Real Estate – How to include it in a mixed-asset portfolio

Charles Ward

Professor of Property Investment and Finance

Department of Real Estate and Planning, The School of Business, The University of Reading. Reading RG6 6AW

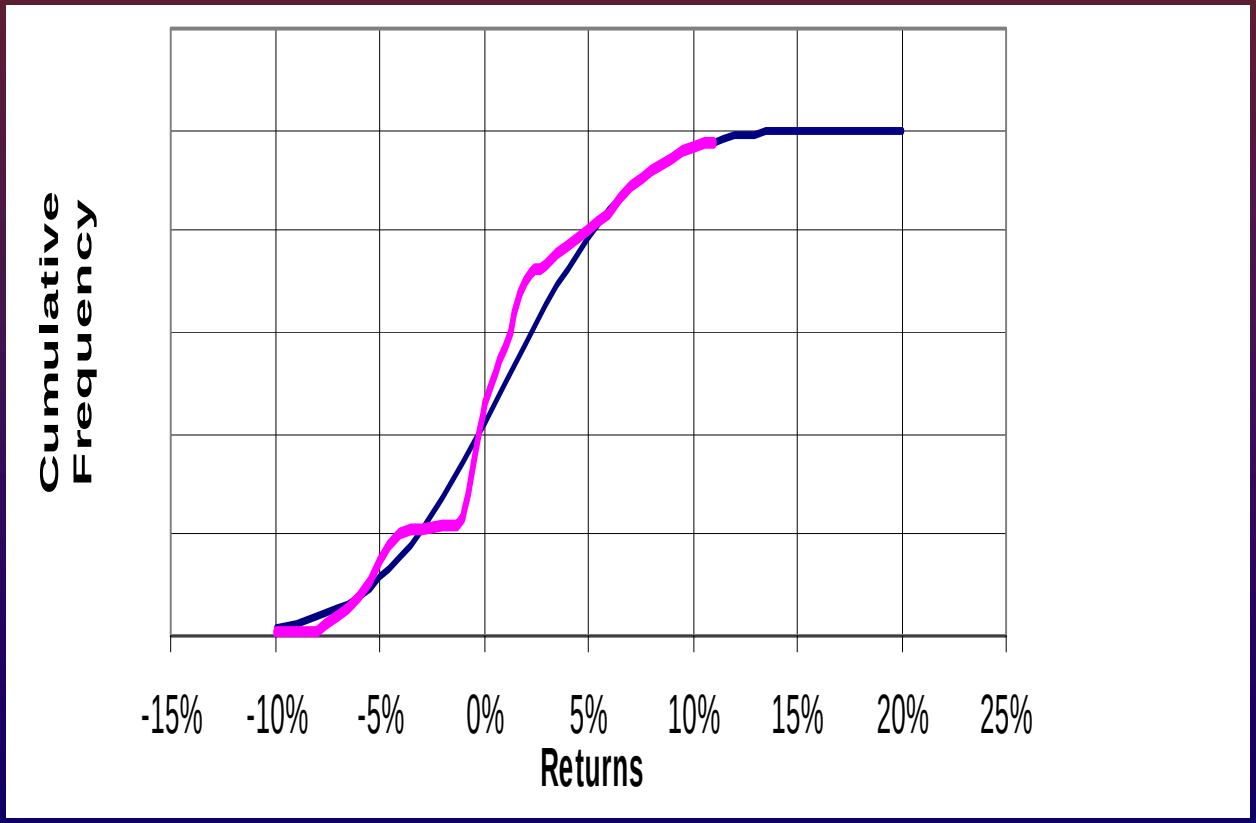
c.ward@rdg.ac.uk

1. **Real estate returns are different: solutions**
   - **Model the return process**
   - **Create new indices of returns**
   - **Make ad hoc adjustments to risk/return numbers**

2. **Developments in the real estate market**
   - **Instruments and derivatives**

