MODULE NO III

DENIS H CAMILLERI
VALUER DHI PERITI - dhc@dhiperiti.com
KAMRA TAL-PERITI

OCTOBER 2013

RENTAL MATTERS

Reading: 3 – 1 Rental Matters

RENTAL PROPERTY 2013

RENTAL PROPERTY 2013 – TABLE 1

	1Bed/r			2 Bed/r			3 Bed/r			average
	Market Price	Rent €/month	Yield %	Market Price	Rent €/month	Yield %	Market Price	Rent €/month	Yield %	%
Bugibba front	123,340.00	240.00	2.34	257,000.00	383.33	1.79	272,050.00	791.40	3.49	2.54
Bugibba internal	67,033.33	272.00	4.32	80,010.00	283.18	3.70	100,800.00	390.00	4.41	4.14
Qawra internal	75,000.00	266.00	4.26	99,959.53	309.58	3.72	110,746.00	464.29	5.03	4.33
Swieqi	114,000.00	335.40	3.53	145,700.00	516.25	4.25	177,020.00	728.57	4.94	4.24
St Julians front	217,884.68	737.50	4.06	348,333.33	506.43	3.34	500,200.00	1,120.00	2.69	3.36
St Julians internal	95,000.00	388.33	4.91	110,000.00	968.75	5.52	169,988.26	633.00	4.47	4.97
Sliema front	248,311.18	606.00	2.93	346,375.00	809.17	2.80	689,481.14	1,375.00	2.39	2.71
Sliema internal	102,200.00	394.44	4.63	135,653.38	531.11	4.70	187,222.22	491.25	3.15	4.16

Table 1 notes the average monthly rent for a 3-bedroomed hovering around €750 per month. Malta's monthly rental rate of €750 is to be compared with Monaco's at €6,358 and London's at €6,559. Hong Kong €4713 France reads €4,379, with Singapore at €3,662, then Italy at €2558 the Netherlands €2,376 Finland €2,520, Luxemburg €2,180 and Denmark at €2,038. Germany at €1,274, Belgium €1,361, the Czech Republic at €1,264 and Cyprus at €780 per month.

RENTAL VALUES FOR VARIOUS LOCALITIES AS A % OF MARKET VALUE

TABLE 2				
Locality	**Rental value as % of market value - 1997**	**Rental value as % of market value - 2004**	**Rental value as % of market value - 2007**	**Rental value as % of market value - 2013**
Bugibba – internal	8%	3.6%	3.25%	4.14
Qawra - internal	8.5%	4.3%	2.75%	4.33
Sliema front	5.5%	2.0%	3.5%	2.71
Sliema inner	5.5%	4.1%	4.5%	4.16
St Julian's	7.5%	3.5%	3.75%	4.97
Swieqi	7.0%	4.15%	4.175%	4.24

Source DHI Periti

The Table above notes the more sustainable residential rental capitalization rates, which since 1997 have shifted to the more realistic market residential annual capitalization rates, as standing at between 2.75% - 4.5% in 2007 & 2.71% - 4.97% in 2013, from the 8.5% - 5.5% highs in 1997.

RENTAL YIELDS

Malta's gross rental yields at 3.75% are generally lower than mainland Europe, hovering around the 4% mark. To be noted that the ex-Soviet satellite countries together with ex-Yugoslavia countries have yields exceeding 5%, with Moldova at 10% and Ukraine at 9%. The Czech Republic has a yield of 3.51% with Greece at 3.25% and Andorra at 2.39%. On the other hand, Monaco with the most expensive property destination as noted above, has the lowest rental yield at 1.64%.

Considering the above present residential rental capitalization rate to hover around 3.75%, the net return to the property investor, who also anticipates to achieve a future estimated 4% pa annual capital return and after deducting 0.65% for maintenance costs is seen to receive a net annual return given by:

3.75% + 4% - 0.65% = 7.1% pa

Thus homeownership is way above a present safe Government 15-year bond issue averaging at around 4% pa.

EXAMPLE OF A BUY TO LET APARTMENT

A 2 bed/r 80m² apartment in Msida leases out at €400/month.

Expenses & vacant period are taken at 25% of income

Annual net income 0.75(€400/month X 12 months) = €3,600pa.

Capitalizing at 3.75% and deducting 10% as purchase expenses

Present Market Value: €3,600pa X $\frac{100}{375}$/1.1 = €87,250 (€1090/m²)

From Table 3 (Module I) Msdia (Zone C) = €886/m² < €1090/m²

MAIN RESIDENCES - (Security of Tenure)

- ✓ **Sitting tenant pre-1st June 1995 lease is defined as the person having title before or on 1st June 2008**
- ✓ **As from 1/01/10 right to continue lease after death of sitting tenant is given as a 1-time right only for the following beneficiaries – having lived the last 4 out of 5 years & after the 1/06/08 continues to live with the tenant until tenant's death (brother or sister/in-law, natural or legal child)**
- ✓ **This Act provides for restricted Security of tenure compared to previous 1995 Act**

Sources: KTP –VS2012 Appendix E

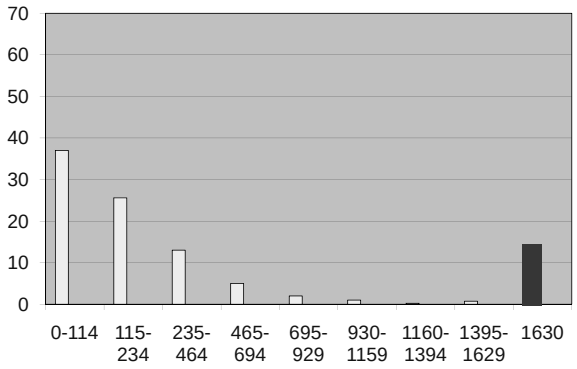
MAIN RESIDENCES- (Rentals)

