MODULE NO IV

FINANCING MATTERS
Going from the technical to the strategic role

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Readings: 4-1 Borrowing Effects on Property Investment
4-2 Mortgage Implications   4-3 Cycles in Downturn

DEFINITION OF GEARING

Gearing – also referred to as leverage and which describes the balance of funding between debt and equity to support development or the acquisition of investment properties

Thus where 90 per cent of the money is borrowed and 10 per cent is equity, the developer/investor is said to be highly geared. There is a higher return to equity in this scenario if the development or investment asset performs as expected.

However high gearing is risky and if the asset underperforms the high reliance on debt can quickly become burdensome for the borrower.

OPTION 1

Purchase the €1 million house with equity of €400,000 and a €600,000 loan

House sale price achieved after 2 years reflecting 10% annual growth	**€1,210,000**
Repay loan which was 60% of the original house price	**€600,000**
Account for 2 years' interest-only loan payments at 7%	**€84,000**
Balance	**€526,000**
Profit after deducting original equity stake of €400,000	**€126,000**

Return on capital invested over 2 years = $\dfrac{€126,000}{€400,000}$ **= 31.5%**

Equivalent to an annual rate of return of: 14.67%

OPTION 2

Purchase the €1 million house with equity of €100,000 and a €900,000 loan

House sale price achieved after 2 years reflecting 10% annual growth	**€1,210,000**
Repay loan which was 90% of the original house price	**€900,000**
Account for 2 years' interest-only loan payments at 7%	**€126,000**
Balance	**€184,000**
Profit after deducting original equity stake of €100,000	**€84,000**

Return on capital invested over 2 years = $\dfrac{€84,000}{€100,000}$ **= 84.0%**

Equivalent to an annual rate of return of: 35.6%

OPTION 3

But where the value of the property falls over two years by 5%

Purchase the €1 million house with equity of €400,000 and a €600,000 loan

House sale price achieved after 2 years reflecting 5% fall in Value	€950,000
Repay loan which was 60% of the original house price	€600,000
Account for 2 years' interest-only loan payments at 7%	€84,000
Balance	€266,000
PLoss after deducting original equity stake of €400,000	€134,000

Loss on capital invested over 2 years =	€134,000	-33.5%
	€400,000	

OPTION 4

But where the value of the property falls over two years by 5%

Purchase the €1 million house with equity of €100,000 and a €900,000 loan

House sale price achieved after 2 years reflecting 5% fall in value	€950,000
Repay loan which was 90% of the original house price	€900,000
Account for 2 years' interest-only loan payments at 7%	€126,000
Balance	-€76,000
Profit after deducting original equity stake of €100,000	€84,000

Loss on capital invested over 2 years =	€176,000	-176.0%
	€100,000	

HOME OWNERSHIP RETURNS

TOTAL PROPERTY RETURN =

Growth + Rental return – Periodic maintenance

$$y = 3.25\% + 3.75\% - 0.75\%$$

$$y - 6.25\%$$

If gearing (80% mortgage taken into consideration, return e on the equity in the property given by

$$e = (y - iM)/(1 - M)$$

y – return on the property/ i - is the loan interest rate/ M – is the loan to value percentage

For i taken at 3.25% / M taken at 80%

$$e = (6.75\% - 0.8 \times 3.25\%) / (1 - 0.8) = 18.25\%$$

The above compared to an acceptable homeowner return of:

(WACC) 0.8(gearing) X 3.25% + 0.2(equity) X 2.75% = 3.15%

Reading 4 - 1

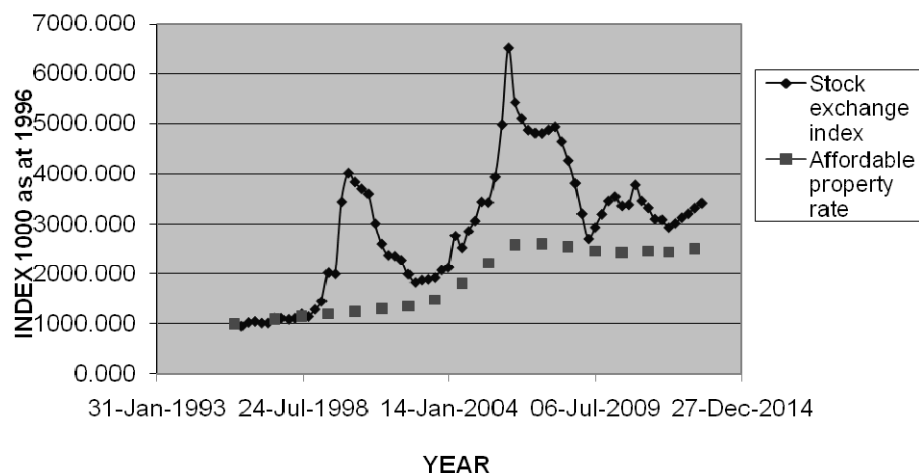# FIGURE 1: PROPERTY vs STOCK EXCHANGE INDEX 1996 - 2013

TABLE 1: HOUSING DATA 2013 FOR SIMILAR STATES.

	Market Rate euro/sqm	Median monthly household income euro	Mortgage rate	Price: earnings ratio.
Malta	1,500	1, 500	3.25%	6.16
Cyprus	1,775	1,175	6.25%	7.44
Hong Kong	7,322	1,944	2.50%	26.56
Singapore	6,405	1,963	2.60%	22.02

Updated August 2013 – Source: Numbeo

Table 1 gives a comparison between the price per square metre for affordable apartments and the price earning ratios of island states similar to Malta. Malta at 6.16 is at the higher end except for Hong Kong.

The price earnings ratio for Singapore has varied from 3.6 in 1995 up to 4.8 in 2009. Here the Government by possessing most of the land provides most of the housing requirements together with the provision of grants. Malta on the other hand has gone for land speculation via planning measures, considered as having boosted the economy.

RESIDENTIAL BLDG PERMITS & VACANT PROPERTY - 1

TABLE 3: RESIDENTIAL UNITS AS APPROVED BY MEPA

YEAR	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Number of total Units	3970	4180	5481	6128	6707	9081	10409	11343	6836	5298	4444	3955	3064

Table 3 indicates that over the past 2003 – 2007 period a higher supply had been provided, with possibly the increase in demand not being matched.

TABLE 4: VACANCY RATES OVER THE VARIOUS MALTESE CENSUS'S

YEAR	1861	1881	1891	1901	1911	1921	1931	1957	1967	1985	1995	2005	2010
%	25	29	20	20	22	19.9	19.4	4	14.9	19.2	23	27.6	

The number of vacant dwellings, as at 2005 stands at 53,120, up from the 1995 value of 35,723, Exceeding 77,000 in 2010. Of these vacant units in 2005, 10,113 are listed as holiday dwellings, i.e. 1/5 of the total vacant stock of which only 349 was rented. This figure shows the importance of 2nd homes of which in 2005 only 85 holiday dwellings were located abroad.

RESIDENTIAL BLDG PERMITS & VACANT PROPERTY - 2

Year	1982	1987	1992	1997	2002	2006	2008	2009	2010	2011	2012
Annual Marriaages	2475	2535	2377	2370	2240	2536	2482	2353	2596	2562	2823
Seperations &Annulments			303	275	375	447	738	731	737	**	554

The number of marriages over the period has averaged out at 2250 annually together with separations/annulments presently averaging at 725 annually. Considering these figures together with 2nd home and foreign buyer purchases in the 400 region, the demand figure does not appear to be too far off from the above supply figure of 4,750 units annually, as noted above. Thus in the coming years it is anticipated that building permit applications for residential units will again revert to the pre-2002 figures.

** figures for separations & Annulments of 2011 not available

TABLE 2: HOUSING AFFORDABILITY INDEX FOR THE MALTESE ISLANDS – HAI

Year	Mortgage Monthly Payment		Medium Family Income**	Qualifying Monthly Income		Ratio of Qualifying Family Income		HAI		House Price: Earnings Ratio
	3-bed/2-bed/r			3-bed/ 2-bed/r		3-bed/2-bed/r		3bed/r 2bed/		
1982	€140	€ 56	€ 229	€559	€ 391	1.3	0.91	77	110	4.28
1987	€161	€114	€ 564	€643	€ 457	1.14	0.81	88	123	4.23
1992	€252	€168	€ 745	€1006	€ 531	1.35	0.90	74	111	5.27
1997	€384	€247	€ 995	€1537	€988	1.55	0.99	65	101	5.80
2002	€394	€263	€1215	€1575	€1057	1.29	0.86	77	116	5.60
2006	€606	€429	€1665	€2119	€1500	1.27	0.90	79	111	7.22
2007	€673	€478	€1738	€2152	€1670	1.35	1.01	74	104	6.97
2008	€615	€410	€1798	€ 2152	€1435	1.20	0.80	84	125	6.58
2009	€478	€319	€1872	€1673	€1118	0.89	0.60	112	168	6.11
2010	€472	€315	€1914	€1652	€1102	0.86	0.58	116	174	5.99
2011	€469	€315	€1959	€1641	€1103	0.84	0.56	119	179	5.29
2012	€448	€305	€2058	€1568	€1067	0.76	0.52	132	192	5.05

An HAI of 100 according to the US National Association of Realtors` signifies that a family earning the median household income just qualifies for a median residence, whilst with a HAI of less than 100 signifies that the median family has to do away with other necessities.
***the median family income is factored at 1 for 1982, and by 1.35 for 2002 increasing to 1.65 for 2012 to account for the effect of the 2nd wage earner.*
Source: updated table Camilleri 2000

The affordability for first time buyers over this period has varied slightly averaging out at 91.5 for a 3 bed/r apartment and at 135 for a 2 bed/r apartment. This occurred, despite the increase in house prices over the period at 7.23%pa, as compared to the wage growth at 3.5%pa over the same period (Refer to V S 2012 – Appendix G).

PRICE:EARNING RATIO & Property Bubbles

The price earning ratio noted in table 2, has increased gradually from 4.28 in 1982 peaking in 2006 at 7.22, before declining to 5.05 in 2012. These ratios are considered high, as a long-term 35 Year average level of house prices to incomes ratio is given at 3.5. The UNCHS (habitat) indicators mention the price earning ratio desirable range to lie between 2 & 6.

Referring back again to property bubbles, a little property bubble will occur if the price earning ratio is less than 6 and a serious bubble will occur if higher than 10. As the highest price earning ratio stood at 7.22 in 2006, Malta's property bubble is characterized as substantial but not serious.

See reading 4 - 2

SUSTAINABLE BORROWING

Housing affordability nowadays may be achieved by educating the first time buyer in restraining his housing requirements to cause less strain on his resources. Prospective homebuyers should learn the new low inflation housing market game by moderating their borrowings and house price bids.

A rise of 1% to 3% over the next years would raise interest costs by 16% for a 1% mortgage rate increase, 33.33% for a 2% mortgage rate increase, and 50% for a 3% mortgage rate increase. What happens to the personal finances of those who borrowed large sums relative to their income? Furthermore, with the present low inflation climate the monthly paybacks are going to erode far slower than previously in the high inflation era, with a consequent lowering of the household's quality of life. A prospective homebuyer should possibly look out for a price-earning ratio closer to the long-term average of 3.5 than the present value in the 8 region.

Reading 4 - 2

MORTGATE CALCULATOR FOR HOUSE BORROWING

Mortgage Information for year	0	5	10
Loan Amount	€90,000.00	€90,000.00	€90,000.00
Annual Interest Rate	3.250%	3.250%	3.250%
Term of Loan (in Years)	35	35	35
PAYMENT			
Monthly Payment (PI)	€359.19	€359.19	€359.19
TOTALS			
Total Payments	€150,860.49	€150,860.49	€150,860.49
Total INTEREST	€60,860.49	€60,860.49	€60,860.49
BALANCE at Year ...	0	5	10
Outstanding Balance	€90,000.00	€82,503.54	€73,685.01
Interest Paid	€0.00	€14,055.04	€26,788.01
PURCHASE PRICE €100,000.00			
Deposit 10%	€10,000.00		
Loan ammount	€90,000.00		
Market value at corresponding year	€100,000.00	€107,728.40	€120,405.63
EQUITY according to adjusted market value	€10,000.00	€25,224.86	€46,720.62

MORTGAGE CALCULATOR FOR HOUSE TO BUY LET

Mortgage Information for year	0	5	10
Loan Amount	€75,000.00	€75,000.00	€75,000.00
Annual Interest Rate	4.950%	4.950%	4.950%
Term of Loan (in Years)	25	25	25
PAYMENT			
Monthly Payment (PI)	€436.55	€436.55	€436.55
Total MONTHLY PAYMENT	€436.55	€436.55	€436.55
Rental taken at 3.75% + costs	359.375	406.5998265	460.0303831
TOTALS			
Total Payments	€130,965.92	€130,965.92	€130,965.92
Total INTEREST	€55,965.92	€55,965.92	€55,965.92
BALANCE at Year ...	0	5	10
Outstanding Balance	€75,000.00	€66,389.16	€55,362.16
Interest Paid	€0.00	€17,582.34	€32,748.53
PURCHASE PRICE €100,000.00			
Deposit 25%	€25,000.00		
Loan ammount	€75,000.00		
Market value at corresponding year	€100,000.00	€107,728.40	€120,405.63
EQUITY according to adjusted market value	€25,000.00	€41,339.24	€65,043.47

VALUATION REPORTING:- as per KTP Valuation Standards – 2012 Chapter 4 / 1

Para 4.01.4 **The instructions** – the client's name and that of the instucting party if different, the purpose, or purposes of the valuation.

Para 4.01.5 **Time period** – the date of valuation and of inspection of the subject properties must be stated.

Para 4.01.6 **Identificatio**n – the subject matter of the valuation, and the sources and nature of the information relied on, concerning tenure, legal charges, land use planning, licensing, statutory controls, and other technical and economic aspects of the properties.   Any assumptions must be stated and explained, and any information that needs further verification must be indicated.   The treatment for valuation purposes of fixtures, fittings, plant and machinery, which are normally valued with land and buildings, must be included as an annex to the report.

Para 4.01.8 **The basis of Valuation** - the basis of valuation, and the valuation methods adopted, is a calculation of value in Use. *Additionally the methodology used and if appropriate, the inclusion of calculations with relevant sensitivity and risk and performance analysis must be clearly communicated.*

VALUATION REPORTING:- as per KTP Valuation Standards – 2012 Chapter 4 / 2

Para 4.01.10 **Risk assessment** – in the case of valuations for loans or other cases where the volatility of the market is of major importance, the valuer should comment on this aspect, and on the suitability of the asset as security having regard to the terms proposed in the loan facility.

Para 4.01.14 **Third Party Liability** – the limits to the legal responsibility of the valuer to third parties must be stated. *This report is confidential to you and your professional advisers and is for the sole purpose stated above.   We can accept no liability if it is relied upon by anyone else, whether for the stated purpose or any other.*

Further Confidentiality Clauses noted in KTP VS Section 4.02

VALUING FOR BANK SECURITY PURPOSES – (VS-2012 chap 6)

MORTGAGE LENDING VALUE shall mean the value of the property as determined by a valuer making a prudent assessment of the future marketability of the property by 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. Speculative elements may not be taken into account in the assessment of the Mortgage Lending Value.

MARKET VALUE shall mean the price at which land and buildings could be sold under private contract between a willing seller and an arms length buyer on the date of valuation, it being assumed that the property is publicly exposed to the market, that market conditions permit orderly disposal and that a normal period, having regard to the nature of the property, is available for the negotiation of the sale.

FORCED SALE VALUE is sometimes required for the purpose of valuations of property, which is, or is intended, to form security for loan. The forced sale value is identical to the Market Value definition with the codicil that the time allowed for marketing is unduly short, and publicity and market exposure is inadequate, compared to the period and promotional measures necessary to achieve the best price in the market. The seller may also be under duress or compulsion.

THE RECOMMENDATION IN A BANK'S VALUATION REPORT

". . . . Suitable security for maximum advance based on the agreed purchase price".

". . . . Suitable security for maximum advance on our valuation of €x which is rather less than the proposed purchase price".

". . . . Suitable for (maximum) advance subject to . . . ."

". . . . Subject to a satisfactory report from a chartered structural engineer in respect of the deflection of upper floors/differential settlement/structural movement/etc."

". . . . Subject to formal confirmation that statutory approvals have been obtained for . . . ."

". . . . Subject to written confirmation for the planning authority that they will not enforce the planning condition that the property may only be occupied by someone wholly or mainly engaged in agriculture . . . . "

" . . . . Suitable security for maximum advance subject to satisfactory completion"

RECOMMENDATION IN THE LOCAL SCENARIO – 1 - for depressed market

26th August 2008 Average global house prices stood at 8.5% p.a. growth for 2006. The present most notable global trend is that house price growth is slowing down. The forecast is for continued slowing of global housing price growth into 2008. It is further to be noted that the Mosta locality, over the past 25 years, with a growth rate of 7.50% p.a., has underperformed in comparison with the Malta growth rate at 8%. However property prices over the past year have decreased by 5.25% as compared to the average of Malta's decline rate taken at 2.5%.

28th May 2010 To be noted that residential premises over the past 25-year period have increased in value on an average annual basis at 7.5% p.a. Over the immediate past 3 year period residential property has declined in value at an overall 10% with further declines in value anticipated up to 2011, whence from 2012, values should stabilize again.

On the other hand, prime property values in Valletta over the past 5-year period have managed to increase in value by 4% pa. This due to the gentrification of the Capital City whereby couples want to have a feel to be accessible to the cultural events occurring in the Capital.

Noting the above, with anticipated increase in future for such prime residential Valletta property, this residence is considered to offer sufficient security in securing a loan over a 38 year period.

RECOMMENDATION IN THE LOCAL SCENARIO – 2 - for depressed market

24th February 2011 From the above, although the price growth of the affordable property has slowed down, the same is not to be said for prime property, where a reasonable sustainable growth rate can be anticipated. Thus present market value of this freehold premises is estimated at €744,0000. This premises is noted to offer suitable security for investment to be undertaken over a 5 loan year period.

26th April 2011 Property in Malta over a long 25-year period has given annual increases in market value averaging out at 7.5%pa. However, following the property slump over the past 3-year period property prices have shed 6.5% off their 2007 value.

Note that presently the property market is anticipated to lose 1.25% of this value in 2011, then lowering to 1% and 0.5%pa for 2012 & 2013 respectively. It is then expected to start recovering in value from 2013 onwards, tending towards a renewed 7.5%pa increase in value over a 25-year period. This signifies doubling its value every 12 years.

Noting the above, this property is considered to offer sufficient security for loan facilities required over a 25-year period

RECOMMENDATION IN THE LOCAL SCENARIO – 3 - for depressed market

23rd November 2012 For the inner prime residential Sliema the increases over the past 30-year period are less at 6.78% pa. However over the immediate past 5-year period the Sliema area has not experienced a loss in value but a minimal cumulative gain of 2.11%. Noting the above, with anticipated increase in future for this residential Sliema property, this residence is considered to offer sufficient security.

16th January 2013 To be noted that affordable Malta residential premises over the past 25-year period as noted in Table 2 have increased in value on an average annual basis at 7.23% p.a. Over the immediate past 5-year period residential property has declined in value at an overall 6.5% with further declines in value anticipated up to 2014, whence from 2015, values should stabilize again.

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Measuring the effects of borrowing on property investments

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Introduction

Many investors make extensive use of borrowed funds to acquire rental properties and to finance building improvements. Borrowing is expected to increase the return on the equity of the investor but it is also believed to add risk. The implications of financial leverage are commonly demonstrated in numeric examples and mathematical models (see, for example, Brueggeman and Fisher, 1993, p. 402 and Rowland, 1993, p. 31). The purpose of this paper is to show how the past effects of borrowing may be measured and, using data from one residential property market in Australia, test whether the expected benefits and risks of leverage were evident.

Previous studies

The few previous empirical studies of the effects of borrowing have used diverse approaches in radically different property markets and their results have not been consistent. In a study of rates of return from single family housing around Salt Lake City, Alberts and Kerr (1981) assessed the geometric mean of the annual returns (made up of imputed rent and capital gain) for a four-year period to 1974 at debt-to-price ratios of between 0.9 and 0. In each of the four years, the return on housing was higher than the (unchanged) loan interest rate and the risks of financing would therefore not have been evident. While the methodology of this study is of interest, the very limited number of periods of data prevent any generalizations from the results.

Mollart (1993) took annual data from the IPD Property Return Index, which measures the return from a large sample of institutional property investments in the UK. Using loan interest rates estimated at a 2.5 per cent margin above a variable base rate, annual rates of return on equity were calculated at loan-to-value ratios of between 25 and 75 per cent between 1981 and 1992. For the three sectors of the property market (offices, retail and industrial), the average returns on equity declined at higher levels of debt and the standard deviation of the annual returns increased. There were difficulties in establishing the costs of debt for the category of investor that might purchase the type of property found in the IPD sample. The current paper is based on work by Mollart and Rowland

(1996) comparing housing returns in the East Midlands, UK and Perth, Western Australia.

There are US indices of both unlevered and levered Real Estate Investment Trusts and the performance of each group can be compared. One study indicated that there was no significant difference in the average returns of REITs with different levels of borrowing (Chan *et al.,* 1990), nor in the volatility of returns. These studies are only tests of the effects of financial leverage if the properties in the two groups have on average the same risk and return characteristics. Barkham and Geltner (1995) concentrate on the levered funds and compare the return on the properties owned by those funds with the return to equity in those funds. They compute an unlevered capital value index from levered REITs (using a version of equation (1) below to adjust for debt, as described in Fisher *et al.,* 1994) and found that the unlevered capital value index showed lower appreciation and less volatility.

Assessing the effects of financial leverage
The return on equity can be expressed as

$$e = \frac{y - (i^* \, M)}{(1 - M)} \tag{1}$$

where

    e is the return on the equity in the property;
    y is the return on the property;
    i is the loan interest rate;
    M is the loan to value percentage.

This illustrates that *e* will increase provided that *y* is greater than *i*. The two factors that determine the benefits of financial leverage are the loan-to-value percentage and the difference between the return on the property and the loan interest rate. One way of assessing the effects of leverage in recent years is to compare the returns from typical properties with loan interest rates. This can be extended to the relationship between the after-tax return on the property and the after-tax cost of borrowing. An alternative way of assessing the effects of leverage is to compare the return and risk of properties (without debt) to the return and risk of equity interests in the same properties. Whichever approach is adopted, the calculation of the property returns and the specification of loan interest rates may significantly influence the results.

Property returns may be the sum of the rental income from a sample of properties added to their appraised capital growth or the sum of a median rental value added to the average change in the price of those properties which have sold. The available data and method of calculation for average rents are not always compatible with the average capital values. All the current measures of property returns have been shown to have shortcomings (Brown and Matysiak, 1995; Fisher *et al.*, 1994; Haurin and Hendershott, 1991; Knight *et al.*, 1995) and the appropriate one depends on the data available and the purpose of the

measurement (Mark and Goldberg, 1984). The returns may be computed for each period (such as quarterly or annually) and then averaged (generally as a geometric mean) or they may be expressed as a return over the data set (such as an internal rate of return). Periodic returns are favoured for comparisons with other investment assets and allow the volatility of returns over time to be calculated.

Loan interest rates for many property investments (other than owner-occupied residences) are not publicized but are negotiated between the lender and borrower. Rates may vary depending upon the terms of the loan such as the basis of repayment and length of time for which the interest rate is fixed. Rates may also vary with the type of property, its location and the credit rating of the borrower. Because of the difficulties of obtaining information about loan agreements, borrowing costs in assessing leverage are approximated as the quoted rates during each period, possibly adjusted by the usual margin for properties of the sample category. If the average property changes in value during the time series (or the loan is amortizing), the return on equity will depend on whether a constant loan amount or a constant loan-to-value ratio is assumed.

The sources of data

Data were assembled to test the extent of the benefits and risks of financial leverage over the period 1982 to 1994 in the residential property market in Perth, Western Australia, where individuals of moderate means have long viewed houses and strata-titled homes as secure investments for which gearing can enhance returns. About 62 per cent of owners of rented residences in Australia have loans over their most recently acquired property (Australian Bureau of Statistics, 1994). In this market, investors seeking rental properties compete with owner-occupiers. The buyers of rental properties are predominantly private investors who own one or only a few dwellings. The tests of leverage are specified to approximate the financing and tax liability that such landlords would face.

These data are summarized in Table I. The capital values shown are the median sales price of all established houses sold by members of the Real Estate Institute of Western Australia during the last month of each year between 1981 and 1994. This would comprise the majority of the established houses sold in the Perth Metropolitan Region and in each month there were about 3,000 sales in the sample. There are minor variations in the median price in the months preceding and following December of each year but these appear to be random. The change in median price is used as a gauge of the capital growth for investors. This may overstate the growth slightly as it ignores the obsolescence in any residential property. With a modern housing stock, ageing does generally have a depressing effect on value (with some exceptions in gentrified suburbs). The median price from a large sample of houses will reflect a renewing stock, both in terms of more recently constructed houses and lump sums spent on renovations.

