Uniwersytet Ekonomiczny

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Analysing Real Estate Values & Prices
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Are valuations more accurate than this?

Importance of accurate commercial property values

- Property assets represent some 45% of fixed assets in UK corporate balance sheets
- 'Wealth effect' on corporate investment activity
  - link between commercial real estate values and borrowing
  - 10% fall in values ⇒reduction of £9.7 billion (€15.61 billion) in company expenditures over 8 quarters

Importance of accurate commercial property values

- Asset allocation decisions
  - need accurate picture of holdings
- Bank lending to UK property companies
  - risk exposure (8%-10%)
- Property performance indices
  - underlying belief is their accuracy
- Real estate performance measures/rankings

RICS Carsberg Committee Report (RICS) (2002)

Recommendation 1 (Valuation Accuracy)

"The RICS should enter discussions with the Investment Property Databank with a view to agreeing a means by which their data could be used to produce ongoing annual reports on the *correlations* between valuations and achieved prices as observed by IPD, and consider with the wider academic community how the data can be additionally analysed to provide better information on the currency of valuations."

RICS Carsberg Committee Report RICS (2002)

Recommendation 15 (Quantifying Uncertainty)

"The RICS should commission to establish an acceptable method by which uncertainty could be expressed in a manner which will be helpful and will not confuse users of the valuation. RICS should also seek to agree with appropriate representative bodies of those commissioning and using third party valuations the circumstances and format in which the valuer would convey uncertainty."

Appraisals

- Subjective and therefore subject to 'error'
  - what is magnitude of potential error?
  - what are the implications?
- Unease (mis-trust?) in wider transactions-based investment markets
  - comparison between valuation-based figures and transactions-based figure

Valuer at work?

Investigating appraisal accuracy

- Aims of the study
  - assess 'accuracy' of appraisal figures at various stages of the property cycle
  - to obtain a better understanding of appraisal 'accuracy' figures
  - to investigate possibility of appraisal 'bias'
  - ⇒ *systematic under/over estimation of prices*

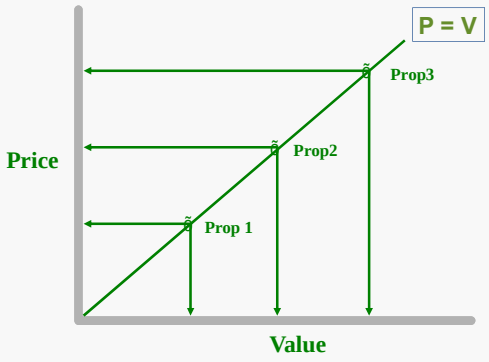
Data features of properties used in the Matysiak & Wang study

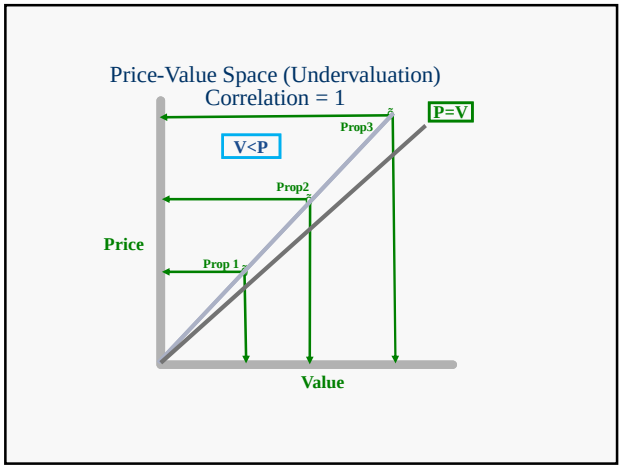
- 317 properties
  - retail, office, industrials and some mixed use provided by JLL
- Covers period 1971-1991
- Total value of ***open market*** transactions £452 million (€600 million)
- Most appraisals undertaken 3-6 months prior to date of sale