- ✓ **Minimum rental amount imposed at €185 p.a. to increase on a 3-yearly basis according to Index of Inflation (Appendix G)**
- ✓ **A moving average for the 3 yearly interval increases works out at 8%, signifying doubling of rental value every 9 periods. This is below the present open market commercial leases increases, varying from 10% to 15% over a 3-yearly period (App G).**
- ✓ **Pre-1995 lease but contractual still running, the contract will apply till termination**
- ✓ **Post-1995 no protection beyond contractual period**

MAIN RESIDENCES- (Maintenance)

- ✓ **External ordinary maintenance to be now within tenant's remit**
- ✓ **Structural repairs by landlord as required through no fault of his own, may now be recouped at 6% instead of 10%, although no doubling restriction in place?**
- ✓ **Tenant can opt to carry out repairs at his expense, with no right for compensation at termination. Amount spent may be deducted from rent**

MAIN RESIDENCES – Rent Paid FIGURE 1



Free rental market contracts

961 (pre-1995)
2910 (post -1995)

Restricted rental market

This min rental of €185 is to effect just over 50% of existing leases given at 28,760 (2005) 33,781 (1995)

Source: Census of Population & housing 2005 Vol 2 Dwellings & Rent Laws pre-submission document

COMMERCIAL PREMISES - Lease Amendments

- ✓ **Lease contracted prior to 1/06/95, a 20-year period is in place to protect existing tenure**
- ✓ **Sitting tenant includes also for spouse, not legally separated, is defined as tenant who had a valid lease since 1/06/08. Hence 20-year period extends up to 31/05/28.**
- ✓ **Sub-letting is now not allowed – for prior sub-letting to 1/06/95, lease terminates at 1/06/18.**
- ✓ **These old leases are to increase by 15% p.a. for 4 years and then by 5% p.a. thereon, unless a rent index introduced by 1/01/14, or by agreement between parties.**
- ✓ **These increases will not apply if other conditions specified in original contract**

VALUATION OF TENANTED PREMISES (lease pre-1995) - 1

•Take life expectancy at 85 years.

Scenario 1 • If present tenant is aged 40 – then possibility of recouping premises is 45 years

Scenario 2 • if present tenant is aged 80 – then possibility of recouping premises is 5 years

•Present market value of premises in vacant possession estimated at:
50m² @ €650/m² = €13,000

Capitalization Rate to be adopted at end of lease Termination

YP is the discounting years' purchase figure taken at the relevant rate of interest, as below:

4.00% for leases greater than 30 years.
4.25% for leases greater than 25 years.
4.75% for leases greater than 20 years.
5.25% for leases greater than 15 years.
5.75% for leases greater than 10 years.
6.00% for leases greater than 5 years.
6.50% for leases less than 5 years.

VALUATION OF TENANTED PREMISES (lease pre-1995) - 2

The present market value of these premises is given by the Present Worth (pv) of 1 period factor @ 3% for the number of years to gain possession, together with reducing the present market value by the Present Worth Factor over 25 years.

Scenario 1: (€185 x 1.025^3) x 24.5 + €13,000/ 1.04^{45}

€4,881 + €2,226 = €7,107

Scenario 2: (€185 x 1.025^3) x 4.58 + €13,000/ 1.065^5

€912 + €4,881 = €10,400

Excel F(x) statistical pv

MARRIAGE VALUE in leased premises

Unencumbered open market value	- €13,000	
Value of Scenario 1 leasehold	- € 4,881	
Value of Scenario 2 leasehold	-	€ 912
MARRIAGE VALUE	€8,119	€12,088

TENTATIVE ASKING PRICE due to restrictive buyers

Scenario 1 €4,881 + € 8,119/3 = €7,587

Scenario 2 € 912 + €12,088/1.5 = €8970

Valuation to a temporary residential emphyteusis expiring in 2018

Refer to Sections 12 & 12A of Appendix D of KTP VS 2012.

It appears that the 2009 rental amendments, do not apply, even when the temporary emphyteusis has been converted into a lease.

The KTP should organise a discussion session on this point of law.

Presently valuation is to be undertaken as per updated Example of 2004 CPD

TEMPORARY EMPHYTEUSIS - 1

Value an emphiteutical 27 year lease at €250pa due to expire in 5 years time.
According to Appendix E para 12 (KTP VS 2012). in 2018 this emphiteutical grant is to be converted into a lease at €500pa, revisable every 15 years.
Assuming inflation to stand at 2.5% pa in the coming period, rental value in next revision to occur in 2033 assumed at
€500pa * 1.025^15 = €725pa, (which as presently a low inflation era is in place doubling of the rental amount has not occurred).
For a doubling to occur inflation has to average 72/15 years = 4.8% pa.

Opportunity cost of money given by
4.75% = 4.25%(RFR) + 0.5% (property risk) + 0% (tenant risk)

TEMPORARY EMPHYTEUSIS - 2

An initial yield is calculated, from d = 4.75% & g is given by 2.5% for n = 15years.

I = 0.0475 (1.0475^15 – 1.025^15)/ (1.00475^15 -1) = 2.63%
(this may be approximated from Gordon's growth model where ARY or initial yield = 4.75% - 2.5% for a growing income stream)

Value of above grant for payments 6 monthly in advance given by Half yearly rate $(1+0.023)^{0.5}$ -1 = 1.306%

YP of €250pa for 5 years @ 6.25%
(YP for 4 years + 1) = 1 + 1/1.0625 + 1/1.0625^2 +1/1.0625^3 + 1/1.0625^4 =
4.45 YP * €250 pa = €1,112.5
YP in perpetuity @ 4.36% backdated by 5 years @ 6.25%.
(100/4.36 + 1) YP * 1/1.0625^5 €125pa = €7,160
€8,272

The Emerald Research Register for this journal is available at
www.emeraldinsight.com/researchregister

The current issue and full text archive of this journal is available at
www.emeraldinsight.com/0263-7472.htm

Evaluating returns in the residential rental sector

Peter Rossini, Paul Kershaw, Wayne Marano and Valerie Kupke
Centre for Land Economics and Real Estate Research (CLEARER), University of South Australia, Adelaide, Australia

Received March 2003
Revised November 2004

Abstract

Purpose – This study seeks to determine an appropriate form of yield analysis as a means of improving the supply of low cost rental housing within Australia.