Year ending December	Median price ($)	Net rent ($)	Property return (%)	Loan rate (%)
1981	42,600			
1982	44,000	2,639	9.48	13.27
1983	44,200	2,924	7.10	12.33
1984	49,000	2,988	17.62	11.63
1985	53,900	3,049	16.22	12.42
1986	58,900	4,171	16.28	15.00
1987	64,100	4,444	16.37	15.13
1988	93,400	4,611	52.90	14.08
1989	104,800	4,920	17.47	16.46
1990	100,300	4,975	0.45	16.35
1991	99,200	5,057	3.94	13.42
1992	102,500	5,062	8.43	10.58
1993	114,800	5,069	16.95	9.42
1994	124,600	5,072	12.95	8.96

Table I.
Perth, Western Australia

The Real Estate Institute of Western Australia also collects data on median weekly rents for three bedroom houses that have been recently let. Table I shows the annual estimated net rent based upon the median gross weekly rent. For each month, the sample comprises about 2,000 lettings. The annual gross rent has been reduced by 30 per cent to reflect average running costs (repairs, insurance, rates and management fees) and a loss to vacancy and bad debts. Running costs vary considerably for houses in Perth but industry norms suggest costs, including management fees, of between 20 and 25 per cent of gross income. Average monthly vacancy between 1982 and 1994 has been 3.6 per cent but has varied between 0.5 and 9.8 per cent (REIWA).

These rents are for a different sample of properties than the sales data. The sales data is from all established houses whereas the sample of rents is for three-bedroom houses only. The sales data is dominated by properties purchased for owner-occupiers, whereas the sample of rents is new lettings of rental properties. The derived net rents indicate a capitalization rate based on the median prices of an average of about 5.5 per cent, varying between 4.1 and 7.1 per cent. This average is believed to be consistent with rates which have been paid by investors. The net rent is the best available proxy for average income returns.

In Table I, the net rent and capital growth during the year have been converted to a percentage rate of return per annum. The indicative loan interest rate for a private property investor during the previous year is also shown. This is the average variable monthly rate quoted for homes for owner-occupation, plus 1 per cent per annum. Until recently, lenders did not publicly quote loan interest rates for property investors but a 1 per cent per annum estimated

margin between owner-occupier and investor mortgage interest rates has been typical since 1984.

Results and discussion

The simplest way to assess whether borrowing has increased the return on equity is to contrast the return on the property with the loan interest rate. Equation (1) above confirms that whenever the return on the property is higher than the loan interest rate, there is positive leverage (that is, the return on equity increases as more is borrowed). The comparison between property returns and loan interest rates is shown in Figure 1, which indicates that Perth residential property returns have been greater than interest rates for most years but that property returns have been much more volatile than interest rates. The average annual mortgage rate advantage was 2.09 per cent per annum (with property returns averaging 15.09 per cent per annum and loan interest rates averaging 13.0 per cent per annum; Fibbens, 1991, p. 24).

Figure 1.
Perth,
Western Australia
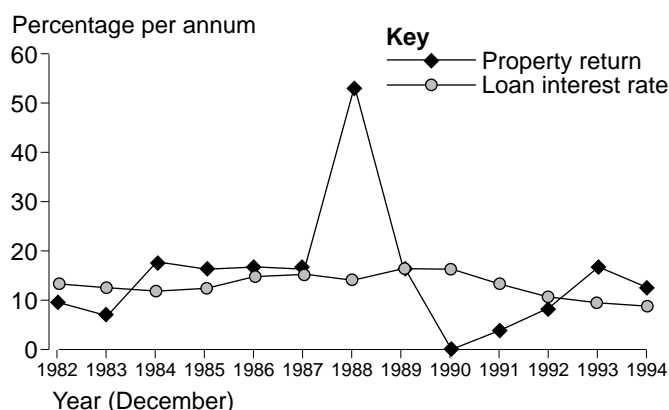
A huge increase in house prices occurred in 1988 in most cities in Australia although the increase in Perth was greater than the Australian average (Australian Bureau of Statistics, Cat. No. 6416.0). The increase in house prices in 1988 and the subsequent decline in 1990 and 1991 in Perth dominate the analysis of the effects of borrowing during the study period. If the change in house prices between December 1988 and December 1991 had been a steady rise, the results which follow would have been considerably different. The validity of any generalizations from this study depends upon the assumption that it is usual for house prices to escalate dramatically followed by cyclical corrections

In Table II, the property return (100 per cent equity) and returns on 75, 50 and 25 per cent equity in each year are displayed. The annual returns on equity are calculated using equation (1) above. The arithmetic and geometric means of these annual returns are shown below the annual rates. The internal rates of

return in Table II are before and after allowance for 3 per cent acquisition costs added to the purchase price at the start of the first year and sales costs deducted from the resale at the end of 1994. The internal rates of return assume that the portion of borrowed funds is fixed at the start of the first year, whereas the annual returns assume that the loan-to-value percentage remains constant in each year.

All these measures indicate that returns would not have been enhanced significantly by borrowing 25 per cent borrowing and only enhanced modestly by borrowing 50 or 75 per cent borrowing. In Table II, the decline in the geometric mean between 50 per cent and 25 per cent equity is caused by the large negative returns on equity in 1990 (which suggests that some characteristics of the geometric mean are inconsistent with those of the compounding of the internal rate of return).

The averages in Table II have been calculated from a small number of periods and there are dangers in relying too heavily on statistics from small samples which are highly variable. For example, a 95 per cent confidence interval for the arithmetic means for the property without debt shows a range of 8.19 to 21.99 per cent per annum and for the 25 per cent equity in the property a range of –6.63 to 49.03 per cent per annum.

Year ending	Property return (%)	Return on 75% equity (%)	Return on 50% equity (%)	Return on 25% equity (%)
December 1982	9.48	8.22	5.69	−1.89
December 1983	7.10	5.36	1.87	−8.60
December 1984	17.62	19.62	23.61	35.60
December 1985	16.22	17.49	20.03	27.64
December 1986	16.28	16.71	17.57	20.13
December 1987	16.37	16.79	17.62	20.12
December 1988	*52.90*	*65.84*	*91.72*	*169.36*
December 1989	17.47	17.81	18.49	20.52
December 1990	*0.45*	*−4.85*	*−15.45*	*−47.25*
December 1991	3.94	0.79	−5.53	−24.47
December 1992	8.43	7.71	6.28	1.97
December 1993	16.95	19.45	24.47	39.53
December 1994	12.95	14.29	16.95	24.94
Arithmetic mean	*15.09*	*15.79*	*17.18*	*21.35*
Geometric mean	*14.52*	*14.80*	*15.07*	*13.44*
IRR before costs	*14.63*	*14.93*	*15.38*	*16.19*
IRR after costs	*14.09*	*14.27*	*14.55*	*15.02*
Standard deviation	*12.69*	*16.90*	*25.38*	*50.92*
Coefficient of variation	*0.84*	*1.07*	*1.48*	*2.38*

Table II.
Perth property and
equity returns,
1982-1994

A proper comparison of levels of gearing must also measure the risk to the return on equity. The standard deviation is the measure of risk commonly used in financial markets and is shown in Table II. The rapid increase in the standard deviation that resulted from borrowing during this period confirms that high gearing would have greatly increased the risks of the typical residential investments in Perth. The coefficient of variation shows that borrowing adds to the risk per unit of return. For consistency, the coefficient of variation is found using the arithmetic mean as the measure of return (Lizieri and Satchell, 1991).

The standard deviation is a measure of risk that enables comparisons with financial assets, such as shares. Nevertheless, it is doubtful whether these short-term periodic variations in return reflect the elements of risk which are paramount in the eyes of private investors, whose main concerns may be financial distress caused by prolonged periods of high interest rates or property vacancies. The range of annual returns on the property, with and without borrowing, is another indication of the volatility created by debt. The best and worst years during the study period are shown in italics in Table II. A loss of 47.25 per cent in 1990 gives a further indication of the risk of borrowing 75 per cent of the purchase price.

For comparative purposes, the risk-return characteristics of the properties at different levels of gearing are compared with the annual risk-return characteristics of two market indices for shares in Figure 2. The standard deviation of the Australian All Ordinaries Index was 28.38 per cent and the mean return was 17.27 per cent over the study period. The Australian Property Trust Index for this period had a standard deviation of 15.55 per cent and the mean return was 14.66 per cent (source: Australian Stock Exchange Ltd). A 25
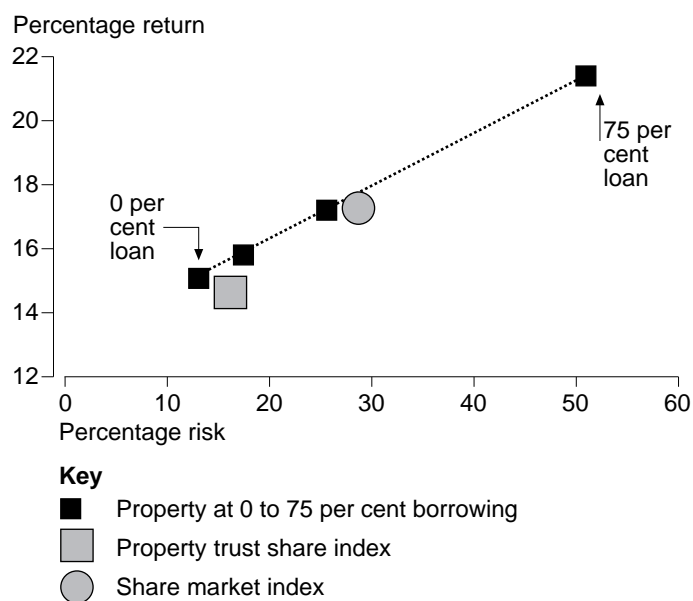
Figure 2.
Risk-return profile

per cent equity in the property would have made the investment considerably more risky than an investment in a diversified portfolio of shares. Figure 2 shows that Perth residential property with 50 per cent equity had a slightly superior risk-adjusted performance than shares (acquired without borrowing). Residential property in Perth acquired without borrowing had a superior risk-adjusted performance to listed property trust shares (acquired without borrowing).

The standard deviation of the average returns per period ignores the variations in return from one property to another. As such, it understates risk to most private investors who does not have a large portfolio of properties (in the same way that the standard deviation of the share market index understates the risk of an investor who purchases shares only in one company).

The tests confirm that leverage added to the return and the volatility of property returns. Because of the extremes of the boom and recession between 1988 to 1991, leverage added more to risk for investors in Perth rental dwellings than it added to their return on equity. Borrowers must either accept that debt magnifies the uncertainty of property investment or they must be confident that they can anticipate the changes in property values and dispose of their properties before or at the peak of any forthcoming cycle.

Further tests of leverage

Further tests on the Perth market data have been carried out to try to identify when borrowing was most effective and whether borrowing helped to meet two important investment objectives of many private investors; these objectives are hedging against inflation and tax shelter.

To search for the periods when leverage had been most beneficial for property investors in Perth, the data were broken into rolling five-year segments and the average returns and standard deviations were calculated for each five-year segment (although this reduces the sample size and widens confidence intervals). The differences between the performance of the debt-free property and the property with 25 per cent equity are displayed in Table III as the benefits for each five-year segment. The difference in the standard deviation of the property and the 25 per cent equity are shown as the risks of leverage. The overall benefits and risks of leverage between 1981 and 1994 were 6.26 per cent per annum and 38.23 per cent per annum.

The best returns from residential properties were obviously obtained from those five-year segments that included the 1988 boom. The five-year segments when the benefits of leverage were above the average of 6.26 per cent between 1981 and 1994 are the same segments for which the standard deviation is above the overall 38.23 per cent per annum. Although this confirms that the higher risks and higher returns are closely linked, Table III does reveal that the risks of leverage remained high for periods as late as 1987 to 1992 whereas the benefits of leverage were declining as early as the period 1985 to 1990. This is partly because interest rates rose towards the end of the boom and remained high until 1991 (see Table I).

Years	Benefits (%)	Risks (%)
1981-86	1.24	14.33
1982-87	4.26	12.39
1983-88	30.69	48.25
1984-89	27.70	49.69
1985-90	15.88	60.44
1986-91	9.43	63.66
1987-92	7.39	63.98
1988-93	−11.39	27.01
1989-94	−9.60	28.76

Borrowing preceding and during the boom proved very attractive but, since then, interest rates have remained too high for leverage to be advantageous. During the study years, changes in interest rates lagged changes in property returns (the highest correlation of the first differences of the returns and interest rates was with a two-year lag, $r = 0.54$). Although the limited sample size prevents firm conclusions being drawn, the results suggest that the most successful strategy for borrowing requires that the investor picks the peaks in property prices and also avoid the subsequent peaks in loan interest rates.

One common reason why private investors acquire residential property is as an inflation hedge (Australian Bureau of Statistics, 1994). It is relevant to test whether leverage enhances the inflation hedging characteristics of residential property. The Perth data has been used to test whether the benefits of leverage are greater when, first, inflation is increasing and, second, when inflation is unexpectedly high. The benefits of leverage can be measured annually as the mortgage rate advantage, which is compared to the (actual) rate of inflation in Table IV. Inflation appears to be uncorrelated with the mortgage rate advantage ($r = 0.05$).

Unexpected inflation is the difference between actual and expected inflation. There are many ways in which expected inflation can be estimated (Hartzell *et al.*, 1987; Matysiak *et al.*, 1996; Newell, 1996). In this case, expected inflation is defined as the difference between 180 day bank bill returns and a 4.5 per cent per annum real risk-free rate (based on the recent yields on tenders for capital-indexed Treasury bonds; Reserve Bank of Australia, 1996). In Table IV, unexpected inflation is contrasted with the mortgage rate advantage. There is only a weak negative relationship between unexpected inflation and the mortgage rate advantage ($r = -0.33$).

This negative correlation is not consistent with the belief that high unexpected inflation benefits borrowers. One explanation for this may be that higher inflation places upward pressure on loan interest rates sooner than it raises property returns. In which case, the benefits of high unexpected inflation are only earned by borrowers if the loan interest rate is fixed. The cyclical

Year ending December	Mortgage rate advantage (%)	Actual inflation (%)	Unexpected inflation (%)
1982	−3.79	11.06	3.31
1983	−5.23	8.61	1.76
1984	5.99	2.55	−6.95
1985	3.80	8.20	−6.55
1986	1.28	9.80	−0.65
1987	1.25	7.14	−0.21
1988	38.82	7.60	−3.45
1989	1.02	7.83	−4.67
1990	−15.90	6.85	−0.60
1991	−9.47	1.51	−1.34
1992	−2.15	0.28	−1.17
1993	7.53	1.95	1.60
1994	4.00	2.24	−2.31

Table IV.
Inflation hedging

movements of interest rates, property returns and inflation are linked but limitations of this data (and the difficulty of knowing what level of inflation is expected) make it impractical to test the relationships reliably.

A further reason why private investors often acquire residential properties in Australia is because at least part of the return will not be taxed, due to the inflation allowance in capital gains tax and accelerated depreciation allowances. Leverage, as measured by the mortgage rate advantage, may be negative before tax whilst it is positive after tax. The Perth data has been used to test whether the tax shelter of part of the return from the property enhanced leverage after tax more than before tax.

It is difficult to establish average after-tax returns or after-tax costs of borrowing because investors are in varying tax brackets and properties offer widely varying tax benefits. However, the effects of taxation upon leverage can be estimated by assuming a constant 40 cents in the dollar as the tax rate and assuming that the tax free portion of the capital gain is part of each year's return. The following formula has been used to approximate the after-tax rate of return per period from the average residential property (Rowland, 1993, p. 21).

$$y^t = y(1 - t) + t(d + 0.1) \qquad (2)$$

where

y^t is the after tax return on the property;
y is the return on the property;
t is the tax rate as a percentage (in this case, 0.40);
d is the rate of inflation.

For this to represent the after-tax return, the growth in the value of the property must be at least as great as the rate of inflation. The final term in the equation

represents the tax shelter provided by building allowances and accelerated plant depreciation allowances and it assumes that 1 per cent of the value of the property can be depreciated for tax purposes each year. As shown in Table V, this after-tax return in Perth can be compared with the after-tax cost of borrowing. Because all loan interest paid to earn assessable income can be deducted for tax purposes, the after-tax cost of borrowing is simply the loan interest rate, multiplied by $(1 - t)$.

The average annual after tax mortgage rate advantage of 3.98 per cent per annum is slightly higher than the before-tax mortgage rate advantage of 2.09 per cent per annum. Using equation (1) above, the annual after-tax return on a 25 per cent equity in the average property is shown in Table V. Arithmetic means and standard deviations of the returns on the property and the equity after tax are compared with the before-tax rates (shown in italics). With a 40 cents in the dollar tax rate, 22 per cent of the property return is lost in tax but only 10 per cent of the equity return is lost, confirming that leverage enhances the tax benefits.

The standard deviations of the returns after tax on the property and the 25 per cent equity are both about 38 per cent less than before tax, as the tax liability tends to even out the annual returns. This is largely the result of measuring the capital gains tax liability annually. For example, the return is greatly reduced in 1988 by tax (when compared with the pre-tax return in Table II above) and the declining or near-static capital values in the three subsequent

Year ending	Property return *after tax* (percentages)	Cost of borrowing (percentages)	Return on 25% equity (percentages)
1982	10.51	7.96	18.17
1983	8.11	7.40	10.22
1984	11.99	6.98	27.04
1985	13.41	7.45	31.31
1986	14.09	9.00	29.36
1987	13.08	9.08	25.10
1988	35.18	8.45	115.38
1989	14.01	9.88	26.43
1990	3.41	9.81	−15.78
1991	3.37	8.05	−10.67
1992	5.57	6.35	3.23
1993	11.35	5.65	28.43
1994	9.07	5.38	20.14
Average	11.78 *(15.09 pretax)*		23.72 *(21.35 pretax)*
Standard deviation	7.98 *(12.69 pretax)*		31.52 *(50.92 pretax)*

Table V.
Leverage after tax: Perth

years lessen the capital gains tax liability. These tests of tax shelter support the notion that borrowing is of special advantage to taxpayers, enhancing leverage but adding little risk.

Conclusion

This Australian study confirms that, between 1981 and 1994, borrowing to purchase residential properties raised the return on equity and the volatility of the periodic returns. High levels of borrowing were very risky and the increase in risk associated with any borrowing was proportionately greater than the increase in the return on equity before tax. For investors with high marginal tax rates, borrowing reduced the portion of their return lost in tax and lowered their risk, suggesting that high levels of borrowing may only be appropriate for these taxpayers.

The data is dominated by the exceptional growth in house prices in 1988 and the subsequent decline in 1990 and 1991. Developing borrowing strategies for the future must consider the likelihood of a similar boom within the proposed holding period. Borrowing at the end of a boom in house prices appears to be particularly unwise because interest rates may remain high for several years after housing returns have declined. A link between the benefits of leverage and the rate of inflation was not substantiated by this data.

Several difficulties in devising a satisfactory measure of the effects of leverage were revealed by this study. The rudimentary housing returns index (particularly after tax), the limited number of data periods and the variations in the results using difference measures of return and risk should be borne in mind when drawing conclusions about the effects of leverage. Nevertheless, the data does confirm the expected increase in risk and return from borrowing to invest in rental properties.

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Emerald Article: The implications of mortgage finance on housing market affordability

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The implications of mortgage finance on housing market affordability

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Abstract

Purpose – The downturn in the residential housing market in Northern Ireland (NI) has been the most pronounced of any UK region, with house prices contracting circa 40 per cent between 2007Q3 and 2009Q4. The downturn at first glance appears to have increased the "ability to afford" however this is nonetheless a "false dawn". Significant deposit levels coupled with a more prudent lending culture has ensured that housing affordability remains a primary policy concern. The purpose of this paper is to empirically analyse the interrelationships between mortgage liquidity and housing affordability in NI during the boom-bust cycle in the residential property market.

Design/methodology/approach – The paper analyses mortgage-lending statistics for NI in the period 1993-2009, using time series panel data. House price data are drawn from the University of Ulster House Price Index over the same time series. To facilitate analytical interpretation and outcome analysis, quantitative evaluation is applied within a first-time buyer (FTB) affordability framework.

Findings – This study finds that the relationship between mortgage finance and affordability has been driven by deregulation of the mortgage market contributing to the rise in house prices and affordability pressures during the market up cycle. More recently, ongoing liquidity constraints within the financial sector are impairing recovery in the residential property market culminating in heightened concerns of both purchase and "deposit gap" affordability. The key findings suggest that the new significant capital requirement needed to access the housing market will inevitably prolong affordability pressures for the foreseeable future.

Originality/value – This paper contributes to affordability debate in two ways. First, it examines the effect of both liberalised and contracted patterns of mortgage finance on affordability and argues that conventional approaches appear to present a "false dawn" for FTBs in NI. Second, the paper demonstrates that affordability post-financial crisis has shifted in genre towards a purchase and deposit gap (lag time) issue.

Keywords Northern Ireland, Housing, Prices, Mortgage finance, Housing affordability, Market liquidity, Financial deregulation, Purchase affordability, Loan-to-value ratio

Paper type Research paper

1. Introduction

The collapse of global financial markets in 2007 and ensuing liquidity crisis within international money markets continues to be one of the most widely debated topics within the popular press and academic circles. Unprecedented in terms of magnitude and geographical outreach, the financial meltdown and subsequent nationalisation of long-established financial institutions has had profound effects on the functionality of the global economy. One significant corollary has been housing market paralysis and deterioration of first-time buyer (FTB) affordability (Kuenzel and Bjørnbak, 2008).

Necessitated and co-ordinated government interventions to recapitalise key financial institutions in the form of nationalisation, support payments and asset

protection schemes in conjunction with quantitative easing measures have to date had marginal impact within the mortgage-lending environment. In the UK, this has culminated in the emergence of a stringent and cautious lending environment and decrease in mortgage activity to historically low levels. The most noticeable of these changes for potential FTBs is a substantial increase in required deposit levels – presenting a new access cost "hurdle". Prior to 2007, both financial markets and the housing market witnessed a speculative boom. Economic performance fuelled by liberal monetary policy initiatives and consumer confidence, in tandem with financial engineering within housing finance and particularly the mortgage industry all served to proliferate demand within the economy in general and the housing market in particular. The heightened financial liquidity fuelled a rapid appreciation in house prices culminating in a marked deterioration in affordability amongst FTBs. This is best manifest in the substantive disconnect between house prices and income levels during the up cycle in the housing market.

After an elongated period of house price growth in Northern Ireland (NI), tangible evidence of a market correction began to emerge in 2007Q4. The University of Ulster House Price Index (UU House Price Index, 2010) recorded a quarter on quarter price decline of 7.75 per cent. In the intervening period up to the end of 2009Q4, property prices have fallen circa 40 per cent from peak. Paradoxically, few FTBs have been able to benefit from the correction in house prices. The transformation in mortgage-lending criteria, comprising a dramatic reduction in loan-to-value (LTV) ratios has resulted in access to mortgage finance moving beyond the reach of the average FTB. This has presented a dichotomy for FTBs, as although affordability is perceived by traditional measures to have increased, access to the mainstream housing market has seemingly never been more challenging.

In essence, there has been a shift in the genre of affordability, with the house price-to-income retrenchment appearing to be a "false dawn". Current affordability concerns centre on purchase affordability and the "ability to borrow" primarily categorised by huge deposit levels, prolonged mortgage rationing and higher borrowing costs. The developments within both finance and housing markets have ensured housing affordability remains a central governmental policy concern. These problems concurrent with recent inflationary pressures and austerity measures introduced by the UK coalition government has increased the basic cost of living and household expenditures, placing increased pressures on disposable income levels. This is likely to exacerbate the regressive nature of the recent affordability phenomena.

This paper scrutinises the relationship between housing affordability and mortgage finance and examines how the effects of liquidity and credit constraints in the mortgage market has influenced affordability over the period 1993Q1-2009Q4. In doing so, the paper highlights that a key distinction can be drawn between market pricing level and access to finance when conceptualising affordability. More specifically, the paper highlights that the employment of an eclectic range of affordability measures can portray that a "one measure fits all" approach is problematic. Significantly, most attempts to operationalise the concept of affordability focus on either the traditional ratio or residual paradigms with very few measures reflecting the issue of access or purchase affordability (Gan and Hill, 2009). Therefore, the concept of affordability is examined in terms of house price-to-income affordability, access affordability (deposit gap), purchase affordability (borrowing capacity of households) and the residual

affordability measure (repayment burden imposed by mortgage costs). Empirically, this paper indicates that the distinction between affordability measures can be pronounced and that policy makers must take into account more than one affordability measure when reforming policy instruments.