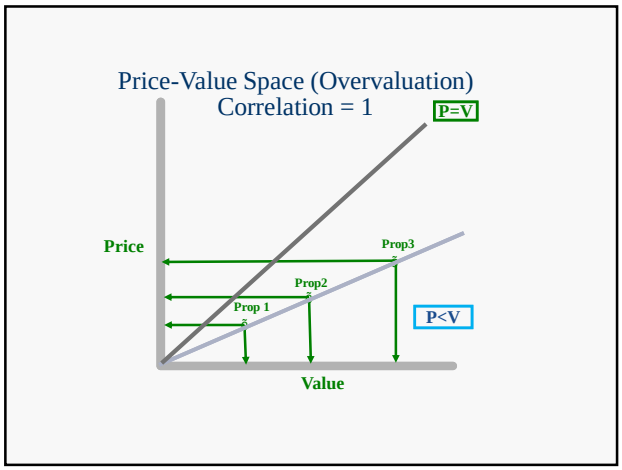
Valuation accuracy

- An important distinction needs to be made:
- Valuations versus valuations
  - are valuations undertaken by different appraisers *good* substitutes?
- Valuations versus market prices
  - are valuations a *good* estimate of price?

Price-Value Space




Price-Value Space (Undervaluation)
Correlation = 1
P=V
Prop3
V<P
Prop2
Price
Prop 1
Value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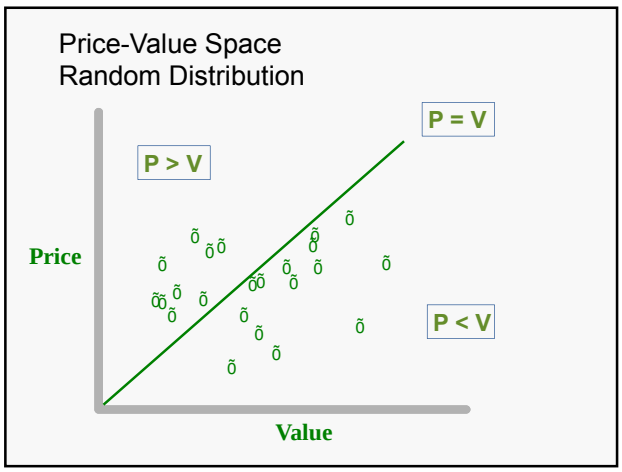

Price-Value Space
Random Distribution
P = V
P > V
Price
P < V
Value

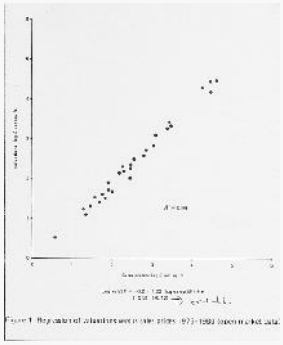
Regression equation formulation

- Interested in testing the proposition that appraisals are unbiased estimates of transactions prices
- V=E(P)
- Bivariate regression formulation augmented by inclusion of market environment variables

Previous studies methodology and tests

- Bivariate regressions (prices & values only)
- Tests of 'adequacy'
  - regression intercept = 0
  - regression slope coefficient = 1
  - regression diagnostics limited to
    - t-test
    - R-squared value

Brown's study



Issues

- Equation mis-specification
  - omitted variables
- Functional for
  - linear/log-linear/other
- Other regression diagnostics
  - normality/constant variance

Conjecture

- Appraisers are slow to respond to market information in arriving at values. That is, market conditions are not fully incorporated (captured) in situations of *relatively* rapid market movements

⇒ appraisers under/over react under certain market conditions

Identifying market environments

- Market profiles checked against trade press articles and newspaper articles and other literature
- Changes in capital values

  ⇒ greater than ± one standard deviation from period average capital value growth

Market features

Period	Market Environment
1974/75	Slump
1977/79	Boom
1987/89	Boom
1990/91	Slump

Bivariate regression coefficients

Regressor	Coefficient	Standard Error	t-Ratio
Constant	-0.1298	0.08984	-1.44 (0.15)
LnValue	1.0136	0.00703	144.14 (0.00)

R-bar squared = 0.985, standard error of eqn = 0.214 and p-values for zero coefficients reported in brackets.

