

Capital City Price-to-Rent Ratios in Australia – An In-depth Look at Melbourne

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Capital City Rent-to-Price Ratios in Australia – Background Story

- The Economist observes a decline in rent-to-price ratios across Australian cities, with Melbourne showing the sharpest apparent decline (Figure 1).
- In part this reflects measurement issues: comparing ABS quality-adjusted rents with non-quality adjusted ABS house price series.
- Construct a non-quality adjusted rent series for the capital cities
 - Use detailed rent data from Census (1971), Household Expenditure Survey (1984, 1999, 2003, 2001) as base years. For imputing owner-occupied (o/o) rents use ABS (2006) estimates based on bedrooms as quality variable for o/o vs rented dwellings.
- This changes the story (Figures 2, 3) but not the direction. Still leaves many unanswered questions.



Figure 1: Estimates of Sydney, Melbourne Rent to Price Ratio – ABS-based series as per The Economist

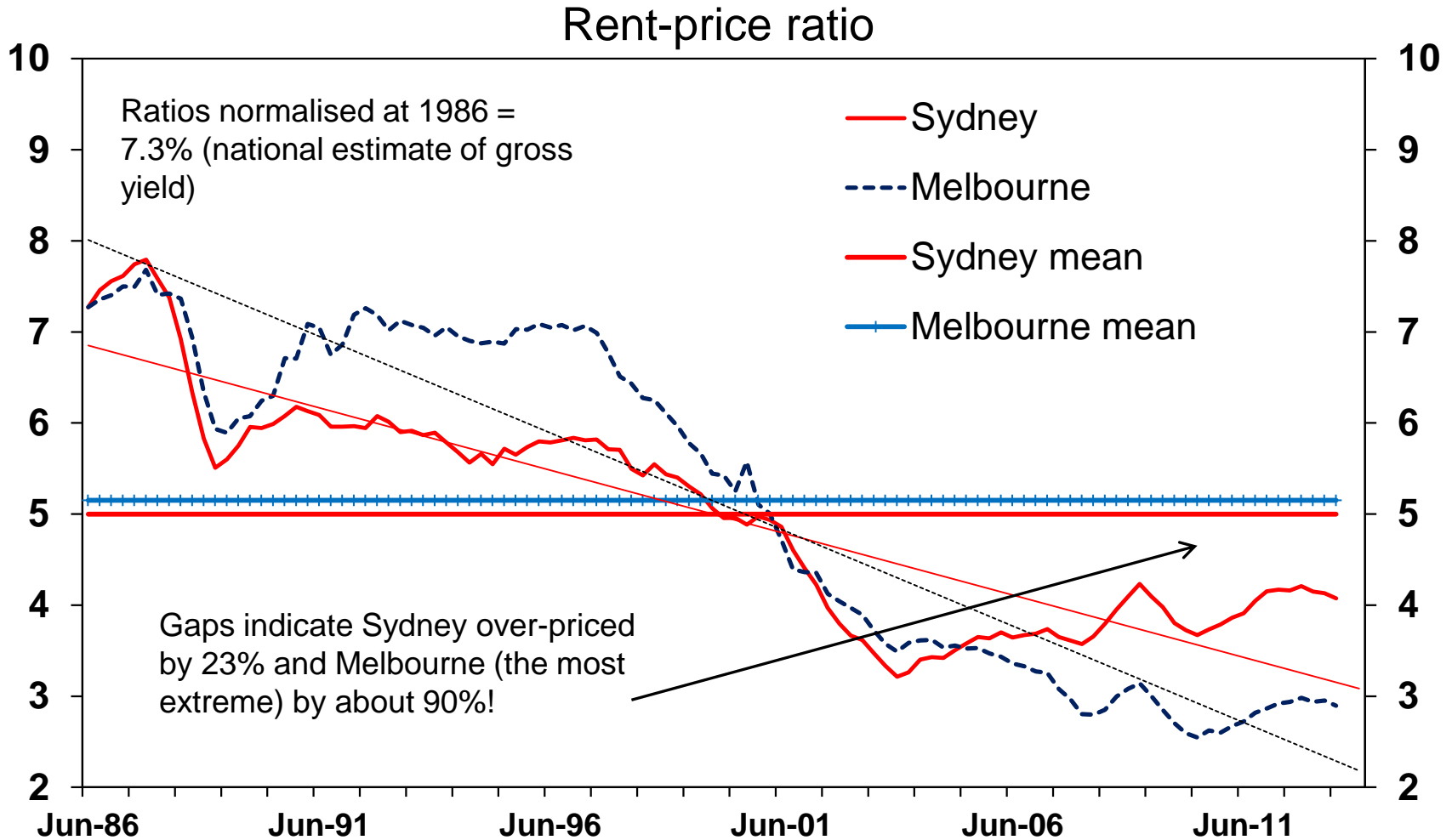


Figure 2: Australian capital city rents 1984-2014

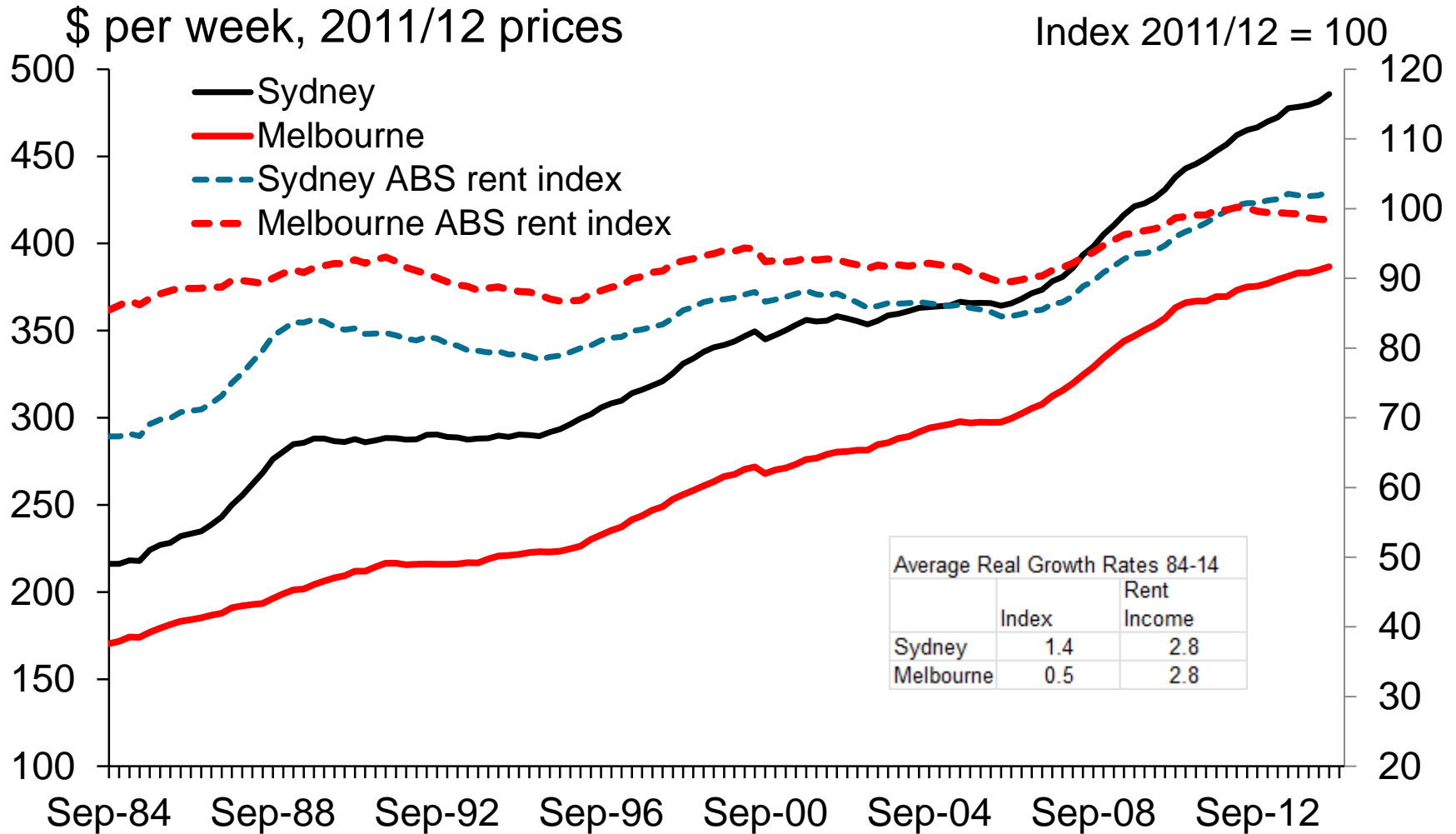
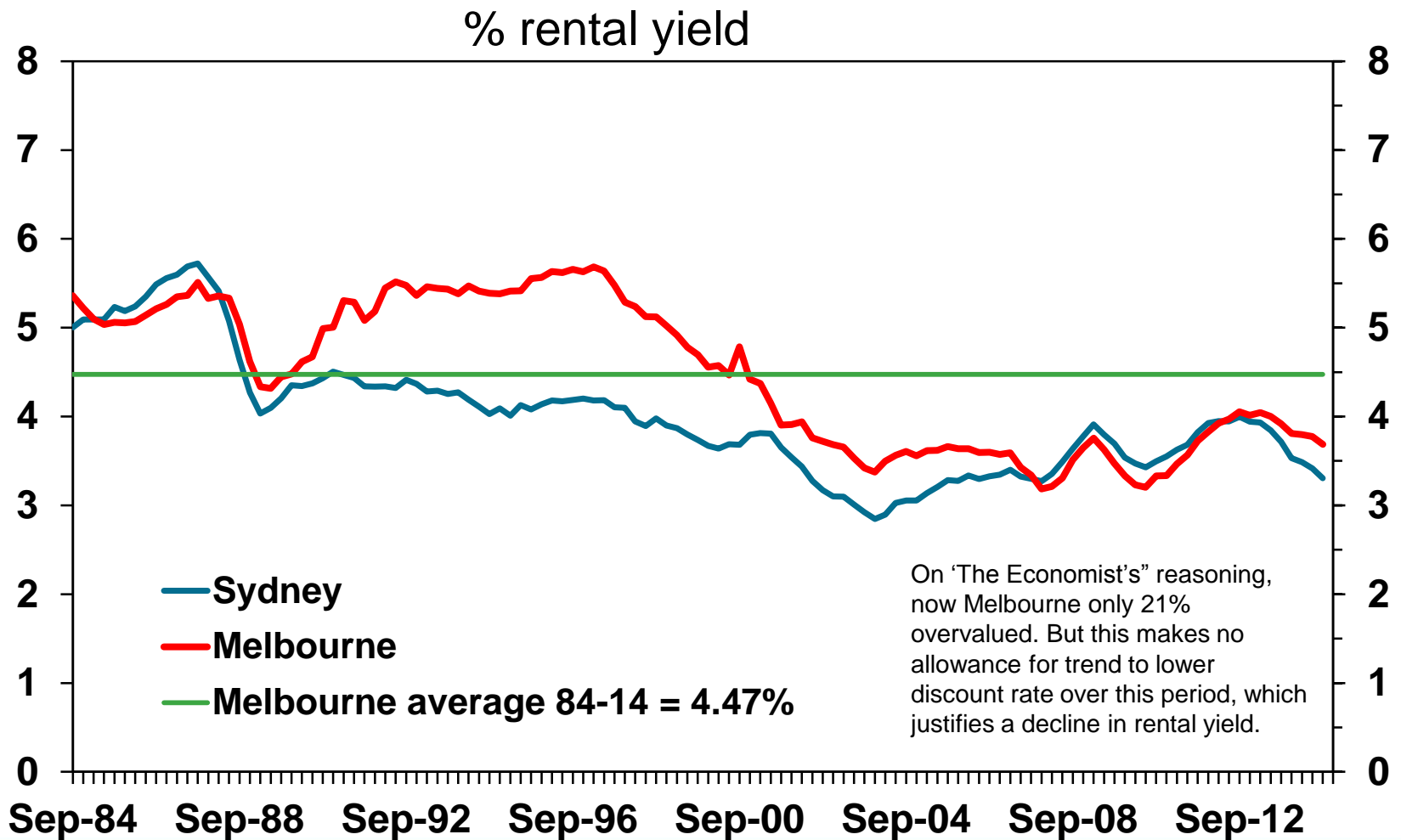


Figure 3: Australian capital city rental yields 1984-2014



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- The unanswered questions are:
 1. Explaining the factors leading to the decline in the rent-to-price ratio
 2. The harder one of whether the current low levels are sustainable (is there a bubble?)
- With Melbourne/Victoria, substantial published database from 1970 of land, house, commercial property sales (prices, block sizes, etc) by LGA
 - Published but hardcopy except for most recent years
- Melbourne has 31 LGAs so reasonable disaggregation
- Census data for 1971, 1976#, 1991#, 1996#, 2001, 2006 and 2011 give rents by LGA
 - # lesser quality for 1976, 1991, 1996 and not published for 1981 and 1986: it was collected but just not published. 2006 and 2011 most detailed (thanks to data-builder)



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Objectives:

1. Estimate imputed rents for LGAs – beds alone may not be adequate.
2. Observe key trends in prices, rents and rent-price ratios (yields)
3. Observe relationship between prices and rent-price ratios
4. Explanation – expected capital gains?
5. Disaggregate user cost into structure and land components – more insight into variation rent-price ratios (yields) across space and across time?

Table 1 – Melbourne LGA Houses - Bedrooms & Rents 2011

Number	Mean beds	Variance	Variance(%)	Houses' ownership	
• All	3.17	0.23	7.3	% share	Variance (%)
Owner-occupied	3.26	0.22	6.7	77.6	7.4 (9.5%)
Rented	2.83	0.21	7.5	22.4	7.4 (33.1%)
OO/Rented	15.1%				
All/Rented	11.9%				
\$ per week	Mean rents	Variance	Variance(%)	Range - high	Range - low
All	398.2	79.4	19.9	558.7	306.7
Owner-occupied	404.1	81.9	20.3	571.0	309.4
Rented	377.4	73.1	19.4	534.9	297.0
OO/Rented	7.1%			Port Phillip (Inner LGA)	Melton (Outer LGA)
All/Rented	5.5%				

Table 2 – Melbourne LGA Units - Bedrooms & Rents 2011

Number	Mean beds	Variance	Variance(%)	Units ownership	
All	2.07	0.21	10.3	% share	Variance(%)
Owner-occupied	2.24	0.19	8.5	39.9	8.9 (22.3)
Rented	1.96	0.23	11.7	60.1	8.9 (14.8)
OO/Rented	14.6%				
All/Rented	5.7%				
\$ per week	Mean rents	Variance	Variance(%)	Range - high	Range - low
All	311.7	56.6	18.2	460.3	240.8
Owner-occupied	323.8	61.6	19.0	489.7	237.0
Rented	306.9	50.5	16.5	442.4	252.7
OO/Rented	5.5%			Melbourne	Melton
All/Rented	1.5%			(Inner LGA)	(Outer LGA)

