

THE ACCURACY OF COMMERCIAL PROPERTY VALUATIONS

ASSOCIATE PROFESSOR GRAEME NEWELL

**School of Land Economy
University of Western Sydney, Hawkesbury**

and

ROHIT KISHORE

**School of Land Economy
University of Western Sydney, Hawkesbury**

INTRODUCTION

Property performance analysis has become increasingly important in recent years. Unlike equivalent transaction-based performance indices for shares and bonds, property valuations are routinely used as a proxy to assess property performance, as evidenced in the Property Council of Australia, NCREIF and IPD “benchmark” commercial property series for Australia, USA and UK respectively. However, the issue of the accuracy and reliability of commercial property valuations as an effective proxy for property sales has received considerable international interest and debate in recent years.

Following the paper by Hager and Lord (1985) and their criticism of the accuracy of UK valuations, empirical studies by Brown (1985), Cullen (1994), IPD/Drivers Jonas (1988) and Matysiak and Wang (1995) have provided support for the accuracy of valuations. Discussion of various statistical, economic and methodology issues by Brown (1992), Lizieri and Venmore-Rowland (1991, 1993) and McAllister (1995) and variability amongst valuers (Hutchinson et al., 1996) have continued this debate. Equivalent USA studies (Cole et al, 1986; De Vries et al, 1992; Webb, 1994) have added to the debate.

No equivalent studies have been conducted in Australia. However, the recent development of the substantive and internationally competitive Commercial Property Monitor (CPM) database (and other data sources) for Australian commercial property provides an excellent opportunity to critically evaluate this key property investment issue in a rigorous and substantive manner.

As such, the purpose of this paper is to:

- (i) critically evaluate the accuracy and reliability of commercial property valuations in Australia over 1987-96 for office and retail property
- (ii) assess the accuracy and reliability of property valuations at various stages in the property cycle, reflecting active, stable and depressed property market conditions

- (iii) critically evaluate the integrity and effective use of property valuations as a reliable proxy for property market performance.

METHODOLOGY

Property data sources

To assess the accuracy and reliability of commercial property valuations as an effective proxy for commercial property transactions, the Commercial Property Monitor (CPM) database, NSW Valuer-Generals records and the Independent Property Trust Review transaction details were utilised. 218 commercial property sales (comprising 101 office and 117 retail properties) worth \$15.5 billion from Sydney over 1987-96 were examined, with Table 1 giving full details of the characteristics of this property portfolio. The average sale price for office and retail properties were \$97M and \$49M respectively.

Commercial properties were only included if the maximum difference between the time of sale and most recent valuation was less than one year. The average time difference between the most recent valuation and sale was 4.5 months. No allowance was made for distressed sales in this period.

The 10-year timeframe enabled the critical examination of various property market conditions under the various stages of the property market cycle in Australia, including active (1987-89), stable (1994-96) and depressed (1990-93) property market conditions.

The Property Council of Australia indices were used to adjust for valuation-timing differences to accommodate property market movements subsequent to valuation and prior to sale.

Statistical analysis

Regression analyses of sales price against valuation:

$$\text{Sales price}_t = \beta_0 + \beta_1 \text{value}_t + u_t$$

were performed.

To accommodate lags between valuations and sales, and different property market conditions, dummy variables were incorporated in the more rigorous statistical analysis (Matysiak and Wang, 1995). The resulting regression models were of the form:

$$\text{Sales price}_t = \beta_0 + \beta_1 \text{value}_t + \beta_2 (\delta_1 \text{value}_t) + \beta_3 (\delta_2 \text{value}_t) + u_t,$$

where: $\delta_1 = 1$ in 1986-89, 0 elsewhere (ie active market)

$\delta_2 = 1$ in 1990-93, 0 elsewhere (ie depressed market).

Both linear and log-linear models were considered.

RESULTS AND DISCUSSION

Initial analysis

Table 2 presents the average percentage difference between sale price and valuation for these 218 commercial properties over 1987-96, as well as for the sub-periods of active, depressed and stable property markets. While the average percentage difference was approximately 2% overall, much larger average percentage differences occurred in an active market (6.6% to 8.8%) and depressed market (-5.0% to -8.3%). At this stage, no consideration of the lag between valuation and sale has been incorporated into the analysis. This 2% difference was consistent with that seen for 469 properties in the USA over 1978-90 (Webb, 1994), and significantly below the 7% difference seen for 317 properties in the UK over 1973-91 (Matysiak and Wang, 1995).

