

# 16<sup>th</sup> Pacific Rim Real Estate Society Conference Wellington, New Zealand

24-27 January 2010

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**Title of Paper:** Dual Rate Taxed Valuation: A More Rational Approach

**Keywords:** Freehold, leasehold, valuation, taxation consequences

## **Abstract**

There has been a lot of criticisms on the Dual Rate approach, such as the concept of recoupment of the initial investment outlay, the setting up of a low yield sinking fund and related tax issues, etc. (Baum et al, 2006). One big problem with the traditional valuation approach is where there is variable profit rent. Valuing varying profit rents by the Dual Rate method will result in error caused by the so called "Double Sinking Fund" problem. Various methods such as the "Double Sinking Fund" method" by Davidson, "Sinking Fund Method and "Annual Equivalent Method" by Greaves and Pannell's method, etc. were introduced to redress this issue (Bowcock, 1983). Despite the modifications made by these methods, nevertheless, Mackmin (2008) claims that the dual rate method is now defunct.

Inspired by Mackmin's work, this paper re-visits the problems of taxation consequences of sinking fund in the UK. It looks at what is believed to be the only rational reason for using the Dual Rate adjusted for tax method variant. It confirms that the traditional method is not satisfactory even after the modifications made by the various methods mentioned above. The Single Rate Net of Tax approach is proved to meet all expectations and can be regarded as a more rational approach to the Dual Rate method.

## Introduction

Mackmin (2008) provides a detailed review of the dual rate valuation method and suggests that this method is defunct because of the flawed “reinvestment principle”, and other shortcomings summarised by Baum et al (2006). The authors of this paper fully agree with this proposition. This paper does not intend to further investigate the problems with the dual rate valuation method. It concentrates on what is believed to be the only rational reason for using the Dual Rate adjusted for tax method variant. It is submitted that this method has the logic of allowing valuers to retain the gross of tax remunerative rate for the purposes of bring cross comparability with valuations of freehold or long leasehold interests.

The structure of this paper is:

1. Valuing a freehold and a leasehold interest by the single rate gross and net of tax approaches to show the logic that works with freehold valuation interest may not work with leasehold valuation.
2. Exploring the tax impacts on sinking fund.
3. Resolving the taxation issue of sinking fund.
4. Demonstrating the solution to the “Double Sinking Fund Problem” by the Greaves method and the Single Rate Net of Tax approach.
5. Exploring the future of the dual rate theory.
6. Conclusion.

It is concluded that if valuers accept that the only justification for a Dual Rate adjusted for tax valuation is the taxation difficulties that surround recoupment of capital, then the same valuation can be achieved using Single Rate valuation of the net of tax income. From that conclusion we suggest that valuers of the “UK School” might consider that not only should Dual Rate valuation be regarded as defunct, but also that the more appropriate approach might be to move to a net of taxation approach. Such an approach would unite the “UK School” with the “US School” and would be a more appropriate method in a globalised valuation environment.

## Gross v. Net of Taxation Valuation

Consider a freehold interest yielding a gross of tax income of \$100,000 per annum where comparable evidence indicates a gross of tax yield of 8%. The value would be:

### Gross of tax approach

Income	100,000	
YP perpetuity @ 8%	<u>12.5</u>	
Value		1,250,000

Assuming tax at 30%, the net of tax income is \$70,000 and the equivalent net of tax yield would be 5.6% (i.e.  $8\% \times (1-0.30)$ ). On a net of tax yield basis the value would be:

### Net of tax approach

Net of tax Income	70,000	
YP perpetuity @ 5.6%	<u>17.8571</u>	
Value		1,250,000

The two results are the same. The traditional valuers, rightly concluded that there was no point using a net of tax income basis as it begged the question, “Which rate of tax should I use in an environment where different rates of taxes are paid by different investors?”

When considering the tax rate to be used, there were certainly difficulties in selecting the rate. In the early 1970s in the UK, the rate of tax paid on properties held by companies varied with distribution policy. Private individuals who were most likely property purchasers paid tax at 83% on earned income plus a 15% investment income surcharge. Charities paid no tax. The tax rate adopted for Dual Rate adjusted for tax valuation tended to be the company rate of tax of 40% except where the property was likely to appeal to tax exempt bodies where the “plain vanilla” Dual Rate basis was used.

