Pricing Mechanisms for Large, Phased Property Developments & Impact of Structured Deals on Price

By

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1. SYNOPSIS

This paper looks at various valuation methodologies (pricing mechanisms) commonly adopted by valuers and developers for large, phased property developments, and tests their suitability with respect to variable project times and equity funds employed in the project. Furthermore, this paper investigates a number of commonly used structured deal arrangements for such large scale projects and how they might enhance or diminish, the deemed land value and/or return to both the landowner and the developer.

To test the alternative pricing mechanisms, this paper has researched a number of relevant case studies, undertaken interviews with the developers of those sites and researched their various financial offers and how pricing was determined. The selected case studies presented in this paper provide insight into how the development site value was derived by different parties and how the financial offer might have been structured based on the assumptions provided.

Based on the above research work, this paper puts forward for industry debate suggested valuation methodologies and their appropriate assumptions relating to escalations, hurdle rates and a profit split rationale for joint ventures.

2. INTRODUCTION

Background

The background to this paper is the observation that many large development sites sales have achieved sale values well above the original deemed market value for the development site at the time of listing/tender. Theses price premiums might in part be explained by:

- **Competitive Tender:** Through a competitive tender process bidders are prepared to bid above market expectations in order to be confident of securing the site;
- **Trophy Site**: The site might be considered a trophy site that will provide exposure or prestige to the successful developer and allow them to **brand** a style of development;
- **Long Term Investment**: A long term development will provide continued employment of resources and balance sheet appeal to larger listed companies;
- **Lower Risk:** There is greater flexibility to delay or accelerate staging if market conditions change for large phased development sites when compared to single phase developments. This provides for lower risk as the project can effectively have a "second wind" if the early stages were developed in a difficult market.

Notwithstanding the above explanation for a price premium, most developers require the development to meet a required minimum "hurdle rate" to justify their investment. Once the project passes this required hurdle rate the project is termed "feasible" provided it falls within an acceptable level of risk.

What should that hurdle rate be? Should the cost and revenues include escalations? Should the hurdle rate be based on the development margin, project IRR before interest, IRR on Equity or some other method of appraisal?

This research paper explores a number of case studies using different methodologies to test their variability to each other and sensitivity to input assumptions.

Research Aim

The aim of this paper to test various valuation methodologies adopted throughout the industry to test which methods provide the most consistent and predicable values to determine the deemed market value for large phased development sites. This research aims to provide a rationale for industry debate as to when and why various valuation methodologies and assumptions are appropriate under certain types of projects.

My Objectives

My research objectives are:

1. Identify through discussion with development industry leaders the key methodologies used for large phased property development and how they are applied;
2. Identify case studies where it is known more than one valuation methodology was used and how that may have lead to different valuation outcomes;
3. Undertake controlled detailed financial modelling to test if various methodologies provide a consistent outcome under certain assumptions or whether one or more methodologies are superior;
4. Further test the relationship of the methodologies to time (4, 8 and 16 years) so as to develop a rational for valuation methodology and their selected hurdle rates;
5. Provide the results of the above research for industry debate and hopefully a better understanding of the sensitivities of valuation methodologies for large scale, phased development.

Hypothesis

My hypothesis is that for large scale phased development projects, an accurate assessment of the development site value requires careful appraisal of not only the project IRR and development margin but also the return on equity. For large projects that attract development companies that employee shareholder funds, the return on equity is a primary method of project value.

The hypothesis is that where a project requires a substantial amount of equity (>10% of the project cost) then it is the internal rate of return on that equity invested in that project

that best defines the residual land value of that project. Furthermore to do this analysis accurately you need to ensure that equity is drawdown when it becomes available for distribution and not left to the end of the project.

It is anticipated that the IRR hurdle rate for return on equity is likely to be higher than the Project IRR because of the leveraging impact of lower cost borrowed funds.

Where a site is fully funded with debt, the project IRR (before interest) is an appropriate methodology if it is assumed the funds can be reemployed to other projects. This may be applicable in case where a line of credit is available and a development company has multiple projects.

Limits of the Study

This paper is limited to large scale phased developments with project time scales in the order of 5 to 15 years. The case studies have been selected as typical of phased development based on the author's industry experience of 25 years and are intended as a guide to the complexity of estimating present value over an extended period of time.

3. METHODOLOGY

My approach to this research project has been to:

1. Investigate valuation methodologies proposed by the Australian Property Institute (API) or its members.

2. Interview leading developers on their valuation methodologies and rational for the selection of hurdle rates and whether this changes for longer term projects and/or structured deals for profit/sale revenue splitting.

3. Identify and analyse valuation methodologies adopted by valuers in their valuation reports for large phased developments and their rationale for selection of hurdle rates.

4. Identify appropriate historical case studies and analyse the facts surrounding the adoption of the deemed land value and, if available, how other valuers/ tenderers calculated the deemed land value for that project and its circumstances.

5. Undertake financial modelling of the selected case studies and test the various methodologies and identify similarities in outcomes and sensitivity to variables such as escalations and modifications to the hurdle rates.

6. Undertake hypothetical modelling to test the impact of variable project times to the selection of discount rates and development margins.

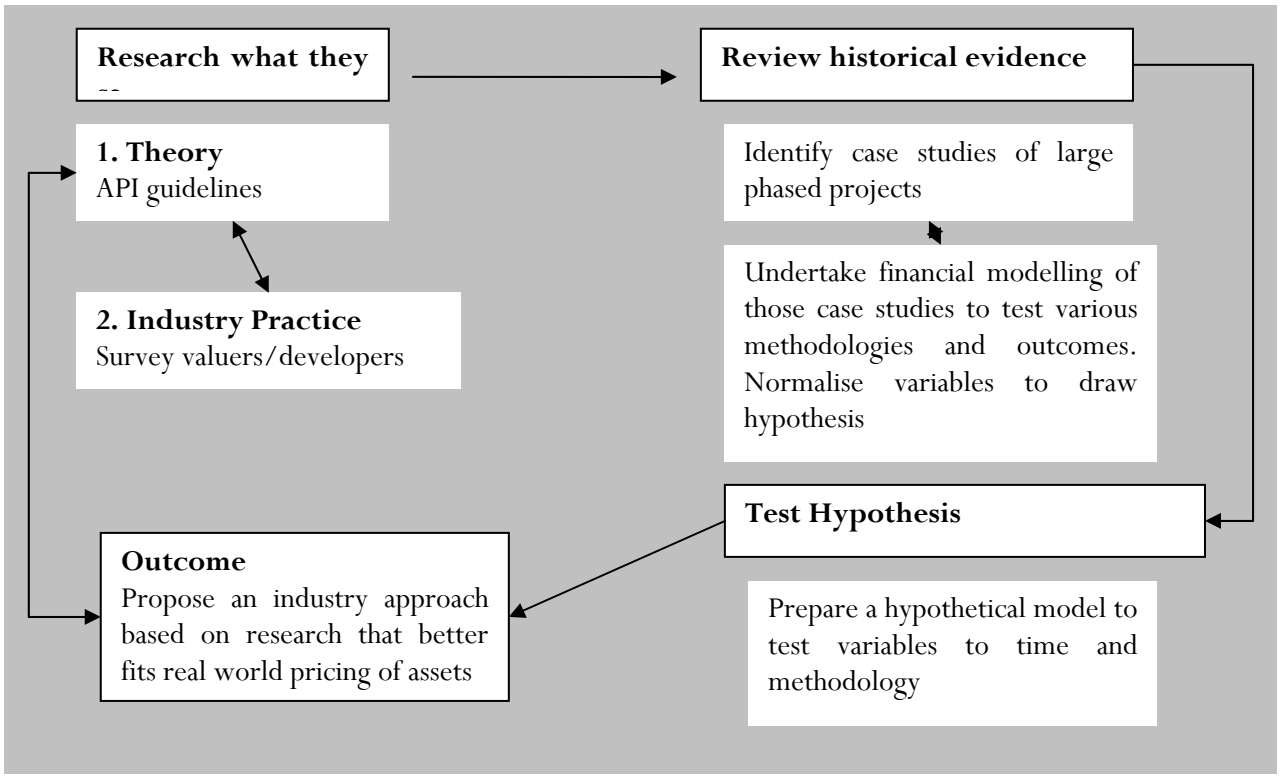
7. Investigate the impact of structured deals arrangements to the market value of land and ascertain in case where there is a premium, whether this to do with risk mitigation and/or financing considerations.

8. Review the case studies and the various tender bids that were submitted, if the bid prices were too high or too low – ascertain what might have been a good price and then identify what process of analysis one should do to determine that price in a future case.

9. Develop an industry approach that defines suitable hurdles and assumption benchmarks and methodologies that are appropriate for large, phase developments.

The logic flow to the methodology adopted is illustrated in the figure below:

Figure 1 - Methodology Chart



4. History & Theory

Valuation Methodologies

There are several valuation methodologies which are applied by various valuers and developers in assessing the highest and best use value for a property development site. The common methodologies include[1]:

- Direct Comparison
- Residual Land Value using static development margin technique (Commonly termed "Turner Approach")
- Residual Land Value using Project IRR before interest
- Residual Land Value using IRR on Equity

The API Professional Practice Guidelines for 2004 state that "there are several valuation methodologies which may used in assessing the value of a property, and different methodologies may often produce different outcomes. It will often be appropriate for more than one methodology to be considered, and a valuer needs to form a view as to which method or methods best suits the property."

The API Professional Practice Guidelines for 2004 under guidance note 6.2 notes "in large, phased schemes the Member should have regard for time and programme constraints and should make use of discounted cash flow techniques if appropriate. The Member should state clearly the assumptions made and should be in a position to justify them by reference to evidence, research and sound reasoning. If a particular variable cannot be assessed objectively, it will often be appropriate to undertake and provide a sensitivity analysis demonstrating the results that would flow from using alternative assumption for that variable."

This paper explores the common methodologies used for large scale phased schemes as follows:

[1] Valuation Principles and Practice First Edition Chapters 1 & 9 Published by API;
Land Valuation and Compensation in Australia by Messrs RO Rost and HG Collins.

1 Direct Comparison

The direct comparison approach involves making subjective allowances to sale properties to allow for such factors as property location, aspect, date of sale, zoning including development capacity/density, land area and expected end realisations and cost comparison to the subject property.

The direct comparison is typically simplified as a land value per hectare or land value per dwelling unit. For large phased development such simplifications are limited as there is often:

- "Works in Kind" required that are unique to the development (eg heritage works);
- Variable amounts of open space or land dedicated for drainage easements;
- Unique major estate works such as a boat harbour or a bridge that are not easily comparable to other developments;
- Planning approval for a range of house types, lot sizes and possible uses including commercial, retail, affordable housing.
- Variable levels of remediation and planning risk associated with the site and project;

By way of example, a 100ha site in Rouse Hill Sydney, offered by Landcom in 2004 demonstrates this difficulty. Apart from standard lot residential subdivision, the conditions of tender required the developer to construct a state of the art town centre in stages by certain milestone dates. The urban character of the town centre was potential contrary to the market demand for bulky good style developments in this locality. In addition the residential component of the development required a minimum amount of apartment buildings to be included near the town centre and surrounding entrance precincts. Demand for such a housing type was uncertain for this location at the time of tender. The masterplan also called for a high degree of ESD commitment and substantial in kind contributions to transport initiatives. Overall, the development project because of its size and conditions of development made comparability to other land sales difficult to assess. The pricing for such a project was entirely dependent upon feasibility testing and pricing of anticipated future cash flow streams. In the case of the subject site, it is understood that the dollar value per hectare of land achieved for the site's sale substantially exceeded the direct comparison of smaller subdivision land sales in the locality, despite the above development constraints.

