Approaches for Prudent Property Valuations across Europe

Independent research steered by a coalition of the leading Global and European professional valuers' associations and valuation standard setters

IVSC | The International Valuation Standards Council
TEGOVA | The European Group of Valuers' Associations
RICS | The Royal Institution of Chartered Surveyors

Preface

This paper represents an independent review of concepts, bases and applications of real estate valuations in response to the current EU and EBA deliberations concerning a prudent property valuation approach developed by the Bank of International Settlements within its Basel III guidance.

The paper has been produced in collaboration and consultation with the academic and practicing residential and commercial real estate community. The research steering group included representatives from the three main valuation international standards setters covering the globe and Europe. It also included representatives of the National Associations of Romania and Spain.

In addition the draft paper was circulated and commented on by most of the leading academics within Europe working on this particular aspect of property valuation. The full listing of both the steering group and the technical consultation are set out in the acknowledgements.

The responsibility for the content of the paper lies with the main authors. The paper includes a number of different technical approaches to both the concept and application of a prudent valuation approach. It is not surprising that these different approaches have different names and terminology and a number of papers and approaches refer to long-term value or sustainable long-term value, although we have used prudent valuation wherever possible.

Although responsibility for the detail and technical content lies with the authors, and the three major global valuation standards setters steering this research do not endorse any one particular approach, IVSC, TEGOVA and RICS are supportive of the overall findings of this research concerning the possible implementation of a prudent valuation approach, and whether it is feasible to harmonise practice across the EU. The research identifies the myriad of problems that may be faced but also a template as to what needs to be done over the long term to facilitate any implementation of the Basel III definition.

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May 2021

Acknowledgements

The authors wish to acknowledge the support and dedication of the Project Steering Group which played a major role in the production of this paper, including the provision of material for inclusion in the paper and significant editing and commenting on the contents. They also wish to acknowledge the input and advice of a number of leading academics in the field for their helpful and incisive comments on the draft report which crystallised some of the issues, provided insights into their own work included in this paper, and generally improved the theoretical discussions behind the models illustrated in the paper. The perspectives of practitioners and the users of long term or prudent valuations are also insightful, and we thank those other valuer and user organisations for their advice on the paper. However, the responsibility for the final content of the paper lies with the authors.

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Executive Summary

Aims and objectives

The aim of this paper is – in case the status quo, including the right to choose between the Market Value and the Mortgage Lending Value, cannot be maintained in the CRR – to review and critically appraise the various different prudent or long-term valuation approaches which could align with the Basel III, 2017 definition of a prudent valuation. That definition is as follows:

"Value of the property: the valuation must be appraised independently using prudently conservative valuation criteria. To ensure that the value of the property is appraised in a prudently conservative manner, the valuation must exclude expectations of price increases and must be adjusted to take into account the potential for the current market price to be significantly above the value that would be sustainable over the life of the loan. National supervisors should provide guidance, setting out prudent valuation criteria where such guidance does not already exist under national law. If a market value can be determined, the valuation should not be higher than the market value…"

Although the Basel III definition is intended for the banking community, the consequences of a change in the definition has a much wider impact as illustrated by the International Valuation Standards Council (IVSC):

"Valuations are used for a multitude of purposes across the financial system such as company listings, mergers and acquisitions, funds and investment, financial reporting, auditing, secured lending, regulatory compliance, taxation, litigation, insolvency and insurance. While it is easy to understand the importance of robust and reliable valuations to businesses and regulators, arguably they impact virtually everyone in society – at an individual level, many people have a pension, or purchase a property. At macro level, society as a whole has a stake in public and private investment in areas such as infrastructure, research and development, retail and leisure. The valuations underpinning these are fundamental to the security of the investments, and when a financial system fails to work effectively it is often the taxpayer that ends up paying the price."

(www.IVSC.org/about)

The objectives of the paper are to:

- Identify and discuss the various concepts and bases of value that underpin both current definitions and the proposed definition. It is vital that a full understanding of the basic concepts underpinning definitions of value drives the development of appropriate methods. These concepts include market value and various alternative definitions of value, including both through-the-cycle and under-the-cycle concepts and bases. Different concepts lead to different kinds of approaches and methods. They also identify important issues such as the application to individual properties or to market segments, and data requirements for the different approaches and methods.
- Collect and collate the current knowledge base on the application of prudent valuations and market analysis. This included identifying the different applications within different countries, building off the work of the European Mortgage Federation.

- Identify the current global published academic and industry research into the actual and potential impact of applying prudent valuations. There are currently a number of applications being tested and tried by various organisations including the IMF and some central banks.
- Assess the feasibility of adopting specific measures in different countries.

Applications need to be capable of addressing the issues attached to definitions of prudent value and, most importantly, are coherent and flexible to the requirements of different jurisdictions around Europe.

This paper has the benefit of the support of the three major global professional standard setting bodies identified above who will be individually responsible for producing professional guidance for their members on the application of any prudent valuation methods across the EU and globally.

Findings

It is important to reduce any negative impacts of the operation of residential and commercial real estate markets on financial stability. In particular, financial markets could be partially protected against the consequences of future real estate market cycles by practices that act counter-cyclically rather than pro-cyclically by restricting lending amounts in an up-cycle. Property valuation of real estate assets offered as collateral for loans is one such important practice.

The normal property valuation basis used to value collateral assets is market value. Market value is defined as *the estimated amount for which the property should exchange on the date of valuation between a willing buyer and a willing seller* and represents the observation of the price at which the asset would exchange at the valuation date had there been a transaction taking place on that asset at that time. It does not seek to comment on the behavior of that price either before or after the valuation date and is therefore analogous to the market price of any other financial asset. There is an increasing evidence base that using just the market value can act pro-cyclically due to the relationship between the price of assets and the amount that can be borrowed if no other constraints are applied in rising real estate markets. There is widespread acceptance that additional valuation advice to lenders and borrowers is required and a number of global organisations and institutions have examined alternative prudent valuation concepts and bases.

Research into real estate markets has identified two different types of historic bubble in real estate prices; those related to capital asset prices and those related to occupier markets. Prudent property valuations need to be able to accommodate bubbles in both rental and capital asset values.

There are two different concepts of prudent value. The first is an under-the-cycle model that aims to identify a value that reflects no more than the lowest value of the real estate asset over the term of the loan. There is an existing basis and definition of value, Mortgage Lending Value, which is an under-the-cycle model. This definition of value is used already in a few countries in Europe and has seen most development in Germany and Spain.

The second approach is a through-the-cycle model that aims to identify the fair economic or equilibrium value. This kind of approach model has been used in real estate and other financial markets for a considerable time to try and detect under and over pricing of assets for portfolio management, acquisition and sale purposes but has not previously been applied for the secured lending valuation role.

RICS (2018) provides a simple illustration of the different concepts.

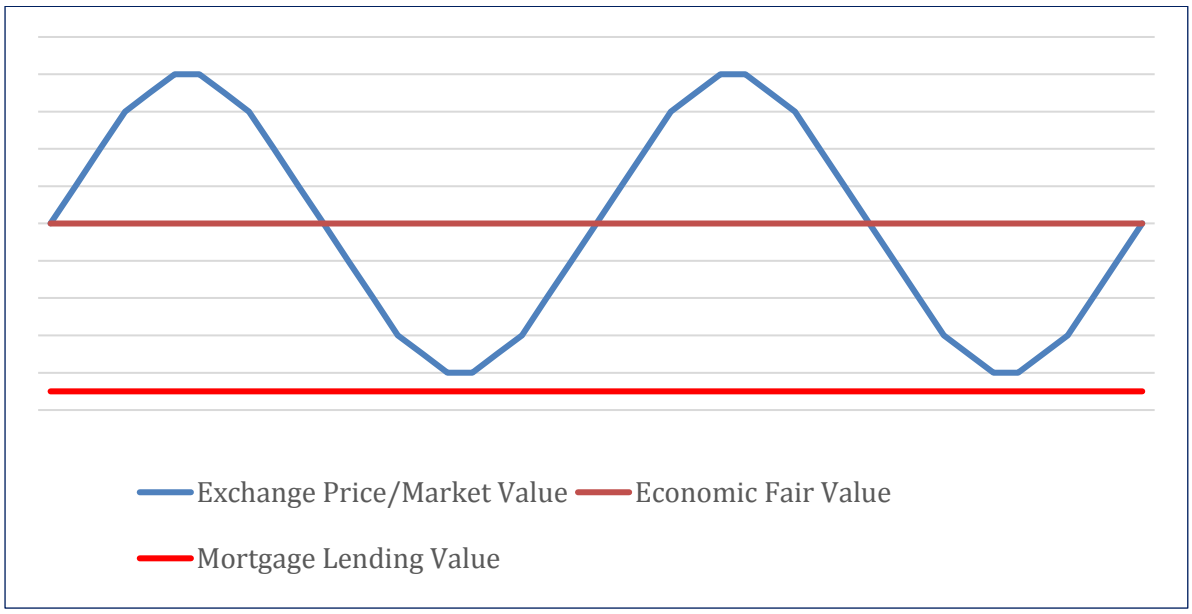


Figure 1: A Stylised View of the Different Approaches to Prudent Value (Source RICS Europe, 2018)

The Basel III definition of prudent value most closely aligns with under-the-cycle models due to the requirement for a valuation which cannot be higher than market value. But, as the definition is principles based and does not prescribe a method, there are a number of different approaches to the determination of prudent value. **Any prudent value assessment should be accompanied by the market value, wherever possible, as this is a necessary benchmark requirement to accord with the Basel III definition.**

This paper identifies a number of different prudent valuation approaches from both the academic and professional valuation literature and links them to the two basic property types (residential and commercial) and tenures (investment and occupation). These models have been established in the real estate literature under the generic heading of Long-Term Value or Long-Term Sustainable Value however in this paper we have substituted the Basel III generic heading of prudent valuation wherever possible.

The paper investigates in detail the application of these different models to these various segments of the real estate market. It concludes that it would be difficult to imagine a harmonised approach across these segments in the near future.

The two major research studies applying different valuation approaches to both commercial and residential real estate, one in the UK and one in Spain, illustrate the difficulties surrounding the development of prudent valuations methods and also isolate the distinction between macro market level analysis and micro individual property criteria.

One of the main constraints to a harmonised valuation method is data availability across the countries of the EU. Data requirements relate to both individual property and market segment level. One of the major factors in market maturity and transparency is the availability of data on transactions and the movement of real estate prices.

In terms of maturity and transparency of real estate markets, the EU has a full range of real estate market maturities from the most transparent and mature markets in the world, with five EU countries in the top ten and ten in the top 20 according to the Jones Lang LaSalle Global Real Estate Transparency Index. However, the EU also has a number of eastern European countries appearing in the semi-transparent category, e.g. Romania, Greece, Bulgaria, Croatia, Slovenia and Serbia.

The variation in data across the EU is matched by the variation in data requirements across the different prudent valuation models tested. Models and methods which are feasible and have been successfully tested in mature markets would not be feasible in the semi-transparent markets until data availability improves. This will take many years to accomplish.

Finally, prudent value is a fairly new concept and application for valuers and the knowledge and skills in this area of practice are limited. There are significant education and training issues attached to any changes to existing practice.

Conclusions

The conclusions of this research are that:

- Full EU alignment with the Basel III standard would necessarily lead to full harmonisation of valuation rules across all EU countries
- The Basel III requirements would require some major changes to valuation practice in a number of countries and it will take time to develop the expertise across the EU as a whole.
- Flexibility is allowed between countries and that would be very necessary if workable solutions are to be found due to the differences in data availability and other national factors, including the knowledge and experience of the valuers.
- The Basel III requirement would be for the valuation to be undertaken at the individual property level. The difficulties with this requirement for many of the prudent value methods is that the long-term past data sets do not exist for some countries in Europe. Even in countries where data is substantial at aggregated geographical and property type segment level, there is no systematic individual past property data, either in the public domain or available to valuers, when undertaking valuations.
- Any method cannot be too prescriptive and needs to be principles based. The guidance on principles would need to be set by the EU (this guidance could be the first significant global guidance and could inform global developments in real estate valuation practice.).
- The EU guidance should be supplemented in each EU country by national guidance addressing any country specific issues. These will include data and market structure. It may also include any differences between investment, development and occupation, and commercial, residential and other segments in individual countries if warranted by the specific institutional or market structures in that country.
- The Basel III definition implies a comparison with market value which must be undertaken to make that comparison. Market value follows the cycle and therefore has been questioned in some quarters as the sole basis for any purpose connected with the

financing of real estate. It is an essential part of any assessment and it would be difficult to imagine any approach which ignores it.

- Methods exist for the determination of prudent value. These can be related to both under-the-cycle and through-the-cycle modelling. The Basel III definition most closely aligns with under the cycle models but a prudent valuation method requires inputs that are common to both models and to Market Value. Elements of all three will be relevant to assessing prudent value under the Basel III definition.
- Many of the available methods for undertaking prudent valuation have been tested at the macro market level and the possible application at the individual property level is part of the additional research required concerning the appropriate criteria and methods of adjustment.
- The required real estate market inputs may be different for residential and commercial property and for investment and occupation, but are based on :
    - current indicators of commercial property rent, capitalisation rate and capital value (in exchange),
    - current indicators of residential capital values,
    - current indicators of residential rental values,
    - housing supply,
    - long-term time trends of these indicators
    - vacancy and stock levels and life cycles/depreciation rates,
- The econometric modelling also requires the drivers of both commercial and residential value and these may include:
    - financial indicators based on long-run risk free rates and risk premia, interest rates, housing finance.
    - demand side indicators such as GDP and sub-sector GDP, consumer expenditure, employment and demographics,
    - Disaggregation of these current and past time series real estate indicators and real estate value drivers.

The applications suggested in Figure 2 will all deliver the basic principles underpinning the Basel III definition of value. These principles include:

- Independent valuation.
- Prudent conservative valuation criteria.
- Adjustments to take into account the potential for the current market price to be significantly above the value that would be sustainable over the life of the loan.
- No adjustments for highly speculative elements (adjusted from the actual wording in Basel III for reasons set out in the report)
- The valuation should not be higher than the market value

Recommendations

We strongly recommend that in the current period of uncertainty due to the COVID pandemic, the existing regime enshrined in the CRR is maintained to provide a level of stability within the regulatory framework. The right to choose from the two definitions of Market Value and Mortgage Lending Value should remain. The applications of Market Value and Mortgage Lending Value are established, standardised, tried and tested and well understood by both valuers and lenders. They have the benefit of a comprehensive information base. Certification and training systems guarantee that qualified valuers can apply the various valuation standards and methods with certainty.

If it is decided that the status quo should not be maintained in the longer-term, the EU should be very wary of prescribing a single approach and EU regulations should set out the broad principles only. The onus should be on individual national supervisors, with appropriate advice from the international and national valuation profession, to provide guidance on the actual prudent valuation criteria where such guidance does not already exist under national law and/or mandatory/discretionary professional standards/guidance.

It is important to note that the implementation of the new definition of value as proposed in Basel III within the new CRR in the short term, if not based upon appropriate evidence and a general consensus amongst member states and valuation bodies on the principles, would result in significant and disruptive changes in valuation practice.

The challenges related to the introduction of a new prudent value approach cover all aspects of property valuation methodology, ranging from the overall concept of value through definitions and data availability to applications at both macro and micro levels. More precisely, the new approach of value needs to be supported by additional interpretation or guidance and valuation standards which have to be competitively neutral, principles-based, transparent and equally applicable in every national real estate market. IT systems would need to be adapted and valuers would have to be trained and certified in the new methodology. These changes will cause substantial alterations to the valuation profession and banking practice and may have a disruptive effect if preparation is inadequate or deficient concepts and methods are employed.

Recommendations concerning the medium and longer-term are:

- The Basel III definition can be adopted as the basis for the development of principles. It reconciles broadly with the existing definition of MLV within the CRR but the statement within Basel III requirements to exclude price increases is flawed. Emphasis should be put on ignoring *highly* speculative elements instead.

- The value for lending purposes should be based on the prudent value or the market value, whichever is lower. Prudent value can be higher than market value therefore it would not be prudent to apply it uniformly, which would also break one of the above principles of the Basel III definition. A prudent valuation must always be accompanied by a market value where possible.

- Over the long-term, the European real estate industry should work with the EU to develop the real estate and related data sources within individual countries. The processes necessary to create some level of convergence of data sources need to be set in motion now in order to provide a framework for harmonization of concepts, definitions, bases, and methods of prudent valuation.

- In the medium-term, we recommend a range of approaches are developed based on the available data within each country with increasing sophistication of method as market maturity and transparency increases. The European real estate industry in conjunction with national valuer organisations will need to develop the training and education requirements necessary to implement the movement towards greater application of prudent valuation methods.

Once these principles and general approaches are agreed, national jurisdictions can research their own countries to develop tailored solutions.

1. Background, Aims and Objectives

The Global Financial crisis had a huge impact on the financial system and society as a whole. Since it occurred in 2007/2008, global financial markets have been heavily scrutinised with the objective of creating more sustainable practices. The Basel Committee on Banking Supervision (BCBS) within the Bank for International Settlements (BIS) identified a loss of faith in banks' reported risk-weighted capital ratios and the need for reform. The detailed guidance within the Basel III accord is driven by a number of objectives based around strengthening the regulation, supervision and practices of banks worldwide, with the purpose of enhancing financial stability. The BCBS aimed to create a banking system that is "*resilient and able to support the real economy and contribute positively to sustainable economic growth over the medium term*". (BCBS, 2017, p1)

There is therefore a balance to be struck concerning regulations which protects global financial stability and also contribute positively to economic well-being and sustainability. When applying the guidance these sometimes-competing objectives need to be weighed.

In the EU, the Basel III recommendations have been implemented through Regulation 575/2013 on Prudential Requirements for Credit Institutions and Investment Firms (Council of Europe, 2013). The major objective of that regulation is set out in paragraph 32 which states:

"Considering the devastating effects of the latest financial crisis the overall objectives of this Regulation are to encourage economically useful banking activities that serve the general interest and to discourage unsustainable financial speculation without real added value. This implies a comprehensive reform of the ways savings are channelled into productive investments. In order to safeguard a sustainable and diverse banking environment in the Union, competent authorities should be empowered to impose higher capital requirements for systemically important institutions that are able, due to their business activities, to pose a threat to the global economy."

Real estate is an important component of the financial system and the search for more sustainable real estate lending markets has been given a high priority in some jurisdictions. This is because the level of lending secured on both residential and commercial property was isolated by some as an important causal factor of the GFC (for example; Duca, et al, 2011, on the US and Ellis and Naughtin, 2010, on commercial property in Australia, France, Spain, Ireland, UK and US). In a recent working paper from the BIS, Kohlscheen and Takáts (2020), using data from the US, Europe and Japan, identify that falls in commercial property prices have a very significant effect on the value of banks due to the large exposures to commercial real estate. In both the GFC and the most recent COVID-19, half of the fall in the value of banks was explained by the level of falls in Real Estate Investment Trust prices. The importance of real estate to the financial stability agenda is emphasised by the European Systematic Risk Board (ESRB, 2018).

Individual factors were different in different countries and they did not behave exactly the same in the run-up to the GFC or in its aftermath. However, regardless of any debate concerning the actual impact of real estate lending on the global financial system, there is enough evidence to suggest that levels of real estate lending in an upturn and subsequent losses in a downturn have a major impact and should be included in the overall scrutiny of that system post-GFC.

Real estate comes in different forms. Commercial and residential property are not very precisely defined in Regulation 575/2013. Article 4 on definitions, paragraph 75 defines residential property as *"a residence which is occupied by the owner or the lessee of the residence, including the right to inhabit an apartment in housing cooperatives located in Sweden"*. Commercial property is not defined so is assumed to be all property not within the residential classification. However different property types can have very different risk profiles (although generally the market performance of different segments within a national property market are highly correlated despite any long-term structural divergences; for example, the general decline in retail relative to logistics and distribution over the last ten years). There is also the question of the differences between ownership for occupation, development and investment which may have some implications for market prices.[1]

One of the major processes within real estate lending is the individual property valuation. Valuations are used for a multitude of purposes across the financial system such as company listings, mergers and acquisitions, funds and investment, financial reporting, auditing, secured lending, regulatory compliance, taxation, litigation, insolvency and insurance. In the absence of real time pricing of identical assets such as that which occurs in equity markets, robust and reliable valuations are important to all users including regulators. Normally they act as an alternative to actual price information as individual real estate assets are not homogenous and are infrequently traded.

Article 208 of EU Regulation 575/2013 sets out the "Requirements for immovable property collateral". Real estate will only qualify as "eligible collateral" if certain conditions apply and paragraph 3 addresses valuations. Real estate values must be monitored frequently, at least annually for commercial and every three years for residential property (more frequently if there is evidence that values are falling). In that case the property value must be assessed independently by a suitably qualified valuer. Institutions may use statistical methods to monitor the value of the property and to identify property that needs revaluation. (Article 208, Paragraph 3). But for loans exceeding 3 Million Euros, an independent valuation must be carried out at least every three years.

Paragraph 65 of Regulation 575 discusses the general approach to valuation of all assets under the Regulation in the context of a prudent assessment of fair value and Article 105 discusses prudent valuation. Prudent valuation should aim to achieve *"an appropriate degree of certainty having regard to the dynamic nature of trading book positions, the demands of prudential soundness and the mode of operation and purpose of capital requirements in respect of trading book positions"* (Article 105, paragraph 1). [2]

Prudent valuation is a major focus for any reforms and both residential and commercial property market valuations are under scrutiny. At present, the EU regulations identify two valuation bases defined within Article 4 paragraphs 74 and 76 as Mortgage Lending Value and Market Value.

Mortgage lending value -"*means the value of immovable property 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"* (Article 4, Paragraph 74).

1 There are instances within markets where identical properties which are let can attract different market prices to those which are owner-occupied. For example this could occur when different levels of security of tenure or taxation regimes exist for owners and renters within a particular jurisdiction.

2 The requirements of Article 105 have been constructed primarily for frequently traded assets which can be marked to market and prudence is conceptualized as being prudent about the bid/offer spread around market prices. This is an exchange price concept which will raise interesting parallels for our discussion around prudent valuation for real estate.

Market value *" - means, for the purposes of immovable property, the estimated amount for which the property should exchange on the date of valuation between a willing buyer and a willing seller in an arm's-length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without being under compulsion".* (Article 4, Paragraph 76)

A number of international organisations such as the BIS and the International Monetary Fund (IMF) plus some central banks have engaged in the post-GFC property valuation debate, and there is a consensus that change is required with more scrutiny of real estate markets and property valuation concepts, bases and methods. This debate has also precipitated a more detailed discussion around property market data.

The BCBS (2017) report entitled "Basel III: Finalising post-crisis reforms" addressed the issue of property valuation by identifying a new definition of value. The definition is:

"Value of the property: the valuation must be appraised independently using prudently conservative valuation criteria. To ensure that the value of the property is appraised in a prudently conservative manner, the valuation must exclude expectations of price increases and must be adjusted to take into account the potential for the current market price to be significantly above the value that would be sustainable over the life of the loan. National supervisors should provide guidance, setting out prudent valuation criteria where such guidance does not already exist under national law. If a market value can be determined, the valuation should not be higher than the market value…"

According to the Basel proposals, only one uniform definition of property value is envisaged; the option to choose between market and mortgage lending value, would no longer apply. In its EU "Policy Advice on the Basel III Reforms: Credit Risk Standardised Approach and IRB Approach" (EBA, 2019), the European Banking Authority (EBA) also emphasises that the requirements of the Basel III value definition "*will no longer allow institutions to solely apply a MV concept […].*[3]*"*

The EBA recommends the EU fully implements the Basel III proposals and suggests "*that the revised European regulatory framework concerning valuation of real estate collateral should be aligned with the final Basel III capital framework".*[4]

The EBA also recommends a "*harmonisation of valuation practices*", which could mean the introduction of a principle-based, uniform valuation basis across EU member states. The EBA concludes that "*further guidance would be needed to fully clarify what banks are expected to do in order to comply with the Basel III value definition*."[5]

These recommendations if implemented as above will create a fundamentally different valuation landscape within many countries within the EU. Some other countries within the EU have lending markets which have already implemented forms of prudent value and the implications for change in these countries may be less.

As indicated above, the EU implemented BCBS proposals within Basel Accords through the Capital Requirements Regulation (EU) No. 575/2013. Council of Europe (2013) reflects Basel III rules on capital measurement and capital standards so it would be expected that the EU would implement the Basel III property valuation definition.

3 EBA policy advice on the Basel III reforms: Credit risk standardised approach and IRB approach, 2 August 2019, paragraph 181
4 Ibid., CR-SA 26
5 Ibid., paragraph 183

This paper is primarily concerned with whether this is a feasible and practical objective. This requires a detailed examination of property valuation concepts, bases and methods but this investigation cannot be divorced from the need to interpret financial, real estate and other asset markets including data availability of past, present and expected future performance. It is essential that international and regional regulatory responses and interventions consider both market data and analysis, and property valuation concepts and bases, in order to properly regulate real estate markets.

The aim of this paper is to review and critically appraise the various different prudent or long-term valuation approaches which could align with the Basel III, 2017 definition of a prudent valuation. The paper has benefitted from the support and encouragement of the International Valuation Standards Council (IVSC Europe), the European Group of Valuers' Associations (TEGOVA) and the Royal Institution of Chartered Surveyors (RICS Europe) which have responsibility for valuation standard setting globally and in Europe.

The objectives of the paper are to:

- Identify and discuss the various concepts and bases of value that underpin both current definitions and the proposed definition. It is vital that a full understanding of the basic concepts underpinning definitions of value drives the development of appropriate methods. These concepts include market value and various alternative prudent value definitions, including both through-the-cycle and under-the-cycle concepts and bases. Different concepts lead to different kinds of approaches and methods. They also identify important issues such as the application to individual properties or to market segments, and data requirements for the different approaches and methods.
- Collect and collate the current knowledge base on the application of prudent valuations and market analysis. This included identifying the different applications within different countries, building off the work of the European Mortgage Federation.
- Identify the current global published academic and industry research into the actual and potential impact of applying prudent valuations. There are currently a number of applications being tested and tried by various organisations including the IMF and some central banks.
- Assess the feasibility of adopting specific measures in different countries. Applications need to be capable of addressing the issues attached to definitions of prudent value and, most importantly, are coherent and flexible to the requirements of different jurisdictions around Europe.

The evidence has been collected via traditional literature review and liaison with a number of National Associations. The technical issues raised by the research have been debated within a technical sub-group, set up by the steering group to include organisations and universities which have a research track record in prudent value and real estate market analysis research. The main authors and members of the steering group and the technical support group are listed at the beginning of the paper.

2. Property Valuation Process, Concepts and Definitions

The appraisal and valuation framework applied across individual countries within Europe for the permanent elements of immovable property and the legal interests therein, has been developed over very many years with an increasing emphasis on harmonisation of both definitions of value and application of methods. Global and regional professional institutions (International Valuation Standards Council (IVSC), Royal Institution of Chartered Surveyors (RICS), the European Group of Valuers' Associations (TEGOVA)) have supported individual national valuation bodies in this standard setting work since the 1970s, culminating in recognised valuation concepts, definitions and methods.

There is therefore an established process for the harmonisation of the valuation process through these regulatory and advisory mechanisms. The process relates to issues such as the qualification, experience and level of training of valuers, including continuing professional development, and the possession of specialist knowledge. It includes the method and procedures for instructing the valuer and advice to credit institutions on the need to ensure that the valuer is appropriately qualified for the specific property market and type of property. Conflicts of interest are an important part of valuation standards and the valuer, in many jurisdictions, must confirm that they are independent of any party interested in the outcome of the valuation.