2. Literature review
Mortgage market structural change and affordability
In the UK, Thatcherite policy changes in the late 1970s and early 1980s were the fulcrum for significant institutional and political transformations. Central to the policy reforms were the noteworthy changes to the supply of subsidised housing (Baddeley, 2003), fiscal incentives which promoted the purchase of government-owned housing stock, and most importantly the financial changes accompanying deregulation, which saw the removal of constraints on mortgage rationing (Baddeley, 2005). Ortalo-Magne and Rady (2002) illustrate that these considerable institutional changes paved the way for encouraging owner-occupation which resulted in an upsurge of housing demand and the resulting amplification of market volatility.

The expansion in the mortgage offer within the UK was in many ways underpinned by government ideology advocating homeownership as an appeaser of social and economic disparity between higher and lower income populations and between homeownership and non-homeownership. Successive UK governments have actively endorsed homeownership, it is significant therefore that government policies aimed at enhancing homeownership tenure and promoting wealth generation in the UK are at least partly culpable for lowering the risk spreads between prime and sub-prime mortgage lending.

The relaxation of governing structures is best encapsulated as an unfolding process subsumed within the wider liberalisation of global financial markets (Stephens, 2007). The initial shift towards market deregulation witnessed the change in mortgage lending from being dominated by local and regional balance-sheet lending by depositories, to a national market-based system of securitized mortgage finance. The deregulation of building societies facilitated the substantial growth in mortgage liquidity and simultaneously introduced instability within the financial system (Baddeley, 2005), as the role of mortgage lending backed by savings was heavily diluted. This removal of mortgage constraints led to an increase in gearing rates and the UK housing market volatility of the late 1980s and early 1990s (Muellbauer and Murphy, 1997). According to Davis and Zhu (2004), the liberalisation of mortgage lending and finance encouraged self-propelling increases in market demand, collateral and mortgage liquidity which, through a positive feedback loop, released further cheap financing into the market which sustained the boom.

The process of deregulation is considered to have reduced the numbers of credit constrained households (Stephens and Quilgars, 2008) with the rises in house prices perceived to enhance the borrowing capacity of existing households. In their research, Campbell and Coco (2003) found a positive relationship between house price increases and relaxed borrowing constraints showing that that the easing of credit restrictions raised the demand for housing. According to Scanlon *et al.* (2008), deregulation within mortgage markets improved the efficiency of the mortgage system by opening up the market to new providers and increasing competition amongst lenders, thereby lowering costs to consumers. This was also highlighted by Girouard *et al.* (2007)

who suggested supply-side innovations within mortgage markets internationally opened up the prospects of homeownership to whole new audiences by easing access to credit amongst lower income borrowers as well as reducing financial constraints for FTBs. These high-risk lending strategies facilitated the rapid expansion in "exotic" mortgages as well as extenuated loan-to-income (LTI) multiples and reduced LTV ratios aimed at prime borrowers, further compounding mortgage market instability (Immergluck, 2009).

Financial engineering and in particular the growth and securitisation of the sub-prime market (Adair *et al.*, 2010), spawned through liberalisation is not only responsible for the creation of new financial products but also responsible for key changes in the finance sector. Within the residential property market the availability and cost of finance was a key factor in determining the performance of property markets (Green and Wachter, 2007). A number of empirical studies have identified strong linkages between mortgage availability and housing market growth in developed countries across the world (Scanlon *et al.*, 2008). In the UK, the confluence of rising housing demand (owner occupier and investor driven), historically low interest rates as well as greater competition between lenders, innovations in mortgage products but most pertinently the widespread availability of comparatively low cost of capital from banks and securitised lenders drove the housing boom (Immergluck, 2009). Kim and Renaud (2009) denote that expectations of reduced risk on the lending side during the property market up cycle created a mistimed financial stimulus in what was an already overheated market, the net result of which was a further inflation of the house price bubble and reduced affordability for some.

In the opinion of Green and Wachter (2007), enhanced property values during the boom made over extensions in borrowing appear almost costless for a period of time, eroding the user cost of housing. Kholdy and Sohrabian (2008) showed that the capacity to capture capital gains played an important role in boosting housing demand. Paradoxically, sub-prime and profligate lending practices created a "vicious cycle", whereby the effective purchasing power of buyers fuelled asset appreciation which in turn served only to further extenuate the boundaries of high-risk lending, particularly amongst securitised lenders vying to capture market share. Stephens (2007) argues that many of the benefits of deregulation have been lost in resultant higher house prices due to the increase in the availability of finance increasing demand, and therefore aggregate prices in the market. This non-prime over-leveraging was symptomatic of heightening risk within borrowing, which in addition to poor and irresponsible lending practices ultimately led to the unfurling of financial markets. The seeds of financial fragility planted by lending excesses created instability (Baddeley, 2005) with the associated bust in property markets closely followed as the fall of prices initiated a chain reaction process. In response to the effects of these events, currently mortgage markets are characterised by "red tape", rationing and cautious lending practices (Scanlon *et al.*, 2008).

Signals for affordability appear to move concomitantly with the cyclicity of the housing market. Maclennan (2008) suggests that affordability and house price volatility are inseparable. There is a general perception that booms in housing markets cause a significant decline in housing affordability as well as a widening of differences in affordability across regions (Gan and Hill, 2009). Moreover, the collapse of the sub-prime mortgage market in the USA and the subsequent contraction in global mortgage liquidity has illustrated that the supply of mortgage finance heightens

affordability concerns, albeit in a different manner. Previous boom-bust cycles within the UK housing market have been shown to be asymmetric across income groups, with lower income groups more adversely affected by economic circumstances which result in repayment difficulties and the reduced ability to enter the market at an affordable point (Pryce and Sprigings, 2009).

Defining housing affordability
Despite the contested nature of the concept of housing affordability, definitions have been employed throughout various policy settings (Gabriel *et al.*, 2006). In this regard, discussion surrounding housing affordability is plentiful, however, there is no universally accepted definition, thus, making housing affordability as a concept at best ambiguous (Linneman and Megbolugbe, 1992). This notion is illustrated by Hancock (1993) who suggests that even though the term "affordability" has gained currency in housing policy debate, it is yet to be defined, and professionals seldom debate the meaning and use of housing affordability as a problem definition (Hulchanski, 2005). In a similar fashion, Bramley (1994, p. 10) in early writings attests that "the lack of official clarity on definitions reflects inherent ambiguities to the housing affordability concept as well as political caution or expediency".

At its most fundamental, Stone (2006a, b) observes housing affordability to be "an expression of the subjective social and material experiences of people, constituted as households, in relation to their individual housing situations", a perspective upheld in earlier writings by Field (1997) who elucidates affordability to involve normative judgements about the proportion of income a family should pay for rent or monthly ownership costs. Moreover, Paris (2007) suggests that affordability may be best understood as a microcosm relating to the circumstances of individuals of households, and should not be benchmarked to particular dwellings at a particular price or rent level, or at the national or regional housing market level as a whole. To this end, affordability is perceived to express the challenge each household faces when balancing the cost of its actual or potential housing, on the one hand, and its non-housing expenditures, on the other, within the confines of its income (Stone, 2006a, b). Therefore, interpretations of individual experiences are mediated through analytical indicators and normative standards of housing affordability that transcend unique individual experiences (Stone, 2006a, b). In this regard, affordability is very much seen as an issue of percentage income spent upon housing, a function of housing debt as a percentage of household income.

In the Canadian context, the Canada Mortgage and Housing Corporation (2003) determines a household to be below its "affordability standard" if it spends more than 30 per cent of its income on housing costs, judging housing to be unaffordable if its cost exceeds 25-30 per cent of the net income of lower income households. This is furthered by HNZC (2004), which comprehends affordability to be a complex issue, which is best described using a benchmark of housing stress. The syndicate opted to label affordability when a household in the lower 40 per cent income bracket pays more than 30 per cent of their gross income on housing costs, whether renting or buying. The US experience has by all comparisons been more advanced than the simplistic measures applied in other countries. The US Department of Housing and Urban Development index measures the ratio of the median family income to the income required to qualify for a conventional loan based on median valued houses sold. The National Association of Realtors index discerns affordability to be the ratio of 25 per cent of median monthly

income to monthly repayments based on a fixed rate mortgage on a median house at the current interest rate. Finally, the National Association of Home Builders measures affordability as the percentage of dwellings sold that could be purchased by the median household using an upper limit of 28 per cent household income. Similar approaches are also used in the Australian context where the foremost indices measure the median loan repayment to income. Nonetheless, in both the US and Australian cases they primarily concentrate on and emphasise repayment affordability.

In contrast, within the UK, there has been considerable criticism of definitions which focus on housing costs and arbitrary effects upon income to the exclusion of other factors such as the ability to borrow and the interaction of planning and social policy (Freeman *et al.*, 1997). As a result, the UK Office of the Deputy Prime Minister (2005) define affordability with focus on lower income households as the ratio of lower quartile house price to incomes. This highlights the complexity of defining affordability as this approach pivots on access to the market, and not entirely income affordability as this is of little relevance for cohorts already within housing. There are two principal strands to defining affordability; the ability of FTBs to purchase a property and the capacity of households to sustain home-ownership through repayments. A rather different aspect of the debate has emerged as a result of macroeconomic conditions, whereby, particular groups can be victims of cyclical shortages and embryonic changes in the economic setting and housing market which increase price-to-income ratios. This is identified by the HNZC (2004) which suggests that affordability is not merely a calculation of housing costs and income. Indeed, it is recognised as the ability to obtain housing and to maintain homeownership, but also have sufficient residual income to purchase basic necessities.

Measuring affordability
Burke (2001) suggests that to get a handle on the issue of measuring affordability, questions pertaining to what the measures are used for need addressing to provide an absolute measurement of affordability. A wide range of affordability measures have been developed and used in different contexts throughout the international arena. As a result, different approaches emphasise different elements of the concept at different scales. Abelson (2009) stipulates that there is no consensus about what housing affordability means and much of the discussion about affordability is based on questionable definitions and measures.

Most quantitative measures of housing affordability are regarded as a relationship between house prices and household incomes. Therefore, an accurate assessment of affordability conditions for accessing and remaining in the private housing market depends unilaterally on the accuracy of specific measures of home prices and household income (Linneman and Megbolugbe, 1992), which are the formal foundations of affordability paradigms, however; there are a variety of opposing approaches to measuring affordability and the lack thereof. Linneman and Megbolugbe (1992) suggest that housing affordability is influenced by the levels and distribution of house prices, household income and the structure of financing costs. The ability to afford property ownership depends on household income and the mortgage repayments, *ceteris paribus*, the higher the household income and/or the lower the mortgage interest rate (MIR), the more affordable the property (Ong, 2000). This concept of "threshold" affordability refers to the ability of households in being able to purchase private market housing which

is expressed as a function of income and mortgage rates, indicating that the proposed buyer is merely able to access the market. In a similar regard, Kutty (2007) suggests for owner-occupiers, changes in affordability have been related to amendments in mortgage costs. As further acknowledged by Mengie *et al.* (2008), it is important to consider the social circumstances that are related to both the standard of living and the economy. To that end, housing affordability is the personal troubles experienced by individual households, both in accessing the market and the sensitivity to market fluctuation.

Measurement approaches

The traditional ratio affordability measure is considered a simplistic appraisal of how expensive housing is relative to earnings (NHPAU, 2010). The house price-to-income ratio is one of the most widely used affordability ratios (Karmel, 1995: Chaplin and Freeman, 1999), which specifies the level of the median free-market price of a standardised house relative to the median annual household income. Generally, this ratio provides insight to the level of access to homeownership, and is regarded as the best measure of pressure on the housing market (Flood, 2001). A major weakness of the house price-income ratio, as acknowledged in Australia by the Productivity Commission (2004), is that it ignores the cost of housing finance and neglects to indicate the capacity to repay ongoing housing costs. This weakness is evident in the work of Abelson *et al.* (2005) who claim that the approximate 40 per cent fall in real interest rates in Australia between the mid-1990s and 2004 was a primary driver of house price inflation as this offset the cost effect of the higher house prices.

Burke (2001) observes the ratio of housing costs to income approach to be a measure which is good for getting an understanding of the scale of the problem, illustrating need or trends over time. The residual income paradigm materialised in the USA in the late 1960s and early 1970s, with discussions culminated in the formulation of an operational standard utilising normative family budgets and their application to measurement of affordability issues (Stone, 2006a, b). Indeed, the residual incomes of households after they have met their housing costs provide a much more direct measure of household financial resources (Milligan, 2003). There are two broad groups of affordability measures, "shelter first" and "non-shelter first" (Burke *et al.*, 2004), which differ in approach. The shelter first method assumes housing to have the foremost claim on the household budget, with additional expenditure met from the remaining income. Conversely, the non-shelter first approach supposes that other expenditure has primary entitlement, with housing costs taken from the remaining allowance.

There are several problems with this definition of housing costs. Turning to household income, Marks and Sedgwick (2008) define this as equivalised disposable household income. According to Abelson (2008), this definition of income seems conceptually appropriate, however Abelson points out that equivalence requires judgements about household equivalence and there may be practical problems in estimating equivalised disposable household income. Moreover, as Marks and Sedgwick (2008) acknowledge, the judgement that housing costs in excess of 30 per cent of household income represent "housing stress" is arbitrary. Indices of housing affordability avoid this arbitrary judgement but can provide only measures of relative housing affordability over time and place. These approaches however neglect the geographic diversity of housing and the demand and supply attributes of markets, thus, do not expose the underlying market conditions which define affordability.

Abelson (2009) further illustrates that measuring the deposit gap, the difference
between the price of a typical dwelling and the maximum loan that could be repaid
from average household income expressed as a proportion of that income, is an
accurate measure of affordability. Indeed, this measurement of borrowing affordability
which illustrates what households can realistically borrow relative to the value of the
average property is relatively under researched within affordability literature.
As previously identified, conceptualising the affordability problem is exigent as
differing interpretations and trends can be applied. Consequently, a plethora of
technical and conceptual problems are associated with exercising affordability. This is
espoused by Bramley (2006) who suggests that affordability is an east concept to
grasp, however complex to operationalise due to evolving household circumstances
over time. Despite the contested conceptual rigour relating to affordability, a wide
range of measures have been developed and applied in different contexts throughout
the international arena. As a result, different approaches can emphasise distinct
elements of affordability at differing scales (Paris, 2007).

3. Methodology and data

The conventional ratio method of affordability measures housing affordability as the
relationship between house price and household income. The general function as
shown below:

$$AR = \frac{P_{aLQ}}{\ln_{aLQ}} \qquad (1)$$

where, P_{aLQ} is the average lower quartile house price and In_{aLQ} is the average lower
quartile income of FTBs[1]. This technique proportionally and directly assesses the
relationship between house prices and incomes, however neglects to account for interest
rate fluctuations which significantly changes repayment affordability for both potential
and existing homeowners. Some existing measures of homeownership affordability
(Quigley and Raphael, 2003) examine price, income and interest rate to ascertain the
amortisation of the standardised mortgage offer on the median house price.

The standard mortgage formula is:

$$M_{rep} = P \frac{i(1+i)^n}{(1+i)^n - 1} \qquad (2)$$

where M_{rep} is the payment amount per period, P is the initial principal (loan amount),
i is the interest rate per period, and n is the total number of payments or periods. This
approach is by and large a repayment affordability issue, as it is the burden imposed
on a household of repaying the mortgage. In spite of this, the central theme of LTV
and down payments is largely ignored in affordability literature to date.

In the current economic downturn, arguably the most pressing matter for FTBs is the
concept of access affordability. This purchase affordability (Gan and Hill, 2009) or
"threshold" affordability (Ong, 2000) considers whether a household is able to borrow
enough funds to purchase a house. Gan and Hill (2009) calculate this affordable limit
concept as the ratio of the maximum allowable loan to income. Indeed, they estimate that a
house with price Y is deemed affordable for a household with gross income X if $Y/X \leq AL$,
otherwise the house is deemed unaffordable. As acknowledged by Gan and Hill (2009),
lenders normally place an upper limit threshold on α which implies that the
debt-to-income ratio is taken as the maximum allocated amount of monthly income

which can be dedicated to mortgage amortisation. This is the suggested maximum amount lending institutions consider affordable for monthly mortgage repayments[2]. The present value of the maximum achievable mortgage repayment stream is given by:

$$\sum_{n=1}^{N} \frac{\alpha X}{(1+i)^n}$$

where, i is the MIR and N is the term of the loan. This concept builds upon the work of Bourassa (1996) who proffered that the borrowing constraint can be written as follows:

$$\sum_{n=1}^{N} \left[\frac{\alpha X}{(1+i)^n} \right] \geq Y - D \tag{3}$$

where, Y is the price of a house and D is the deposit. This distinctively measures the effective demand borrowing capacity of a potential purchaser based on the deposit requirement (LTV), property value and MIR and term structure.

The user cost of housing is calculated using the simple user cost formula proposed by Poterba (1992) and Quigley and Raphael (2004) which indicates that:

$$User\ cost\ of\ housing = P(i^a + \tau + f - \pi) \tag{4}$$

where P is the house price, i^a is the after-tax MIR, adjusted to encompass the period of tax deduction through mortgage interest relief (MIRAS) in the UK which applied between the period 1993 and 2000. This calculation accounts for deduction ceilings or credits and the tax base against which the deduction is applied. τ signifies the property tax rate for owner-occupation which has been calculated using the horizontal spread across the jurisdictional tax rate for NI, f represents recurrent housing costs comprising depreciation, maintenance and associated operating costs. π is the expected capital gains or loss which is taken as the lagged change in house price per annum as there is no capital gains on principal private residences in NI, thus denoting expected future house price inflation.

Data
The data in this paper are sourced from a number of diverse but robust governmental departments and non-governmental institutions between the period 1993 and 2009. The mortgage data are provided by the Council of Mortgage Lenders (CML, 2006) which represents mortgage lenders in the UK. It comprises of banks, building societies and specialist lenders serving to represent 98 per cent of mortgages, thereby providing an accurate and robust data source. The statistics are provided through the *Regulated Mortgage Survey*, with aggregated estimates from the sample of lenders reporting to reflect total market size[3].

The house price data were derived from the University of Ulster House Price Index (UUHPI)[4]. This survey analyses the performance of NI house prices quarterly based on a large and representative sample size of open market transactions. Data relating to MIRs were derived from the Bank of England and compiled by the British Bankers Association. The paper applies the monthly interest rate of the UK resident banks and building societies sterling standard variable rate (SVR) mortgage to households. These end of month weighted average interest rates, premised on three-year fixed mortgage (95 and 90 per cent LTV) and three-year SVR mortgage (95 and 90 per cent LTV)

statistics were applied as they represent the typical FTB mortgage product. According
to Bourassa (1996) and Brischetto and Rosewall (2007), the average typical loan
product term has increased over the last 15 years due to financial engineering and
competition between lenders. In this regard, both the fixed and SVR mortgage offer
were calculated over both a traditional 25-year mortgage term and an increased 30-year
mortgage term period.

4. Analysis and findings of the mortgage market on affordability
The mortgage market in NI experienced unprecedented levels of lending over the last
decade in terms of both the volume and value of loans approved. CML figures indicate
that 257,500 loans with a value of circa £20.5 billion were approved for house purchase
in NI in the ten-year period 2000-2009, with the value of loans approved peaking in
2006 at circa £3.5 billion. The dramatic increase in mortgage activity, predominately a
consequence of financial de-regulation and the advent of securitised residential
mortgage investment was a key driver in the exceptional levels of house price growth
experienced in NI. Figures compiled by the University of Ulster demonstrate that the
average house price in NI increased from £82,833 (Q1, 2001) to 250,586 (Q3, 2007)
coinciding with the peak of the market, an increase of more than 202 per cent.

Analysis of long-run mortgage market trends relative to house price identifies that
mortgage availability was a key driver of house price growth in NI, and that the
mortgage market led the housing market during the period 2001-2009. The analysis
suggests that the loosening of credit restrictions in the mortgage market and
macro-economic forces including the relatively benign interest rate environment
(Figure 1) were a primer for the rise in house prices and affordability concerns.

One of the key characteristics of the housing boom in NI was the contraction in FTB
activity. Unprecedented levels of demand, fuelled by frenzied speculative investor
activity ensured that FTBs were essentially priced out of the market as house prices
surpassed what FTBs could manageably afford (Figure 2). Correlation analysis,
significant at the 0.01 level, reveals a strong negative correlation (-0.814) between
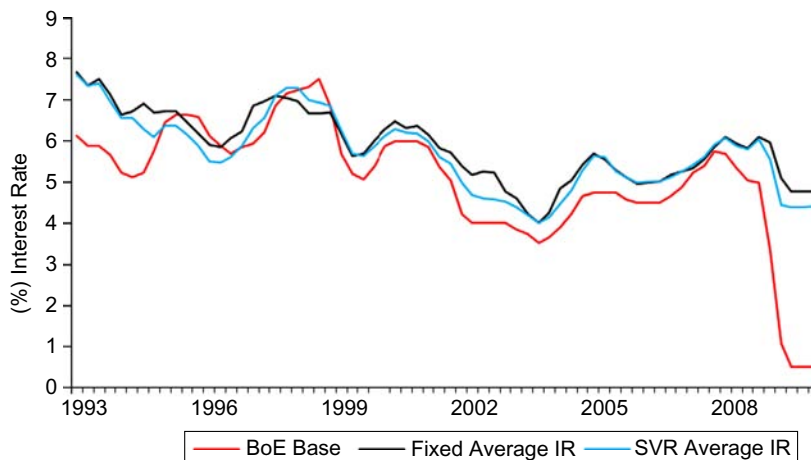
Source: Compiled from CML data and BoE Statistics (1993-2010)

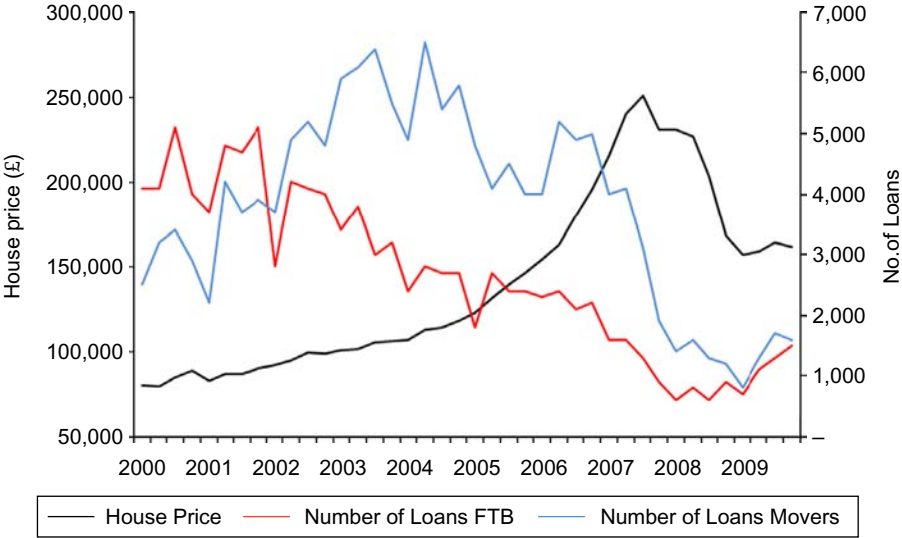**Figure 1.**
Mortgage and base
interest rates from
1993 to 2010

Source: Compiled from CML data and UUJ House price Index (2000-2009)

house price and FTB activity, suggesting a clear reduction in affordability. As house price continued to appreciate in the period 2001-2007, the number of loans approved to FTBs appears to have diminished to an appreciable extent.

