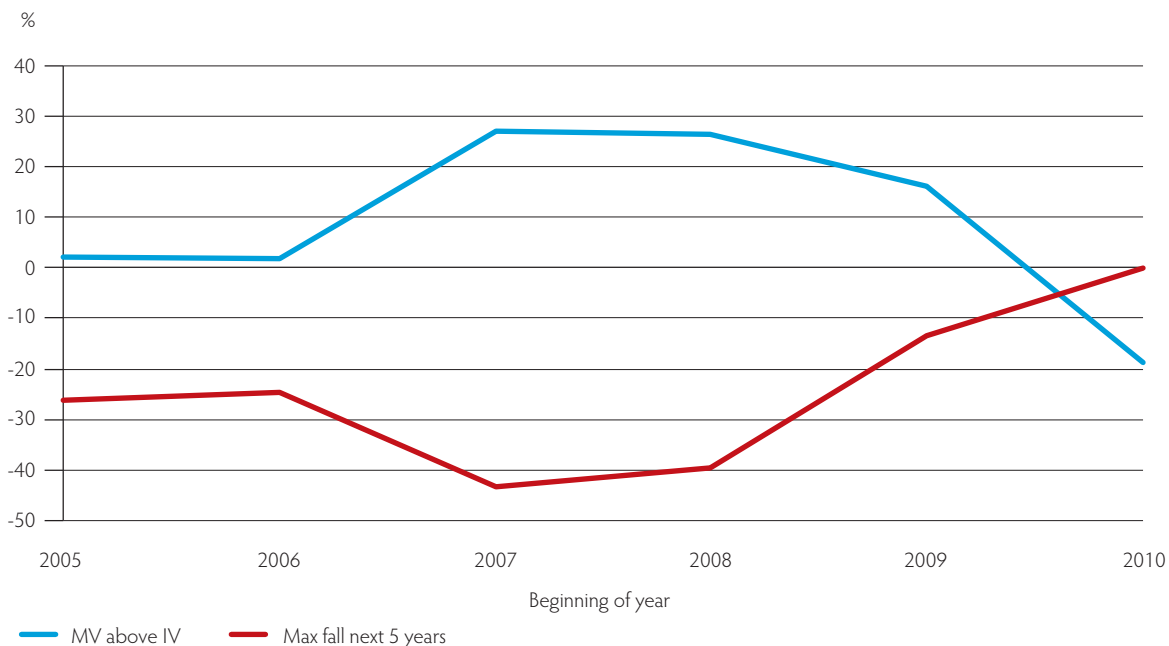
Sources: MSCI, Bank of England, IPF and JLL.

By contrast, weaker rental forecasts for Retail and Shopping Centres meant that the low cap rates translated into the IV model indicated overvaluation as early as the end of 2004/beginning of 2005, as shown in Figure 15.

Figure 15: **Shopping Centres – MV/IV vs maximum subsequent fall**
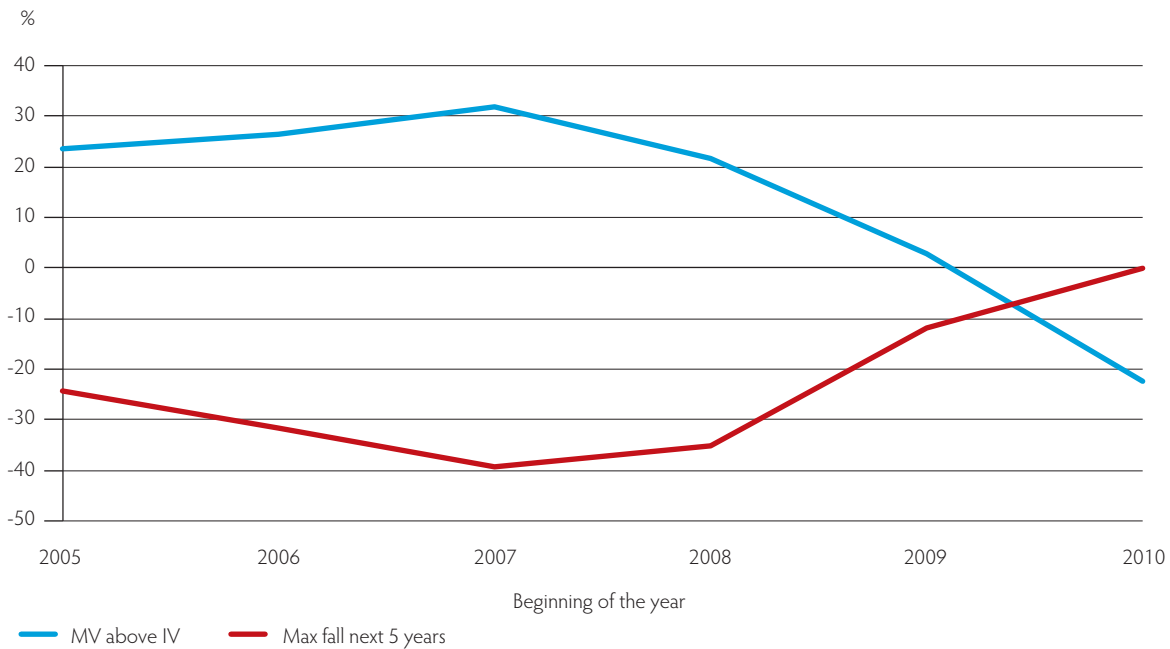

