

AN ANALYSIS OF THE SYDNEY PRESTIGE WATERFRONT PROPERTY MARKET: 1991-2002

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ABSTRACT

Prestige residential property is a relatively small property sector; however, it attracts considerable attention due to the relatively high prices paid. This paper will examine the prestige Sydney Harbour front residential property market to determine if this small, but significant, property sector has performed in a similar way to the residential property markets directly adjoining, as well as the general property market in Sydney.

The study will be based on the analysis of waterfront and waterfront reserve single residential and strata title unit sales transactions over the period 1991-2002. Comparisons will be made in relation to average annual capital growth, volatility of average annual capital growth and a correlation analysis of these average annual returns will be undertaken to determine if these specific residential property markets have performed in a similar manner to other residential property markets in Sydney.

Keywords: Residential property, waterfront property, Sydney prime residential property, residential property performance, housing price analysis.

INTRODUCTION

Sydney is a dynamic and major city in the Asia Pacific region, with a growing business and residential population. As one of the major cities in the world, the residential property market covers the full range of socio-economic sectors and property types.

As the city of Sydney has developed around a very scenic harbour, prime residential real estate markets are generally those residential areas close to the Sydney CBD and with views of the Sydney Opera House and the Sydney Harbour Bridge. Within these prime residential areas, properties with direct water frontage are

considered to be premium properties, with a higher value than similar quality residential properties with only water views or only frontage to waterfront reserves.

This paper will analyse the Sydney premium residential market for the period of 1991 to 2002. The results of this analysis will be used to determine the trend of the various premium residential property markets in Sydney compared to the median house price for inner Sydney suburbs and Sydney in general. The paper will also determine if the various sectors of the premium Sydney residential market have performed at similar levels or if these are actually individual property sectors within the Sydney residential market.

LITERATURE REVIEW

Rapid inflation in house prices, particularly over the past five years, is now a global phenomenon. The Economist (2003) launched its global house price indicators in early 2003. Over the past five years, real house prices have increased at average annual rates of 8%-12% in Australia, UK, Ireland, the Netherlands and Spain. In these six economies, the ratio of house prices to average earnings is at record levels and much higher than the average level over the period 1975 to 2002. The Economist concludes that house prices continued to climb despite a stockmarket crash, global economic slowdown and the Iraq war, and have fuelled the belief that they can only keep rising. Indeed in many countries, investors bruised by poor stockmarket performance have invested heavily in residential property. Australia is now the most active residential investment market, with investors accounting for 40% of all new mortgages.

In terms of further work on the global perspective, Crooks and Despeignes (2002) chart the growth of house prices in Europe, America and parts of Asia, noting increasing rates not seen since the 1980s. In Europe, the gains have been particularly strong in countries that have experienced a sharp fall in interest rates as a result of joining the euro; for example, Spain with growth of 18% and Ireland 8%. However, house prices have not been strong everywhere. In Germany, Japan and Hong Kong, prices have been stagnant or falling and the hotspots are widely spread from Sydney to Stockholm. House prices have risen by 18% in the UK and in Australia by 17% over the year.

Khatri (2003) analyses real house price movements across 14 out of the 15 European Union (EU) nations over the five year period 1997-2002 in relation to variations in unemployment, real interest rates and real compensation of employees. Across Europe as a whole, real house prices have been rising at an annual average rate of 13.7% pa. Over the same period, there has been a decline in unemployment rates across almost all countries except Greece. The largest falls are recorded in Ireland and Spain, the countries with the highest rises in house prices. A similar relationship is found in terms of employee compensation, with Ireland and the UK

experiencing among the highest rates of real wage inflation and house price rises in the EU since 1997. Interest rates are an important factor in driving house price performance; however, Khatri (2003) notes that differences in mortgage market structures mean that for some countries, short-term interest rates play a greater role in housing demand than long-term rates. Nevertheless, despite the prevalence of different housing finance systems and rates of owner occupation, those countries with the strongest labour markets and wage growth, and relatively larger falls in interest rates, experienced the most rapid rise in house prices in recent years.

Over the past decade in Australia, Oluwoye and Higgins (1999) note that the proportion of private dwellings occupied by their owners has dropped from 69% in 1986 to 66% in 1996, primarily due to increased house prices. In their study, Oluwoye and Higgins (1999) review a number of Australian house price studies which show that house prices are linked to several interrelated variables, with those relating to demand exerting a greater influence than supply variables. Comparable with other western economies, the past decade has witnessed significant falls in mortgage interest rates and increased household net income, due to the growth in households with multiple income earners. In their analysis, Oluwoye and Higgins (1999) examine whether determinants of aggregated house prices in Australian capital cities are linked to financial and economic activity by using quarterly housing and financial data over the period 1985 to 1997. They conclude that house prices are independent of any individual macro-economic indicator, house prices increase with growth in employment and net income, and inflation is not significant in predicting house prices. Finally, they highlight the importance of interest rates and household net income as key elements in extending home ownership.