Design/methodology/approach – Rental returns are quantified on a disaggregated basis based on the amalgamation of three major government property databases.

Findings – Much of the information on returns in low cost rental housing is based on erroneous assumptions. More accurate reporting of returns would put in place the appropriate risk premium for investment in low cost rental housing.

Originality/value – The study adds value by allowing policy makers to better understand the nature of returns required to increase the level of investment in the low cost end of the private rental market.

Keywords Housing, Rents, Investments, Rental value, Australia

Paper type Research paper

Introduction

There are increasing concerns about the ability of the private rental market in Australia to cater for sustained high levels of demand, especially from those in significant housing need looking for low cost accommodation (Wulff *et al.*, 2001). This holds true despite the rise in average living standards and low nominal interest levels experienced in Australia throughout the 1990s. Much of the new supply in the private rental market, brought about by historically low interest levels, has been inner city high rise apartments and flats, at medium to high cost, which does little to solve the low cost rental needs of single parents and young families. According to Berry (2002), despite the Australian economy growing strongly through two economic cycles since the early 1980s, the housing situation of low-income households has actually deteriorated especially for those in the private rental market.

At the same time this sub market is becoming more important to a wider range of population groups than previously, including younger age groups now taking longer to achieve home ownership, but also to low-income groups unable to access public housing (Yates, 1999). As of 2000, some 20.5 percent of households in Australia were estimated to be in the private rental sector and this percentage was expected to increase (ABS, 2000). With the winding down of the public housing sector pressure is increasing on the private rental market to accommodate a larger proportion of low-to-moderate income earners and for a longer period of time (Wulff *et al.*, 2001).

This paper results from an Australian Research Council (ARC), Strategic Partnerships with Industry – Research and Training Scheme (SPIRT) grant in cooperation with the S.A. Department of Human Services, Shelter SA and UPmarket Software Services.

Property Management
Vol. 23 No. 4, 2005
pp. 286-300

0263-7472
DOI 10.1108/02637470510618424

Investment in the private rental housing

In terms of supply much of the private rental housing in Australia is provided by a diverse group of property owners ranging from householders to non-profit institutions, employers and corporations (Berry, 2000). However, the largest group of providers is made up of private households who supply some 60 percent of all rental accommodation (ABS, 1998). Sustained government withdrawal from the public rental sector and the lack of enthusiasm from the large commercial sector ensures that these small investors, that is household or family, will continue to supply significant levels of rental housing including the low cost properties.

With the growing pressure on the private rental market in Australia, especially at the low cost end, various incentives to encourage investment have been proposed. These have included taxation reform, construction subsidies and the issuing of government bonds (Wood, 2001; Wood and Watson, 2001; Shroder and Reiger, 2001; Affordable Housing National Research Consortium (AHNRC, 2001). As most investors own only one property (ABS, 1998) and with demand strongest at the low cost end of the rent scale, it is thought important to encourage as many participants as possible. Thus, governments, including those in the UK, have been keen to modernise the ownership of private rental housing by enlarging the landlord base (Hughes, 1999; Crook and Kemp, 1999, 2002). In Australia Macquarie Bank (McNelis *et al.*, 2002) has recommended also that, rather than seeking major pooled investment, the private rental sector should be "grown" further and the attractive features of the pre existing cottage industry should be utilized (McNelis *et al.*, 2002).

However, analysts in the UK and in Australia (Crook and Kemp, 1999; Berry, 2002; McNelis *et al.*, 2002) have identified lack of market information as a significant problem for investors in the private rental market. They consider that much of the risk associated with this form of investment can be allied to the lack of information about real returns. Hughes (1999) notes the paper by Barkham and Geltner (1996) which argues that, using portfolio investment theory, the returns available in the private housing market should make it more than competitive with commercial property as an asset and that rational investors would hold a considerable proportion of their assets in this form.

The reporting of returns (termed yields) in the Australian rental-housing sector is based regularly on rental and sales data produced quarterly by the Real Estate Institute of Australia (REIA, 2000). This data is released at aggregate metropolitan level with no submarket representation and represents REIA members only. While aggregated data may produce adequate information for rates of return to be calculated for metropolitan areas as a whole, there has been no systematic attempt to produce returns based on disaggregated data representing high and low cost rental submarkets and distinguished by location, dwelling type or size.

The assumed relationship between rental sub-markets and the level and nature of return within them is typically regarded to be one of higher yields for lower income properties. Owners of higher income rental property are said to achieve lower returns but that these are offset by proportionally lower operating costs, greater capital gains and lower risk. However, for these views to be tested, market values, real capital gains and consistent measurements of return across sub markets need to be calculated. Research conducted in Australia by Yates and Wood (1997) indicated that the systematic relationship between total returns and associated risks was hard to quantify in the private rental market given aggregated data. Studies by Berry (2002) and by McNelis *et al.* (2002) also identify the need for disaggregated analysis in order to

provide useful information on rates of return across geographic regions and within different rental submarkets. Berry (2002) agrees with Crook and Kemp (1999) that the lack of such market information adds an extra premium to the return looked for in the rental-housing sector.

Aim of the study

This study aims to demonstrate how the information set on the supply side of the rental market can be improved by quantifying returns on a disaggregated basis (Rossini, 1996, 1997; Marano, 1993). It seeks to determine an appropriate form of yield analysis that will allow for an accurate comparison of returns between low and high cost housing. Consistency in the calculation of returns over time and across rental sub-markets has been facilitated by the use of well practice valuation methodologies and by the adoption of a constant quality price index (Rossini, 1996, 2000, 2002; Rossini *et al.*, 2002; Kershaw and Rossini, 1999; Kupke *et al.*, 2003).

For the purposes of the paper the "private rental market" is defined as encompassing those properties which are rented through a real estate agent or from a person who is a non relative and not an inhabitant of the dwelling. This definition ensures that the rentals discussed in this report reflect true market rents.