* Dates indicated are as at 1 January each year
Sources: MSCI, Bank of England, IPF and JLL.

As mentioned above, it seems likely that the use of a sustainable rent input for IV that could be analysed on a quarterly basis would make it easier to conduct statistical correlation and probability analysis to link IV overvaluation levels with particular levels of maximum subsequent falls.

MLV Subsector Analysis

Figure 16: **Market value above MLV London Offices 1982-2015**
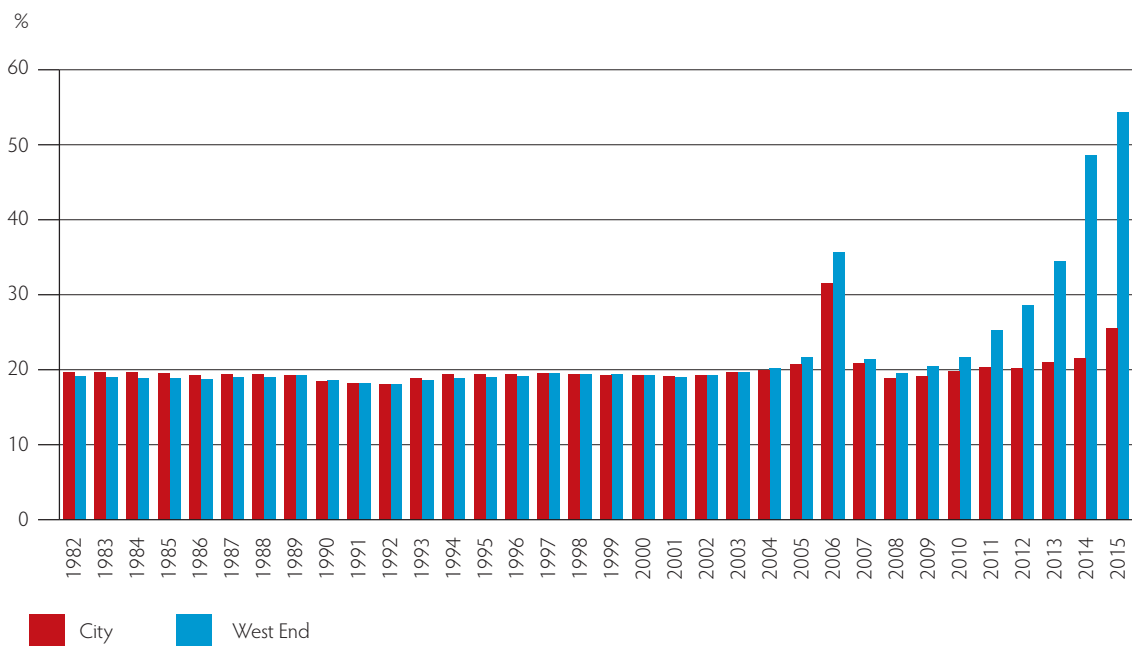
Source: MSCI

Figure 16 shows MLV subsector analysis focusing on London Offices. It illustrates the concern that the methodology as tested does not provide effective advance warning. The analysis also highlights some of the difficulties of applying the technique to data sets where average yields fall while remaining above permitted minimum thresholds.