Another example is the analysis of large brown field site sales in Melbourne. Below is a summary of sales evidence displayed in a valuation report for a Commonwealth of Australia site disposal. The valuation was a comprehensive report by a leading valuation firm. Note the variations in date of sale, lot density, $/lot and $/ha analysed. Also note the number of various factors to consider in the valuer's comparison of sales.

Table 1 - Englobo sales comparison

Vendor	AFL	Orica	Telstra	ACL	CSIRO	CoA
Purchaser	Mirvac	AIDC /Urbex	AV Jennings	Stockland	Vulpera / Prime Equity Group	Millennium Properties
Sale Price	$110m	$35m	$12m	$5.45m	$2.6m	$4.2m
Cash[2] Equivalent 8%	$74.4	$35m	$12m	$5.45m	$2.6m	$4.2m
Contract Terms	Terms	Standard	Terms	Standard	Standard	Standard
Sale Date	Oct -01	Aug -03	Oct -02	Nov -02	May 97	Mar 98
Land Area (ha)	80.5 ha	17.74ha	9.79ha	4.54ha	7.58ha	4.35ha
Zoning	Special Use Zone 1	Industrial 1 Public Park	CoA Land	Industrial 3	CoA land	CoA land
Lot Yield	1335	440		105	118	86
$,000/ha	970	2092	1172	1773	422	965
$,000/lot	58	84		76	27	48
Lot Density/ ha	16.68	24.8		23.13	15.57	19.77

Any such analysis of comparable sales needs to highly qualified and subjective. It should be noted that the subject site that was being valued for this report included a significant proportion of site area for commercial premises as well as heritage buildings to be refurbished.

Notwithstanding the above limitations, direct comparison remains an important cross check method to ensure that in the light of sales evidence and development constraints, the subject

[2] Cash Equivalent is the purchase price assuming an immediate sale. Where there is a delayed settlement the pur chase price is discounted at the stated cost of money.

property is comparable or not comparable to historical sales for other large sites in comparable locations.

2 Development Margin- Profit & Risk (Turner Approach)

The development margin approach does not take into account the time value of money but is a commonly used valuation tool by the valuers. This methodology has case history as an accepted methodology to be used in court determinations. The method is often referred in the valuation industry as the "Turner" Approach given its reference in the Turner & Anor vs Minister of Public Instruction (1956) 95 C.L.R. where Chief Justice Dixon stated "that there must be deducted from the anticipated net return the allowance which a purchaser of the land in globo at the date of resumption for the purpose of subdivision would require both for risk and realisation and to furnish him a profit for his enterprise".

For large, phased developments, the project period is likely to be extended beyond several years, and hence the development margin is a less effective tool to reflect the present value worth of the project or the equivalent return on your investment if equity funds are employed.

Notwithstanding this limitation, many valuers adopt the development margin approach because of its simplicity and common use by developer/builders for smaller sized projects. The issue of variable timings can be compensated to some degree by increasing the development margin for longer term projects. This is analysed later in this paper.

The development margin can range in these valuations from 10% to 30%. A 2004 valuation report by Urbis JHD (leading national valuation firm) for a large development site in Melbourne quoted the following development margin hurdles:

10%- 15% Usually short term considered to be relatively risk free.

15%- 20% Generally medium term developments of up to two years with some associated risks such as prolonged development and selling period.

20%- 30% Longer term developments of over two years with the major risk being the sheer size of the development.

Urbis JHD suggests a variable development margin for the project risk. Furthermore that related project length with risk suggesting that longer term projects have an inherent added risk due to their "sheer size of the development".

Our research provides two notable exceptions to this observation by Urbis JHD as follows:

1. Many development companies adopt a single rate for their development margin. Mirvac Ltd a leading development company in a submission to DIPNR (NSW planning Department) quoted a fixed development margin of 17% as typical of development margin for unit development of variable size and length. Landcom, a large government development company involved in both land subdivision and urban renewal in NSW, adopts a single benchmark of 20% for both DCF analysis and for the development margin.
2. My interviews with developers (see appendix N) and prior analysis of (Hill PDA 1994[3]) large sized projects (>200 dwelling units) show that developers were often prepared to accept a slightly lower (not higher) rate of return for a longer term project because it provided greater certainty about their long term profits and employment of company resources if project were to become scarce in the future or less profitable.

It is a misconception, to view the increased development margin for longer term projects as an indicator of greater inherent risk due to the term of the project alone. The development margin is increased not because of increased risk but rather to take into account the fact that you require a higher margin of profit if your money is tied up longer to compensate for the time value of money. It is an accounting adjustment for financial return over time and not a reflection of increased project risk.

The development margin method (Turner Approach) typically assumes that the project is fully funded from external borrowed funds with no indexation of either revenue or expenses. **This is**

[3] Hill PDA report 1993, prepared for Department of Planning NSW "Cumulative Impact of Major Redevelopment Precincts on Housing Supply in Sydney" prepared by Martin Hill, Robert Hirst and Camille Abbott 1993.

referred to as a static fully funded model. For phased developments over extended periods (> 5yrs) the inclusion/exclusion of escalations on costs and revenues can have significant impact on the residual land valuation. Likewise the level of borrowing will substantially impact the residual land value. Industry practice would strongly suggest that most projects that require external funding will have some level of equity funding that is in order of 10% to 30% of total project costs. It is the performance of those equity funds invested that best describe the developer intent to invest or not. This is discussed later.

3 Project IRR

The project IRR (before interest) with the advent of computer modelling is an increasingly favoured method of feasibility analysis and valuation by developers, financiers and valuers alike. My research project uses the Estate Master DF 2003 programme, a commonly used financial model in the property industry to assess Project IRR, Development Margin and Return On Equity. The project IRR is a favoured evaluation tool as it takes into account the time value of money and is not affected by the cost of funds or the amount equity invested.

For this research project I undertook a field survey[4] of 20 plus leading development/finance companies in the private and public sector. This list included ACT Land Development Agency, Landcom, VicUrban, Transfield. Lend Lease, Stockland, Australand, Ernst & Young, Sydney Harbour Foreshore, Eclipse Financial Group, AVO, Planning NSW, AV Jennings, Norwest, Macquarie Bank, Babcock & Brown, Defence Housing Authority, Department of Defence and Honeysuckle Development Corporation. The survey was on a confidential basis but the general consensus of Project IRR hurdle ranges were as follows:

16%- 18% Usually for relatively low risk developments where the sales risk is minimised by either off the plan sales (for residential development) or demand is exceeding supply (vacant land sales in Sydney)

[4] The survey letter and list of developers contacted is attached to Appendix N.

18%- 22% General discount associated with property development given planning approval is in place and a detailed feasibility is in place.

22%- 30% Riskier projects such as a commercial development or where there is a zoning risk.

Of the 20 interviews I undertook none of the respondents quoted a Project IRR outside this range and all respondents in their analysis utilised the Project IRR. Not all respondents used IRR on Equity.

My survey indicated a frequent use of a single discount rate to evaluate all development proposals. This was typically justified on the basis that this is the opportunity or cost of capital for their firm. Furthermore they state that in their feasibility they standardise risk by assuming that all project analysed must have planning approval, zero contamination risk and supporting evidence for market demand. Unlike the development margin, developer's generally selected hurdle rates in the mid range of 18% to 22%.

The finding that many firms adopt a single hurdle rate is supported by a UK research study[5] that found that almost one half of all firms applied a single discount rate to all projects irrespective of risk, although management theory would state that the discount rate should be varied to reflect systematic risk.

According to portfolio theory we would expect development companies to seek a range of projects with a spread of risk. Portfolio theory as initially developed by HM Markowitz[6] makes the following assumptions:

1. The returns from investments are normally distributed. Hence two parameters, the expected return and the standard deviation, are sufficient to describe the distribution of returns.
2. Investors are risk averse. Hence investors prefer the highest expected return for a given standard deviation and lowest standard deviation for a given expected return.

[5] E Brigham "Hurdle rates for Screening Capital Expenditure Proposals' Finance Management 1975 pp 17-26

[6] HM Markowitz Portfolio Selection: Efficient Diversification of Investment John Wiley & Sons New York 1959

Under such a financial management theory one would expect a developer (as an investor of capital) would seek to diverse their portfolio of development opportunities to reduce their market risk. This would not only apply to location (eg NSW vs ACT) but also property types (industrial vs retail vs residential). As with adopting a single discount rate for project appraisal, many development companies would seem to favour specialisation in a single market as opposed to diversification to other property markets to reduce risk.

The subject of this research project, large phased development projects potentially offers an opportunity to reduce risk and hence the ability to adopt a lower hurdle rate (expected return) with the following project benefits:

- The potential to benefit from a rising market, given that fixed future payments may represent a discount to value at the time of payment.
- The overall level of development risk is reduced due to the cost of infrastructure being a relatively small component of development costs.
- The developer does not have to move onto the next stage (within reason) until the previous stage has achieved an acceptable level of sales.

4 IRR on Equity

My confidential survey suggests that the IRR on equity is considered by sophisticated lenders and list development companies as a more accurate yardstick of performance for the following reasons:

- It reflects your return on equity rather than the hypothetical project return which is, or partly funded by external funding;
- As equity is a scarce resource, projects which require less equity for the same project IRR are more favourable as your unused equity can be reused elsewhere to return greater profits. Colloquially known as “drive your dollar further”.
- Phased developments which allow your equity to be either reduced upfront or progressively withdrawn are more favourable than projects that lock all your equity

upfront and release it at the end. An appropriate yardstick should reflect this flexibility and performance of return on equity.

Discussions with the above selected developers and financiers suggested the hurdle rate for IRR on Equity typically varies from 25% to 35% depending upon project risk and the level of funds borrowed. This is a higher hurdle than the project IRR hurdle rate quoted in the previous section. This higher hurdle reflects the ability to leverage the equity with the cheaper cost of debt (7% to 8%) to produce a higher return on the equity invested. The less equity invested the greater benefit of leverage assuming the cost of debt is lower than the project IRR**. This leverage of equity with debt however comes at a greater financial risk if the project is delayed and interest costs increase with capitalisation.** This reflects a higher project risk and hence a higher required rate of return. (Refer to portfolio theory discussed earlier).

In the case where a project is to be fully funded by equity, the hurdle rate should comparable or in fact lower than the project IRR hurdle rate. It is interesting to note that Project IRR (before interest) is not necessarily the same as the IRR on Equity for a fully equity funded project. The reason being that the Project IRR assumes the project funds are drawn in and out as required by the net cash flow. In a fully equity funded project the equity may be placed up front in the project and only paid back at the end of the project. The flow of equity hence is not free. In this case unless the surplus equity funds are earning an interest rate identical to the Project IRR (before interest), then there will be a discrepancy between the two IRR rates achieved. The IRR on Equity will be lower if the reinvestment rate is lower than the Project IRR.

Case Studies

As part of my research I have selected two case studies that reflect the complexity of large phased developments. Case study 1 is a joint venture (JV) where the landowner is offering the land as equity to the JV. Each tenderer was requested to identify the deemed land value (market value of the site) and their financial offer of profit split to the landowner. This case study provides insight into not only the market value of the development site but also insight into profit splitting for joint ventures and structured deal arrangements. This case study was an open tender and reflected keen market interest.