Commensurately, "rents" are defined as current rents that is those that are actually being paid by households in the private rental market.

In terms of the analysis "low cost" or "low rent" housing is identified as any private dwelling available for rent where the weekly rents are in the lowest 20 percent bracket (quintile) using median rents for one point in time. As the primary focus of this study is the supply of rental property the affordability of rental accommodation, in terms of the tenant, is not represented by this definition.

Methodology

The methodology for this study involved three steps. First, in order to establish a sample of rental properties three data sets were matched, namely a rental data file, a valuation data file and a data file of sale prices. The second step involved the construction of two indexes; a median rent index to make minor adjustments to rentals and a constant quality price index in order to accurately measure price change in the residential market over time. Third, an appropriate measurement of return was determined.

Step 1 establishing the sample

The sampling frame is based on the matching of three separate data sets. The first data set is the South Australian Rental Bond Data File, which is the basis for current rental information. This contains a record of all current and new residential rental bonds paid since the early 1990s. Only a small subset of the data was released for this study and this did not include a robust property indicator. In order to use this file efficiently it was necessary to obtain more reliable property details including an indicator of location. To do this the file was matched with the South Australian Valuation List. After considerable manipulation of the bond file, address fields for 115,628 records were matched to provide a database of properties rented between January 1, 1994 and December 31, 2000, which could be identified correctly by address.

The second data set is the South Australian Sales History File, which contains information on all property transactions, and was the source used to extract

transaction information, including price, for all properties that were detached, semi-detached and home units[1] in the Adelaide metropolitan area for the same period. Sales to or from government agencies were not included.

The third data set is a matched file of property sales with rental properties identified correctly by address and is based on the on the following process:

- A subset of the file with rental properties identified correctly by address was created where all properties rented after 1993 and showing a sale recorded between 1994 and 2000 were extracted (the valuation file indicates the date of the last sale).
- All residential sales from 1994 to 2000 were compared to this subset to establish matches that is where a property had been sold and rented during the period.
- The matched records were then accepted as probable investment properties if the property was rented within 12 months either side of the sale. It is accepted that in some cases the property may have been purchased for private ownership and that the lease may have ceased soon after sale or that the resulting rental of the property may have resulted from accidental rather than intentional circumstances. However, for the purposes of yield analysis, the match of a market rental and market sale should give good evidence of returns.
- Probable non-market rentals were removed. Typically, these involved rentals from private companies.
- Sales from deceased estates were removed where it appeared to be a non-market transaction.
- Sales that appeared to include substantial rural, industrial or commercial interests were removed. This included several house-workshops, house-surgeries and several small rural holdings.
- The details of the sales and rental properties were then compared in terms of dwelling characteristics to remove circumstances where only a part of the property was rented. Examples included several house-workshops, house-surgeries and small rural holdings as well as a large number of houses with granny flats or separate rooms. In each case, it was not clear if the whole property was rented or only a part of the property.

The resulting data set contained 1,966 transactions.

Properties in the sales history and in the matched file were then classified into strata based on location, dwelling type and number of main rooms. This allowed consistency of comparison and would also allow for segmentation of results to allow for quality variations. The basis of this classification was as follows:

- Each property was classified within one of ten regions based on amalgams of postcodes;
- Each property was classified as a detached house, semi-detached house or home unit depending on the classification attached in the valuation list. A second classification (Houses) was created where detached and semi-detached houses were consolidated;
- The house properties were then separated into two groups, houses with up to five main rooms and houses with more than five main rooms. These classifications

are consistent with those used previously by Rossini (2002) and were necessary to match with existing price indices used to indicate capital growth.

Step 2 median rent index and constant quality price index

Median rent index. The third data set described above is based on the file of matched observations from the South Australian Rental Bond File and the South Australian Sales History File. Each observation had a rental and sale date within a 12-month period of one another. In other words recently rented and sold. However, even within 12 months there may be significant changes in rent. To overcome this a simple median rent index was created to make adjustments to the rents to bring all rents to the data of sale. This index was based on median rents, in each region, for each year. The index was calculated for each year and for each region, using the following formula:

$$MRI_{y,r} = 100(\text{MedianRent}_{y,r}/\text{MedianRent}_{1994,r})$$

Where:

$\text{MRI}_{y,r}$ = the Median Rent Index for year y and region r

$\text{MedianRent}_{y,r}$ = the weekly median rental in dollars for year y and region r

$\text{MedianRent}_{1994,r}$ = the weekly median rental in dollars for 1994 (base year) and region r

y = are the years where data is present from 1994 to 2001

r = the regions used for this project numbered 1 to 10.

Constant quality price index. Since a major part of the expected return from residential properties is believed to be capital gain, it is important to have a robust indicator of changes in property price. A series of constant quality prices indices were created to measure the capital gains. These indices were stratified by location (using the regions from the former analysis) and by property type (also based on the former discussion).

The aim was to produce indices for each region, broken up by the major dwelling type and then further into low cost, typical cost and high cost. This last stratification became problematic. Low and high cost would normally be defined in terms of price. Possibilities are the lowest and highest quartiles. However, as prices change over time, this stratification would have to change with the index. Thus, for each time period the quartile ranges would change. It is probable that, as these change, individual properties may move between low and typical or high and typical price ranges. This problem of "rolling" price ranges is further compounded if it is calculated for each region and for each dwelling type. Since this solution seems unreasonably complex and difficult to apply on an ongoing basis, it was decided to use a simpler approach. Since the number of rooms could neatly divide houses and units, this was used as the final stratification. Houses and detached houses were broken up into two categories, up to five rooms, and more than five rooms. Units were separated based on less than, equal to or more than four rooms.