The following example demonstrates the case of a leasehold valuation using the single rate method as per freehold valuation. With a leasehold profit rent interest yielding the same income for 5 years, the two valuations would be:

Gross of tax approach

Income	100,000	
YP 5 years @ 8%	<u>3.9927</u>	
Value		399,270

And:

Net of tax approach

Assuming a tax rate of 30%		
Income [100,000 x (1 – 0.3)]	70,000	
YP 5 years @ 5.6% [8% x (1 – 0.3)]	<u>4.2586</u>	
Value		298,102

The two results are not the same. The difference in valuation varies according to the length of term, with greater and greater disparity being evidenced with short term leasehold profit rents. It highlights the fact that the logic that applies to freehold valuation may not equally apply to leasehold valuation.

**Tax Impact on Sinking Fund**

In the UK, leasehold interests are traditionally valued by the Dual Rate method, which is based on the concept of comparing leasehold to freehold investments and the need to recoup the investment capital at the end of the leasehold investment period by setting aside a sinking fund. Early writers (such as Davidson, 1968; Greaves, 1969; Trott, 1980; Baum, 1983 & Bowcock, 1983, Baum & Butler, 1986, etc.) pointed to the sinking fund as being the source of the disparity in valuation. The problem is more acute when the leasehold interest is subjected to varying profit rents. Various methods such as the “Double Sinking Fund” method by Davidson, and “Sinking Fund Method and “Annual Equivalent Method” by Greaves and Pannell’s method, etc. were introduced to redress the issue (Bowcock, 1983). The modified methods are, however, dismissed by the RICS report (Trott, 1980 cited by Baum & Yu, 1985) as “not practical”, and rejected by practitioners for being too academic and too complex (Mackmin, 2008).

Mackmin (2008) advocates using the cash flow approach or the Single Rate approach to value leasehold interest. The cash flow approach is widely used in the USA. It is however relatively more complex to apply even with the assistance of a computer. In contrast, the Single Rate approach is simpler and easy to apply. Researchers such as Trott (1980), Enever (1981) and Baum & Yu (1985), etc. support the use of this method. The return of capital after tax is the corner stone of

the Dual Rate method. The Single Rate approach, as demonstrated in the sections below, can satisfy the Dual Rate valuation requirement that it passes the “twin test” of securing the required return on capital and the required return of capital after tax.

However, valuers in the UK School were wedded to the concept of valuing gross of tax incomes at gross of tax yields in order, one suspects, that they could cross compare yields from freeholds with yields from leaseholds.

The preference towards valuing gross of tax incomes at gross of tax yields produces the conundrum whereby the valuation using a Single Rate basis would result, after tax, in **either** a failure to recoup capital **or** would result in a net of tax return that was less than the net of tax single rate yield.

In the example below, the gross income of the leasehold interest is valued at gross of tax yield with the Single Rate approach.

Income	100,000	
YP 5 years @ 8%	<u>3.9927</u>	
Value		399,270

Next the twin test (i.e. test for return of and return on capital) is used to check the impacts of tax on leasehold valuation.

**Check**

Net of Tax Income (10000 x (1 – 0.3))	70,000*	
Required return @ 8% of 399,270	<u>31,942</u>	
Balance for SF	38,058	
Amt \$1 p.a. 5 years @ 5.6%	<u>5.5922</u>	
Capital recouped		212,831

(Note: \* net of tax income is used to reveal the actual amount available for capital recoupment)

**OR:**

Net of Tax Income	70,000	
ASF to Replace \$399,270 in 5 yrs @ 5.6%	<u>71,397</u>	
Return	-1,397	
Return % of Value		-0.35%

The example highlights that the tax problem for leasehold is twofold:

1. Taxation reduced the balance available for the sinking fund, and
2. Taxation reduced the return on the sinking fund.

**Resolving the Taxation of Sinking Fund Issue**

We may, following Mackmin’s logic, set aside as probably irrelevant the view that sinking fund yields were regarded as different from required rates of return. But there remains the question of cross comparability with (gross) freehold yields. To bring comparability, the appropriate approach to the taxation issue is one that preserves the gross remunerative rate of return whilst allowing for tax adjusted accumulative rate of return on the grossed up sinking fund contribution required to recoup capital.