3. **Futures of real estate market**

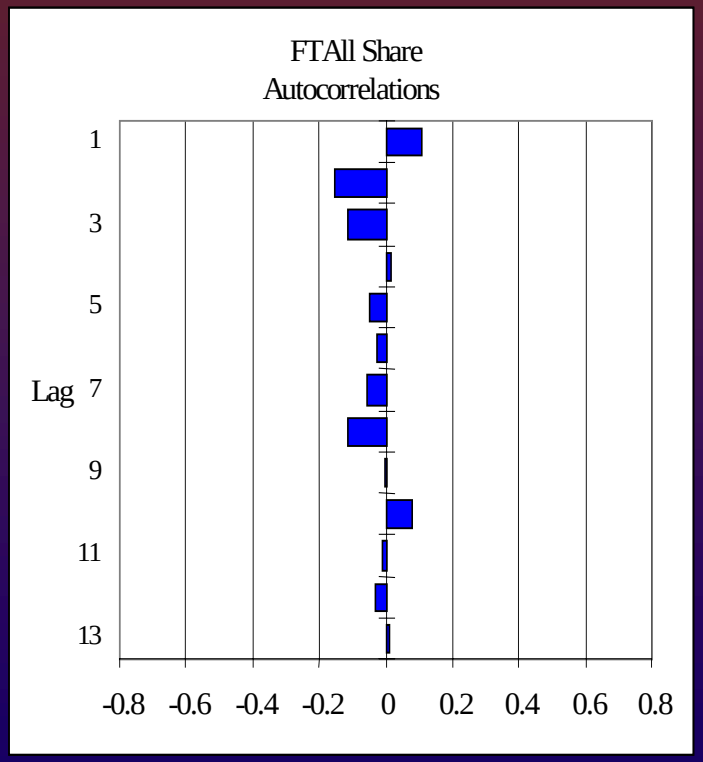
The problem: Example 1
Monthly returns from Property Unit Trusts

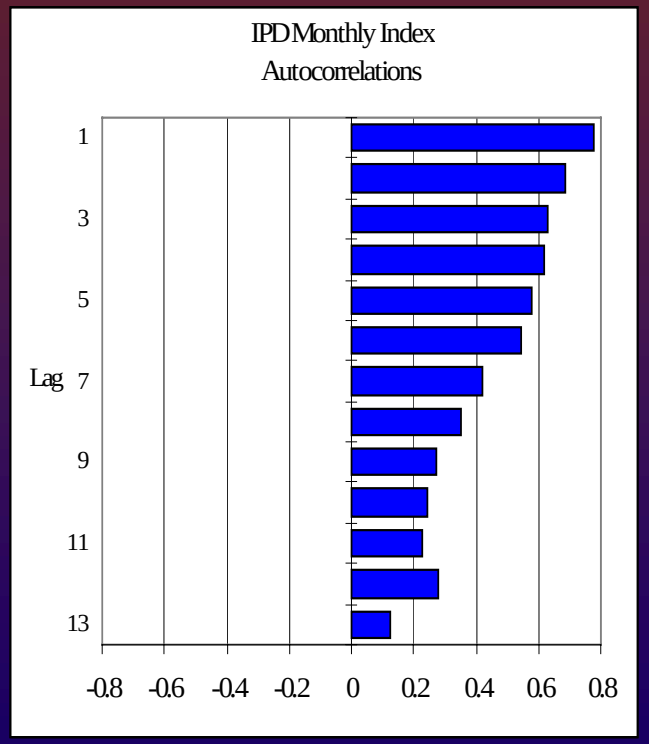


Results

- Returns depend on changes in successive valuations
- Non-normal
- Too many zero returns
- Too many small positive returns
- Too few larger positive returns
- Too few small negative returns

Example 2 – Auto correlation





Results

- Returns depend strongly on previous returns
- Symptomatic of persistence and momentum to a very high degree
- Estimates of risk (as measured by standard deviations) very low
- Estimates of correlations/covariances with other assets also very low (zero?)

So Property is great to have in your portfolio - right?

Not so fast Sunshine. Let's think about where are the returns coming from…

Assume a valuer behaves like a "smoother"

$$R_t = \alpha (R_{t-1}) + (1 - \alpha) Rtrue_t$$

So we can de-smooth by reversing the model

$$Rtrue_t = (R_t - \alpha (R_{t-1}))/(1- \alpha)$$

The Rtrue series will have the same average as the observed series but a higher standard deviation

Some estimates of smoothing factors

	α	Effect on S.Dev
Brown (monthly)	0.8	3.4
MacGregor (quarterly)	0.6	1.9
Ward (quarterly)	0.7	2.9
Ward (annually)	0.5	1.8

But these adjustments are too simple and the model is wrong

Elaboration 1: Seasonal ARIMA

$$R_t = \mu + \alpha_1(R_{t-1}) + \alpha_s(R_{t-s}) + \beta_s e_{t-s} + (1 - \alpha_1 - \alpha_s - \beta_s)e_t$$

Elaboration 2: Fractional Differencing

Provides for long-term memory effect that would also explain the property cycle

Estimates from ARIMA(1,d,0)

	AR	d	Standard Deviation Annual
R.E. Month	0.98	-0.45	13.6
R.E. Quarter	0.91	-0.32	16.8
R.E. Annual	0.53	-0.12	17.7

- Problems remain: needs much data to fit the model
- Property returns may not be stable in the model sense
- Still assumes that the underlying model is an efficient market

Artificial indices

IPD Indices are valuation-based

(1) Perhaps a transaction-based index?