House price-to-income measure
In terms of the conventional house price-to-income measure of affordability, ratio analysis displays a steady increase concurrent with house price growth from the late 1990s to 2005 (Figure 3). In 2005Q3, a pronounced increase in the house price-to-income
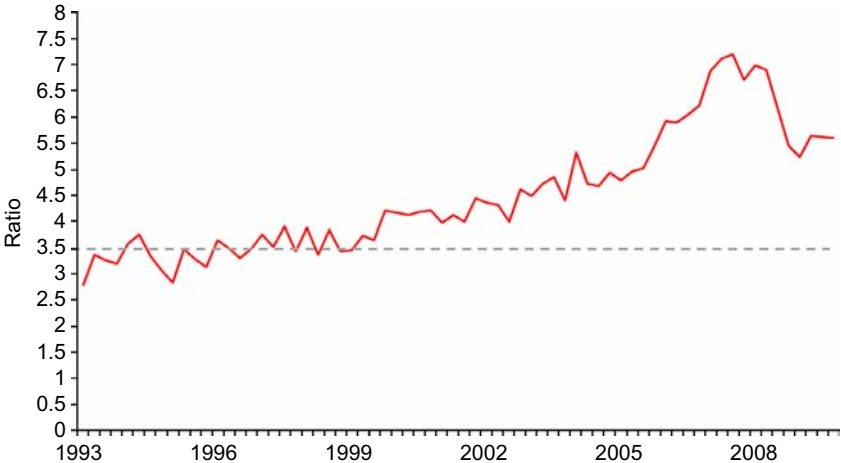
Source: CML & UU house price data (1993-2009)

ratio is noticeable which is maintained through until 2007Q3 when the ratio peaked at circa (7.2:1), indicating a possible erosion of income purchasing capacity relative to house price. The severe correction in house prices post 2007 resulted in the house price-to-income ratio converging backwards towards a level of circa (5.6:1) in 2009Q4, in sync with house price movements. Using the traditional measure, this suggests that affordability has returned to more acceptable long-run levels.

However, an important issue is that the ratio has only come back to 2005-2006 levels, a period when a lack of affordability was a pertinent issue for FTBs. Moreover, following the international banking crisis, lending has severely contracted resulting in lower LTV and LTI ratios. Therefore, whilst the house price-to-income measure suggests that affordability in 2009 has improved relative to 2007, such incremental changes in the house price-to-income ratio is inconsequential for FTBs wishing to enter the market as the ratio still rests over and above what is deemed affordable (for the majority of FTBs).

Residual housing cost measure
The change of affordability in terms of residual housing costs against income shows that, in general, housing costs as a percentage of income remained constant from 1993 until 2004 in relative terms. It is noticeable in Figure 4 that repayment affordability remained relatively stable for NI over the period 1993-2003. There was however, an exponential increase in repayment mortgage costs from circa £500 per month in 2004Q4 to circa £1,050 per month in 2007Q1, an increase of 110 per cent over the two-year period. Significantly, even in light of the stable interest rate setting, repayment costs amplified above the 30 per cent affordable threshold. Indeed, this highlights that repayment affordability is inextricably linked to the movement of house prices for FTBs.

The percentage income consumed by housing costs (mortgage repayments) until the start of 2004 had generally remained under 30 per cent of the average FTB income, with affordability not a pressing issue. The period 2004Q1-2006Q4 witnessed an overall
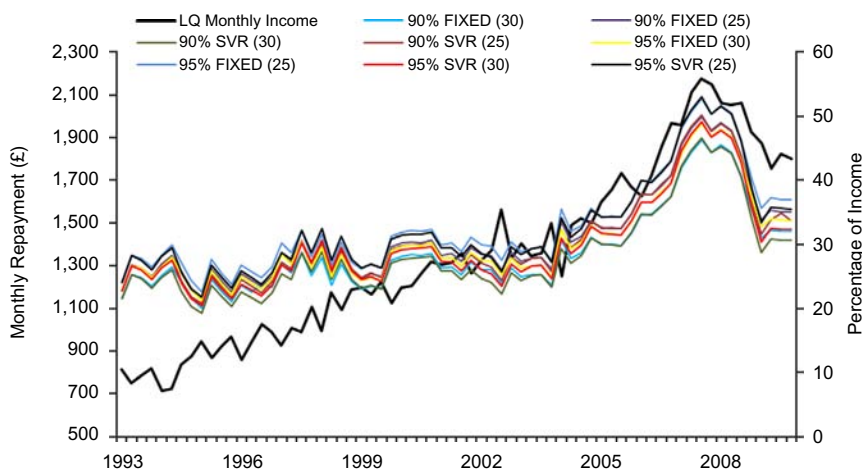
Source: Compiled from CML data (1993-2009) and authors calculations

Figure 4.
Lower quartile income and mortgage repayments as a percentage of FTB income

increase to 35-40 per cent. At the peak of the residential property market house prices (2007Q3), the average mortgage repayment increased to 49.62 per cent of income (Table I).

Invariably, the correction in the housing market has brought back housing costs as a percentage of income. Nonetheless, housing cost repayments as a percentage of household income continue to reside above the 30 per cent threshold, demonstrating that the current market remains unaffordable on a residual basis. This pattern is similar to that of the house price-to-income ratio measure intimating that they do in fact measure similar facets of housing affordability (Figure 4).

Purchase ratio measure
The detachment between income and mortgage advances over the period 2000-2007 highlight the profligate lending practices evident within the mortgage environment. The advance to FTBs increased from £50k to £135k in tandem with house price growth extenuating the shift in income multiples amongst the FTB segment and reflecting the relative un-affordability of housing for FTBs during the growth cycle (Figure 5).

With the "bursting of the housing bubble" in late 2007, house prices have depreciated more in NI than in any other UK region. According to DCLG (October, 2010)[5], the re-adjustment in average house prices, since market peak reached 42 per cent illustrating the magnitude of the house price crash in NI relative to other UK regions. Whilst ordinarily it would be reasonable to assume that such a substantive decline in house price would permit greater home ownership accessibility for FTBs this has been offset by the contraction in LTV ratios across the mortgage market. LTV ratios in the FTB market came in from an average 95 per cent in 2001 to 77 per cent at the end of December 2007, substantially increasing deposit requirements for FTBs wishing to enter the housing market.

In the period since the correction in the housing market mortgage activity amongst FTBs reached an all time low. In 2008, 2,900 FTB loans with a capital value of £350 m were approved. In 2009, the number of FTB loans approved increased to 4,600 with a capital value of £444 m. This equated to an increase of 58.6 per cent by number and 26.9 per cent by value in the 12-month period to the end of December 2009. Whilst such an enhancement in mortgage lending to FTBs would seem substantive, the increase is achieved from a historically low base and the volume of FTB loans approved remains 68.5 per cent below long-run trends[6].

	LQ income (£)	90% FIXED (30years)	90% FIXED (25years)	90% SVR (30years)	90% SVR (25years)	95% FIXED (30years)	95% FIXED (25years)	95% SVR (30years)	95% SVR (25years)	Avg.
2003	1,406	25	27	24	27	26	29	26	28	26.65
2004	1,250	31	34	29	32	32	35	31	34	32.35
2005	1,598	30	32	30	33	32	34	32	34	32.11
2006	1,625	35	38	35	38	37	40	37	40	37.25
2007	1,958	42	46	42	46	44	48	45	48	45.11
2008	2,061	45	49	45	49	48	52	48	52	48.47
2009	1,874	31	34	29	32	33	36	30	33	32.14

Table I.
Percentage mortgage costs to income

Source: Compiled from CML Data (2003-2009) and author's calculations
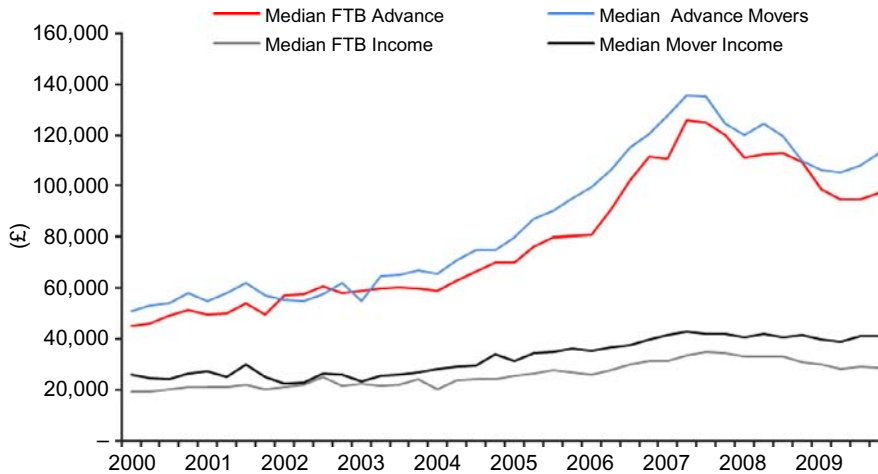
Source: Compiled from CML data (2000-2009)
Note: Detachment of mortgage advances from income

Figure 5.
Profligate lending

The shift from the immodest lending practices which characterised the market pre-boom (Figure 5) to the over conservatism with which prospective purchasers are now faced has created a lag in the housing market. For many FTBs the transition from 100 per cent mortgage products, to a more tightly regulated and prudent lending culture, has only served to stifle FTB affordability and reinforced barriers to home ownership. Whilst both the conventional house price-to-income and housing-cost-to-income concepts demonstrated that affordability was seriously implicated in the rapid appreciation of house prices, the purchase affordability measure remained relatively constant. Deposit levels remained relatively low due to heightened LTV ratios primarily through financial engineering, competition between institutional products and the macro-economic environment. The analysis indicates that the percentage deposit to the average FTB income remained below 30 per cent until 2006 and would have reached a maximum of 35 per cent at the height of the market (Figure 6).

Until late 2006, deposit levels or purchase/access issues were not of core concern within affordability narrative. However, the wholesale removal of 95 per cent LTV mortgage products in early 2007 caused the cost burden of entering the market to severely increase adversely affecting purchase affordability. At the peak in house prices (2007Q1), the deposit requirement consumed 34 per cent of annual income. However, the removal of the 95 per cent LTV product increased deposit levels to 70.2 per cent of income in 2008Q1 for 90 per cent LTV ratios and to 105.1 per cent of annual income for 85 per cent LTV products, which currently represent the lending environment. The results demonstrate that the deposit gap has increased from the previous long-term average to a four-and-a-half to six-year deposit lag[7], respectively (Table II).

Whilst this has reduced due to the correction in house prices, the prolonged illiquidity within financial markets has resulted in the further erosion of both LTV and LTI ratios comprising a significant effect on deposit levels for FTBs. In 2009Q1, the typical FTB deposit translated to 78.45 per cent of annual income. Based on these

Figure 6.
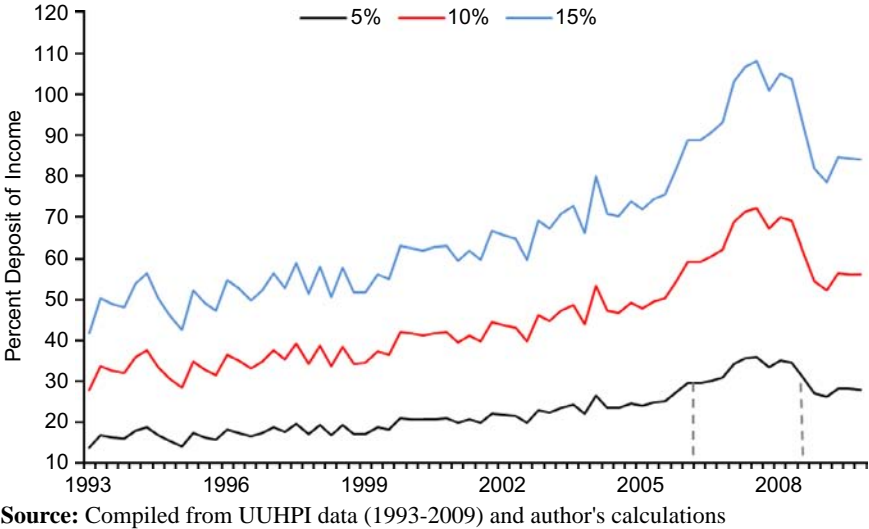Percentage deposit
of the typical FTB income

Source: Compiled from UUHPI data (1993-2009) and author's calculations

	LQ income	5% deposit (£)	10% deposit (£)	15% deposit (£)
1995Q1	11,322	1,612	3,223	4,835
2000Q1	14,344	2,994	5,988	8,982
2005Q1	19,176	4,600	9,200	13,799
2006Q1	19,500	5,770	11,540	17,310
2007Q1	23,493	8,085	16,169	24,254
2008Q1	24,732	–	17,318	25,977
2009Q1	22,491	–	11,764	17,646

Table II.
Deposit requirement
against income

Source: Compiled from CML, UUHPI data (1995-2009) and authors calculations

figures, a four-year adjustment lag in the market persists for the average FTB to amass a deposit of this magnitude (Figure 7).

Purchase measure
Analysis based on the affordable limit maximum borrowing capacity measure (Gan and Hill, 2009) demonstrates the general relationship between lending practice with house price movements between 1993 and 2009. Over this period, the relaxation in mortgage finance is clearly evident, keeping pace with house price increases. The affordable limit for NI rises continuously between 2002 and 2007 before falling back significantly in 2008 and 2009. It should be noted that an increase in the affordable limit does not necessarily translate to an improvement in affordability, since the loosening of credit constraints appears to have impacted on house prices driving the market to higher prices against relatively fixed incomes.

House price-to-income affordability continues to be a pressing matter as the ratio persists above what FTBs can actually afford to borrow (Figure 8). As a result, there still remains a substantive gap between lending criteria and what FTBs can
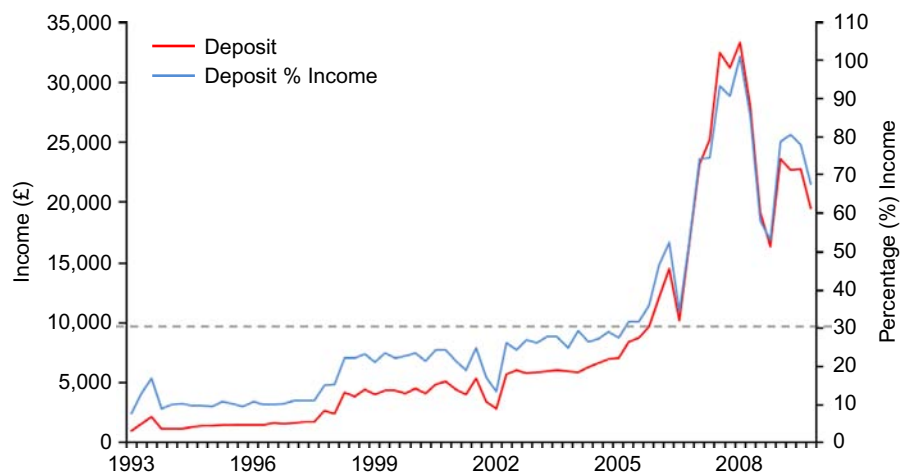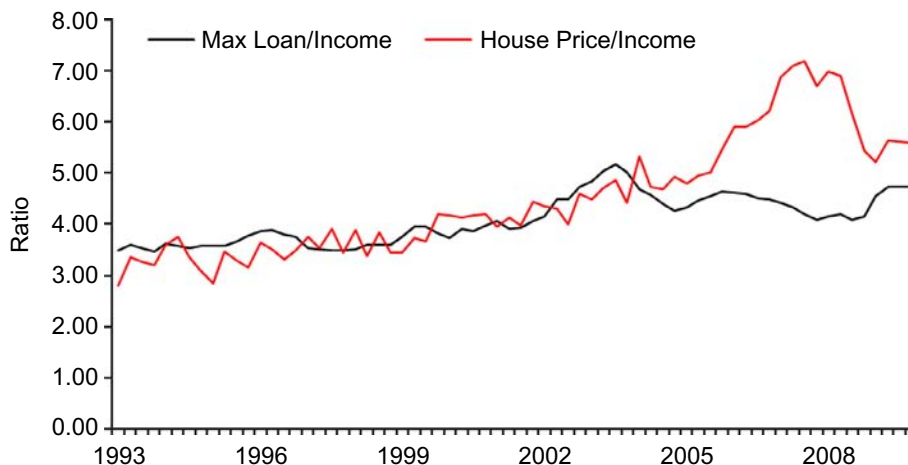
Source: Compiled from CML statistics (1993-2009) and authors calculations

Figure 7.
FTB access affordability

Source: Compiled from CML, UUJ HPI data (1993-2009) and authors calculations

Figure 8.
Comparison of the
affordable limit and house
price-to-income ratios

realistically afford. Furthermore, whilst both measures have decreased, the affordable limit measure currently sits at (4.5:1) whereas the house price-to-income measure rests at (5.6:1). Indeed, this places more emphasis on the deposit level required for the typical FTBs to access the housing market, shifting the focus of affordability.

User cost
The user-cost measure (Figure 9) shows that owner occupiers unilaterally benefited from the appreciation in capital gains due to the exponential rise in house prices. The results reveal that the user cost of housing decreased during the market upswing and at the height of the market was actually negative as a result of house price inflation, thus this

Figure 9.
User cost of housing
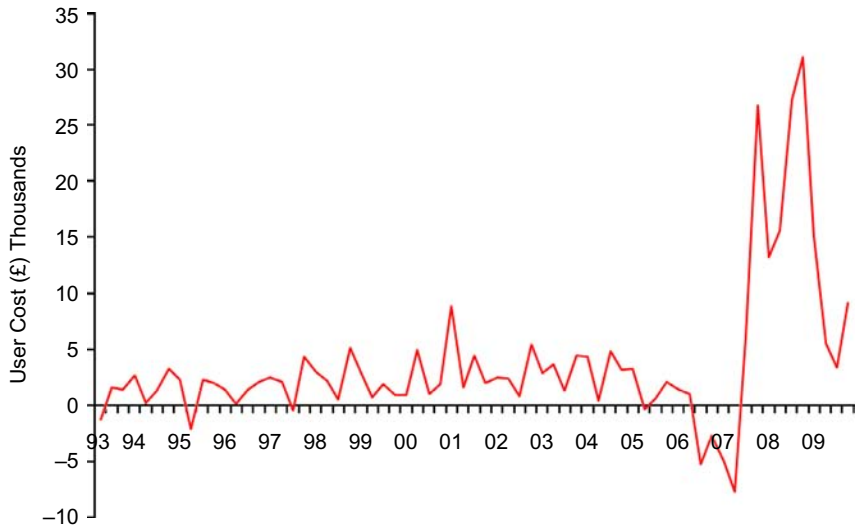
was likely a primary driver for FTBs attempting to access the market. Significantly, this shows that the timing of housing purchase was of critical importance for FTBs. During the market up cycle, the user cost for existing owners shows no issues of repayment affordability, due to the capitalisation effect, underestimating the affordability issues in the market at that time. The user-cost indicates that over the boom period the user cost decreased, yet the severe correction in the housing market in late 2007 illustrates a substantial increase in user costs, primarily due to the negative capital gains.

Figure 10 shows the lower quartile gross income, as a proxy for FTB income and both measures of user cost, both excluding (user cost) and including (user cost (cg)) capital gains/losses. It could be argued that the user cost depicts the position of

Figure 10.
User cost of
housing and income
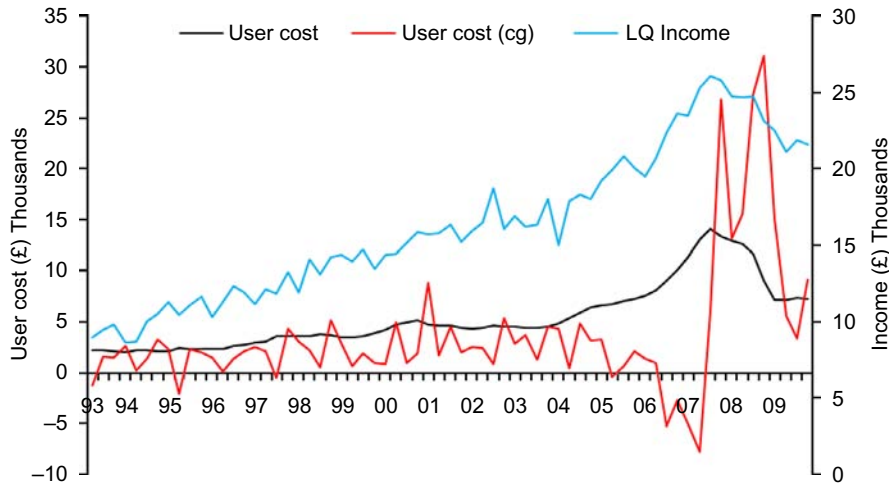
the prospective or recent purchaser, whilst the user cost (cg) depicts the position of the existing owner. The performance of the two user-cost measures is at a broadly similar overall level between 1994 and 2004, albeit that the user-charge (cg) is marginally lower (reflecting steady house price growth) and considerably more volatile. The two measures diverge markedly during the rapid price inflation of the property boom.

The user charge (Figure 11) shows that the house price growth decreased affordability, despite concomitant rising incomes, from a level slightly below the "affordable" benchmark of 30 per cent, peaking to over 50 per cent at the top of the housing market. The user charge (cg) shows an inverse profile from the "take off point" of the price boom. At this point, the deflationary effect on user charges provided by capital gain overtakes the inflationary effect of increase in the base cost. When prices fell steeply in 2007, the user cost (cg) spikes to in excess of the LQ gross income (Figure 10). This suggests that this is an effective proxy of market sentiment, fuelling demand, whilst masking the true user costs for market entrants who where reliant on continued price inflation to ameliorate their cost of ownership – a considerable gamble. This may well depict the "herd instinct" which built upon the market fundamentals of rising incomes and financial liquidity to create the property boom and subsequent crash.

The inclusion of capital gains and losses into a calculation of effective user cost has the potential to mask affordability issues, positively reinforcing price rises in the up cycle. This is followed by a magnification of the affordability problem in the downturn, accentuating and exacerbating the property market cycle. It would also appear that this is how the market has perceived effective user cost in practice, including existing owners, prospective purchasers and perhaps lending institutions. This raises an important question within the contemporaneous market as to whether it is a user costs issue, within the context of a more sober housing market perspective, or a lack of purchase affordability due to more stringent lending criteria. Whilst the user cost is an acid test for market sentiment, and a core issue in times of extreme volatility,
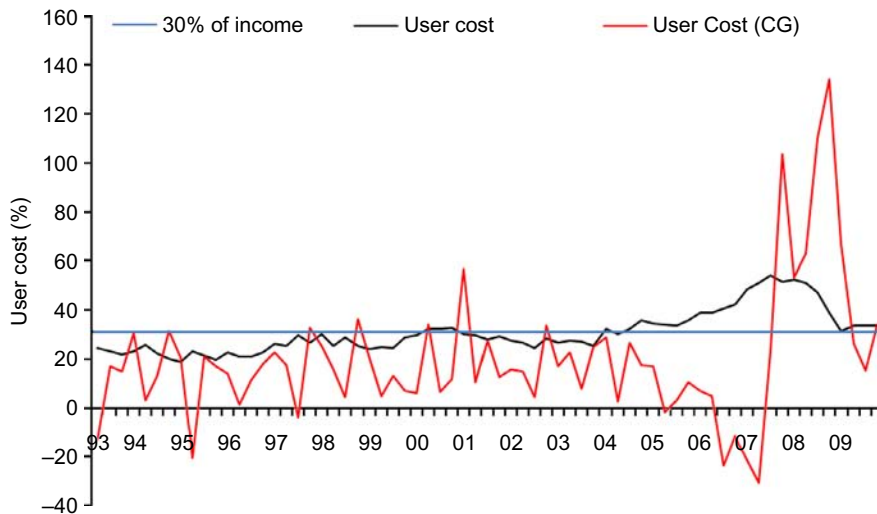

Figure 11.
User cost of housing
as a percentage of income

the analysis suggests that user cost has returned to a long-run stable level, albeit slightly above the long-term average against income and only marginally over the affordability benchmark of 30 per cent. The purchase and access affordability measures, on the other hand, are well in excess of affordable limits and the long-run average.

5. Conclusions

The findings in this paper indicate that a nexus exists between financial deregulation and affordability in the NI housing market. Initially, the main impact of mortgage market deregulation and its auxiliary impacts within the macro-economy helped fuel and sustain a housing boom, inducing effective demand within the housing market resulting in house price exuberance and the detachment of income from house prices, and increased housing costs.

These structural and unfettered changes within the mortgage market undoubtedly fuelled demand within the housing market and the development of a housing bubble. During this period, affordability became a foremost issue due to the acute increase in house prices in contrast to the relatively linear increase in wage structures. However, this was somewhat masked by the readily available finance within the lending market and perceptions of effective user cost incorporating capital value increases. In the wake of the financial crisis, the parameters of mortgage lending have been drastically realigned. Invariably, risk appetite amongst lenders has contracted and due-diligence within the sector has become more robust. The result of these practices is a significant deposit gap required for FTBs accessing the market, primarily a result of reduced LTI and LTV multiples.

The analysis strongly suggests that the issue of housing market affordability has seen a paradigm shift in emphasis from a house price, income and repayment issue, or combination of these, towards a problem of access and purchase affordability in terms of the deposit gap. Purchase affordability and the deposit gap remained under the radar until the collapse of the financial markets. In accord with Gan and Hill (2009), this paper highlights that the concept of housing affordability cannot and should not be analysed using one concept, measure or definition. The empirical investigation clearly indicates that the traditional measures are similar in their assessment of affordability; however, this paper has shown that they neglect to encompass the "lumpy" access costs to finance required for entry into homeownership. Within the contemporaneous market setting this purchase affordability is the most pressing affordability concern, albeit that the house price-to-income measure shows that there is a disconnect between it and the ability to borrow ratio and the residual measure and user-cost measures illustrate housing costs still sit above 30 per cent of income. To this end, affordability cannot be labelled as an umbrella concept and achieved through a one-dimensional policy objective as different measures of affordability essentially measure different aspects of the housing market and its performance.