MLV is closely correlated to market value due to the use of market rent within the calculation. It is only when overvaluation is the result of a fall in cap rates that any major divergence occurs. For almost all of the reference period in Figure 16 (as at year-end 1982-2015), market value was relatively constant at around 20% above MLV and the analysis shows very little advance warning of the 2007-08 peak.

Figure 16 also shows a very wide gap between the City and West End markets in 2014 and 2015. This highlights a weakness in the underlying property data to which MLV is especially vulnerable. The London City Office universe reported to IPD by its predominantly UK institutional data contributors includes a relatively small proportion of prime properties. Prime City Offices are disproportionately owned by overseas investors who are less likely to report to IPD. The MLV banding has used 5.5% as a minimum Offices yield, and while Prime City Offices in 2015 were well below that level, secondary and tertiary City offices had significantly higher (above 5.5%) yields. Applying MLV to this subsector, therefore, fails to identify falling (non-prime) yields in the City (and in certain other subsectors). The result is that MLV trends up with market value without activating the lower banding level. As previously indicated, MLV needs additional research into appropriate banding levels and life cycles, as well as the sustainable rent concept, if it is to be widely applied in the UK.

Application of the Long-term Value Methodologies to Individual Properties

The core analytical approach adopted in this paper has been to backtest the methodologies against historical data to assess objectively their ability to predict over- and undervaluation reliably and in a timely manner. Unfortunately there is insufficient data to complete any comprehensive, statistically-relevant analysis at the individual property level. Whilst a property level application of these methodologies may work, it is almost impossible to prove this by backtesting and a different approach would be required.

In principle, all three methodologies can be applied to individual properties. Indeed, the original and main intended use of MLV and IV is at the property level, and it is possible that those methodologies may perform best in the individual property valuation environment. AMV can also be applied at the individual property level, using a normal market value appraisal and either All Property or, perhaps more appropriately, sector or subsector long-term trend lines, from which the market adjustment percentage can be derived.

However, given the inability to backtest the methodologies at the individual property level, no objective evidence-based conclusions on their effectiveness at the individual property level can be drawn. Of course, it should be possible to look at dispersion levels around the mean to assess how consistently effective property level application may be but, in the absence of readily available data, such an analysis was beyond the scope of this research. The implementation of Recommendation 1 (loan database) of the *Vision* report could potentially address this data deficiency.

Application of the Long-term Value Methodologies in the Current Market

While the analysis in this paper is based on backtesting each methodology against historic data, the underlying goal is to identify a methodology that can act in the future as a reliable indicator that the peak of the cycle is approaching. The methodologies need to be applied and work in real time. The obvious current and recurring question is what they can tell us about likelihood of a major fall in values in today's UK CRE market, particularly against the backdrop of an unprecedented low yield environment.

The most important test is at the All Property level, where the methodologies have been most comprehensively tested and seen to perform best. All three methodologies indicate that the market is currently overvalued, but based on the backtesting that has been carried out, the overvaluation is not at levels that suggest an imminent major fall in values.

AMV, which has been the most consistently accurate methodology historically, calculates a 10% market adjustment for IPD All Property as at the end of 2016. That is well within historic tolerances and below the 20% level indicative of a strong likelihood of a major fall in values within the next five years.

IV (using rental forecasts) sees All Property as being around 5% overvalued at the end of 2016. The difference with the 10% indicated by AMV can principally be explained by the incorporation of the RFR in the IV approach. Overvaluation of 5% at the All Property level using IV is not indicative of heightened risk of a major fall in values, so the substantive conclusion on the current market is in line with that using the AMV approach.

By contrast, MLV sees overvaluation at the All Property level of around 58%, which is substantially above the 'normal' 20% MLV overvalue level, and close to the level it reached in 2006. However, the historic performance of MLV as tested for this study suggests that this warning should be used with caution.