This leads to the following Dual Rate approach Years Purchase (YP) formula:

$$YP = \frac{1}{\left\{ i + ASF \left[ \frac{1}{1-i} \right] \right\}}$$

where  $i$  = leasehold yield;  $t$  = tax rate

$ASF$  = Annual Sinking Fund at the net of tax rate of return.

Consider the same leasehold interest scenario. The valuation using Dual Rate adjusted for tax method is as follows:

Income	100,000	
YP 5 years @ 8% & 5.6% (Tax 30%)	<u>2.9810</u>	
Value		298.102

#### Check (Using Twin Test)

Net of Tax Income	70,000	
Required return @ 5.6% of 298.102	<u>16,694</u>	
Balance for SF	53,306	
Am \$1 p.a. 5 years @ 5.6%	<u>5.5922</u>	
Capital recouped		298,102

#### OR:

Net of Tax Income	70,000	
ASF to Replace \$298,102 in 5 yrs @ 5.6%	<u>53,306</u>	
Return	16,694	
Return % of Value		5.6%

It can be seen that using the Dual Rate adjusted for tax method, the valuer could compare the 8% yield with the yield that was being used on the previous freehold valuation. There was no need to specify or assume whether the quoted yield was gross or net of tax or to address the issue of netting down the rentals or to address the vexed issue of what tax rate to use. All valuations used gross of tax incomes and used gross of tax yields. It was just that with leasehold valuations the valuer could simply use dual rate valuation tables.

The twin test above also shows that if the valuation is done on a Single Rate Net of Tax basis, i.e. using net of tax yield on net of tax income basis, the requirement for return of and return on capital is satisfied.

#### Double Sinking Fund Problem

When the profit rent is fixed, the Dual Rate adjusted for tax approach may be an adequate solution to the problem of how to value gross of tax incomes at gross of tax yield whilst preserving the ability to recoup a sinking fund at net of tax yields on net of tax incomes. Alternatively, a Single Rate YP approach using net of tax income and yields would have worked just as well. However, there was a pre- and post-War tendency for shorter and shorter occupational leases granted out of the many thousands of longer head leases that existed throughout the UK (Scott, 1996). This tendency, plus post War significant inflation in rental values, led to the problem of how to value variable profit rents. That problem was known as the "Double Sinking Fund Problem".

There are no less than four methods put forward for resolving the Double Sinking Fund Problem; the "Double Sinking Fund method", the "Sinking Fund method", "Annual Equivalent method", and "Pannell's method". These four methods were analysed by Harker et al (1991) who found in favour of the Greaves approach (i.e. the Sinking Fund Method). That approach with variable profit rents passed the twin test of producing a valuation that secured the exact required return on capital together with the exact return of capital.

However, the Greaves approach is complex and the final solution to the Double Sinking Fund problem is not to use it at all! The Greaves approach certainly derives a valuation that can be demonstrated as being correct. However, we now demonstrate below that precisely the same valuation can be arrived at by using Single Rate valuation of the net of tax income using net of tax yields (i.e. the Single Rate Net of Tax approach). That approach, being a Single Rate approach, avoids the Double Sinking Fund problem, which was essentially caused by multiplying Dual Rate YPs by non tax adjusted Present Values.

The Greaves approach is demonstrated in the following example. Readers who are unfamiliar with the Greaves approach may refer to the work of Harker et al (1991) for detailed explanation.

Consider the following rising leasehold income stream:

Term 1	5 years	Sublease Rent Term 1	\$50,000.00
Term 2	5 years	Sublease Rent Term 2	\$150,000.00
Term 3	10 years	Sublease Rent Term 3	\$250,000.00
Head Rent	\$10,000.00	Tax	30%
Cap Rate	8.000%	SF Rate	5.600%

The following shows the classic layout of the Greaves approach:

Income Term 1	40,000		
Amt \$1p.a. 5 years @ 5.6%	5.59		
Amt \$1 5 years @ 5.6%	1.313165883		
Amt \$1 10 years @ 5.6%	<u>1.724404637</u>		
Accumulated Term 1			\$506,530.01
Income Term 2	140,000		
Amt \$1p.a. 5 years @ 5.6%	5.59		
Amt \$1 10 years @ 5.6%	<u>1.724404637</u>		
Accumulated Term 2			\$1,350,061.75
Income Term 3	240,000		
Amt \$1p.a. 10 years @ 5.6%	<u>12.94</u>		
Accumulated Term 3			<u>\$3,104,591.30</u>
Sum of Accumulation		∑ =	\$4,961,183.06
Tax Adjustment factor			1.428571429