Case study 2 is also a large land subdivision with a degree of planing uncertainty and mix of uses and densities. The case study is review of how two leading valuation firms approached the methodology of valuation, the time value of money, property escalations over time and planning risk to determine current market value.

Case study 3 is a hypothetical development where the time period is adjusted with increased staging from 4 years to 16 years. The hypothetical model provides a controlled financial platform to test the suitability of the various valuation methodologies under various scenarios outlined in the objectives of this study and how the hurdle rate might be affected.

5. CASE STUDY 1

Background

This case study provides the opportunity to review several tenderers rational for pricing the deemed land value of a large phased development that was offered as a joint venture opportunity to a short list of tenderers. The preferred tenderer was required to place 50% of the deemed land value as equity in the project upfront.

Case Study 1 is a large land subdivision with a potential for over 1,000 lots. The deemed land value estimate by the landowner was $41m. This valuation was based on detailed masterplanning for the site with comprehensive cost and revenues planning and staging prepared for the project by the landowner's team of expert consultants. The project was assumed to be in five stages over a five (5) year period.

Tenderers were requested to joint venture the project with the landowner on a 50/50 basis. The tenderers were requested to estimate the deemed land value of the site and if successful, to provide half that value upfront as equity to the project. The landowner would provide the other half of the land value as equity and balance of funds required would be borrowed under the joint venture's name but the risk shared equally. The six short listed tenderers provided deemed land ranging from $42m to $57m. All six tenderers submitted their financial offers using the development feasibility model Estate Master DF2003. I have researched each of the bids.

Tender Y Bid

Attached in Appendix B is the financial model of one of the unsuccessful tenderers using the Estate Master Development Feasibility Model DF 2003. I will refer to this tender as Tender Y. Tender Y estimated the land value to be $45.175m based on the following key assumptions:

- Zero equity;
- External funds sourced at 7% per annum;
- Costs escalating at 3% per annum and revenues escalating from year 2 at 3%per annum;
- Residual land value based on a discount rate of 20% (before interest) ;

- 5 stages over 5 years;
- Stamp duty is nil because the landownership is not transferred.

The financial summary of the model is as follows:

Figure 2 - Case Study 1 Tender Y estimate of Land Value

COSTS & REVENUES	$ Total	$ Per Lot	$ Per Ha	% of Cost	% of Revenue
REVENUE					
Total Sales Revenue	227,798,244	197,913	1,662,761	158.7%	112.5%
Less Selling Costs	(8,621,124)	(7,490)	(62,928)	-6.0%	-4.3%
NET SALE PROCEEDS	219,177,119	190,423	1,599,833	152.7%	108.2%
Rental Income	-	-	-	0.0%	0.0%
Less Outgoings	-	-	-	0.0%	0.0%
Less Letting Fees	-	-	-	0.0%	0.0%
Less Incentives (rent free and fit out costs)	-	-	-	0.0%	0.0%
NET RENTAL INCOME	-	-	-	0.0%	0.0%
INTEREST RECEIVED	-	-	-	0.0%	0.0%
TOTAL PROJECT REVENUE (before GST paid)	219,177,119	190,423	1,599,833	152.7%	108.2%
Less GST paid	(16,602,113)	(14,424)	(121,183)	-11.6%	-8.2%
TOTAL PROJECT REVENUE (after GST paid)	**202,575,006**	**175,999**	**1,478,650**	**141.2%**	**100.0%**
COSTS					
Land Purchase Cost	45,175,000	39,248	329,745	31.5%	22.3%
Land Transaction Costs	-	-	-	0.0%	0.0%
Construction (incl. construct. contingency)	73,594,137	63,939	537,183	51.3%	36.3%
Professional Fees	7,895,850	6,860	57,634	5.5%	3.9%
Statutory Fees and Contributions	1,442,568	1,253	10,530	1.0%	0.7%
Project Contingency (Project Reserve)	4,308,233	3,743	31,447	3.0%	2.1%
Land Holding Costs	465,893	405	3,401	0.3%	0.2%
Finance Charges (including line fees)	181,665	158	1,326	0.1%	0.1%
Interest Expense	16,231,330	14,102	118,477	11.3%	8.0%
Miscellaneous Costs	3,232,103	2,808	23,592	2.3%	1.6%
TOTAL PROJECT COSTS (before GST reclaimed)	152,526,779	132,517	1,113,334	106.3%	75.3%
Less GST Credits Reclaimed	(9,024,001)	(7,840)	(65,869)	-6.3%	-4.5%
TOTAL PROJECT COSTS (after GST reclaimed)	**143,502,778**	**124,677**	**1,047,466**	**100.0%**	**70.8%**

PERFORMANCE INDICATORS		
Net Development Profit [1]	**59,072,229**	
Development Margin (or Profit/Risk Margin) [3]	38.83%	on total development costs (including selling costs).
Residual Land Value (Target Margin) [4]	57,804,685	(at 25% target development margin)
Maximum Debt Exposure	73,574,712	
Debt to Value Ratio	32.30%	
Date of Maximum Project Overdraft	Jan-2007	(Month 24)
Breakeven Date for Project Overdraft [5]	Oct-2008	(Month 45)
Breakeven Date for Cumulative Cash Flow [6]	Oct-2008	(Month 45)
Net Present Value [7]	**24**	(at 20% per ann. discount rate, nominal)
Benefit Cost Ratio [8]	1.0000	(at 20% per ann. discount rate, nominal)
Project Internal Rate of Return (IRR) [9]	**20.00%**	(per ann. nominal)
Residual Land Value (based on NPV) [10]	45,175,025	
IRR on Equity [11]	N.A.	($0 Equity Contributed)
Equity : Debt Ratio:	0%	
Profit : Equity Ratio	N.A.	

The key financial hurdle they used to determine the deemed land value was the 20% Project IRR (discount rate) before interest. This provided a residual land value of $45.175m. The residual land value using a target development margin of 25% instead of a Project IRR of 20% would have produced a $57m residual land value which is coincidentally similar to the highest deemed land value bid for the property. I say coincidental because the highest bidder did not use the

development margin method but rather DCF method to determine their residual land valuation. Their feasibility used a different set of costs and revenues.

The costs and revenues used in the financial model of Tender Y were similar to two of the top three tender bids. Why their estimated market land value differed was due to the fact that their financial modelling failed to recognise:

- The project as a joint venture where the landowners interest in the land was a cost and not a equity contribution ; and
- that half the deemed land value had to paid upfront as equity.

This financial impact of this modelling disparity is discussed later.

Benchmarking to Original Valuation

To compare Tender Y's bid value of $45.175m to that of the $41.0m, the deemed market value of land as determined by the landowner's valuer, I have adjusted Tenderer Y financial model as follows:

- No escalations on costs or revenues.
- Maintained the development margin set at 25% and the NPV at 20% discount rate.

The model is referenced as Case Study 1a and is attached in Appendix A. The residual land value results are as follows:

Valuation Methodology	Residual land Value
Development Margin @ 25% Non discounted method	$52,778,895
NPV at 20% Discounted Method	$41,352,015

There is a significant disparity between the two valuation methodologies but my understanding is that the valuer used the NPV approach with a cross check method to comparable sales for sites in the location and near comparable size.

For the financial model of the Valuer to yield a $41m residual land value, the development margin would have to be increased to 33%. For the residual land value to equal $52.7m using the NPV method, the discount rate would have to be decreased to 15.4%. Both these figures are outside the normal range of hurdle rates for their respective asset classes. We can see that there is a wide disparity in deemed land value depending upon what method we use.

Based on my review of all the tenders, the developers tended to use the DCF residual land value method as opposed to the residual land development margin method. Where the valuer's financial model differed from the developer feasibilities is that the latter used escalated costs and revenues. The valuer used static costs and revenues.

Modelling Impact of Joint Venture on Deemed Land Value

The $45.175m deemed land value by Tender Y utilising a DCF approach with conservative escalation amounts would appear to be a well founded valuation methodology based on comparison of other developer feasibilities. However, this approach fails to recognise that the tender offer is for a joint venture with 50% of the deemed land to paid as equity upfront. Does this warrant a different valuation methodology and possibly a different deemed market land value?

In Appendix C the financial model has been rerun to reflect the above joint venture.
The key modifications to the assumptions are as follows:

- Equity equivalent to the land value of $45.175m is contributed 50/50 by the developer and landowner;
- Developers pays 50% of the deemed land value upfront as their equity contribution;
- Costs are split 50/50;
- Landowner pays all land holding costs;
- Revenues net of GST and selling expenses are split 50/50;
- Cost of borrowing is 7% p.a.

The financial results are summarised in the following table:

Figure 3 - Case Study 1c Base Case JV Model

Project: case study 1

Case study 1(c) -- Base JV model

1151 Lots, 137 Ha

Estate Master for Excel 97+ Designed by Hill PDA and Licensed to: Hill PDA

COSTS & REVENUES	$ Total	$ Per Lot	$ Per Ha	% of Cost	% of Revenue
REVENUE					
Total Sales Revenue	113,899,122	98,957	831,380	176.3%	112.5%
Less Selling Costs	(4,310,562)	(3,745)	(31,464)	-6.7%	-4.3%
NET SALE PROCEEDS	109,588,560	95,212	799,916	169.6%	108.2%
Rental Income	-	-	-	0.0%	0.0%
Less Outgoings	-	-	-	0.0%	0.0%
Less Letting Fees	-	-	-	0.0%	0.0%
Less Incentives (rent free and fit out costs)	-	-	-	0.0%	0.0%
NET RENTAL INCOME	-	-	-	0.0%	0.0%
INTEREST RECEIVED	-	-	-	0.0%	0.0%
TOTAL PROJECT REVENUE (before GST paid)	109,588,560	95,212	799,916	169.6%	108.2%
Less GST paid	(8,301,057)	(7,212)	(60,592)	-12.8%	-8.2%
TOTAL PROJECT REVENUE (after GST paid)	**101,287,503**	**88,000**	**739,325**	**156.8%**	**100.0%**
COSTS					
Land Purchase Cost	22,587,500	19,624	164,872	35.0%	22.3%
Land Transaction Costs	-	-	-	0.0%	0.0%
Construction (incl. construct. contingency)	36,797,069	31,970	268,592	57.0%	36.3%
Professional Fees	3,947,925	3,430	28,817	6.1%	3.9%
Statutory Fees and Contributions	721,284	627	5,265	1.1%	0.7%
Project Contingency (Project Reserve)	2,154,116	1,872	15,723	3.3%	2.1%
Land Holding Costs	-	-	-	0.0%	0.0%
Finance Charges (including line fees)	177,499	154	1,296	0.3%	0.2%
Interest Expense	1,058,513	920	7,726	1.6%	1.0%
Miscellaneous Costs	1,616,051	1,404	11,796	2.5%	1.6%
TOTAL PROJECT COSTS (before GST reclaimed)	69,059,958	60,000	504,087	106.9%	68.2%
Less GST Credits Reclaimed	(4,450,878)	(3,867)	(32,488)	-6.9%	-4.4%
TOTAL PROJECT COSTS (after GST reclaimed)	**64,609,079**	**56,133**	**471,599**	**100.0%**	**63.8%**

PERFORMANCE INDICATORS		
Net Development Profit [1]	**36,678,424**	
Development Margin (or Profit/Risk Margin) [3]	53.22%	on total development costs (including selling costs).
Residual Land Value (Target Margin) [4]	34,798,342	(at 25% target development margin)
Maximum Debt Exposure	10,746,751	
Debt to Value Ratio	9.44%	
Date of Maximum Project Overdraft	Jan-2007	(Month 24)
Breakeven Date for Project Overdraft [5]	Feb-2008	(Month 37)
Breakeven Date for Cumulative Cash Flow [6]	Oct-2008	(Month 45)
Net Present Value [7]	**434,277**	(at 20% per ann. discount rate, nominal)
Benefit Cost Ratio [8]	1.0094	(at 20% per ann. discount rate, nominal)
Project Internal Rate of Return (IRR) [9]	**20.39%**	(per ann. nominal)
Residual Land Value (based on NPV) [10]	23,029,015	
IRR on Equity [11]	15.96%	($22.588m Equity Contributed)
Equity : Debt Ratio:	210.18%	
Profit : Equity Ratio	162.38%	

The financial model shows a slightly enhanced project IRR of 20.39% because the land holding costs are bourn by the landholder. The deemed land value determined by the NPV of 20% is slightly up at $46.06m (up from $45.175m).

