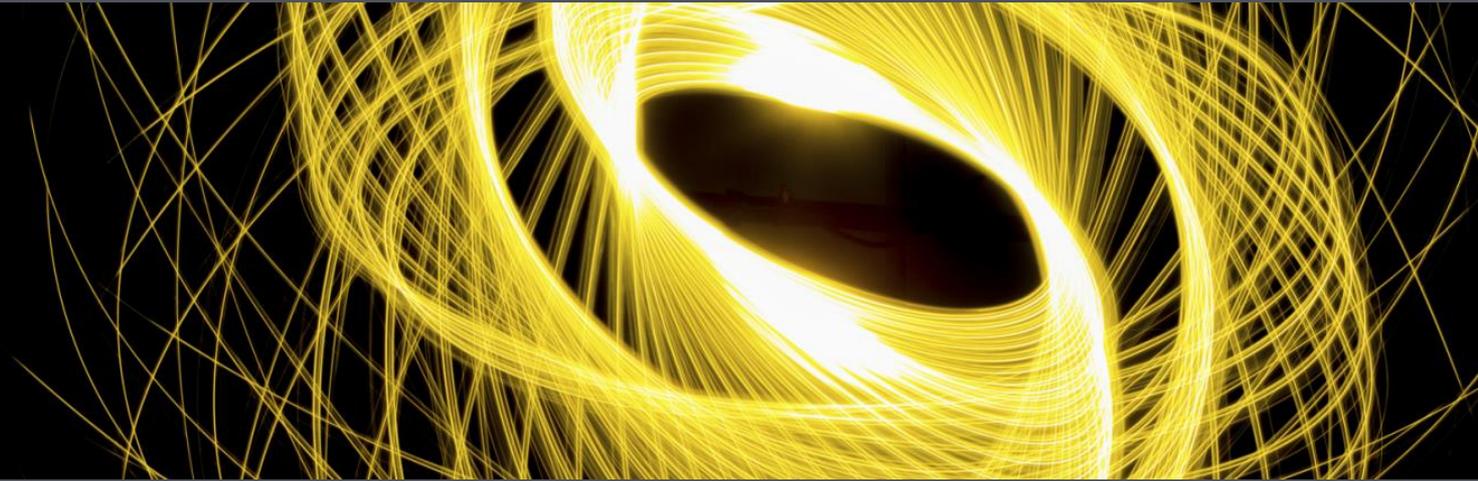


The implied internal rate of return in conventional residual valuations of development sites



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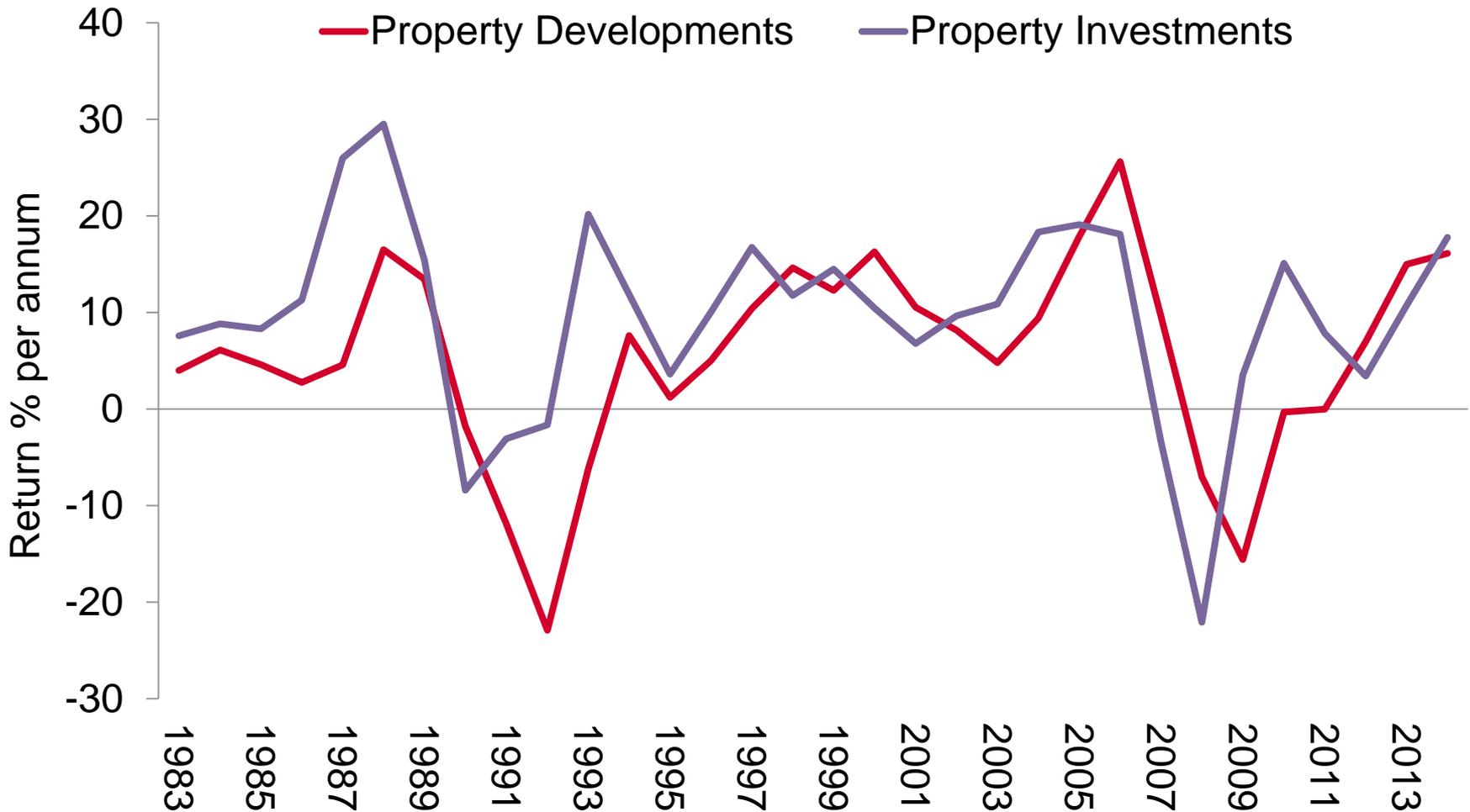
Introduction