The inspection and reporting process is also regulated including issues such as the use of reports commissioned by or on behalf of the borrower. Valuation reports should include a number of elements set out in Appendix 5. Most importantly, it should include the valuation figure. In the case of a prudent valuation we are recommending that the market value is also provided in every case where possible.

The regulation of the process can form the basis for harmonisation across the EU and encourages the valuer and the instructing client to ensure the appropriate level of knowledge and skill base.

The development of the valuation skill base has been supported by an increasing academic and industry research agenda that has led to global developments in valuation theory and practice. Global, Regional and National valuation practice is therefore an evolving discipline with a strong research and development capacity. This paper draws heavily on that knowledge base.

There is a wider research base on real estate cycles and a behavioral finance literature which explains some of the conditions which cause real estate (and other) markets to perform cyclically. There is also a literature that identifies a positive relationship between the level of lending in real estate markets and real estate prices (for example, Brunnermeier & Pedersen, 2009) and a smaller literature on lead-lag relationships between lending and real estate prices. It is not the intention of this paper to revisit this literature as the decision of BIS to determine a prudent value definition and the decision of the EU to adopt it signify an acceptance that the current system did not protect the global financial markets from a major correction in real estate (and other) asset prices in 2007-2009 and that the current system needs changing.

Current system are different across countries, but the overwhelming approach of the global valuation industry is to value both residential and commercial property to the same basis; market value. In a survey

of 21 countries within the European region, the European Mortgage Federation (EMF-ECBC, 2017) found that 14 used only market value (MV) as the basis for their lending valuations, four used MV in conjunction with a form of prudent valuation and only two used solely a prudent value (while one response was impossible to interpret). RICS Europe (2018) found it difficult to categorise countries into those that use market value and those that use a form of prudent valuation as many operate both practices according to the particular valuation purpose and/or client. However it suggested that countries that currently rely on market value or similar estimates include Belgium, Bulgaria, Cyprus, Denmark, Finland, France, Greece, Iceland, Ireland, Italy, Latvia, The Netherlands, Norway, Portugal, Romania, Russia, Sweden, Turkey and the UK. The countries it identified as making reference to a prudent valuation, or more specifically Mortgage Lending Value, within regulations include Austria, Czech Republic, Germany, Hungary, Luxembourg, Poland, Slovenia and Spain. It states that Romania has guidance on MLV within national valuation standards but at present valuers are directed to MV. However, MLV is no longer part of the Romanian National Valuation Standards

It should be noted that in the real estate academic and professional literature, alternative models to market value have been established under the generic heading of Long-Term Value or Long-Term Sustainable Value. However, in this paper we have substituted the Basel III generic heading of prudent valuation for long-term value wherever possible, but readers seeking more evidence of the development of these models should be aware that long-term value in the literature and prudent value in this paper have the same or similar meaning.

2.1 Market value

The definition within the EU CRR of Market Value is set out in Section 1. This definition is based on longstanding agreement between international and national standard setters including IVSC, TEGOVA and RICS on the basic principles surrounding the market value definition. It is a value in exchange definition and, therefore, it is the role of the valuer to identify the exchange amount at the date of valuation and *not* to identify an amount that might be correct/expected sometime before/after the valuation date. There are debates around the impact of the date of valuation and the marketing period (a single time point estimate of an asset that takes considerable time to transact) and whether it represents the best amount that might be found or that this best amount needs to be repeatable by other bidders, but these intricacies are immaterial in the current context. The lending valuation informs the lender and borrower of the amount the valuer estimates that the property could sell for at the valuation date. It does not give any information either side of the valuation date and its expected value profile through the lending period.

The cycles and real estate finance literature all point to a major problem with market value as the sole basis for bank lending valuations of individual properties or of markets at a more aggregated level. Despite arguments concerning market efficiency, past analysis would suggest that market prices in both residential and commercial real estate markets are cyclical, and that market value will observe those cyclical movements. In the absence of any adjustments to the loan to value lending ratio, a rising market price will allow an increased level of lending. In the event of any falls in value, those loans can fall into technical default.

There is no counter-cyclical pressure within this process. It has long been argued by those accepting the behavioral paradigm, that there is an element of incentivization and risk shifting which enhances the ability of bubbles to survive longer than neo-classical theory suggests they should (Jensen and Meckling,

1976; Allen and Gale, 1999). The use of debt and the limited liability of both investors and fund managers, encourages them to take risks as they share in the returns but do not take an equal share in the losses. In a study of commercial real estate markets, Graff and Webb (1997, p 37) concluded that these rewards led to "frenzied acquisitions and overbidding" in some market states.

As prices rise, lending levels based on static LTV ratios also rise and this weight of money can fuel more price rises, which in turn allows more lending. There are also questions about the nature of the relationship in a downturn and whether the reverse is true, restricting lending in a falling or fallen market when lenders are forced to replenish their capital buffers. Price bubbles could also be encouraged by relaxed lending criteria, which is what happened in Spain in 2002-2007 in residential.

Regardless of the theoretical economic causation arguments, what is unarguable is the link between lending and real estate prices and the result in 2007-2009 was that, in some real estate markets, there was a sharp downturn in real estate prices precipitating some significant defaults (ESRB, 2018), particularly with loans granted in the last two years of the price boom (Clarke, 2019), with a subsequent impact on the financial system. In these circumstances, a lender requires additional information to inform counter-cyclical behaviours that could reduce the increases in the amount of lending to individual assets – and thus associated risk – when prices are rising above their 'equilibrium' levels, particularly in the last few years of an up-cycle.

There is also an argument that there is an additional counter-cyclical requirement and that is the encouragement of lending when property values are below equilibrium levels. This stems from the situation when lenders have to replenish their capital reserves in the aftermath of a downturn. The losses have been made on loans brokered near the top of any rising markets, which subsequently went into default based on the loan-to-value ratio. At precisely the time when values may be low and lending would be at much less risk, banks are unable to lend to stimulate recovery as they have had to raise capital for their reserves. Failure to lend may damage business efficiency in that good quality new or improved property is not available to support firms, thus hampering recovery from economic downturns that frequently coincide with property market lows.

2.2 Prudent value concepts

There are two different concepts of prudent value: economic fair value which is a through-the-cycle model and sustainable prudent value which is an under-the-cycle model. RICS Europe (2018) discusses these two concepts under the general heading of long-term value and how they relate to the value-in-exchange concept. They represent this in Figure 2.1.

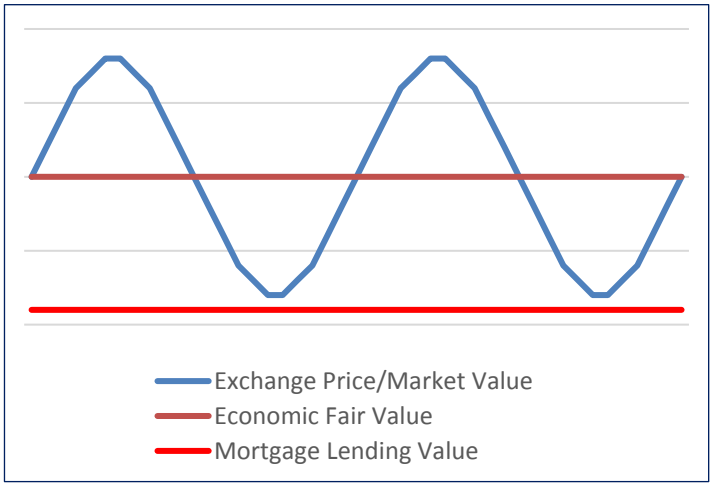


Figure 2.1: A Stylised View of the Different Approaches to Prudent Value (Source RICS Europe, 2018)

What is economic fair value? In the context of investment there are two schools of thought; one based on normative economics and one based on behavioural economics. Discussions of precisely what economic fair value in investing means are generally quite confusing. On the one hand there are references to the value in exchange in the marketplace but there are other references to how it is distinguished from market value by taking account of intrinsic worth. Economic fair value in Figure 2.1 accepts the latter concept. It is therefore not a prudent application of market value, it is a wholly different concept and assumes that the amount paid is in some form of long-term price equilibrium (see, for example, Hendershott, MacGregor and Tse, 2002; Hendershott, MacGregor and White, 2002). It represents rational pricing taking into account future expectations concerning both the property and the market, while market value/value-in-exchange is driven by the market conditions at the date of the transaction/valuation and looks solely at the amount that can be obtained at that point.

Market value may represent rational pricing at any particular point in time but it may also differ from the long-term value equilibrium price (and hence rational price) and can be above or below market value. Additionally, both values can change through time. Figure 2.1 is a very simplistic representation and long-term values are not static through time. This point is reinforced by Cardozo, et al (2017) and Crosby, et al (2020).

However, this form of prudent value is not the only interpretation of the concept and the equilibrium approach fails to accord with the BIS Basel III definition in one crucial respect; "*If a market value can be determined, the valuation should not be higher than the market value".* It is plain from the, albeit simplistic, representation within Figure 2.1 that the RICS Europe (2018) fair value concept of prudent value can exceed market value at certain times within a real estate market cycle.

The second representation of prudent value within Figure 2.1 is an under-the-cycle model which never goes above market value. It could be approached in two ways. . First, it could be a forecast of the lowest amount at points in the future (i.e. a series of future market values over the period of the loan). Second, and the approach that has been adopted by some countries in Europe, it could be an attempt to value the property using the current level of values adjusted for parameters which in effect tend to assume low points in a normal property cycle.

2.3 Prudent value definitions

International and European valuation standards recognise these different concepts in the form of different definitions of value. A through-the-cycle model has been characterised as a market orientated form of **Investment Value** by Crosby and Hughes, (2011) and it is this model that has been used by the International Monetary Fund as driving their approach to the impact of commercial real estate on financial stability in certain countries where the data allows (see for example, Sweden in IMF, 2019). The Bank of England have also cited the prudent through-the-cycle model as driving both their analysis of commercial real estate markets for their Financial Stability Report (BoE, 2015) and subsequent stress tests of the financial system.

The definition used to underpin this through-the-cycle approach was set out in International Valuation Standards (IVS, 2000, S2, para 3.4):

> *The worth or value of a property to a particular investor or class of investor for identified investment objectives*

Recent editions of IVS have amended this definition to a different concept that identifies differences between market value and Investment Value as being driven by the characteristics and preferences of the individual buyer and seller, not the group of investors identified above.

> *Investment value is the value of an asset to the owner or a prospective owner for individual investment or operational objectives.* (IVS 2020, Para 60.1)

This amendment makes the current definition of **Investment Value** less appropriate as the original concept suggests that differences between market value and a through-the-cycle equilibrium model are not solely referenced to the individual buyers and sellers but have some element of irrational pricing by the market as a whole ("*class of investors"*).

The under-the-cycle model is more difficult to rationalise and there has been some commentary concerning these difficulties (Crosby, et al, 2000; Lind, 2005, Bienert and Brunauer, 2007). Conceptually, as indicated above, an under-the-cycle approach is either a future market value based on expectations over the life of the assessment (which may be the loan period) or a principles-based approach.

A future market value is both theoretically and practically quite feasible as real estate investment markets regularly assess the expected capital value in the future, calling it an exit value, within cash flow modelling. The prudent value could be based on the lowest estimate of a succession of exit value calculations throughout the loan period. This approach would put a significant weight on forecasting of inputs into a valuation model and there is a significant literature on the accuracy (or inaccuracy) of forecasts of both rental and capital values in real estate markets. However, Bellman and Lind (2019) studied the application of DCF models within Sweden and comment that exit value should be seen as part of a wider calculation. They suggest that the cap rate used in Swedish valuations is part of a market analysis process using existing discount rates. There is also anecdotal evidence that UK valuers adopting cash flow approaches have identified the exit capitalisation rate as the current capitalisation rate. If a future capitalisation rate is used to identify the exit value, it must be calibrated properly and this can only be done within the wider modelling context suggested by Bellman and Lind.

There is experience within Europe of principles-based prudent under-the-cycle models and we identified countries within Europe which already use such an approach (particularly Germany and Spain albeit with very different interpretations and applications). The CRR definition of this form of prudent value, mortgage lending value, is set out in Section 1. It is also set out in identical format within European Valuation Standards.

The principles are characterised by Bienert and Brunauer (2007) as sustainability (because the value must at least maintain its initial level throughout the complete credit period), avoidance of any speculation (which they define as no appreciation assumptions) and traceability (proof of derivation of the input data and results because banks have very strict requirements concerning the documentation). EVS (2020) 2, para 7.2 emphasises the EU CRR requirements and the avoidance of speculative elements within the valuation. RICS (2018) requires Chartered Surveyors undertaking mortgage lending valuations to report the market valuation.

The major principles are: a prudent assessment, sustainability through time, elimination of speculative elements and transparency. These are highly subjective criteria.

2.4 Reconciliation of the definitions with Basel III

The elements of a prudent assessment, the elimination of speculative elements, sustainability through time and clear and transparent documentation sit comfortably with the Basel III definition and it can only be presumed that BCBS drew heavily on EU experience when drafting it.

For example, the Basel III definition includes "*the valuation must be appraised independently using prudently conservative valuation criteria".* It gives an example of what that actually means (or more accurately what must not be included). *"To ensure that the value of the property is appraised in a prudently conservative manner, the valuation must exclude expectations of price increases*". This specifically excludes positive growth forecasts but not negative forecasts of value falls.

It then describes an adjustment that must be made which is the "*potential for the current market price to be significantly above the value that would be sustainable over the life of the loan".* It is silent on how that is to be accomplished apart from passing that responsibility onto national jurisdictions. "*National supervisors should provide guidance, setting out prudent valuation criteria where such guidance does not already exist under national law.*

The definition creates a paradox. It implies some level of assessment of the potential for values to fall through the loan period but discourages speculation.

Finally, as indicated above, the definition lays down a cap which is the market value where it can be determined. "*If a market value can be determined, the valuation should not be higher than the market value".*

This suggests that a market valuation is an absolute requirement where it is possible to determine market value so that the comparison can be made.

Our interim conclusion is that the Basel III definition most closely aligns with the principles of the current Mortgage Lending Valuation definition (subject to the cyclical markets and property specific issues raised above) and that it also aligns with the RICS Europe (2018) guidance that, wherever possible, an assessment of mortgage lending value is accompanied by a market valuation.

Our first recommendation is that valuations for any purpose which adopt the new Basel III definition should follow this principle and produce both assessments. This recommendation should be included in all IVSC, TEGOVA and RICS professional standards and guidance notes to promote consistent practices around the world, not just in the EU. Mortgage lending value is the lower of prudent value or market value.

One advantage of this recommendation is that it would allow through the cycle modelling to take place if desired but would also implement the principle that MLV can never be above MV. There are market efficiency arguments for identifying under as well as over pricing in real estate markets.

3 Valuation Methods

The academic and practitioner literature on valuation methods is extensive and includes a wide range of possible approaches to the application of the various principles set out above. The different property types also have a bearing on the method adopted. This paper concentrates on the major commercial (retail, office, industrial, warehouse/logistics) and residential property types. It also identifies the differences between owner-occupation and investment.

The Basel III definition doesn't distinguish between commercial and residential. So far, within the context of a prudent value approach, the residential sector hasn't been subjected to as much scrutiny as commercial. There are a lot of similarities between residential and commercial as far as valuation method is concerned. The methods for valuing investment property are usually based on the ability to generate a rental income and the capitalisation of that income stream using capitalisation factors based on required yields and returns on investment capital.

The methods adopted for owner-occupied residential are usually based on direct comparison. In the case of commercial owner-occupation, direct comparison is operated but often in conjunction with an income approach. Residential markets tend to have more legal and political characteristics and interventions affecting both elements of income and return so the major differences are concerning the drivers of rent and the level of risk to that cash flow. In order to put the methods into context, this chapter starts with a brief review of residential markets.

3.1 Residential Markets

There are three different residential sub-markets: homeowner occupier, residential investment and social housing.

The homeowner occupier market

The size of the homeowner occupier market differs considerably across the European countries. The price in those markets can vary over time influenced by economic upturn or downturn, the percentage which can be financed and borrowing rates. The price may be influenced relatively upwards and downwards by significant changes in the neighbourhood (for example, positively in the case of major renovation/ gentrification of the area), by a different composition of the population in that neighbourhood or by increased vacancy or social problem, or by the disappearance of facilities. Residential is affected by political acts at a local, regional or national level.

The residential investment market

Institutional and private investors are active in most European countries within residential markets Investment is based upon net rental income and any expected change in both rental and capital value through time. Institutional investors and other large scale investors tend to invest in larger size blocks of apartments or houses. Residential investors may be mainly concerned with the rental income and its future performance but may have a policy of selling individual vacant units into the owner-occupied

market as part of their asset management policy. This can be affected by the individual country residential tenure laws and any form of rent control which may exist within private rented markets.

The social housing sector

The social housing sector is less market driven and the political influence is high: rents are regulated and maximized, subsidies are given sometimes in land prices or as a subsidy for construction. Tax friendly measures are often in place as are preferable financing conditions which are sometimes guaranteed by government. Tenants, if qualified, can have better protection than other private market tenants and in some countries have permanent occupation rights. In some countries, companies who specialize in the development of private owner-occupied housing have to include elements of affordable and social housing as part of the total development.

Interconnection between the submarkets

There are often opportunities to sell assets from one sector to another. Investors might decide to sell individual units to home owner occupiers. Also, under certain conditions and/or law, social housing companies might decide to sell whole blocks to private investors or individual units to home owner occupiers. So, the possible interconnections between each submarket are very important to the valuation of residential properties in a number of countries and values can be driven by political as well as economic factors. The possibilities of switching sectors may influence values within those sectors. In the main commercial markets are driven by economic factors.

3.2 Comparative Market Valuation

The assessment of market value by a direct market comparison approach should be the easiest valuation in principle and the least problematic. The basic methods are well established and rely on transaction evidence in the main, with some resort to retail turnover, business profitability or costs where the individuality of the use or the lack of market evidence makes comparable techniques inoperable. This is the main approach for valuing residential owner-occupied property, subject to the interconnections outlined above, but can also be used within owner-occupied commercial property markets.

However, there is a literature including some empirical analysis that the application and interpretation of market value causes some significant differences between some countries. These arguments are international but are most significant within Europe and centre on the different levels of “smoothing” of valuations. It has been addressed by some of the leading researchers within real estate over many years (for example, Fisher and Geltner, 2000; Quan and Quigley, 1991) mainly in the context of the development of appraisal-based commercial property indices. They argue that it is rational behaviour for valuers to anchor on past transaction evidence and that, alongside other behavioural biases, this causes valuers to understate both increases and decreases in value through time and thereby smooth the peaks and troughs of actual property prices. Crosby and Devaney (2019) note that there is surprisingly little empirical evidence of this phenomenon. Bond, et al., (2012), Clayton, et al., (2001) and Lizieri, et al (2011) are exceptions with Lizieri, et al. suggesting that smoothing is greater in the fastest moving markets, both boom and bust.

A most useful piece of evidence comes from the work of the major global real estate data providers MSCI in trying to produce transaction-based performance measures to run alongside their valuation-based

indices. They generated transaction-linked indices from their data and compared the volatility (Standard Deviation) of the capital change with the appraisal-based indices for a number of countries and the results are set out in Table 3.1.

Table 3.1: IPD Quarterly Standard Deviations of Capital Returns for Selected European Countries
Source: Compiled by authors from MSCI (2013)

Standard deviation of the quarterly capital returns (%) (2002-2012)			
	IPD Transaction linked index	IPD Appraisal based index	Ratio TLI/VBI
Denmark	6.17	1.05	5.88
France	3.14	1.46	2.15
Germany	4.08	0.33	12.36
Ireland	9.8	5.19	1.89
Netherlands	2.86	1.26	2.27
Norway	6.76	1.36	4.97
Sweden	5.49	1.47	3.73
Switzerland	4.4	0.25	17.60
UK	4.87	3.77	1.29

According to the analysis of transactions, Ireland and the Scandinavian countries have the most volatile markets while it is the Netherlands and France that appear to have been the most stable at a standard deviation of around 3% per quarter. Germany, Switzerland and the UK all fall within the 4%-5% per quarter bracket.

The valuation-based indices do not follow that pattern. First and foremost, they prove that valuers smooth the peaks and troughs of prices, giving additional evidence for those academic arguments. In all cases the transaction-linked indices are more volatile than the valuation-based indices. The ratios are indicative of by how much the valuation-based indices understate the actual volatility of prices.[6]

Second, the lowest ratio or gap between transactions and valuations is in the UK. Although absolute differences are highest for Ireland and the Scandinavian countries, Germany and Switzerland exhibit the highest relative differences. These differences have led to questions about the application of market value within those countries. How is it that market valuations of German and Swiss properties within MSCI indices differ so much from transactions in a sample of those same properties? Although all valuers are using the same definition, are they interpreting it the same or are they applying it very differently? For example, are German valuers already applying an element of prudence and conservatism within their market valuations? It should also be noted that these analyses are of data produced for the performance measurement of funds, not valuations linked to real estate finance.

These analyses raise some important questions for the harmonisation of valuation practices across the EU and other European and international markets. Harmonisation of definitions has occurred across the globe over the last 40-50 years with the introduction and subsequent development of valuation

6 Recent as yet unpublished research on rental value appraisal-based v transaction-based indices of rental values suggest exactly the same smoothing and lagging situation exists in rental markets. Interested parties are encouraged to read Part III, entitled Real Estate Appraisal and Performance Measurement, of MacGregor et al, (2019) for a fuller explanation.

standards. Evolving definitions have been tried and tested and generally agreed but we still have a wide variation in applying these definitions, including even the most basic and well-developed definition of value. It is difficult to envisage harmonisation of practices around a new Basel III definition if we still do not have harmonisation around a formal definition of value that has been around in a similar format since 1977 within the most mature real estate markets, and internationally since 1985.

We have recommended that any prudent value is supported by a market value assessment where possible, so it is important that these valuations are consistently applied across the EU. Given that harmonisation of practices is a major aim for the EU, a research programme into the application of methods within different EU jurisdictions would identify reasons for the differences in interpretation and application and give us the basis for any possible solutions.

3.3 Prudent value – Past trends

In 2007, Bienert and Brunauer discussed alternative models to the established prudent valuation method developed primarily in Germany (German Mortgage Lending Value). One option they discussed was a prudent value derived from market value and this does fit with the Basel III definition particularly the part that states "*the valuation must exclude expectations of price increases and must be adjusted to take into account the potential for the current market price to be significantly above the value that would be sustainable over the life of the loan"*

That section of the definition, as well as implying that the current market value needs to be assessed, also implies that some assessment of the cyclical nature of the market over the loan period and any deterioration of the property over the loan period needs to be considered.

This is not straightforward and these issues are central to all property/real estate investment decision-making. They have therefore been subject to a huge amount of research and development across both residential and commercial property markets. This research encompasses the analysis of past trends and the forecasting of future markets and is coupled with location, use and building change, including the value changes due to obsolescence.

It is not the role of this paper to review this research[7], rather to suggest ways to utilise this knowledge in any valuation system. However, it does throw into question one of the central planks of all prudent valuation definitions which is the removal of speculative elements of prices, part of the existing MLV definition. These statements have to be put into context.

Most of the price paid for real estate is *speculative* of what might happen in the future. We pay now to purchase the future benefits and the future is a "speculation". For example, in the 1980s in some countries with high inflation and high nominal growth prospects, the amount paid for commercial property could be broken down into one-third based on the current level of rental value and two-thirds dependent on expected growth in rental value being realised. In the event even the one-third was not sustainable as the level of rent was already above sustainable rent. There is a need to define what is meant by speculation and speculative elements.

[7] There is an established real estate literature on depreciation (in the investment rather than the accounting sense) and the life cycle of buildings given its fundamental impact on real estate investment returns. Empirical data to establish the actual life cycles and financial impacts is less well established and requires the same prudent datasets discussed in section 4.3.

Prices are risk-adjusted for those speculations and we should assess these statements in the context of trying to remove *highly* speculative elements of the pricing and perhaps apply higher risk rates to elements of the pricing decisions which are less able to be grounded in current or past facts or relationships. Speculation of what will occur over the future is a necessary element to any adjustments from market value. Understanding where we are in the cycle, and how that might evolve in the future are very necessary speculations in order to develop well-grounded prudent valuations.

A prudent valuation model based on a discount to market value must address these questions or it has no basis for the discount. These issues have been central to the development of one group of prudent valuation models; through-the-cycle modelling as practiced by the International Monetary Fund and some central banks and some lending institutions and their advisors.

However, the Basel III definition seems to exclude the use of any kind of explicit forecasting of values within a prudent valuation model. These adjustments, inherent in all pricing, may have to be kept implicit within any valuation model. We recommend that this specific element of the Basel III definition is removed from any EU legislation or guidance and replaced with wording around "highly speculative elements".

There is an alternative to these speculations and the property valuation literature identifies two basic variations, both of which are modelling the past trend to see where current market values are placed within the long-term trend.

The first was called *Adjusted Market Value (AMV)* by Cardozo, et al, (2017) and is simply identifying long-term trends in capital values by reference to past data of capital value movements. The analysis is undertaken in real terms and has relied solely upon long term databases of capital value such as MSCI for its application. The precise technical specification of the AMV model is reported in Cardozo, et al (2017).

Second, Nordlund (2008) sets out his concept of *Reference Value* which he defines as *"the value that a rational investor should come to if he/she assumed that the future would look like the past"*: for example future cash-flows (rental income, operating and maintenance expenses, etc.) would be like those of the past, as would capitalisation rates and discount rates which would revert to long-term averages. In essence this is the same as AMV.

The Nordlund and Cardozo models are based on the same thesis so can be assessed together. Nordlund (2008) does not claim that Reference Value is either true or correct but that any significant mismatch between AMV/reference value and market value must prompt a discussion. *"The idea behind the concept of reference value is that such a situation would need an explicit discussion and an explanation and/or interpretation of why the situation looks like this. Why are the two values not equal? The usefulness of the concept of reference value is based on the idea that it would need stronger arguments to believe that the future will be different from the past, than it would take to believe that the future would look very much like the past. If presentations make differences between market value and reference value explicit, this could lead to clearer arguments about probable causes of the differences and to more rational prices. These discussions would increase the transparency of, for instance, valuations and/or financial reports.*" (Nordlund, 2008).

The analysis set out in Section 4.1 looks at the past performance of an adjusted market value technique based on past trends through a number of major property market downturns. That analysis does prompt those discussions.

As well as being based on reporting differences between long-term trend and market value, these past trend approaches are prudent through the cycle methods and therefore have a number of similar characteristics to the models set out in the next section. But they do not accord with the Basel III definition which states that the prudent value must never be higher than market value. Basel III would be satisfied if the definition was stated as "The prudent value should be the lower of MV or past trend value".

The application is illustrated in Figure 3.1.

