

# VOLATILITY – THE ELUSIVE FACTOR

## NEW FOCUS ON PROPERTY TRUST RETURNS

by DAVID RICKARDS

*The need for close attention to portfolio risk management has placed property trust returns under the analyst's microscope. 'True volatility' is a complex factor.*

One of the major asset allocation problems with the real property sector is the lack of readily comparable indexes of return with other asset categories such as stocks, fixed interest or commodities.

PGE maintains an accumulation index for the unlisted property trust sector in Australia. This index is made up of some 60 issues and is equal-weighted. Like other similar indexes, it exhibits small volatilities and large amounts of serial correlation. These characteristics are not inherent to real property but rather reflect the method of valuation through the process of appraisal. The appraisal process also tends to disguise the correlation of the real property sector with other asset classes such as bonds and commodities.

If an asset class with low variability in returns and a low correlation with other asset classes is introduced to a traditional asset class risk-and-return optimiser, the obvious result will be a larger portfolio weighting in the less-risky asset; i.e., in this case, property. It is for this reason that a large amount of effort is being concentrated in calculating the true volatility of returns for assets such as property.

Various methods have been used to isolate the true market value volatility. One method outlined by Firstenberg, Ross and Zisler (see references) is to undo the appraisal process by statistical analysis to isolate the new information contained in each appraisal. Another method is to use the residual risk and

correlations from the asset markets to isolate the underlying volatility of the asset. Although this latter method provides volatilities that are perhaps more in line with intuition, the process lacks a theoretical justification.

Graph 1 compares the excess returns of the All Ordinaries Index and the listed property trust index. The listed property trusts have a historical beta of 0.46 to the All Ords with a correlation of 0.83.

Thus, the property trust sector is quite insulated from the factors that influence the market as a whole. In fact, as an industry group, the property trust sector is the one most unlike the All Ords.

Graph 2 illustrates how different the unlisted property trust sector is from both the listed trusts and the All Ords. In this graph, the listed property index has a higher volatility than the unlisted index (15.5 per cent against 3.4 per cent annual standard deviation).

As an attempt to analyse more closely the factors affecting the return of these two property sectors, we removed the returns attributable to the market from the listed property sector returns. The process was carried out by subtracting the All Ords returns multiplied by 0.46 (the beta of the property trust sector to the All Ords). The result of this process is illustrated in Graph 3.

Through this process we have removed the overall market factors from

*David Rickards is the manager of PGE (Australia) Pty Ltd.*

the listed property trusts index and this should (all other inputs being constant) reflect the returns of the underlying property assets held by the trusts as valued by the market. The volatility of this residual set of excess returns is 10.5 per cent on an annual basis. This should then be a surrogate for the returns of the unlisted property sector.

On analysing the returns for the unlisted property sector, it is apparent that there is considerable serial correlation. The major serial correlation is due to the six-monthly revaluation cycle. On the basis that a considerable amount of previous information being used in the six-monthly appraisal process, we regressed the unlisted property series against a six-monthly-lagged series and calculated the resulting residual series. A reference for this procedure is the paper by Firstenberg, Ross and Zisler.

Graph 4 shows the unlisted property trust recalculated on this basis. The annual rate of return and annual standard deviation is 6 per cent compared with unadjusted return and standard deviation of 3 per cent. We believe this series is a more accurate reflection of the true volatility of this sector, although it has been conducted on a somewhat rough-and-ready basis.

Table 1 sets out the pertinent statistics of the indexes used in this study. It is interesting to note that the cumulative excess return for the period from September 1985 to August 1988 for the listed property sector residual was close to 3.2 per cent. In contrast, the cumulative return for the unlisted series was close to 6.5 per cent in excess of the risk-free return.

The results of a historical risk-return optimisation using the recalculated unlisted property series, the listed property series, the All Ords and the CBI index are shown in Table 2. Basically, for a low-risk portfolio, the optimised asset allocation for the past three years was 30 per cent bonds and 70 per cent unlisted property. For higher risk tolerances, increasing amounts of All ords were selected in preference to the bonds.

In summary, we have highlighted some of the differences between the listed and unlisted property series available to investors in Australia. The smooth returns of the unlisted sector do not reflect an inherent lack of volatility in the underlying assets; rather, they are a reflection of the valuation process used by the management.