The residual land value determined by the development margin of $69m ($34.798m x 2) has increased significantly because of the equity contribution which has increased the profit level by reducing the amount of interest payable. The development margin estimate of land would appear to be fallacious under this set of assumptions. A summary of the join venture returns are below:

Figure 4 - Case Study 1c JV returns

Project: case study 1

Case study 1(c) -- Base JV model

1151 Lots, 137 Ha

Estate Master for Excel 97+ Designed by Hill PDA and Licensed to: Hill PDA

COSTS & REVENUES	Land Owner ABC	Developer XYZ	Joint Venture	% by Land Owner
REVENUE				
Land Sale to Developer	22,587,500			
Net Rental Income	0	0	0	N.A.
Sales Revenue	113,899,122	113,899,122	227,798,244	50.0%
Interest Received	0	0	0	N.A.
GROSS REVENUE	136,486,622	113,899,122	227,798,244	59.9%
Less Selling Costs	-4,310,562	-4,310,562	-8,621,124	50.0%
NET REVENUE (before GST paid)	132,176,060	109,588,560	219,177,119	60.3%
Less GST paid	-8,301,057	-8,301,057	-16,602,113	50.0%
NET REVENUE (after GST paid)	123,875,003	101,287,503	202,575,006	61.2%
COSTS				
Opportunity Cost of Land	41,000,000		41,000,000	
Land Acquisition Costs		22,587,500	0	
Construction Costs	36,797,069	36,797,069	73,594,137	50.0%
Professional Fees	3,947,925	3,947,925	7,895,850	50.0%
Statutory Fees and Contributions	721,284	721,284	1,442,568	50.0%
Project Contingency (Reserve)	2,154,116	2,154,116	4,308,233	50.0%
Miscellaneous Costs	1,616,051	1,616,051	3,232,103	50.0%
Land Holding Costs	465,893	0	465,893	100.0%
Finance Charges	0	177,499	177,499	0.0%
Interest on Debt	0	1,058,513	1,058,513	0.0%
TOTAL COSTS (before GST reclaimed)	86,702,339	69,059,958	133,174,796	65.1%
Less GST Input Credits Reclaimed	-4,435,424	-4,450,878	-8,886,302	49.9%
TOTAL COSTS (after GST credits reclaimed)	82,266,915	64,609,079	124,288,494	66.2%
PERFORMANCE INDICATORS				
Net Development Profit	41,608,088	36,678,424	78,286,512	
Development Margin on total development costs (including selling costs).	48.06%	53.22%	58.90%	
Discount Rate	0.00%	20.00%		
Net Present Value of Cash Flow	82,608,088			
NPV less Land Value	41,608,088	434,277		
Internal Rate of Return	23.46%	20.39%		
* Note: No redistribution of Developer's Gross Profit				

Figure 5 -

The above hurdle rates adopted for this financial model have not been adjusted to reflect whether there is a reduced financial risk with increased equity or that the project costs and revenues are shared.

Notwithstanding the above point about adjusting the hurdle rates, the remodelling of the financial model to be a joint venture does not significantly alter the deemed land value as the costs and

revenues are essentially split. The deemed land value would only alter if the modeller decided to change the discount rate hurdles.

Return on Equity & Improved Financial Offer

For Case Study 1c, the IRR on equity is a low 15.96% because of the significant contribution of equity. The amount is four times that of the maximum debt exposure. The project is effectively equity funded. This level of equity would appear to be unnecessarily high with the maximum debt exposure only $10.7m for $86m in total project costs. Realistically this can be halved resulting in the IRR on equity increasing to 23%p.a.

The financial model also assumes that the equity is held to the project end. Given the project is over a five/six year period and cash surpluses are available from year 4, it is likely that progressive equity drawdowns would occur from that point or earlier if a debt to equity ratio was adopted.

In the financial model if you go to the cash flow print out in Appendix C you will note from Jan 09 (month 48) $3m can be drawn down. This can be done every quarter with increasing amounts to $6m. This manual draw down of equity as shown in the financial model can improve the IRR on equity to around 27.8% with a $45.175m deemed land value.

Please refer to over the page to view the financial summary for Model Case Study 1c which has had its equity cash flow optimised. No other costs or revenues have been changed.

Figure 6 - Case Study 1c with Equity Cash Flow Optimised

COSTS & REVENUES	$ Total	$ Per Lot	$ Per Ha	% of Cost	% of Revenue
REVENUE					
Total Sales Revenue	113,899,122	98,957	831,380	168.5%	112.0%
Less Selling Costs	(4,310,562)	(3,745)	(31,464)	-6.4%	-4.2%
NET SALE PROCEEDS	109,588,560	95,212	799,916	162.1%	107.7%
Rental Income	-	-	-	0.0%	0.0%
Less Outgoings	-	-	-	0.0%	0.0%
Less Letting Fees	-	-	-	0.0%	0.0%
Less Incentives (rent free and fit out costs)	-	-	-	0.0%	0.0%
NET RENTAL INCOME	-	-	-	0.0%	0.0%
INTEREST RECEIVED	-	-	-	0.0%	0.0%
TOTAL PROJECT REVENUE (before GST paid)	109,588,560	95,212	799,916	162.1%	107.7%
Less GST paid	(7,854,466)	(6,824)	(57,332)	-11.6%	-7.7%
TOTAL PROJECT REVENUE (after GST paid)	**101,734,094**	**88,388**	**742,585**	**150.5%**	**100.0%**
COSTS					
Land Purchase Cost	22,587,500	19,624	164,872	33.4%	22.2%
Land Transaction Costs	-	-	-	0.0%	0.0%
Construction (incl. construct. contingency)	36,797,069	31,970	268,592	54.4%	36.2%
Professional Fees	3,947,925	3,430	28,817	5.8%	3.9%
Statutory Fees and Contributions	721,284	627	5,265	1.1%	0.7%
Project Contingency (Project Reserve)	2,154,116	1,872	15,723	3.2%	2.1%
Land Holding Costs	-	-	-	0.0%	0.0%
Finance Charges (including line fees)	179,374	156	1,309	0.3%	0.2%
Interest Expense	4,050,514	3,519	29,566	6.0%	4.0%
Miscellaneous Costs	1,616,051	1,404	11,796	2.4%	1.6%
TOTAL PROJECT COSTS (before GST reclaimed)	72,053,833	62,601	525,940	106.6%	70.8%
Less GST Credits Reclaimed	(4,450,878)	(3,867)	(32,488)	-6.6%	-4.4%
TOTAL PROJECT COSTS (after GST reclaimed)	**67,602,955**	**58,734**	**493,452**	**100.0%**	**66.5%**

PERFORMANCE INDICATORS		
Net Development Profit [1]	**34,131,139**	
Development Margin (or Profit/Risk Margin) [3]	47.46%	on total development costs (including selling costs).
Residual Land Value (Target Margin) [4]	31,329,423	(at 25% target development margin)
Maximum Debt Exposure	23,635,653	
Debt to Value Ratio	20.75%	
Date of Maximum Project Overdraft	Jan-2007	(Month 24)
Breakeven Date for Project Overdraft [5]	Oct-2008	(Month 45)
Breakeven Date for Cumulative Cash Flow [6]	Oct-2008	(Month 45)
Net Present Value [7]	**640,787**	(at 20% per ann. discount rate, nominal)
Benefit Cost Ratio [8]	1.0139	(at 20% per ann. discount rate, nominal)
Project Internal Rate of Return (IRR) [9]	**20.58%**	(per ann. nominal)
Residual Land Value (based on NPV) [10]	23,238,376	
IRR on Equity [11]	27.81%	($11.294m Equity Contributed)
Equity : Debt Ratio:	47.78%	
Profit : Equity Ratio	302.21%	

The IRR on equity is a good performance indicator of the developer's net equity cash flow, being the equity paid into the project, the equity drawn back out and the distribution of profits. If a benchmark IRR of 25%pa return on equity was set, the deemed land value could be increased to $55m without changing any of the original costs, revenues, project timings or escalations. This amount of $55m is the deemed land value that was awarded to the successful tender.

My research with major developers (see appendix N for list of developers) suggests a greater level of attention is being given to the IRR on Equity for large phased projects. While it is recognised

that the project IRR (before interest) remains the most common valuation/feasibility tool it is observed it forms just one of the performance hurdles investigated.

The performance indicators for the Case Study 1d with a deemed land value of $55m. is as follows:

Figure 7 - Case Study 1d – Deemed Land Value $55m – Opportunity Value $41m

COSTS & REVENUES	Land Owner ABC	Developer XYZ	Joint Venture
REVENUE			
Land Sale to Developer	27,500,000		
Net Rental Income	0	0	0
Sales Revenue	113,899,122	113,899,122	227,798,244
Interest Received	0	0	0
GROSS REVENUE	141,399,122	113,899,122	227,798,244
Less Selling Costs	-4,310,562	-4,310,562	-8,621,124
NET REVENUE (before GST paid)	137,088,560	109,588,560	219,177,119
Less GST paid	-7,854,466	-7,854,466	-15,708,931
NET REVENUE (after GST paid)	129,234,094	101,734,094	203,468,188
COSTS			
Opportunity Cost of Land	41,000,000		41,000,000
Land Acquisition Costs		27,500,000	0
Construction Costs	36,797,069	36,797,069	73,594,137
Professional Fees	3,947,925	3,947,925	7,895,850
Statutory Fees and Contributions	721,284	721,284	1,442,568
Project Contingency (Reserve)	2,154,116	2,154,116	4,308,233
Miscellaneous Costs	1,616,051	1,616,051	3,232,103
Land Holding Costs	465,893	0	465,893
Finance Charges	0	184,998	184,998
Interest on Debt	0	6,224,559	6,224,559
TOTAL COSTS (before GST reclaimed)	86,702,339	79,146,002	138,348,341
Less GST Input Credits Reclaimed	-4,435,424	-4,450,878	-8,886,302
TOTAL COSTS (after GST credits reclaimed)	82,266,915	74,695,124	129,462,039
PERFORMANCE INDICATORS			
Net Development Profit	46,967,179	27,038,970	74,006,149
Development Margin on total development costs (including selling costs).	54.25%	34.22%	53.60%
Discount Rate	16.00%	20.00%	
Net Present Value of Cash Flow	54,804,808		
NPV less Land Value	13,804,808	-4,193,284	
Internal Rate of Return	29.18%	16.55%	

Note in the above financial model the opportunity value of the land to the landowner is shown as $41m. This was market value of the land determined by the landowner's valuer prior to the tender. All estimates of market value by the tenderers exceed this amount.