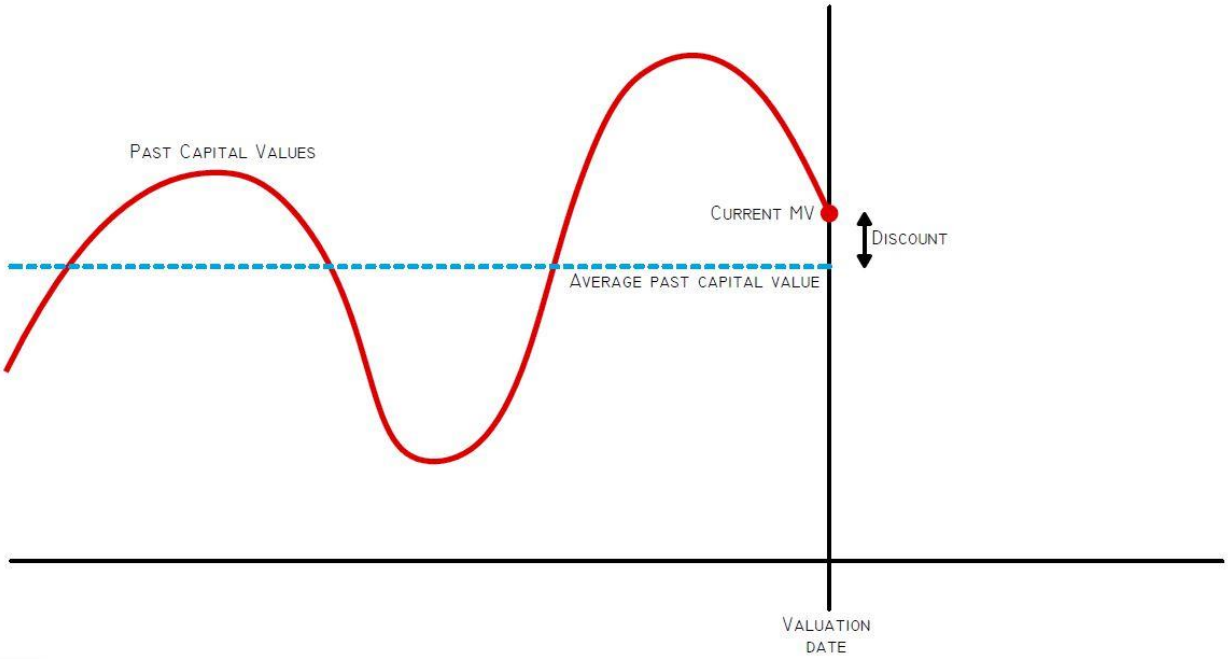


Figure 3.1 – Past Trend Prudent Value Based on a Discount to MV or MV, Whichever Lower.

3.4 Prudent through-the-cycle valuation methods

The past trend value is a through-the-cycle model but does not include any notion of the extension of that trend through into the future. More sophisticated prudent models do that in one form or another. However, all of the through-the-cycle modelling set out below includes some reference to current values and the results are often expressed as over or under pricing by reference to market value, as in the past trend value.

Burston and Burrell (2015) of international real estate agents Jones Lang LaSalle ask the question "What is fair value?" They answer it within a context of modelling past, present and future real estate markets via a comparison of actual prices with rational expectations of prices to identify mismatches through the cycle. They use a conventional financial cash flow model to do that using required returns and forecasts of value change through a five-year time horizon to identify what the present value of the cash flow should be and compare it with the market value to determine any mismatch.

With a small amount of adaption of their model, it is almost exactly the same as the cash flow model used by Crosby and Hughes (2011) to indicate how this type of analysis could have been used to predict the actual downturn in the GFC about two years before it happened. They used UK data and the UK central

bank developed this model for its 2015 Financial Stability Report and subsequent stress tests of the banks they regulate. The IMF have since used it to assess some international markets such as Sweden and the US and are investigating its use in other markets. Appendices One sets out the basis of the cash flow model used to determine the prudent through the cycle value and Appendix Three illustrates an application.

The approach to this application of the through-the-cycle model is also illustrated in Figure 3.2. The rental values are forecasted and those forecasts can be discounted back. It can be applied as a most likely/base case model (Appendix Three) or as a set of probabilities of base case/ best case/worst case scenarios. It also requires a forecast of the exit yield to capitalise the forecasted rent. The PV is then compared to the MV.

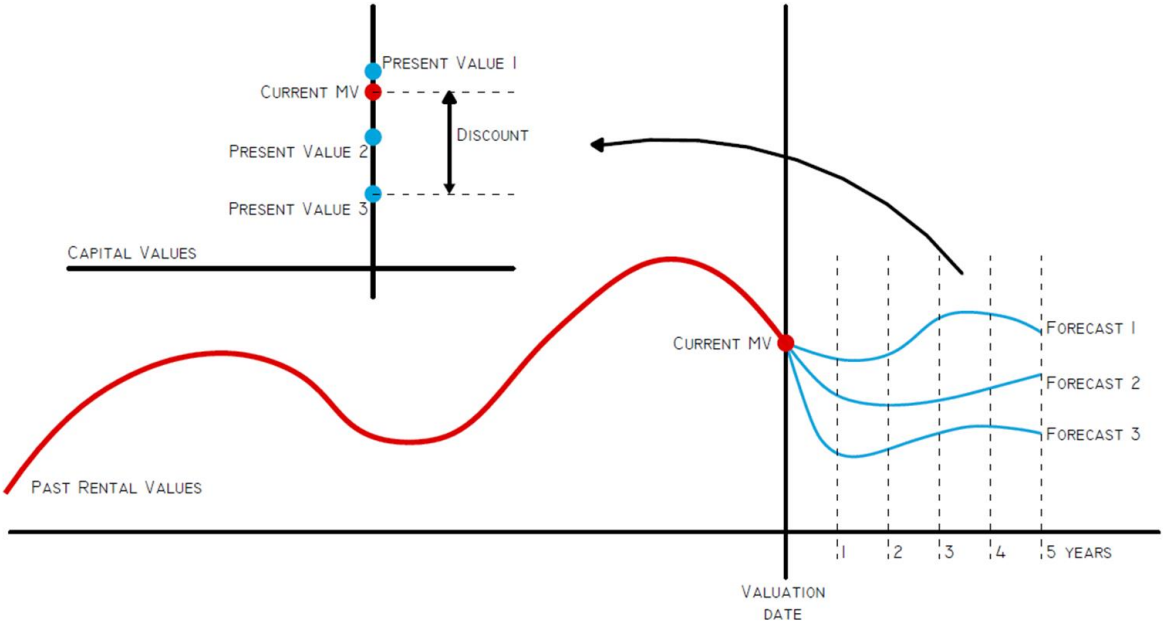


Figure 3.2 – Through-the-Cycle Prudent Value Model based on Cash Flow Income Approach

By definition, as with past trend models, a through-the-cycle cash flow based model will have periods of both being above and below market value and therefore on its own would not fulfil the Basel III definition of value which specifically states that prudent value should not be higher than market value. Again, as before, this can be countered by a definition that states that "The prudent value should be the lower of MV or through the cycle prudent value".

3.5 Prudent under the cycle methods

The longest running, most well established and developed prudent value models are under the cycle models developed primarily in Germany as far back as the early 20th Century. Mortgage Lending Value is applied in a number of other countries and different countries may have different legislative requirements for the application. However, all applications of MLV have some common principles set out in RICS (2018) which reflect quite closely those in section 2.5.

- The usual internationally recognised methods of valuation apply to MLV. The three major applications identified by the European Mortgage Federation (EMF, 2012) for MLV are the income method, the comparison method and the depreciated replacement cost method. MLV is often applied by reference to more than one approach for an individual property; for commercial property this would normally include an investment-based valuation method and a value based on the depreciated replacement cost method.
- The approach requires the valuer to produce a valuation that ignores short-term price volatility. This principle underpins all aspects of the method. Sustainability of any comparative values needs to be taken into account. Information and references to the volatility in specific markets is a pre-requisite of a well-documented valuation.
- Site values and building values are sometimes assessed separately (for example within some German Mortgage Lending Value prescribed methods) with site values based on a value in exchange, subject to an assessment of where land values are within any particular cycle. Building values are based on a limited life cycle and must be depreciated accordingly. These building lives can be prescribed within legislation but where they are not prescribed the valuer needs to take a view on the life cycle of the building and the age and quality of any existing buildings.
- Capitalisation rates should also be based on long term sustainable rates and these are not necessarily the current market capitalisation rates. One approach (for example within the German Regulation on the determination of the MLV (BelWertV)) is to use market capitalisation rates unless they fall below prescribed floors. Where they are not prescribed, the valuer should be aware of how capitalisation rates have in the past fluctuated for the particular market and not use rates that are significantly below these longer-term trends.
- Rents and rental values should be sustainable – they should be based on current market levels but reduced where letting markets appear to be under-supplied and market rents unsustainably high. Over-renting is normally ignored in an MLV valuation. No attempt has been made to specify sustainable rental values in jurisdictions where other inputs have been enshrined in legislation. This may be because, in these jurisdictions, rental values have been historically measured to show low cyclical movements. In jurisdictions where traditionally markets have been measured as having more cyclical movement in rental values, the use of current market rents as a sustainable rent within an MLV would produce significant volatility in the MLV through time. This is particularly apparent where any cyclicality in values is caused by demand and supply mismatches in occupier rather than investment markets. In cyclical rental markets, it is particularly important to consider the basic economic indicators of demand and the supply side characteristics of the location and reduce the rental value input to a more sustainable level where rental markets are perceived to be overpriced relative to fundamental occupier market indicators.
- As with all valuations, irrecoverable costs should be deducted. In some jurisdictions, these are specified in legislation, but these may be inappropriate for the particular market. Where they are not specified in any local legislation or guidance, appropriate deductions should be based on actual lease structure and cost of occupation wherever possible.
- MLV is normally based on the current use of the property. It should only be calculated on the basis of an alternative use when that permission has been obtained or if there is a proven intention to renovate or change the use. The valuation of land for MLV can be undertaken using the usual methods, including residual methods, but, given the added uncertainty surrounding some aspects of land valuation for development, inputs must be specified at a level that pass the

test of *"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*."

These characteristics identify the importance of long-term data sets for yields (and we would suggest rents as the analysis of sustainable rents is a vital part of a prudent valuation model - see Crosby, et al, 2020). Without long-term trend data, past trends cannot be measured accurately and if caps and floors are required, cannot be set accurately. Long-term data is also necessary to monitor properly for any changes to long-term trends. The data issue applies to all forms of market or prudent valuation, not just MLV.

The concentration is on the assessment of past data and trends within it to try and estimate issues surrounding the longer term sustainability of the values and the specific identification of building life and therefore depreciation. Some of the analysis of past data is very similar to that undertaken within through-the-cycle analysis but the emphasis is on the identification of the lowest point in the cycle alone, and there is no identification of the level of over or under-pricing.

At present, as indicated previously, the most prescriptive MLV approach is in Germany and there are a number of prescriptions that work there but may not work across other jurisdictions and market structures. This includes the separation of land and buildings. Land values can be affected by individual site characteristics and in many jurisdictions around the world, comparative valuation methods have been deemed inappropriate for the market value of land due to the individuality of development rights and possibilities. Residual valuation techniques have taken their place as the primary method (See global and regional valuation guidance IVS, 2020, section IVS 410; EVS, 2020, Section II, 9 and RICS, 2019). We would suggest that any prescription regarding a compulsory split of land and buildings would raise significant issues for many countries. There are other measures that can be incorporated into valuations to take account of building obsolescence and depreciation issues rather than a specific building split and life cycle estimate.

Following on from that, yields observable and analysed from market transactions tend to be for the whole building in many jurisdictions and past data refers to this all property yield rather than particular yields applied to particular parts of the asset. In these jurisdictions, the use of past trend data of yields collected at the all property level should not be applied to the life cycle of the building. As indicated above, this is not unsolvable for individual jurisdictions.

Figure 3.3 illustrates the prudent value/ MLV approach.

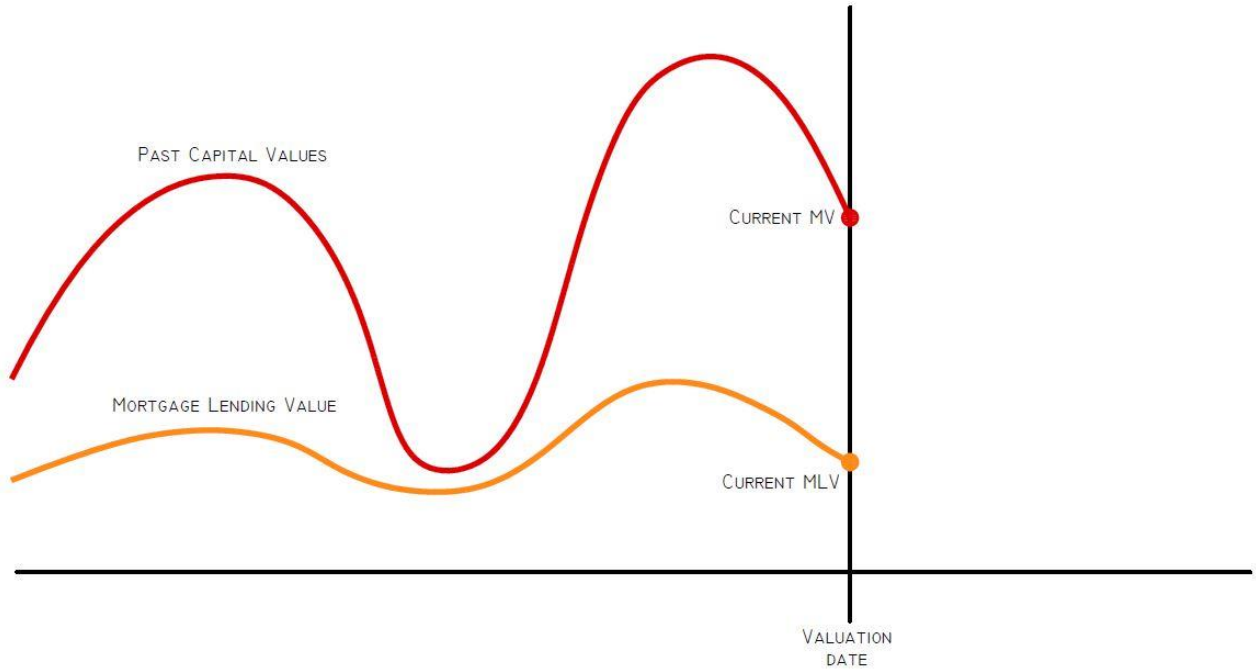


Figure 3.3: Under-the-Cycle Prudent Value Model.

There is a possible variation on the under-the-cycle theme and that is the use of a future market value approach. This can be accomplished by reference to forecasts of the expected exit value at all points throughout the loan period. The forecasting of exit values is a fundamental part of a cash flow approach set out above so cash flow analysis is much more closely related to the through-the-cycle approach than to MLV. Figure 3.4 illustrates.

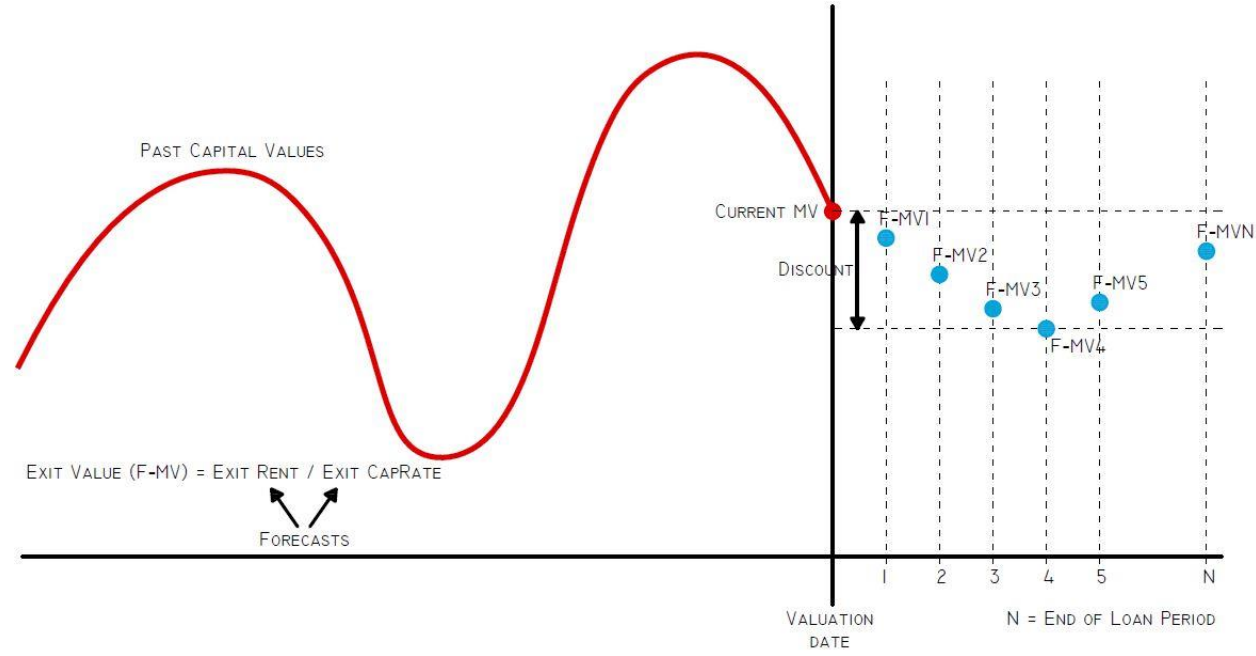


Figure 3.4: Under-the-Cycle Future Market Value Approach

3.6 Summary

This review of valuation methods illustrates that there are two main approaches to valuing property, direct comparison and the income approach. They can both be applied to under-the-cycle and through-the cycle prudent valuations, but the applications will be different.

Figure 3.5 identifies how the comparison approach might be applied to owner-occupied residential property via the two different concepts of prudent value and Figure 3.6 illustrates how the income approach might be applied to commercial or residential investment property.

Figure 3.5 illustrates a future market value approach to under-the-cycle and a past trend analysis to through-the-cycle for more owner-occupied residential property while Figure 3.6 suggests an investment value based approach for through the cycle and either a future market value or mortgage lending value approach to under-the-cycle.

Approach	Method
Through-the-cycle methods	Long-Term-Past-Trend Adjusted Market Value *Identification of the **average capital value** in the past and comparison with current Market Value*
Under-the-cycle methods	Lowest future Market Value *Forecast, through **econometric models**, of **future capital values (in a 5-6 year period)**, and comparison of the lowest of them with current Market Value*

Figure 3.5 – Comparison Method Applications to Prudent Value

Approach	Method
Through-the-cycle methods	Fair-Forecasted Future: Present Value vs. Current Value *Forecasting of **future rental cash-flows (in a 5-6 year period)**, based on **rational/fair expectations** (considering past trends) and discounting them to the present. Comparison of the so-forecasted present values with current market value*
Under-the-cycle methods	Lowest future Market Value *Calculation of future Exit Values, based on forecasted Rental Values and forecasted Capitalisation Rates (Exit Rent / Exit CapRate)*
	Mortgage-Lending Value *Principles-based approach (limited life-cycle, limited cap rates, sustainable rents, deduction of irrecoverable costs…)*

Figure 3.6 – Income Approach Applications to Prudent Value

A number of these applications have already been tested or developed and the next section of this paper investigates this research into applications more closely. The review of the theoretical and conceptual bases of a prudent valuation model illustrates that a number of them rely on market analysis of past trends and relationships to identify where the individual property lies within the cycle of real estate prices. It is not surprising therefore that the most sophisticated analyses so far attempted for both residential and commercial property are grounded in attempts to relate the past cycle of prices to the long-term drivers of those prices using econometric techniques.

There are two analyses related specifically to the identification of prudent value methods. One of these analyses was undertaken by the Universities of Cambridge and Reading using UK data undertaken during 2018 and 2019 and published by the Investment Property Forum in 2020 for the commercial property market (Crosby, et al, 2020). The other was of residential owner-occupied property in Spain, undertaken by a team led by Paloma De La Taltavull at The University of Alicante and published by the Spanish Association of Value Analysis (AEV, 2020). These two studies identify a framework for an approach to prudent value and are summarized in Section 4 below.

4. Application of Valuation Methods

4.1 Underlying principles

The underlying principles of a prudent valuation model have been identified by the Long Term Sustainable Value Network diagrammatically as follows in Figure 4.1 and this framework does accord with the discussion in Section 2 and 3 above.

Figure 4.1 : Prudent Value Framework
Source (Long-term Sustainable Value Network (2018) http://ltsv.info/ltsv/ltsv.html)

Whichever basic framework is adopted there are a set of common principles regarding methods and inputs which can be summarised as follows.

First, the valuation approach can be based on one of more of the major methods adopted by valuers globally. These are the:

- Income approach;
- Comparison approach;
- Cost approach.

The most appropriate choice depends upon the type of property, jurisdiction and available data. If more than one approach is adopted, due consideration must be given to any wide deviations in the respective results in reaching the final value conclusion.

If the income approach is chosen, there are two major elements that have to be assessed; rent and capitalisation factor or yield.

In market valuations, a rent based upon current income or rental value is normally adopted but in the case of a more prudent valuation, there needs to be consideration of the longer-term sustainable rental income. This aspect has received less attention than the yield element in most applications of a longer-term value but the most recent research set out in the next section has that element at the heart of the study. The income must take account of any landlord or notional landlord's irrecoverable costs which vary significantly across Europe depending on the lease contracts within each jurisdiction and it would normally ignore any contractual over-rents.

The income approach includes the capitalisation of the rental income and the same principles as for rent apply. The sustainable capitalisation rate and/or sustainable yield has to be assessed by having regard to relevant long-term trends relating to the respective type of property and its relevant market.

Part of both rental and capitalisation rate trends relate to the life cycle of the building and the impact that will have on both those trends.

The direct comparison approach is used to determine market value but can used to determine a prudent value. However, the principles regarding the use of sustainable prudent values rather than current market values is the same as for the elements of the income approach. In addition to the normal criteria of using comparable sales transactions of similar properties in respect of physical and location characteristics, the comparable sales prices should be assessed in terms of their sustainability and be adjusted, where appropriate. The second case study in the next section identifies how that might be approached.

The cost approach consists of an estimation of the land value plus the adjusted depreciated replacement costs of the building in relation to costs of comparable property. The land value is derived either directly from appropriate actual sales prices, which equates to a direct comparison approach, or can be based on a residual approach for the similar use. The comparative prices and information on construction costs are to be checked by the valuer for sustainability and corrected if necessary (e.g. thorough discounts).

Development or replacement cost elements require the identification of current building costs but also the same requirements as to long-term trends within those current cost elements.

The costs include utilities, site works, landscaping and ancillary costs such as: professional and project management fees, statutory and consent charges, as well as construction costs. Replacement costs do not include demolition costs.

An important consideration in any sustainable valuation is the life cycle of the investment and/or building. The building life can be a physical consideration but with many real estate assets, redevelopment and or refurbishment is a financial life cycle decision rather than a physical wearing out of the building. The rate of depreciation within a cost approach requires an assessment of the remaining life and the effect on that of minor or more major refurbishment. The rate of depreciation in a income approach is a combination of the impact on rental value change through time and the impact on capitalisation rate through time, both of which can be modelled through time for markets and buildings where that data exists.

The rest of this Section of the paper examines the detailed application of the different models based on the discussions regarding concepts, bases and definitions above. We have identified the conceptual base of three possible models, some of which are used in practice and some which have been suggested in the valuation literature as solutions to the problem of pro-cyclical market value.

We now set out an analysis of basic applications of these three different types of model investigating how they would have performed through a number of market cycles in terms of providing decision-making information to governments, regulators, lenders and investor/occupiers. This analysis will illustrate where the models work and where they have limitations.

The next section of the paper undertakes some very basic analysis of the different commercial and residential markets across the EU 27 countries. This analysis is set out in Appendix Two and summarised in Section 4.2. It includes some basic trend analysis and identifies the data problems discussed later in this section.

Next, in Sections 4.3 and 4.4, we undertake a more detailed review of the two major pieces of research into prudent value undertaken globally, introduced in the previous section. The two case studies illustrate that a wide range of analyses and data sources are needed at different spatial levels; national, regional and local, but that many of the alternative models actually use the same basic data. Together they indicate the different level of analysis that is required to operate any long term modelling across both mature and less mature European real estate markets.

We end this section with an examination of data availability in Section 4.5 followed by illustrations of how the models can be applied either at the individual property level (Section 4.6) or at a market segment level (Section 4.7).

4.2 Applying prudent valuation models across mature and less mature markets

Appendix Two sets out an analysis of various European real estate markets. Data constraints limit any analysis of commercial real estate markets to those which have that data, discussed later in this chapter and in Appendix Two. Where the data exists, existing research, including that set out in the next section, illustrates that the downturn following the global financial crisis was entirely predictable and the only major issue is the time frame for that prediction. Appendix Two, using unsophisticated time trend modelling to determine a sustainable, rather than market rent and a long term capitalisation rate floor, illustrates that, in the mature economies with rental value and yield data going back to before the millennium, the spike in capital values emerging in some countries during 2004, should have been causing unease in 2005/06. Figure 4.2 illustrates this for Spain and France and it is also a conclusion from the UK case study in the following section. The prudent value projections for the less mature CEE economies are constrained by the data which does not commence in Poland, Hungary and Czech Republic until 2005.

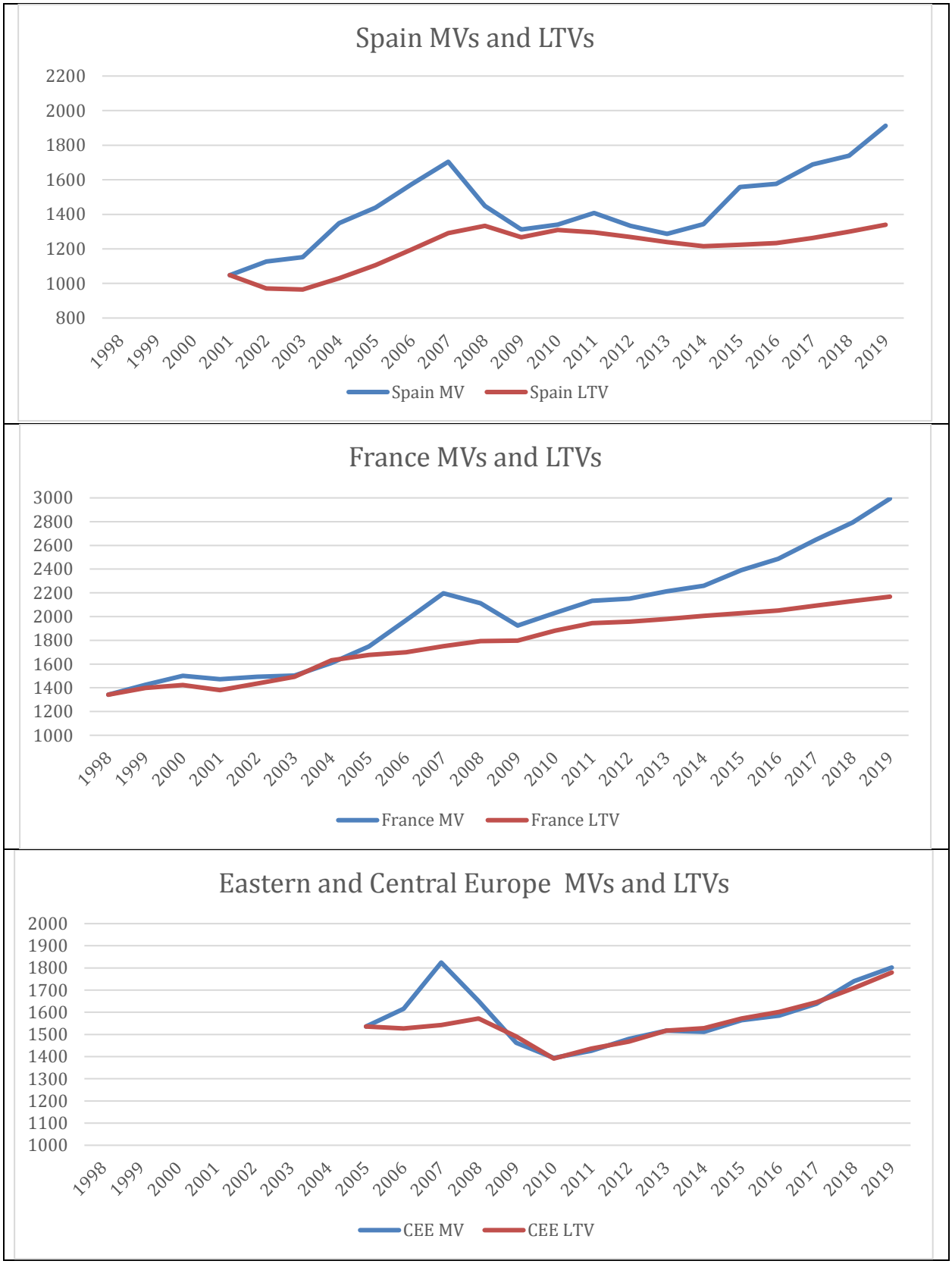


Figure 4.2: Commercial Property Investment Market: Market Value and Long Term Trend Value. Compiled by Authors from MSCI source data.