Regression with all property environments included

Regressor	Coefficient	Standard Error	t_Ratio
Constant	0.03428	0.10089	0.34
LnValue	0.99926	0.00802	124.53
Slump74/75	-0.01126	0.00381	-2.96**
Bull77/79	0.00288	0.00297	0.97
Bull87/89	0.00908	0.00245	3.71**
Slump90/91	0.00029	0.00335	0.09

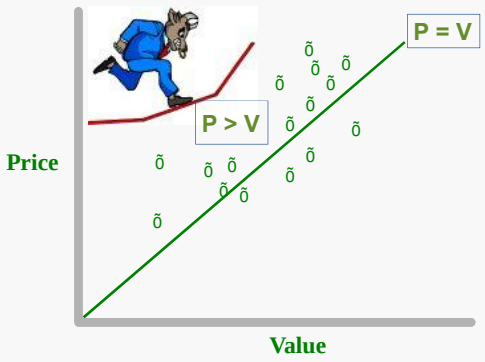
R-bar squared=0.986, standard error of eqn=0.206. For market environment variables, the absolute critical value of a one-tail test=1.645 at 5% level & 2.326 at 1% level; indicates significant at 1% level.**

Regression for significant property environments

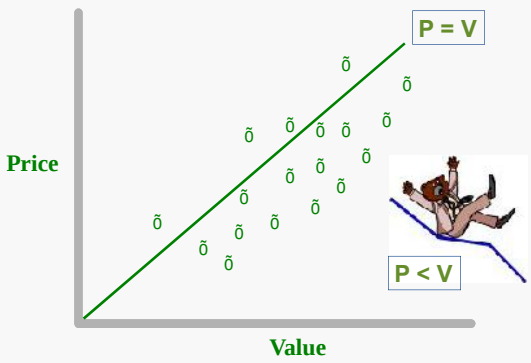
Regressor	Coefficient	Standard Error	t_Ratio
Constant	0.02831	0.09514	0.30
LnValue	0.99979	0.00750	133.25
Slump74/75	-0.01126	0.00373	-3.02**
Bull78	0.00780	0.00455	1.72*
Bull87/89	0.00898	0.00232	3.87**

R-bar squared=0.986, standard error of eqn=0.206. For market environment variables, the absolute critical value of a one-tail test=1.645 at 5% level & 2.326 at 1% level;* indicates significant at 5% level and ** indicates significant at 1% level.

Price-Value Space
Bull Market



Price-Value Space
Bear Market



Bootstrapped 95% coefficient confidence intervals

Regressor	OLS 95% CI	Bootstrap 95% CI
Constant	-0.1582 to 0.2148	-0.00924 to 0.06649
LnValue	0.9851 to 1.0145	0.99674 to 1.00275
Slump74/75	-∞ to -0.0051*	-0.01288 to -0.00839*
Bull78	0.00032** to +∞	0.00368** to 0.00933
Bull87/89	0.0052** to +∞	0.00748** to 0.00978

Note:* signifies upper one-sided limit and ** signifies lower one-sided limit.

Bootstrap prediction intervals for mean appraisal figure of £1,285,786

Prediction Interval	Lower limit	Upper limit
90 per cent	£991,185	£1,738,720
95 per cent	£599,724	£1,854,839

Probability of achieving selling price

Selling price	Probability
Within +/- 10% of the appraisal	30%
Within +/- 15% of the appraisal	55%
Within +/- 20% of the appraisal	70%

Conclusions

- Appears to be some evidence for appraisal bias, but not in every market environment
- Wide range of uncertainty regarding appraisal accuracy
- Investment performance rankings may be unreliable as:
  - biases may be present
  - errors in appraisals may not average out to zero

Conclusions

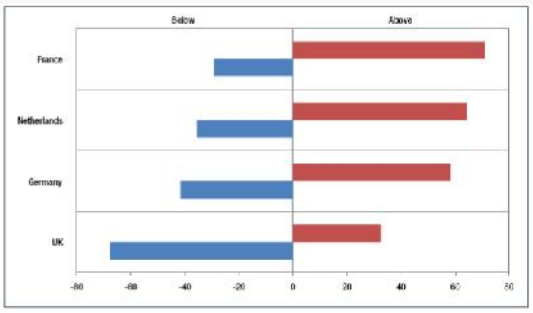
- May be systematic tendencies for appraisals to lag market transactions prices
- Bias and random variation in appraised values means that an assessment of property managers investment ability becomes difficult

Conclusions

- Are appraisal biases/errors likely to be the same in all situations?
  - location
  - type of property
  - size of transaction
  - up market *versus* down market (asymmetric effect)
- Are the results sample specific?