Impact of Real Escalations on Cost & Revenues

The financial model for Case Study 1d shows a project IRR of 16.55% for the developer. This is based on 3% escalations for cost items from the year 1, and 3% for revenue items from year 2. This is a realistic forecast in the short term based on market expectations for the ACT in 2005 and 2006. But based on historical growth records over the last 20 years it is a very conservative forecast. Given the longevity of the project, I consider the proposition of real growth rates needs investigation.

Since 1983, Canberra houses prices have shown escalations of 7.13% compound per annum (or 3.3% over inflation) as follows:

Table 2 - Real and Nominal Escalation Capital Cities 1983 to 2003.

1983 - 2003	Sydney	Melbourne	Brisbane	Adelaide	Perth	Canberra
% Growth	557%	652%	477%	411%	399%	425%
% p.a. avg.	8.52%	9.34%	7.72%	6.96%	6.81%	7.13%
CPI % p.a.	3.97%	3.94%	3.90%	3.96%	3.83%	3.83%
Real % p.a.	4.6%	5.4%	3.8%	3.0%	3.0%	3.3%

Source REIA

A similar pattern is shown if the time period is taken over the last 10 years when the inflation rate has been lower on average. The rates vary from 2.5% to 6.12% real growth rates over CPI. Real escalations were at least 100% above the CPI rate as shown below:

Table 3 - Real and Nominal Escalation Capital Cities 1993 to 2003.

1993 - 2003	Sydney	Melbourne	Brisbane	Adelaide	Perth	Canberra
% Growth	244%	242%	216%	174%	190%	166%
Av. Compound Growth	8.46%	8.38%	7.23%	5.14%	6.01%	4.74%
Inflation	2.50%	2.27%	2.36%	2.31%	2.32%	2.24%
Real Compound Growth	5.97%	6.12%	4.87%	2.84%	3.70%	2.50%

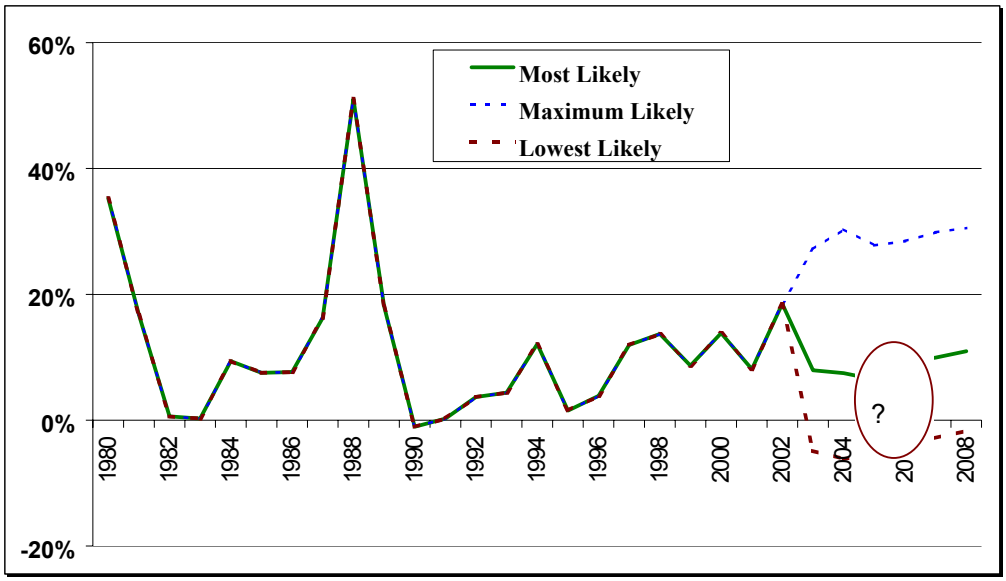
Source REIA

The relationship between house price escalation and rental yield is the subject of another research paper but a property market expert, John Edwards, suggests that to attract investment in the market, the overall internal rate of return for housing investment must be in the order 15%p.a.

John Edwards in a paper presented in 2004 showed research dating back to 1910 which shows the relationship between house price capital growth, rental yield and overall return. The overall

return has tended to trend down in the 1990s because in part due to the lower inflation rate and the housing boom. If you look at nominal capital growth rates over last 25 years for Sydney house prices there has only been 1 year where the rate has been negative according to Residex Data.

Figure 8 - Sydney Houses Capital Growth Peaks 1980 to 2004 + Forecast



Source Residex 2004

A similar pattern is shown if we use REIA house price data for all capital cities. Note however, that Canberra does show a slump in the mid 1990s following the change in Government.

Table 4 - Median House Price by Capital Cities since 1983

Year ended June	Sydney	Melbourne	Brisbane	Adelaide	Perth	Canberra
	$000	$000	$000	$000	$000	$000
1983	80.4	52.6	55.4	48.2	49.9	62.1
1984	84.3	61.6	57.0	60.2	47.1	77.7
1985	89.7	74.6	60.2	73.9	50.5	87.0
1986	98.0	82.9	61.3	77.1	53.9	92.3
1987	109.8	86.4	60.1	76.7	58.6	**91.1**
1988	142.0	102.2	65.9	77.6	65.8	93.0
1989	206.1	127.0	86.4	88.8	97.8	111.2
1990	**183.9**	138.2	103.4	100.9	98.8	116.8
1991	**174.8**	138.4	108.3	107.4	**95.5**	125.9
1992	180.0	**136.4**	119.0	109.5	97.7	147.5
1993	183.3	141.5	122.6	114.0	104.7	158.3
1994	195.5	143.1	127.7	112.1	119.1	160.5
1995	197.0	146.3	132.8	109.5	126.1	**158.3**
1996	203.7	146.3	133.8	110.2	127.1	**155.5**
1997	230.0	170.0	138.0	112.0	132.0	**151.0**
1998	248.5	189.5	141.8	116.6	140.0	156.8
1999	271.1	208.0	146.3	122.9	144.9	155.8
2000	301.6	242.4	154.5	131.9	152.5	172.3
2001	312.8	265.8	172.5	138.9	160.9	190.6
2002	356.3	318.3	215.0	162.3	176.4	219.9
2003	448.0	343.0	264.3	197.9	199.0	263.5

Source REIA 2004

The overall evidence does suggest over the longer term (5 or more years) the probability of real growth is more significant enough to account for it rather than to ignore.

If revenue escalations are increased to a nominal 6% pa average (3% real) over the 7 year period and cost escalations are retained at 3% (CPI forecast) then the project IRR for Case Study 1 increases to 22% and the IRR on equity to 30%. The deemed land value increases from $55m to $60m if we maintain a 20% NPV hurdle rate.

Figure 9 - Financial Summary Case Study 1e – Real sale escalation of 3%

COSTS & REVENUES	$ Total	$ Per Lot	$ Per Ha	% of Cost
REVENUE				
Total Sales Revenue	131,653,559	114,382	960,975	178.8%
Less Selling Costs	(4,924,571)	(4,279)	(35,946)	-6.7%
NET SALE PROCEEDS	126,728,987	110,103	925,029	172.2%
TOTAL PROJECT REVENUE (before GST paid)	126,728,987	110,103	925,029	172.2%
Less GST paid	(9,468,505)	(8,226)	(69,113)	-12.9%
TOTAL PROJECT REVENUE (after GST paid)	**117,260,482**	**101,877**	**855,916**	**159.3%**
COSTS				
Land Purchase Cost	27,500,000	23,892	200,730	37.4%
Land Transaction Costs	-	-	-	0.0%
Construction (incl. construct. contingency)	36,797,069	31,970	268,592	50.0%
Professional Fees	3,947,925	3,430	28,817	5.4%
Statutory Fees and Contributions	721,284	627	5,265	1.0%
Project Contingency (Project Reserve)	2,154,116	1,872	15,723	2.9%
Land Holding Costs	-	-	-	0.0%
Finance Charges (including line fees)	179,582	156	1,311	0.2%
Interest Expense	5,205,442	4,523	37,996	7.1%
Miscellaneous Costs	1,616,051	1,404	11,796	2.2%
TOTAL PROJECT COSTS (before GST reclaimed)	78,121,470	67,873	570,230	106.1%
Less GST Credits Reclaimed	(4,506,697)	(3,915)	(32,896)	-6.1%
TOTAL PROJECT COSTS (after GST reclaimed)	**73,614,772**	**63,957**	**537,334**	**100.0%**

PERFORMANCE INDICATORS		
Net Development Profit [1]	**43,645,710**	
Maximum Debt Exposure	28,854,512	
Net Present Value [7]	**2,634,084**	(at 20% per ann. discount rate, nominal)
Project Internal Rate of Return (IRR) [9]	**21.98%**	(per ann. nominal)
Residual Land Value (based on NPV) [10]	30,177,439	
IRR on Equity [11]	30.74%	($11.294m Equity Contributed)

My survey with developers and review of a number of feasibilities prepared by valuers and developers suggest it is not common practice to adopt such high historical escalations for revenue but rather present this scenario as one of the sensitivity tests.

For short term projects, escalation are not a relevant matter but for projects which extend over 5 to 10 years and hence a full property cycle, it would be foolish to ignore their impact.

A clear benefit of a large phased project is the ability to delay or bring forward stages to match and take advantage of property cycles and long term property price escalations.

6. STRUCTURE DEAL AGREEMENTS

An increasingly common method of disposal of large sites is for the landowner to retain an interest in a project by both putting their land in as equity and receiving a guaranteed minimum return with a share of profits. Alternatively they may receive a split of sales revenue. This is often attractive to the landowner where the full development potential of the land is yet to be achieved either through a rezoning process or site decontamination. A quick sale may heavily discount that potential. In some cases because of the uncertainty of the development approval process both in time and development outcome, the full value of the site is undeterminable or is likely to be heavily discounted by the market accordingly.

For Case Study 1 it was assumed that the landowner would put the land into the Joint Venture (JV). The developer would fund the infrastructure cost and the sales of the project would be split. The percentage split of the revenue to the landowner could be determining when setting a hurdle IRR to the developer (say 18%).

The questions are:

1. Does this reduce the developer's debt exposure and financial risk?
2. Does it increase the total return to the landowner in nominal and discount terms?

For comparative purposes I have looked at Case Study 1b - the standard development model and Case Study Model 1c - the base JV model and to which I have an additional model I have referenced as Case Study 1f. Its assumptions are as follows:

- Zero land cost but a opportunity value to the landowner of $41m
- Costs and revenues including escalations as per 1c and 1b
- All costs other than land holding paid by the developer
- Land holding costs paid by landowner
- Sale revenues split of 50/50 equated to a 18.36% IRR to the developer which was the required hurdle rate.