There have been a number of significant studies completed in relation to residential property prices and the influence of views and proximity to natural scenic locations. A study by Thorsnes (2002) indicated that proximity to forest areas resulted in residential lots closer to the forests achieved higher selling prices than those with a less favourable proximity.

Further studies by Bond, Seiler and Seiler (2002), Bourassa, Hoesli and Sun (2003) and Yu, Han and Chai (2005) have also confirmed that a view provides a premium or greater value to residential property, ranging from 15% to a maximum of 89% as stated in the Bond, Seiler and Seiler (2002) study. All these studies have also confirmed that the actual amount of any premium for a view depends on the supply of such property and the potential for such views to be blocked by future development. These results supported the earlier studies by Darling (1973), Plattner and Campbell (1978) and Gillard (1981), which also found that views have a significant influence on the value of property.

In relation to the upper end of the market, Newell and Smith (1989) have highlighted the importance of luxury property in Sydney Harbour in attracting

attention because of its social status and top of the market real estate values. The capital appreciation of this luxury property market has grown more than any other sector of the real estate market. Their analysis of the residential waterfront property market concludes that it is high demand for a rare property asset, extensive capital appreciation, social status and international appeal, in combination with the views and natural beauty of Sydney Harbour which are the principal driving forces.

The next section of the paper measures empirically the performance of the Sydney waterfront property market and seeks to determine the principal factors driving house price growth.

RESEARCH OBJECTIVES

The initial objective of this research is to determine:

- If the prestige waterfront residential property market in Sydney is driven by the same market factors as those that influence the overall residential property market in Sydney (albeit at a higher price)

or

- Alternatively, if the Sydney waterfront property market is actually based on different factors to the general property market in Sydney.

RESEARCH METHODOLOGY

The initial stage of this research study involved the identification of the more prestigious waterfront properties in the Sydney residential market. Reviewing house price statistics from Residex and REI Australian property market indicators (2003) showed that the highest priced residential properties in the Sydney market were those properties on the inner harbour foreshores with city, Opera House and Harbour Bridge views. These statistics also showed that these harbour front properties attracted higher prices than ocean front properties. A study of the Sydney eastern suburbs and lower north shore identified four main prestige residential property types within Sydney Harbour as being:

- Direct waterfront single residential properties
- Direct waterfront strata title residential properties
- Waterfront reserve single residential properties
- Waterfront reserve strata title residential properties.

Direct water front properties are those residential properties with their front boundary being the high tide mark, with many of these properties having private marinas or deep-water boat access. Waterfront reserve properties are classified as

residential properties that directly front designated waterfront reserves (parks) or are only separated from the direct water access by a single road frontage and no possible situation where this access and water views could be impeded in any way.

In total, six Sydney suburbs were identified for inclusion in this study. In all cases, these suburbs are regarded as premium residential locations and have excellent harbour views of either or a combination of the city, Opera House and Harbour Bridge. The suburbs selected for this study are:

Eastern Suburbs

- Darling Point
- Rose Bay
- Point Piper
- Vaucluse

Lower North Shore

- Kirribilli
- Neutral Bay.

Street directories and ortho-photo maps were used to identify which streets in these six suburbs were actually direct waterfront properties or waterfront reserve properties. Once these streets were identified, a physical inspection was carried out to determine the houses in the street that were actually direct waterfront or waterfront reserve properties (based on house numbers).

A commercial database (R. P. Data Pty Ltd) was then used to extract all sales that had occurred in these streets since 1991. Combining the sales data with both the map and inspection data allowed sales to be grouped into the four research classifications listed above. In most suburbs, prestige residential property would be either direct waterfront or waterfront reserve. In relation to the six suburbs identified in this study, there were no suburbs where there were both direct waterfront properties and waterfront reserve properties.

To test the performance of these selected streets compared to non waterfront or waterfront reserve residential property, a comparison of the sales data was made on the following basis for both single residential and strata residential property:

- Direct water front to waterfront reserve
- Direct waterfront to suburb average
- Direct waterfront to local government area average
- Direct waterfront to Sydney average
- Waterfront reserve to suburb average
- Waterfront reserve to local government area average

- Waterfront reserve to Sydney average
- Waterfront property to premium Sydney suburbs (geographic locations).

Residential prices for each suburb and local government area were obtained from The Real Estate Yearbook (Allan, 1996, 1999, 2003) and the Sydney house price data was obtained from the REI Market Facts (2003).