The financial crisis in tandem with the property market downturn has played a significant role in transforming the landscape of affordability for prospective FTB households. FTBs remain at the threshold of being priced out of the NI Housing market according to all affordability measures examined within this paper. Significantly, the wholesale removal of 100 per cent (or indeed 100 per cent +) LTV mortgage products acts as a considerable affordability barrier to homeownership, as the rapid shift in LTV

ratios will necessitate a period of capital adjustment for FTBs. The capacity to save even a 10 per cent deposit is problematic given the comparatively low wage structures in NI coupled with ongoing economic austerity measures and economic sentiment. The evaporation of "hope value" of capital appreciation post purchase in regard to the perceived user cost of housing has also impinged upon the "willingness to save". In essence, this has served to increase social disparity as those cohorts from relatively more affluent settings can finance homeownership mainly through intergenerational wealth channels, whilst those on lower incomes remain relatively excluded from the mainstream property market.

The house price-to-income ratio has diminished in the wake of the sharp house price correction, along with repayment affordability. Pertinently, these measures at first glance suggest that affordability has improved, in reality however they still reside at a level which is deemed unaffordable. The downturn in the NI housing market has presented a clear shift in how the concept of affordability should be analysed as the foremost challenge and obstacle faced by FTBs in the housing market is an access and purchase measure issue. In this regard, the affordability narrative should be redirected towards the "lumpy" deposit costs needed to initially access the market, the limited incentives to save and the stringency of lending criteria. Indeed, it would appear that there is no right or wrong way to measure affordability, just different aspects and implications at different times within the housing market cycle. To focus solely on one measurement of affordability will mask the fact that other macroeconomic or financial issues impinge upon the affordability cycle and result in an overly simplistic interpretation of what is essentially a multidimensional concept comprising several interlinking and continuously evolving market dynamics. In this sense, affordability remains an omnipresent policy concern explicitly tied to housing market cyclicity.

Notes

1. Based on the ODPM (2005) definition of housing affordability.

2. This paper applies the generally accepted guideline for front end debt-to-income ratio as 30 per cent.

3. All figures from 2005 onwards are premised upon product sales data, with figures pre-April 2005 comprised of data taken from the *Survey of Mortgage Lenders*.

4. Provided by the Centre for Research on Property and Planning in partnership with Bank of Ireland and the NI Housing Executive (NIHE).

5. Refer to NI's housing market update, Ulster Bank, October 2010 available at: www. ulsterbankcapitalmarkets.com/home/Economist/NI%20Economics%202/Housing.aspx

6. Long-run trend based on CML FTB approval rates for the 12-year period 1993-2004.

7. Based on households saving, 20 per cent of annual income per annum to amass deposit requirement.

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Emerald Article: Valuation procedure and cycles: an emphasis on down markets

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Valuation procedure and cycles: an emphasis on down markets

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Abstract

Purpose – Current economic conditions have identified a complication if not conflict in the application of valuation analysis assumptions with the free fall in asset prices observed since 2007. Discrepancies in debt obligations (from prior periods) with underlying collateral value have been opined to be an unforeseen anomaly. This investigation aims to observe an alternative perspective using data from 1900 to the present.

Design/methodology/approach – This 110-year period of observation shows that return (value) volatility is the characteristic norm of the market system. Showing volatility as a fundamental characteristic of economic and property performance supports conjecture by definition, observation and rationality that valuation analysis had to be successfully employed in prior down cycles and across divergent economic regimes. A systematic literature search was conducted to identify the application of specific value theory, premises and concepts with appropriate valuation techniques in given economic regimes. The variables derived from the literature and practices observed and designated as operating across time emphasizing recorded recessions are then tested for statistically significant associations using χ^2 tests.

Findings – The findings show that traditional value techniques are successfully applied in stabilized and even accelerated growth periods, but weaken and even break down during down markets. Alternative approaches and techniques are emphasized and developed during these periods that address specific problems but are befitting more general issues. The alternative perspectives are then observed to operate, generating much debate for extended periods. They are then incorporated as orthodox or disappear as issues. This study identifies a statistical link between the economic and valuation concerns of the Great Depression of the 1930s and the current Great Recession of 2007-2009. The more relevant finding, however, is that the period following the depression of the 1930s, which shows a period characterized as using innovation and alternative valuation techniques, was continued into a period that ran from the 1950s into the mid-1990s. This was a period of stabilization, at least into the early 1980s. The deregulation of the 1980s generated a period of fewer cycles but major magnitude shifts in the less frequent measures of volatility. Unfortunately, the sophistication in debate concerning valuation procedure and valuation premises, as statistically measured, declined from the 1990s into the present period. The present economy reflects statistical measures similar to those observed from 1900-1930.

Originality/value – Given the 110 years considered in the study, the findings should not be considered original with regard to assisting the general welfare or professional decision making. However, given that the market shifted from being a useful institution to assist in the allocation and distribution of property to being a religious caveat that could only result in perfect solutions to solve all social needs, wants and ills, the findings emphasizing valuation techniques based on rational value premises that can operate to assist inference of future events subject to divergent and cyclical operations might be calmed to offer very useful assistance with procedure based on fundamentals and expression of behaviour that has long been vilified. The uses of the patterns identified in this study need to be incorporated into causal analysis.

Keywords Value theory, Valuation theory, Chi-square (χ^2) tests, Hierarchy of techniques, Cycle phases, Regimes, Recession, Asset valuation, Financial markets

Paper type Research paper

Valuation procedure and cycles

The collapse of the commercial real estate market in the USA began in 2007 and came on the heels of the worst financial crisis observed since the Great Depression according to Reinhart and Rogoff (2009). Indeed, developers, investors, lenders, policy-makers and regulators seemed totally unprepared for the downturn, claiming it was unprecedented and thus unpredictable. Once the bubble began to burst and the depth of the problem started to sink in, the market panicked. As a result, capital flows to the asset class froze and market activity came to a screeching halt. The disruption led to record levels of distressed assets and bid-ask spreads that were so wide that transaction activity almost completely dried up. Some observers noted that this correction differed from prior downturns, which typically were associated with overbuilding. Alternatively, this downturn was related more to over-pricing and the failure to consider the risk side of the equation. Regardless of the factors that led up to the downturn, the end result was a market environment in which the value of commercial real estate was difficult to establish.

The turmoil in the commercial market led to a lot of finger pointing including criticism of the appraisal process. Many observers called into question the process of appraising properties suggesting that valuation policies and practices were a major contributing factor behind the collapse. This criticism of appraisal is not new and has emerged in a number of situations in which the market is out of balance either at the bottom of the cycle where a floor in value is hard to establish or at the peak of the cycle where a series of record prices suggest the sky is the limit. In such situations, the emphasis on recent transaction prices as an anchor for real estate value becomes problematic. This is especially true when such analysis ignores the externalities that may create a distortion between current prices of individual properties and the underlying market value of the broader set of properties and when transaction volume abruptly changes. In such situations it could be argued that emphasis should shift to longer-term trend indications of economic activity needed for asset and durable good decisions. These issues are at the crux of the on-going debate in the literature differentiating price and value, which becomes more heated during certain stages of the market cycle.

Despite historical experience with economic cycles, major market players, institutions and regulators often seem to be caught off guard when abrupt changes in market behaviour are triggered. The importance of these behavioural responses and the nature of their cause-and-effect relationship to economic conditions have not been adequately addressed in the literature. Indeed, the recent risk of an outright economic collapse suggests a failing of the financial and economic orthodoxy based on assumptions of efficient and stable markets rather than one based in part on changes in market behaviour. Such behavioural responses are often ignored in the regulation and operation of financial institutions and government agencies, which are often based on the assumption of stable behaviour. The alternative perspective offered by Minsky (1992) that financial markets and practice are inherently instable (financial instability hypothesis) offers some insights into such behaviour. His explanation notes that as asset values are inflated, financial underwriting constrains seeking gains and profits become relaxed and rational risk aversion is modified if not suspended so that "surprises" become more probable. Recognition of this instability and research into the underlying forces may assist in altering expectations and in turn reduce the tendency towards and the acceptance of "surprise."

Real estate valuation policies and practices are based on many of the same assumptions as economic theory. In particular, valuation practices assume transaction prices are set by fully informed and knowledgeable participants acting under no duress and can be used in estimating market value. The recent collapse of the commercial market, which created record volumes of distressed assets and disrupted the normal market flow, suggests some of the underlying economic assumptions may not hold up over the complete market cycle. This is evidenced by the record number of distressed assets that quickly accumulated as the market effectively shut down in a panic mode. In this environment, appraisers where left with a dearth of transactions for which prices could be extracted and extended to other properties to estimate value. This suggests that reliance on the assumption that prices equal value is unreliable over certain stages of the real estate cycle. While some might argue that the recent situation was an anomaly and will not repeat itself, history suggests this may not be the case. For example, during the collapse of the real estate market in the latter-1980s the market also shut down with prices of few assets that did sell spiralling downward and leaving the market struggling with the question of what is the true value of real estate.

The fundamental question of whether the value equals price assumption holds up over time has received little attention in contemporary appraisal literature. The absence of a debate may be philosophical and relate to the position that values should be positive and focus on "what it is" rather than on normative or "what it should be." It is also possible that some of the resistance to debating the issue is based on the belief that it is not possible to determine when the assumption breaks down and should be ignored to prevent valuation from becoming speculative. Interestingly, the argument that price does not equal value (price $\neq$ value) can be traced back to the Great Depression of the 1930s when appraisal organizations first emerged in the United States in response to the need for formal policies and practices to guide the process of estimating real estate value after the market has broken down. The primary objective of this study is to explore whether the fundamental assumption of whether real estate "value equals price" is valid or whether it becomes unreliable during certain phases of the market cycle. Of particular interest is the question of whether abrupt changes in market cycles can trigger changes in market behaviour that in turn creates a divergence between observed transaction prices and alternative choices of estimating value. A secondary objective is to determine whether future real estate cycles and changes in market behaviour should continue to "surprise" the market or whether they are related to the economic cycles which could signal when valuation based on the status quo is likely to break down and alternative premises of value and valuation technique needs to be considered.

I. Methodology and data development

The methodology for this study is based on a two-stage design. In the first stage, the inquiry applies quantitative analysis of economic cycles to delineate clear regimes or time periods during which the real estate market may have been subject to similar market forces. The analysis integrates economic cycles and real estate performance to determine breakpoints between one period or regime and the next. This analysis helps ensure that the delineated time periods are meaningful and likely to represent temporal frames during which the real estate market exhibited similar behaviour that affected the price versus value proposition in a consistent manner. In the second stage,

valuation literature is scrutinized over these time periods or regimes to determine whether the treatment of value versus price changed over time or whether it remained stable as suggested by strict adherence to economic theory. Since the underlying issue was not directly addressed over time, qualitative analysis is used to explore if and how its treatment changed over time. This involved detailed content analysis of valuation literature, which extracted articles that addressed the issue explicitly or implicitly. Based on the relative frequency in which the issue was debated and how it was addressed, the fundamental question of whether the price equals value proposition has been sacrosanct over time or whether it has been periodically modified to respond to changes in market behaviour can be resolved. If the literature has been consistent across regimes the results would suggest that value can be treated as the sole function of isolated and random transactions and analytics which are characterized by autonomous price measures and the risk they infer. On the other hand, if the literature reveals the industry has responded to changes in market behaviour across regimes the results would argue that the industry has recognized the need for a more behavioural approach to valuation practices, but has not codified that approach. These alternative positions as operating standards in the economic environment have been addressed in the literature over time with recent examples offered by Akerlof and Kranton (2000), Akerlof and Shiller(2009), Ferguson (2009), and Krugman (2009).

The time frame for this study is rather wide to enfold the major cycles and evolution of value theory, policies and practices. Given that Marshall (1979) is credited with the development of valuation theory (as distinct from value theory), the study covers the period from 1900 to the present (2010). This time frame provides the ability to identify long-term trends in cyclical patterns operating sequential to and consistent with the formulation, development and operation of value and valuation theory and practice. This temporal context enables an investigation and testing of the inferential nature of valuation procedure (versus spot pricing) and corresponding economic phases. The beginning of the time frame also extends back to the establishment and formulation of valuation theory developed in Marshall's (1979) synthesis of classical economics focusing on value theory as the primary decision criterion in establishing the foundations for both neoclassical economics and valuation practice.

Ia Methodology procedure

This study begins with a presentation of the notions and premises of value and valuation theory as they can be linked to economic activity, phenomena, experiences and market structure to set the stage for the analysis. After detailing the constructs of value and valuation theory to use as a foundation for empirical investigation, the paper investigates and empirically demonstrates the cyclical patterns and performance of the general economy relative to the property market over a 110-year period. The cyclical performance of the economy and property market is linked to value/valuation premises to construct splines to establish economic regimes based on observed and measurable trend reversion patterns (directions of measured movement) based on the trended patterns endogenous in to the data. Assumptions on spline analysis procedure are consistent with the trend reversion assumptions defining the primal premise of value theory as differentiated from price.

The cyclical and spline analysis and related conceptual constructs are used to develop the empirical analysis of the segmented economic measures observed and

developed from 1900 through 2010. The relationships of the developed data and measures are then tested using correlation analysis between the general economy as represented by changes in GDP and total property returns for the designated study period. The correlated relationships are further investigated using tracking error measures based on the magnitude of spread between the associated measures. Tracking error analysis focuses on the magnitude of spread experienced per period relative to the level of association suggested by correlation. This technique enables the identification and specification of lag effects that may be in operation, despite variant degrees of correlation. In particular, it responds to recognition that discussions of techniques and methods in the literature, which is the focus of this study may in effect operate in following periods creating a lag between changes in behaviour. The tracking errors and the lags identified assist with the notions of value and valuation theory to quantitatively construct and develop the splines. The spline analysis and economic regime/phases as supported by recognized recessions, sets the context for the time defined analysis of the literature.

Based on the discrete regimes emanating from the spline analysis, a systematic literature search is conducted to link the literature on value and valuation theory and practice to the economic period or phase in which it is published. The results of this inquiry are summarized in discrete tables to provide insights into the linkage between economic conditions and valuation policies and practices and to reveal how they have changed over time. Finally, the conceptual and applied use of valuation and value theory observed in specific periods as developed from the systematic literature review are explored through the development of frequency measures. These measures track the number of times the value versus price issue appears in the literature, as well as how it is approached. The frequency counts or experiences are empirically analysed and tested using alternative Chi-squared (χ^2) analytics. These measures identify the consistency of value concepts and valuation techniques across given market periods to determine if they respond to the economic situation in which they operate or if they are indeed, stable and robust over time. These results will suggest whether the underlying assumptions of stable and consistent relationship between value and prices has been upheld over time or whether the industry has implicitly recognized the need to make adjustments to respond to changes in market behaviour over time and across economic and market cycles. This approach allows a test of valuation procedure and theory as conducted in the economic context experienced in the 110-year time frame from the creation of valuation theory based on the Marshallian Synthesis to the present Great Recession. See Marshall (1979), Wendt (1974), Graaskamp (1979) and Grissom (1981, 1985) for the link of modern appraisal theory to Marshall's value based economics.

I.b Data development

The cyclical economic patterns are based on the change in gross domestic product (GDP). This economic unit as a proxy for economic performance is promulgated in the economic literature by Cho and White (2007), Hamilton (1989) and Chow and Lin (1971). It has been alternatively suggested as a measure of the change in aggregate national income, the change in national wealth, and as a measure of the real interest rate as per Diermier *et al.* (1984). GDP has not been consistently reported as the primary measure of aggregate income and production for the entire period studied. This required a comparison of GNP with the development of GDP from gross national product

estimates (GNP) for the period from 1900 to 1927. The relationship between GDP and GNP, then was compared with the GDP offered by NBEA. The process used to develop the GDP measures during this period, employed the procedure suggested by Hamilton (1989).

A more intensive development effort was required to construct a long-term measure of property performance. Consistent data series were limited and unavailable prior to institutional investors taking an interest of in the property market (circa 1974). Ibbotson and Siegel (1984) offered a composite real estate return series using a built-up rate procedure beginning in 1947 and continuing into 1984/1992. They offered a business or commercial return series from 1962 until 1992. The authors' research shows that Ibbotson and Associates began to use the National Council of Real Estate Investment Fiduciaries (NCREIF) at that time. The nature of these data series and the transition to NCREIF is discussed in detail by Grissom and DeLisle (1998, 1999). These latter citations also investigate the relationship of these three data series with the data offered by the National Real Estate Index (NREI), the data offered by the Real Estate Research Corporate (RERC), Evaluation Associates (EAI), Korpacz Associates, and American Counsel of Life Insurance data base (ACLI).

The available multi-period data series cited are supplemented with data made available in a broad array of independent studies, articles, books and proprietary research offering real estate returns for unrelated sporadic time periods from 1836 into the 1980s. These studies are accessed and derived from the literature including articles by Sirmans and Sirmans (1987), Norman *et al.* (1995), Hoag (1980), Kau and Sirmans (1984), Ricks (1969), Webb and Sirmans (1980), Roulac (1976), Zerbst and Cambron (1984), Zerbst (1978), Nourse (1986), Ambrose and Nourse (1993), Folger *et al.* (1984) and Scott (1996) amongst others. The data from these articles is compared and contrast with the series data noted above and the proprietary research conducted by the authors at Equitable Real Estate Investment Management and Price Waterhouse in the early 1990s. The individual data and the series are correlated over matching time frames and rate spreads are developed and further tested for patterns and relationships overtime. The associations, spreads and correlations are further tested against the Case-Shiller housing index for the patterns and relationships noted across matching time periods. These associations are further tested against the data series for the UK developed by Scott (1996) to identify if any anomalies or unique and distinct measures can be identified or isolated. These relationships and the patterns developed are then tested against explanatory and associated factors such as inflation, productivity measures, mortgages rates and other index and forecasting factors as suggested in the literature by Scott (1996), Shiller (1989, 1998) and Grissom and DeLisle (1999). This array of studies is combined with the available data series to arrive at the property return data illustrated in Figures 1 and 2. The long range property series developed is then compared to the changes in GDP from 1900 into 2010.

To address the objectives of this study, the stepwise analytic procedure first explore the underlying premises and notions of price and value theory and offer appropriate units of comparison. These specifications of the basis of worth used as a unit of comparison is then compared to the appropriate valuation technique and procedure fitting the basis of worth defined or identified given the problem situation. The link between value premise and valuation techniques used in prior economic regimes, especially down cycles are identified and linked to their application in given phases of
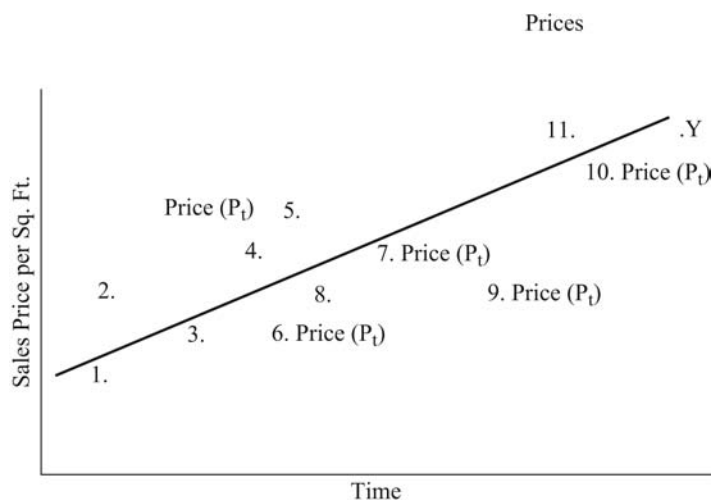
Figure 1.
Graphical conceptual specification of market price and market value

Where: numbered data are comparable sales

P_t = market prices at various times (t = 1, 2, 3,....11)
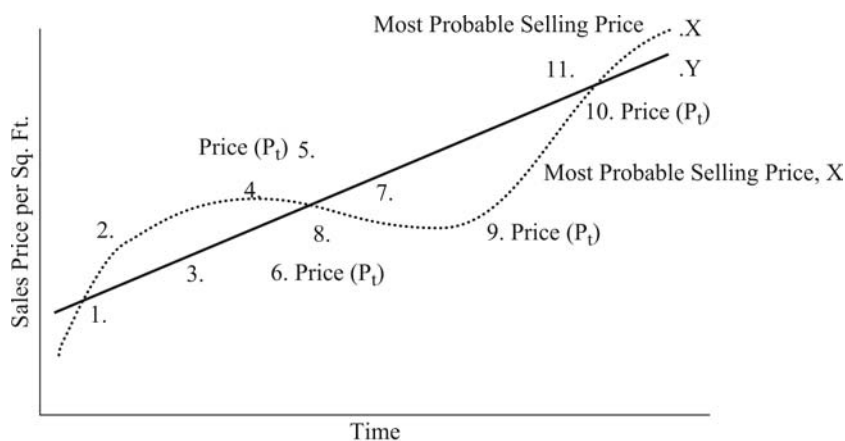Y = market value, if value premise is used

Figure 2.
Graphical conceptual specification of market price, most probable selling price and market value

Where: numbered data are comparable sales

P_t = market prices at various times (t = 1, 2, 3,....11)
X = most probable selling price as a function of P_t
   Occurring prior to X in time t or Xt
Y = market value, if value premise is used

past economic cycles. The fit of these techniques to the fit of specific economic cycle phases as developed above are linked to the specific causes, effects and characteristics of the cyclical phases as they are identified over time. The association of valuation procedures as to their fit to diverse phases of economic cycles and the market structure

entailed are then used to identify appropriate valuation procedure to fit changing and specific market situations. The findings of the fit of valuation procedure to cyclical/market context developed in the temporal phases of the literature is further used to identify valuation procedure that can assist valuation analysis and problem solving in dynamic and future market and pricing shifts.

II. Value/valuation theory

Value and valuation theory are conceptually and procedurally linked to the assumptions and constructs of economic structure. The premise and guidelines that underlie value/valuation theory and economic structure as entailed in the neo-classical or Anglo-Saxon (Anglo-American) market economic structure are interrelated. The analytic foundations that set the context of market economies assist in identifying why they rise and fall. Even more remarkable is that despite the evidence that shows instability, fluctuation and behavioural changes, the key assumption is that internal stability in economic relationships is fundamental and is only altered because of random uncontrollable external events. The base assumption of market structure as supported by valuation theory is that the market is stable, efficient and rational. However, if this is the base foundation of structure, then why is there risk and periodic fluctuations from the equilibrium norm and even more practically why is highly compensated risk management necessary? If the market is always going to correct as a result of the perfectly competitive rational market mechanism where individual participants all seeking their own self interest always operates to an optimal position for all, then we should not observe periodic volatility much less significant shifts in the economy and pricing system. These same assumptions are intrinsic in market value theory[1]. If so, is this behaviour observed in valuation practice or is there an endogenous, inherent instability operating in economic and property market performance? Is this instability observed in the valuation literature or the economic relationships investigated above and can it be measured? Are the situations consistent with the long-term indications of economic and property performance observed across time?

IIa Associations of valuation and economic analysis

Alternatively or at least coincidentally, are the institutional and behavioural relationships delineating and setting up our operational economic procedure defined by inherent characteristics and derivative measurement procedures that create endogenous stability or instability in relationships. Can endogenous relationships result in surprise or unexpected occurrences that create uncertainty that surprises most, if not all market participants? In the context of measurement and valuation, is proclaimed surprise associated with changes in the direction if not the rate of changes in trends in value, price or returns. The consideration of endogenous impacts on fluctuation and volatility as well exogenous random and uncontrollable events alters not only the acceptance of major economic changes as a surprise to those in charge, but the extent to which issues should be embedded in prices estimation. This is especially interesting since Juglar (1862), Mills (1920), Marshall (1979), Schumpeter (1930) and numerous other economists have repeatedly suggested that the major cause of economic bust have been their preceding economic booms. This is partially identified in the correlation and tracking error analysis to be considered. In turn are these issues

sequentially reflected in valuation literature? The constructs of the issues and questions fits the construct of the χ^2 tests to be conducted by testing observed periodic measures against what would be expected in that economic context.