To avoid the problem of over-valuations (valuation > sale) and under-valuations (valuation < sale) cancelling out their respective effects, average absolute percentage differences are presented in Table 3. Over 1987-96, average absolute percentage differences of approximately 9% were obtained. Differences in active and depressed markets were similar, with a stable market also giving rise to differences between sales and valuations of approximately 7%. This 9% average absolute difference was below the 11% level seen in the USA (Webb, 1994) and significantly below the 17% level seen in the UK (Matysiak and Wang, 1995). To similarly avoid the additional problems of distressed sales (ie potential outliers) and use of smaller samples in property market sub-periods, future ongoing analysis will utilise median rather than average valuations and sales.

Table 4 presents the distribution of absolute percentage differences over this 10-year period. Overall, only 65% of valuations were within 10% of sale price. This distribution was similar for active and depressed markets, with this “within 10%” figure increasing to 75% in a stable property market. 9% of valuations differed by more than 20% of the sale price. Again, this result was below that seen in the USA (14%) (Webb, 1994) and the UK (20-34%) (Cullen, 1994; Hutchinson et al, 1996; Matysiak and Wang, 1995).

Table 5 presents the results of the regression analysis to assess the effectiveness of valuations as proxies for sales, with this regression-based approach used previously by Brown (1985), Cullen (1994) and IPD/Drivers Jonas (1988). Over this 10-year period, no significant differences ($P > 5\%$) were obtained for office, retail and the total property portfolio. However, significant under-valuations and over-valuations were obtained in active and depressed markets respectively. This reflects some degree of valuation bias under active and depressed market conditions, as obtained by Matysiak and Wang (1995). No significant differences were obtained in the stable market period of 1994-96.

This regression-based result indicates that, on average, valuations are an effective proxy for sales. This result is consistent with the previous UK studies that used the regression-based approach (Brown, 1985; Cullen, 1984; IPD/Drivers Jonas, 1988).

Valuation-timing adjusted analysis

For a more detailed analysis, it is important to account for lags between valuations and sales, and the state of the property market. Using the PCA property indices, the necessary adjustments were made to accommodate lags between timing of valuations and respective sales, with the appropriate time-lags given in Table 1. Table 6 presents the resulting average absolute percentage differences, with the resulting differences being approximately 5% over 1987-96. More significant differences (approximately 7%) were evident in periods of depressed markets than active markets (approximately 1%). This clearly reflects issues relating to access to property information in a depressed market, and the general tendency for valuers to more significantly lag their value estimates in a depressed property market.

Using the regression-based procedure of Matysiak and Wang (1995), Table 7 presents the resulting regression analysis after dummy variables were incorporated to account for this valuation-timing difference and the state of the property market. For both linear and log-linear models, valuations were found, on average, to be an effective proxy for sales in the total property portfolio, with this being more evident for retail properties than office properties.

VALUATION IMPLICATIONS

This Australian study has shown that valuations on average, are an effective proxy for sales, particularly after adjustments are made for valuation-timing and the state of the property market. Whilst some differences do occur, the extent of these differences (ie absolute percentage difference and percentage of absolute differences exceeding 20%) were less than those seen in equivalent USA and UK studies. The recent development of the AIVLE valuation standards will hopefully continue to see the ongoing reliability of valuations as an effective proxy for sales.

REFERENCES

- Brown, G. (1985). Property investment and performance measurement: a reply. *Journal of Valuation* 4:33.
- Brown, G. (1992). Valuation accuracy: developing the economic issues. *Journal of Property Research* 9:199.
- Cole, R. et al. (1986). Towards an assessment of the reliability of commercial appraisals. *The Appraisal Journal* (July): 422.
- Cullen, I. (1994). The accuracy of valuations revisited. RICS "Cutting Edge" Conference: London.

De Vries, B., Miles, M. and Wolgin, S. (1992). Prices and appraisals: where is the truth? *Real Estate Issues* (Fall): 7.

Hager, D. and Lord, D. (1985). The property market, property valuations and property performance measurement. Institute of Actuaries: London.

Hutchinson, N. et al. (1996). Variations in the capital valuations of UK commercial property. Royal Institution of Chartered Surveyors: London.

IPD/Drivers Jonas (1988). The variance in valuations. Drivers Jonas: London.

Johnson, D. and Bauerly, R. (1993). Accuracy and reliability of commercial real estate appraisals. ARES Conference, Key West.