Sales data, collected and stratified on the basis outlined above, were extracted. Probable non-market transactions were excluded. This data set became the basis for all index work and included all transactions of residential properties that occurred from January 1, 1984 to September 30, 2001. Basic indices were calculated first using the mean and median prices for each quarter. The hedonic models were then estimated for

each stratum of the data. The constant quality indices are calculated using procedures established by Rossini (2002) using a hedonic price function with estimates from a log-linear multiple regression estimate. The models were specified as:

$$Y^{*}\beta_0 + \beta_1 d_1 \cdots \beta_n d_n + \theta_1 \mathrm{X}_1 \cdots \theta_n \mathrm{X}_n$$

where:

Y^{*} = natural log of the observed transaction price

β_0 = a constant

d_1 = dummy variable for quarter 1

d_n = dummy variable for quarter n

β_1 = price index for quarter 1

β_n = price index for quarter n

X_1 = 1st physical attribute variable

X_n = nth physical attribute variable

θ_1 = price index for physical attribute 1

θ_n = price index for physical attribute n

The physical attributes used in these models were: land area, building area, condition code and a series of dummy variables for building style, wall cladding and roof cladding. For each index the base quarter was the first quarter in 1993. This period was chosen as it represents a point at which there is a change in the method for holding data. It is also conveniently in the middle of the time period.

The creation of the index allows for easy assessment of seasonality, trend and cycles. For this paper seasonal factors are estimated using the ratio to moving average method that is frequently used in classical time series decomposition. This is a straightforward procedure as discussed in most econometric texts (Mendenhall and Sincich, 1996).

Step 3 measuring returns

Studies of investments usually involve an analysis of returns or "yields". Unfortunately, the term "yield" has many different interpretations and in most cases one "yield" cannot be compared to another "yield". An understanding of these different yields and how they are calculated is fundamental to understanding how and when they can be compared.

The most basic calculation of yield is the gross yield calculated from the purchase price (taken from a transaction) and its market gross income (annual rental, assuming it is at a market rate).

$$\text{Gross yield} = \frac{\text{Market gross income}}{\text{Purchase price}}$$

This is a highly simplistic yield calculation but is often adopted in situations where there are a substantial number of "rack-rented" properties (rented at market income)

and costs are relatively even across the population of properties. This yield is not capable of comparison with most other investments because it makes unrealistic assumptions such as an infinite investment life, no capital or rental growth and no capital or annual expenditure. Notwithstanding these shortcomings, the gross yield is often used as a means of comparison between simple investment properties that are within the same general property submarket. One important point here is that the yield calculation relates to a specific sales transaction. If a large number of transactions are examined, it is possible to calculate the mean gross yield that is the arithmetic mean (or average) of these yields by calculating:

$$\overline{\text{Gross yield}}_s = \frac{\sum_{j=1}^{n} \text{Gross yield}_j}{n}$$

where:

$\overline{\text{Gross yield}}_s$ = the mean of a sample of gross yields

Gross yield_j = observed gross yield from property j

n = the number of observed values of gross yield_j

This in effect is to sum the gross yields and divide by the number of gross yields.

An alternative methodology, which is used in some cases, is to use aggregate data to produce an aggregated gross yield.

In this case one might calculate:

$$\text{Gross yield}_A = \frac{\overline{\text{Market gross income}}_A}{\overline{\text{Purchase price}}_A}$$

where:

Gross yield_A ="typical"gross yield based on aggregated data

$\overline{\text{Market gross income}}_A$ = mean of all gross inomes at aggregate level

$\overline{\text{Purchase prices}}_A$ = mean of all Purchase Prices at aggregate level

Thus, the aggregated gross yield is calculated simply by dividing the mean market gross income by the mean sale price. Importantly, even if the same sample data is used to form the aggregated data, the mean of the sample yields does not equal the yield from the aggregated means, except in the highly unlikely circumstance where the entire sample yields are identical.

Thus:

$$\overline{\text{Gross yield}}_s \neq \text{Gross yield}_A$$

This is proved in the Appendix. In practice the aggregated gross yield is calculated from existing aggregate data. Usually, the mean income figure is derived from a sample of investment properties that are rented. In comparison the mean sale price is usually derived from a sample of properties that have sold and is usually dominated by owner occupied residences. Since the distribution of investment properties is typically skewed towards the lower end of the price bracket, it follows that the mean sales price

for all properties will overestimate the sale prices for the investment properties and that the yield will be correspondingly underestimated. Since the aggregated gross yield is not the "average yield" and is based on non-comparable data, it seems reasonable to argue that the methodology is flawed and it is hypothesized that it will often give too low an estimate of investment returns. Also, the calculation using the aggregate provides no insight into the distribution of yields. Analysis of yields from individual sales can provide this insight through calculation of other characteristics of the distribution including the standard deviation, skewness and kurtosis.

A less complex calculation involves the use of the basic gross yield and the growth factor, while ignoring the various other costs. This enables a calculation of a capital growth adjusted gross yield and explicitly adjusts for a situation where income return is augmented by capital growth. Since the capital growth estimate is essentially an aggregate figure, it is inappropriate to apply this at an individual property level but is logical at an aggregate level:

$$\text{Growth adjusted gross yield}_A = \left\lfloor (1 + \overline{\text{Gross yield}_s})(1 + g) \right\rfloor - 1$$

where:

$\text{Growth adjusted gross yield}_A$ = the aggregated gross yield adjusted for capital growth

$\overline{\text{Gross yield}_s}$ = the mean of a sample of gross yields

g = estimated capital growth rate based on constant rates for regions, housing types and price ranges

Summary of yield estimates

The calculations of the various yields are made using the matched files, and include those properties meeting the specifications as described in Step 1. The individual rental bond and sales files are used also for amalgamated results and as a basis for rental adjustment. The gross yield (gross yields) is calculated for each property in the matched file. However, as the rentals could have occurred as much as 12 months before or after the sale, it is necessary to make minor adjustments to the rents to allow for this. The basis of this adjustment is the simple median rental index calculated for each region and year in Step 2. The gross yield is then calculated on the basis of the adjusted weekly rental and the actual sale price. The growth adjusted gross yield using the yield calculations and capital growth estimates is based on constant quality price indices also calculated in Step 2. The growth adjusted yields are calculated for house properties stratified by region and house size. The yields used were based on sales across the whole time period (1994 to 2000) and the capital growth estimate is the average annual growth over the same period.