The financial model Case Study 1(f) summary is as follows:

Figure 10 - Case Study 1f

Project: case study 1
Case study 1f) -- Landowner 50% of Sale - for development of land
1151 Lots, 137 Ha
Estate Master for Excel 97+ Designed by Hill PDA and Licensed to: Hill PDA

COSTS & REVENUES	Land Owner ABC	Developer XYZ	Joint Venture	% by Land Owner
REVENUE				
Land Sale to Developer	0			
Net Rental Income	0	0	0	N.A.
Sales Revenue	117,316,095	117,316,095	234,632,191	50.0%
Interest Received	0	0	0	N.A.
GROSS REVENUE	117,316,095	117,316,095	234,632,191	50.0%
Less Selling Costs	-2,578,112	-6,279,302	-8,857,413	29.1%
NET REVENUE (before GST paid)	114,737,984	111,036,794	225,774,778	50.8%
Less GST paid	-8,165,100	-8,165,100	-16,330,199	50.0%
NET REVENUE (after GST paid)	106,572,884	102,871,694	209,444,579	50.9%
COSTS				
Opportunity Cost of Land	41,000,000		41,000,000	
Land Acquisition Costs		0	0	
Construction Costs	0	73,594,137	73,594,137	0.0%
Professional Fees	0	7,895,850	7,895,850	0.0%
Statutory Fees and Contributions	0	1,442,568	1,442,568	0.0%
Project Contingency (Reserve)	0	4,308,233	4,308,233	0.0%
Miscellaneous Costs	0	3,232,103	3,232,103	0.0%
Land Holding Costs	465,893	0	465,893	100.0%
Finance Charges	0	181,457	181,457	0.0%
Interest on Debt	0	3,807,845	3,807,845	0.0%
TOTAL COSTS (before GST reclaimed)	41,465,893	94,462,193	135,928,086	30.5%
Less GST Input Credits Reclaimed	-234,374	-8,673,409	-8,907,782	2.6%
TOTAL COSTS (after GST credits reclaimed)	41,231,519	85,788,784	127,020,303	32.5%
PERFORMANCE INDICATORS				
Net Development Profit	65,341,365	17,082,910	82,424,275	
Development Margin on total development costs (including selling costs).	149.15%	18.55%	60.66%	
Discount Rate	16.00%	18.00%		
Net Present Value of Cash Flow	57,182,422			
NPV less Land Value	16,182,422	230,810		
Internal Rate of Return	25.04%	18.36%		
* Note: No redistribution of Developer's Gross Profit				

A comparison of Case Study 1b, 1c and 1f is summarised in the table below.

Table 5 - Comparison Table 1b 1c & 1f

	Case Study 1b	Case Study 1c	Case Study 1f
Description	Developer purchase land and undertake development	50/50 JV partnership	Landowner contributes Land Developer the infrastructure. Revenue Split
Land Sale	$45.175m	$22.587m	$0
Developer equity	$0m	$22.587m	$0
Maximum debt exposure to developer	$73.5m	$10.7m	$23.5m
Maximum debt exposure to	$0	$10.7m	$0

	Case Study 1b	Case Study 1c	Case Study 1f
landowner			
Development Profit to Developer	$59m	$36.7m	$17m
Project IRR to Developer	20%	20%	18%
Total Net Funds to Landowner	$45.175m	$82.6m	$106m
NPV to Landowner 16% discount rate	$45.175m	$49.716m	$57m

Case Study 1c (the standard development model) shows the highest development profit but the maximum debt exposure to the developer. The project IRR for each option is comparable.

From the perspective of the landowner, the revenue split option of Case Study 1c is superior both in nominal return and NPV return. It is understandable where a landowner can dictate to market their terms, as in the case of a prime development site or a scarce land subdivision, the latter structured deal has both financial appeal and development control appeal. This is particularly relevant in the case of a development land agency whose mission statement is not only to maximise revenue but also to set exemplary development standards to the community and the development industry. The revenue split option minimises the landowner's financial exposure to the development while maintaining control of the development's performance through the release of land by stages. For the developer's perspective by being in partnership with the government, reduces potential planning risks, reduces financial exposure to the holding cost of land while returning a market rate of return on the funds employed.

Conclusion

In conclusion a structure deal is not necessarily a zero sum game for both participants (JV partners). By the appropriate sharing of risk (government holding the land, the developer taking the construction risk) and the blending of different costs of capital (government lower cost of capital and lower risk taker; developer higher cost higher return taker), a structured deal provides a more efficient frontier of investment to optimism both group's optimisation of capital return.

7. CASE STUDY 2

Background

This historical case study of a large, brownfield development provides an opportunity to assess the different methodologies adopted by two independent valuers for the site. Their different valuation approaches namely the static development margin method and secondly the project IRR method resulted in different deemed land values. Furthermore their valuation methodologies were tested with real escalation growth as the project term extends 15 years. The deemed land values of these methodologies have also been compared to a deemed land value based on return on equity for the project.

Case Study 2 is a 100ha+ brownfield infill development site which is to be redeveloped into a medium density residential estate in Melbourne. The potential dwelling yield is in excess of 2,800 lots with 5.5ha of employment lands in addition. The land is currently not zoned but for the purposes of the valuation, the valuers were instructed to value the property on the basis of the site being zoned for its highest and best use being mixed use development.

Valuer A: Development Margin Approach Case Study 2a

The simulated financial model of Valuer A, who adopted the static development margin approach in preference to the direct comparison, is located in Appendix G. In an earlier draft of their valuation, Valuer A had included a residual land value using a DCF approach but in the final draft this approach was not displayed or discussed.

The valuer suggested a development margin range of 25% to 30% for a project of this type. Based on this range, Valuer A adopted a deemed land value of $113.6m. The key assumptions of the model are as follows:

- Project start date Jan 2005.
- Land Purchase Cost $113.5m.
- Nil remediation costs (as per instructions).

- Nil Stamp duty (as per instructions).
- Zero escalations.
- Development management fees 1.5%.
- Construction cost $134.12m staged in four stages over 10 years (as per instructions).
- Selling cost (agency, legals, marketing) 4.7%.
- Sale revenue of $466m over 11 years.

The results of the financial model are summarised as follows:

Figure 11 - Financial Summary Case Study 2a

COSTS & REVENUES	$ Total	$ Per dwelling	$ Per ha	% of Cost	% of Revenue
REVENUE					
Total Sales Revenue	466,035,750	161,762	3,669,573	145.7%	113.0%
Less Selling Costs	(21,656,180)	(7,517)	(170,521)	-6.8%	-5.3%
NET SALE PROCEEDS	444,379,570	154,245	3,499,052	139.0%	107.8%
Rental Income	-	-	-	0.0%	0.0%
Less Outgoings	-	-	-	0.0%	0.0%
Less Letting Fees	-	-	-	0.0%	0.0%
Less Incentives (rent free and fit out costs)	-	-	-	0.0%	0.0%
NET RENTAL INCOME	-	-	-	0.0%	0.0%
INTEREST RECEIVED	-	-	-	0.0%	0.0%
TOTAL PROJECT REVENUE (before GST paid)	444,379,570	154,245	3,499,052	139.0%	107.8%
Less GST paid	(32,048,705)	(11,124)	(252,352)	-10.0%	-7.8%
TOTAL PROJECT REVENUE (after GST paid)	**412,330,865**	**143,121**	**3,246,700**	**128.9%**	**100.0%**
COSTS					
Land Purchase Cost	113,500,000	39,396	893,701	35.5%	27.5%
Land Transaction Costs	-	-	-	0.0%	0.0%
Construction (incl. construct. contingency)	134,012,647	46,516	1,055,218	41.9%	32.5%
Professional Fees	6,990,536	2,426	55,044	2.2%	1.7%
Statutory Fees and Contributions	-	-	-	0.0%	0.0%
Project Contingency (Project Reserve)	-	-	-	0.0%	0.0%
Land Holding Costs	-	-	-	0.0%	0.0%
Finance Charges (including line fees)	-	-	-	0.0%	0.0%
Interest Expense	80,076,833	27,795	630,526	25.0%	19.4%
Miscellaneous Costs	-	-	-	0.0%	0.0%
TOTAL PROJECT COSTS (before GST reclaimed)	334,580,016	116,133	2,634,488	104.6%	81.1%
Less GST Credits Reclaimed	(14,787,215)	(5,133)	(116,435)	-4.6%	-3.6%
TOTAL PROJECT COSTS (after GST reclaimed)	**319,792,801**	**111,001**	**2,518,054**	**100.0%**	**77.6%**

PERFORMANCE INDICATORS		
Net Development Profit [1]	**92,538,064**	
Development Margin (or Profit/Risk Margin) [3]	27.10%	on total development costs (including selling costs).
Residual Land Value (Target Margin) [4]	113,638,070	(at 27% target development margin)
Maximum Debt Exposure	173,727,803	
Debt to Value Ratio	37.28%	
Date of Maximum Project Overdraft	Oct-2006	(Quarter 7)
Breakeven Date for Project Overdraft [5]	Apr-2013	(Quarter 33)
Breakeven Date for Cumulative Cash Flow [6]	Apr-2013	(Quarter 33)
Net Present Value [7]	**(38,758,447)**	(at 20% per ann. discount rate, nominal)
Benefit Cost Ratio [8]	0.7777	(at 20% per ann. discount rate, nominal)
Project Internal Rate of Return (IRR) [9]	**13.43%**	(per ann. nominal)
Residual Land Value (based on NPV) [10]	73,547,325	

Note for this model the IRR achieved is 13.43% for a $113.5m land purchase. This is well below the target hurdle rate. If we adopt the NPV residual land value using a 20% discount rate the residual land value is $73.5m. This is well below comparable market evidence on a per hectare basis presented in the report.

Valuer B: DCF Residual Land Approach – Case Study 2b

Valuer B adopted the residual land value approach using a DCF approach. Valuer B suggested a discount rate of 15% for the NPV calculation. They suggested that this rate "reflects the nature and length of the project, potential fluctuating market conditions and the works undertaken" with masterplanning for the site to date. No evidence of comparable discount rates was provided to support their selection of hurdle rate.

Valuer B had slightly different revenue figures but similar costs and timing as Valuer A. Based on Valuer B's assumptions, the residual land value using a 15% discount rate equated to **$120m.** For comparative purposes however, I have adopted the same costs, revenues and timings used by Valuer A for Valuer B. The only thing I changed was the target discount rate from 20% to 15%. This resulted in a lower land value of $102.1m. The simulated financial model of Valuer B is located in Appendix HI.