The repeated reclamation of surprise and thus the failure to synthesis the lessons of the past suggests that there is a conscious choice to be ignorant, that professional training and research is lacking, or fraudulent behaviour and/or irrational exuberance is the basic mode of behaviour operating in market systems as offered in the research of the ilk of Akerlof and Shiller (2009), Shiller (2000), and Galbraith (2008). This would create difficulty in modelling except as variation from some norm and can be treated as if the assumptions of competitive capitalism are so random, inconstant and unstable that it is set up to repeatedly fail. Though these issues arise, the key assumptions of the neoclassical market model are that the ability to learn is offset by the lack of control that can be exercised my market participants. The static state, efficiency and equilibrium conditions assumed in the basic model shows that stability inherent in the system can only be altered by random exogenous events. This external causation as the basis and premise of fluctuations in an inherently stable economic system, implies that any attempts to manage and plan for contingencies is ineffective and can only be endured not planned for, learned from or guarded against (except for insurance). The assumption in this context by economist like Friedman and Schwartz (1963) and Hayek (1966) assume that the market if unregulated through its free will, will self correct. However, if the market is freely operating in its best interest, with full knowledge of the outcome, thus operating efficiently and rationally, how can failure occur in the first place? Given rational expectations, should not even the external random events have already been impounded in the pricing system?

In part all these issues can be addressed in the test of the extent and magnitude of measure of $P \neq V$ and the possibility of a difference in an occurrence and measure of $P = V$ or $P \neq V$ operating between stable or down markets. This can be investigated by testing the use of Marshall's valuation techniques relative to value premises employed in different time periods and tested over time as situations change. Unlike the monetarist and Austrian perspectives of the market, the neoclassical market economic model is focused on the determination/estimation of a market price or value. This prime objective led Marshall (1979) to specify a theory of valuation and value premises that incorporate and consider the same set of assumptions and premises. In effect the changes and problems that arise with the economic shifts and cycles should be linked or found absent in the issues to be addressed in the employment and concentration of value and valuation theories relative to economic phases and regimes.

Grissom (1986a,b,c,d,e) illustrates a direct association between alternative market structures, value premises and valuation techniques. To understand how to address this reoccurring situation, it is first necessary to understand how price and value as a premise of worth is related to valuation procedure. With this focus on measurement, the valuation process can be linked to the characteristics and nature of fluctuation in market conditions and the cyclical patterns experienced over time. To establish this association it is necessary to identify the factors that create the swings and fluctuations sequentially observed in alternative market situations. To appropriately identify valuation that fits the context of the market, it is beneficial to identify the causes that initiate changes in market situation and characteristics that specify the market context and constraints on pricing and value estimation. Identification of the causes, nature

and patterns of market cycles helps in identifying valuation techniques and procedures
that fit the context of the market situation and structure that specify an appropriate
value estimate.

IIb Value theory
Value theory is identified by Wendt (1974) and Grissom (1985) as specifying and
modelling the factors that form the bases and premises of worth in an asset or good.
This indicates that value is a more complex and inclusive measure of worth than price.
In fact, at best price is a limited concept and subset of value theory. The differentiation
of price and value has been an issue of concern in economic discussions of the classical
economists. Though probably an issue of concern even before the formulation of
economics in the classical period, according to Wendt (1974) value theory issues
dominated decision concerns and economic pricing models until the late 1950s when
price determination dominated value as essential decision criterion. Despite this clear
point of differentiation in the place of value and price as the primary decision criterion,
the differentiation of price and value was a key concern and criterion promulgated by
Babcock (1932) to assist in solving appraisal problems during the Great Depression
era. He noted the difficultly in using price in a down market and the failure of price as a
unit of measure to fit the problem context and characteristics that define a down
market scenario.

In effect price is a short-term measure. It is an artefact derived from transactions
that may or may not reflect or account for a value premise (see Grissom
(1986,a,b,c,d,e)). Alternatively, value is a concept, a hypothetical or conjectural
specification of an object's worth; an expected *ex ante* measure of worth premised on
the attributes of value theory. Value is premised on the interaction of effective demand,
the supply available as a function of the cost to produce an object/asset and the ability
and system to transfer or exchange the good demanded and supplied. For the market
based determinants of value the asset must have functional utility and furnish
satisfactions to the probable users (behavioural utility). Incorporating these value
variables into the specification of the premise of asset worth, Marshall (1979) identified
a time dimension inherent in the concept of value. The short run is reflective of a
market price or market value that is a current exchange value derived from current
transactions. These short-term measurement phenomena are equated to or associated
with a longer-term normal cost or value notion that allows the analytical benefits of the
stable state and equilibrium analysis that defines the basic market-pricing construct.
Grissom (1985) depicts the conceptual differences between market value, price and
most probable selling.

III. Empirical analysis of economic performance and methodology for
temporal analysis of valuation theory

This empirical analysis and cyclical economic relationships are related to the
formulation of valuation theory and property decision needs by a structured
specification of value and valuation theory that has been developed and evolved over
time based on the economic synthesis offered by Marshall (1979). The conceptual
construct employed is illustrated in Figures 3 and 4 as developed by Grissom (1985) to
differentiate value and price. This same method was recently employed by Fanning
et al. (2010) in a presentation to UPAV Congress members to explain down market

Note: Recessions in dark shade
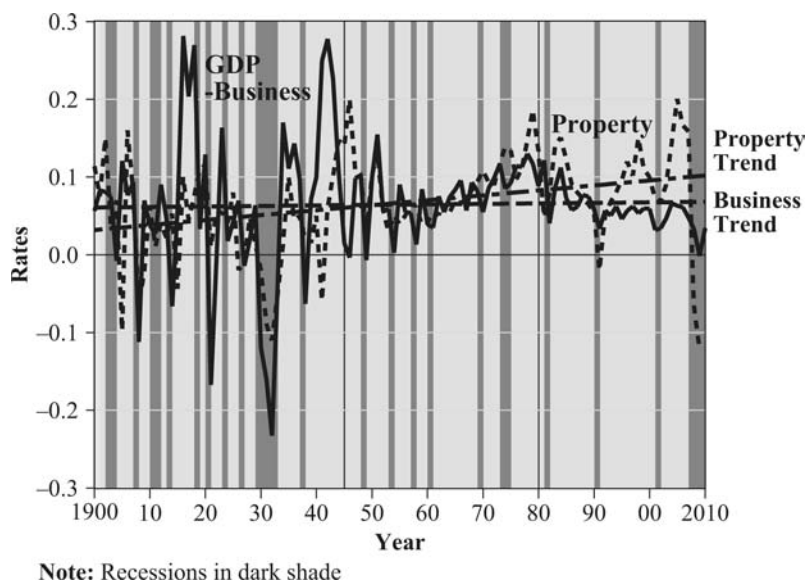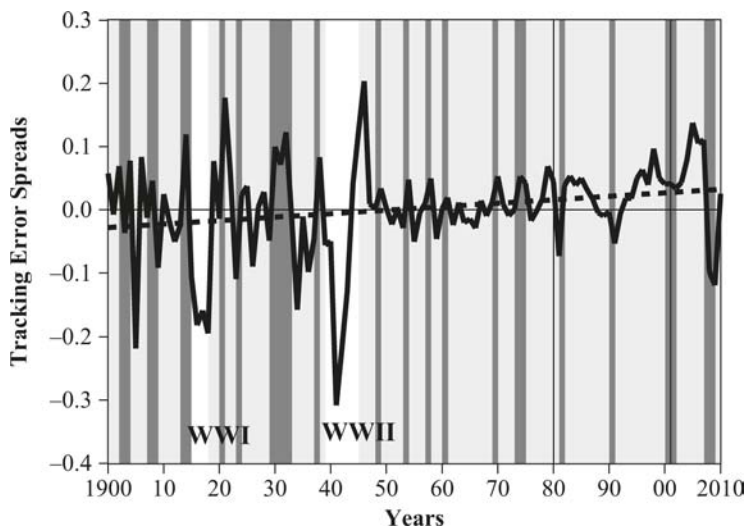
conditions. The figures depict price as fluctuating points cycling around a linear notion of value. This graphic presentation seeks to illustrate the difference between value, as a stabilised future and longer-term trended measure of worth, while price is depicted as an individual point. This depiction illustrates value as a trend reversion concept and price as a historic measure or short-term spot inference of worth.

Figure 4 adds an illustration of the concept of most probable price as a distinct notion from value. Most probable selling price as defined by Ratcliff (1972a,b) is a predicted price based on a inferred or statistically expected price based on

endogenously inferred pricing expectations derived from transactions and associated economic measures. This conceptual notion is depicted as a non-linear line by Grissom (1981, 1985) and is proposed as a unique statistical concept by Colwell (1979). The comparison between price, most probable price and value as depicted in Figures 3 and 4 is used as the conceptual basis for value and price measures structured as spline and regime units of economic performance trends operating as sections within the general cyclical flows.

Figure 1 illustrates the cyclical performance of the general economy based on the changes in GDP discussed in the methodology and data development section. The long-term performance trend despite the volatility indicated by the marginal rate of growth of the general economy over the 110-year period of study shows a moderate growth trend is produced. The trend measure suggesting that since 1900 the economic growth of the US economy has been almost stable. GDP is a proxy of business cycle performance. This is compared with periodic real estate returns. The real estate data shows a less volatile property market (at least until the last few years) than the general economy, but a higher growth pattern. The long-term trended property data illustrate a higher rate of asset growth than has been experienced by the general economy. This division in aggregate income and asset performance may offer a insight into the current down turn and the issues experienced in asset valuation. The comparison of the cyclical patterns and long-term trends of the general economy and the real estate market are the key input used in the correlation and tracking error analysis.

Table I illustrates the annual/regime phased correlation between property and the general economy. The change in real economic production and property returns indicates a high to moderate correlation of 35.63 per cent over the 110-year period from

Regime phase	Correlation: property returns and ΔGDP (%)
1900-2010[a]	35.63
1900-1914	21.99
1900-1918	27.12
1914-1918	52.35
1918-1920	−86.23
1920-1932	77.75
1929-1932	91.73
1932-1938	81.03
1937-1938	58.61
1939-1945	−43.79
1941-1945	−68.72
1945-1953	2.44
1954-1973	41.98
1973-1976	−87.19
1973-1979	40.05
1980-1990	46.87
1991-1997	73.19
1991-2000	59.91
1997-2001	57.68
2002-2007	80.16
2007-2010	84.87

Notes: [a]Total period studied

1900 to 2010. The long-term period is then segmented to assist differential comparison of real estate returns and real economic performance. Table I presents the correlation between property returns and changes in GDP over the respective regime phases. For example, a 27.12 per cent correlation between the general economy and property is noted for the period from 1900 through 1918. The relationship from 1920 to 1932 is then increased to 77.75 per cent, which reveals the strong integration between property markets and the broader economy during this period. However, this relationship was not stable during phases of this regime as noted by the major decline following the First World War (-86.23 per cent). The relationship during the Great Depression years (1932-1938) reflects a high correlation of 81.03 per cent. The recession from 1937-1938 shows reduced correlation between the economy and property market dropping to 58.61 per cent. The period during the Second World War reflects a high negative correlation ranging from -43.79 per cent and -68.72 per cent for the European and America war periods respectively. The period from the Second World War to the Korean War shows the lowest correlation between property and the economy at 2.44 per cent, which is somewhat understandable in light of the dramatic changes that occurred in the post war recovery period, which was characterized by rapid expansion of the real estate market.

Once the market stabilized, the integration of the property and economic markets resumed, as noted by the 1954 to 1973 period with a correlation of 41.98 per cent. The financial crisis that occurred from 1973 to 1976 disrupted this relationship as evidenced by the high negative -87.19 per cent correlation. This period of disintermediation was dramatically different than the subsequent the phase of stagflation during which the correlation from 1973 through 1979 is 40.05 per cent. This period reflects the strong links between asset values and inflation. The decline in both real economic growth and property performance following the correction from stagflation occurs in the period from 1980 into 1990. This period shows a correlation of 46.87 per cent. This connotes a period of perverse inflation effects ending in the 1990-1991 recession. The growth phase following the 1991 recession and extending into the Asian financial crisis produced a high correlation between property and the economy of 73.71 per cent. The association between property performance and the changes in the economy between the Asian financial crisis and the recession beginning in late 2000 is illustrated by the comparative drop in correlation measured for the period from 1991 through 2001 and 1997 and 2001 which are 59.91 per cent and 57.68 per cent respectively. The differences measure for these overlapping periods after the highs prior to the global impacts of Asian financial actions shows the instabilities operating during the growth phase of 2002-2007 is significant to the economic crisis operating after 2007. The growth phase observed from 2002-2007 shows a correlation of 80.16 per cent. This high rate is followed by the 84.87 per cent correlation between property and economic performance during the major financial crisis between 2007 and 2010.

This high correlation shows the significance between property and the general economy during a major financial crisis (see Reinhart and Rogoff (2009)), which is somewhat counterintuitive. However, a general pattern can be observed from the long term comparative approach developed in the analysis. Large negative correlations are observed between property performance and the general economy during periods of real economic disruptions such as wars and financial crises (as distinct from generic down cycle or phases of the economy). The high negative measures are observed after

the First World War, during the Second World War and during the disintermediation
of the mid-1970s. During economic regimes characterized by high inflation and
consumption periods can slow investment. These activities influence the natures of the
general economy and the property market, which are in sync in being actively down.
The sequential decline in the economy and property market can be observed in the
financial and real economic recessions of 1929-1932, 1932-1938 (1937-1938), and the
financial crisis of 2007-2009, show this high measure of positive correlations. Only the
growth phases of 1920-1932, 1991-1997 and 2002-2007 show high positive correlations
(75-90 per cent range) between property and general economic performance out of the
entire period of study. Each of these phases preceded a major recessionary decline.
More typical (stabilized) economic periods/regimes tend to reflect correlations in the
low 40 per cent to high 50 per cent range.

The changing relationships between property and the economic performance over
time initially support the diversion from trend noted by Hendershott and MacGregor
(2005b) between real estate investors and general economic trends in their US research.
However, the failure to recognize the reversing relationships between wars and
financial crises, periods of moderate growth and active growth can tend to distort
pricing and valuation standards.

The cyclical disjoining of the property market and the general economy, often in
less than intuitive patterns based on correlation analysis may be assisted by
investigating the tracking error. The tracking error is measured as the spread observed
between the correlated series

The specific tracking error analysed is the difference between the property return
observed for a specific time period and the change in the GDP per period. As illustrated
in Figure 5, the spread is negative (economic performance is greater than return on
property during that time period). The greatest of the spread, where property returns
show a weaker performance than the general economy occurs in a lagged fashion.
Negative property performance lags the depression of 1904 (the Rich Man's Panic) and
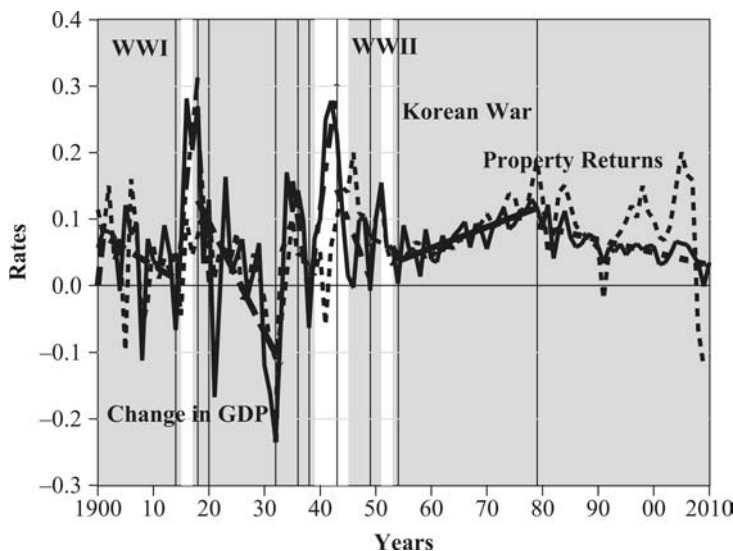

Figure 5.
GDP splines and valuation

both the First and Second World Wars. Despite the high correlations (in up and down markets) between property and the general economy, tracking error calculations show a lag in the negative spread between property and the change in GDP occurring after all recognized recessions from 1900 to 1980. However, from the dual recessionary dip of 1980 and 1981-1982 until the present down-turn, the negative tracking measures for property in relation to the general economy is consistently timed with the phases of recognized recessions. This structural shift seems to coincide with the defined phases of the recognized recessions operating since major deregulation of financial institutions after the legislation in the early 1980s. These institutional and economic shifts require greater insights and understanding of institutional standards in relation to market forces, decisions and operating activities, such as required under the R-41b memorandum of the Federal Home Loan Bank Board and the asset valuation standards specified by the Resolution Trust Corporation (RTC). These institutional valuation restrictions were in operation prior to the mid-1990s. The tracking error analysis and temporal breakdowns specified are used to assist in the delineation and specification of cyclical phases and value theory based splines.

IIIa Cycle stages and phases

The period of study begins with a recession that began at the end of the nineteenth century and continued through 1900 due to bank panics in the latter 1890s (see Reinhart and Rogoff, 2009). An upturn occurred from 1900 into 1902 when another down turn occurred. This down turn was designated as the Rich Man's Panic of 1904. This panic in effect was tied to mispricing and speculation of rail road stocks that was not matched with real production. Though the term panic is used, this was a mild recession and since the measure of the decline was based on limited data afforded by business annals, may have overstated the impact. However, more extensive financial implications are suggested for this period. As illustrated in Figures 1 and 2, based on the change in GDP, a decline is noted. The Rich Man's Panic ending in 1904, was followed by an expansion into 1907. The Panic of 1907 extended into 1909 and was followed by an upturn into 1913. The financial disruption attributing to the Panic of 1907-1909 contributed to the development of the Federal Reserve System (FRS). The Fed was created by legislation in 1913 and began effectively acting on interest rate management in 1916. This legislation and regulatory participation coincides with another economic slowdown/panic referenced as occurring from 1913-1916. The fluctuations observed in this pre-First World War period of *laissez-faire* economic activity reflecting a two-five year cyclical phase fits the pattern noted by Kitchin (1923). The cycle economists at the NBER, which was established around this time have noted that the Kitchin cycle pattern is highly associated with an inventory cycle pattern. This fits the economic structure and foundation observed for this era. The characteristics observed fit the structure of an unregulated industrial/agricultural based economy. The economic operations observed during this period and reflected in the business annals data used to establish the cycle phases comply with the nature of the cash cycle enterprises that describe manufacturing firms or agricultural operations. These are the dominant organizational operations observed during this period. The economic and operational structures characterising this period comply with the three approaches promulgated by the neo-classical synthesis and valuation procedure of Marshall (1979). The valuation literature during this period (to be discussed) shows a

preference or emphasis on the use of the sales comparison and income capitalization approach. Limited consideration of the cost approach during this period was observed in the literature.

This *laissez-faire* competitive market structure was altered with the economic acceleration created with the advent of the World War. The war economy reflected accelerated growth with eventual inflationary effects developing prior the deflation associated with the reversion to a peacetime economy. The reversion/contractive slowdown transformed into a growth phase extending from 1915-1919. The war to peacetime rebound was very limited with a major decline occurring in a drop in GDP in 1920-1921, then rising and again moderately declining in 1923-1924. A fluctuating but continuous decline is observed in the GDP of the Great Depression beginning in 1929. As noted in Figure 2, the economic and property regime patterns reveal a declining trend from the end of 1900 until the war inflection observed in 1914. The downward inflection for the war is observed in 1918 based on trend reversion behaviour devised using spline analysis. If the war effect is omitted the spline/trend analysis coupled with the changes per period for the GDP indicates that a general decline in production is observed from 1900 through 1933. Interestingly, the property market during this period shows greater volatility than the general economy as measured by the change in GDP, but produces a more stable and effectively longer-term regime trend after the phase from 1900-1908 is considered. The potential for volatility in excess of the general economy may be consistent with a reliance on sales comparison and short-term rental capitalization during this period. The lack of or limited significance placed on cost analysis (a longer term valuation phenomena) is consistent with the short-term cyclical patterns identified in the economic structure. This fits the data illustrated in Figure 1, Figure 5, and Figure 2.

Despite the greater volatility reflected in the property market during the beginning of the century into the interwar period, a ten-year growth trend in real estate is observed from 1908 through the First World War. The trend decline in property from the end of the war through the first trough of the Great Depression correlates with the general economic trend measure during this period. As illustrated in the interwar period and through the Second World War, significant economic fluctuation is observed. The fluctuation in the property market is more moderate. This may be attributed to the limited or constrained structure of the real estate market given that the regime during this period is defined or constrained by a major depression and a major war (see Figure 1, Table I, Figure 5 and Figure 2).

Interestingly, the trend observed coming out of the depression and extending trough the Second World War is characterised by a positive sloped regime trend. This may be linked to a stimulated war driven economy-requiring space for real production activities. Interestingly, based upon both the actual performance measures and allowing for the endogenous trend behaviour, a long term period is observed for the conversion to a peace time economy. This in part reflects a managed and planned economy developed to assist the war effort and offset the negative effects expected in conversion to a peacetime economy. Note that the post war economy after the Second World War does not reflect the magnitude of the unregulated market observed after the First World War. The volatility after the Second World War is more moderate than observed after the First World War, but illustrates a steeper but consistent period of decline. A decline spline of the transitional economy continues despite the intercession

of the Korean War in the early 1950s and a general plan for economy development orchestrated during this period. The domestic Marshall Plan generated with the Defence Development Act allowed a focused control, but denotes a low economic and property correlation of 2.44 per cent as presented in Figure 5.

Ebell and Ritschl (2008) in investigating the interwar period link the recession of 1923-1924 with the great depression occurring between 1929 and 1930. They note the key problem impacting the fluctuation in profits, unemployment and productivity are linked to pro-business and pro-union judicial decisions. Judicial rulings combined with laxity in anti-trust enforcement and leniency in enforcing union activity contributed to concentrations in economic control accruing to specific firms and industries rivalling the pricing of labour via collective bargaining[2]. The end result was that the concentration of business control coping with limited representatives of large groupings of labour resulted in declining profits and restricted access to resources. This fits the negative effects of the accelerator principle and the mechanism of Schumpeter's boom to bust secondary wave. Linking these structural effects with the concentration of compensation to labour and resource coordination reflects a disruption in the distributive factors used to construct value theory and valuation technique.

Uncertainty and major cyclical fluctuation is observed in both the economy and property market from the end of the recession in 1938, through WWII and into the Korean War. This phase includes not only the war efforts with lags shown with Figure 1, Figure 2, and Figure 5, but also the shift in the economy as a result of conversion to a peacetime economy. This shift in part is linked to housing policy via the FHA and the VA to stimulate the housing and construction industry as well as a national industrial policy. These effects where operating during the recessions by definition in 1948-1949 and in 1953-1954. These recessions combined with the traditional inventory cyclical phases that operate in a manufacture based economy. These recessions illustrate the benefits of fiscal policy in industrial economies and the notion of growth recessions.

The 1960s reflect the foundation shift in the economic base of the economy into global markets and financial sectors that will be enhanced in the 1970s with the repeal of the Bretton Woods Agreement and associated financial disintermediation. The effect of the "growth" recessions linked to economic structural shifts and creeping inflation influences the investment and economic behaviour that can be associated with Keynesian economic programs initiated and magnified under the Kennedy and Johnson administrations is noted by the research of Minsky (1992) and Galbraith (2008)[3]. This is followed by the monetary theories employed by Volker under the Nixon and Carter Administrations. This major shift in both economic structure and policy can be associated with the conditions of disintermediation in the mid 1970s and stagflation initiated in the later 1970s. These impacts where absent in the prior recessions that where addressed with Keynesian policies.

The needs and reactions of the inflationary conflicts, low production and unemployment linked to the stagflation preceded the policies to reduce inflation and financial deregulation that where put into effect from 1981 through 1990. These acts include the 1980 Tax Act, the DMC Act of bank deregulation, Garn-St Germain (1982), 1986 Tax Act and FIRREA in 1989. The 1981 Tax Act stimulated real estate and general economic development and activity, often with an after tax perspective guiding the decision process. The deregulations acts and policy enabled banks to competitively

price capital in a market and global context, while the 1986 Act was a *de facto* tax hike that had negative and punitive impacts on property investment, while stimulating mortgage conduits and new financial products. Grissom and DeLisle (1999) identified the significant impact of tax policy during this regime that has not been observed in the remainder of the 110-year study period (before and after the 1980-1990 term).

The 1990s started with a recession, in part as a result of the economic volatility and decline in property and economic markets beginning in the latter 1980s as associated with the S&L and bank failures linked to property overbuilding. This required an extended period of absorption in the deference of demand and consumption. This economic downturn linked to energy problems and capital shortages especially in the USA and the Scandinavian banking crisis in part resulted in the Ombudsman Tax Act of 1993. This tax act had major impacts on REITs along with other attempts to enhance economic activity with capital flows. The period that follows 1995 represents a growth regime up until the recession beginning in the spring of 2001 and the impacts of 9/11 on property and security perceptions. This growth phase was inclusive of the Mexican and Asian banking and financial problems and the dot.com failures.