Appendix Two also addresses simple trend analysis for residential owner-occupied property and identifies issues concerning not just data, which does exist at the global country level, but this analysis cannot benefit from addressing the two components of income and capitalisation rate (rent and yield) possible within investment markets. Analysis which takes into account relationships and value drivers within residential markets will be required.

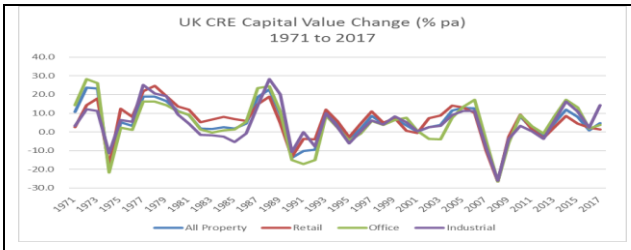
This is also the preferred approach for commercial and the case studies below highlight what can be done in the more mature markets around Europe. But they also show how important the establishment of data bases are for the less mature real estate markets, discussed later in this chapter.

4.3 How do different valuation bases perform through the property cycle - A commercial property case study.

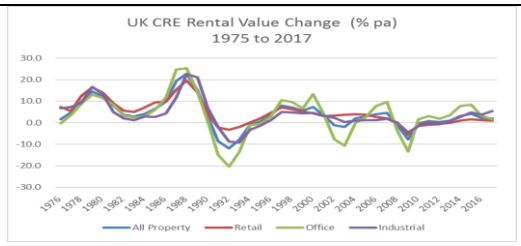
Since the Global Financial Crisis (GFC), a number of governments, central banks and regulatory and industry organisations have realised the role of real estate and real estate data in financial stability activity. However, many markets remain opaque and difficult to research through lack of long-run market data. The most sophisticated and transparent real estate markets, according the Jones Lang LaSalle Global Transparency Index (JLL, 2020), are also the markets with the longest running and deepest data sources, such as the US and the UK which were the first countries to develop indices. Because of this, these are the two markets which potentially provide the most promising laboratories for assessing the impact of revised or supplementary approaches. The fact that both are outside the EU is immaterial to this analysis, in any event the UK case study analysis relates to the period when the UK was a member state.

Following the GFC, the UK real estate professions and industry identified the need for a prudent value definition and application. With the encouragement of the UK central bank and the support of data providers (MSCI, Jones Lang LaSalle and CBRE), the three different type of models (Adjusted MV, through-the-cycle prudent value and under-the-cycle prudent value) were evaluated in a research programme initiated in 2014 which have resulted in two reports (Cardozo, et al, 2017 and Crosby, et al, 2020).

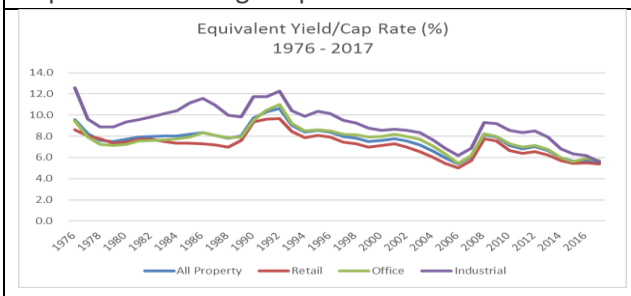
Cardozo, et al, (2017) was an interim report but provided some very useful findings about the performance of the different types of model in two different scenarios; an occupier/rental market downturn and a capitalisation rate correction (capital market downturn). The UK market has experienced both: an occupier market downturn in 1990-93 and an asset market downturn in 2007-09 (See Figure 4.3). Analysis of the 1990 and 2007 downturns provides some major insights into the operation of the different models through the different kinds of cycles and, more importantly, insights into the operation of certain valuation inputs that are common to many of the models proposed. It is these inputs that are the backbone of the various methods.



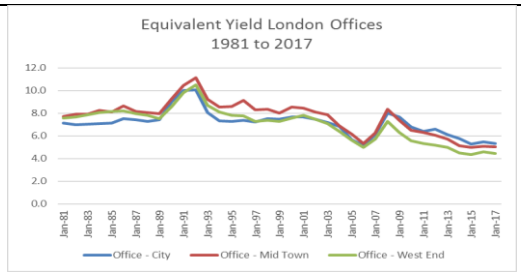
Capital value change % pa 1971-2017



Rental value change % pa 1975-2016



Capitalisation rates 1976 -2017



Capitalisation rates London Offices 1981 to 2017

Figure 4.3 : UK Commercial Real Estate Long Term Performance (Source MSCI)

The Cardozo, et al (2017) report compared the performance of market value, a trend based model, similar to that used in the section above, they termed Adjusted Market Value (AMV), an Investment Value based through the cycle model and a mortgage lending value representing an under the cycle model over the long-term, including the two major downturns.

The AMV model modelled the capital value trend data from 1982 to 2015 (in real terms). The through-the-cycle cash flow approach could only be modelled from 1989 onwards, followed the approach used in Crosby and Hughes (2011) and the Bank of England (Bank of England, 2015), and used:

- a five year time horizon,
- a discount rate based on the UK Government bond rate plus a fixed risk premium
- an assessment of an exit capitalisation rate based on the past 15 years long term average (moving average)
- current rental value
- forecasts of rental growth over the next five years. The time period of the analysis was restricted to a 1989 start point as the forecasting data source did not commence until that date.

There are other variations of this model. For example, the application being developed by the Long-term Sustainable Value Network uses risk free discount rates plus a risk premium and growth rates. Capitalisation rates are calculated from the discount rate less the expected rental growth rate and are therefore forward looking rather than backward trend facing. The basic equation also discounts for an element of depreciation. The LTSV network modelling is identical to Bank of England (2015) but the basis of the input choice is different, and it is the basis of the input choice that has the greatest impact on the performance of the model through the property cycles. These variations of the basis of the input choice were not tested in Cardozo et al, (2017) but were included in the Crosby, et al, (2020) research.

The under-the-cycle model was a simple form of the more formal and prescribed German MLV approach. It used set parameters for caps and floors for capitalisation rates and for life cycles of buildings based on

the German Regulation on the determination of the MLV (BelWertV) and included deductions for outgoings, etc. Crucial to the analysis was that it adopted current market rent as a proxy for sustainable rent. The MLV model is also set out more formally in Appendix One.

The first finding of this research programme was about the nature of cycles. Figure 3 illustrates that the 1990 downturn was precipitated by unsustainable levels of rent rises in the late 1980s and a subsequent correction in 1990-93. Capital values also fell caused by the fall in rents but also a sharp correction in capitalisation rates caused by and subsequent to the correction in rents precipitating a minor banking crisis. In 2007, rents were stable but capital values had increased above long term trend levels from 2004 until June 2007 due to capitalisation rates falling. The initial fall in capital values was initially due to a correction in capitalisation rates but the subsequent financial crisis caused rents to fall, which further escalated the falls in capital values through to 2009.

The second major finding was that the different models did not perform consistently across the two different types of downturn. All of the models successfully identified the 2007 capital asset market downturn and would have been sounding warning signals at least two years before the event (in 2005). This was because the boom in capital values in the 2005-2007 period was driven by interest rate and capitalisation rate reductions and all three models included a major capitalisation rate input or, in the case of AMV, used past trends in capital values. The use of a past trend in capitalisation rates will identify this kind of downturn regardless of which model is used. Most UK loans in default in the GFC were initiated in the last two years of the boom period (Clarke, 2019) so the analysis of long-term past average trends would have created a more sustainable lending environment in the boom market.

In 2005-2007, there was a relatively stable occupier/rental market which meant that the capitalisation rates were not driven by rental growth expectations. In the previous downturn in 1990, rents were not stable and had been increasing at significant rates, accelerated in nominal terms by significant levels of inflation. This in turn was driving capital values. The basic trend AMV model successfully identified this downturn with a similar lead period.

The two prudent value models did not identify the impending rental market correction. There are two reasons for this. First, the use of current rents as the baseline for the valuation (which were rising significantly every year through 1985 to 1989 driving upwards all valuations based on them). Second, the use of forecasts within the cash flow through the cycle approach proved inaccurate. There is a literature on the accuracy of forecasting within real estate markets and forecasts have regularly not identified turning points in rental market cycles. They tend to have an element of momentum within them (forecasting that existing booms or busts continue into the future). Capitalisation rates were very stable through this period and gave no indication of any issues.

The third major finding was that the use of both current rents/rental values and forecasts do not identify impending occupier market downturns the research recommended that sustainable rents using other techniques should be explored.

Subsequently, further research was commissioned with one of the major aims of the research to investigate methods of determining sustainable *rental value*. The existing datasets were expanded and analysis took place from 1982 to 2016 using quarterly data and a much more sophisticated econometric analysis of the through the cycle models (Crosby, et al, 2020). They found that the most accurate way to establish the relationship between market value and prudent value was to use econometric modelling of equilibrium values using methods developed by Hendershott and others in the 1990s/2000s. This method best identified the downturns in good time but is highly data driven and has not yet been replicated in

any of the existing EU countries, due partly to these data requirements/constraints. The findings indicate what might be achieved throughout the EU. In some EU countries with the necessary data they could be developed quite quickly but in others it will be over a decade or two before the necessary datasets can be formed (the research used 15 year rolling windows of past data). This assumes the necessary datasets begin to be constructed in the immediate future. This process could be quickened if past data can be found and assembled.

The final finding is that econometric models are the best indicators of prudent value. However, realistically, the econometric approach, or even the basic trend approach, cannot be put in place across the whole of the EU until this data issue is addressed. At present, although a solution to the prudent valuation harmonisation agenda may be available through these models, at present they do not form a workable solution.

What this research and the analysis of different countries in the previous section does do is identify the basis for such a model.

First it illustrates that not all cycles are the same and valuation models need to be able to pick up both types if they are to fulfil the function of restraining over-lending in an upturn, booming market.

Second, it illustrates that both through-the-cycle and under-the-cycle valuation models cannot just rely on past trends of capitalisation rates (and discount rates) while adopting current market rents. They must also adjust current market rental values to sustainable or prudent rental values. There is no established basis for doing that, although Carduzo, et al (2017) and Crosby, et al, (2020) identify and test the various methods which could be used; ranging from a past trend model using past real rent trends (mimicking the analysis in the previous section) to an econometric model, also based in real values, using long-term trend based supply and demand indicators.

Third, it suggests that a basic past trend based model has been successful in identifying where current market values, for whatever reason, appeared high and action could have been taken to secure more sustainable secured lending and give advance warning of corrections to market prices. However, this model relies totally on past trends and does not relate these trends to any structural breaks in the market. Nordlund (2008) is clear that a trend-based model identifying a mismatch between prudent value and market value is a starting point for discussion, and not the end point. It does not take account of any structural breaks in the data/markets and assumes the future will mimic the past.

Examples of structural breaks are particularly relevant at the moment. Even leaving aside the impact of COVID-19, there has been a major shift in retailing due to changing shopping habits, including on-line. This has precipitated rental value and capital value corrections and past trend based models are now "predicting" that retail segments are heavily undervalued relative to other real estate markets and "industrial" segments are undervalued. This anomaly is of course explained by reference to a shift in the value of retail premises in favour of distribution and logistics caused by the changing habits.

The fourth major finding relevant to constructing a model is that prudent valuation models are not static through time despite the common terminology used for them of long-term valuations. They do have a valuation date and do not "last" through time. They are dynamic. Assumptions change, so the requirement to make sure they are sustainable is a speculation in itself about how markets and properties will change in the future over the lifetime of the loans. Figure 4.4 illustrates this change in values through the term of the analysis from the data underpinning the Cardozo, et al (2017) analysis.

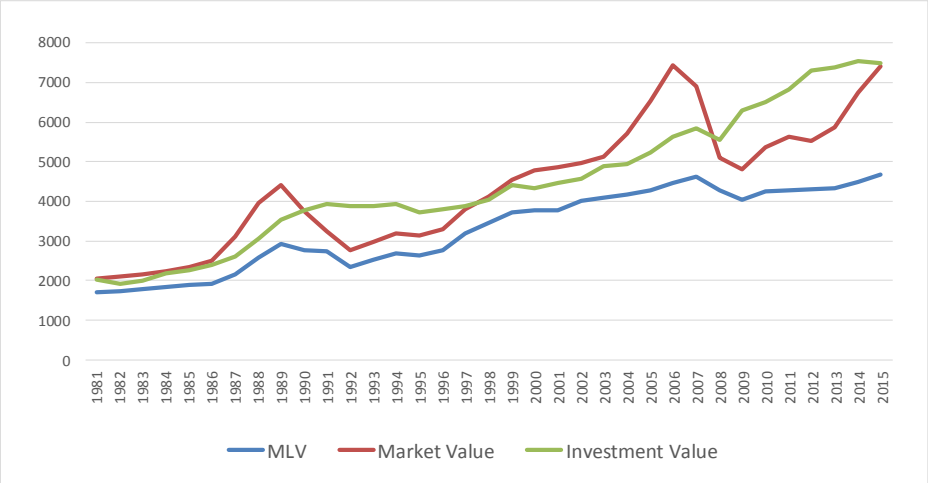


Figure 4.4: Capital Values Through Time Estimated by the Different Valuation Models. UK All Property 1981-2015 (Rental Value £1 in 1981) (Source: Compiled by Authors from Data provided to Cardozo, et al, (2017) by MSCI)

This means that a prudent valuation at a specific valuation date cannot guarantee under any circumstances that the market value will not fall below MLV during the loan period or any other period in the future. No valuation or any other kind of assessment can make that guarantee. The Basel III definitional requirement to adjust to "*take into account the potential for the current market price to be significantly above the value that would be sustainable over the life of the loan*" must be interpreted to have due regard to that possibility. Market analysis of where we are in the cycle is part of that regard and so is a consideration of the impact of unforeseen events, such as COVID-19.

This suggests that Figure 4.5 is a much more realistic interpretation of the different concepts and methods with long term nominal growth in real estate prices being norm with none of the models static through time. This does question one of the principles set out in the Basel III definition, that of the valuation including no increases in prices through the term of the loan.

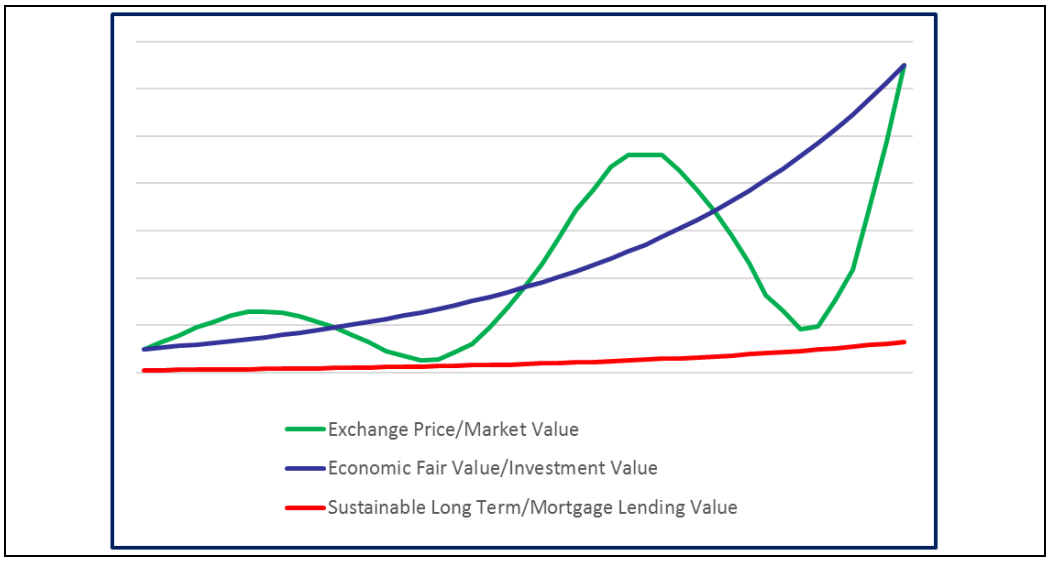


Figure 4.5: An Amended Stylised View of the Different Approaches To Prudent Value (Source: amended by authors based on RICS Europe, 2018)

In reality, not all applications of Mortgage Lending Value adhere to these stylised views. In Germany the Mortgage Lending Value applications are largely under-the-cycle. But Carduzo, et al, 2017 shows that in reality, they may well tend to follow some part of the up-cycle and close the gap between MV and MLV in a rising market. In Spain, this would be even more apparent as MLV tends to be more aligned with adjusted market values. The applications therefore may introduce elements of through-the-cycle.

The research into commercial investment property prudent value identifies that the best performing models are the most sophisticated econometric models where the changes in values are not just related to cycles, but that these cycles can be both rational and irrational depending on changes to the drivers of values. The most successful model for predicting the 1990 and 2007 UK commercial market downturns, and over and under-pricing throughout the cycles, was an econometric model using various demand and supply side variables. For example the rental income predictions were based on real Gross Domestic Product (offices), real Household Consumption (retail) and floorspace, based on their own long-term trends and not those appertaining at the date of the assessment.

4.4 Residential owner-occupied property

The case study for owner-occupied property relates to Spain. The research, undertaken at the University of Alicante and published by the Spanish Association of Value Analysis (AEV, 2020), had the objective of creating an "objective, consensual and technically correct formula to determine the MLV of residential owner-occupied properties."

The most recent housing census carried out in Spain (INE) was in 2011 and at that point there were a total of 25.5 million residential properties[8]. Of these, about 72% (18 million) constitute "main properties", that is, habitual residences, which remain occupied for most of the year. Almost 80% of these main properties are owner-occupied. Spain is thus one of the countries in Europe with the lowest percentage of rental homes (14% of the stock) and one of the most relevant owner-occupant markets.

The basis of valuation applied in a lending context will have a huge impact on market operation and any change to the lending process should research the economic consequences. Like many countries since the GFC, the tightening of mortgage finance in Spain has created a situation whereby the gap between loan and price has reduced demand and shifted it to the rented sector, with a relative booms in rents. It is not the role of this paper to review the housing economics literature but the decision to adopt a prudent valuation basis will have consequences that should be understood by regulators before they make decisions. In some countries, regulation of the residential mortgage sector concentrates on the borrower and what they can afford rather than the property security.

The regulatory context within Spain is that MLV is calculated to comply with the provisions of Article 12 of a Ministerial Order ECO 805/2003:

"The Valuation Company must report, with clarity and including their reasoning, the possibility that the appraised value of the property may experience losses in the future, highlighting the data (past cycles in the same local market, common expectations among experts, volatility assessed in the price of its comparable properties; market dominated by speculative elements etc.) at their disposal regarding the

[8] More recent figures (MITMA) reveal that in 2019 that volume had grown up to 25.8 M.

characteristics and situation of the relevant property market. […] The estimate must be based on solid data available on the economic circumstances of the local market, and the caveat must mention that probability, substantiating the existence of such probability and the data on which the company's estimate is based". (AEV, 2020, p2)

Also contained in this regulation is the obligation to eliminate the "speculative gap" in any valuation carried out by the comparable method. The specifics of this appear not to have been ever applied as the speculative component is difficult to isolate and the Bank of Spain did not prescribe a method. This raises issues of prescription and education where the definition is vague.

The fact that in Spain it is so infrequent (in relative terms) to rent a home instead of buying it means that, in general, residential properties are practically always valued by the comparison method, and not by DCF methods, since it is considered that, in most local markets, it is "unlikely" that a house will be exclusively used for rent. AEV (2020) also identifies that the comparison method is used to determine both market value and Mortgage Lending Value by directly linking it to what it terms as the "adjusted comparison value", as indicated in Article 20.3:

"(Applicability of the Comparison Method): *this method is used to calculate two technical values called the comparison value, which is used to calculate the Market Value of a particular asset, and the adjusted comparison value, which is used to calculate its Mortgage Lending Value*." (AEV, 2020, p2)

The Ministerial Order specification of MLV accords broadly with the definition of MLV set out in EVS (2020) and the new definition within Basel III. The application of method and the limitations of the applications are therefore relevant evidence for the application of the Basel III definition to owner-occupied residential property (and other property not normally valued by investment methods (rental capitalization).

AEV (2020) identifies two possible approaches to Mortgage Lending Valuation applications in Spain; an adjusted market value or a conventional mortgage lending value using sustainable inputs and the expected life of buildings. AEV (2020) points to a lack of a specified method for MLV calculations with the result that *"Spanish Valuation Companies have been determining the Mortgage Lending Value under individual criteria, with their own methodologies and with less effective overall results than would be desirable".*

The research commenced in a very similar way to the previous commercial case study in that it concentrated on the study of real estate cycles as the obvious mechanism for determining any mismatch between residential prices and longer-term sustainable values. It adopted an econometric modelling approach and sought to identify the connections between residential prices and external factors. Initial investigation identified the long-term relationship between residential prices, GDP and employment from 1986, but that full extent of the cycle of prices was not explained by these two factors. Figure 4.6 identifies two spikes in residential real estate values in the late 1980s and the pre-GFC era, very similar to the timing of the commercial real estate price peaks in the UK.

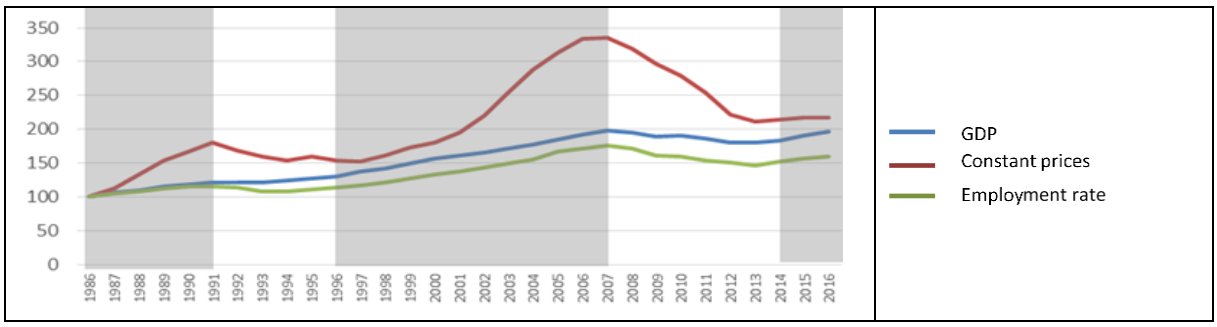


Figure 4.6: Spain – Residential Real Estate Constant Prices, GDP and Employment 1986-2016
Source : AEV (2020)

The Spanish case study also identified the ability to obtain mortgage finance as a main contributor and concentrated on the relationship between rent and capital value, noting that in the 2007/2008 downturn rents and capital values diverged significantly. In effect, they hypothesized that rent was a truer reflection of the real economic level of the demand for housing and that any identification of a long-term divergence of the rental and capital markets was an indicator of a bubble and the market value of the asset should be adjusted down to that long-term relationship. AEV (2020) introduced mortgage payments as a major input into that relationship comparing rent to payments (Figure 4.7) and this again identifies the bubble in 2005-2007.

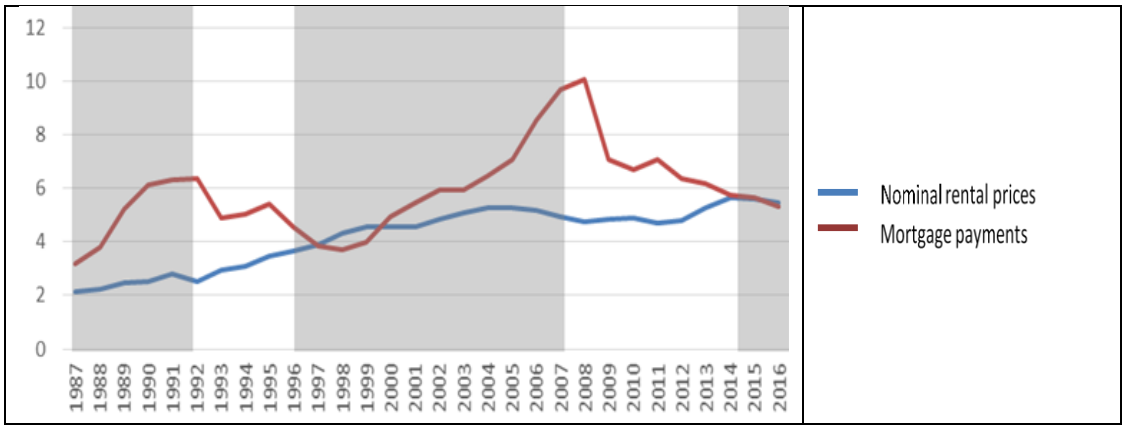


Figure 4.7: Spain – Residential Nominal Rents and Mortgage Payments 1986-2016.
Source: AEV (2020)

However, they made it clear that the appearance of bubbles cannot be defined directly by a single parameter and they needed to identify multiple indicators. They set themselves **two objectives**. **First**, a method that *"allows the determination of a prudent value at the time of the valuation, mitigating the effect that the birth of a possible bubble may be having on prices*" and **second**, a method which is able to *" analyze the upward or downward trend of prices in **the 6 years** following the granting of the loan, in such a way that the sustainability of the certified value is pursued for at least the next 6 years"* They also noted that MLV cannot, predict the value of real estate in the lowest point of the price evolution curve during the life of the loan, but did aim to do that at for the sixth year of the loan based on their analysis of loan defaults.

Anchoring their analysis on the element of the Ministerial Order relating to "solid data available on the economic circumstances of the local market", AEV (2020) used an econometric model applied to a disaggregated dataset of 271 municipalities of more than 25,000 inhabitants (clustered in 8 groups) for which *public* statistics on appraised prices were available. This covers a large percentage of the transactions that take place in the Spanish market. In the case of Madrid and Barcelona, the disaggregation was to 31 different districts across the two cities.

Data requirements for the modelling were relatively high and included variables related to transaction levels, rents, CPI, age distribution of the population, percentage of primary residences, number of people in the household and percentage of population born in the EU.

The AEV (2020) research aims is to provide an adjusted market value based MLV as illustrated in Figure 4.8. For residential owner-occupied property, this approach to a prudent valuation appears to be the most promising, whether it be by means of sophisticated modeling or more basic past trend analysis, dependent upon data constraints.