- Residual valuation: a simple technique widely used in the UK for appraising development land when comparable evidence is limited.
- Subject to various technical weaknesses on the treatment of time, finance and profit (see Coleman et al., 2012).
- Here, we pay attention to the way that profit is dealt with and what this might imply about the rates of return a developer is expected to make.
- Profit is expressed as a simple % of revenue or costs and not as a rate of return: this makes it hard to benchmark expected return rate against other assets, e.g. property investments.

Motivation

- In comparative terms, the appraisal and performance of real estate development schemes is poorly understood.
- This not only matters for market actors, but also because development appraisals are used in certain policy contexts, e.g. to determine scope for affordable housing.
- We want to improve understanding around the treatment of profit while addressing the following specific questions:
 1. What does use of a particular % on cost or value imply about the return rate a developer is expected to make?
 2. Do rates of return implied by use of such metrics exhibit logical relationships with the risks in different situations?

Achieved returns: a puzzle?



MSCI (2015). *IPD UK Annual Property Digest 2014*. Investments – total return measured over year. Developments – median IRR for developments completed that year.

Previous literature

- Little theoretical treatment except in Geltner & Miller (2000).
- Lack of data is a key problem for setting target return rates.
- Lack of understanding is another, with negative comments on use of IRR by some areas of UK practice.
- Coleman et al. (2012): 1 out of 19 UK development appraisals studied in detail specified a target IRR.
- Southwark LBC (2014): only 2 out of 19 appraisals submitted in planning process used a target IRR.
- Sayce et al. (2017): development return not expressed as an IRR in any of the cases reviewed.

IRRs in practice

- Achieved IRRs
 - MSCI
 - Prop Cos and REITs
 - Press and Research
- IRRs in development viability appraisals
 - Property consultants
 - Planning consultants
- IRRs in planning appeals
 - Holsworthy
 - Innsworth

Method

- Scenario-based analysis using inputs that are consistent with appraisals from UK professional practice.
 1. Carry out a series of hypothetical residual valuations, varying the key inputs to establish land bid at specific levels of profit on cost.
 2. Construct cash flows using the revenues, costs, timing assumptions and suggested land bids from the stage 1 residual valuations.
 3. Compute the internal rates of return for each cash flow constructed in stage 2. They reconcile the inputs to the residual valuation with the land bid that it proposes.

- Stage 1: Residual valuation

Development value	£2,000,000
Development costs:	
Construction costs	-£1,000,000
Finance on construction costs for half period @ 5% p.a.	-£50,000
Developer's profit on construction & finance costs @ <u>15%</u>	-£157,500
Residual balance	£792,500
Developer's profit on land cost @ <u>15%</u>	-£103,370
Finance on land for total period @ 5% p.a.	-£64,068
Residual land value	£625,062

- Stage 2: Implied cash flow

	YEAR 0	YEAR 1	YEAR 2
Development value			2,000,000
Development costs	-625,062	-1,000,000	
Project cash flow	-625,062	-1,000,000	2,000,000

Project IRRs

- Using a 20% profit on cost, the following inputs to the residual model are varied: ratio of construction costs to total value, length of development period and finance rate.

	1 year	2 year	3 year	4 year	5 year	6 year
Construction costs at 25% of development value						
Interest 5%	30%	17%	13%	11%	10%	9%
Interest 6%	31%	18%	14%	12%	11%	10%
Interest 7%	33%	19%	15%	13%	12%	11%
Construction costs at 50% of development value						
Interest 5%	36%	20%	15%	12%	11%	10%
Interest 6%	38%	21%	16%	13%	12%	11%
Interest 7%	39%	22%	17%	14%	13%	12%

Equity IRRs

- Using a 20% profit on cost, as before, and assuming that the scheme has been financed at a 60% loan-to-cost ratio. The IRR is for the equity cash flow received by the developer.

	1 year	2 year	3 year	4 year	5 year	6 year
Construction costs at 25% of development value						
Interest 5%	68%	33%	23%	18%	16%	14%
Interest 6%	70%	34%	24%	20%	17%	15%
Interest 7%	72%	36%	26%	21%	18%	16%
Construction costs at 50% of development value						
Interest 5%	86%	40%	28%	22%	18%	16%
Interest 6%	88%	42%	29%	23%	20%	17%
Interest 7%	90%	43%	30%	24%	21%	19%

Conclusion

- Use of standard mark-ups for profit-on-cost or value implies very different expected returns depending on the attributes of the proposed scheme.
- Published appraisals suggest that these standard mark-ups are widespread, but we are not yet certain about practice in this respect.
- The next steps for this research are as follows:
 - Survey of developers and consultants: how do they set expected return, whether an IRR or some other metric?
 - Reworking of actual appraisals to find implied IRRs and discussion of their implications.