8. IMPACT OF ESCALATIONS ON CASE STUDY 2C

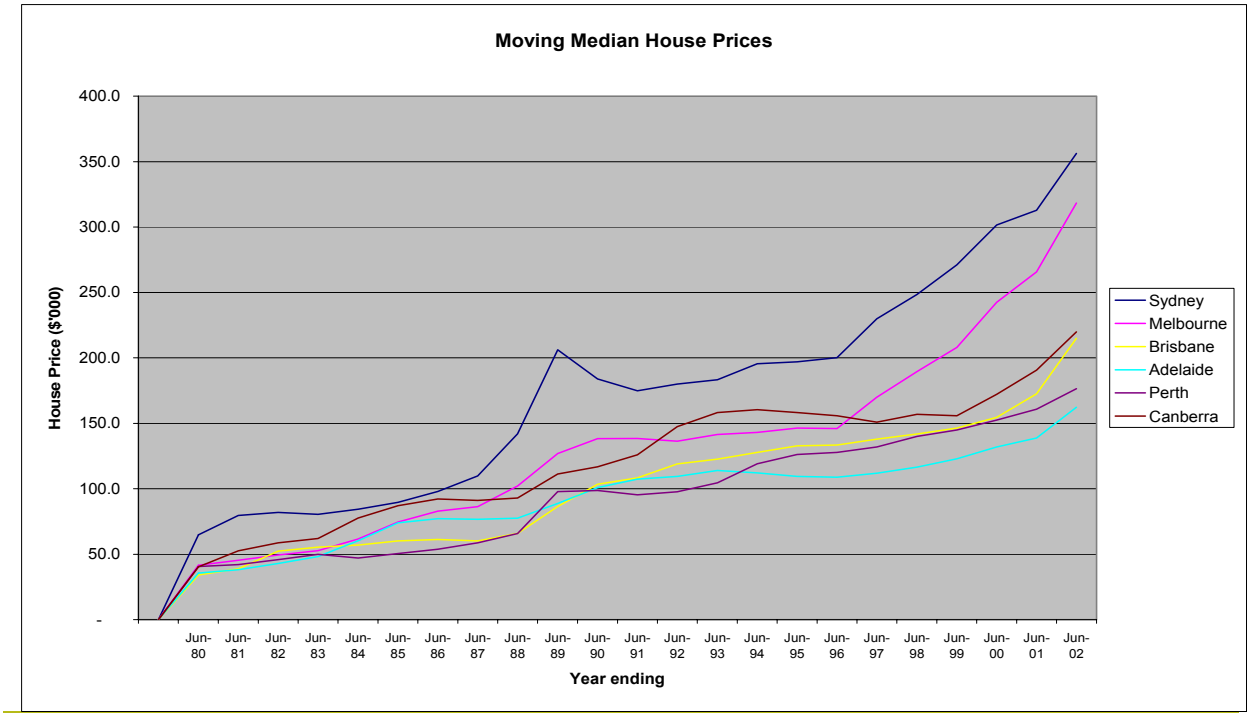
I have rerun Valuer B's financial model using 3% escalations for costs and revenues. The model using the development margin of 27% jumps the residual land value to $151m. If I use a 15% discount rate, the residual land value jumps to $132m. A 15% discount would appear to be very low. Discount rates for longer term projects of this nature which I have researched range between 16% and 20% with the norm closer to 17% or 18%. Running sensitivity on the discount rates, the following residual land values are computed.

Table 6 - Case Study 2c Sensitivity to Discount rates

Discount Rates	Residual Land Value
15%	$132.1m
16%	$123.6m
17%	$115.6m
18%	$108.3m

As discussed earlier in this paper, over the longer term (>5years) one can anticipate a strong prospect of real capital growth. The major capital cities including Sydney, Brisbane and Melbourne have been quite consistent in capital growth due to their growing population and shortage of land supply.

Figure 12 - House Price for the Capital Cities compiled by REIA.



I have rerun the Case Study 2 model using a real growth rate of 3% over the 15 year term for the financial. This is attached in Appendix JK as Case Study 2c.The summary of financial results for Case Study 2c is as follows:

Figure 13 - Case Study 2c Financial Summary

COSTS & REVENUES	$ Total	$ Per dwelling	$ Per ha	% of Cost	% of Revenue
REVENUE					
Total Sales Revenue	685,041,683	237,779	5,394,029	224.1%	113.9%
Less Selling Costs	(31,827,305)	(11,047)	(250,609)	-10.4%	-5.3%
NET SALE PROCEEDS	653,214,377	226,732	5,143,420	213.7%	108.6%
Rental Income	-	-	-	0.0%	0.0%
Less Outgoings	-	-	-	0.0%	0.0%
Less Letting Fees	-	-	-	0.0%	0.0%
Less Incentives (rent free and fit out costs)	-	-	-	0.0%	0.0%
NET RENTAL INCOME	-	-	-	0.0%	0.0%
INTEREST RECEIVED	-	-	-	0.0%	0.0%
TOTAL PROJECT REVENUE (before GST paid)	653,214,377	226,732	5,143,420	213.7%	108.6%
Less GST paid	(51,958,335)	(18,035)	(409,121)	-17.0%	-8.6%
TOTAL PROJECT REVENUE (after GST paid)	**601,256,042**	**208,697**	**4,734,300**	**196.7%**	**100.0%**
COSTS					
Land Purchase Cost	113,500,000	39,396	893,701	37.1%	18.9%
Land Transaction Costs	-	-	-	0.0%	0.0%
Construction (incl. construct. contingency)	134,012,647	46,516	1,055,218	43.8%	22.3%
Professional Fees	10,275,625	3,567	80,910	3.4%	1.7%
Statutory Fees and Contributions	-	-	-	0.0%	0.0%
Project Contingency (Project Reserve)	-	-	-	0.0%	0.0%
Land Holding Costs	-	-	-	0.0%	0.0%
Finance Charges (including line fees)	-	-	-	0.0%	0.0%
Interest Expense	63,933,804	22,192	503,416	20.9%	10.6%
Miscellaneous Costs	-	-	-	0.0%	0.0%
TOTAL PROJECT COSTS (before GST reclaimed)	321,722,076	111,670	2,533,245	105.2%	53.5%
Less GST Credits Reclaimed	(16,010,507)	(5,557)	(126,067)	-5.2%	-2.7%
TOTAL PROJECT COSTS (after GST reclaimed)	**305,711,569**	**106,113**	**2,407,178**	**100.0%**	**50.8%**

PERFORMANCE INDICATORS		
Net Development Profit [1]	**295,544,473**	
Development Margin (or Profit/Risk Margin) [3]	87.56%	on total development costs (including selling costs).
Residual Land Value (Target Margin) [4]	197,008,828	(at 27% target development margin)
Maximum Debt Exposure	174,685,317	
Debt to Value Ratio	25.50%	
Date of Maximum Project Overdraft	Oct-2006	(Quarter 7)
Breakeven Date for Project Overdraft [5]	Jan-2012	(Quarter 28)
Breakeven Date for Cumulative Cash Flow [6]	Jan-2012	(Quarter 28)
Net Present Value [7]	**23,006,048**	(at 18% per ann. discount rate, nominal)
Benefit Cost Ratio [8]	1.1282	(at 18% per ann. discount rate, nominal)
Project Internal Rate of Return (IRR) [9]	**20.94%**	(per ann. nominal)
Residual Land Value (based on NPV) [10]	137,232,612	

The residual land value using the DCF approach is $137.2m while the development margin is $197m.

Residual land Value using IRR on equity- Case Study 2d

The above model Caste Study 1c was rerun with a 15% equity contribution ($22m). The IRR on equity was 25% if all the equity was retained to end of the project. This is an unrealistic

scenario/assumption as the equity is available for payback from Year 7. If equity is drawn down as available, the IRR on Equity jumps to 32% p.a.

Such an equity return is considered high for such a long term project. Possibly a rate closer to 30% might be considered more appropriate. If the target rate for the IRR on equity falls to 30% the residual land value climbs to $155. Please refer to Appendix L for details of the model outcome. The summary of financial results for Case Study 1d is as follows:

Figure 14 - Cast Study 1d

COSTS & REVENUES	$ Total	$ Per dwelling	$ Per ha	% of Cost	% of Revenue
REVENUE					
Total Sales Revenue	685,041,683	237,779	5,394,029	180.9%	113.2%
Less Selling Costs	(31,827,305)	(11,047)	(250,609)	-8.4%	-5.3%
NET SALE PROCEEDS	653,214,377	226,732	5,143,420	172.5%	108.0%
Rental Income	-	-	-	0.0%	0.0%
Less Outgoings	-	-	-	0.0%	0.0%
Less Letting Fees	-	-	-	0.0%	0.0%
Less Incentives (rent free and fit out costs)	-	-	-	0.0%	0.0%
NET RENTAL INCOME	-	-	-	0.0%	0.0%
INTEREST RECEIVED	-	-	-	0.0%	0.0%
TOTAL PROJECT REVENUE (before GST paid)	653,214,377	226,732	5,143,420	172.5%	108.0%
Less GST paid	(48,185,608)	(16,725)	(379,414)	-12.7%	-8.0%
TOTAL PROJECT REVENUE (after GST paid)	**605,028,770**	**210,007**	**4,764,006**	**159.8%**	**100.0%**
COSTS					
Land Purchase Cost	155,000,000	53,801	1,220,472	40.9%	25.6%
Land Transaction Costs	-	-	-	0.0%	0.0%
Construction (incl. construct. contingency)	134,012,647	46,516	1,055,218	35.4%	22.1%
Professional Fees	10,275,625	3,567	80,910	2.7%	1.7%
Statutory Fees and Contributions	-	-	-	0.0%	0.0%
Project Contingency (Project Reserve)	-	-	-	0.0%	0.0%
Land Holding Costs	-	-	-	0.0%	0.0%
Finance Charges (including line fees)	-	-	-	0.0%	0.0%
Interest Expense	95,347,785	33,095	750,770	25.2%	15.8%
Miscellaneous Costs	-	-	-	0.0%	0.0%
TOTAL PROJECT COSTS (before GST reclaimed)	394,636,057	136,979	3,107,371	104.2%	65.2%
Less GST Credits Reclaimed	(16,010,507)	(5,557)	(126,067)	-4.2%	-2.6%
TOTAL PROJECT COSTS (after GST reclaimed)	**378,625,550**	**131,422**	**2,981,304**	**100.0%**	**62.6%**

PERFORMANCE INDICATORS		
Net Development Profit [1]	**226,403,219**	
Development Margin (or Profit/Risk Margin) [3]	55.16%	on total development costs (including selling costs).
Residual Land Value (Target Margin) [4]	190,747,423	(at 27% target development margin)
Maximum Debt Exposure	197,471,827	
Debt to Value Ratio	28.83%	
Date of Maximum Project Overdraft	Oct-2006	(Quarter 7)
Breakeven Date for Project Overdraft [5]	Apr-2016	(Quarter 45)
Breakeven Date for Cumulative Cash Flow [6]	Jul-2012	(Quarter 30)
Net Present Value [7]	**(17,223,448)**	(at 18% per ann. discount rate, nominal)
Benefit Cost Ratio [8]	0.9221	(at 18% per ann. discount rate, nominal)
Project Internal Rate of Return (IRR) [9]	**16.16%**	(per ann. nominal)
Residual Land Value (based on NPV) [10]	137,232,612	
IRR on Equity [11]	30.08%	($22m Equity Contributed)
Equity : Debt Ratio:	11.14%	
Profit : Equity Ratio	1029.11%	

In conclusion, the return on equity resulting from the leverage of cheaper borrowed funds justifies a higher residual land value. In the case where a developer is limited by the availability of equity, analysis of the return on equity makes sense.

Based on discussions with developers, I consider a prudent developer will look at all performance measures including their development margin, project IRR and IRR on equity.

In the case of such a long term project, unlike possibly the prudent valuer, a commercially minded developer will consider the probability of real property price growth and the performance of their equity and minimisation of market risks associated with delayed staging. Based on these assumptions, my research would suggest that if such a site was put to the market on a competitive tender basis the higher residual land value of $137m to $155m might be achieved.

Of course one important factor overlooked in this analysis is the risk of site decontamination. This can not only provide a cost uncertainty but also a timing uncertainty. Discussions with developers show a significant risk aversion to accepting any site risk of contamination. For the purpose of this research I have assumed a cleaned site or an undertaking by the landowner that the site is fully remediated or that cost is capped with no impact to staging.