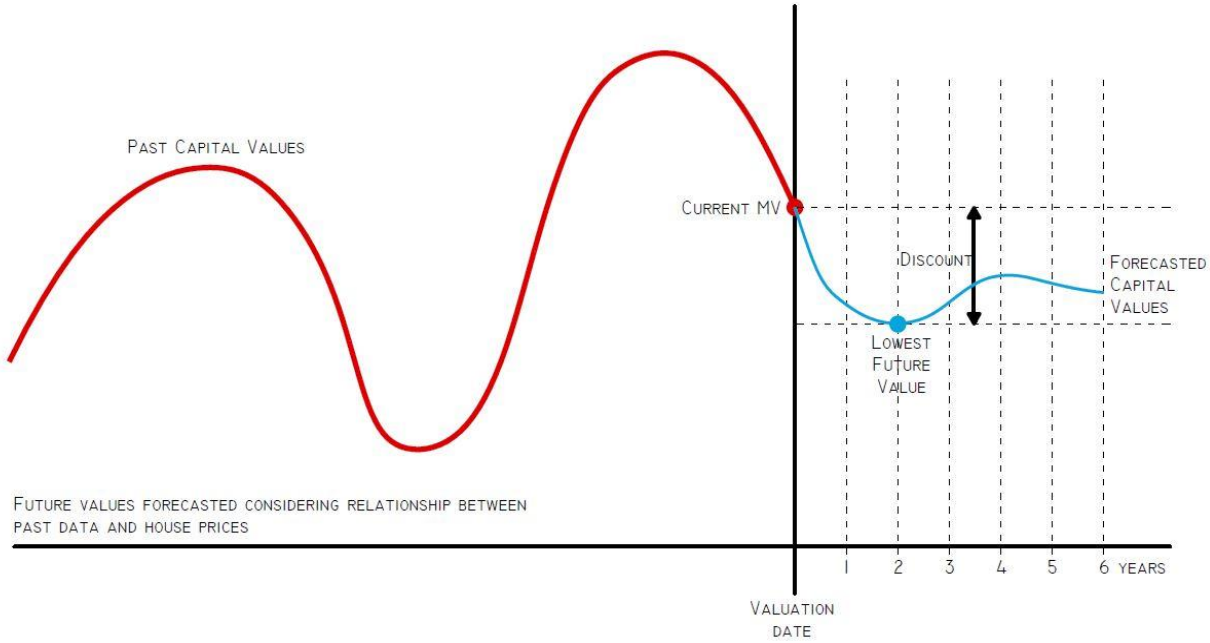


Figure 4.8: Residential Owner-Occupier Adjusted Market Value

The Spanish case study enables the identification of a number of principles and criteria which will be valid for other markets as well.

The first principle relates to the valuation method to be applied to owner occupied properties. Owner-occupied residential properties are practically always valued by the comparison method which leads to the second principle, which is that the first valuation basis to be applied to owner-occupied residential property would be the market value.

The second principle is the requirement for an adjustment to transpose market value into a prudent valuation approach. Hence, the outcome would be an adjusted comparison value where the adjustment requires measurement at the individual property level.

Third, the measurement of the adjustment requires a model which could be implemented on a pan-European basis. Such a model could consist of the following two components:

- *A macro-economic component:*

This component aims at identifying the mismatch between residential real estate prices (market values) and longer term sustainable values. Valuers would be required to measure this mismatch and related market volatilities by analyzing past cycles property data. In case of missing longer-term market data or incomplete property data sets, the model should seek to identify the long-term relationship between residential prices and external economic factors such as inflation, GDP, demographics, consumer expenditure, employment rate etc. Misalignment of figures, e.g. spikes of house prices vs. the chosen macro-economic ratios would provide evidence of the existence and the size of price bubbles.

A similar assessment could be carried out on the basis of a correlation analysis between rent and capital values where the misalignment of data curves would act as an indicator for a bubble. These assessments are undertaken at the market/sub-market level

- *Micro-economic component:*

The second driver determining the amount of the discount to be applied to the market value applies at the level of the individual property. A quality assessment of the individual property on the basis of its main characteristics shall be carried out. The valuer would be required to develop a precise set of criteria allowing to assessing the quality of the property in its local market.

Appendix 6 of this study provides a residential property quality ratings schedule which can be used as a template and/or be developed or adapted to the relevant national circumstances.

Evidence derived from both components provides the basis for the determination of the adjustment to the market value. This approach appears not only suitable for all European owner-occupied housing markets but can also be developed further to a trend-based model allowing to assemble data sets able to explain and predict price trends of real estate in its longer-term context.

Regarding these principles of approach, the two case studies of the commercial and residential markets are very consistent. They both adopt an econometric approach and attempt to develop the datasets to enable the models to explain and predict the price of real estate in its long-term context. In both case studies, the models are still under development, but both represent through-the-cycle modelling with comparison to market value to create an under the cycle model. And both have been developed and applied at the macro, market level so far with disaggregation dominated by data availability in the case study markets.

Both studies make the same point concerning the single time point of the valuation and the ability to predict through the loan period but both models can be used to provide some analytical basis for assessing the movement of prices to “equilibrium” levels. They are trend-based models in that they are grounded in past relationships between real estate markets and the drivers of real estate prices but are more nuanced than basic trend models and can pick up structural breaks so long as the independent variables have some measures representing the underlying change. In that sense they are dynamic and evolving all the time.

The level of sophistication of these models, both residential and commercial, is related to the quality, disaggregation and timing of the datasets on which they rely. Given that, they represent the future rather than the present due to the data issues and considerations set out below.

4.5 Data issues and considerations

Real estate data issues are well understood as a major problem. Silver and Graf (2014) of the International Monetary Fund note their importance for economic analysis, monetary policy, financial stability and prudential supervision.

Two questions arise. The first is the variation of data sources around the EU which mimics the position globally. The second is the data requirements of any harmonised approach; whether that be a harmonisation around broad principles or around a more detailed prescribed approach.

EU real estate markets differ markedly. The Jones Lang Lasalle Global Real Estate Transparency Index (JLL, 2020) measures the transparency and maturity of global commercial and residential real estate markets and the EU countries are represented across a range from highly transparent to semi-transparent. France lies fourth overall behind the UK, the US and Australia. The Netherlands, Ireland, Sweden, Germany lie 7th, 8th, 9th and 10th with 5 more EU countries placed between 11th and 20th and 6 more between 21st and 30th.

A number of eastern European countries appear in the semi-transparent category and Figure 7 below shows that countries such as Romania, Greece, Bulgaria, Croatia, Slovenia and Serbia are not improving very quickly.

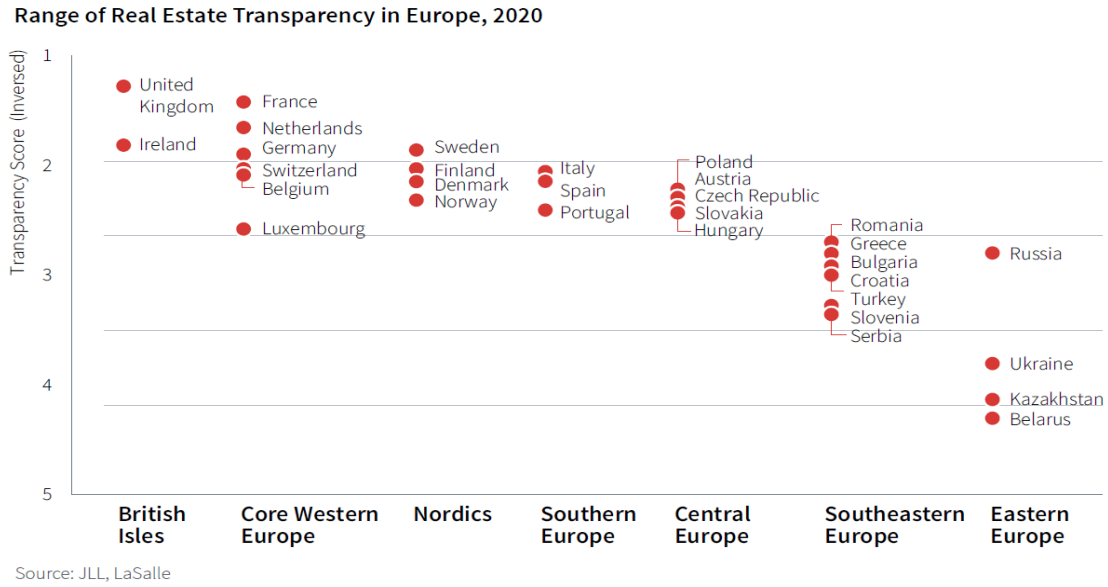


Figure 7 : Range of Real Estate Market Transparency Across Europe (source Jones Lang LaSalle)

A lack of market transparency can lead to a less competitive market with higher prices (Ionașcu, et al, 2019)

Regarding commercial property market data, by far the most important global provider is MSCI. MSCI real estate indices availability mirrors the findings of JLL (2020). Across Europe, it produces national indices of performance returns including capital values within 18 European countries of which 15 are in the EU (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, The Netherlands, Poland, Portugal, Spain and Sweden). Given the relationship between data and transparency, it is not a coincidence that the semi-transparent countries do not figure as part of the global commercial real estate performance measurement community. For the mature markets, MSCI has detailed regional and sectoral breakdowns with a significant magnitude of properties to produce a range of past trend analysis at a disaggregated level. This refers to a handful of countries across the EU; for example, France, and for the UK. Table 2 sets out the countries in Europe which it covers, the date of commencement of the indices and the market size and coverage of the data.

Country	Date of commencement of data	Estimated market size 2018 (USD Billion)	Estimated market size 2019 (USD Billion)	MSCI index coverage in annual index 2019. (USD Billion)	Coverage ratio in annual index (%)
Austria	2004-12-31	42.8	45.1	9.7	21.50%
Belgium	2005-12-31	57.8	59.8	8.2	13.70%
Czech Republic	2005-12-31	25.8	28.1	3.7	13.20%
Denmark	2000-12-31	66.7	70.7	2.2	3.10%
Finland	1999-12-31	79.4	86.5	25.7	29.70%
France	1998-12-31	426.6	441.2	197.8	44.80%
Germany	1996-12-31	535.4	580.1	100.3	17.30%
Hungary	2005-12-31	10.7	10.8	0.7	6.70%
Ireland	1984-12-31	30.3	32.1	10	31.10%
Italy	2003-12-31	125	128.1	28.9	22.50%
Netherlands	1995-12-31	167.2	184.3	64.7	35.10%
Norway	2000-12-31	53.7	56.7	20.4	36.00%
Poland	2005-12-31	48.2	49.8	6.6	13.20%
Portugal	2000-12-31	29.2	30.2	9	29.70%
Spain	2001-12-31	104.4	110.8	21.5	19.40%
Sweden	1984-12-31	213.1	231.5	104.9	45.30%
Switzerland	2002-12-31	241	266.3	111.2	41.70%
United Kingdom	1981-12-31	713.8	745.5	282.3	37.90%

Table 2: MSCI Annual European Real Estate Investment Performance Indices (Source Compiled by authors from MSCI Global Intel and MSCI Real Estate Market Size Report- 2019/20 (MSCI, 2020))

More recent European Wide initiatives include the development of new institutional investment datasets by INREV (European Association for Investors in Non-Listed Real Estate Vehicles). INREV have introduced two European indices, the INREV Asset Level Index and the European Open-End Diversified Core Equity (ODCE) Fund Index. The asset level index "is a new quarterly pan-European index measuring real estate market performance on an asset level across Europe. This initial 'consultation' index is based on five years of historical quarterly data representing a total of around €150 billion and covering over 7,000 assets across all the main commercial real estate sectors and countries"
(https://www.inrev.org/news/press/inrev-unveils-keenly-awaited-asset-level-index).

The diversified fund index covers 13 funds accounting for €31.9 billion as at Q2 2020 and has an inception date of Q3 2011.
(https://www.inrev.org/system/files/2020-08/European-ODCE-Consultation-Index-Q2-2020-Snapshot.pdf).

French (2020) reports on a survey undertaken for TEGOVA of property market transaction data around Europe. It uses a colour code to identify the availability and amount of use of different types of property market information underpinning market valuations. The detail of the different kinds of information and the findings are set out in Appendix Four but includes direct transactional evidence which it terms hard information and softer information such as transactions listed within publicly available sources (which is often selective) or on subscription databases such as Co Star. It also identifies Government listings or cadastre systems and subscription databases, AVMs, indices, historic transaction evidence and market sentiment as data underpinning market valuations using comparable methods. These sources are also listed in professional institution guidance notes supporting valuation standards by IVSC, TEGOVA and RICS.

The TEGOVA study identifies France, Germany, Ireland, Sweden and the UK as highly transparent; Austria, Belgium, Czech Republic, Denmark, Italy, Poland, Portugal, Romania and Spain as transparent; and Bosnia & Herzegovina, Bulgaria, Croatia, Georgia, Greece, Latvia, Lithuania, Montenegro, North Macedonia, Russia, Serbia, Slovenia and Ukraine as semi-transparent.

Global house price data is held by a number of organisations such as the OECD and IMF and includes semi-transparent Eastern EU countries as defined by JLL (2020) such as Bulgaria and Romania. For example, OECD have data back to the early to mid-2000s for these countries and much longer country-specific data for the more mature housing markets of Western Europe and Scandinavia. Eurostat has quarterly national house price data for all EU countries from Q1 2010 onwards – again the data for the more mature markets within the EU goes back further.

The variation in availability, disaggregation, and timing of both commercial and residential data for analysis to underpin any valuation model or market analysis is huge across the EU. It is the major constraint to harmonisation of valuation practice. The creation, specification and collation of real estate data is complex due to the individuality of property and infrequent transacting. These are the main reasons why much of the data sources and measurement practices are valuation-based. Coupled with a lack of freedom of the information in many countries (or lack of individual property characteristics within available data), property market data sets globally fail to cover the whole universe of property and it remains a major resource intensive undertaking for any private company to put this data together. It also requires consistent processes and procedures so that the data analysis is itself consistent across countries.

4.6 Requirements for the practical application of the models at the individual property level

To establish a prudent valuation infrastructure requires long-term datasets. It is no surprise that where these datasets have been established, they are not published or available at the individual property level. The case studies of both commercial and residential prudent value both analyse at a market segment level rather than an individual property level.

All the various models require data and the brief analysis of data sources suggests that long-run series are very difficult to acquire and it would be impractical to suggest that long-run data will be collected for each individual property by an individual valuer undertaking the valuation.

Current time-specific data for market valuation is another matter entirely and is currently collected for every valuation undertaken, regardless of method. For example, current rental value and capitalisation rate data is collected for market valuations undertaken using investment methods and for MLV of investment property and current price data is collected for both the MV and MLV of properties usually valued comparatively directly to capital value.

Both prudent value approaches can operate using some data on long-run trends in both rents and capitalisation rates. Long-run financial data for countries is more readily available so any inputs based around risk free rates and inflation rates can be incorporated if required across a wider range of countries than can property data. It also does not suffer from the same spatial variation. However, none of this data is individual property specific and even the most disaggregated series of private sector data does not go beyond town centre level. That data over the long term is private subscription data and uneconomic for single property valuations. The only data that gets into the public domain and is analysed systematically, even in the most transparent markets globally, is generally highly aggregated national data over three or four main segment levels (residential, retail, office, and industrial - including logistics).

In addition to the data restrictions set out above, cash flow modelling at the individual property level is a significantly more sophisticated and resource intensive task. The inputs are far wider than any basic analysis of current market rents and yields for market value. This is illustrated in Appendix Three which sets out a textbook case study of a commercial office building using market value, investment value (cash flow) and mortgage lending value approaches (See Baum, et al, 2021, forthcoming). Obviously, there are a number of other ways in which this case study valuation could have been addressed within each method but it illustrates the difficulties in applying cash flow techniques. But it also illustrates issues with current MLV approaches where decisions have to be made regarding sustainable rent, life cycle of buildings and capitalisation rate caps and collars.

The Spanish case study illustrates the possible applications of an adjusted market value for owner-occupied residential property and also raises the questions of how a macro market level analysis of drivers of property prices can be amended for the individual property appraisal. This raises the prospect of a three level approach which we discuss in more detail in Chapter 5.1 where the appraisal starts with an assessment of market value, adjusts the market value for any macro market level assessments of over-pricing and then looks at the individual property factors that may warrant variation from the market value assessment at the individual property level and the market adjustment factor.

4.7 Property types/segments

In Section 1 of this paper we identified issues with the definition of property within the CRR which is confined to residential property. The case studies illustrate a clear distinction between a standard commercial real estate asset and an owner-occupied residential asset.

The distinction between different types of real estate is not straightforward. For example, the approach to a residential investment property would be much more aligned or open to the methods set out in the commercial property case study and the investment value of the office in Appendix Three. There is

therefore a case for identifying the different property types and any ambiguities between them in more detail than we have done in section 3.1 for residential.

Another example is development land. Valuation methods for both residential and commercial development sites are similar and can be very different from either owner-occupied residential units or the investment approach to most standard commercial property segments and residential investment property. The residual/cash flow method of market valuation for development land could be applied to long-term sustainable inputs creating either an adjusted market value, through-the-cycle or under-the-cycle prudent value. So is development land a separate category or is it to be assimilated into general residential and commercial segments according to whether it is residential or commercial? Much development is now mixed-use.

These arguments would need to be considered at both an EU and individual national level to determine the appropriate classifications/segments allied to the appropriate prudent value approach.

5. Conclusions and Recommendations

5.1 Discussion

We hope the discussion in this paper sets the agenda for more detailed research within member states. There is a general consensus that market value is the most objective valuation basis and most easily applied and evidenced. But there is also a recognition that it follows the cycle and gives no information about them and requires support and/or amendment to continue to operate successfully within the real estate financial stability arena.

Prudent valuation alternatives do exist and can operate at both individual property and segment levels as alternatives or support to the market valuation of individual properties. They could include more subjective elements, which are less easily evidenced, and/or prescriptive elements. They can operate as a measure of over and under-pricing relative to long-term parameters, depending on which conceptual approach is adopted. There is no guarantee that they will maintain the required capital buffer through the loan term but under-the-cycle models are designed to operate under that assumption.

Through-the-cycle models are as likely to value the property at more than market value as they are at less than market value and, in order to satisfy the Basel III definition, need to operate in conjunction with market value. Under-the-cycle models can operate in isolation of market value but some professional guidance instructs member valuers to always report a market value estimate, in addition to reporting the prudent value (RICS, 2018). We support that recommendation as there is a Basel III imperative to have prudent value no higher than market value. Market value is needed as a benchmark for the prudent value.

Figure 5.1 identifies the taxonomy of prudent value and its relationship with the Basel III definition.

Existing valuation bases	**Market Value:** pro-cyclical				Not Basel III compliant
	Long-Term Value	**Through-the-cycle:** Fair / Economic / Investment Value	Long-Term-Past-Trend **Adjusted Market Value**		Basel III compliant, if L-TV is the lowest of MV and AMV
			Fair-Forecasted Future: **Present Value vs. Current Value**		Basel III compliant, if L-TV is the lowest of MV and AMV
		Under-the-cycle: Sustainable Long-Term Value	**Lowest Future Market Value**		Basel III compliant, but inaccurate/uncertain
			Principles-based approach **(Mortgage Lending Value)**	Sustainability Prudency No speculative elements Transparency Reference to Market Value	Basel III compliant

Figure 5.1: Market and Prudent Valuations and their Relationship with the Basel II Definition
(Note: for Long Term value and L-TV use Prudent Value)

The through-the cycle models include various forms. Different research papers and projects have investigated a variety of methods using pure past trends, a forecasting model using rental growth forecasts (investment value) or sustainable rents and yields from more sophisticated econometric models using combinations of past and present data of economic drivers of real estate value. The under the cycle models include the determination of exit values within a cash flow approach (lowest future market value) or an established mortgage lending value approach).

Figure 5.2 identifies the two major methods of valuation and identifies the need to investigate the different types of property and accompanying methods of appraisal, in particular the need to identify the differences between occupation, investment and development.

Comparison Method	DCF/Income Methods
Owner-occupied properties (with no active rental local market): • Residential properties • Some commercial properties • Some offices and industrial units • Single-unit residential land plots	Rented (or mostly probable or subject to be rented) properties: • Residential properties • Most commercial properties • Most offices and industrial units • Land

Figure 5.2: Different Property Types and Methods of Valuation

The review of concepts of value and the new prudential valuation rules, coupled with the different property types and available methods of valuation, create a matrix of possibilities for the EU as a whole and the individual countries within the EU, in an attempt to harmonise property valuation practices around a sustainable prudent valuation philosophy. Figure 5.3 sets out this matrix.

	Valuation Methods			
Type of RE	Market value	Past trend prudent value	Through the cycle prudent value	Under the cycle prudent value
Residential owner occupier	By direct capital comparison using current transaction evidence	Based on lesser of 1. Average past capital values in real terms adjusted for inflation. 2.MV	Based on lesser of : 1. Econometric modelling of capital values. 2.MV	Based on lesser of : 1. Econometric modelling of capital values. 2. Estimated future market value at lowest point in the loan period. 3.MV
Residential Investment	Income approach using current rent and yield evidence	Based on lesser of: 1. Average past capital values in real terms adjusted for inflation (or average rents and yields). 2.MV	Based on lesser of : 1. Present value of future cash flows based on forecasting of rental values and yields or Econometric modelling of rents and yields using equilibrium models. 2.MV	Based on lesser of : 1.Mortgage Lending Value using pillar approach including costs or income approach using sustainable rents and capped yields 2.Estimated future market value using forecasts over loan period. 2.MV

Type of RE	Valuation Methods			
	Market value	Past trend prudent value	Through the cycle prudent value	Under the cycle prudent value
Commercial owner occupier	Either direct capital comparison or income approach	Based on lesser of 1. Average past capital values in real terms adjusted for inflation. 2.MV	Based on lesser of : 1. Present value of notional future cash flows based on forecasting of rental values and yields or Econometric modelling of rents and yields using equilibrium models. 2.MV	Based on lesser of : 1. Mortgage Lending Value using pillar approach including costs or notional income approach using sustainable rents and capped yields, or estimated future market value using forecasts over loan period. 2.MV
Commercial Investment	Income approach	Based on lesser of : 1. Average past capital values in real terms adjusted for inflation (or average rents and yields). 2.MV	Based on lesser of : 1. Present value of future cash flows based on forecasting of rental values and yields or Econometric modelling of rents and yields using equilibrium models. 2.MV	Based on lesser of : 1. Mortgage Lending Value using pillar approach including costs or income approach using sustainable rents and capped yields, or estimated future market value using forecasts over loan period. 2.MV

Figure 5.3: Valuation Methods for Market Value and Prudent Value of Major Property Types

The applications in Chapter 4 give some indications of how a prudent valuation model might be implemented but also illustrate the range of market maturity and transparency around the EU member states is no less variable than around the globe and there are difficulties in harmonising practices in so diverse a market.

One of the main issues isolated by this study for a prudent valuation approach is the distinction between market analysis and individual property valuations. Much of the analysis concentrates on the analysis of markets and attempts to distinguish actual pricing in markets from longer-term trends and relationships. How might an individual valuation be constructed using the market based analysis.

The determination of Prudent Value could consist of a three-step process:

1. Determine the Market Value, which will serve as a basic reference in the process.

2. Determine the level of over or underpricing of the relevant market, with the maximum possible disaggregation, depending on the availability of data related to market prices and to the drivers (econometric and social variables) that explain the first. This local analysis will make it possible to determine an “average” percentage of the discount that, in case of market overpricing, would need to be applied to the market value to obtain a PV.

3. However, assuming that all properties belonging to the same local market (especially, when the disaggregation of the study has not allowed obtaining more than a broad reference, regional or even national) would be excessively simplistic and would have only regard for the characteristics of the specific property that are included in the market value assessment. Therefore, it is necessary to incorporate a third step to try and pick up on characteristics that may not be included in the market value assessment and the market indicator of over or under pricing.

4. Consideration of the inherent characteristics of the specific property being valued, in comparison with its local market average, not so much with the intention of *classifying* each property, but with the purpose of determining whether the characteristics are worse, in terms of demand, than the rest of properties in their near area, and so more likely to suffer sharper or longer price drops.

One practice in real estate markets is to develop ratings for the qualification of properties in order to determine their capacity to generate a return and Appendix Six has a possible template for residential property. It is usual that these ratings contain a good number of parameters with which it is possible to assess or quantify the rating of a property by its intrinsic characteristics: quality, location, type of architecture, energy efficiency, infrastructure in the area, etc. And, in fact, the greater or lesser overall quality of a property and its surroundings will be key to ensure its level of occupation and income, as well as to estimate the expenses associated with its maintenance and exploitation. But some of these will be included in the market value assessment and some may not. The primary objective is to assess the risk that the current value of a property does not remain stable relative to the disaggregated market segment.

5.2 Conclusions

The discussion of concepts, definitions, data and methods leads to a number of very specific conclusions and recommendations. These are:

- Full EU alignment with the Basel III standard would necessarily lead to full harmonisation of valuation rules across all EU countries
- As the Basel III requirements would require some major changes to valuation practice in a number of countries and it will take time to develop the expertise across the EU as a whole, the maintenance of the status quo in the CRR is recommended.
- Flexibility is allowed between countries and that would be very necessary if workable solutions are to be found due to the differences in data availability and other national factors, including the knowledge and experience of the valuers.
- The Basel III requirement would be for the valuation to be undertaken at the individual property level. We have suggested that a combination of market value, market analysis and an individual property rating could marry up the market analysis techniques with any requirement for an individual valuation. The difficulties with this requirement for many of the prudent value methods is that the long-term past data sets do not exist for some countries in Europe to assess the market analysis component. Even in countries where data is substantial at aggregated geographical and property type segment level, there is no systematic individual past property data, either in the public domain or available to valuers, when undertaking valuations.
- Any method cannot be too prescriptive and needs to be principles based. The guidance on principles would need to be set by the EU (this guidance could be the first significant global guidance and could inform global developments in real estate valuation practice.).

- The EU guidance should be supplemented in each EU country by national guidance addressing any country specific issues. These will include data and market structure. It may also include any differences between investment, development and occupation, and commercial, residential and other segments in individual countries if warranted by the specific institutional or market structures in that country.
- The Basel III definition implies a comparison with market value which must be undertaken to make that comparison. Market value follows the cycle and therefore has been questioned in some quarters as the sole basis for any purpose connected with the financing of real estate. It is an essential part of any assessment and it would be difficult to imagine any approach which ignores it.
- The Basel definition most closely aligns with under the cycle models.
- Methods exist for determination of prudent value. These can be related to both under-the-cycle and through-the-cycle modelling. A prudent valuation method requires inputs that are common to all three methods and elements of all three will be relevant to assessing prudent value under the Basel III definition.
- Many of the available methods for undertaking prudent valuation have been tested at the macro market level and the possible application at the individual property level is part of the additional research required concerning the appropriate criteria and methods of adjustment.
- The required real estate market inputs may be different for residential and commercial property and for investment and occupation, but are based on :
    - current indicators of commercial property rent, capitalisation rate and capital value (in exchange),
    - current indicators of residential capital values,
    - current indicators of residential rental values,
    - housing supply,
    - long-term time trends of these indicators
    - vacancy and stock levels and life cycles/depreciation rates,
- The econometric modelling also requires the drivers of both commercial and residential value and these may include:
    - financial indicators based on long-run risk free rates and risk premia, interest rates, housing finance.
    - demand side indicators such as GDP and sub-sector GDP, consumer expenditure, employment and demographics,
    - Disaggregation of these current and past time series real estate indicators and real estate value drivers.