When applied at a more granular level, the three methodologies give conflicting views about the state of different sectors and subsectors, albeit unsurprisingly, AMV and IV both suggest that London and, to a lesser extent, the South East are overvalued, both by reference to their long-term trend and relative to the wider market. AMV suggests that regional markets are mostly undervalued relative to long-term trend, whereas IV suggests all parts of the market are at least slightly overvalued. MLV sees the greatest overvaluation in Industrial, with London (particularly City) bringing the average down[11].

However, the need for caution over the interpretation of the subsector analysis completed to date needs to be reiterated. With none of the methodologies has it been possible to establish a clear and reliable link between any given level of overvaluation and a high likelihood of a major fall in values below the All Property level. Further work may establish such a link.

More broadly, the current market environment will focus minds on whether a methodology (such as IV) which can adjust for changes in the RFR and RP is to be preferred over a methodology (such as AMV) which cannot. AMV ignores the potential 'new paradigm' possibility that the RFR may remain at current low levels for the long run. Nevertheless, using the best available market data, AMV based solely on the long-term trend of real capital values is empirically effective, successfully anticipating every major market downturn over almost 100 years, in a range of different macroeconomic, interest rate and investment environments.

For those who believe that interest rates are a key factor in CRE values and need to be taken into account, the empirical effectiveness of AMV may not be enough. They may argue that an acceptable methodology needs to be able to reflect movements in the RFR. IV can do that; but data availability and forecasting issues have not allowed it to be tested over as many cycles as AMV. Furthermore, more work is required to allow a robust sustainable rent concept to be used in IV instead of rental forecasts. If that known weakness can be overcome, the greater complexity of IV, as well as its potential for more bespoke operation at the individual property level, may offer advantages that AMV lacks.

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11 This assessment of London City may be the result of the way MLV minimum yields interact with the current composition of the relevant IPD universe, discussed in the MLV Subsector Analysis section above.

Conclusions

1. **Long-term value methodologies can serve as a key tool for regulators and lenders to minimise cycle risk in CRE lending:** Compared to the common practice of lending against market value-based LTV (to the exclusion of other value metrics), there is no question that the methodologies analysed in this paper can offer useful insights into and protection from market bubbles. Lenders and regulators must consciously and proactively recognise and respond to the information revealed by this type of analysis, building it into a market peak mitigation strategy. That could be achieved as part of the regular oversight, review and management of CRE lending activity and/or through day-to-day lending decisions. This caveat is important, because historically lenders and regulators have generally failed to take the necessary action, despite evidence that they were aware of substantial overvaluation relative to trend.

2. **AMV applied at the market level is the most effective long-term value methodology based on the work completed so far:**

   a. **Accuracy, reliability and analytical granularity:** At the All Property level, AMV is the most reliable and accurate at predicting crashes, and is the methodology that can be most rigorously and objectively backtested (because it can be tested over four major crashes over the last 100 years, and with quarterly accuracy for the last 40 years).

   b. **Flexibility and ease of use:** It is very easy to calculate and apply AMV at both All Property and subsector levels. It can also be applied at the individual property level in conjunction with market value. However, it should be noted that accuracy levels are diluted the more granular the data set being used, and no testing has been conducted at the individual property level. In addition, importantly, AMV does not rely on any subjective data or judgments – only market values as expressed in the index.

   c. **Limitations:** AMV is blind to structural change. In some respects, this may be an advantage, demonstrated by its consistent identification, using the best data available, of market crashes in a range of different economic and investment climates over almost a century. Over this period, AMV was not adjusted to make special allowances for significant and sustained structural change – but the methodology still seems to have been effective. However, there is still concern that interest rates or other transformational factors might cause values in the future to diverge structurally from their historic trend. In such an event, excessively early warning signals could lead to a potential loss of credibility for the methodology.

   Aside from that point of conjecture, it is clear that AMV functions best at the market level and where a long appropriate data series is available. As indicated, its accuracy is diluted with more granular and volatile data sets, and its predictive reliability is weaker for emerging CRE types and markets.