This data was analysed to determine the price growth performance of prestige residential property in Sydney and compare these results to the residential property markets in the immediate suburb and Local Government Area, as well as the Sydney residential property market in general. A correlation analysis has also been carried out to determine if the movement in prestige waterfront and waterfront reserve residential property has been similar to the movement in residential prices in the comparative property markets.

RESEARCH LIMITATIONS

The study period is based over the period 1991 to 2002. Although this period does not represent a full cycle in the Sydney prestige housing market, complete data for full comparison purposes was only available for this time period.

Table 1: Sales transaction summary: 1991-2002

Property sector	Total sale transactions: 1991-2002	Percentage of total study area sales
Direct Waterfront Houses	95	0.68
Waterfront Reserve Houses	114	0.82
Direct Waterfront Units	192	1.38
Waterfront Reserve Units	302	2.18
Direct Waterfront Units: Eastern Suburbs	76	0.55
Waterfront Reserve Units: Eastern Suburbs	124	0.89
Direct Waterfront Units: Lower North Shore	116	0.84
Waterfront Reserve Units: Lower North Shore	178	1.28
Study Area	13884	100.00

The major limitation of this research project is the limited number of properties in the Sydney prestige property market that actually have direct water frontage or are classified as waterfront reserve.

The relatively small number of direct waterfront and waterfront reserve properties in the Sydney residential market is also reflected in the number of sales transactions that occur over time. For example, in the suburbs of Darling Point and Vaucluse, there are 5158 and 5358 residential homes respectively. In 2002, there were respectively only 2 and 5 waterfront or waterfront reserve houses sold in these two suburbs. This represents only 0.04% of the Darling Point residential house stock and 0.09% of the Vaucluse housing stock. These single residential direct waterfront properties, unless heritage listed, are also extensively modified and renovated on purchase, with this capital expenditure and increase in improvement size being reflected in future sale prices.

Table 1 also shows that these specific residential property markets are very small in relation to the number of properties sold per annum. A direct waterfront house sale over the study period only represents 0.68% of all residential properties in those specific suburbs. The percentages are slightly higher for the other prestige property sectors, with waterfront reserve unit sales having the highest percentage of the total sales for the period 1991-2002, at 2.18% of total transactions. The low percentage of these property sector sales to total transactions are expected to result in significant variation in results from a year to year basis.

It was also found that the number of single direct waterfront properties on the lower north shore suburbs of Kirribilli and Neutral bay were very low, with the majority of residential properties in these two suburbs being strata title. Although the direct waterfront sales could be used in the overall prestige market analysis, sale transaction numbers for single residential direct waterfront properties were too small to extract worthwhile analysis figures. These low sale transaction numbers also cast significant doubt on the measure of volatility in the change in house price growth from year to year, with the high annual volatility reflecting limited data rather than actual property investment risk.

There is also a considerable variation in the type, house size and land area for single residential properties in these prestige markets, which can influence the annual volatility of the analysis. This is further complicated by the small number of sales that actually occur each year, thus resulting in significant variation in average house and unit prices in some years of the study.

In relation to waterfront single residential dwellings, the major limitation is the fact that this sector of the Sydney property market is actually decreasing rather than increasing. Larger sites tend to be purchased for development for medium density

residential. In comparison, the number of strata title waterfront properties has increased in number, as these multi-residential developments are completed.

RESULTS

Initially, it was intended to focus this study on the single residential waterfront property market. However, as discussed in the research limitations, the small number of actual sale transactions and the significant variation in the value of property that is sold each year has provided significantly varied data from year to year, which has restricted the validity of the data. However, the greater availability of unit sales provides a more accurate analysis of these property markets. Due to these limitations, the results will focus primarily on the residential strata title unit markets, with later comment on the single residential housing markets.

The discussion of the research results will focus initially on the performance of waterfront property compared to waterfront reserve property for both single residential and strata property on an amalgamated suburb basis for the period 1991-2002. The second section of the results will compare waterfront property to residential property in the individual suburbs for the period 1995 to 2003. The final discussion of results will be based on a comparison of waterfront property to the Local Government Area and the overall Sydney property market.

Direct Waterfront Residential Property and Waterfront Reserve Residential Property

Strata

The demand for waterfront or waterfront reserve property has always resulted in the development of more multi-residential properties in these prime waterfront locations compared to other areas of Sydney. This is also reflected in the higher number of annual sales for strata title units compared to the number of annual sales for single residential properties in the same location.