The applications suggested in Figure 2 will all deliver the basic principles underpinning the Basel III definition of value. These principles include:

- independent valuation.
- prudent conservative valuation criteria.
- adjustments to take into account the potential for the current market price to be significantly above the value that would be sustainable over the life of the loan.
- no adjustments for highly speculative elements (adjusted from the actual wording in Basel III for reasons set out in the report)

- the valuation should not be higher than the market value

5.3 Recommendations

One of the major conclusions of this paper is that the EU contains a wide variety of residential and commercial real estate markets with a wide range of data availability and transparency. Harmonisation of practices implies some sort of harmonisation of resources and this is obviously a major issue within the EU countries.

5.3.1 Recommendations in the short-term

We strongly recommend that in the current period of uncertainty due to the Covid pandemic, the existing regime enshrined in the CRR is maintained to provide a level of stability within the regulatory framework. The right to choose from the two definitions of Market Value and Mortgage Lending Value should remain. The applications of Market Value and Mortgage Lending Value are established, standardised, tried and tested and well understood by both valuers and lenders. They have the benefit of a comprehensive information base. Certification and training systems guarantee that qualified valuers can apply the various valuation standards and methods with certainty.

The immediate recommendation is that the EU should not attempt to prescribe a single approach and EU regulations should set out the broad principles only. The onus should be on individual national supervisors, with appropriate advice from the international and national valuation profession, to provide guidance on the actual prudent valuation criteria where such guidance does not already exist under national law and/or mandatory/discretionary professional standards/guidance.

It is important to note that the implementation of the new definition of value as proposed in Basel III within the new CRR, if not based upon appropriate evidence and a general consensus amongst member states and valuation bodies, would result in significant and disruptive changes in valuation practice.

The challenges related to the introduction of a new prudent value approach cover all aspects of property valuation methodology, ranging from the overall concept of value through definitions and data availability to applications in the daily business. More precisely, the new approach of value needs to be supported by additional interpretation or guidance and valuation standards which have to be competitively neutral, principles-based, transparent and equally applicable in every national real estate market. IT systems would need to be adapted and valuers would have to be trained and certified in the new methodology. These changes will cause substantial alterations to the valuation profession and banking practice and may have a disruptive effect if preparation is inadequate or deficient concepts and methods are employed.

5.3.2 Medium- and longer-term options

If it is decided that the status quo should not be maintained in the longer-term, the EU should be very wary of prescribing a single approach and EU regulations should still set out the broad principles only with the onus on individual national supervisors providing the guidance on implementation.

Over the long-term, the European real estate industry should work with the EU to develop the real estate and related data sources within individual countries. The processes necessary to create some level of

convergence of data sources need to be set in motion now in order to provide a framework for harmonization of concepts, definitions, bases, and methods of prudent valuation. At present we are far from that goal, hence the recommendation to set in motion the processes necessary to create information to underpin convergence.

There are major constraints to this task, not least that real estate markets are private and transaction and other data is generally not freely available in the public domain. Even the most transparent of European markets rely heavily on private subscription data and the incentive to develop these data bases is fuelled by the major institutional real estate investors' desire to benchmark themselves against their competitors. Hence the best served real estate markets are in countries with enough depth of market and stock to attract these investors. This tends to be the more mature economies of Western Europe and, at best, the capital cities in Eastern Europe.

Resources need to be aimed towards these countries to improve data quality and availability. In the meantime, a tiered system should be encouraged so that the implementation of an alternative valuation process is not too long delayed.

At the level of the least transparency and maturity, an adjusted market value approach is the only feasible alternative. Market valuations can be undertaken using current market data as at present. Adjustments can only be based on relatively anecdotal data and the national valuer associations should lead developments in data assembly to begin to create some real estate price data where that basic data does not exist already. This data needs to be married with wider economic data that has been shown in other countries to impact on real estate prices across the various segments of the market (retail, residential, offices, etc.). This will enable adjustment factors to be produced which should improve in quality over time as data improves.

For countries which already have emerging data sets but little analysis and/or little disaggregation of data, a similar approach could be used but grounded in these more robust data sources. For example, a pure past trend model through this data could pick up on prudent deviation from trend. Basic through-the-trend past data reference models compared to market value do provide some information but do not take into account structural change and would, for example, overvalue retail and undervalue logistics given the structural change in the retail market. They rely on the future mimicking the past and require significant long-run past data sets of capital value change, preferably, at a disaggregated level. They should operate within real value parameters, not nominal values but can be reconverted back to the valuation date. These countries could begin to develop prudent valuation and analysis models that go beyond past trends.

For countries with long established datasets of over 15 years with good disaggregation geographically and by property segment, and good economic and financial data, we have shown that the choice of approach is very wide. The Reading/Cambridge University study tested in detail the performance of different models across two different kinds of cycle and showed that an econometric analysis did give the best results although simple trend models would have given an early warning signal had those models been in operation at the time. Restricted lending in the period up to the peak of the two cycles investigated would have reduced the losses very significantly and created a more robust financial system that could have better weathered the GFC. The residential case study using a similar econometric approach illustrated similar results.

This process should be the catalyst for much discussion within the European valuer community and subsequent change in all jurisdictions, not just within emerging real estate markets. A major discussion

point is the application of the various approaches at the geographic level ranging from a set of national/major city adjustment factors to individual property level valuations.

The discussion leads to a number of over-arching recommendations to encourage the convergence of valuation practice within the Basel III and CRR framework.

The over-arching recommendation is that the EU should not attempt to prescribe a single approach and EU regulations should set out the broad principles only. The onus should be on individual national supervisors to provide guidance on the actual prudent valuation criteria where such guidance does not already exist under national law and/or mandatory/ discretionary professional standards/ guidance.

The Basel III definition can be adopted as the basis for the development of principles. It reconciles broadly with the existing definition of MLV within the CRR but the statement within it to exclude price increases is flawed. Emphasis should be put on ignoring highly speculative elements instead.

The principles underpinning a prudent valuation are:

- independent valuation.
- prudent conservative valuation criteria.
- adjustments to take into account the potential for the current market price to be significantly above the value that would be sustainable over the life of the loan.
- no adjustments for highly speculative elements.
- the valuation should not be higher than the market value.

The MLV should be based on the prudent value or the market value, whichever is lower. Prudent value can be higher than market value therefore it would not be prudent to apply it uniformly, which would also break one of the above principles of MLV. A prudent valuation must always be accompanied by a market value where possible.

There are a number of implications for both the real estate industry and the EU. In addition to the data constraints already discussed, there are also a number of education and training issues that arise. Prudent valuation is a relatively new development for the majority of countries in the EU and around the world. The depth and breadth of knowledge and skills in this area of practice is relatively low and this has huge training implications for national organisations throughout the EU. Combined with data issues, these two factors are a major constraint to any objectives to implement this valuation basis around the EU in the short term. This leads to the final two recommendations of this report.

Over the long term, the European real estate industry should work with the EU to develop the real estate and related data sources within individual countries.

In the medium-term we recommend a range of approaches are developed based on the available data within each country with increasing sophistication of method as market maturity and transparency increases. The European real estate industry in conjunction with national valuer organisations will need to develop the training and education requirements necessary to implement the movement towards greater application of prudent valuation methods.

Once these principles and general approaches are agreed, national jurisdictions can research their own countries to develop tailored solutions.

Appendix One – Technical Detail of the Various Valuation Methods.

Market value

Can be expressed simply as the current rent divided by the current capitalisation rate.

$$R/CR$$

Where:

R = rent (less all outgoings)/net operating income
CR = capitalisation rate

This simplistic formula hides a wealth of detail around the application of the model where rents are at more or less than market rent or there are numerous tenancies within the building. Inputs into the model are almost universally found by reference to market comparison and this includes the most simple of direct capital value comparisons which remove the need to undertake a capitalisation of an actual or notional rent. Appendix Three gives examples of these complications. It can be applied to the property as a whole or to the land and building content separately. It can also be found by discounted cash flow (see investment value method below)

Mortgage lending value (prudent value under-the-cycle)

A principles based application

It can have two pillars; one based on depreciated costs of construction costs plus land value and one based on investment principles.

Pillar two basically comprises the land value (*LV*) plus the capitalisation of sustainable net operating income from the building (*BSR*) over its remaining expected life (*d*) at the capitalisation rate (*CR*)

$$Vo = LV + BSR.\sum(1 + CR)\text{^} - d)$$

Where:

LV = Land value
BSR = sustainable rental income of the building element.
∑PV = the sum of the present values
d = the expected remaining life of the building

As with all valuations there are various detailed applications and, in some jurisdictions, has some prescription applied regarding the model and the inputs used within the model. These can attach to the building sustainable rent (*BSR*) regarding deductions from either market rental value or sustainable rental value for irrecoverable outgoings, the exclusion of certain elements of the contracted rent, the *CR* and the expected life cycle of the building (*d*).

Investment Value (prudent value through-the-cycle)

The investment value model is based on a standard discounted cash flow appraisal to determine the present value of a future cash flow. The formulae is:

$$Vo = R.\sum(1 + DR)\text{^} - t) + (R.((1 + rg)\text{^}t)/(CR.(1 + DR)^t))$$

Where:
R = current rent/rental value
rg = expected rental growth
DR = the discount rate.
t = the holding period

Applications are numerous surrounding how the inputs are formed. Rental growth (*rg*) can be forecasted but it can be implied from transaction analysis or extrapolated from a past trend, as in the sustainable rent trend analysis. In long term modelling *R* can be based on sustainable rent but can also be based on current rent or rental value. Forecasts can be made off either sustainable or current rent. The discount rate has to be matched to the income; real discount rates for real incomes which have been adjusted for inflation and nominal discount rates for nominal incomes flows. Discount rates and growth rates can be adjusted for depreciation although the data on depreciation rates is sparse. Building life can be taken into account via assumptions for both future letting and refurbishment/redevelopment causing some reversions to development site value. Appendix Three raises some of the issues.

In all three models capitalisation rates can be based on current market rates, prudent past trends or forecasts of future change based on existing target rates and growth expectations.

The models can be adapted and integrated into a wide array of applications depending upon the requirements of the valuation, whether it be for acquisition and sale, performance measurement, accounting or for reasons relating to the EU CRR requirements.

Econometric models (through the cycle)

Econometric models are based on regression analysis and closeness of fit of the value or price to a set of independent drivers. They come in a variety of forms but the model used to examine sustainable rental value in Crosby, et al, (2020) both supply and demand side drivers were regressed on real rental value. The coefficients were used to predict an equilibrium rent given the values of the independent variables at any point. A long-run relationship was posited between rental values, demand and supply, and deviations are used to explain short-run adjustments in rental values and other indicators such as vacancy rates. The long-run equation took the following basic form:

$$\text{Ln(Real Rental Value}_T) = \beta_0 + \beta_1 \text{ Ln(Demand proxy}_T) + \beta_2 \text{ Ln(Stock proxy}_T) + \varepsilon$$

where β_0 is the intercept from the regression and β_1 and β_2 are slope coefficients measuring the relationship between real rental values and the independent variables.

The fitted values generated from estimation of this model can be used as an estimate of the equilibrium real rental value at each time point. Meanwhile, ε measures the deviation of real rental values from their equilibrium value. A positive error term suggests that real rental values are above their equilibrium level in that period and a negative error term suggests the opposite.

Appendix Two - Applications within the range of European jurisdictions

Chapter 4 identified two of the major related constraints to the application of a harmonised LTV prudent valuation approach across the EU. These relate to the various degrees of market maturity and the related issue of data availability within each segment. The JLL Global Transparency Index places five EU countries in its group of 10 "highly transparent" markets and identifies another 14 EU countries as "transparent". However there are also a group of EU countries regarded as "semi-transparent"

For the purposes of undertaking prudent valuations, the case studies reveal that the level of sophistication of methods is highly dependent on having long term data to identify prudent trends and prudent relationships. The prudent data availability of the five highly transparent countries show some similarity with the age of the major property market datasets in that they were also the first five countries in the EU to have an Investment Property Databank dataset.

The UK is the most transparent global country within the JLL assessment and also had the first dataset in 1981. The oldest start date of the next five European IPD datasets link to the five highly transparent EU countries. By the end of the 1990s, only 6 EU countries had MSCI data sets. Given that the UK data was now 20 years old, It explains why the UK has the most advanced analysis of trends (Section 4.2 case study) but also indicates what can be achieved in the highly transparent markets of the EU.

There are 15 EU countries which have a fifteen year set of IPD (now MSCI) indices (commenced before the start of 2006. Fifteen years is an important time period as the UK research used a fifteen-year rolling average so that the analysis of long term trends was not dominated by past data. It gives any structural breaks in the data more emphasis. This implies that there are 15 EU countries who have developed enough information for some basic country-wide analysis of prudent property market trends from a consistent dataset. It would be possible to develop econometric modelling for a through-the-cycle model but it is also possible to assess the data for past trend analysis, yield caps and sustainable rents using 15 year rolling averages. This would enable a basic form of trend analysis to operationalise either under-the cycle or through-the-cycle modelling.

It still leaves a number of EU countries with no or partial, inconsistent data on past property market performance. Basic measures such as income and yield will need to be sourced. This project does not have the budget or resources to source that data or undertake individual analysis of the datasets within each country and develop the appropriate models to match those datasets.

When that data is sourced, we can illustrate that even the most basic of analysis using trends in the rents and yield floors can provide the basis for a prudent valuation approach based on adjusted market values or under-the-cycle MLV based models.

The principles of the different approaches are set out in Appendix Figure 1

	Valuation Methods			
	Market value	**Past trend L-TSV**	**Through the cycle L-TSV**	**Under the cycle L-TSV**
Residential owner occupier	By direct capital comparison using current transaction evidence	Based on lesser of 1. Average past capital values in real terms adjusted for inflation. 2.MV	Based on lesser of : 1. Econometric modelling of capital values. 2.MV	Based on lesser of : 1. Econometric modelling of capital values. 2. Estimated future market value at lowest point in the loan period. 3.MV
Residential Investment	Income approach using current rent and yield evidence	Based on lesser of: 1. Average past capital values in real terms adjusted for inflation (or average rents and yields). 2.MV	Based on lesser of : 1. Present value of future cash flows based on forecasting of rental values and yields or Econometric modelling of rents and yields using equilibrium models. 2.MV	Based on lesser of : 1.Mortgage Lending Value using pillar approach including costs or income approach using sustainable rents and capped yields 2.Estimated future market value using forecasts over loan period. 2.MV
Commercial owner occupier	Either direct capital comparison or income approach	Based on lesser of 1. Average past capital values in real terms adjusted for inflation. 2.MV	Based on lesser of : 1. Present value of notional future cash flows based on forecasting of rental values and yields or Econometric modelling of rents and yields using equilibrium models. 2.MV	Based on lesser of : 1. Mortgage Lending Value using pillar approach including costs or notional income approach using sustainable rents and capped yields, or estimated future market value using forecasts over loan period. 2.MV
Commercial Investment	Income approach	Based on lesser of : 1. Average past capital values in real terms adjusted for inflation (or average rents and yields). 2.MV	Based on lesser of : 1. Present value of future cash flows based on forecasting of rental values and yields or Econometric modelling of rents and yields using equilibrium models. 2.MV	Based on lesser of : 1. Mortgage Lending Value using pillar approach including costs or income approach using sustainable rents and capped yields, or estimated future market value using forecasts over loan period. 2.MV

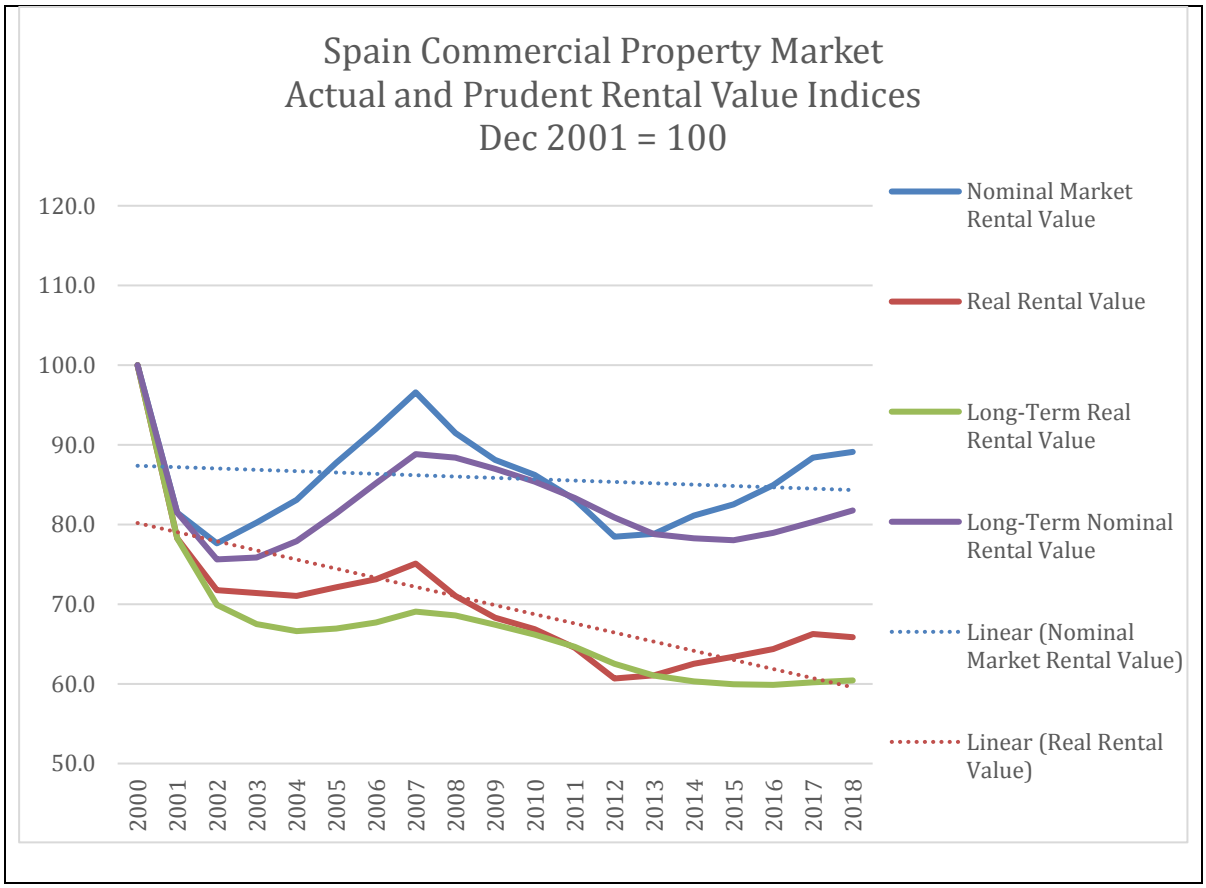
Appendix Figure 1: Valuation Methods for Market Value and Prudent Sustainable Value of Major Property Types

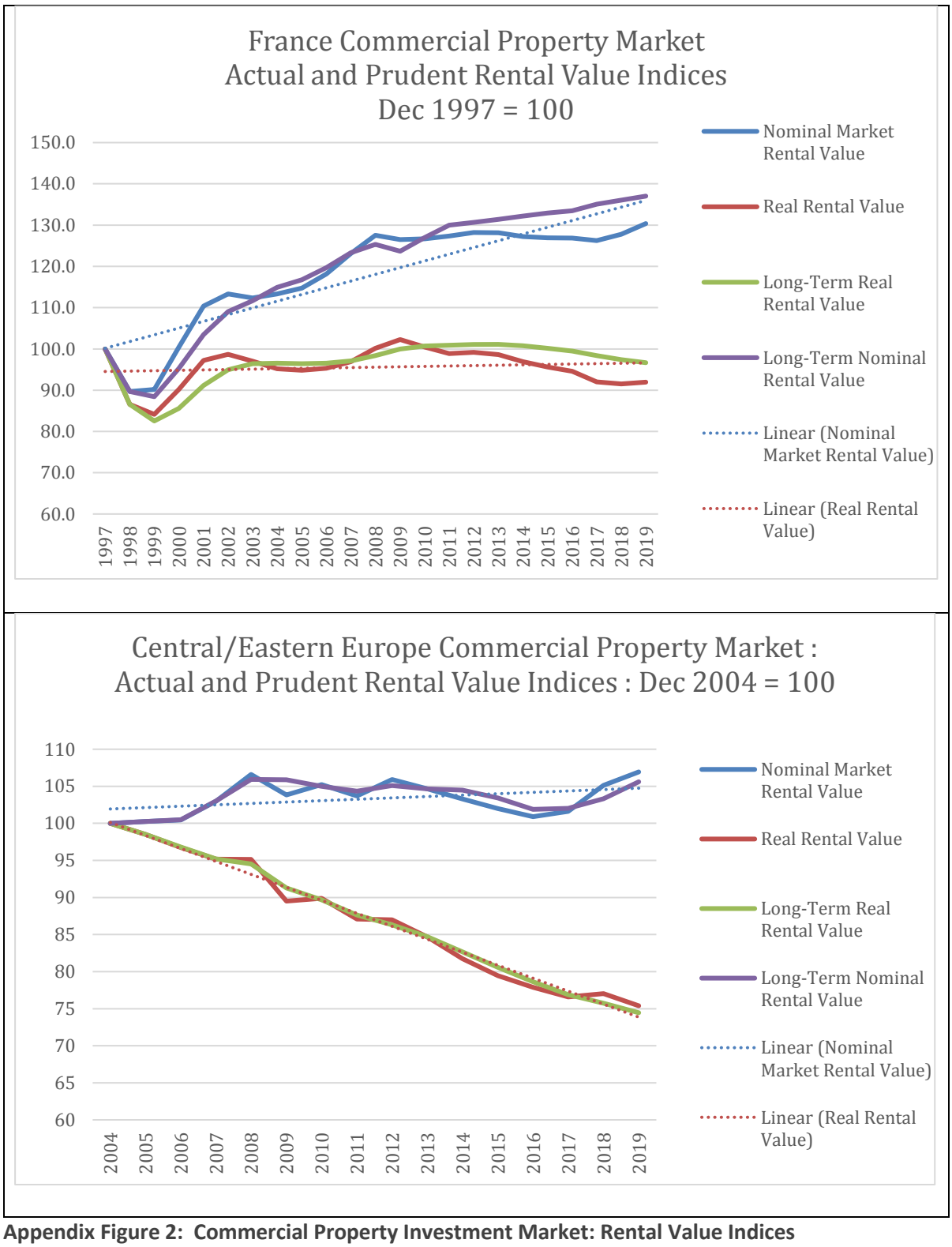
Commercial investment

Using a basic trend approach, Figure 2 illustrates market and sustainable rental values for two highly transparent countries with more than 20 years of data and a combined index for the three Central and Eastern European countries with the same data availability over a shorter period (15 years). It also shows the real and nominal market rental value linear trends. This represents the lower of the market value or a through-the-cycle long term value, in effect creating an under the cycle model.

The sustainable rent in Spain does fall significantly below the market rent during the global financial crisis however this is not the case in France or the central European countries. On the surface these two results are surprising but it does mimic precisely what happened in the UK analysis of rents during the GFC. The GFC was a capital asset investment market downturn and this means that any impact on rents was later and caused by downturns in the real economy as a result of the financial crisis. Overheating in the real economy and in occupier markets was a much greater problem in the late 1980s in the UK and the trend modelling applied to the UK in the 1980s and 1990s did pick up this cycle at that point.

For Spain and France, the sustainable rent series look far from stable. This is a function of the methods used which are in effect cumulative. As the time series extends the trend lines smooth over a longer period and become more stable over time. The longer the time series the greater the amount of data available to determine the trend.

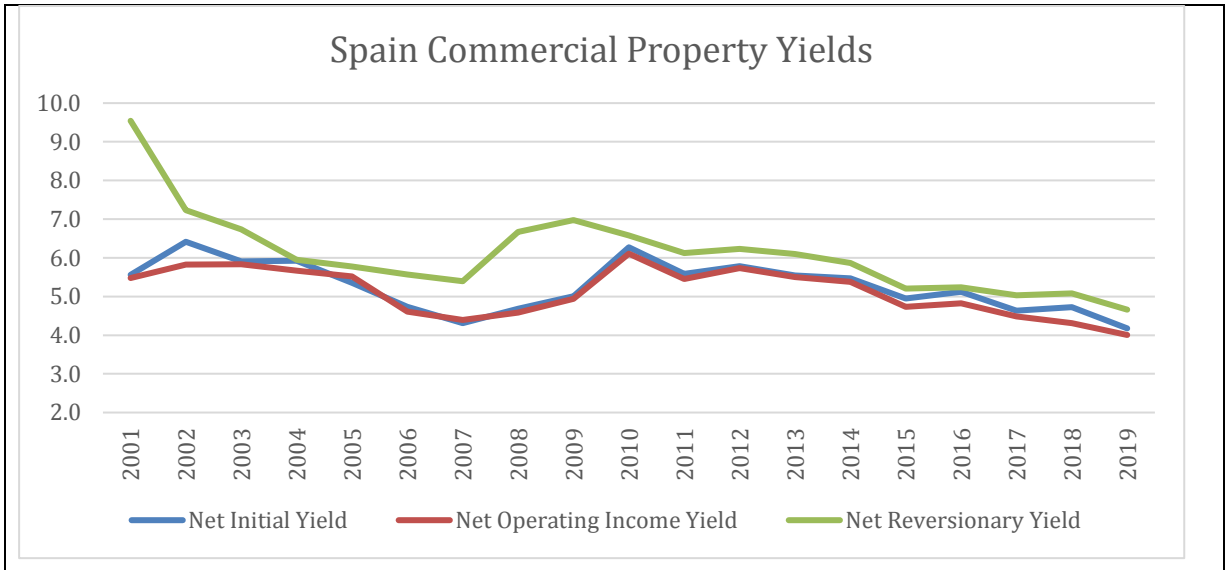


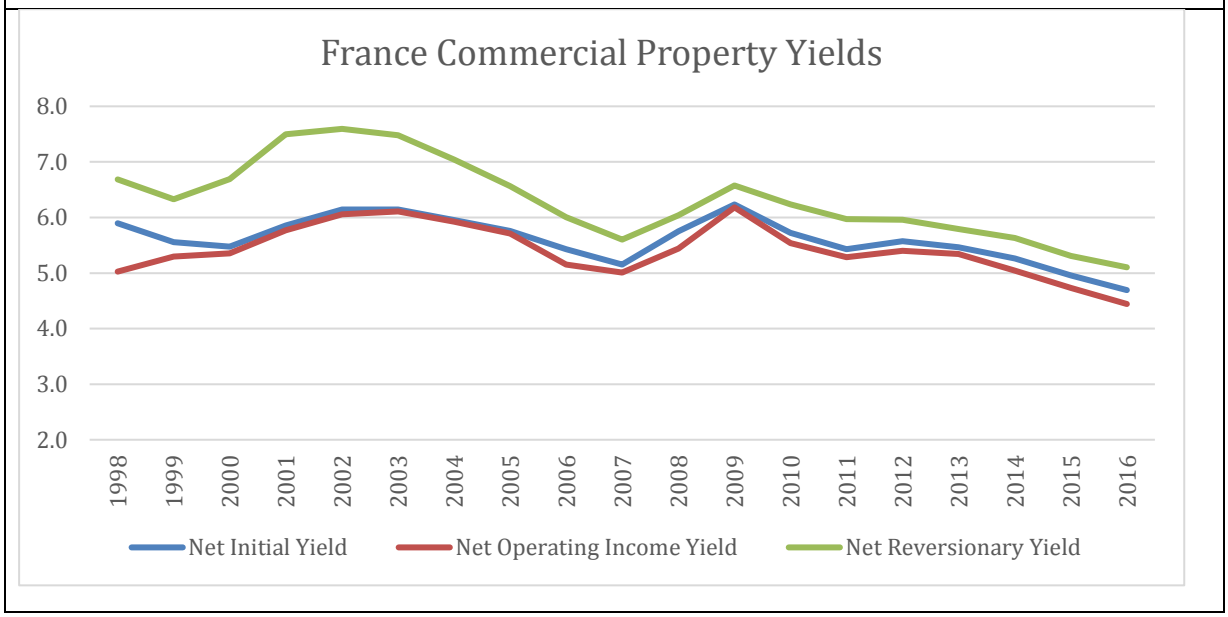


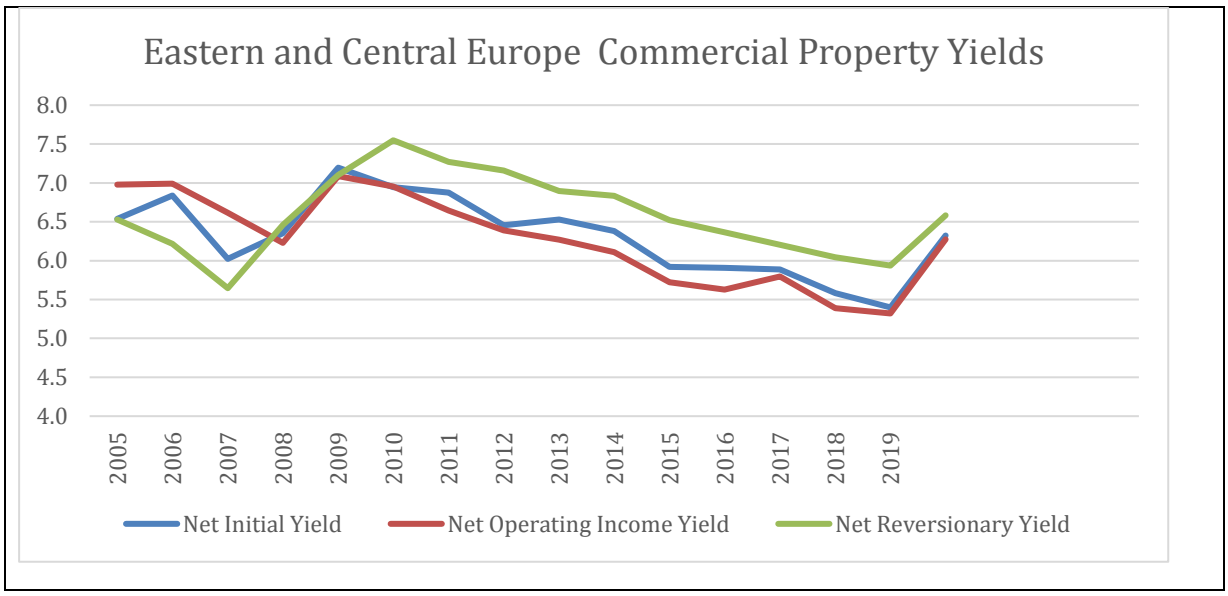
Appendix Figure 2: Commercial Property Investment Market: Rental Value Indices Compiled by Authors from MSCI source data.