Figure 4: Australian capital city rental yields 1971-2014

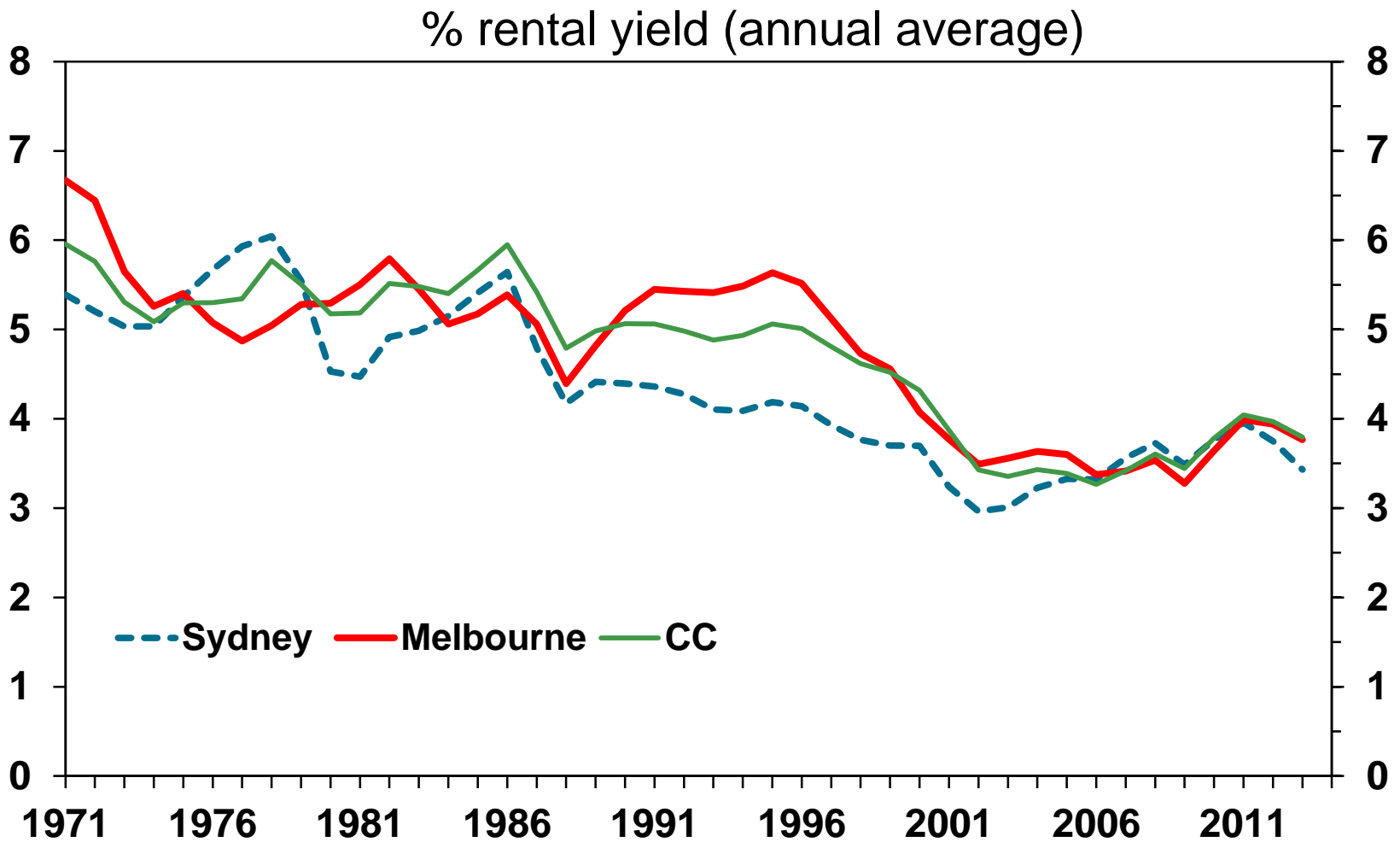


Table 3 – Melbourne LGA House Prices and Rents

Summary Statistics on Real House Prices						
\$'000s, 2011/12 prices	House Prices for the 31 LGAs			House Rents for the 31 LGAs		
Year	Mean	Variance (\$)	Variance (%)	Mean	Variance (\$)	Variance (%)
1971	134.2	27.4	20.4	161.0	25.8	16.0
1991	252.9	89.6	35.4	235.8	39.6	16.8
1996	238.9	96.0	40.2	236.2	47.3	20.0
2001	403.1	191.1	47.4	284.1	70.7	24.9
2006	556.4	273.7	49.2	300.3	64.9	21.6
2011	712.6	341.3	47.9	373.4	72.1	19.3

Table 4 – Melbourne LGA Unit Prices and Rents

Summary Statistics on Real Unit Prices						
\$'000s, 2011/12 prices	Unit Prices for the 31 LGAs			Unit Rents for the 31 LGAs		
Year	Mean	Variance (\$)	Variance (%)	Mean	Variance (\$)	Variance (%)
1971	126.0	22.9	18.2	168.0	17.5	10.4
1991	199.3	47.3	23.7	190.9	23.3	12.2
1996	181.1	55.5	30.7	191.0	29.7	15.5
2001	290.4	97.1	33.4	229.2	47.5	20.7
2006	374.0	102.2	27.3	242.2	47.5	19.6
2011	454.2	120.4	26.5	309.4	51.5	16.6

Table 5 – Melbourne LGA House Price and Rent Growth

Growth rates, 2011/12 prices						
Period	ALL	Variance	Inner LGAs	Middle – high price LGAs	Middle – low price LGAs	Outer LGAs
Prices						
1971-2011	4.1	0.5	5.2	4.2	4.0	3.2
1971-1996	2.2	0.6	3.4	2.4	2.3	1.9
1996-2011	7.3	1.2	8.1	7.9	7.5	6.2
Rents						
1971-2011	2.1	0.3	2.6	1.8	2.0	2.0
1971-1996	1.5	0.4	2.0	1.2	1.4	1.5
1996-2011	3.1	0.8	3.2	3.1	3.2	3.0

Table 6 – Melbourne LGA Unit Price and Rent Growth

Growth rates, 2011/12 prices						
Period	Mean growth	Variance (%)	Inner LGAs	Middle – high price LGAs	Middle – low price LGAs	Outer LGAs
Prices						
1971-2011	3.4	0.5	3.7	3.4	3.4	2.7
1971-1996	1.9	0.6	2.3	2.0	1.8	1.6
1996-2011	5.6	1.2	6.0	6.6	7.0	5.8
Rents						
1971-2011	1.5	0.3	1.9	1.5	1.5	1.3
1971-1996	0.5	0.4	0.6	0.5	0.4	0.6
1996-2011	3.2	0.8	3.5	3.3	3.6	2.8

Table 7 – Melbourne LGA Rent-Price Ratios (Rental Yields)

1971-2011						
Year	Houses	Variance	Range	Units	Variance	Range
1971	6.32	0.70	4.65-7.35	7.24	0.92	5.43-9.61
1991	5.10	0.82	3.17-6.81	5.13	0.78	3.47-7.46
1996	5.46	0.85	3.39-7.02	5.74	1.00	4.23-8.52
2001	3.99	0.78	2.43-5.82	4.32	0.81	2.86-6.38
2006	3.10	0.66	1.59-4.24	3.45	0.41	2.43-4.13
2011	3.04	0.74	1.54-4.21	3.66	0.52	2.79-4.86

Key Observations on Melbourne Property Data – Part 1

- Sharp contrast in experience 1971-1996 vs 1996-2011
 - Which period is best guide to the future – or are any a guide to future?
- As expected inner urban prices and rents have risen faster than outer
- Observe significant variation in rent price ratios – across time and space (see Figures below)
- As we will observe this variation seems to be closely related to price.

How could we explain relationship between prices and rental yields?

- Standard user cost for housing = $r + exp - cg = \frac{R_H}{P_H}$
- $\rightarrow r + exp = \frac{R_H}{P_H} + cg$
- Where r is discount rate (interest plus risk premium), exp is expenses such as depreciation, maintenance, rates and taxes and cg is growth rate in house prices P_H , or growth rate g in house rent R_H
- If many US studies, assume expense components are constants, and if interest rates are common to all market segments, it follows that it would be variation in cg or g which would be looked to explain the variation in rent to price ratios.
- Preliminary observation is that adding add estimates of cg does explain some of the variation.