3. **Weaknesses with rental assumptions in IV and MLV need to be overcome if they are to be used as reliable predictors of market overvaluations:**

   a. **Investment Value:** IV suffers from failing to predict the 1989-90 downturn, principally because relevant rental forecasts were either unavailable or overly optimistic. There is insufficient data to backtest before the 1990s (mainly because of limited rental forecasting data and the annual nature of the core data series). In order to address this, and to improve understanding of correlations between overvaluation and subsequent falls, it is necessary to conclude a more thorough investigation into IV using a concept of sustainable rent to determine whether this methodology can be recommended for use as a reliable early warning mechanism. Further work is also required to assess whether this methodology should be recommended for use at the individual asset level to inform individual lending decisions. Such a move would imply widespread adoption of a new

valuation methodology in the market alongside market value, which is not a straightforward matter. Additional transactional costs would also be involved.

A clear strength of IV is the fact that it can specifically incorporate the RFR, allowing it to be adapted to different interest rate and investment return environments. For that reason, it is worth seeking to address its weaknesses. Another reason for recommending further work is that preliminary analysis using sustainable rent instead of rental forecasts has been encouraging.

    b. Mortgage Lending Value: MLV also fails to anticipate or highlight the 1989-90 downturn, principally because the strictly prescribed methodology (including reliance on market rather than sustainable rent) does not pick up the above-trend rental growth in that cycle. As in the case of IV, the use of an appropriate sustainable rent measure could make a big difference. A broader issue is the fact that other prescriptive parameters of the German valuation methodology would also need to be adapted to the characteristics of the UK CRE market as a whole, where its use is currently limited to lending by certain Pfandbrief-using banks. Further modification would also be required to meet the *Vision* goal of allowing under- as well as overvaluation to be identified, given the different, 'safety first' policy objective of MLV in Germany. Ongoing industry efforts to develop a more international version of MLV could help provide solutions to these problems, so relevant collaboration is recommended (and early stage discussions are already under way).

4. Historic yield and rental trend analysis is central to an effective methodology: All three methodologies adopt some form of recognition of historic capital value norms – as trends, value ceilings or minimum yields – which in each case make a very material contribution to the end outputs. AMV already includes this to a large degree and this research suggests that IV and MLV could be substantially improved for the purpose of identifying a long-term value. Further improvements might be identified by breaking sustainable rental value into its more fundamental components, rather than just relying on past trends.

5. Potential uses of the long-term value methodologies:

    a. Advance warning of a major fall in CRE prices: The AMV analysis of IPD All Property has been reliably effective at sending strong advance warning signals of major overvaluation of the market as a whole. Lending institutions and regulators should consider giving it a central position in risk assessment and management tool kits for broad market and portfolio level risk. The AMV analysis may also be useful when applied at sector or subsector level, although it is less consistently anticipative of major cycle changes than at the IPD All Property level.

In order for IV to work, a more standardised historic trend approach is required on rental growth assumptions. In addition, a more forensic statistical analysis of accuracy and timeliness of predictions and appropriate warning levels should be undertaken before recommending the IV route as a reliable key market indicator.

Although it is a helpful tool to limit lending exposure as the market rises, MLV as designed and analysed so far has not demonstrated that it can reliably predict major crashes. While further modification could significantly improve it, diverging significantly from the statutory German approach to MLV would reduce the comfort that can be taken from its long track record in Germany. In this context, the significant current policy and industry interest in developing a more international MLV concept for the purposes of European banking regulation may be relevant. Coordinating with those efforts may be the most promising way to access the expertise and resources necessary for further refinement of MLV for the purposes of *Vision* Recommendation 4. Existing regulatory regimes have a role for prudent valuations (for instance, Article 126(a)(a) Capital Requirements Regulation) and showing how a long-term approach to valuation might be applied to bank lending.

b. Use as a tool for informing lending policies and individual loan decisions: Had lending institutions and regulators used AMV as a key metric to inform lending policies in recent CRE cycles, lending could have been moderated in the last few years before each major correction, rather than increased. The losses suffered by individual lending institutions and the need for taxpayer support may then have been very substantially reduced, not least because the vast majority of write-offs typically relate to loans made in the two years at the peak of the cycle.