Results

The calculated gross yields for houses and units are approximately normally distributed with mean and median yields in the range of 8 to 10 percent per annum. The distribution of results is indicated in Figure 1. This shows that the yields from home units are remarkably consistent with over 60 percent falling in the 8 to 10 percent range with 95 percent falling into the 6 to 12 percent range. The distribution of unit

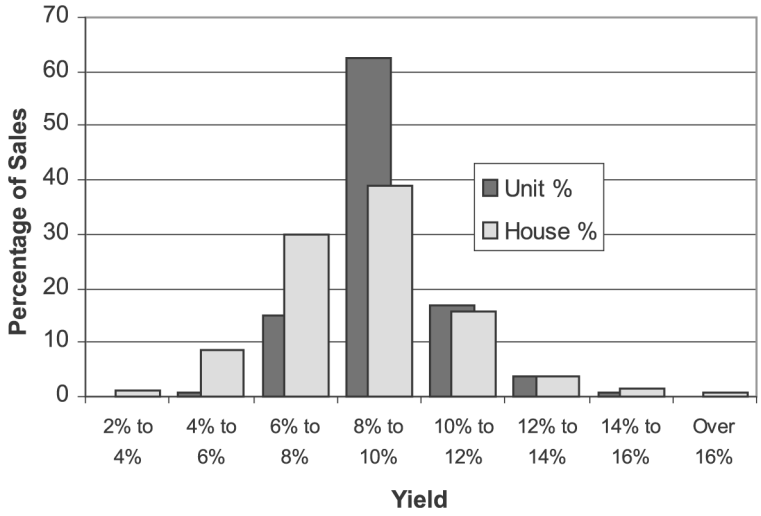


Figure 1.
Distribution of gross yields using all data 1994 to 2000

yields appears to be non-skewed. The distribution of yields for houses is flatter and slightly skewed. Houses show a much wider range of possible yields with 95 percent of yields falling into the 4 to 14 percent ranges.

Table I compares yields calculated from individual yield estimates with those from aggregated data. The mean of the gross yields (gross yield_S) is compared to two gross yields based on aggregated data (gross yield_A). The first of these is calculated from the aggregated sample data with the second calculated from data aggregated from the population of rents and the population of sales. The yields are based on sales from 1994 to 2000 and are calculated for detached, semi-detached and home unit properties.

Table I clearly indicates the previously described problem with using aggregate data. The aggregating of the data produces a poor estimate of the gross yield even when based on the same sample data, while the use of population data suggests significantly lower yield estimates that the mean gross yield produced though individual sales analysis. The reasons for this phenomenon are partly mathematical but primarily caused by the type of properties that are purchased as residential investment properties. Comparison of the mean sale price and rental between the sample of known residential investment properties and all residential sales shows that for detached and semi-detached houses the properties being purchased are at the cheap end of the spectrum, with the rents being correspondingly low. However, this is not a ratio relationship. The population of semi-detached house sales has a mean price almost 100 percent larger than the sample while the rents are only about 33 percent larger. Clearly, the residential investment market for detached and semi-detached houses is made up primarily of properties at the cheaper end. However, the investment market for home units seems to approximate the population of sales. Both the mean price and rent are very similar. However, even in this case, the aggregated yield estimate is significantly lower than the mean of the individual sale yields.

The results from Table I provide clear support for the development of a yield index based on individual property transactions rather than the current practice of using aggregate data. Even at a gross yield level, the wide difference between the estimate based on individual transactions and that based on the aggregated population

Table I. Yield estimates by building type for aggregated and non-aggregated data (all sales 1994-2000)

	Mean gross yield (sample) (%)	Sample mean rent	Sample mean price	Aggregated gross yield (sample data) (%)	Population mean rent	Population mean price	Aggregated gross yield (population data) (%)
Detached houses	8.54	A$137	$87,964	8.09	A$169	A$139,821	6.29
Semi detached houses	9.62	A$123	$80,455	7.97	A$174	A$160,532	5.64
Home units	7.15	A$131	$98,600	6.91	A$126	A$104,673	6.28
All	8.53	A$136	$88,063	8.01	A$150	A$133,638	5.85
Observations (*n*)	1966	1966	1966		115628	146662	

statistics is dramatic. It is reasonable to conclude that policy makers should take yield estimates based on aggregated data with a considerable degree of skepticism, especially in markets where a large proportion of the investment properties are at the lower end of the price range.

Yields by region and year

Yields from house sales have been further examined at sub-market level. Table II shows the mean yield for each region for each of the seven years between 1994 and 2000.

There are two significant issues from these results. Overall, average yields have increased across all regions from 7.8 percent in 1994 to 9.5 percent in 2000. This is largely the result of increases in regions 8 and 10. These are the northern and southern regions and make up nearly 50 percent of all of the transactions. There is also significant variation across the regions. The northern and southern regions are areas of low prices, low rentals and high yields. Regions 1,3 and 5, Adelaide's prestigious central, south eastern and coastal areas are marked by higher prices, higher rents but lower yields. Clearly, the high rents in these locations do not offset the much higher prices.

If investors are rational, then they may offset the return from rental with capital growth. This is usually hypothesized as the reason for the yield differences. If this is the case, then the growth adjusted gross yield (Table III) should have less variation than the yields in Table II.

This appears true as the results in Table III indicate that the expected return from houses (there were insufficient observations for home units) is reasonably consistent across the various regions when the yields are adjusted for probable capital growth. This is true across the regions and also when comparing larger and smaller properties. Table III also reveals that larger (normally higher priced) properties generally show lower gross and adjusted gross yields than the smaller, less expensive properties. The notable exceptions to this are the yields for larger properties in regions 5 and 7. These are the prestigious eastern suburbs of Adelaide. While smaller houses in these locations show similar growth adjusted yields to other regions, the yields on larger home are noticeably lower. This may reflect a smaller number of very large homes. This finding warrants further investigation.