Figure 5: Melbourne LGA House Rental Yields vs Price 1971

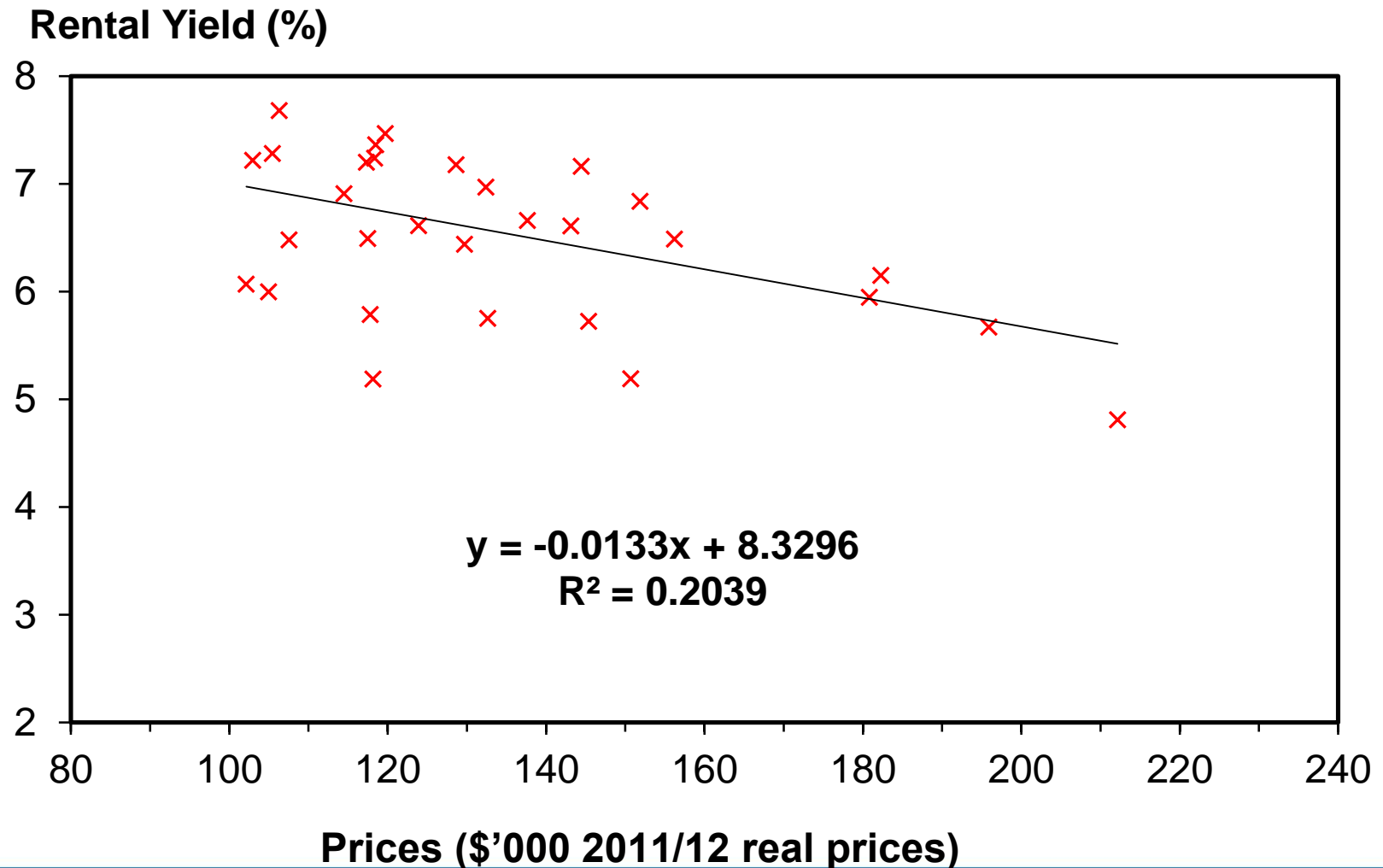


Figure 6: Melbourne LGA House Rental Yields vs Price 1996

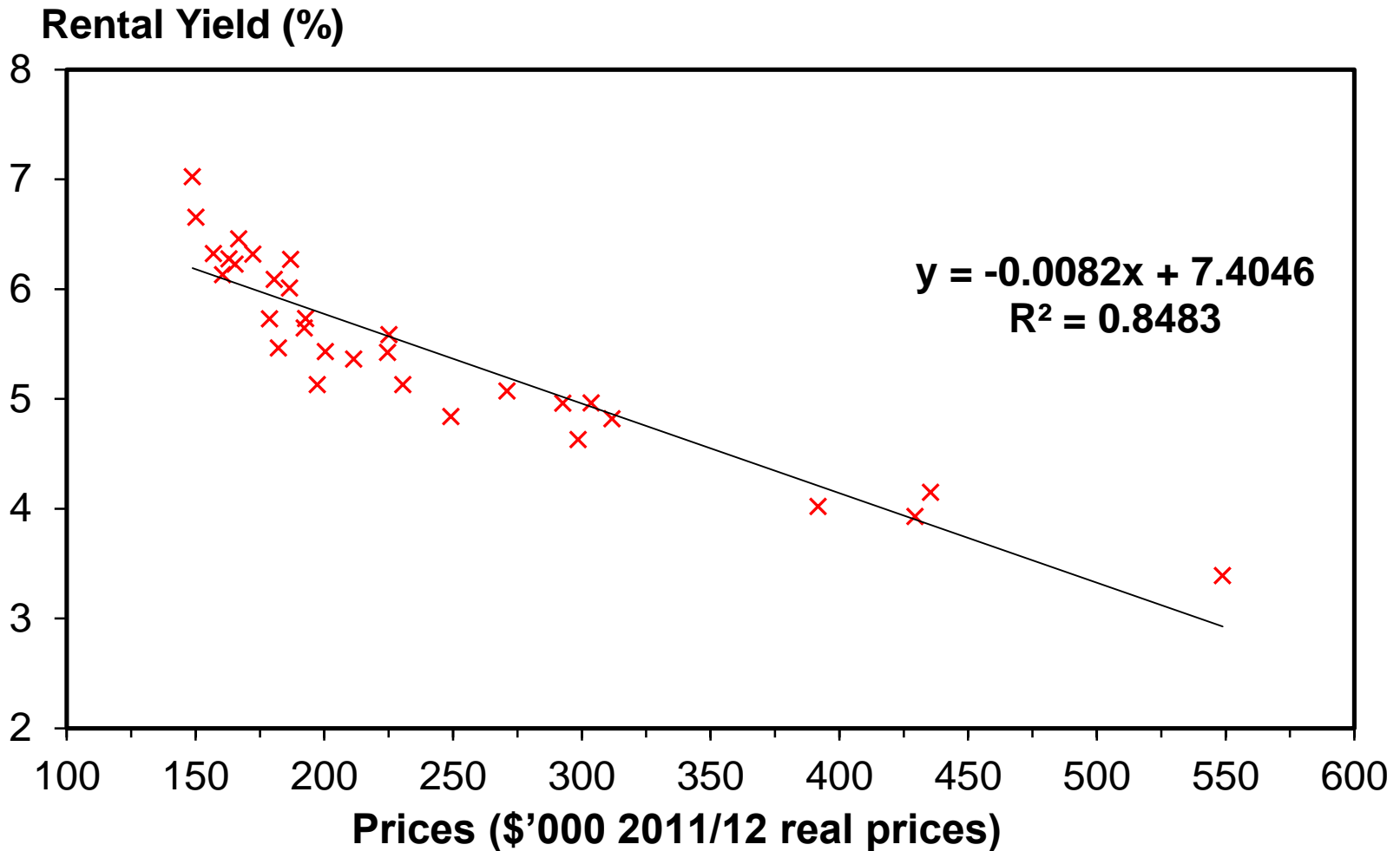


Figure 7: Melbourne LGA House Rental Yields vs Price 2006