AMV is a powerful tool for managing risk at the market level. Based on the work carried out so far, it would not necessarily be a suitable tool for individual loan decisions or LTV limits. Every individual property is different, and emerging areas and market subsectors can diverge from the most relevant index's historic trend for good reasons. If it is important to have a direct feed from the long-term value methodology to individual lending decisions (as distinct from broader lending policies), further work would be required at more granular levels and to explore the level of dispersion around the mean. As part of this, further work at sector and subsector level is probably required in any event, not least to recognise the divergence between the central London market and the rest of the UK.

When applied to specific properties and where the relevant information can be obtained, IV should provide a reasonable sense check against market value. However, this has been difficult to demonstrate objectively using the backtesting approach adopted for the research conducted so far. Potential improvements to the methodology have been identified and are proposed as next steps.

Not surprisingly, MLV does have uses as a valuation approach for lending purposes. This is best demonstrated by its successful use in conjunction with the 60% MLV-based LTV limit adopted for the purposes of Germany's Pfandbrief covered bond market. However, the prescriptive design of MLV for the purposes of the Pfandbrief specifically seeks to produce a valuation that is conservative across the cycle, by reference to the characteristics of the German CRE market. The principles and prescriptions of MLV need to be better adapted to the context of the UK market and the goals of the *Vision* before it can be recommended.

c. Application of the methodologies in the current market: The methodologies all conclude that the market overall is overvalued – but not to an extent that suggests a major fall in values should be expected within the next five years. Each methodology points to more significant overvaluation in particular parts of the market, but the results at this level are neither as robust as those at the All Property level, nor consistent across the three methodologies. To the extent that the methodologies point to overvaluation in London and the South East, this seems to be a reflection of the attractiveness of those markets to global capital, combined with the current low returns available in global investment markets across all the asset classes.

The fact that AMV (the most reliable of the three methodologies, based on the All Property level backtesting that has been carried out) highlights increasing overvaluation without taking any account of the prevailing yield environment could be seen either as a strength or as a weakness, depending on what one is trying to prove, and how one is using AMV. A narrowly prescriptive approach that depends solely on AMV, particularly if applied at a granular level, may be difficult to justify. However, it seems irrefutable that AMV provides valuable objective context that can be used in conjunction with other indicators to inform a more complex decision-making framework on the current state of CRE markets.

Recommended Next Steps

The analysis reported in this paper has revealed valuable insights that can be effectively applied to reduce cycle-related CRE lending risks. However, during the course of the analysis, it became clear that there were a number of areas where further more detailed work beyond the original scope should be completed. Aspects of the long-term value methodologies need to be refined and tested further in order to improve confidence levels in their statistical reliability, and more work needs to be undertaken at subsector and individual property level to inform or facilitate certain potential practical applications.

In addition, while the *Vision* report recommended placing a long-term valuation methodology at the heart of regulation of UK CRE finance, the way in which that might be effected has been kept firmly outside the scope of this paper. The first goal was to identify and prove a high integrity methodology. Only as this work advances and the contours of possible approaches become clear will it be appropriate to focus on how they might be used by lending institutions and indeed regulators.

Follow-on work is required to develop and refine this analysis, raise its profile to ensure that it is recognised in the lending community and encourage its widespread adoption as an effective embedded market mechanism (which may also be used by applicable regulatory frameworks).

Accordingly, the recommended next steps are as follows:

1. **Start publishing All Property AMV and market adjustment data on a quarterly basis.** AMV is sufficiently proven at the All Property level that the market would benefit from regular publication of the All Property long-term trend line and the associated market adjustment. In the meantime, further work should be carried out as outlined below.