Figure 1 represents the annual change in average sale price for both direct waterfront strata title units and waterfront reserve strata title units. From this figure, it can be seen that unlike the housing sectors analysed later in this study, these two market sectors have shown a very similar trend in prices over the period 1991-2002. Over this period, the average annual sale price for direct waterfront units has increased from \$764,000 to \$2,592,000. During the same period, waterfront reserve units increased in average annual price from \$395,000 to \$1,811,000, with both sectors recording their highest average annual sale price in 2001 (\$2.61 million and \$1.988 million respectively).

Figure 1: Average annual sale price: prestige waterfront units: 1991-2002

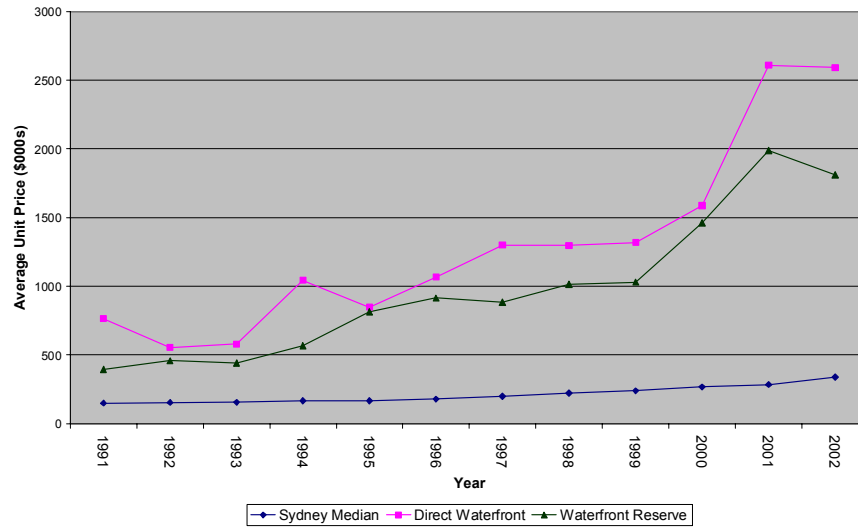
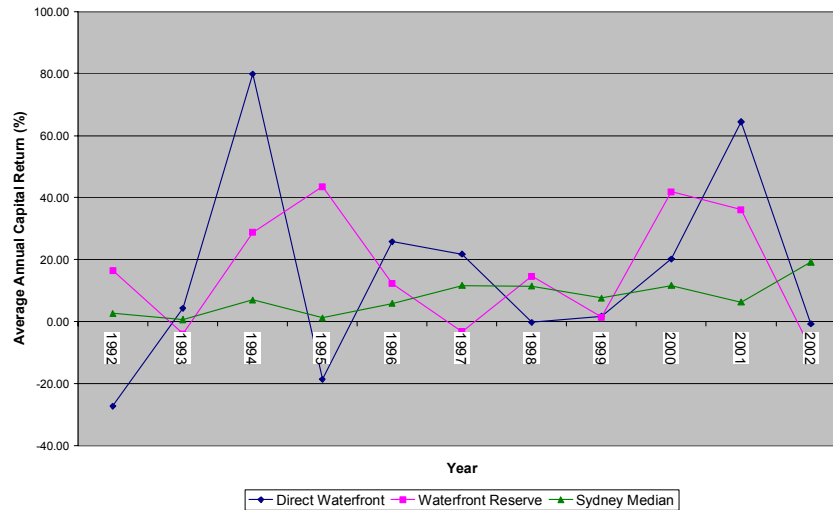


Figure 2: Average annual capital growth: prestige waterfront units: 1991-2002



The prestige strata unit residential market has shown to be very volatile compared to the Sydney median house price. This may actually be a reflection of the limited

number of sales transactions rather than risk associated with this property type. This assumption is supported by the results that show a lower risk for waterfront units compared to waterfront houses. Figure 2 represents the annual capital return for direct waterfront and waterfront reserve strata title units in the prime Sydney Harbour-side suburbs. Unlike the case with prestige waterfront or waterfront reserve houses, the greatest volatility in unit annual capital returns has been in the direct waterfront units, not the waterfront reserve property. However, as was the case with direct waterfront houses, waterfront units had the largest annual increases and falls in capital returns over the period 1991-2002, particularly between 1993 and 1995.

Table 2 confirms that over the period 1991-2002, the average annual capital return for direct waterfront strata title units has been 15.58%, with the average annual capital return for waterfront reserve units being slightly higher at 16.28%. As was the situation in relation to the single residential housing sectors, the strata unit sector with the higher average annual capital return also had a lower volatility, which is contrary to normal investment performance theory and again can only be explained by the smaller sample sizes in the analysis.

The interesting aspect of this analysis of the prestige strata unit markets is that waterfront reserve units have been showing a higher average annual return compared to direct waterfront units, which is the opposite to the prestige housing sector, as discussed below.