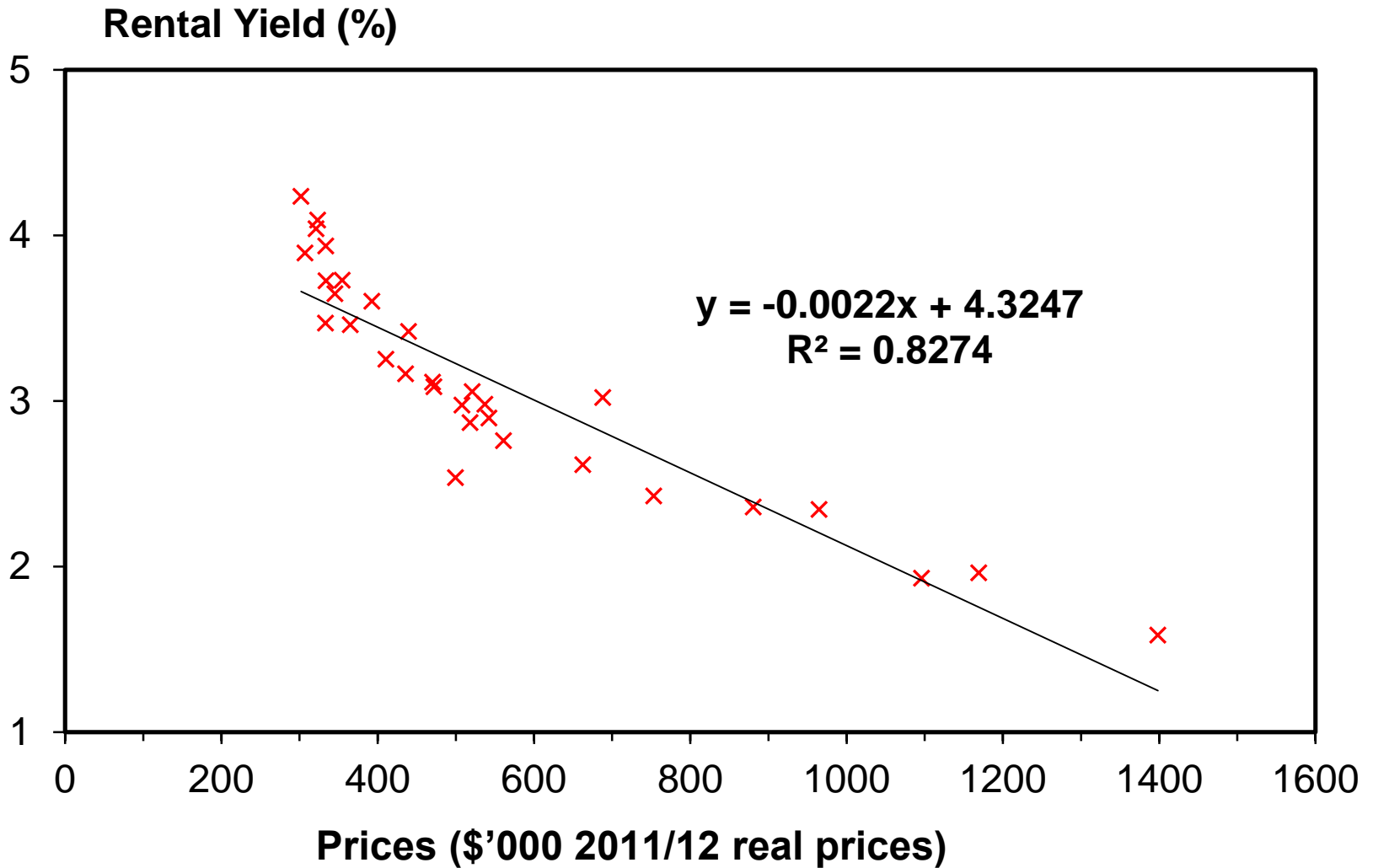


Figure 8: Melbourne LGA House Rental Yield + Past Capital gains (01-06) vs Price 2006

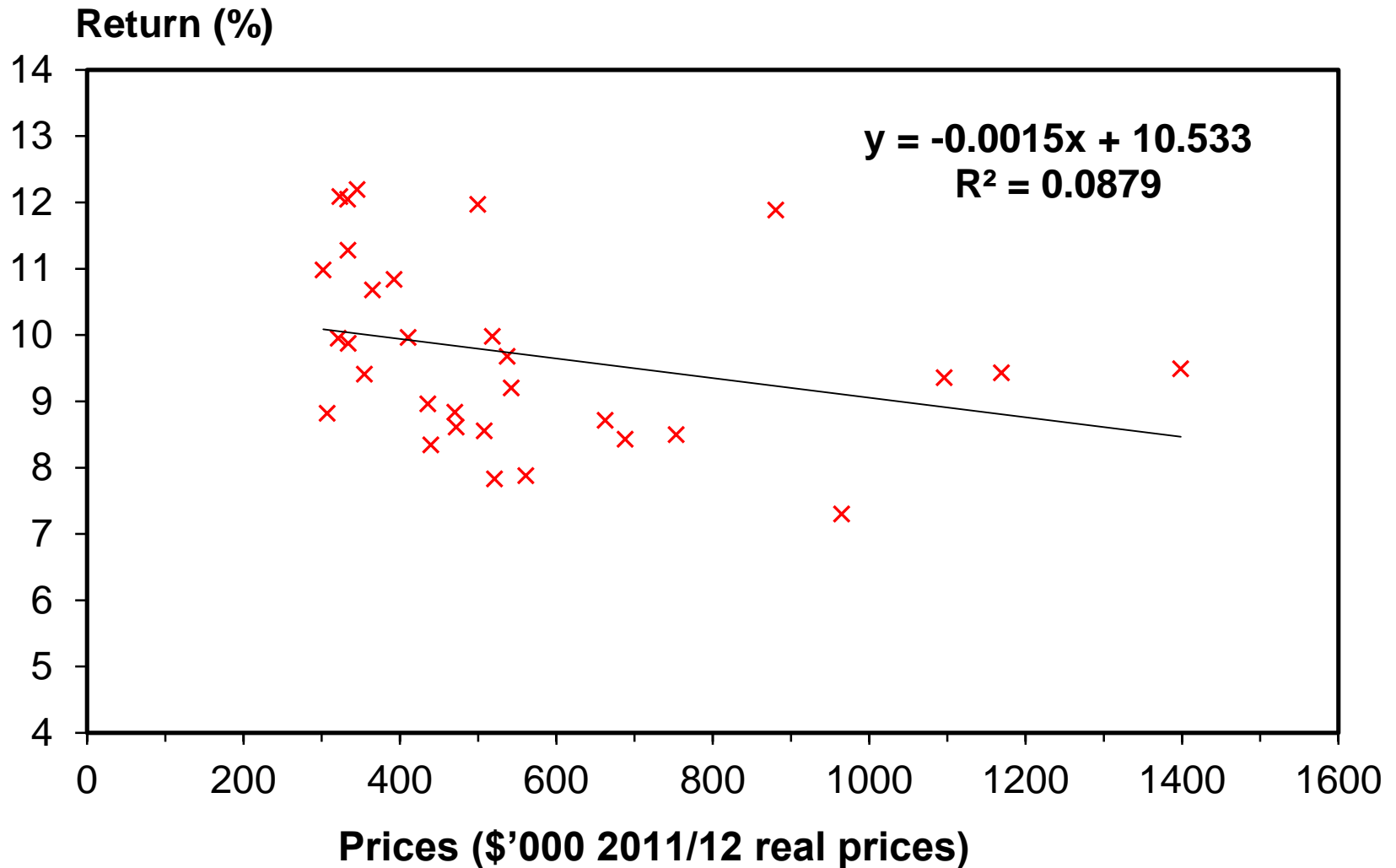


Figure 9: Melbourne LGA House Rental Yield + Future Capital gains (06-11) vs Price 2006