9. CASE STUDY 3

Background

Case Study 3 is a hypothetical development case study designed to test the impact of increased time periods on the performance hurdles of the Development Margin, Project IRR and IRR on equity.

A matrix of variables and their outcomes have been analysed as follows:

Project Time	4yrs, 8yrs and 16yrs
Cost Escalations	0% & 3%
Revenue	0% & 3%
Equity	Nil Equity and 15% of total funding required using 3% escalation

Costs and revenues and timings have been based on a typical land subdivision as follows:

1. Land purchase price estimated using a financial model that includes 3% cost and revenue escalation and a 20% Project IRR Hurdle Rate
2. 100 lots developed per stage per anum
3. Cost (including contributions) per lot of $70,000
4. Development management fee of 1.5% on sales
5. Selling, legal and marketing 4.7% of sales
6. Average lot sale price of $225,000

Note that as I have increased the time period I have increased the number of lots developed so that the project remains viable. For example for the 4 year project I have assumed 300 lots while for 8 years 700 lots and for 16 years 14000. Consequently the value of the hypothetical site increases as the size increases. This increase is not linearly proportional to the lot size because of the time value of money. Adopting a 20% Project IRR hurdle rate the residual land values for the 3 hypothetical sites are $25m, $44.6m and $60m respectively.

A sample of one of the financial models used for Case Study 3 is attached in Appendix-M. I have grouped the outcomes into 3 tables referring to the years of the project. The tables are 4 years, 8 years and 16 years. For the hurdle rates I have assumed the following ranges:

Development margin	25-to 30%
Project IRR	16% to 20%
IRR on equity	25% to 35%

Performance hurdles that fall outside that range I have highlight light-green in the tables.

The results of this analysis are as follows:

For a 4 year Period

Escalation	Equity	DM	Project IRR	IRR on Equity
0%	$0m	18.5%	16.42%	n.a.
0%	$8m	23.8%	16.42%	25.5%
3%	$0m	27.54%	20.4%	n.a
3%	$8m	32.9%	20.4%	31.5%

For a 8 year Period

Escalation	Equity	DM	Project IRR	IRR on Equity
0%	$0m	31.0%	16.0%	n.a.
0%	$8m	36.9%	16.0%	21.2%
3%	$0m	49.8%	20.0%	n.a
3%	$8m	55.7%	20.0%	25.6%

For a 16 year Period

Escalation	Equity	DM	Project IRR	IRR on Equity
0%	$0m	56.6%	15.84%	n.a.
0%	$9.4m	100.0%	15.84%	22.5%
3%	$0m	97.8%	20.0%	n.a
3%	$9.4m	105.7	20.0%	28.8%

The conclusions that can be drawn from this controlled financial modelling experiment are as follows:

1. As the time period extends, the development margin approach becomes exceedingly difficult to fall within known parameters of comparable hurdle rates. The failure to identify the time value of money is evident

2. The inclusion of equity and escalations further erode the viability of using the development margin as a yardstick for such longer term projects.

3. The project IRR before interest recognises the time value of money and is not sensitive to the cost of funds or the amount of equity. As a standard variable this has the attraction of comparing a number of projects with varying funding and equity. It is a fair reflection of the project performance excluding financing requirements.

4. Notwithstanding the above observation of comparability, financing requirements are a real factor influencing a developer's decision or attraction to undertake a project. The amount of equity required, the cost of finance and ability to draw down profits are key factors in assessing a project when compared to another project. I consider not to factor the financial impact is to ignore an important component of the project and its risk/reward relationship.

5. The IRR on equity recognises both the time value of money as well as the performance of the equity and impact of financing. The fact that IRR on equity varies according to the percentage of gearing and the cost of borrowing should not be viewed as a shortcoming but an advantage to assess the actual performance of your equity funds invested and the sensitivity of that profit to the key variables.

6. The issue relates to setting a standard set of variable so as to test what value the market will put on the development site. As shown in this research this may vary according to the financial position of the developer. A recommendation for industry debate is that as a valuer or tenderer for a development site, one should anticipate the typical financial profile of the developer and model the feasibility/valuation accordingly. In the case of large phased developments it is the amount of equity required and the ability to drawn down profits during the course of the project that is a key consideration for a developer and the price they are willing to pay to win this project.

7. Consequentially analysis of the IRR on equity and the optimisation of the equity drawn in the cash flow is an important consideration of modelling and pricing. In other development scenarios (eg short term projects) this may be less relevant and the project IRR or the static development margin may be the tool that the market uses to price their acquisition and hence those may be more appropriate.

8. The conclusion is that the valuer or the tenderer need to put themself in the mind of the likely purchaser(s) and understand in cash flow terms what is relevant to them and what benefits/risks they perceive. The IRR on equity may well be a useful tool to estimate the residual land value a developer might be willing to pay for a site. In the case of large phased development with or without a structured deal arrangement, a conclusion of this research paper is that is the IRR on equity that may be the key performance yardstick or hurdle that will set the purchase price for the successful bidder. The key point is that the return on equity is not simply a financing matter but rather a fundamental question on the performance of your investment namely – the NPV of capital invested being your equity and NPV of the future cash flow stream net of interest costs and taxes – is your real investment performance. In an efficient market of capital investment this will be the main determinant of market value.

10. Conclusions/Recommendations

1. For large phased development sites the most commonly used valuation methodologies adopted by valuers is the residual land value method using either the development margin or DCF approach coupled with direct comparison approach of comparable sales analysis.

2. For the residual land valuation approach, valuers typically adopt a static model (zero cost /revenue escalation) irrespective of how long a project may extend or any market forecast for price escalations. Likewise valuers generally assume nil equity (100% borrowings) despite the fact that most development projects require equity to be fundable.

3. In the case of adopting the development margin approach, valuers and developers have adopted a higher development margin for longer term projects. Short term projects of 1 year have a development margin of around 15% - 18% while long term projects may have a development margin of 30%. Research by this paper suggests that this is not a reflection of the added project risk of the longer term project but rather a financial calibration to account for the time value of money of the developer's funds employed. Surprisingly this simplistic approach can be fairly accurate for project up to about four years as the progressive drawn of funds over time tends to halve the effective time period while the development margin is effectively doubled. The net result is an nominal annual return of 15% per annum which is similar to the short term margin. Clearly this approach has shortfalls for project terms extending over 4 years or where the progressive drawn of funds vary significantly from year to year.

4. Direct comparison of comparable sales still remains an important reality check if they can be identified. The difficulty with large projects is that sale evidence is not only thin but comparability is poor due to many variables relating to such things as site decontamination, masterplan requirements, timing issues and social infrastructure requirements such as public transport, affordable housing and environmental restoration. With such diverse variables from project to project, price comparability is hard to establish.

5. Valuers that have adopted DCF approach to residual land valuation have also tended to use a static model approach with a fairly constant discount rate or IRR hurdle rate off 18% to 20% irrespective of the project term. Since the internal rate is a before interest calculation, whether equity is injected in their model or not is irrelevant. This approach is becoming more common with the advance of computer feasibility models such as Estate Master.

6. Likewise a developer in doing their feasibilities generally adopts the DCF residual land approach with the development margin as a second hurdle. That is to say the project must pass a certain development margin hurdle (16% to 22%) as well as the IRR hurdle. The NPV at the required discount rate is used to determine the residual land value rate. The common discount rate range used by the industry is 16% to 22%. Longer term projects tend to fall in the lower IRR target range because of ability to defer market risk.

7. A significant departure from valuers is that developers are more willing to adopt escalations in their feasibility modelling. The rates of escalation tend to be conservative with cost and revenues generally set to the CPI outlook of 2.5% to 3%. In some cases the revenue might be adjusted to reflect a current forecast of no growth for 1 or 2 year but then revert to a CPI growth rate.

8. Research by this paper shows the long term trend for house prices is an escalation of 2-5% over CPI. This shows that all examples of feasibility modelling tend to be conservatively based in forecasts.

9. More sophisticated developers, typically those listed on the stock exchange with large shareholdings; tend to look to their return on equity (capital) as their main yardstick for pricing a project. Their hurdle rate for internal rate of return on equity is 25% to 35% which is higher than the project IRR (before interest) hurdles of 18% to 22%. The higher hurdles are achievable because of the leverage impact of borrowed funds which are cheaper than the Project IRR achievable. If not, the project is not feasible.

10. Where projects require sizeable equity injections, The IRR on Equity would appear to provide a more consistent result reflecting not only the time value of money but a more direct measure of the return on funds which can be used as pricing mechanism for the acquisition of a project.

11. The IRR on equity, with careful attention to cash flow management of equity, can return a higher deemed land value in some cases. This is particularly true in long term projects that provide the opportunity to delay equity input or allow early withdrawal of equity and profit on a phased basis.

12. This is also evident in structured deals where the government might retain ownership of the land and the developer funds the infrastructure. This reduces the amount of equity required and the financial risk of the project if the site can be phased and developed to suit market conditions. By the appropriate sharing of risk (government holding the land, the developer taking the construction risk) and the blending of different costs of capital (government lower cost lower risk; developer higher cost higher return), a structured deal provides a more efficient frontier of investment to optimism both groups investment of capital.

13. It would appear that the development margin and Project IRR before interest undervalue the benefit of such large phased projects and/or structured deals and that the IRR on equity is likely to be a better reflection of market pricing.

14. It is suggested that valuers and developers for large phased projects will adopt the IRR on equity as a cross check method in their analysis as a standard practice to more accurately assess market value. Furthermore they should consider the long term CPI escalations in their modelling including and a commentary on real cost/revenue escalation with a separate model run to reflect its impact on the profit/residual land value. This will provide for a more informed market valuation.

15. In time it might be considered that the IRR on equity for major projects will become the primary method of pricing rationale.

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APPENDIX 1 - TERMINOLOGY AND ABBREVIATIONS

API - Australian Property Institute
Direct Comparison Method Direct comparison method compares sale prices with comparable or similar properties and makes adjustments for differences in property characteristics that may affect value.
Development Margin = (Net Profit/Total Development Cost) x 100 %
Deem Land Value is value deemed (agreed) to be value of land contributed to a joint venture. This is typically the market value but the terms of the joint venture may warrant a variation to this value.
In globo or Englobo is land who highest and best use is subdivision into smaller parcels from its existing use.
Internal Rate of Return (or Project IRR) is the discount rate at which the sum of the discounted negative cash flows equals the discounted positive cash flows, that is when NPV equals zero. Interest on borrowings is ignored since this is incorporated in the discount rate.
Internal Rate of Return after Interest is the same as the IRR except that interest on debt is included as a cost. Whilst it is commonly used in the industry this indicator does not follow sound principles since borrowed money is not included as a cash inflow. That is incorporating interest expense in both the cash outflow and the discount rate is a form of double counting.
Internal Rate of Return on Equity is the same as Project IRR except that it measures only the return on equity contributed to the project where the project is funded by both debt and equity. It is a common performance measure for developers and investors, particularly for comparing different investment options.
Net Present Value (NPV) is the sum of the present values of all project cash inflows and outflows over the life of the project. A positive NPV infers a return greater than the discount rate. Interest on borrowing's and interest received on re-investment of surplus funds and equity is ignored since this is incorporated in the discount rate.
Residual Land Value (RLV) is the maximum price that a hypothetical developer would pay for the land to achieve acceptable hurdle rates based on the most probable development option for the land.

APPENDIX 2 - BIBLIOGRAPHY

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