The 2001-2002 recession was influenced by the burficated economic construct of failure and growth in the later 1990s. This economic uncertainty continued into the 2000s including the 9/11 event with a significant split in the performance in the general economy's decline and growth in the real section. This period may contribute heavily to the findings of Hendershott and MacGregor (2005a) in the USA, that may not be the case over a longer period of study. The period from the mid-2000s through 2010, shows a constant decline that began in the 1980s in the general economy continued on a steady downward path until mid 2007, when a major decline abruptly is illustrated. This steady economic decline is inversely related to the measures of property return performance (and general nominal asset enhancement) as illustrated in Figure 2. The recessionary drop 2007 into early 2010 (July 2009 by definition and noted as the Great Recession) shows a major decline that significantly exceeds the decline associated with the economic performance recorded for the regime of the Great Depression from 1929 through 1933 and 1938-1939 (and their combined effect). See DeLisle (2008-2010)[4] for discussion of property and economic relations for the last decade.

IIIb Economic cycle regimes and valuation theory and procedure
The return data developed and associated with GDP change presented in Figures 1 and 2 are segmented into economic regimes using spline analysis. This spline analysis is based on the techniques developed and presented by Grissom and DeLisle (1999) and are consistent with the value/valuation theory illustrated in Figures 3 and 4. The economic and value splines are supported by the notion of long-term normal value promulgated by Marshall (1979), Babcock (1932), Mertzke (1927) and the FHA and VA valuation manuals (1970s). The formulation of the spline regime measures in comparison with the annual return series, allows a direct comparison of economic conditions, with property performance and the valuation procedures that are practiced and operating in any given period of time.

These economic phases noted previously can be linked to valuation issues and procedures that are operating within specified time frames or regimes. Aggregating these economic events and philosophies in association with the spline analysis enables the calculation of normal long-term value trended measures as shown in Figure 2.

Formulation of spline analysis and the value constructs implicated, enables the delineation of perceptions of economy performance using valuation procedures that are possibly continued over time or at least into the next economic regime. These events and associations are denoted in Tables II-VIII for the periods from 1900-1932, 1932-1938 (1940-1949), 1950-1969, 1970-1979, 1980-1990, 1990-2000 and 2000-2010. The second column in Tables II-VIII denotes the economic phases and events that occurred for each period/regime. This includes the recessionary impacts for each economic phase. Column three lists and directs the issues and procedures identified in the literature on value and valuation theory during these phases. A further effort was made to recognize reactions and solutions to deal with recession related valuation procedure and issues. The consideration of the valuation issues with the economic structure operating in each regime then enables the identification of conceptual perspectives and procedural techniques that continue from prior periods. This systematic approach can then assist the identification of procedures, techniques and conceptual premises that are potentially carried forward into the next and future regimes.

Although not put forward as exhaustive, Tables II-VIII are representative of the economic trends and valuation procedures noted in the literature of each period offering measures to assist decisions. In general, major changes in economic and property relationships can be observed between the periods from 1900 until 1954 and from 1954 into 1980 and from 1980 into 2010. Property then shows significant variation from 1980 to 1990, and 1990 to 2007. The relationship between 2007 and 2010 is still

Key economic characteristics/events	Corresponding central valuation issues
Marshall's Neo-classical Synthesis (1890) Ely's Development of land economics (1892) Eight to nine recessions during period, linked to inventory cycles, except for the financial and banking crises of 1904 (Rich Man's Panic), Panic of 1907 and 1913/14 and the Great Depression initiated in 1929 *Key events and economic impacts:* First World War, Formulation of Federal Reserve System – linked to 1900 banking panics, Initiated IRS and income tax, on top 1 per cent wealthy Hoover Administration's push for universal home ownership, lenient financing (see Bush period)	Marshall's Neo-classical Synthesis and Valuation Theory – three approaches: Mertzke (1927) property applications and promulgation of a theory of equivalence between three approaches Land economic techniques and value theory: emphasis on sales comparison and income capitalization (residual techniques and split rates) Collective works of Dorau and Hineman, Babcock, E. Fisher Establishing of National Association of Real Estate Brokers Board (NAREB) Focus on equation of price and market value (assumption of perfectly competitive market structure; $P = V$) and Sales comparison analysis Irving Fisher's (1906) Structural development of the income analysis and theory of interest as trade-off of consumption and investment allowing an enhanced application of income approach Hurd's focus of average price as measure of exchange value and income as intrinsic value; link of value to use (HBU) Regression analysis used for farm land (1920s) Development of broader conceptual measures of depreciation-based causes of diminished utility losses due to physical deterioration, design or functional and external loss

Table II.
Economic regimes and valuation issues 1900-1930

Key economic characteristics/events	Corresponding central valuation issues
Banking and Financial Crisis 1929-1933 Glass-Steagall Banking Act (1933) Restrictions on Saving and Investment (speculative activities) banking functions, establishing FDIC Keynesian Economics and Fiscal Policy and active participation of government in the economy using fiscal and monetary actions Founding of Federal Housing Administration Recession 1937-38 Second World War (1939-1945) Recognition of Oligopoly, Monopolistic Competitive Market Structure	Major differentiation in market price and value as concepts and the emphasis of distinction between price from value as a measure, $P \neq V$ Emphasis on Marshall's three approaches with relaxation of theory of equivalence, but emphasis on normal value and value as long-term and stabilized concept Babcock (1932): - Seven valuation approaches, one sales comparison approach, four income approaches varying with different degrees of property and enterprise emphasis and two cost methods - Purpose of decision and appraisal sets choice of valuation approach used Bonbright (1937) and Jerrett (1937) legal perspectives support case-based multiple value perspective, and legal uses Emphasis on income analysis and property fundamentals Link of cost to value with principle of substitution

Table III.
Economic regimes and
valuation issues
1930-1940

Key economic characteristics/events	Corresponding central valuation issues
Six recessionary phases linked to reconversion from war time economy to peace time economy, Domestic (George) Marshall Plan Bretton Woods Agreement (1944/1959) – open markets, fixed exchange rates and basis of gold standard dollar Korean War; Conflicts in Southeast Asia: Laos and instigation of Vietnam War; Oil Crisis/Suez Canal Tax Act 1954 (multiple alternative accelerated depreciation schedule options) Kennedy Fiscal Policy Tax cut (Keynesian) 1961 REIT Legislation (Cigar Act 1960/1966) Increased government participation in the economy, "Great Society"; creeping Inflation, Usury laws, Regulation Q, foundations for disintermediation Creation of HUD and move of FHA, FNMA (Fannie Mae), GNMA (Ginnie Mae), FHLMC (Freddie Mac) 1968-1970 Enhanced influence of lenders and institutions as well as government on economic policy and lending procedures Increased Institutional impact on asset pricing; Asset Pricing Models	Evolution of Probability and risk analysis in valuation; Most probable selling price (MPSP; Medici, 1953), Ratcliff, 1965 specification of MPSP as a inference approach of an expected or probabilistic future occurrence, Vp (*ex ante*); Most probable use (Kinnard (1966)) Increased use of regression in valuation – sales comparison analysis – simple linear, multiple regression and price-quality regression – See Wendt (1956) and H. Babcock (1968) Rejection of residual techniques and built-up rate analysis Increased sophistication of mortgage – equity analysis, and valuation as a tool of investment analysis as linked to yield capitalization. See Ellwood (1956, 1959) Market basis of appreciation and depreciation measures; enhanced consideration of income analysis, with emphasis on DCF analysis Intensified dichotomy between employing three approaches with a theory of equivalence construct and a hierarchy of approaches reflecting problem situation and decision objectives encountered: Dichotomy in debate of $MP = MV$ vs $MP \neq MV$ and $MPSP \neq MV$ ($Vp \neq Ve$)

Table IV.
Economic regimes and
valuation issues
1940-1969

Key economic characteristics/events	Corresponding central valuation issues
Three associated recessions Shift from Keynesian to Monetarist Policy Vietnam War OPEC Oil crisis Creeping to accelerated inflation, Stagflation Breakdown of Phillips Curve Disintermediation, inverse yield curve Repeal of Bretton Woods agreement, repeal of usury laws, Regulation Q Fiat currency, flexible exchange rates Employers Recovery and Income Security Act (ERISA) 1974 (inflation protection) 1976 Tax Act: multiple accelerated depreciation procedures; High marginal tax rates; capital gains deductions Creation of NCREIF, PREA, and NAREIT Failure of Mortgage REITs and issues of anti-alluviation: death of cash machines Increased application of asset-pricing models in securities valuation and institutional effects in capital markets	Continuation of valuation issues, with increased intensity: $P = V$ vs $P \neq V$ debate, three approaches with theory of equivalence and hierarchy debates; Differences in value and value theory (Wendt, 1974; Ratcliff 1972a,b) Increased conflicts in issues of risk and uncertainty considerations: • Statistical premises of value definitions, not just statistical application of measurement (see Colwell, 1979) • Increased emphasis on DCF, with debates as to nature and appropriateness of risk-adjusted rates and certainty equivalence techniques • Increased focus on mortgage-equity and after-tax analysis, DCR, Ellwood, Gettel • Cash equivalency adjustments • V_p and inference of probable transaction price Investment and income analysis as simulation of probable value Increased application of feasibility analysis with valuation; linked to most probable use (MPU) and most fitting use (MFU) concepts; see Kinnard (1966), Ratcliff (1972a,b), Graaskamp (1979)

Table V.
Economic regimes and valuation issues 1970-1979

evolving. The structural change in the relationship of the general economy and property performance between these general time frames supports further temporal segmentation that is consistent with value and valuation theory as discussed in value theory section of this report. The breaks and splines presented in Figure 2 are supported by the contingency and time segment tables discussing economic and valuation events presented in Tables II-VIII. These tables represent the data developed from observations in the literature. They suggest the variance in economic events and conditions had an impact on the evolution of valuation theory, practice and perceptions over the diverse segmented phases

Lasting/dominating perspectives from 1900-1930

· Marshallian perspective of time dimension of value measure; sale prices in short run, income analysis for interim periods and replacement cost new based on normal value (cost) and reversionary trend in long run. Approaches only equate in structure of perfect competition and equilibrium condition or in long run.

· Marshall's contribution was minority perspective, the notion of $P = V$ dominant with emphasis on short run measures using comparable sales; With dynamics of stock market behaviour, increasing attention to income analysis and fundamentals is considered.

· Regression fades, given limited technology and onset of Depression.

· Dialectic and dichotomy of period influences development of market and investment value concepts; notion of Highest and Best use.

Key economic characteristics/events	Corresponding central valuation issues
Three associated recessions, double dip in 1980/1981-1982	Integration of feasibility, investment, market and statistical analyses, see SREA courses
Supply-side economics, trickle-down theory and the Laffer Curve	Increased focus on investment analysis, DCF and IRR as decision tools reflecting investor behaviour and techniques. Increased emphasis on after-tax analysis as central criterion of decision making
Major reduction of inflation on economic decisions and measures	
Tax Act 1981	Impacts of government and financial institutions of valuation procedure: FHLBB R41-b memorandum, documented self-contained report, increased emphasis on market analysis
Depository Institutions Deregulatory and Monetary Control Act (MCA) – 1980	
Garn-St Germain Act (1982): bank deregulation act	Market analysis emphasis linked to further conflicts between land use models and links to value. HBU $\neq$ MPU $\neq$ MFU (Graaskamp (1979), Grissom, 1983))
Breakdown of segmented capital markets – direct competition between Banks, Thrifts and the evolution of new intermediaries and capital sources	
Insolvency and failures occurring with the Savings and Loans crisis and the Southwest Plan (1984)	Issue of policy and agency objectives integrated in the value definition and difference in value and valuation theory (Boykin (1986), Grissom (1986a, 1985))
Tax Act 1986, punitive impact on after-tax property deals and creation of Investment conduits; REMIC	Impact of market structure, risk and levels of uncertainty on value concepts (Grissom (1986a,b,c,d,e))
Financial Institutions Reconstruction and Recovery Act (FIRREA) 1989	Integration of finance theory and Valuation (Lusht (1984)), Syndications and valuation impacts (enterprise and financial structure on value) (Sirmans and Beaton (1986)), Grissom (1986)
	Increased use and reliance on indices in valuation (see Geltner (1989))

Table VI.
Economic regimes and
valuation issues
1980-1989

Lasting/dominating perspectives from 1929-1939

- More active consideration of Marshallian valuation theory using three basic approaches and the notion of value as a long-term normal value or cost premise.

- Government influence on valuation procedure FHA, lending institutions, regulatory agencies.

- Multiple value concepts possible for a given property based on different agency objectives or decision needs (purpose).

- Incorporation of policy into value definitions, multiple value concepts, linked to purpose of analysis and decision objectives.

- Concept that P $\neq$ V, with price being a historical fact and value being recognized as a concept to be established to assist decisions.

- Increased importance and dominance on income analysis as the premise of real estate value; strengthen emphasis of difference in market value (as defined measure of exchange value) from investment value (an intrinsic value based on fundamentals).

Lasting/dominating perspectives from 1940-1969

- Growth in appraisal dichotomy of traditional and alternative approaches.

Key economic characteristics/events	Corresponding central valuation issues
One recession	Maturity of state licensing of appraisers
Rubinomics – third way economics: tax increase and reduction of deficit	Reduction in value debates and alternative structures
Enhanced global capital impacts: foreign recessions and banking crisis, Scandinavian real estate and banking crisis	Increased dependence on DCF analysis; Implementation of "as is" value construct; comparison of stabilized value concept based on direct/yield capitalization to "as is" value via DCF. See Wincott *et al.* (1996)
Creation and activation of Euro currency and zone (1992)	
Mexican banking crisis (tequila crisis) 1994-1995, Asian financial crisis (1997-1998)	Link of mortgage equity yield analysis and DCF, using J and K factors. Link back to Fisher (1906, 1977, 1979) and Cannaday and Colwell (1981)
FIRREA impacts, creation of CMBS	Increased use of security returns and REIT returns to local property performance
Development of derivative securities and options	
Diversity in deficit status (deficit to surplus to deficit)	Enhanced association of capital market performance to local property performance
Termination of 30 year Treasuries; instigation of 50 year bonds in Asia/Europe	Increased consideration of valuation to cyclical phases; return to economics of the property and reduction in significance of tax shelter as driving decisions
1993 Ombudsman Tax Act; major institutional shift in REIT structures, change in REIT instruments from mutual fund structure to speciality vehicles	
	Consideration of real estate as an alternative asset class or industry sector
The New Economy and Technology Boom/Bust: dot.com crisis	Increased focus on automated valuation models (AVM)
Malfeasance in securities market	Increased focus on behavioural procedures of valuation and links to information access

Table VII.
Economic regimes and valuation issues 1990-1999

Key economic characteristics/events	Corresponding central valuation issues
Two recessions, 2001-2002, Second great financial crisis: 2007-2009 – "The Great Recession"	Mark-to-market emphasis
Bush Neo-Keynesian – tax cut fiscal policy without matching spending cuts or job creation efforts – Compassionate Conservatives	International or European FASB standards vs American GAAP and FASB procedure
	AVM techniques
9/11 event and terrorist impacts on economy	Valuation for financial reporting;
Wars in Middle East	"as is" valuation and stabilized valuation approaches. Focus on timing and trends for equation
Derivative market	
Malfeasance in securities market	Reversion to 1950 HBU concerns (Lennehoff (2003))
Malfeasance in government	
Production advances moderate to high	Quantitative focus on price analysis – option of single value or multiple value concept
Funds flowed to business and government, with nominal economic growth (not real as perceived)?	Increase discussion with local market derived returns in comparison to indices and aggregated performance measures
Corporate Bankruptcy and Golden parachutes, not corresponding with economic performance or profit notions	Increased emphasis on business and enterprise valuation relative to real estate use (link back to Babcock and Bonbright in the 1930s)
Accelerated outsourcing	
Cost control accounting profit (labor and cost cuts)	Conflicts in perspectives of property as a commodity, factor of production, resource or asset class. Return to theory of distribution and distributive returns

Table VIII.
Economic regimes and valuation issues 2000-2009

- Increased support by professions on Marshallian 3 approaches, but premised on theory of equivalence – assumes prefect competition and equilibrium.
- Increased emphasis on investment value as consistent with changing financial and tax structures as influencing behavioural/decision processes.
- Increased debate between price and value and the nature of value (normal, long term, short-term, *ex post*, *ex ante*).
- Increased use of policy in definitions of value, inserting ethical component into market value (see Ratcliff (1965, 1972a,b)).

Lasting/dominating perspectives from 1970-1979

- Major impacts of inflation and financial uncertainty on assets increased the emphasis placed on property financial structure and after tax implications.
- Tax shelter analysis and accelerated depreciation considerations on buyer calculus impacts property valuation.
- Continuing debates in theory of equivalence or valuation hierarchy of approaches with debate centred on: MP = MV vs MP ≠ MV and (Vp ≠ Ve).
- Increased debates between HBU and MPU/MFU.
- Statistical concepts of value link to asset pricing theory.

Lasting/dominating perspectives from 1980-1989

- Issues of property as inflation hedge and perverse inflation impacts.
- Conflicts in economics of property and after tax analysis.
- Increased concern with alternative financing options, syndication and securitization, gearing and value conclusions.
- Deregulated financial markets and the concern with alternative financing courses and financial structure impact on value.
- Focus on market structure and impact of financial structure on market pricing.
- Development of new information sources and improvements in data series.
- Increasing impact of technology on valuation and analysis.
- Increased impacts of institutions on valuation procedure (Graaskamp (1986)).

Lasting/dominating perspectives from 1990-1999

- Decline in traditional and alternative appraisal theory and technique application debates, concerns or interest.
- Increased focus on financial institutions and markets with real estate performance.
- Increased association of performance with asset indices and capital markets.
- Increased focus on investment analysis.
- Continuing or enhanced consideration of Vp as inferred probable price and investment value.
- Maikels, price behaviour in securities market and firm fundamental analysis.
- Risk pricing, valuation and management.

Lasting/dominating perspectives from 2000-2009

- Increased focus on financial structure and valuation for financial reporting, issues of mark to market.

- Increased integration of financial accounting and valuation.

- Distributive theory and alternative perspectives of property.

- Increased focus on technology and availability, access and impacts of data and relevant information.

- Recycling of value discussions, sales comparison procedures and income linked to market derived performance and aggregated indices.

- Failure to incorporate prior knowledge on dealing with recession and down markets.

- Differentiation between financial crisis and traditional economic recession.

IIIc Value/valuation and economic regime contingency tables
The spline analysis and its implication to appraisal analysis are presented in contingency tables (Tables IX-XV). The literature research is used to form the frequency data that allows empirical testing in the χ^2 contingency tables as presented

Concept/ technique	$p =$ value	$p \neq$ value	Recession issue	Total	Measure $p = 0.0000$
Value concept					Observations
	10	12	11	33	Good-fit χ^2
	0.233819	1.360032	0.680421	2.274272	χ^2
	15.507740	8.707002	8.883644	33.09838	Independence
	0.0160662	0.093451	0.046753	0.1562708	Probability
Sales price					Observations
	15	7	5	27	Good-fit χ^2
	4.796926	0.292071	1.495955	6.584951	χ^2
	44.90127	25.21035	25.7218	95.83342	Independence
	0.329608628	0.020068935	0.102791	0.4524683	Probability
Income					Observations
	7	11	10	28	Good-fit χ^2
	0.292071	0.680421	0.233819	1.206311	χ^2
	8.225555	4.618335	4.712029	17.55592	Independence
	0.02006893	0.04675339	0.016066	0.08288859	Probability
Cost					Observations
	5	5	5	15	Good-fit χ^2
	1.495955	1.495955	1.495955	4.487864	χ^2
	30.60171	17.18169	17.53027	65.31367	Independence
	0.102791	0.102791	0.102791	0.3083728	Probability
Total					Observations
	37	35	31	103	Good-fit χ^2
	6.81877	3.828479	3.906149	14.5534	χ^2
	99.23628	55.71738	56.84774	211.8014	Independence
	0.4685345	0.2630642	0.268401	1	Probability

Table IX.
Valuation literature
issues 1900-1932

Concept/technique	p = value	$p \neq$ value	Recession issue	Total	Measure $p \neq 0.0000$
Value concept					Observations
	10	11	11	32	Good-fit χ^2
	0.075758	0.366667	0.366667	0.809091	χ^2
	0693112	1.833939	1.186667	5.089917	Independence
	0.0120423	0.0582851	0.058285	0.1286127	Probability
Sales price					Observations
	10	5	11	26	Good-fit χ^2
	0.075758	1.893939	0.366667	2.336364	χ^2
	5.975427	5.295758	3.426667	14.69785	Independence
	0.0120423	0.3010597	0.058285	0.3713872	Probability
Income					Observations
	7	9	11	27	Good-fit χ^2
	0.512121	0.00303	0.366667	0.881818	χ^2
	2.255317	1.998788	1.293333	5.547438	Independence
	0.0814065	0.0004816	0.058285	0.14017341	Probability
Cost					Observations
	5	9	11	25	Good-fit χ^2
	1.893939	0.00303	0.366667	2.263636	χ^2
	5.789421	5.130909	3.320000	14.24033	Independence
	0.30105973	0.000481696	0.058285	0.35982659	Probability
Total					Observations
	32	34	44	110	Good-fit χ^2
	2.557576	2.266667	1.466667	6.290909	χ^2
	16.08948	14.25939	9.226667	39.57554	Independence
	0.40655106	0.360308285	0.360308285	1	Probability

Table X.
1932-1938 period

in Tables IX-XV. The relationships of the choice and issues considered in the economical delineated time periods are empirically analysed using chi square (χ^2) tests for goodness of fit and independence. The key tests are the treatment of the relationships between price and value as equivalent conceptual and measurement concept; where P = V or P $\neq$ V. These base precepts are then associated with the occurrence or timing of recessions within a given time period/economic phase. This allows for insights into the nature and practice of the conceptual premises previous proposed in the articles researched and their treatment as suggested in down markets. This information is then used to differentiate if valuation treatment differs statistically between recessed and more stable general economies.

The general value theory premises (P = V or P $\neq$ V) are then also tested for goodness of fit and independence with and between the three valuation techniques traditionally considered in appraisal practice. This is reflected in the contingency tables of Tables IX-XV. The χ^2 goodness-of-fit and independence tests show if the distribution of price-value relationships used in the reports fit a theoretical or expected distribution used in the literature of a specified period given endogenous economic structure operating in that period (recession and/or growth periods). The relationship between the value concepts and valuation techniques: sales comparison, income and cost are then compared in general and with associations to recessionary phases. The

Concept/technique	p = value	$p \neq$ value	Recession issue	Total	Measure $p \neq 0.0000$
Value concept					Observations
	14	18	5	37	Good-fit χ^2
	1.852564	6.980769	2.314103	11.14744	χ^2
	50.59221	164.3532	103.1852	318.1307	Independence
	0.0649146	0.2446091	0.081087	0.3906109	Probability
Sales price					Observations
	14	18	5	37	Good-fit χ^2
	1.852564	6.980769	2.314103	11.14744	χ^2
	50.59221	164.3532	103.1852	318.1307	Independence
	0.0649146	0.2446091	0.081087	0.3906109	Probability
Income					Observations
	9	10	5	24	Good-fit χ^2
	0.057692	0.00641	2.314103	2.378205	χ^2
	10.79339	35.06328	22.01364	67.87032	Independence
	0.0020215	0.0002246	0.081087	0.0833333	Probability
Cost					Observations
	7	7	5	19	Good-fit χ^2
	0.775641	0.775641	2.314103	3.865385	χ^2
	17.54290	56.98964	35.77959	110.3121	Independence
	0.0271787	0.0271787	0.081087	0.1354447	Probability
Total					Observations
	44	53	20	117	Good-fit χ^2
	4.538462	14.74359	9.25641	28.53846	χ^2
	129.5207	420.7594	264.1637	814.4438	Independence
	0.15902965	0.516621743	0.324349	1	Probability

Table XI.
Valuation literature
issues 1945-1969

contextual format expressed in Tables II-XIII is the foundation used to construct the contingence tables presented in Tables IX-XV. Tables IX-XV are set up for each of the economic time periods. The contingency tables set up to cover the association, goodness-of-fit and independency between the basic valuation premises (see Grissom, 1985, 1986a,b,c,d,e) of P = V or P $\neq$ V and the occurrences of recessions within that time frame are then tested in relation to use or appearance of the three traditional approaches (sales comparison, income and cost).