Table II.
Yield estimates for houses by region and year of sale

	Region										
Year	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)	10 (%)	All regions (%)
1994	6.2	6.7	6.2	7.0	6.4	7.8	7.2	9.1	7.2	8.4	7.8
1995	6.5	8.1	7.4	7.1	4.4	7.3	7.5	9.2	N/A	8.1	8.0
1996	6.6	8.0	7.2	7.5	6.5	7.8	8.2	10.0	7.8	9.2	8.6
1997	6.4	8.3	6.6	7.4	7.4	7.7	8.0	10.3	8.3	9.6	8.8
1998	5.1	7.7	7.3	7.2	7.0	8.8	7.9	10.1	7.7	9.0	8.8
1999	6.5	8.5	6.3	7.9	5.7	8.2	8.4	11.4	8.7	9.4	9.5
2000	5.7	6.5	6.1	7.3	7.4	8.6	8.5	11.0	N/A	9.5	9.5
All years	6.3	7.8	6.8	7.3	6.5	8.0	7.8	10.2	7.9	9.1	8.5

Conclusion

This study has attempted to determine an appropriate form of yield analysis that will allow for an accurate comparison of returns between low and high cost housing, through the use of disaggregated data. The results of the research would suggest that, based on aggregate data, accurate information about returns in the private rental market could not be assumed. Not only may useful information be difficult to find; much of the information that does exist is based on erroneous assumptions.

Much of the private rental stock is derived from housing at the lower priced end and, as such, market returns estimated from aggregated sales data grossly underestimate the true returns. Table I illustrates this point. Returns from aggregated data would suggest the semi-detached dwellings achieve the lowest return of all dwelling types at 5.64 percent. However, analysis based on disaggregated data shows that, at 9.62 percent, semi-detached dwellings achieve the highest return for all dwelling types. As much of the private rental stock in Australia is in the semi-detached category this is an important finding.

Information based on this understanding of the market is not widely available and, as most non-institutional investment is based on reported historic returns, this sets up a discriminatory environment in terms of investment in the rental sector. Either returns are not widely reported at all, or those that are reported may be erroneously lower than those achieved by other investments, such as the share market or the property trust market.

This suggests a need for the quality of the information set to potential investors to be enhanced in terms of accuracy, availability, regularity and public profile. This in turn implies a need for further research to allow for the construction of a regular index based on actual market rents matched to real property price increases but targeted to the representative end of the private rental stock. Further research could show that accurate targeting might allow for the aggregation of data and thus the efficient production of a regular index. Another issue is that the error term associated with the under reporting of returns cannot be predicted and therefore cannot be adjusted for. However, better targeting could allow for more accurate aggregation of data that would narrow the margin of error and reduce the volatility in the error term.

Also, more accurate reporting of returns would put in place the appropriate risk premium for investment in lower cost rental housing. This research shows that the risk premium is only about 0.5 percent. However, in order to match other investments it should be about 1 or 2 percent. The main risk perceived by investor would appear to be

Region	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)	10 (%)
Houses with five main rooms or fewer										
Gross yield	6.43	8.03	7.08	7.43	6.78	8.05	8.01	10.38	7.91	9.28
Capital growth	4.97	3.15	4.69	3.60	4.01	2.29	2.64	1.36	3.35	2.42
Growth adjusted gross yield	11.72	11.43	12.11	11.29	11.05	10.52	10.86	11.89	11.53	11.93
Houses with more than five rooms										
Gross yield	5.15	6.38	5.71	6.52	4.86	7.60	7.06	9.47	N/A	8.24
Capital growth	5.26	3.42	4.78	3.47	3.73	2.90	2.51	2.22	N/A	2.52
Growth adjusted gross yield	10.68	10.01	10.77	10.22	8.78	10.72	9.75	11.90	N/A	10.98

Table III.
Growth adjusted gross yields stratified by large and small houses

tenants. As such, policy makers need to look at schemes that would more adequately cover this risk.

Note

1. The classifications for dwelling type used in this study are based on those from the South Australian Valuation List. This file deals with property from the perspective of both legal and physical aspects. This means that property is divided primarily on the basis of title. Detached dwellings will normally be Torrens Titled with one fully detached dwelling on the site. Semi-detached houses may have a variety of title systems but will be two houses attached with a common wall. Home units may also have a variety of methods of title. Most will be strata or community titles but other forms of ownership are possible. They will generally involve both individually owned space and common property but could also include row type houses. In each case the dwelling is capable of ownership and transfer for the dwelling as a separate legal entity. Multiple Flat Buildings have a number of dwellings under a single title. Hence one owner and one title may cover multiple dwellings. Each multiple flat building may be more than one dwelling unit and may contain many tens of dwelling units.

References

ABS (2000), *Australian Housing Survey 1999, Housing Characteristics, Costs and Conditions*, Cat No 4182.0, AGPS, Canberra.

ABS (1998), *Household Investors in Rental Dwellings Australia*, Cat No 8711.0 AGPS Canberra.

AHNRC (2001), *Affordable Housing in Australia: Pressing Need, Effective Solution, Affordable Housing*, National Research Consortium, September 2000, Canberra.

Barkham, R. and Geltner, D. (1996), "Owner occupied houses versus commercial property in the UK: a suggestion for promoting some affordability and investment opportunities", *Proceedings of the 1995 "Cutting Edge" Conference*, RICS, London.

Berry, M. (2000), "Investment in rental housing in Australia: small landlords and institutional investors", *Housing Studies*, Vol. 15 No. 5, pp. 661-81.

Berry, M. (2002), *New Approaches to Expanding the Supply of Affordable Housing in Australia: an Increasing Role for the Private Sector*, AHURI Final Report, Australian Housing and Urban Research Institute, Melbourne.

Crook, A.D.H. and Kemp, P. (1999), *Financial Institutions and Private Rented Housing*, Joseph Rowntree Foundation, York.