Table 2: Investment performance: prestige waterfront units: 1991-2002

Property type	Average annual capital return (%)	Volatility (%)
Direct Waterfront	15.58	32.43
Waterfront Reserve	16.28	18.99

A review of the sales data for units has revealed that this difference is across all suburbs in the study. Table 2 represents the average annual capital return for units in the lower north shore area of Sydney and shows that over the period 1991 to 2002, waterfront reserve units have achieved an average annual capital return 2.36% higher than direct waterfront units. During the sales and study area inspection, it was noted that the direct waterfront unit blocks tended to be older 1920-1940 style complexes, whereas the waterfront reserve units were more modern and newer complexes. In addition, all the newer high rise unit blocks adding to the supply of units in this prestige market were the waterfront reserve properties.

Again, the limited number of direct waterfront unit sale transactions in the analysis is a contributing factor to the high annual volatility of capital growth (32.43%) in this market sector. The variation in price for direct waterfront units in the eastern suburbs of Sydney are the main contributing factor for this high level of volatility rather than the actual perceived market risk for this type of property. This is evidenced by the sales transaction data in Table 1, showing very limited sales for direct waterfront strata property and a range in sales in some years of from \$605,000 to \$2,900,000(1991); \$630,000 to \$3,250,000 (1994); \$1,300,000 to \$3,900,000 (1998). This same variation in sale prices per annum for direct waterfront in the lower North Shore was not as significant, with the resulting annual volatility in annual capital growth being significantly lower at 18.70% for direct waterfront and 22.79% for waterfront reserve (Refer to Table 3)

These results suggest that the prestige residential unit market places a premium on more modern, larger units than older style direct waterfront units. This difference also applied in the Eastern Suburbs.

Table 3: Investment performance: prestige waterfront units: Lower North Shore: 1991-2002

Lower North Shore property type	Average annual capital return (%)	Volatility (%)
Direct Waterfront Units	16.19	18.70
Waterfront Reserve Units	18.55	22.79

Single residential

As discussed in the research limitations, the number of sales transactions for direct waterfront and waterfront reserve houses is very limited, with this limitation impacting on both the average annual capital return and the risk of this very specific residential property sector, compared to both the actual suburbs they are located in as well as the general Sydney housing market. The sales data is also influenced by the significant differences in the value of these properties in any single period.

The sales data shows that in any year of the study, the lowest sale in a waterfront street can be as low as 20% of the value of the highest priced sale in the same period, impacting significantly on the calculation of both price change and risk. For example, in 2002 the lowest sale price for a direct waterfront house was \$5 million, with the highest price house sale being \$22 million. This variation in sales value is reflected in the average annual capital growth and volatility of the average annual capital growth.

Figure 3: Average annual sale price: prestige waterfront houses: 1991-2002

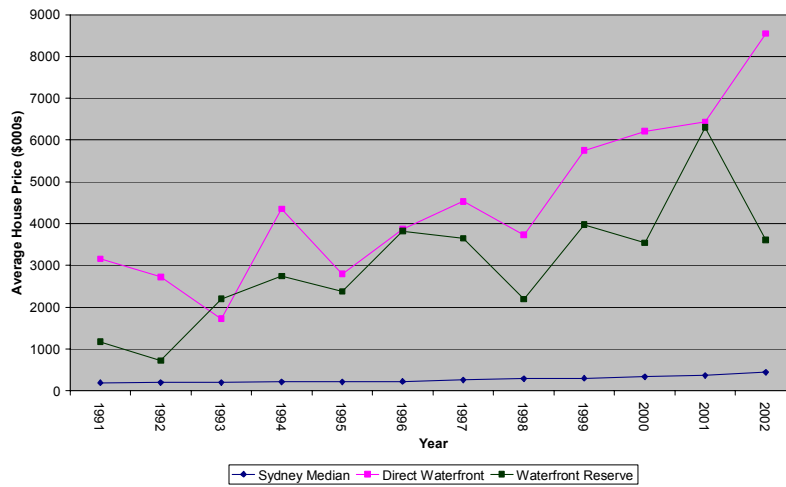
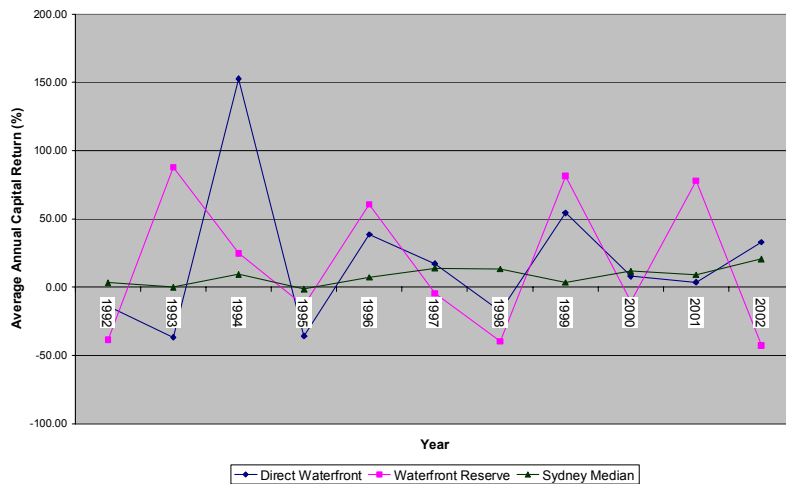