An approximation of the true

**Table 1: September 1985 – August 1988**

|                            | Correlation matrix     |        |   |   |
|----------------------------|------------------------|--------|---|---|
|                            | 1                      | 2      | 3   | 4 |
| 1. CBI                     | 1                      |        |   |   |
| 2. Unlisted property trust | 0.02                   | 1      |   |   |
| 3. All Ords                | 0.405                  | -0.105 | 1   |   |
| 4. Listed property trust   | 0.433                  | -0.191 | 0.812   | 1 |
|                            | Excess annual return % |        | Standard deviation %p.a. (continually compounded) |   |
| 1. CBI                     | 1.97                   |        | 6.86  |   |
| 2. Unlisted property trust | 6.51                   |        | 7.06  |   |
| 3. All Ords                | 6.88                   |        | 45.41   |   |
| 4. Listed property trust   | 3.22                   |        | 22.17   |   |

**Table 2: Results from asset class risk-return optimiser**

Asset mix optimisation (Multiple risk tolerances)

| Holdings                 | risk-free CBI   | risk-free unlisted | risk-free All Ords | risk-free listed |      |
|--------------------------|-----------------|--------------------|--------------------|------------------|------|
|                          | 25.0            | 25.0               | 25.0               | 25.0             |      |
| Current risk tolerance   |                 |                    |                    |                  |      |
| 10                       | 29.0            | 68.5               | 2.5                | 0.0              |      |
| 20                       | 0.0             | 93.5               | 6.6                | 0.0              |      |
| 30                       | 0.5             | 92.5               | 7.0                | 0.0              |      |
| 40                       | 0.5             | 91.5               | 8.0                | 0.0              |      |
| 50                       | 0.5             | 91.0               | 8.5                | 0.0              |      |
| 60                       | 0.5             | 90.5               | 9.0                | 0.0              |      |
| 70                       | 0.5             | 89.5               | 10.0               | 0.0              |      |
| 80                       | 0.5             | 89.0               | 10.5               | 0.0              |      |
| 90                       | 0.5             | 88.0               | 11.5               | 0.0              |      |
| 100                      | 0.5             | 87.5               | 12.0               | 0.0              |      |
|                          | Expected return | Standard deviation |                    |                  |      |
|                          | 4.5             | 15.3               |                    |                  |      |
| Current risk tolerance   |                 |                    |                    |                  |      |
| 10                       | 4.8             | 5.2                |                    |                  |      |
| 20                       | 6.0             | 6.7                |                    |                  |      |
| 30                       | 6.0             | 6.7                |                    |                  |      |
| 40                       | 6.1             | 6.8                |                    |                  |      |
| 50                       | 6.1             | 6.8                |                    |                  |      |
| 60                       | 6.1             | 6.9                |                    |                  |      |
| 70                       | 6.1             | 7.0                |                    |                  |      |
| 80                       | 6.1             | 7.0                |                    |                  |      |
| 90                       | 6.1             | 7.2                |                    |                  |      |
| 100                      | 6.1             | 7.2                |                    |                  |      |
| Probability distribution | 5%              | 25%                | 50%                | 7%               | 95%  |
|                          | -17.3           | -5.0               | 4.5                | 15.0             | 32.0 |
|                          | -3.6            | 1.3                | 4.8                | 8.5              | 14.0 |
|                          | -4.7            | 1.5                | 6.0                | 10.8             | 18.0 |
|                          | -4.7            | 1.5                | 6.0                | 10.8             | 18.0 |
|                          | -4.8            | 1.5                | 6.1                | 10.9             | 18.1 |
|                          | -4.8            | 1.4                | 6.1                | 10.9             | 18.2 |
|                          | -4.9            | 1.4                | 6.1                | 10.9             | 18.3 |
|                          | -5.0            | 1.4                | 6.1                | 11.0             | 18.5 |
|                          | -5.1            | 1.4                | 6.1                | 11.1             | 18.7 |
|                          | -5.3            | 1.3                | 6.1                | 11.2             | 18.9 |
|                          | -5.4            | 1.2                | 6.1                | 11.3             | 19.1 |

volatility can be had by isolating the relevant factor in a more efficient market such as the stockmarket. It is suggested that the differences in volatility can be considered as a liquidity premium that is paid so an investment position can be easily adjusted.

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# COMING DOWN ON INSIDERS

define better concepts such as tippee liability and material price change.

**Improve the performance of the stock exchanges** in listing companies and monitoring the activities of persons associated with them; in enforcing the Listing Rules, especially in relation to the disclosure of information by listed companies; in monitoring the market for signs of insider trading.

**Develop greater awareness of the illegality of insider trading.** Directors need to understand the risks they run by trading; companies need to improve the security of price-sensitive information; and the shareholding public must understand that insider trading is illegal and that they are its victims.

**Introduce a greater emphasis on ethical training.** This is necessary in the stockbroking industry in particular and in tertiary business courses in general.

**Recognise the international dimension of the securities market.** The fate of Australia's international capital raising is inexorably linked with the overseas perception of our market. It is therefore essential for Australia to pull its weight in the detection and prosecution of international securities market abuses. □