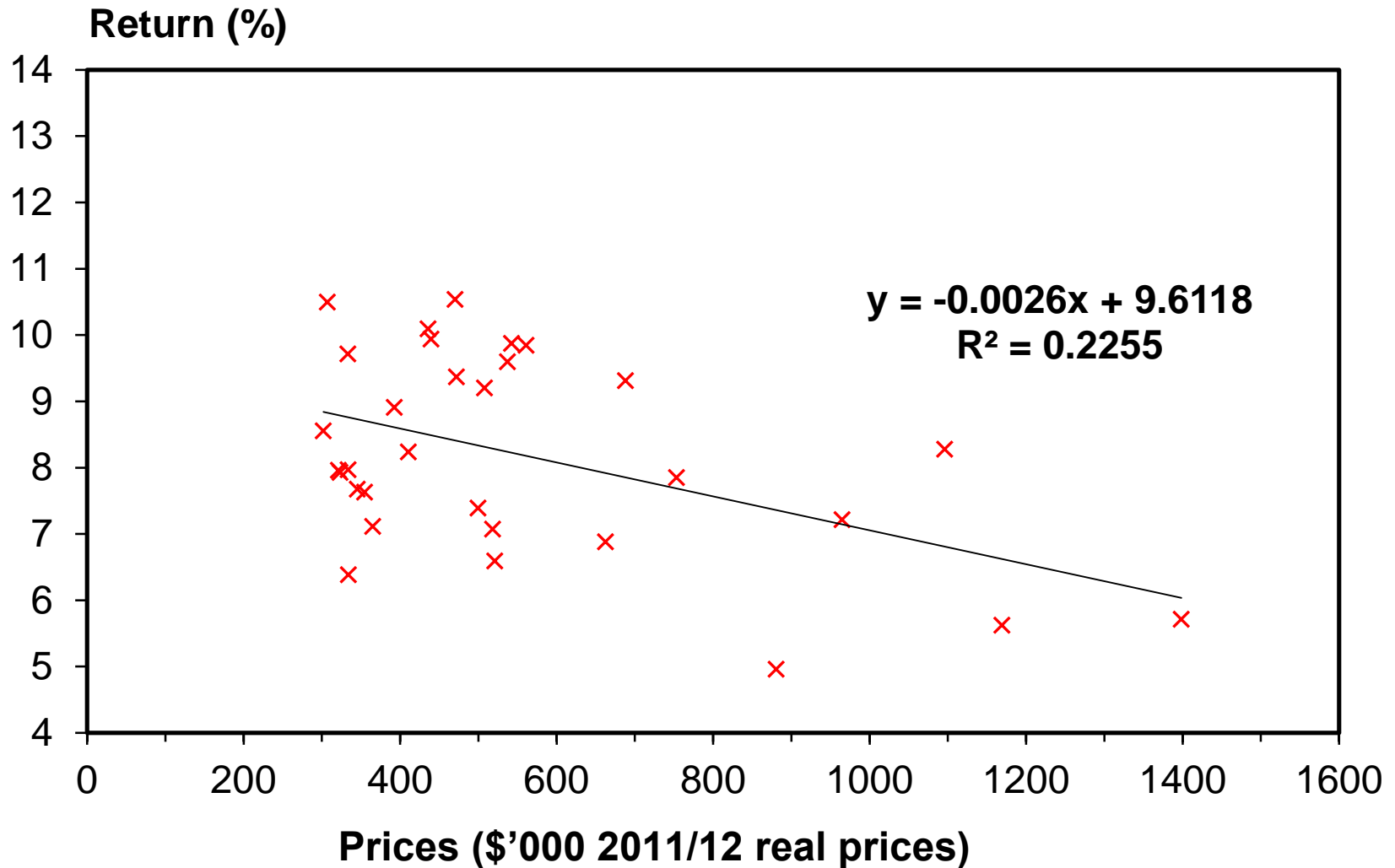


Figure 10: Melbourne LGA Unit Rental Yields vs Price 1971

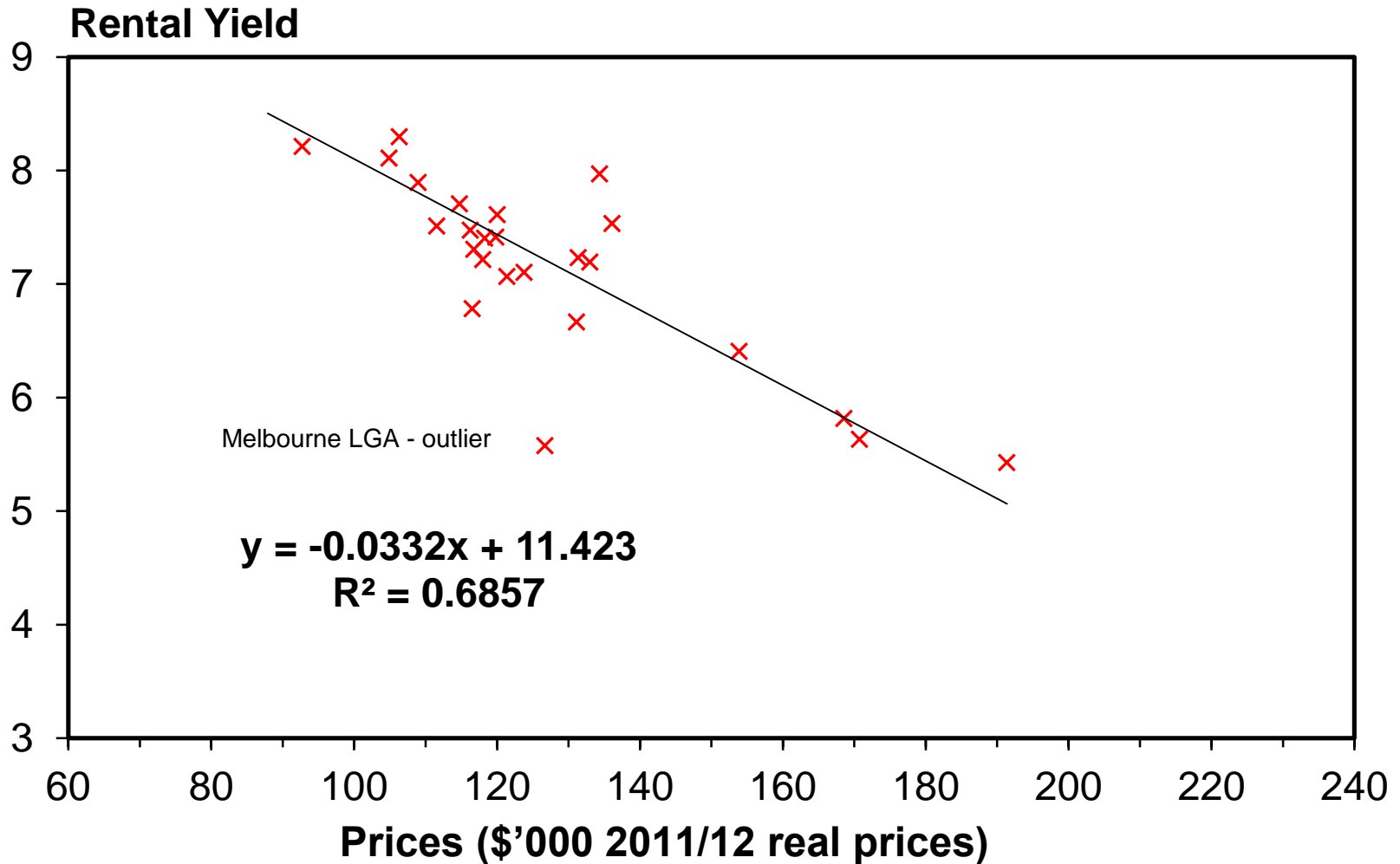


Figure 11: Melbourne LGA Unit Rental Yields vs Price 1996

Rental Yield (%)