Figure 4: Average annual capital growth: prestige waterfront houses: 1991-2002



Despite these limitations, Figure 3 shows that over the period 1991-2002, the average annual sale price for both direct waterfront property and waterfront reserve property has been increasing at a similar rate. However, in 2002, there was a significant decline in the average annual sale price for waterfront reserve houses compared to direct waterfront houses. This may be the result of a larger number of

lower priced houses being sold in this market for that particular year rather than a market trend.

Since 1991 the average annual sale price of direct waterfront houses has risen from \$3.15 million to \$8.55 million in 2002. Over the same period, the average annual sale price for waterfront reserve houses has risen from \$1.17 million to \$4.14 million (peaking at \$6.3 million in 2001).

Figure 4 represents the average annual capital growth for both direct waterfront and waterfront reserve houses in the study area. This figure confirms that the annual movement in price and capital return for both property sectors has been reasonably similar over the period 1991-2002, particularly during the period 1995-2000. However, this figure also shows that during the period 1992 to 1994, these two prestige residential property markets actually differed in that waterfront reserve property had its largest percentage capital return in 1992, with a decline in the annual capital return in the following two years. In comparison, direct waterfront property had its highest average annual capital return in 1994, but actually fall in the capital return in the following year.

Table 4: Investment performance: prestige waterfront houses: 1991-2002

Property type	Average annual capital return (%)	Volatility (%)
Direct Waterfront	19.53	24.26
Waterfront Reserve	17.38	54.42

Table 4 shows the average annual capital return for these two prestige residential property sectors over the period 1991-2002. This table shows that direct waterfront houses have achieved an average annual return of 19.53% over the period of the study, with waterfront reserve houses showing an average annual return of 17.38%. A study by Eves and Wills (2002) recorded the average capital return for the median house price in Sydney over the same period was only 10.1%.

Table 4 also shows the significant volatility of average annual capital returns for these two market sectors. The very high risks for direct waterfront and waterfront reserve houses (17.38% and 54.42%) is considered to be a reflection of the small number of properties that are sold per year and the large variation in property size and type, rather than these properties being substantially greater risk than similar large non-waterfront property in the same location.

Suburb comparison

Table 5 presents the average annual capital returns for direct waterfront or waterfront reserve residential houses in each of the selected harbour side suburbs for the period 1991 to 2002. These returns are also compared to the average annual

capital returns for the specific Local Government Area these prestige houses are located in, as well as the average annual capital return for each of the individual suburbs in the study (except Rose Bay as this suburb has the same postcode as Point Piper and data was only available for one suburb in each postcode area).

This table shows that over the period 1991 to 2002, both the direct waterfront and the waterfront reserve housing sectors in all the study areas outperformed the suburb and Local Government Area average annual capital returns.

This difference was most prominent in the eastern suburbs of Vaucluse and Point Piper. However, the difference between the average annual capital return for waterfront reserve houses in Neutral Bay and Darling Point were not as great compared to the suburb and Local Government Area average (refer to Table 4).

Over the 11-year period, the percentage difference between direct waterfront and waterfront reserve houses and the average capital return for houses in the same suburbs have been Darling Point (10.20%), Point Piper (35.58%), Vaucluse (41.67%) and Neutral Bay (21.97%).

Table 5: Comparison of waterfront prestige houses to suburb and local governments area housing markets: 1991-2002

Suburb	Local government area average	Suburb average	Suburb direct water frontage	Suburb water front reserve
Darling Point	10.98%	16.86%	N/A	18.59%
Point Piper	10.98%	14.21%	18.84%	N/A
Vaucluse	10.98%	12.31%	N/A	17.44%
Neutral Bay	9.42%	9.60%	N/A	12.28%

Table 5 presents the average annual capital return for strata title units in the study area for the period 1991 to 2002. Again, this table compares the annual capital returns for strata waterfront and waterfront reserve units to the annual capital returns for units in the same suburb and the same Local Government Areas. This table shows that in all cases, the direct waterfront and waterfront reserve units have outperformed the units both at a suburb and LGA basis for the period 1991-2002. In Kirribilli, waterfront reserve units showed an average annual capital return of 19.50%, which is 9.03% per annum higher than the suburb average and 12.55% higher per annum than the LGA average for the same period.