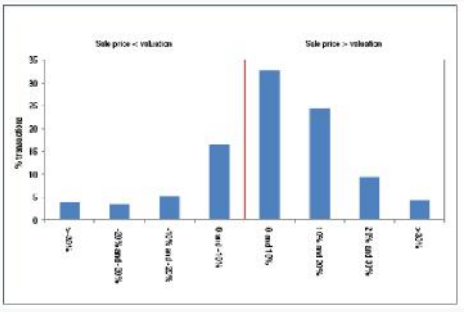
Appendix 1
Some international comparisons

Proportion of sales above/below 2008 valuation



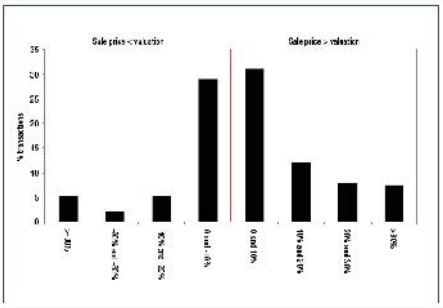
Source: RICS/IPD 2009

France: 2008



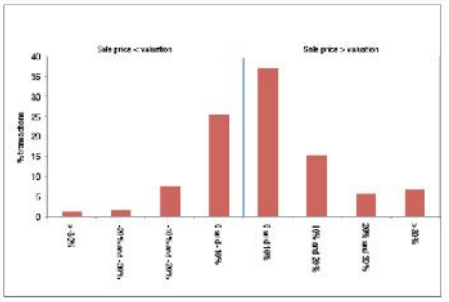
Source: RICS/IPD 2009

Germany: 2008



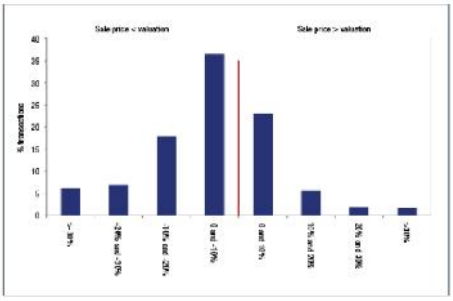
Source: RICS/IPD 2009

Netherlands: 2008



Source: RICS/IPD 2009

UK: 2008



Source: RICS/IPD 2009

Average absolute differences:2008

	France	Germany	Netherlands	UK
Retail	13.7%	10.2%	11.3%	12.7%
Office	11.6%	16.0%	10.0%	10.1%
Industrial	17.9%	-	12.3%	12.0%
Residential	16.7%	- %	12.9%	-
All Property	13.3%	14.2%	12.0%	11.8%

Note: UK retail are 'standard' retail, offices are 'City' offices and industrials are 'South East'
Source: RICS/IPD 2009

Appendix 2

Augmented equations formulation

'Environments' regression equation formulation

$$Ln\,Price_t = \alpha_0 + \beta_1 LnValue_t + \alpha_1 \phi_1 LnValue_t + \beta_2 \phi_2 LnValue_t + \alpha_2 \phi_3 LnValue_t + \beta_3 \phi_4 LnValue_t + \varepsilon_t$$

The α_i coefficients pick up the effect (evidence) of under/over estimation of values.

where,

ϕ_i = dummy variables taking the following values :

ϕ_1 = 1 in 1974/75, 0 otherwise (slump)

ϕ_2 = 1 in 1977/79, 0 otherwise (boom)

ϕ_3 = 1 in 1987/89, 0 otherwise (boom)

ϕ_4 = 1 in 1990/91, 0 otherwise (slump)

‘Environments’ regression equation formulation

In a bear market, values should be lower as market prices *overestimated*

In a bull market, values should be higher as market prices *underestimated*

Given the assertion of appraisal inertia, that is, in a bear market values are *overestimated* and in a bull market *underestimated*, the expectation is that $_2 > 0$, $_3 < 0$, $_4 < 0$ and $_5 > 0$. Under relatively static conditions $_0 \geq 0$ and $_1 \leq 1$.

$$[Ln\,Price_t = {}_0 + {}_1 LnValue_t + {}_2{}_1 LnValue_t + {}_3{}_2 LnValue_t + {}_4{}_3 LnValue_t + {}_5{}_4 LnValue_t + \varepsilon_t]$$

Recent publications:

MSCI Real Estate Index Analyses: Valuation and Sale Price Comparison Report, June 2015

RICS IPD Valuation and Sales Price Report 2012 (separate reports for UK and Europe)

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