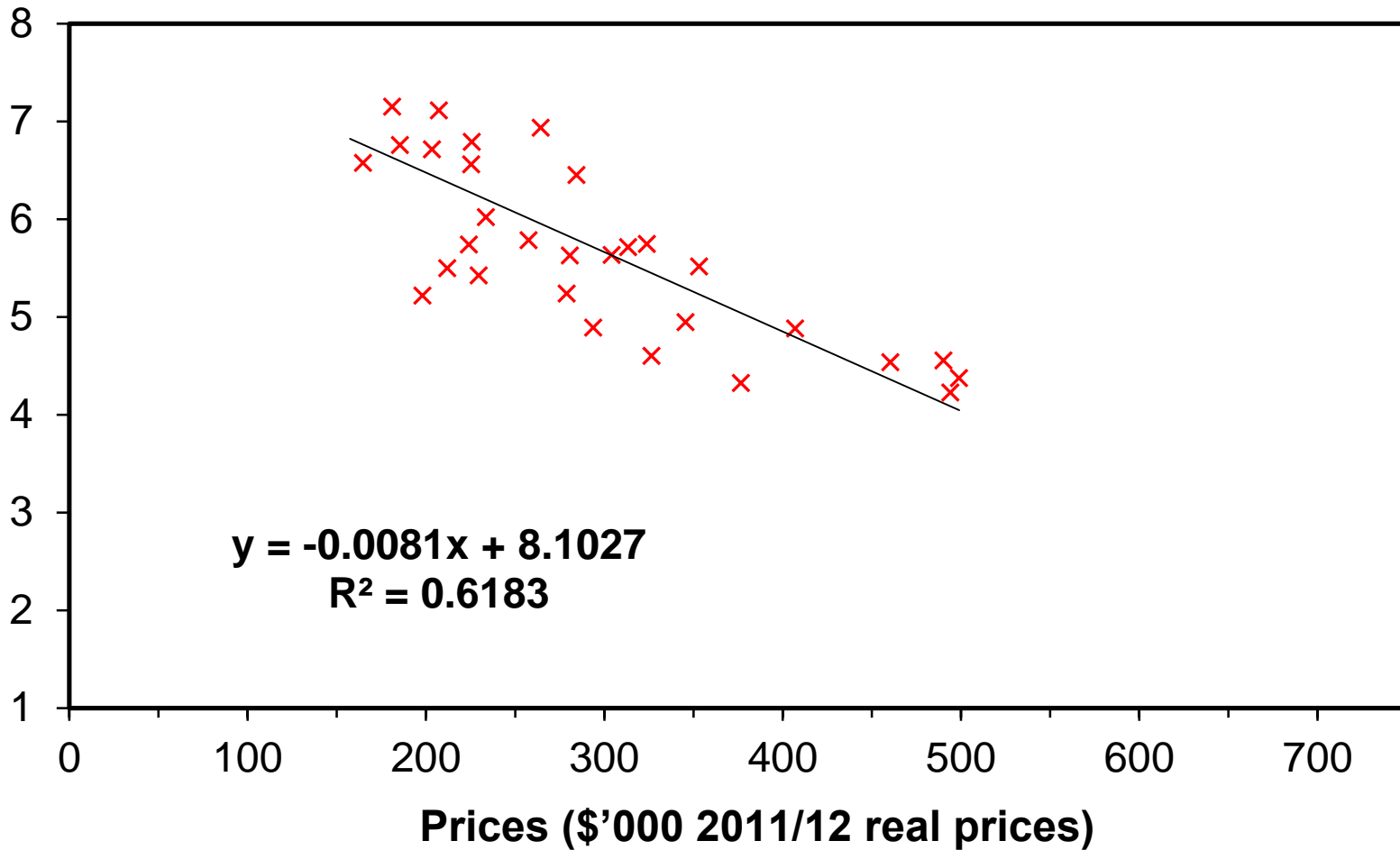


Figure 12: Melbourne LGA Unit Rental Yields vs Price 2006

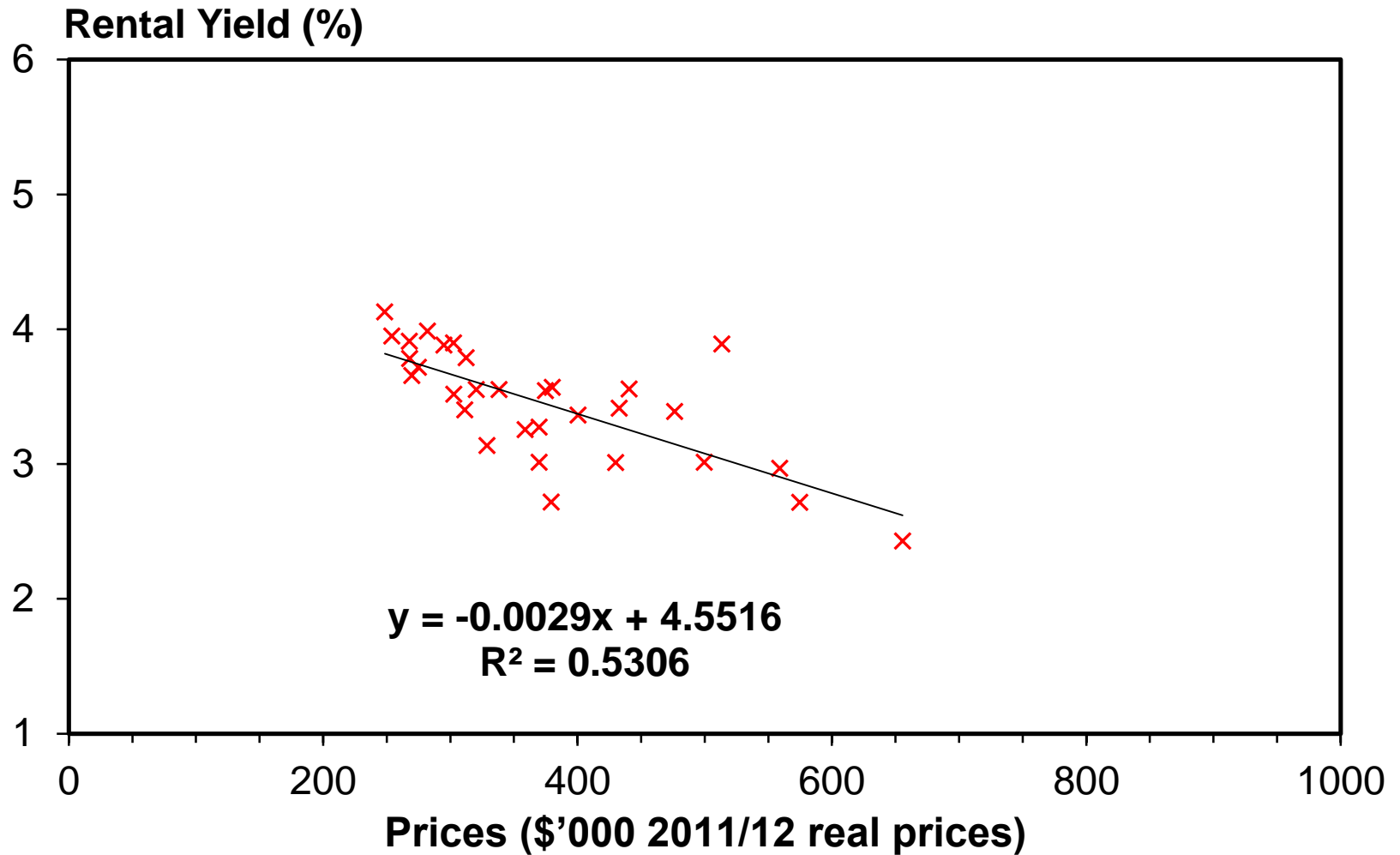