Table 6 also shows that direct waterfront units in Kirribilli have shown a higher average annual capital return compared to units in the same suburb and LGA; however, at 15.52%, it is well below the waterfront reserve average annual return of 19.50%.

Table 6: Comparison of waterfront prestige units to suburb and local government area unit markets: 1991-2002

Suburb	Local government area average	Suburb average	Suburb direct water frontage (strata)	Suburb water front reserve (strata)
Darling Point	8.98%	9.43%	N/A	18.19%
Point Piper	8.98%	9.92%	18.84%	N/A
Kirribilli	6.95%	10.47%	15.52%	19.50%
Neutral Bay	6.95%	5.82%	13.98%	N/A

Unlike Kirribilli, the average annual return for direct waterfront units in Neutral Bay (also a lower north shore suburb) has actually been considerably higher than the suburb and LGA average annual return.

Premium geographic suburb and Sydney median comparison

In addition to comparing the prestige waterfront residential property markets to their surrounding markets, a further analysis has been carried out on the basis of comparing these two prestige markets to high value residential markets throughout the City of Sydney.

Areas selected for the comparison were:

CBD fringe	Paddington
Inner West	Strathfield
North Shore	Lindfield
Northern Beaches	Palm Beach
Southern Beaches	Cronulla
Western Harbour	Hunters Hill

All these suburbs are considered to be the best residential locations in each of these geographic locations.

Tables 7 and 8 compare the average annual capital return of the prestige waterfront property to the higher value suburbs within Sydney.

Over the period 1991-2002, the average annual capital return for both direct waterfront and waterfront reserve houses have been significantly higher than the capital returns for residential property in the premium suburbs of Sydney not located on the main Sydney Harbour area. Residential property on the northern beaches of Sydney and the western harbour have shown the highest average annual

capital returns over the period; however, at an average of 12.19% and 12.88% respectively per annum, these average annual capital returns are still well below the returns achieved by waterfront harbour property.

Table 7: Comparison of waterfront prestige houses to premium Sydney residential housing markets: 1991-2002

	Direct Water Front	Water Front Reserve	CBD Fringe	Inner West	North Shore	Northern Beaches	Southern Beaches	Western Harbour
Average annual capital return (%)	18.46	16.57	9.72	8.83	7.99	12.19	8.94	12.88

Table 8 shows that units in these prime residential suburbs of Sydney have not performed as well as houses in the same suburbs, with only units in the Northern Beaches and inner west suburbs showing an average annual capital return, within 55% of the capital return for waterfront units over the same period.

Table 8: Comparison of waterfront prestige units to premium Sydney residential unit markets: 1991-2002

	Direct Water Front	Water Front Reserve	CBD Fringe	Inner West	North Shore	Northern Beaches	Southern Beaches	Western Harbour
Average annual capital return (%)	15.58	16.28	8.79	9.09	6.25	9.21	6.15	6.49
Annual volatility (%)	32.43	18.99	14.52	13.77	14.01	14.27	10.61	26.65

This table also shows that the annual volatility of waterfront reserve units, with the highest percentage of actual sales transactions to total sales transactions in the study area, is still higher than other premium residential unit markets in Sydney. However, the difference is not as great, as was the case with single residential waterfront and waterfront reserve houses. This suggests that the high volatility of the direct waterfront houses, waterfront reserve houses and direct waterfront units is a function of low sale numbers.

CORRELATION ANALYSIS

A correlation analysis has also been carried out to compare the relationship between the movement in price for direct waterfront and waterfront houses and units to the movement in house and unit prices for these property sectors in the same suburb and LGAs and to prime residential property in the better geographically located suburbs in Sydney. This analysis has been carried out to determine if the movement in the price of prestige waterfront property is based on similar factors as both the adjoining housing and unit markets and prime residential property or if these changes in house and unit prices are due to totally different factors.

Tables 9 and 10 show that in relation to direct waterfront houses, there is no significant positive correlation between the movement in house prices in this market sector to the movement in house prices in the waterfront reserve market. This correlation analysis also shows that there is a negative correlation between direct waterfront housing property and Woollahra LGA ($r = -0.23$), Point Piper ($r = -0.14$), Vaucluse ($r = -0.23$) and Neutral Bay ($r = -0.10$). The waterfront reserve housing market shows a negative correlation with all other suburb and LGAs, with a significant negative correlation with Woollahra LGA ($r = -0.75$) and Darling Point ($r = -0.58$).