- **Too few transactions**
- **No more volatile**

(2) Perhaps a movers-only index?

- **Too few transactions**
- **Unrepresentative**

(3) Stock-Market index de-geared?

Simple and *ad hoc* adjustments

(1) Assume a de-smoothing alpha of 0.6

(2) Multiply the standard deviation of returns by 2 or 3

(3) Relate de-smoothing to market conditions

All of these approaches have non-predictive effects on correlations with other assets

So…

Lengthen Measurement intervals

StDev	IPD	FTRE	FTSE	Ratio 1/2
Monthly	0.9%	6.5%	5.0%	0.14
Quarterly	2.6%	12.2%	8.9%	0.21
6-monthly	4.9%	18.5%	11.5%	0.26
Annually	9.0%	25.0%	11.7%	0.36
2-Yearly	16.0%	31.4%	9.2%	0.51

Effect on Correlations

IPD- FTRE

Month	**-0.03**
Quarter	**0.096**
6-month	**0.202**
Annual	**0.547**
2-Year	**0.796**

Perhaps Property isn't so hot after all?

Attempts to make real estate more exciting

Derivatives on individual properties

Derivatives on groups of properties

Derivatives on indices

Securitisation of property

UK Real Estate

The institutional lease

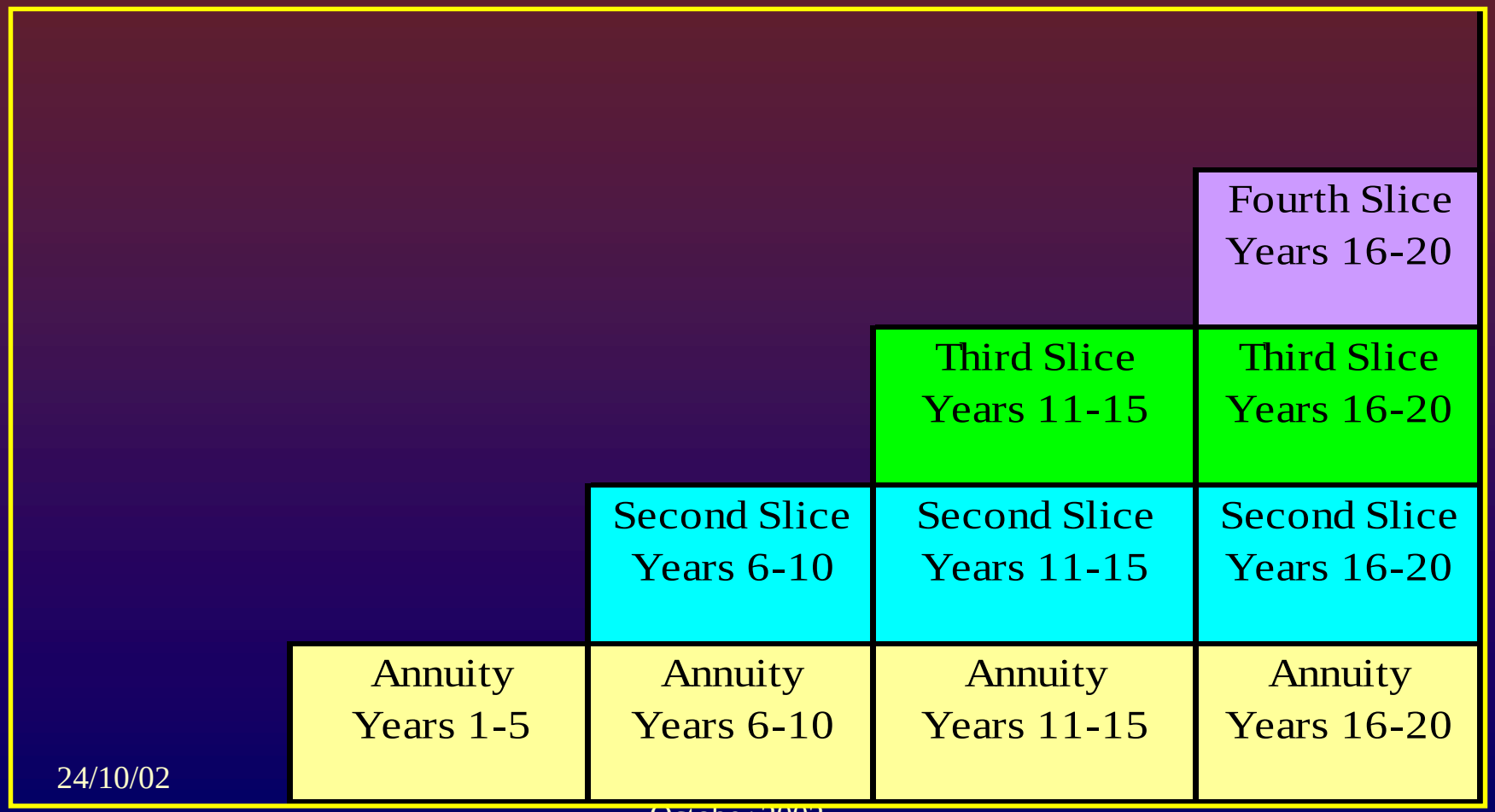
(1) 25-year lease with rent marked to 'market' every 5 years (but upwards-only)