The counts or frequencies in the tables are derived from a systematic review of the literature identifying the issues and variables operating in each article. The accounting of the variable or issue identified is based on the observation of a direct or inferred mention or expression of a specific value premise. These inferred or stated value premises are then matched with the article's association with a recession or the articles direct inclusion of a discussion of down or limited market issues. Whether the value premise is a direct statement or inference, it is then associated with the use or discussion of each and every valuation approach in the article and reflects the ranking or emphasis placed on each approach's application in general and in specific recessionary periods.

Concept/ technique	$p =$ value	$p \neq$ value	Recession issue	Total	Measure
Value concept					Observations
	14	20	4	38	Good-fit χ^2
	0.925641	7.75641	4.310256	12.99231	χ^2
	45.70627	303.1538	224.0007	572.8608	Independence
	0.0209932	0.1759130	0.097755	0.2946615	Probability
Sales price					Observations
	14	20	4	38	Good-fit χ^2
	0.925641	7.75641	4.310256	12.99231	χ^2
	45.70627	303.1538	224.0007	572.8608	Independence
	0.0209932	0.1759130	0.097755	0.2946615	Probability
Income					Observations
	9	20	4	33	Good-fit χ^2
	0.310256	7.75641	4.310256	12.37692	χ^2
	43.54138	288.7949	213.3908	545.7271	Independence
	0.00703652	0.175913003	0.097755	0.280704815	Probability
Cost					Observations
	7	10	4	21	Good-fit χ^2
	1.35641	0.064103	4.310256	5.730769	χ^2
	20.16055	133.7179	98.80434	252.6828	Independence
	0.0307629	0.0014538	0.097755	0.1299720	Probability
Total					Observations
	44	70	16	130	Good-fit χ^2
	3.517949	23.33333	17.24103	44.09231	χ^2
	155.1145	1028.821	760.1966	1944.132	Independence
	0.0797859	0.5291928	0.391021	1	Probability

Table XII.
Valuation literature
issues 1970-1979

The number of articles designated as addressing a specific issue is listed in the first line of the cell. This is then followed in the second row of each cell by the chi square measure for the goodness-of-fit test. The chi-square (χ^2) equation per cell is of the form:

$$\chi^{2_i} = (Oi - Ei)^2/Ei$$

this measure is then summed to develop the χ^2 for each row and column to construct the χ^2 test-statistic.

Where:

Oi =   the actual observation (issue or topic) placed in each cell.

Ei =   the expected observation based on a theoretical measure resulting from the number of observation (N) in relation to the number of cells or sections (n) in which the observations are allocated. The n sections in relation to the rows and column (r-1)* (c-1) sets the degrees of freedom. This combination of variables set the measure of the χ^2 test-statistic, which in turn test the fit of the actual distribution to a theoretical distribution (much like a fair share construct) given the aggregation of the

Concept/ technique	$P =$ value	$P \neq$ value	Recession issue	Total	Measure
Value concept					Observations
	14	23	7	44	Good-fit χ^2
	0.504197	11.2524	1.813549	13.57014	χ^2
	46.11246	294.6706	98.44049	439.2236	Independence
	0.0155775	0.3476513	0.056031	0.4192598	Probability
Sales price					Observations
	14	20	4	38	Good-fit χ^2
	0.504197	2.532974	1.813549	4.850719	χ^2
	16.48314	105.3316	35.18807	157.0028	Independence
	0.0155775	0.0782581	0.056031	0.1498666	Probability
Income					Observations
	9	20	7	36	Good-fit χ^2
	0.576139	6.115707	1.813549	8.505396	χ^2
	28.90203	184.6915	61.69981	275.2933	Independence
	0.0178002	0.1889493	0.056031	0.2627806	Probability
Cost					Observations
	7	7	7	21	Good-fit χ^2
	1.813549	1.813549	1.813549	5.440647	χ^2
	18.48776	118.1416	39.46753	176.0969	Independence
	0.0560309	0.0560309	0.056031	0.168092	Probability
Total					Observations
	44	67	28	139	Good-fit χ^2
	3.398082	21.71463	7.254197	32.36691	χ^2
	109.9854	702.8353	234.7959	1047.617	Independence
	0.1049862	0.6708898	0.224124	1	Probability

Table XIII.
Valuation literature
issues 1980-89

observations. The columns consider value premises relations and market conditions; the rows present value concepts and valuation approaches and techniques.

χ^2 test-statistic $= \Sigma[Oi-Ei]^2/Ei$. This statistic calculated for each column and row is tallied in the total column and row for the contingency table. This is used to calculate and overall fitness test with a combined summing of the row and column totals.

The third row of figures in each cell offers a measure of independence between the variables being associated. In this case, an "observation" consists of the values of two outcomes and the null hypothesis is that the occurrence of these outcomes is statistically independent. Each observation is allocated to one cell of a two-dimensional array of cells (called a table) according to the values of the two outcomes. If there are r rows and c columns in the table, the "theoretical frequency" for a cell, given the hypothesis of independence, is

$$E_{i,j} = \frac{\sum_{k=1}^{c} O_{i,k} \sum_{k=1}^{r} O_{k,j}}{N},$$

Concept/technique	$p =$ value	$p \neq$ value	Recession issue	Total	Measure
Value concept					Observations
	14	21	9	44	Good-fit χ^2
	3.282051	17.55128	0.012821	20.84615	χ^2
	210.3323	373.8945	9.086785	593.3136	Independence
	0.115315	0.616666	0.000450	0.732432	Probability
Sales price					Observations
	5	7	7	19	Good-fit χ^2
	1.551282	0.320513	0.320513	2.192308	χ^2
	22.11982	39.32101	0.955621	62.39645	Independence
	0.054504	0.011261	0.011261	0.077027	Probability
Income					Observations
	5	9	8	22	Good-fit χ^2
	1.551282	0.012821	0.051282	1.615385	χ^2
	16.29882	28.97337	0.704142	45.97633	Independence
	0.0545045	0.000450	0.001802	0.056756	Probability
Cost					Observations
	3	8	8	19	Good-fit χ^2
	3.705128	0.051282	0.051282	3.807692	χ^2
	38.41864	68.29438	1.659763	108.3728	Independence
	0.130180	0.001801	0.001802	0.133783	Probability
Total					Observations
	27	45	32	104	Good-fit χ^2
	10.08974	17.9359	0.435897	28.46154	χ^2
	287.1696	510.4832	12.40631	810.0592	Independence
	0.354504	0.630180	0.015315	1	Probability

Table XIV.
Valuation literature
issues 1990-1999

and fitting the model for a measure of "independence" reduces the number of degrees of freedom by $p = r + c - 1$. The value of the test-statistic is

$$X^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{i,j} - E_{i,j})^2}{E_{i,j}}.$$

The number of degrees of freedom is equal to the number of cells rc, minus the reduction in degrees of freedom, p, which reduces $(r - 1)(c - 1)$. For the test of independence, a chi-square probability of less than or equal to 0.05 (or the chi-square statistic being at or larger than the 0.05 critical point) is commonly interpreted by applied workers as justification for rejecting the null hypothesis that the row variable is unrelated (that is, only randomly related) to the column variable. The alternative hypothesis corresponds to the variables having an association or relationship where the structure of this relationship is not specified.

Interestingly, the test of independence is upheld in each test situation, suggesting that the choice of valuation choices is not contingent on the choice of value premise or other valuation techniques employed. This would infer a weakness in appraisal theory overall of linking the basis of worth to its appropriate method of measurement. From a

Concept/technique	$p =$ value	$p \neq$ value	Recession Issue	Total	Measure
Value concept					Observations
	8	9	6	23	Good-fit χ^2
	0.142857	0.571429	0.142857	0.857143	χ^2
	5.265306	1.591837	0.489796	7.346939	Independence
	0.016667	0.066667	0.016667	0.100000	Probability
Sales price					Observations
	12	8	6	26	Good-fit χ^2
	3.571429	0.142857	0.142857	3.857143	χ^2
	23.69388	7.163265	2.204082	33.06122	Independence
	0.416667	0.016667	0.016667	0.450000	Probability
Income					Observations
	6	9	6	21	Good-fit χ^2
	0.142857	0.571429	0.142857	0.857143	χ^2
	5.265306	1.591837	0.489796	7.346939	Independence
	0.016667	0.066667	0.016667	0.100000	Probability
Cost					Observations
	3	5	6	14	Good-fit χ^2
	2.285714	0.571429	0.142857	3.000000	χ^2
	18.42857	5.571429	1.714286	25.71429	Independence
	0.266667	0.066667	0.016667	0.350000	Probability
Total					Observations
	29	31	24	84	Good-fit χ^2
	6.142857	1.857143	0.571429	8.571429	χ^2
	52.65306	15.91837	4.897959	73.46939	Independence
	0.716667	0.216667	0.066667	1	Probability

Table XV.
Valuation literature
issues 2000-2009

valuation perspective this suggests a rejection of the theory of equivalence in practice if not in concept in that it infers a rejection of an equation of the three approaches. By extension this includes a rejection of the underlying assumption of market value based on equilibrium conditions operating in perfectly competitive markets. This seems to operate within each distinct market regime and across the entire period studied. This would argue against a consistent appraisal bias in the choice of value premise and valuation method chosen. It may infer in practice a preference by appraisal practitioners and academics for a hierarchy of valuation approaches relative to the situation being considered. The supported null hypothesis in all investigated situation in effects states that the occurrences observed are no more associated or independent that would occur in a truly random pattern. The degrees of freedom for all contingency test at 6 per cent based on the states of occurrence (cells) being considered. This would infer that though individual appraisal bias may exist, a general aggregated valuation bias is not in effect and thus smoothing may not occur since individual bias may randomly offset one another.

The goodness of fit test offers an additional insight to appraisal theory over time, especially as relates to the difference in normal and recessionary markets. The goodness of fit between value premises and techniques where one emphasizes a $P = V$ premise and a preference for sales comparison is compared to a preference for

fundamental analysis based on income analysis produces a cumulative $\chi^2 = 14.55$ at 6 degrees of freedom. See Table IX, column five, cell five in row six. This χ^2 measure infers for the period from 1900-1932 that the random or independence observed or argued in the literature between the sales comparison approach and the income approach are different. This supported the debate dominant in this period and carried over to the present that a difference exists between investment and market value. This is supported by the low goodness of fit measure for the income approach of 1.206311 and fits the theoretical or expected distribution of low p-values, (limited probability of a rejecting the appropriate technique or premise when applied) across the variables. The statistical findings of the fit of valuation techniques are consistent with the preference during this period of equating price with value. The use of the cost approach shows it as a significant approach, but has a high probability of rejection even if correct. This fits the focus on engineering valuation during this period versus the laissez faire emphasis on price as the base measure of value. See Wendt (1974).

The 1932-1938 period shows a $\chi^2 = 6.29$ at 6 degrees of freedom. This infers a p-value of 40 per cent, suggesting that the fit of the methods and theory observed in the depression period with a theoretical or expected distribution is insignificant. This is reasonable given that despite the contribution of the works of Babcock and others during this period, the techniques and methods may not have fit the context of the problem situations experienced. This might relate to the impact of perfect economic assumptions, government and policy decision in the definition of market that do not fit the context or situation of the market structure that is being experienced or observed as highlighted by DeLisle (2000), Wendt (1974), Ratcliff (1965, 1972a,b) and Grissom (1985). This inconsistency in decision issues and measurement is important given that the empirical measures shows a high correlation between property performance and economic growth as shown in Table I, but appears more relevant given the lagged calculations observed by the tracking error illustrated in Figure 5 and Figure 2. The lagged effect developed by the tracking error, supports the low measure of association suggested between value premises and valuation techniques and their relationships as suggested by the χ^2 measure for the period of the Great Depression and after.

The period from the end of the Second World War from 1945 through 1969 shows a major increase in the χ^2 goodness of fit to 28.53 at 6 degrees of freedom. This period linked to many economic structural and cyclical changes has been identified as a major period of challenge and change to the traditional appraisal process. See Miller and Markosyan (2002). These challenges and changes are mainly based on the difference in the emphasis placed on the theory of equivalence and debates related to the validity of the income and cost approaches to measures of market value and/or price. The challenges and debates initiated during this period continued and remain persistent in the debates continuing into the 1970 into the early 1990s.

These persistent challenges and the alternative appraisal procedure initiated by Ellwood (1956, 1959), Wendt (1956, 1974), Kinnard (1966) and Ratcliff (1961, 1965, 1972,a,b) were continued into the 1970s, 1980s and 1990s. As illustrated in Table XII, an increasing significance in the goodness of fit test is shown by an increase in χ^2 to 44.09 over the 1970-1979 period. The focus on the link between value theory and valuation techniques and the fit of the techniques to the problem situations shows definite improvement into valuation procedure relative to the economic situations experienced. The debates and resulting improvements in practice initiated in the

decade of the 1970s appropriately fits the economic situations experienced. This is reflected by the spline analysis illustrated in Figure 2, the correlation analysis presented in Table I and the tracking error findings shown in Figure 5.

The χ^2 of 32.36 for the period 1980 to 1990 is very statistically significant, but shows a decline from the active appraisal literature from the 1970s. A further decline, though still producing a significant statistic in terms of goodness of fit is observed for the period extending from 1990 into 2000. The χ^2 for 1990-1999 is 28.46. This is just slightly less than the χ^2 of 28.54 observed for the period covering the years from 1945-1969. Interestingly, the literature for this period, except for the period in the early part of the decade concerned with the 1990-1993 recession and the initial growth phase is similar to the property specific issues that where the concerns of practitioners in the earlier period. The period from 2000 to 2010, shows a major decline in the goodness of fit test with a χ^2 of 8.57. Though the bulk of this period shows a continuous decline that began in the 1980s, a major increase in the weakness of valuation procedure to economic situation is statistically observed. This is similar to and slightly better than the level observed in the 1932-1938 Great Depression period showing a *p*-value of 20 per cent. This suggests the possibility of rejecting an appropriate value premise and fitting valuation techniques in the current down market periods. A distinct decline in the articles addressing conceptual issues of value, valuation and analysis of economic and market structure to property valuation is noted in the literature of the current period. This is specifically noticed in relation to down markets and recession related valuation issues. Only two articles focusing on these issues are identified.

The decline from the 1980s to present in the statistical significance of value theory and technique reflected by the χ^2 is consistent with the economic analysis previously conducted. It also is consistent with observations of valuation procedure developed in the literature and associations established by the spline analysis integrating value theory and valuation techniques with economic data. Though the current literature is lacking, the comparative technique comparing "as is" cash flow based analysis with a stabilized valuation based on a normalized, active market and the time frame required to equate the two situations which was developed in the 1990s (see Wincott *et al.* (1996) as an example) was identified in limited current work; see Parli and Fisher (2010) and Fanning *et al.* (2010). This approach offers a direct application of value theory, valuation theory and technique that fits the current economic constructs and situations observed in the long-term cyclical analysis, presented in this paper.

IV. Conclusions

In effect appraisal theory and practice shows a historic cyclical progression associated with but not syncopated with the general economic patterns and regimes observed over time. Conceptual improvement and growth in the development of technique is observed in the literature from its recorded beginnings, peaking with the challenges initiated in the latter 1950 through the 1970s. These themes of discussion were noticeably continued into the 1980s. Decline in the general advancement of philosophy, technique and assistance to decision making is observed beginning in the latter 1980s and continuing into the present period, with major concerns in evidence for the state of theoretical development and practice. Little concern with value and valuation theory and technique is observed in the current period, especially as relates to the treatment and consideration of asset valuation in the current down market.

The major contribution in evidence since the mid 1990s to the current period in relation to down markets is the comparison of "as is" value via DCF analysis with a stabilized value estimate based on long-term normal value. The focus of this comparison is the estimation of the time needed and the assumptions employed to achieve equilibrium between the two measures. This equilibrium equation and time framing is the premise of a forecasting process that fits the needs of decision-makers in the current economic situation and the construct endogenous in valuation procedure as developed by Marshall.

The current decline in the goodness of fit between the consideration of observed appraisal theory and procedure compared to a chi-square theoretical construct which is based upon the situational context of the market per period can be tied to understanding basic economic analysis and an awareness of past developments and relationships. The direct link of valuation practice to cycle analysis can be accounted for in the shifts in distributive associations and factor priority observed and analysed in valuation technique and the measured and observed changes in economies and factor relationships operating over time. As the relationships between distributive factors of productions shift in their compensation and specification of these compensations as a basis of value (why something has worth) requires that techniques of measurement employed have to change to fit the context of the situation experienced. Understanding why changes occur in economic relationships, resource availability and the processes or organizations employed in enterprise undertakings will change with referenced cycles. These changes on measuring relationships in turn define the structure and form of the mix of factors determining value. These casual associations determining value or worth of a thing in return direct the choice of measurement/valuation that fits the situation to address.

Hence the conceptual and practical link between cycles and valuation is the information and notions characteristic of the theory of distribution. This suggests the increase use of development valuation residual techniques, the profit method integrated with investment analysis/valuation and enterprise valuation as they support the modification of the valuation approaches as the basis of feasibility models. For details on these approaches see the behavioural work of DeLisle (1985, 2000) and the technical procedures offered by Grissom (1986,a,b,c,d,e), Graaskamp (1971, 1979) and Grissom and Diaz (1991). The application of these concepts to deal with valuation analysis in down markets can be achieved with the use of the "as is" to stabilized method of temporal equilibrium offered by Parli and Fisher (2010) and Wincott *et al.* (1996). The link offered by this technique is especially useful in linking the timing of cyclical impacts on property valuation. This requires the linking of valuation technique to value theory as needed to fit the context of distinct cyclical phases.

The cyclical association of property performance with changes in general economic growth (ΔGDP) supports the use of value and valuation in property analysis over time. This positive association is supported by the high measures of correlation observed during periods of economic growth and decline. This is reflected in the lagging measures and more recent coincidental associations of the magnitude of spreads noted with tracking error analysis between valuation regimes and cyclical economic performance. The statistical analysis of cycle relationships supports consideration of valuation and probable selling price inference in association with property and economic fundamentals in the decision process and analysis needed to address the

economic and pricing analytics of property assets. Given the cyclical nature of real estate performance as well as the general economy, price determination is not sufficient to support decision needs, especially in down property markets. The empirical associations and the insights afforded with the temporal patterns identified with the spline analysis support the use of value as well as price measures in the measurement of property performance in time. The notions illustrated in Figures 3 and 4 and empirical demonstrated in Figure 1, Table I, Figure 5 and Figure 2 supports the comparison of price and value measures based on fundamentals and periodic variances from pricing behaviours. The linkage of regime/splines to cyclical performance is supported by the tracking error measures and coincides with the chi-square analysis of valuation trend analysis noted in the development of the literature.

The differences in the base measures (fundamentals and behavioural expectations) and the extent of their differences in economic time, is essential in the analysis and valuation of assets in down and less active markets. As the 110-year cycle and literature analysis has shown, concern for valuation and decisions in down markets has occurred before and can be expected to occur again. The confusion that arises, especially given the findings of this study and the knowledge of solutions that have been developed over time, then one must inquire, why do cyclical shifts and the actions required in response, still elicit surprise from well placed decision makers, policy gurus and street-wise practitioners?

Notes

1. As such why is there even a need for risk management, proactive management, or planning for the future as integrated in value/valuation theory. More so, if the market is as conjectured and risk exposure is self adjusting, why is strategic process employed and why is it so excessively compensated? It seems by their own assumptions and delineation of the problem context, a major economic mispricing of the distributive factors is occurring, valuation techniques are being inappropriately applied and the environment is being set up to reward negligence if not intentional malpractice or even fraud. Do these concerns vary over time with the situations characterizing market phases?

2. Investigation of the economic, cycle and economic history literature identifies an effort during this period to establish orthodox economic theory as based on an oligopolistic or monopolistically competitive market. See Sweeney (1939), Robinson (1933) and Chamberlain (1940).

3. Interestingly, this unique economic regime based on the structure of the economy and the economic policies in effect were projected as permanent economic structural conditions possibly extending into perpetuity. This attitude is observed in an article by Moore (1974), which is typical of the era. Keynesians can be as misguided as free-market acolytes.

4. Series of articles addressing the integration and relationships between capital and space/property markets identifying causal cycle and economic impacts beginning in 1999 and published quarterly.

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Property Valuations
from a Bank's Perspective

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BOV
Bank of Valletta

Property held as Collateral

- Immovable Property as the most important source of collateral to the Bank;

- Immovable Property accounts for around 80% of total collateral held (BOV);

- Equitable mix between Commercial and Residential

Commercial 52%

Residential 48%
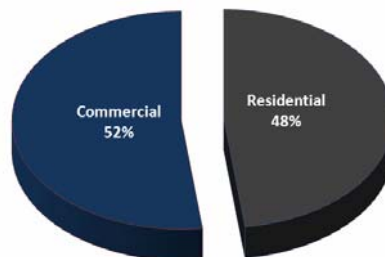
The Importance of Valuations

Valuations of property are important to determine the overall collateral coverage of the credit portfolio and are used as a measure to calculate the following <u>key metrics</u>:

- **Loan to Value Ratio** – This is an important measure to determine the leverage on a particular property and resultant buffers;
- **Provisions** – In line with BR09, exposures which are unsecured trigger more taxing provision requirements;
- **Capital Charge** – The RWA on secured facilities is lower than unsecured facilities, thus attracting a reduced capital charge and lower opportunity cost of capital;

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Price Fluctuations

Fluctuations in property prices in recent years accentuated the importance of having <u>up to date and realistic</u> valuations;

Source: Central Bank Website – www.centralbankmalta.org

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The concept of Haircuts and FSV

- <u>Forced Sale Value</u> is the value the property would fetch in a distressed scenario;

- <u>Haircuts</u> are margins applied on the property's market value to determine the Forced Sale Value in an overall porfolio;

- Through the application of the haircut the Bank seeks to protect its interests, ensuring that the collateral value is enough to cover the exposure at all times especially <u>in cases of repossession</u>;

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Property Valuation Received by the Bank

- The Bank recognises the <u>Perit</u> as the warranted professional which is licenced value property in Malta.

- In many instances the Bank relies on property valuations prepared by <u>customer's architects.</u>

- In certain instances however, BOV`s <u>Bank Architect</u> is requested to value or review particular property portfolios:

  – When the <u>value of the collateral</u> exceeds certain thresholds.

  – When the property is deemed to be <u>unique or "uncommon".</u>

  – When the report received (from customer's architect) <u>does not answer satisfactorily the bank's queries</u>.

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Valuation Forms

- Apart from the valuation certificate, BOV may also request that a property form is completed (by customer's architect).
- This is an <u>administrative tool</u> for the banker and <u>does not</u> waive the necessity for submitting a full Valuation Report.
- Although in minor cases the Perit might "get away with" not submitting a full report, this could be counteractive to his client and could extend loan approval procedures.
- The necessity of a full report is highlighted in the form itself.

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Property Valuations – End User Feedback

Heads managing Credit Units have been recently consulted to gauge the quality of valuation reports they receive from Customer's Periti. Common complaints are:

- Lack of <u>consistency</u> in reporting detail and format.
- A number of reports <u>lack comment on fundamental details</u> such as property size, title, condition and planning permits.
- Many reports get <u>too technical</u> without an eventual recommendation.
- Sudden <u>increases in value</u> when re-valuing properties over a short period of time without given any real explanation.
- In certain occasions <u>incorrect statements</u> have been noted in relation to state of property and certification of works.

Many times when such cases are reported the Bank Architect is asked to re-assess the property independently which comes at an additional expense and delay to the detriment of the customer.

Reports –Expectations & Recommendations

- Be <u>Clear</u> - The report needs to include necessary technical detail yet understandable to the lay person (i.e. the banker).
- Periti are encouraged to utilise a <u>structured and easily readable format</u> in their reports.
- Bank forms are there solely to collect the bare minimum general information required – <u>A full report is expected</u>, and this is to include all necessary detail relevant to the valuation process.
- Valuations for bank purposes should <u>exclude all elements of speculation</u>.
- Periti are <u>encouraged to state their assumptions, methodologies</u> <u>and calculations</u> (were applicable) … This can only validate further their conclusions.
- Certain <u>fundamental variables</u> (such as planning permits) need to be clearly bottomed out.
- The valuation report may be considered as <u>a record of the property's current status</u>. It is not solely there for the granting of a loan but may be referred back to in later years.

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Responsibility of the Perit towards the Bank

*"It is to be noted that since such valuations by Periti are often required in order to assist a Bank when granting a Loan using the property being valued as a security, **the onus of responsibility on the said Perit is a grave one and not to be taken lightly**.*

…The legal implications of a Bank Loan furnished on the basis of an incorrect or misleading valuation or one which is not based on a comprehensive inspection of the property need not be pointed out and such practices by a Warrant Holder can cast a very bad light upon the integrity of the profession."

KTP Directive Ref 07/14 Dated 16/09/08

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THANK YOU