Crook, A.D.H. and Kemp, P. (2002), "Housing investment trusts: a new structure of rental housing provision?", *Housing Studies*, Vol. 17 No. 5, pp. 741-53.

Hughes, J. (1999), "Happy returns: the individual investor as a source of new capital for rented housing in a time of changing social welfare structure", *Housing Studies*, Vol. 14 No. 4, pp. 507-24.

Kershaw, P. and Rossini, P. (1999), "Using neural networks to estimate constant quality house price indices", paper presented at the International Real Estate Society Conference, Kuala Lumpur, January.

Kupke, V., Rossini, P., Marano, W. and Kershaw, P. (2003), "An analysis of the private rental investment market: some preliminary findings", *The Flinders Journal of Law Reform*, Vol. 7 No. 1, pp. 41-60.

McNelis, S., Hayward, D. and Bisset, H. (2002), *A Private Rental Investment Vehicle for the Community Housing Sector*, AHURI, Final Report, Australian Housing and Urban Research Institute, Melbourne.

Marano, W. (1993), "Discrimination in rating valuations", paper presented at the 3rd Australasian Real Estate Educators Conference, Sydney.

Mendenhall, W. and Sincich, T. (1996), *A Second Course in Statistics: Regression Analysis*, Prentice Hall, Englewood Cliffs, NJ.

REIA (2000), *Market Facts Quarterly Publication*, Real Estate Institute of Australia, Sydney.

Rossini, P. (1996), "Using constant quality house prices to assess property market performance", *The Valuer and Land Economist*, August, pp. 15-24.

Rossini, P. (1997), "Artificial neural networks versus multiple regression in the valuation of residential property", *Australian Land Economics Review*, Vol. 3 No. 1, pp. 1-12.

Rossini, P. (2000), "Estimating the seasonal effects of residential property markets – a case study of Adelaide", paper presented at the 6th Pacific-Rim Real Estate Society Conference, Sydney, January.

Rossini, P., Kupke, V., Marano, W. and Kershaw, P. (2002), "Calculating a better index of rental return", paper presented at the 8th Pacific Rim Real Estate Society Conference, Christchurch, January.

Rossini, P. (2002), "Calculating stratified residential property indices to test for differences in trend, seasonality and cycle", paper presented at the 8th Pacific-Rim Real Estate Society Conference, Christchurch, January.

Shroder, M. and Reiger, A. (2001), "Vouchers versus production revisited", *Journal of Housing Research*, Vol. 11 No. 1, pp. 91-107.

Wood, G. (2001), "Promoting the supply of low income rental housing", *Urban Policy and Research*, Vol. 19 No. 4, pp. 425-40.

Wood, G. and Watson, R. (2001), "Marginal suppliers, taxation and rental housing: evidence from microdata", *Journal of Housing Research*, Vol. 12 No. 1, pp. 91-114.

Wulff, M., Yates, J. and Burke, T. (2001), *Low Rent Housing in Australia 1986 to 1996*, Australian Housing Research Fund, Project Number 213, Canberra.

Yates, J. (1999), "Decomposing Australia home ownership trends 1975-1994", paper presented at the Department of Family and Community Services Seminar, Australia Housing Choices Stability or Change? Canberra, February.

Yates, J. and Wood, G. (1997), "Rental yields as indicators of market efficiency", *Australia's Private Rental Housing Market: Processes and Policies*, Australian Housing and Urban Research Institute, Melbourne, Victoria.

Further reading

Kershaw, P., Rossini, P., Marano, W. and Kupke, V. (2002), "Evaluating returns in the residential rental sector", paper presented at the 9th European Real Estate Society Conference, Glasgow, June.

Appendix

A Mathematical Proof that Arithmetic Operations on the Means of Aggregate Data produce inaccurate estimates

Let x = annual rent
Let y = 1/capital value
Then Return = x times y
Prove that:

$$\sum_{i=1}^{n} \frac{x_i \times y_i}{n} \neq \sum_{i=1}^{n} \frac{x_i}{n} \times \sum_{i=1}^{n} \frac{y_i}{n}$$

When expanded $\sum_{i=1}^{n} \frac{x_i \times y_i}{n}$ becomes:

EQUATION 1

$$= \frac{1}{n}(x_1 y_1 + x_2 y_2 + x_3 y_3 + \cdots + x_n y_n)$$

where as $\sum_{i=1}^{n} \frac{x_i}{n} \times \sum_{i=1}^{n} \frac{y_i}{n}$ becomes

EQUATION 2

$$= \frac{1}{n}(x_1 + x_2 + x_3 + \cdots + x_n) \times \frac{1}{n}(y_1 + y_2 + y_3 + \cdots + y_n)$$

$$= \frac{x_1}{n^2}(y_1 + y_2 + \cdots + y_n) + \frac{x_2}{n^2}(y_1 + y_2 + \cdots + y_n)$$

$$\cdots \frac{x_n}{n^2}(y_1 + y_2 + \cdots + y_n)$$

If we subtract Equation 1 from Equation 2 and equate to zero we obtain:

$$0 = \frac{1-n}{n^2}(x_1 y_1 + x_2 y_2 + x_3 y_3 + \cdots + x_n y_n) = \frac{1}{n^2} \sum_{i,j=1}^{n, i \neq j} x_i y_j$$

or after simplification

$$(n-1)(x_1 y_1 + x_2 y_2 + x_3 y_3 + \cdots + x_n y_n) = \sum_{i,j=1}^{n, i \neq j} x_i y_j$$

If and only if $x_1 = x_2 = x_3 = \cdots = x_n$ then

$$(n-1)(x_1 y_1 + x_2 y_2 + x_3 y_3 + \cdots + x_n y_n) = x(n-1) \sum_{i=1}^{n} y_i$$

and

$$\sum_{i,j=1}^{n, i \neq j} x_i y_j = x(n-1) \sum_{i=1}^{n} y_i$$

if x and/or y are not scalar quantities then equality is not guaranteed.

Figure A1.