Figure 13: Melbourne LGA Unit Rental Yield + Past Capital Gains (01-06) vs Price 2006

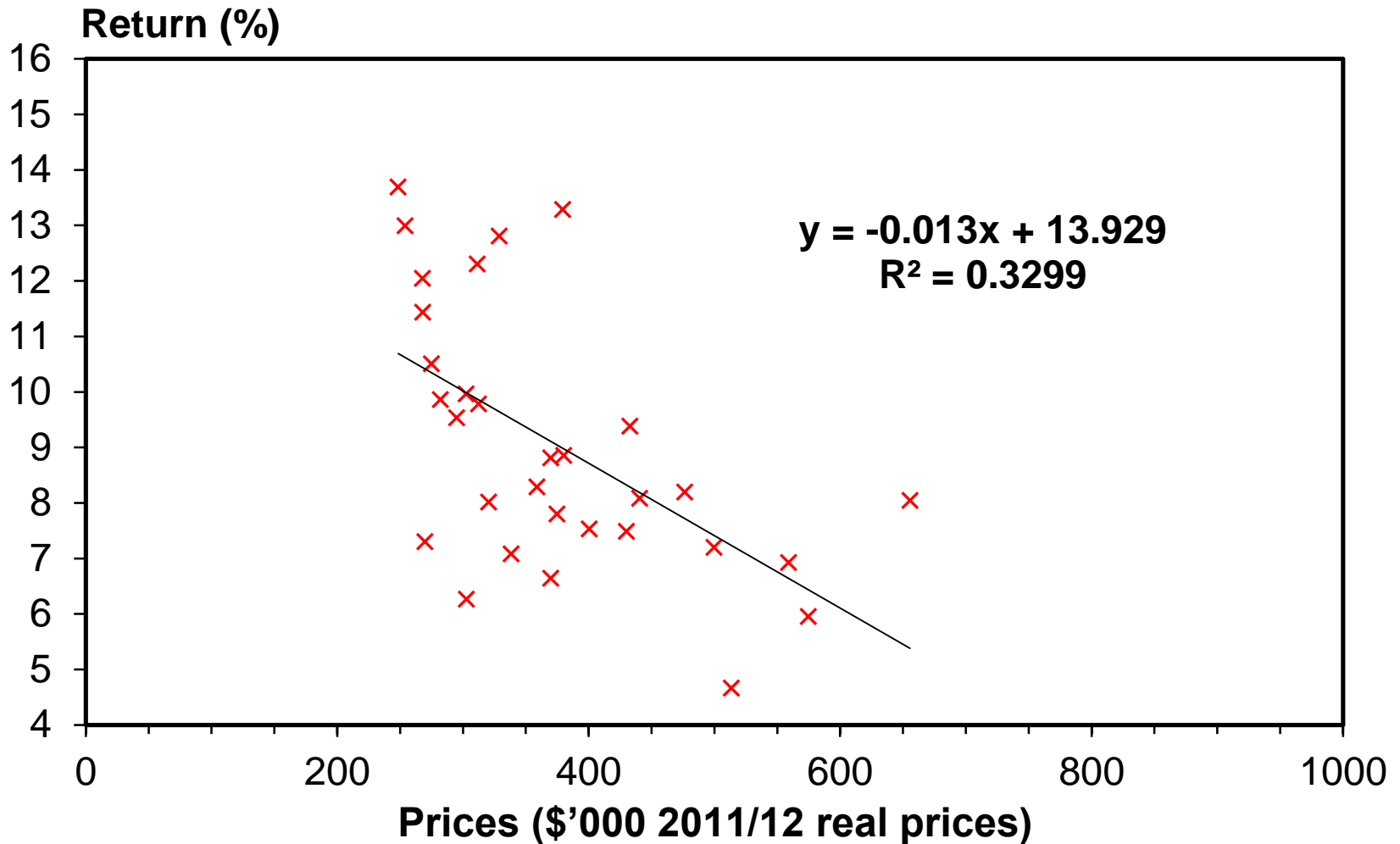
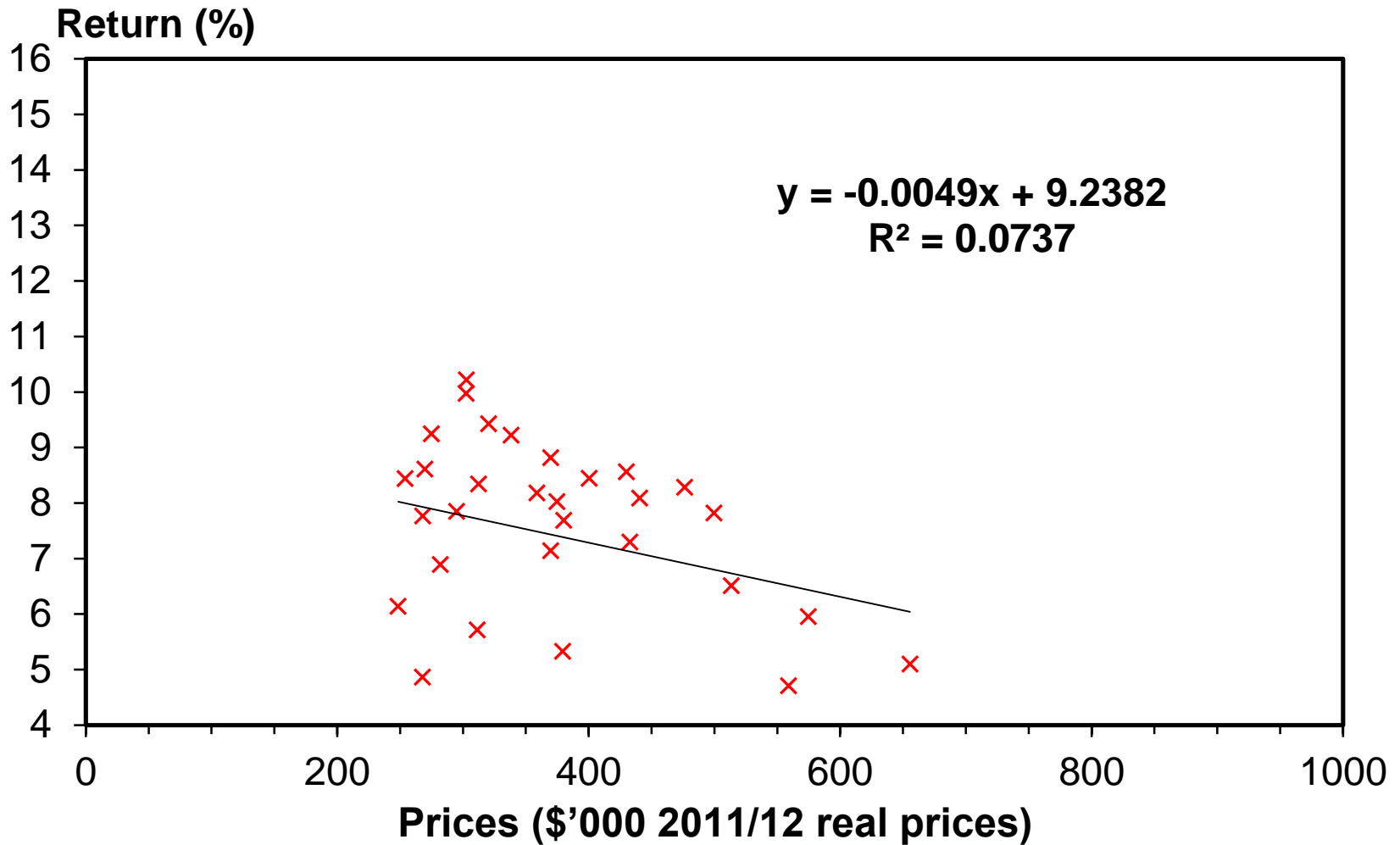