[1/(1 – 0.30)]

Rate Term 1	8.000%		
Amt \$1p.a. 5 years @ 5.6%	5.592248		
Amt \$1 5 years @ 5.6%	1.313166		
Amt \$1 10 years @ 5.6%	<u>1.724405</u>		
Accumulated Rate Term 1		1.013060	
Rate Term 2	8.000%		
Amt \$1p.a. 5 years @ 5.6%	5.592248		
Amt \$1 10 years @ 5.6%	<u>1.724405</u>		
Accumulated Rate Term 2		0.771464	
Rate Term 3	8%		
Amt \$1p.a. 10 years @ 5.6%	<u>12.935797</u>		
Accumulated Rate Term 3		<u>1.034864</u>	
Present Value Adjustment factor		∑ =	4.247959

**Value**

(divide Sum of Accumulation by PV Adjustment factor) **\$1,167,898.04**

The Single Rate valuation of the same net of tax income stream using the net of tax required return is as follows:

<b>Term 1</b>			
Income	\$40,000.00		
Tax	<u>\$12,000.00</u>		
Net Income		\$28,000.00	
YP 5 years @ 5.6%		<u>4.258600</u>	
Value of Term			\$119,240.79
<b>Term 2</b>			
Income	\$140,000.00		
Tax	<u>\$42,000.00</u>		
Net Income		\$98,000.00	
YP 5 years @ 5.6%		<u>4.258600</u>	
		\$417,342.78	
PV 5 years @ 5.6%		<u>0.761518413</u>	
Value of Term 2			\$317,814.21
<b>Term 3</b>			
Income	\$240,000.00		
Tax	<u>\$72,000.00</u>		
Net Income		\$168,000.00	
YP 10 years @ 5.6%		<u>7.501602</u>	
		\$1,260,269.12	
PV 10 years @ 5.6%		<u>0.579910294</u>	
			\$730,843.03

## Valuation

**\$1,167,898.04**

Clearly the Single Rate valuation approach is more user-friendly and easier to understand than the Greaves Approach. We have previously demonstrated that the Single Rate approach passes the twin test of securing the desired rate of return on capital and the return of the capital invested. Although there is no explicit allowance for a sinking fund, it can be easily proved that the Single Rate method incorporates an inherent sinking fund at the remunerative rate.

In the above example, a single yield is used throughout and the approach is thus analogous to a net of tax IRR obtained from non inflation adjusted cash flows. If one uses variable rates of return, care should be taken to discount the reversions at the term yields and not make the fundamental error of discounting at reversion yields Harker et al (1991).

An advantage of this Single Rate approach is that it can easily be implemented with financial calculators and spreadsheet programs without the need for custom formulas or user defined functions. If a single yield is used throughout, the method can also be easily implemented in a DCF format.

Comparability of the net of tax yield with gross yields which valuers may apply to valuing freeholds can be achieved by netting down the gross yield thought to be applicable. The single rate approach using net yield on net income should be used to replace the Greaves approach **as long as we accept the view that the only raison d'être of the dual rate approach is to adjust the method for the adverse taxation of income set aside for the sinking fund and income within the sinking fund.**

The Greaves approach is more flexible if one departs from that adverse tax raison d'être and accepts the view that the accumulation of the sinking fund should be at a more secure rate. That view was explored and rejected by Mackmin (2008).

Greaves (1969) and Harker et al (1991) had all failed to note the equivalence of the Double Sinking Fund corrected approaches with Single Rate valuation **in cases where the Sinking Fund rate was the net of tax required rate of return.** That point had also been missed by earlier valuation texts of Lawrence & May (1943) and Baum & Mackmin (1981). In more recent valuation text such as that by Baum, et al, (2006), the advantages of the single rate net of tax approach are recognised and the approach is introduced in the leasehold valuation chapter.

The complexity of the Greaves approach is only required if one is accepting the hypothesis that the sinking fund rate is other than the net of tax remunerative rate.

That hypothesis is questionable for all of the reasons submitted by Mackmin (2008) not the least of which is that there is no evidence that sinking funds are indeed used by market buyers of leasehold profit rents.