Figure 3 sets out the other major component of an investment value; the capitalisation rate or yield.

This shows a similar trend to many other commercial property markets globally, and that is a decreasing level of capitalisation rates. This may be a function of lowering target rates of return requirements which in turn may be a function of either lowering real return requirements and/or lowering risk premiums for the better quality real estate lowering in the aftermath of the global financial crisis. The GFC is the spike in all three countries following a reducing level of capitalisation rates up to 2007. The significant increases in capitalisation rates were the major cause of the major falls in capital values during 2008 and 2009. This has since been followed by reducing yields again, so much so that all three results show that net operating income yields, net initial yields and reversionary yields are all lower as at the end of 2019 than they were just before the global financial crisis.







Appendix Figure 3: Commercial Property Investment Market: Capitalisation Rates Compiled by Authors from MSCI source data.

Capital values are a function of rent and yield in an investment scenario. The overall outcome is that the differences between sustainable rents and yields and market rents and yields can be tracked and Figure 4 sets out the index of the market capital value versus the prudent capital value for the three sets of data from Spain, France and the three CEE countries.

There are a number of prudent value approaches that could have been used for this illustration and in this case the long term value is a function of the long term nominal sustainable rent and the higher of the market capitalisation rate and the average long term capitalisation rate. Alternatives could include the lower of the sustainable rent and the market rent and capitalisation rates could be based on a forward looking first principles model of investment value (see Appendix Three).

The basic formulae for the capitalisation rate based on first principles is:

$k = RFR + RP - g + d$

Where:

k	=	Current capitalisation rate
RFR	=	Required risk free rate of return
RP	+	Property risk premium
g	=	Expected rate of future value change (delivered via increases in rent and changes in *k*)
d	=	Depreciation in the value of the asset through time due to various causes.

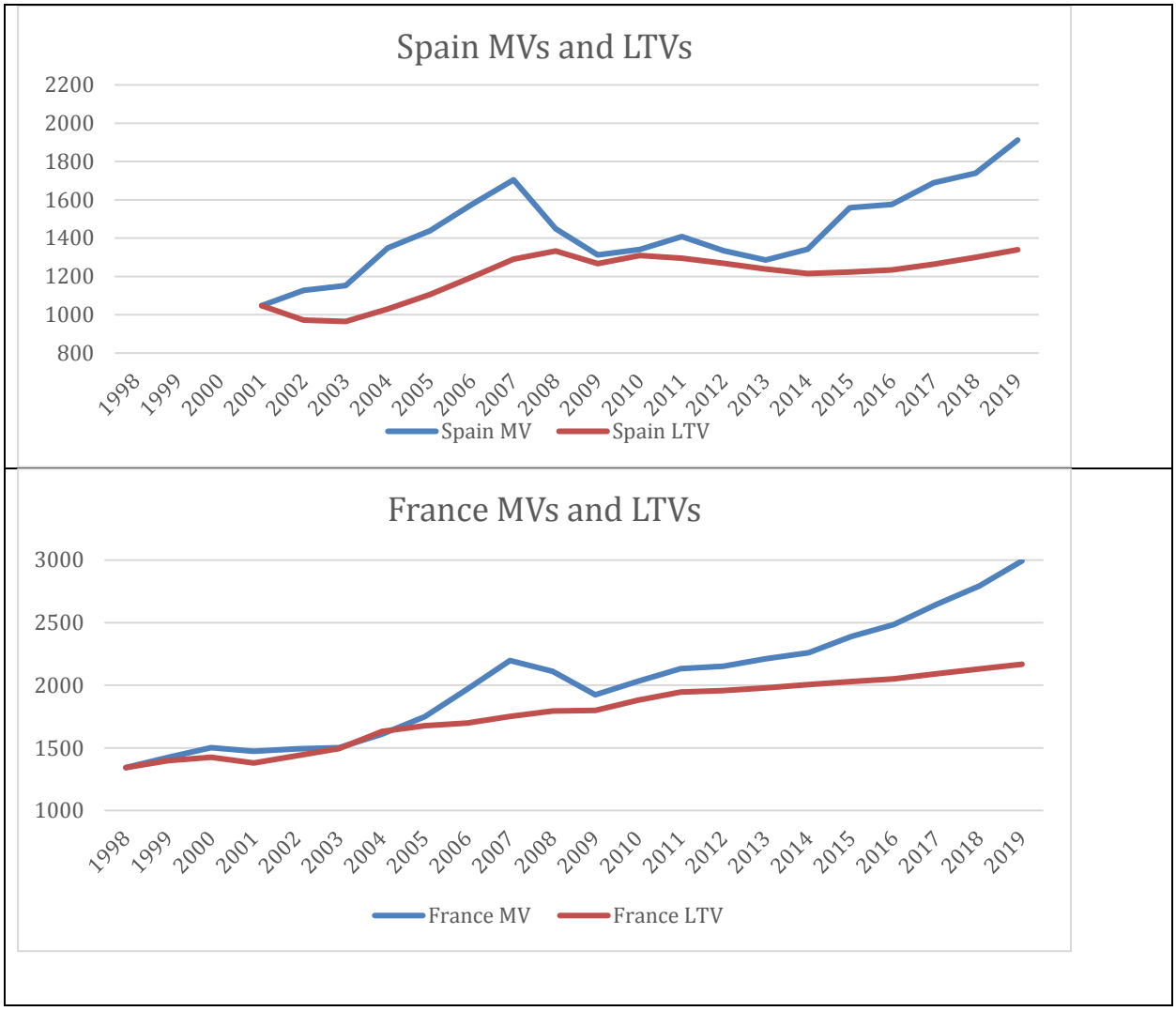
These issues are fully discussed in Baum, et al, (2021) and Appendix Three has an investment value cash flow illustration which incorporates these elements.

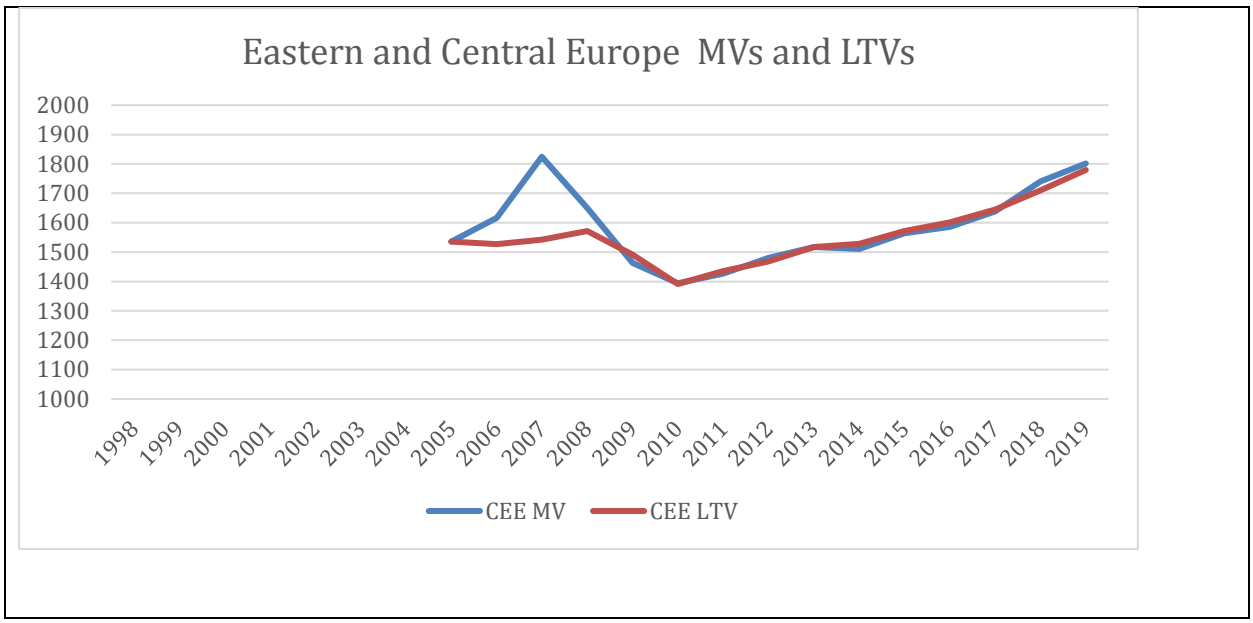
The market value used in this comparison of market value and prudent value is a simple function of the market capitalisation rate and the market rent.

Capital values generated by this analysis illustrate a similar pattern for Spain and the three CEE countries with a major spike in the market values compared to the prudent value up to 2007, commencing during 2004 in Spain and in 2006 in CEE (this could very well be the function of the dataset only just starting, so it is too early to see trends developing). France was a lot more stable with only 2007 appearing as any kind of spike. In the UK the cyclical upward trend data started to appear in 2005 and followed the pattern for Spain with the major downturn starting in 2007 and falling until 2009.

The reducing capitalisation rates over the last decade have reintroduced the divergence within commercial property values across all three illustrations with the mismatch between price and prudent value standing at 43% in Spain, 33% in France and 12% in the three CEE countries by the end of 2019, before any effects of the pandemic.

In order to carry out this kind of basic analysis of any mismatch between actual prices/market values and longer term trends, minimum data requirements are a 10 year or preferably 15 year time series of rents and capitalisation rates.





Appendix Figure 4: Commercial Property Investment Market: Market Value and Long Term Trend Value. Compiled by Authors from MSCI source data.

Residential owner-occupier

A similar approach using either the long term trend or the market value, whichever is lower, can be developed for owner-occupied residential properties. At a country level, the basic data is available including the World Bank series of residential prices and for owner-occupied properties the only data is for capital prices.

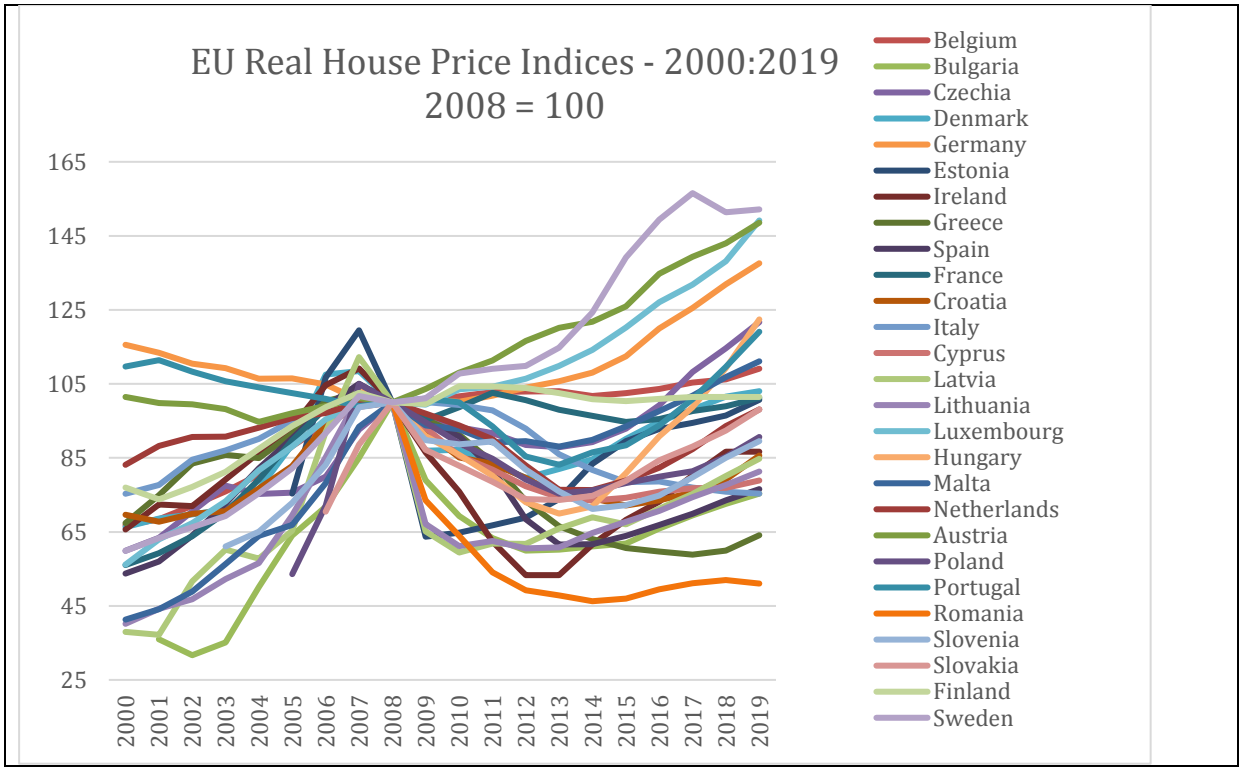
Figure 5 sets out the real house price movements across the 27 countries of the EU over the last 20 years. For a number of countries the World Bank data is not available for the full period, with Romania being the country with the shortest data time series. The data for all countries has been rebased to 2008.

In the period leading up to 2008, the CEE countries show some significant real growth in house prices with the greatest growth for those countries in the CEE region having data from around 2000. Significant real growth can be seen in Bulgaria, Latvia, Lithuania, as well as some of the CEE countries with commercial market data such as the Czech Republic. By contrast, the more mature economies of Europe show more modest change, and in the case of Germany, Portugal and Austria, some falls in the real price of housing. In the case of Germany this is over 20% between 2000 and 2007. However, overall, the EU countries grew real house prices by nearly 50% in the period 2000 to 2007.

After 2008, the significant growth in some of the CEE countries is lost with a series of significant falls up to 2019. Romania has seen real prices halve between 2007 and 2019. However despite the loss in value since 2008, Latvia and Lithuania have managed to retain much of the growth experienced pre 2008 with a 100% real increase over the whole period, despite a 15% fall since 2007. Greece has experienced the second largest fall in real value since 2007, the fall is 65%.

Overall the average house price across the EU appears to be virtually identical to the peak in 2007 indicating zero growth in real terms. In a number of countries the real value of house prices has risen; in Sweden and Luxembourg by 50%. Malta, in addition to having one of the highest real growth rates before

2008 has also managed to continue that trend up to 2019 with real values standing 170% higher than in 2000. Sweden is the only mature EU economy to manage a growth rate of over 100% at over 150% over the full time series.



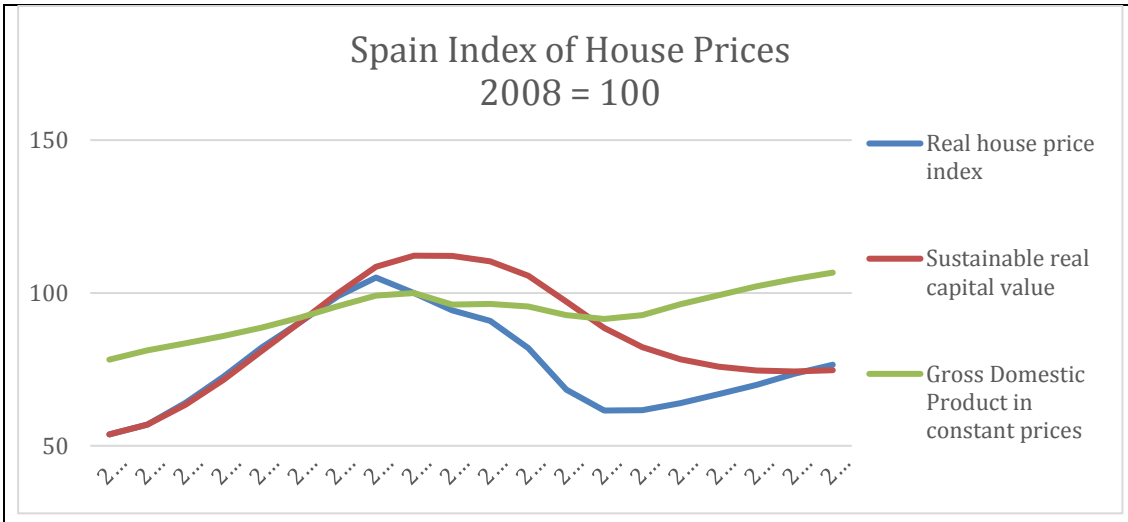
Appendix Figure 5: Residential Property Market: EU Country Real Price Indices 2000-2019. Compiled by Authors from World Bank source data.

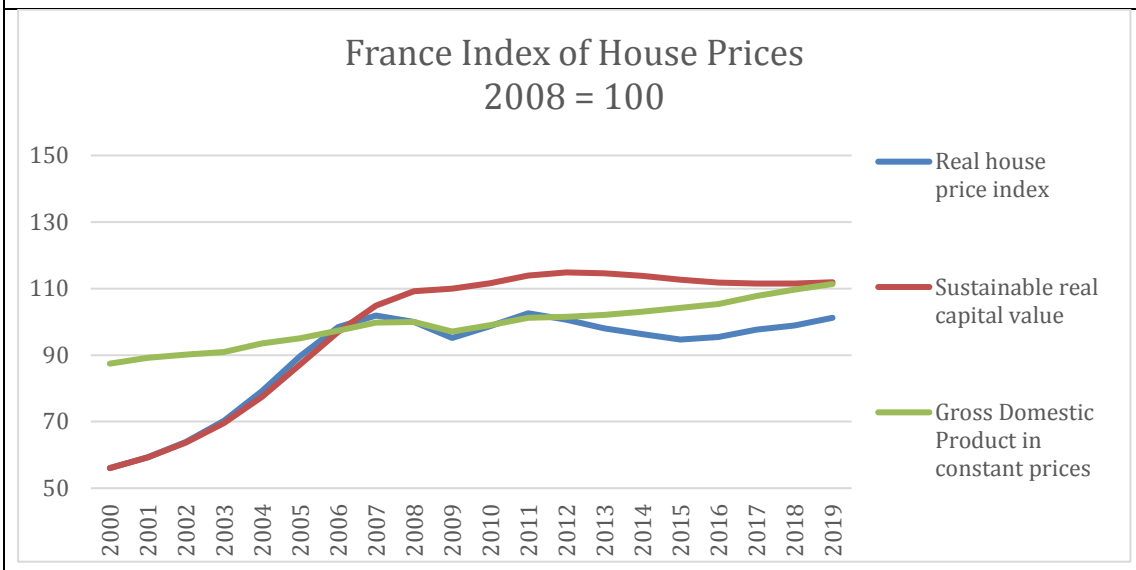
With regard to applying value data to determining prudent value and any adjustments to market values, the last 20 years in house price movements looked at in isolation are problematic. Figure 6 sets out a number of trend based analyses for individual countries within the EU, similar to that applied to commercial investments.

It illustrates that the trend in the first eight years of the analysis was significantly upwards and the trend line picks those up and for the first few years after the peak suggests it should continue. The result is a number of countries with a 20 year history are suggesting that 2019 market values are below long term trend. Between 2008 and 2019 they also indicate that this under-pricing was most significant just after the downturn in values at the time of the financial crisis.

The data in Romania does not commence until 2008 and not surprisingly, as the trend is based on the slump in real values after 2008, it suggests the opposite.

Hence the conclusion in the main text that the use of capital value trends is not robust enough to give good indications of under and over pricing and that adjustments to market value must be grounded in more robust analysis of markets and their drivers, as evidenced by the more detailed Spanish study presented in Chapter 4.4 of this paper.


Spain Index of House Prices
2008 = 100
150
100
50
Real house price index
Sustainable real capital value
Gross Domestic Product in constant prices


France Index of House Prices
2008 = 100
150
130
110
90
70
50
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
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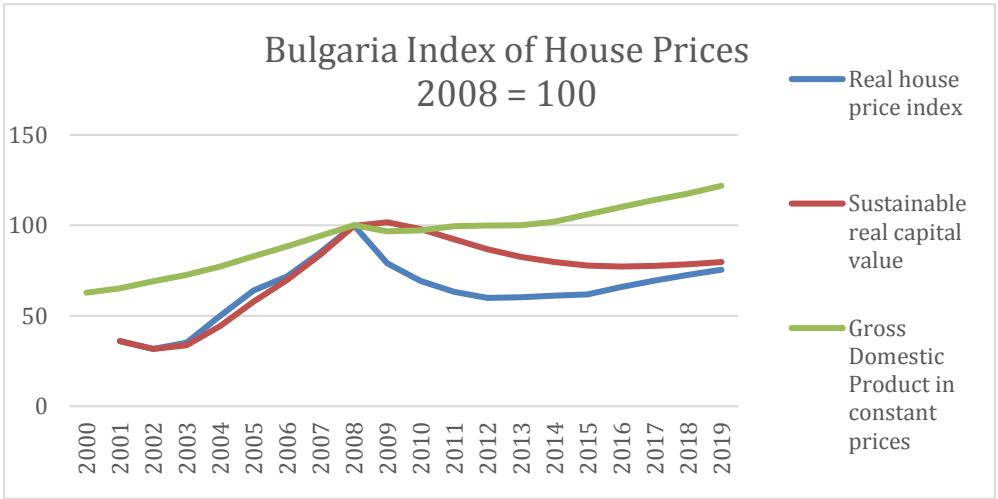
2011
2012
2013
2014
2015
2016
2017
2018
2019
Real house price index
Sustainable real capital value
Gross Domestic Product in constant prices


Bulgaria Index of House Prices
2008 = 100
150
100
50
0
2000
2001
2002
2003
2004
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2006
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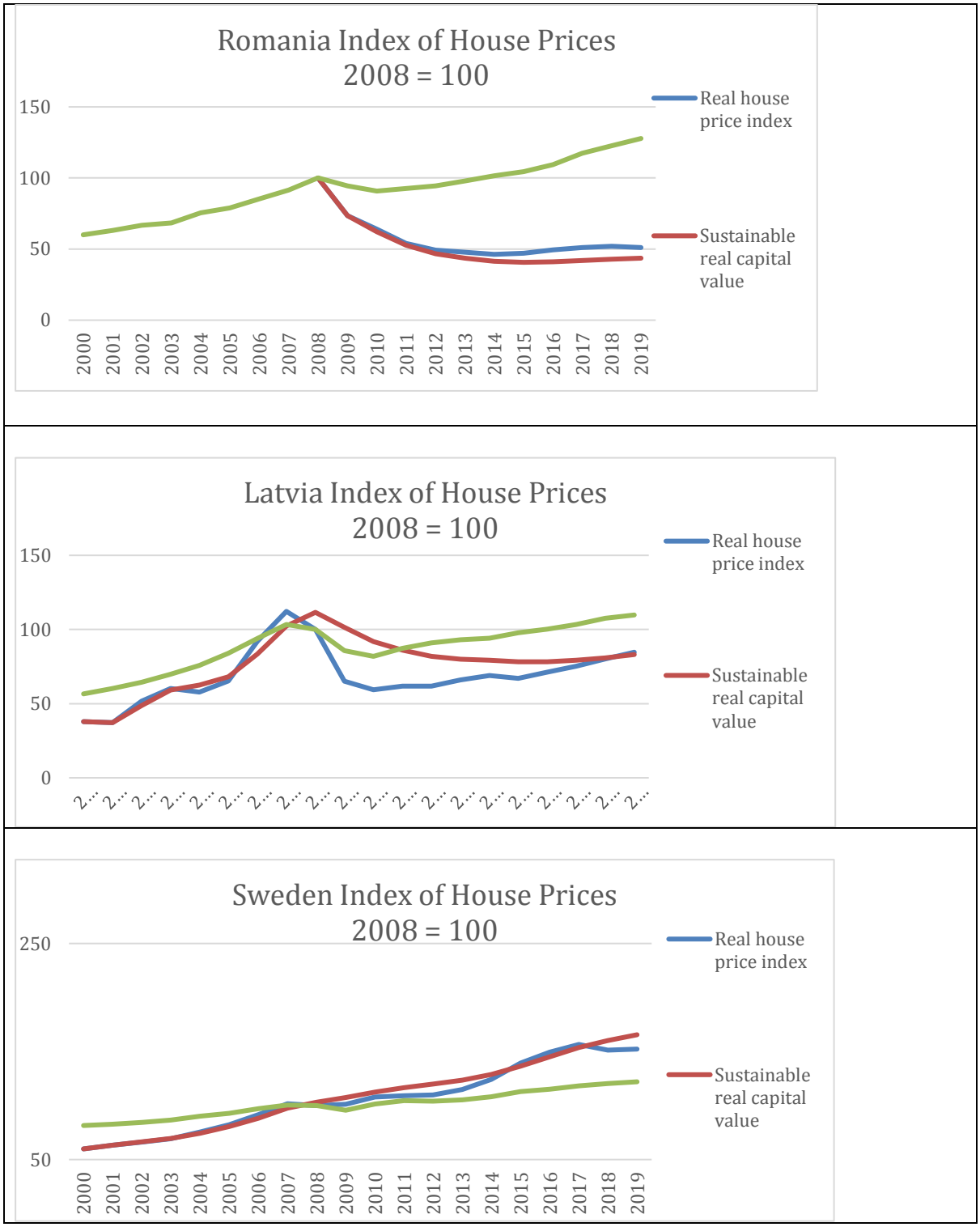
2019
Real house price index
Sustainable real capital value
Gross Domestic Product in constant prices



Appendix Figure 6: Residential Property Market: Long Term Trend Value, Market Value and GDP in Real Terms 2000-2019. Compiled by Authors from World Bank source data.