Lizieri, C. and Venmore-Rowland, P. (1991). Valuation accuracy: a contribution to the debate. *Journal of Property Research* 8:115.

Lizieri, C. and Venmore-Rowland, P. (1993). Valuation, prices and the market: a rejoinder. *Journal of Property Research* 10:77.

Matysiak, G. and Wang, P. (1995). Commercial property market prices and valuations: analysing the correspondence. *Journal of Property Research* 12:181.

McAllister, P. (1995). Valuation accuracy: a contribution to the debate. *Journal of Property Research* 12:203.

Webb, B. (1994). On the reliability of commercial appraisals. *Real Estate Finance* 11:62.

Table 1: Sample characteristics of property portfolio: 1987-96

Number of commercial properties : 218

- office : 101
- retail : 117

Number of commercial properties (by state of market)

	1987-89 (active)	1990-93 (depressed)	1994-96 (stable)
Retail	51	29	37
Office	43	26	32
Total	94	55	69

Total sales: \$15.51 billion

- office : \$9.75 billion (average = \$97M, ranging from \$2M-\$450M)
- retail : \$5.76 billion (average = \$49M, ranging from \$3M-\$380M)

Sales (by state of market)

	1987-89 (active)	1990-93 (depressed)	1994-96 (stable)
Office	\$4.56B	\$2.55B	\$2.63B
Retail	\$1.43B	\$1.79B	\$2.53B
Total	\$5.99B	\$4.34B	\$5.16B

Average time difference (months) between valuation and sale

	1987-89	1990-93	1994-96
Office	5.0	4.0	4.0
Retail	5.75	4.0	4.75
Total	5.5	4.0	4.5

Table 2: Average percentage difference between price and valuation

Sector	1987-96	1987-89	1990-93	1994-96
Office	2.1%	8.8%	-7.7%	1.0%
Retail	2.3%	6.6%	-8.3%	4.7%
Total	2.2%	8.5%	-5.0%	2.6%

Table 3: Average absolute percentage difference between price and valuation

Sector	1987-96	1987-89	1990-93	1994-96
Office	9.0%	9.9%	9.7%	7.1%
Retail	8.6%	8.5%	10.8%	7.0%
Total	8.8%	9.5%	9.4%	7.1%

Table 4: Distribution of absolute percentage differences: 1987-96

	1987-96			1987-89			1990-93			1994-96		
Difference	Total	Off.	Ret.	Total	Off.	Ret.	Total	Off.	Ret.	Total	Off.	Ret.
0-5%	40%	43%	38%	39%	40%	39%	40%	46%	34%	42%	44%	41%
5-10%	25%	24%	26%	20%	19%	24%	20%	19%	21%	33%	34%	32%
10-20%	26%	24%	28%	29%	28%	30%	29%	27%	31%	20%	16%	24%
>20%	9%	10%	8%	11%	14%	8%	11%	8%	14%	4%	6%	3%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 5: Regression analysis: 1987-96

Period	Regression coefficient	Standard error	Significance	R ²
1987-96:				
Office	0.98	.019	ns	.964
Retail	0.97	.015	ns	.974
Total	0.98	.012	ns	.969
1987-89:				
Office	1.05	.050	ns	.948
Retail	1.11	.007	*	.999
Total	1.10	.012	*	.995
1990-93:				
Office	0.94	.011	*	.995
Retail	0.95	.015	*	.990
Total	0.87	.029	*	.960
1994-96:				
Office	1.03	.040	ns	.952
Retail	0.96	.034	ns	.957
Total	0.99	.016	ns	.969

* : represents regression coefficient significantly different to 1 (P < 5%)

Table 6: Average absolute percentage difference (after valuation-timing adjustment)

Sector	1987-96	1987-89	1990-93	1994-96
Office	3.9%	0.4%	4.4%	6.3%
Retail	6.2%	2.3%	9.9%	6.2%
Total	5.3%	0.9%	7.2%	6.4%

Table 7: Regression analysis, including “state of market” adjustment

Sector	Regression coefficient	Standard error	Significance	R ²
Analysis #1: valuations, sales				
Office	0.93	.026	*	.972
Retail	1.03	.015	ns	.984
Total	0.98	.016	ns	.977
Analysis #2: ln valuations, ln sales				
Office	0.96	.010	*	.992
Retail	0.99	.009	ns	.991
Total	0.98	.007	ns	.992

* : represents regression coefficient significantly different to 1 (P < 5%)