2. **Additional analytical work to refine and better understand the potential range of applications and limitations of the three methodologies:** Sufficient work has been completed to establish that long-term value methodologies, most obviously AMV, are effective at the All Property level and should be an important part of managing lending risk and regulating CRE lending activity through the cycle. However, the following additional work should now be undertaken:

   a. **Sustainable rent:** Develop and adopt a sustainable rent approach in both IV and MLV, establishing where adjustments might be made to account for any potentially fundamental changes in market circumstances, particularly at sector or subsector levels. This larger and more granular data set may then be used to analyse statistical correlations between particular levels of overvaluation and the probability of particular levels of subsequent falls, identifying key recommended warning thresholds.

   b. **RPR/RP:** Review the concepts of the RFR and RP as they apply to different assets and different stages in the cycle, for a more nuanced approach to IV. In addition, consider whether one could justify (and, if so, how one might apply) an adjustment mechanism to AMV that might better accommodate the continuing low yield outlook for financial markets, without compromising its historically based predictive reliability. This might involve merging elements of AMV and IV into a hybrid model.

   c. **MLV methodology adjustments to suit the UK market:** It is clear that if MLV is going to be widely applied to the UK market (potentially unlocking access to regulatory advantages for banks using such a methodology), further work needs to be completed to adapt MLV to better reflect the characteristics of the UK market. While this task is not inherently difficult, judgments and iterative testing would likely be required. Collaboration with independent industry efforts to develop a more international MLV concept is likely to be the best way to unlock the expertise and resources required to carry out this work.

   d. **Deconstruct AMV drivers:** Establish a way of better attributing over- or undervaluation to variations in rental values and cap rates. This would provide greater insights on evolving market dynamics and could make AMV a more sophisticated and versatile tool in the hands of risk managers and regulators.

e. **Review IPD data sets:** If any methodology is going to be actively adopted across the market, it would be valuable to better understand the dynamics and make-up of the IPD indices on which this research has relied. It would be useful to identify structural changes in the composition of the IPD universe over time, as well as how it compares with, and how its performance correlates with, the CRE exposures on individual UK bank balance sheets and across the CRE lending industry. This would help increase confidence levels regarding the suitability of the long-term value methodologies at debt market, individual portfolio and more granular levels.

f. **Subsector and property level analytics:** Further research is needed to assess how the long-term value methodologies might be usefully applied at subsector and/or individual property level.

g. **Granularity:** Institutional and systemic risks associated with CRE lending are a function of the worst loans rather than the average. While correlation across different market segments is generally higher around the cycle peak, the extent of dispersion of individual property performance around the mean needs to be better understood. This is especially so because the methodologies have only been effectively tested at the market level but, having completed the subsector and property level analytics, lending institutions or regulators may wish to apply a long-term value metric at a more granular level.

Some of the next steps identified above should have a higher priority than others. Decisions about precisely what should be done, and in what order, should be informed by the views of stakeholders including lending institutions and other market participants, in the light of this research. Considerations relating to possible regulatory applications will also be relevant, and may shape the content, extent and priority of additional work and how the respective strengths and weaknesses of the methodologies are perceived.

3. **Establish other key metrics:** The *Vision* report was clear that, while long-term value would be a powerful risk management tool, other factors and metrics remain important in the assessment and management of CRE lending risk. For both lending institutions and regulatory purposes, a number of appropriate additional metrics should therefore be identified to be monitored alongside long-term value. They should also be backtested to assess how correlations might feed into prediction confidence levels.

   A list of possible metrics is set out in Appendix 2 of the *Vision* report. From those, yield trend analysis (including spreads over relevant benchmark yields), capital market liquidity levels and bank lending levels are worth highlighting.

4. **Analysis of how the long-term value methodologies could be used in practice:** This is needed both at the level of individual lending institutions and for macro- and microprudential regulators. Further quantitative modelling of the methodologies against real and/or simulated loans and loan portfolios through the cycle could be supplemented by modelling different responses to warning indicators. This should both validate the methodologies and help identify the best way to use them so as to protect financial stability, while minimising the costs to productive investment and economic activity.

5. **Dialogue with lenders:** A dialogue with lenders is critical and iterative (and has already begun). If lending professionals and their firms do not appreciate the usefulness of long-term value methodologies, they are unlikely to embed them into their risk management systems, and warning signals may be missed when the next crash is looming.

6. **CRE loan database:** Implementation of Recommendation 1 (Loan database) of the *Vision* report would assist significantly with the future evolution of effective long-term value metrics by providing comprehensive, consistent and reliable market data.

We will be approaching academics and research houses to discuss these recommendations in anticipation of refining the related follow on work. As part of this, the working papers that underpin the analysis presented in this report will be made available to those selected parties.

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