Appendix Three –Application of Market Value, Investment Value and Mortgage Lending Value

Example of the detailed application of the three major valuation approaches of Market Value, Mortgage Lending Value and Investment Value as presently practiced based on a property investment valuation textbook example (Baum, et al; 2021). The example is of an institutional grade, multi-occupancy office investment property.

The hypothetical building is a five-storey office building let to three tenants with one floor vacant. It has had little refurbishment carried out since it was built around 25 years ago apart from some minor refurbishment of ceiling, floor and toilet facilities on the second and third floors prior to re-letting in 2007 and 2011 respectively. The fourth floor is being refurbished at the same minor level at the present time.

Valuation date January 1st 2016

The leases are as follows:

- *Ground and first floors:* Let from 1st July 1991 on a 30 year full repairing and insuring lease with 5 year upwards-only rent reviews. The rent passing under the lease has been #321,300 p.a. since it commenced; it has not been decreased at any rent review since then due to the upwards-only provision.
- *Second floor:* Let from 1st January 2007 on a 15 year full repairing and insuring lease with 5 year upwards-only rent reviews. At the last review in 2011 the rent was negotiated between landlord and tenant at #140,000 p.a.
- *Third floor:* Let from 1st November 2011 on a 10 year full repairing and insuring lease with a 5 yearly upwards-only rent review and a break clause also after 5 years. The rent is #145,000 p.a.
- *Fourth Floor:* Vacant:

Assumptions concerning the valuation can be made as follows even though some of them will not be used depending upon the particular valuation applications

- Land Value existing use #4,000,000.
- Existing rental values are at #140,000 per floor effective rental value (in reality there would be a higher headline rent agreed with some rent free or other inducements offered). We have assumed that the vacant lease is let at a higher headline rent of #160,000 with a six month rent free period. This is addition to a void period of nine months before a tenant is found.
- Capitalisation rates over the last 15 years have averaged 6.25% for a new property, 7.25% for existing buildings with little or no refurbishment. The current estimated capitalisation rate for the existing building is 6.5%.
- Lease events in chronological order are a rent review on the ground and first floor on Ist July 2016, a rent review/break opportunity for the tenant on the third floor in November 2017 and a rent review

on the second floor on the 1st January 2017. After that there are the lease expiries in July 2021, November 2021 and January 2022, all after the holding period of 5 years ends.

- Prime rents are expected to grow at 3% per annum and depreciation is expected at 1% per annum. Mortgage Lending Value, depending upon application, may require a set of assumptions concerning the land and building content, rental value, remaining life cycle and yields. We are illustrating the method using the assumption that a split of value between land and buildings is required within the prescribed method and that the sustainable rent and market rent are at the same level.
- Land content 37% of the sustainable rental value
- Remaining building life 35 years

Investment value requires a set of decisions concerning a strategy for the building and the outcome of lease events. We assume that the tenant on the ground and first floor continues to pay the same rent for the remainder of the term (the market rent is lower than the passing rent and is unlikely to increase enough between now and the review date to catch up so the upwards-only review applies). We assume the second floor tenant pays a market rent of #140,000 plus any rental growth at the next review in 2016. We assume that the third floor tenant stays and also pays the market rent of #140,000 plus any growth. We assume the fourth floor is let after a further void period of 9 months, the rent is #160,000 per annum (plus any growth between now and the letting date) on a lease for five years expiring November 1st 2021. The rent free period is 6 months.

For the exit value, the existing rental values are grown at the depreciated rate of rental growth. In January 2021 the property is sold for a capitalisation rate of 7.25% due to the fact that it is not going to have any refurbishment in the holding period but could well need it quite soon after the end of the holding period. The resulting cash flow discounted at an 8% target rate to determine the present value.

1. Market Value

Basic investment capitalization method

Capitalization Rate 6.5% – Valued Lease by Lease making simple assumptions concerning reversions to effective rents and no incentives and short void periods for vacant leases.

	Term rent	Time to next rent lease event/ rent change (Yrs)	Current estimated rental value (ERV)	Present value of core rent @6.5%	Present value of reversion (increase or decrease) to ERV @6.5% Over-rent at 8%	Gross Valuation less Purchaser costs equals Net Valuation
Lease 1	321,300	5.5	280,000	4,943,077	-457,222	GV 4,485,855 NV 4,241,943
Lease 2	140,000	1	140,000	2,153,846	0	GV 2,153, 846 NV 2,036,734
Lease 3	130,000	0.75	140,000	92,266	2,054,483	GV 2,146,749 NV 2,030,022
Lease 4	Vacant	0.75 void period assumed	140,000	0	2,054,483	GV 2,054,483 NV 1,942,773
Total					**Say**	**NV 10, 251,472 10,250,000**

Note: Although the ERV of the vacant unit is expected to be 160,000 pa subject to a rent free period, the basic investment method assumes the effective rent and no rent free period. If 160,000 were used the capitalisation rate would have to change.

2. Mortgage Lending Value

Pillar 1 (Cost Approach)

Land value	4,000,000
Replacement costs	7,500,000
Less Depreciation @ 41.7%	4,375,000
Plus outside facilities at 5% as a max	218,750
Sub total	4,593,750
Less min safety margin @ 10%	4,134,375
Total MLV	8,134,375
Less Purchaser's Costs	7,692,080

Say 7.6 Million

Pillar 2 (Income Approach)

Land Value	4,000,000
Sustainable Rent700,000	
Less Sustainable Vacancy 10%	70,000
Less Land Value Rent - 6.5% of 4 million	260,000
Less 15% Minimum Irrecoverable Expen	94,500
Net operating Income on Bldg	275,500
YP 35 yrs @ 6.5%	13.69
Value of Building	3,770,757
Total MLV (building plus land)	7,770,757
Less Purchaser's Costs	7,348,233

Say 7.3 Million

Result: Mortgage Lending Value 7.3 Million

3. Investment Value (Target Rate 8%)

Period (End of Quart)	Lease 1	Lease 2	Lease 3	Lease 4	Income/ Outflow	Man Costs	RR and other letting costs	Refurb costs	Net Inflow/ Outflow	PV	Present value
0					0				0	1.0000	-
0	80,325	35,000	32,500	-	147825	7391	0	0	140434	1.0000	140,434
1	80,325	35,000	32,500	-	147825	7391	0	0	140434	0.9809	137,758
2	80,325	35,000	32,500	-	147825	7391	0	0	140434	0.9623	135,132
3	80,325	35,000	35,519	-	150844	7542	7104	0	143301	0.9439	135,264
4	80,325	35,693	35,519	-	151537	7577	7139	0	143960	0.9259	133,296
5	80,325	35,693	35,519	40,593	192129	9606	8199	0	182523	0.9083	165,782
6	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.8910	162,623
7	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.8740	159,524
8	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.8573	156,484
9	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.8410	153,502
10	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.8250	150,577
11	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.8093	147,707
12	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.7938	144,892
13	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.7787	142,131
14	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.7639	139,423
15	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.7493	136,766
16	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.7350	134,160
17	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.7210	131,603
18	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.7073	129,095
19	80,325	35,693	35,519	40,593	192129	9606	0	0	182523	0.6938	126,635
20	80,325	35,693	35,519	40,593	192129	9606	0	0	10668560	0.6806	7,260,842
								Total PV	Incl Exit Value		10,123,630

Investment Valuation – Gross 10,123630 – Net 9,573,173 Say 9.5 Million. (Note: The total value is the price that an investor could afford to pay given the assumptions made. The price is made up of the price paid to the current freeholder and the purchaser's costs (PCs) so the actual price offered would be less those purchaser costs.

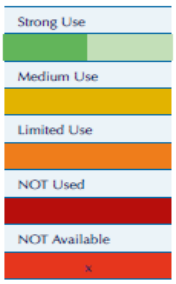
Case study valuation summary results

Valuation Model	**Valuation Result**
Market Value/value in exchange	£10,250,000
Mortgage Lending Value/under-the-cycle	£7,300,000
Investment Value/through-the-cycle	£9,500,000

Appendix Four - Real Estate Data Availability and Use

Real Estate Data Availability and Use within Market Valuations in Highly Transparent, Transparent and Semi-Transparent European Markets [9] (Source French, 2020)

KEY

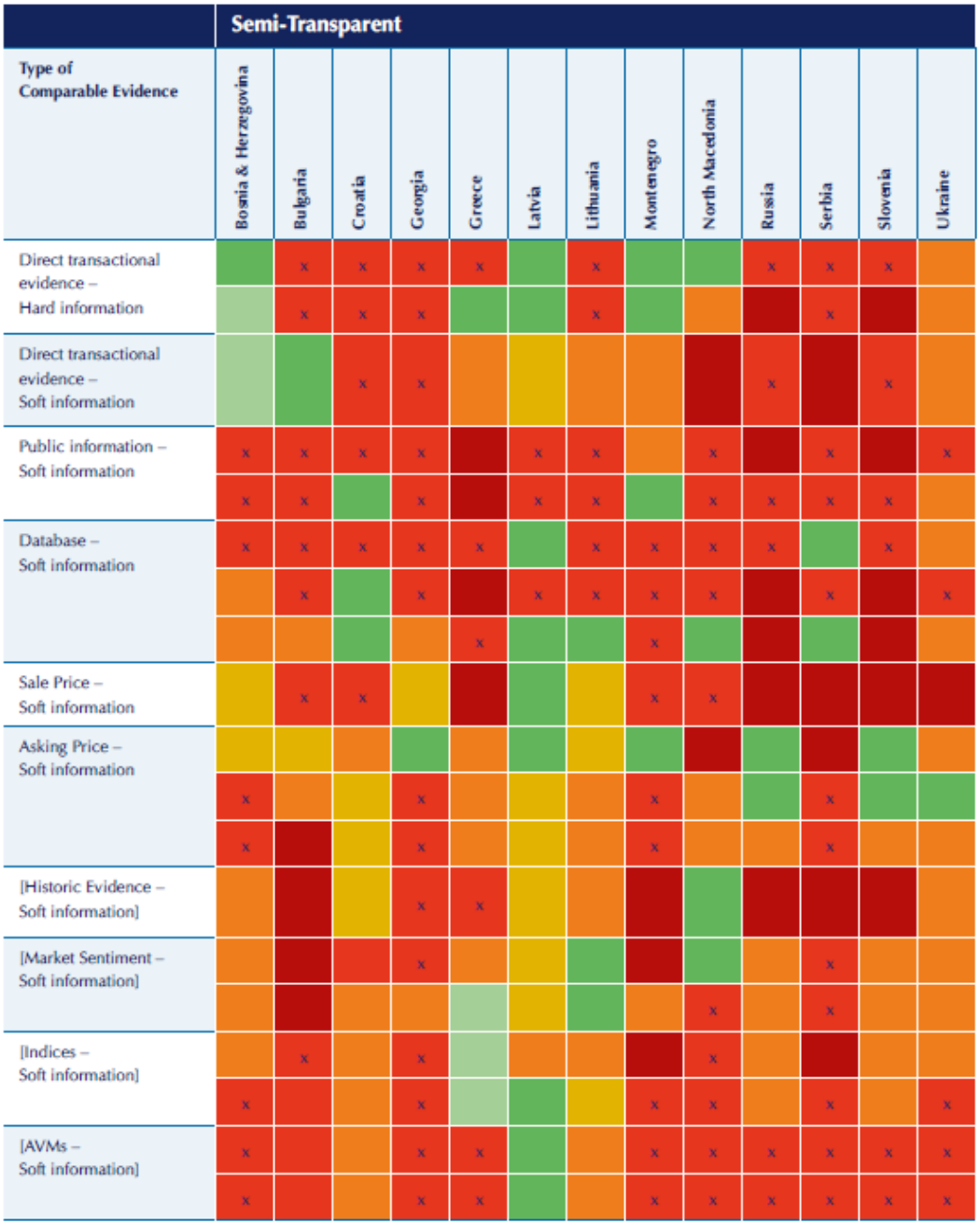


The colours have gradients of shade depending upon ranking of use. Darker Shades reflect greater emphasis within each category of colour.

	Highly Transparent				
Type of Comparable Evidence	**France**	**Germany**	**Ireland**	**Sweden**	**UK**
Direct transactional evidence – Hard information		x			
		x			
		x			
Public information – Soft information					
Database – Soft information					
			x		
			x		x
Sale Price – Soft information		x			
Asking Price – Soft information					
		x			
	x	x			
[Historic Evidence – Soft information]		x			
[Market Sentiment – Soft information]					
[Indices – Soft information]	x				
	x				
[AVMs – Soft information]	x	x			x
	x	x			x

[9] The lack of hard transaction evidence noted for Germany above is disputed by German members and others on this research steering and support group and doesn't fit comfortably with the ranking of Germany in the JLL, (2020) transparency Index.

	Transparent								
Type of Comparable Evidence	**Austria**	**Belgium**	**Czech Republic**	**Denmark**	**Italy**	**Poland**	**Portugal**	**Romania**	**Spain**
Direct transactional evidence – Hard information						x		x	
						x		x	
Direct transactional evidence – Soft information									
Public information – Soft information							x	x	
		x					x	x	x
Database – Soft information						x			
					x	x		x	x
		x				x		x	x
Sale Price – Soft information								x	
Asking Price – Soft information									
[Historic Evidence – Soft information]									
[Market Sentiment – Soft information]									
[Indices – Soft information]									
		x							
[AVMs – Soft information]				x		x	x		
				x		x	x	x	x


Semi-Transparent
Type of Comparable Evidence
Bosnia & Herzegovina
Bulgaria
Croatia
Georgia
Greece
Latvia
Lithuania
Montenegro
North Macedonia
Russia
Serbia
Slovenia
Ukraine
Direct transactional evidence – Hard information
Direct transactional evidence – Soft information
Public information – Soft information
Database – Soft information
Sale Price – Soft information
Asking Price – Soft information
[Historic Evidence – Soft information]
[Market Sentiment – Soft information]
[Indices – Soft information]
[AVMs – Soft information]

Appendix Five – The Content of Valuation Reports

Valuation reports should include:

- the instruction;
- the valuer's qualifications;
- the basis and purpose of the valuation;
- the valuation date;
- the inspection date, the person who inspected and the scope of inspection
- a description of the property;
- the condition of the property;
- a summary of the legal context (tenure, zoning, planning, building consents, tenancies, etc.);
- a commentary as to the market for the property, i.e. normally including a market value;
- a description of the valuation methodology and analysis;
- any assumptions that have been made;
- All legal, contractual, technical, environmental and natural conditions which have been identified must be assessed;
- Comment upon potential factors which could impact on value and/or marketability of the property;
- any limitations on the report;
- signature,
- The valuation figure, and, in the case of a prudent valuation,
- the market value.

Appendix Six : Developing a Template for a Residential Property Quality Ratings Schedule

The list of the assessed indicators should include, in each country or relevant market, all those scenarios or characteristics that may cause an increase in mortgage risk, be it because they correspond to anomalous situations or because they describe types of properties with a low or very low potential demand, a fact that would intensify, for that specific property, the strength and duration of a price drop that took place in the corresponding geographical area.

We can prefigure three categories of items, and some illustrative examples of indicators in a non-exclusive list to be considered:

- **REGARDING THE PROPERTY ENVIRONMENT**

  - ☐ Unconsolidated areas, with low levels of occupation, poor accessibility (lack of transport and communication infrastructures) and / or difficulties in accessing urban services of first necessity.
  - ☐ Degraded areas, due to delinquency, drug addiction, shanty town or marginal population.
  - ☐ Areas with high seismic or flooding risk.
  - ☐ Areas affected by negative environmental factors of any kind (noise, smell, etc).

- **REGARDING THE BUILDING**

  - ☐ Information about unfavorable Technical Inspection, with relevant problems.
  - ☐ Detection of serious pathologies or construction problems, such as cracks due to foundation settlements or deformations, pronounced flections in slabs, etc.
  - ☐ Building or parts thereof ruinous or non-habitable.
  - ☐ Detection of illegal occupations and / or marginal population in the building.
  - ☐ Problems of habitability or healthiness.
  - ☐ Building with equipment or construction features inferior to what is demanded.
  - ☐ Buildings in which degraded or degradable materials are detected (e.g. old structures of wooden pillars).
  - ☐ Building materials with insufficient fire protection or easily combustible.

- **REGARDING THE SPECIFIC ELEMENT**

  - ☐ Property located in second floor or superior without elevator.
  - ☐ Property with low natural light, such as those located on interior ground floors or basements.
  - ☐ Property with problems that cannot be corrected by reform (spatial distribution, free height, thermal or acoustic insulation, ventilation, etc).
  - ☐ Property that lacks linked elements usually demanded in the area (storage room, garage, etc).
  - ☐ Property with constructive pathologies difficult to solve (moisture, breakage, etc).

Each of the above hypotheses should be accompanied by a score, depending on the severity or significance of the event and the impact it may have on the potential demand of the valued element. The marking of one or more of the above situations would entail the linear addition of their scores (therefore, all those situations that are not marked, either because their non-applicability has been proven, or because that end could not be checked in the inspection) would have a null effect on the category score. The overall score would provide an orientation for the fixing of the definitive percentage of discount, derived from the initial range identified in Step 2.

Abbreviations:

MV	Market Value
L-TSV	Long-term Sustainable Value
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
IRB Approach	Internal Ratings-Based Approach
EBA	European Banking Authority
RICS	Royal Institution of Chartered Surveyors
IVSC	International Valuation Standards Council
TEGOVA	The European Group of Valuers' Associations
EMF	European Mortgage Federation
MLV	Mortgage Lending Value
LTI	Loan to income
LTV	Loan to Value
IPD Index	Investment Property Databank Index (IPD Index) – now MSCI
MSCI	Morgan Stanley Capital International
VBI	Valuation Based Indexes
TLI	Transaction Linked Indicator
CPI	Consumer Price Indicator

References

AEV (2020). *Residential market stability barometer - An approach to the determination of mortgage lending value for owner-occupied residential properties.* Spanish Association of Value Analysis.

Allen, F. and Gale, D. (1999), "Bubbles, crises, and policy", *Oxford Review of Economic Policy,* Vol. 15 Issue 3, pp 9-18.

Bank of England (2015*)* *Financial Stability Report*, December. Bank of England: London. https://www.bankofengland.co.uk/financial-stability-report/2015/december-2015

Baum, A., Crosby, N. and Devaney, S. (2021) *Property Investment Appraisal (4e)*. Wiley Blackwell: Oxford (forthcoming).

BCBS (2017) , *Basel III: Finalising post-crisis reforms*. Bank for International Settlements. https://www.bis.org/bcbs/publ/d424.pdf

Bellman, L. and Lind, H. (2019), "Valuation standards and methods: are Sweden's (still) different?", *Journal of European Real Estate Research*, Vol. 12, Issue 1. pp. 79-96.

Bienert, S. and Brunauer, W. (2007), "The mortgage lending value: prospects for development within Europe", *Journal of Property Investment & Finance*, Vol. 25 Issue 6. pp. 542-578.

Bond, SA., Hwang, S. and Marcato, G. (2012) Commercial real estate returns: an anatomy of smoothing in asset and index returns. *Real Estate Economics,* Vol 40, Issue 4. pp 637-661

Brunnermeier, MK. and Pedersen, LH. (2009) Market Liquidity and Funding Liquidity. *The Review of Financial Studies,* Volume 22, Issue 6, pp 2201–2238,

Burston, B and Burrell, A (2015) What is Fair Value? *IPF Short Paper 24*. Investment Property Forum: London. https://www.ipf.org.uk/resourceLibrary/what-is-fair-value---april-2015--short-paper.html

Cardozo, C., Clarke, R., Crosby, N. and McTique, J. (2017). *Prudent Value Methodologies and Real Estate Lending.* Report for the Property Industry Alliance. London: Investment Property Forum / Commercial Real Estate Finance Council Europe. http://www.ipf.org.uk/asset/D05FA2C5-487D-4C76-997B57F3A3D72BAD/

Clarke, R.J. (2018) *The CRE Lending Black Hole: Steady gains followed by extreme pains.* Report for the Property Industry Alliance Debt Group. London: Lipton Rogers. https://propertyindustryalliance.files.wordpress.com/2018/10/cre-lending-report-final.pdf.

Clayton, J., Geltner, D. and Hamilton, SW. (2001) Smoothing in Commercial Property Valuations: Evidence from Individual Appraisals. *Real Estate Economics* Vol 29: pp 337-360.

MSCI (2013) IPD Quarterly Property Price Indicators. Investment Property Databank: London.

Council of Europe (2013) Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012. http://data.europa.eu/eli/reg/2013/575/oj.

Crosby, N. and Devaney, S. (2019) Appraisal-based indices. in MacGregor, BD., Schulz, R. and Green, RK. *Routledge Companion to Real Estate Investment.* Routledge: Abingdon, UK/New York.

Crosby, N. and Hughes, C. (2011) The basis of valuations for secured commercial property lending in the UK. *Journal of European Real Estate Research*. Vol 4 Issue 3: pp 225 - 242.

Crosby, N., Devaney, S. Lizieri, C., Mansley, N. and Wang, Z. (2020) *Prudent Value Methodologies in Commercial Real Estate Lending.* Investment Property Forum: London.

https://www.ipf.org.uk/resourceLibrary/ipf-prudent-value-methodologies-in-commercial-real-estate-lending--july-2020--full-report-.html

Duca, JV., Muellbauer, J. and Murphy, A. (2011) House Prices and Credit Constraints: Making Sense of the US Experience. *The Economic Journal*, Volume 121, Issue 552, 533-551.

EBA (2019) *Policy Advice on the Basel III Reforms: Credit Risk - Standardised Approach and IRB Approach*. European Banking Authority. https://eba.europa.eu/sites/default/documents/files/documents/10180/2886865/d383ee58-8665-4f8b-99d3-058984c2711e/Policy%20Advice%20on%20Basel%20III%20reforms%20-%20Credit%20Risk.pdf?retry=1

Ellis, L. and Naughtin, C. (2010) *Commercial Property and Financial Stability – An International Perspective*. Bulletin, Reserve Bank of Australia, June Quarter, pp 25-30. https://www.rba.gov.au/publications/bulletin/2010/jun/pdf/bu-0610-4.pdf

EMF (2012) *Study on the Valuation of Property for Lending Purposes*. European Mortgage Federation: Brussels.

EMF-ECBC (2017) *Study on the Valuation of Property for Lending Purposes*. European Mortagge Federation/European Covered Bond Council: Brussels. https://hypo.org/app/uploads/sites/3/2017/09/EMF-ECBC-Study-2017-FINAL.pdf.

ESRB (2018) *Report on vulnerabilities in the EU commercial real estate sector*. European Systematic Risk Board: Frankfurt-am-Main. https://www.esrb.europa.eu/pub/pdf/reports/esrb.report181126_vulnerabilities_EU_commercial_real_estate_sector.en.pdf .

EVS (2020) *European Valuation Standards (9e).* The European group of Valuers' Associations (TEGOVA). https://www.tegova.org/data/bin/a5fa02ecd84317_TEGOVA_EVS_2020-digital.pdf

Fisher, J. and Geltner, D. (2000). De-Lagging the NCREIF Index: Transaction Prices and Reverse-Engineering. *Real Estate Finance. Vol* 17, Issue 1. pp 7–22.

French, N. (2020) *Pricing to Market - An Investigation into the use of Comparable Evidence in Property Valuation*. TEGOVA. https://tegova.org/data/bin/a5eff013f34586_Report_on_Comparable_Evidence_in_Property_Valuation.Nick_French.June_2020.pdf

Graff, R. and Webb, J. (1997), "Agency costs and inefficiency in commercial real estate", *Journal of Real Estate Portfolio Management,* Vol. 3 Issue 1, pp 19-37.

Hendershott, P. H., MacGregor, B. D. and Tse, R. Y. C. (2002). Estimation of the Rental Adjustment Process. *Real Estate Economics*, Vol 30 Issue 2: pp 165-183.

Hendershott, P., MacGregor, B. and White, M. (2002). Explaining Real Commercial Rents Using an Error Correction Model with Panel Data. *Journal of Real Estate Finance and Economics*, Vol 24, Issue 1/2: pp 59-87.

Ionașcu, E., Taltavull de La Paz, P., & Mironiuc, M. (2019). The Relationship between Housing Prices and Market Transparency. Evidence from the Metropolitan European Markets. *Housing, Theory and Society,* DOI: 10.1080/14036096.2019.1672577, pp 1-30.

IVS (2000) *International Valuation Standards*. International Valuation Standards Council: London

IVS (2020) *International Valuation Standards*. International Valuation Standards Council: London. https://www.rics.org/globalassets/rics-website/media/upholding-professional-standards/sector-standards/valuation/international-valuation-standards-rics2.pdf

Jensen, M.C. and Meckling, W. (1976), "Theory of the firm: managerial behaviour, agency cost and ownership structure", *Journal of Financial Economics*, Vol. 3 Issue 4, pp. 305-60.

JLL (2020) *Global Real Estate Transparency Index*. Jones, Lang LaSalle/LaSalle Investment Management: Chicago/London/Singapore. https://www.jll.co.uk/en/trends-and-insights/research/global-real-estate-transparency-index

Kohlscheen, E. and Takáts, E. (2020). What can commercial property performance reveal about bank valuations? *BIS Working Papers No 900*, Bank of International Settlements. https://www.bis.org/publ/work900.pdf .

Lind, H. (2005), "Value concepts, value information and cycles on the real estate market: a comment on Crosby, French and Oughton (2000)", *Journal of Property Investment and Finance,* Vol. 23 Issue 2, pp. 141-7.

Lizieri, C., Satchell, S. and Wongwachara W.(2011) Unsmoothing Real Estate Returns: A Regime-Switching Approach. *Real Estate Economics*. Vol 40, Issue 4. 772-804

Prudent Sustainable Value Network (2018) *Why L-TSV?.* http://ltsv.info/ltsv/ltsv.html,

MSCI (2020) *Real Estate Market Size 2019-2020.* MSCI. London. https://www.msci.com/documents/1296102/19878845/MSCI_Real_Estate_Market_Size_2020.pdf/06a13e2c-0230-f253-26fa-3318cecb1c59

Nordlund, B. (2008), *Valuation Performance Reporting in Property Companies According to IFRS*, doctoral thesis in Building and Real Estate Economics, Royal Institute of Technology, Stockholm.

Quan, D. and Quigley. J. (1991) Price Formation and the Appraisal Function in Real Estate Markets. *Journal of Real Estate Finance and Economics.* Vol 4, Issue 2. pp 127–146.

RICS (2019) *The Valuation of Development Property*. RICS Guidance Note. RICS: London

RICS Europe (2018) *Bank lending valuations and mortgage lending value.* RICS professional standards and guidance, Europe. RICS Europe: Brussels. https://www.rics.org/globalassets/rics-website/media/upholding-professional-standards/sector-standards/valuation/bank-lending-valuations-and-mortgage-lending-value-1st-edition-rics.pdf

Silver, M and Graf, B. (2014) Commercial property price indexes: problems of sparse data, spatial spill overs, and weighting, *IMF Working Paper* WP/14/72, International Monetry Fund: Washington DC,