### **The Future of Dual Rate Theory**

The only reasons that the authors believe can be valid for continuation of use of Dual Rate theory are:

1. The market continues to use Dual Rate valuation in its assessments of value and that bidders using that method represent the market value purchasers.

2. That the appropriate method of valuation of income is to use and quote gross of tax yields applied to gross of tax incomes.

In Australia, there is no evidence to show that the market value purchasers use the Dual Rate theory in deriving their bids. Whipple (2006) states in his valuation text that “[s]inking funds derived from UK valuation practice ... are not used by the property industry in Australia”. “It makes no sense for an investor to place funds in an account which earns interest less than the investing cost of capital.” We should, however, point out that in Australian State Capitals for historic and legislative reasons, there are far fewer leasehold interests granted out of longer leases.

Even in the UK, Dual Rate adjusted for tax valuation of short leasehold interests was discarded by market value bidders as early as 1980. By that time the market value bidders for short leases had moved from Dual Rate (Taxed) to Dual Rate (No Tax) approaches and from there to Single Rate Valuation in a Discounted Cash Flow matrix. This movement was not one induced by valuers who had “seen the light” and had rejected Dual Rate theory. It was driven by the major purchasers of leasehold profit rents who were charities or otherwise tax exempt funds. They possessed a major advantage of buying at values that were heavily discounted because of the tax handicap which they did not suffer from. In competition with other charities, they bargained away part of the higher return than that obtained from “normal” (non short leasehold) investments. Often the purchase of the short leasehold profit rent went hand in glove with a leaseback to the occupier at full open market rental.

Whether or not Dual Rate Taxed valuation is used for the valuation of occupational leases is a matter for research into current market practice. Based upon that research, academics may well conclude that Dual Rate theory should be consigned to historical texts on valuation theory.

The question remains as to whether the UK School approach of valuing gross incomes at gross yields is the method to be used. Again, that is a matter for research into the current practice of the market value bidders.

The US School of valuation uses Discounted Cash Flow method to value leasehold interest (North, 1984; Keating, 1998, Fisher & Martin, 2004, etc.). It certainly has no problem with valuing net of tax incomes. The differences of tax rates of different individuals are absorbed into assessments of worth. Those assessments become market value if that assessment of worth is the assessment made by the market value bidder.

Perhaps the reason for the US School approach was that valuers had to face much earlier not just differences in taxes between individuals but also differences between States where taxes were different. In other words, the United States had to address the problem of cross border comparability of investments much earlier than did the UK School. That is now a factor that valuers are facing with the globalisation of the market for property.

The authors believe that it is presumptuous of academics to consign any method of valuation to the dustbin. Academics and texts may well use normative and positive approaches<sup>1</sup> to discussion of method. We believe that the positive approach to valuation should be the predominantly emphasised approach of texts and teaching. In other words we should be asking, “What is / are the methods being used by the

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1. In this context we borrow the language of economists who refer to “positive” as being “what is” and “normative” as being “what should be.”

market value bidders in deriving the figure that they have decided to bid.” In a valuation context, the alternative approach of asking, “What method **should** the market be using?” is interesting but irrelevant except for the purposes of deriving what “we” should bid.

Our UK valuation contemporaries may advise what their research into current market practice shows as the approach actually used by market value bidders

### **Conclusion**

The problems with the Dual Rate valuation lie in the reinvestment assumption via the inclusion of a sinking fund. The problems are more serious when varying incomes are to be valued. Various writers have pointed out that the reinvestment assumption has no footing in the contemporary property market. Valuers in the US and Australia simply do not use this method.

In Australia, anecdotally it appears that internally, institutions are not using Dual Rate Method to make their own assessments of worth before determining if and what they will bid. Their valuations are fully tax adjusted. This needs further research.

To use the cricket analogy used by Mackmin (2008), the Dual Rate theory argument looks more likely to be a series of one day matches rather than a single day match. But the umpire here needs to research into the practice of the market bidder rather than the opinion of the cricket coach as to how a particular ball should be bowled.

The Single Rate Net of Tax Approach is a rational valuation method and simple to apply. As there is an inherent sinking fund at the remunerative rate to recoup the capital in this method, it meets the expectation of those valuers who insist that a sinking fund must be an integral part in the valuation. For valuers who are not comfortable with following their American counterparts to use the cash flow approach, the Single Rate Net of Tax Approach is the best alternative to the Dual Rate valuation method.

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