Figure 14: Melbourne LGA Unit Rental Yield + Past Capital Gains (01-06) vs Price 2006



Key Observations on Melbourne Property Data – Part 2

- For 2006 we observe past capital gains explain some of the variation.
 - Past guides expectations for houses but less so units!
- Future capital gains explain a lot less
 - Ratios are poor forecasters for housing but good for units!
- This is only preliminary observation – more to be done.
- Even if expectations matter, can be wrong. Focus today more on framework for understanding the long-term relationship between prices and price rent ratios.
- For that we turn to user cost.

Can user cost help explain relationship between prices and rental yields?

- Let us see if we disaggregate user cost between land and structure.

- User cost for housing = $r + rt + d + m - g = \frac{R_H}{P_H}$

- Where r is discount rate (interest plus risk premium), rti is rates, taxes and insurance, d is depreciation, m is maintenance and g is growth rate in house prices P_H (house rent R_H)
- In long-term equilibrium, that is other variables constant, growth rate for prices and rents need to equate.
- In short-run, these two growth rates can diverge.
- User cost for housing can be composite of those for structure and land components of housing:

- $\frac{R_H}{P_H} = \frac{R_S + R_L}{P_H} = (\alpha) \frac{R_S}{P_S} + (1 - \alpha) \frac{R_L}{P_L}$

- Where $\alpha = \frac{P_S}{P_H}$ and $1 - \alpha = \frac{P_L}{P_H}$: i.e. the shares of structure and land of the value of the house.

User cost for land and structure

- User cost for land component:

- $\frac{R_L}{P_L} = r + rti_L - g_L$

- User cost for structure component:

- $\frac{R_S}{P_S} = r + d_s + m_s + rti_s + tc_s - g_s$

- In Tables 8 and 9 we generate some estimates of the user cost for land and structure.
- In Table 11, we see how different land-structure ratio can “explain” different rent-price yields

Table 8 - User cost of Land

- User cost for land component: $\frac{R_L}{P_L} = r + rti_L - g_L$

Variable	Data	% of value of structure
Real interest rate or discount rate	Fox and Tulip (2014) – 10 year fixed mortgage, less 1% term premium, less expected inflation.	3.4
plus Rates on land rti_L	Land does not depreciate/require maintenance but typically rates are applied to the value of the land (and is payable even when land is vacant). ABS HES data suggests a ballpark estimate of order of (average) 0.3%.	+ 0.3
plus Transaction costs	Fox and Tulip (2014) – stamp duty + real estate commission amortised over 10 years.	+ 0.7
less expected capital gains	For Melbourne outer LGAs, for the period 1971-2011, value of land has averaged 4.7% per annum.	- 4.7
= Total user cost for land		- 0.3

Table 9 - User cost of Structure

- User cost for structure component: $\frac{R_S}{P_S} = r + d_S + m_S + rti_S + tc_S - g_S$

Variable	Data	% of value of structure
Discount rate	As per Land user cost.	3.4
Plus depreciation d_S and maintenance m_S	Related to the value of the structure. For the period 1971-2011, ABS national accounts data indicate an average 2.2% and 0.8% respectively.	+3.0
plus Rates on land rti_S	Insurance is related to structure and a component of utility services is related to occupation (presence/use of structure). ABS HES data suggests a ballpark about 0.5%.	+ 0.5
plus Transaction costs	As per Land user cost.	+ 0.7
less expected capital gains	Over the period 1971-2011, ABS national accounts estimates have real residential construction costs rising an average 0.8% per annum.	- 0.8
= Total user cost for land		= 6.8

Table 10 - User Cost of House – with hypothetical scenarios

Land share	Structure user cost = 6.8%	Land user cost = -0.3%	Total user cost
0.35	4.42	-0.105	4.315
0.5	3.4	-0.15	3.25
0.6	2.72	-0.18	2.54
0.7	2.04	-0.21	1.83

- User costs based on assumptions in Tables 8 & 9. Critical here is land user cost assumption on capital gain. Lower capital gain expectations in 1971 for example would mean higher user cost.

Table 11 - Indicative Evidence on Trends in Land-Structure Ratio 1971-2011

Land as Ratio of House Value in LGAs*				
	Outer LGAs (9/10)	Middle – Low Price (7/8)	Middle – High Price (6/6)	Inner LGAs
1971	0.35	0.43	0.50	ns
1996	0.47	0.50	0.60	ns
2011	0.52	ns	ns	ns

* Note: this is ratio of mean value of vacant blocks sold to mean value of houses sold in the same year for LGAs.

Key observations on Melbourne Property – Part 3

- Significant difference between user cost of structure (high) and land (low)
- It follows that we would expect to observe lower r/p ratios for LGAs with a high land component
- If this is the explanation, we would expect to observe a positive relationship between land ratio and prices (or yields) – Table 11 points in that direction.

- But while explaining long-term trends, does not preclude overvaluation (or bubble)
 - Capital gains in user cost still need to be plausible (consistent with rental growth)
 - Can the trends apparent 1971-2011 keep on keeping on?