(2) reluctance to grant shorter leases or up-down reviews

(3) trend to allow more 'break clauses'

(With penalty)

Slices of income in upwards-only lease



Characteristics of Lease

- Current rent effectively forms a long-term annuity/bond
- Upwards-only clauses are call-options, for landlords, on market rents, with unknown exercise prices.
- Break clauses are put-options (for tenants) on market rents.

Individual property derivatives

- Option pricing used in valuing upwards-only leases but not yet formally recognised
- No derivatives marketed or traded

Securitisation on individual properties
The Rotch Experience

- Rotch – private company
- Arbitrage – bought UK property lease,
- Securitised the current rental stream for length of lease
- Because of differences in cap rates, raised sufficient cash to pay for lease!

The British Land issue

- £1.54bn issue, 1999, arranged MSDW
- Secured on 13 Broadgate, Offices
- Notes long maturity, fixed & floating
- Seven tranches, £785m Aaa (Moody's)
  - (5.9%; LIBOR + 0.55%)
- Rating generally higher than B Land's
- Claimed reduced debt cost 150 bp by using proceeds to repay expensive loans

Issues regarding asset-backed securitisation

- Lower interest payment partly because of longer maturity
- Also affected security of other bonds previously issues with floating charge on British Land properties (prices weakened)
- Was there any economic benefit?
- Perhaps contributed to opening up of ABS market
- Some analysts surprised, some appalled

Derivatives on groups of properties

- **The Workspace experience**
  - **Portfolio of small secondary properties**
  - **Banks happy to offer high-rated bond issue**
- **Creating a property proxy**
  - **Portfolio of FTSE All Share, Gilts, Property companies + other equities**

What is the model?

Co-integration model; long term form is
Property = 1.841 Equity + 2.554 Gilts - 2.34 FTA

Short term portfolio is long in FTA short in equities

Long term portfolio is long in equities short in FTA

Under-performs property

Suggests some equilibrium but weak ECM

Derivatives on Indices

The FOX experience

The Prudential initiative

PICs (1) 1994 PIFs 1996 (BZW)

The Standard Life case, PICs (2)

Futures on IPD Monthly Index

FOX

Futures on IPD Monthly Capital / Rental 1991 - 1991

Thin (non-existent) trading
No marking to market
No market depth
Inference that market makers reported non-existent trades

Prudential initiative

- **Prudential – largest UK institutional real estate investor**
- **Wished to reduce exposure to UK offices**
- **Offers to swap IPD UK Office returns for UK retail returns over five year period.**
- **Still under development**

Barclays PICs PIFs

Originating from property held by Barclays Bank

1994 Sold PICs (mirroring IPD Annual returns)

1996 offered P I Futures - Forward contract 1 and 2 year ahead of IPD Capital index.

Quoted on Reuters – not a lot of movement

PICs 2 – The Standard Life 'Swap'

£150m, 1999 (3 tranches of £50m)

IPD property index

- **Income swapped for LIBOR**
- **Capital sold as property index forward**
- **Combined as PICs**

Sold to charities/local authority pension funds

No secondary trading

Little expectation of sector index trade

Conditions for successful derivative trading

- Volatility of prices
- Depth of market in longer-maturity assets
- Breadth of market
- Holistic organisational perspective of real estate

Residential Investment

The UK housing market

Lack of institutional ownership

Initiatives to encourage ownership

Trading in derivatives (spread betting?)

Conclusion on derivatives

- Thin markets, shallow markets – a text book case for not establishing derivative market
- Tenant pressure will force landlords to price leases more efficiently
- Use of volatility-based pricing may encourage model-based pricing – (OPM)
- Once approach is accepted, more trading may follow

Summary and Future questions

- Will property companies survive? Will institutional direct property persist?
- Effect of lease accounting standard?
- Boutique investment companies/funds?
- Large portfolio investors - should they dominate the market?
- Actuarial / pension fund regulations?