When the correlation analysis is carried out for the direct waterfront and waterfront reserve unit market, there are differences in the results of this correlation analysis compared to the results shown for waterfront and waterfront reserve houses.

Table 9 shows that there is more positive correlation between the movement in direct waterfront units to the non-waterfront unit property markets in the same suburbs and LGAs. During the period 1995 to 2002, the only negative correlations with direct waterfront units were Darling Point ($r = -0.06$) and Neutral Bay ($r = -0.32$). Unlike the case with direct waterfront houses, waterfront units show a slight positive correlation with waterfront reserve units ($r = 0.61$), North Sydney LGA ($r = 0.77$), Point Piper ($r = 0.52$) and Kirribilli ($r = 0.55$).

However, the correlation analysis for waterfront reserve units is actually more in line with the results recorded for direct waterfront houses. In this case, waterfront reserve units have shown a negative correlation with all the eastern suburb suburbs and Woollahra LGA and a very insignificant correlation with North Sydney LGA ($r = 0.25$) and Kirribilli ($r = 0.20$).

These results suggest that the waterfront reserve prestige residential unit market is influenced by different factors than those that result in price movements in the general harbourside residential unit markets (non-waterfront) in Sydney.

Table 9: Correlation matrix: waterfront prestige house market v suburb and LGA housing markets: 1991-2002

	Direct		North						
	Waterfront	Reserve	Woollahra LGA	Sydney LGA	Piper Point	Vaucluse	Darling Point	Kirribilli	Neutral Bay
Direct Waterfront	1.00								
Waterfront Reserve	0.16	1.00							
Woollahra LGA	-0.43	-0.50	1.00						
Nth Sydney LGA	-0.09	-0.16	0.72*	1.00					
Point Piper	-0.23	-0.44	-0.03	0.12	1.00				
Vaucluse	-0.20	-0.22	0.39	0.49	0.50	1.00			
Darling Point	-0.38	-0.44	0.75*	0.25	-0.01	0.24	1.00		
Kirribilli	-0.46	-0.32	0.32	0.05	0.05	-0.01	0.42	1.00	
Neutral Bay	-0.14	0.52	0.36	0.54	-0.58*	0.01	-0.01	-0.17	1.00

* Significant at the 5% level

Table 10: Correlation matrix: waterfront prestige unit market v suburb and LGA unit markets: 1991-2002

	Direct		North						
	Waterfront	Reserve	Woollahra LGA	Sydney LGA	Piper Point	Vaucluse	Darling Point	Kirribilli	Neutral Bay
Direct Waterfront	1.00								
Waterfront Reserve	0.27	1.00							
Woollahra LGA	0.16	-0.68*	1.00						
Nth Sydney LGA	-0.06	-0.38	0.74*	1.00					
Point Piper	0.27	-0.52	0.73*	0.77*	1.00				
Vaucluse	-0.06	-0.65*	0.71*	0.68*	0.65*	1.00			
Darling Point	-0.10	-0.40	0.58*	0.37	0.22	0.14	1.00		
Kirribilli	0.28	-0.27	0.60*	0.78*	0.61*	0.75*	0.16	1.00	
Neutral Bay	-0.24	-0.69*	0.80*	0.75*	0.56*	0.77*	0.59*	0.58*	1.00

* Significant at the 5% level

CONCLUSIONS

Although there is some limitations in the study due to the low number of transactions in this very unique residential property market, there have been some significant results in relation to the prestige waterfront residential market in Sydney.

This study has shown that prestige waterfront residential property has a premium over and above prestige property with water views. The study also shows that over the period 1991 to 2002, both waterfront houses and units have shown a higher average annual capital return to non-waterfront houses and units in the same suburbs and locations. However, the waterfront reserve prestige residential unit market has been the best performing market in the Sydney Eastern Suburbs and Lower North Shore areas.

The market also appears to be willing to pay more for waterfront reserve units than direct waterfront units in the same suburb. This could be due to the direct waterfront units being older style buildings, with heritage status that limits any future development of both the site and the units on the site. Although waterfront reserve units do not have direct water frontage, the newer design and greater future potential appears more attractive to the prestige residential unit market.

The correlation analysis suggests that the factors that determine the general housing market in Sydney are different to those that determine the movement in prices for prestige waterfront and waterfront reserve houses and units. This confirms the fact that the prestige residential property market is a global market and is more influenced by global, rather than domestic economic factors.

The negative and insignificant positive correlations between these premium housing markets and the prestige waterfront markets suggest that there are different market forces operating within the same large city location.

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