PROPERTY RELATIVE PERFORMANCE DERIVATIVES

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Abstract

Property relative performance derivatives have been used for several years by British companies as management incentives. These derivatives may be characterised by vesting criteria and benchmark. Typically, an executive is awarded a number of shares times the initial price (at the time the incentive is set) equal to a percentage of base salary. These are vested after T years if and only if the total shareholder return exceeds: (I) $(1+x)^T$ times an index, (II) a mean or median of a benchmark group of comparable firms, (III) vesting 100% if in the top quartile of comparables, and then pro-rata for other quartiles, (IV) vesting 100% if first of comparables, and then pro-rata for other rankings. Closed-form solutions for similar derivatives are adapted for these four generic derivatives. Then, these models are adjusted for some of the restrictions on executives entitled to these performance incentives, and applied to the largest British property companies based on prices over the last five years. While these non-traded derivatives are apparently intended as incentives, similar traded property derivatives could be based on the same conditions, and available for employees and issuers to hedge their property performance and incentive exposure.

Keywords: Property derivatives, relative performance incentives and executive share options, benchmarks, comparables, and order statistics.

1. Introduction

Relative performance derivatives are incentive grants of shares or share options contingent in amount and/or vesting on performance criteria, typically the growth in total net asset value per share, or total shareholder returns relative to a benchmark, or to a group of comparable securities. Numerous British property companies use property performance derivatives as an incentive mechanism for executives.

There are four generic performance property derivatives (so far in the UK), characterized by vesting criteria and benchmark. These are usually referred to as Long Term Incentive Plans ("LTIP"), implying that executives can control in some way the performance of the growth of a company's net appraised property value per share over time, or the stock price, but the executives have no control over the general property market (rentals and capitalization rates) or the general stockmarket prices of real estate companies. Typically, an executive is awarded a number of shares times the initial price (at the time the incentive is set) equal to a percentage of base salary. These are vested after T years if and only if the total shareholder return meets one of the following criteria: (I) exceeds $(1+x)^T$ times an index, (II) exceeds a mean or median of a benchmark group of comparable firms, (III) vesting 100% if in the top quartile of comparables, and then pro-rata for other quartiles, (IV) vesting 100% if first of comparables, and then pro-rata for other rankings. Many incentives have other conditions, such as a percentage vesting dependent on an absolute total return exceeding either a stated percentage, or the Retail Price Index, or a benchmark of appraised property returns (see Appendix A for a description of incentive plans for the fifteen largest British property companies)[2].

This study provides general closed-form solutions for these four generic derivatives. Derivatives I and II are closest to outperformance or performance-vested options as modelled by Derman (1996), Zhang (1998), Johnson and Tian (2000a) and Ingersoll (2002). Derivatives III and IV are closest to order statistics models of Boyle (1989) and Boyle and Tse (1990) assuming normal distributions.

[2] See Buck et al. (2003) for a description of the heterogeneity of LTIP for U.K. companies, as well as an evaluation of the apparent incentive effect on company performance. They noted there are "flat spots" in some LTIP schemes like I, II and III, where there are no rewards below the benchmark criteria, or above the 25% mark, if the criteria is based on quartiles. They concluded that LTIP are associated in the UK with higher levels of total executive pay but with lower performance-pay sensitivities, but they did not use a specific model for valuing LTIP contingencies.

Many of the considerations applied to executive stock options such as multiple severance conditions, vesting delays (typically three years for UK property incentive schemes), illiquidity and other restrictions, as discussed and/or modelled in Carpenter (1998), Ingersoll (2002), Pandher (2003), Hull and White (2004), Ammann and Seiz (2004) and Sircar and Xiong (2005), are also relevant for valuing these property performance derivatives. Not considered in this study is the effect of these incentive compensation schemes, and the equivalent value at the LTIP award date, on the subsequent relative performance of property management. Whether executives have an incentive to encourage adoption of particular LTIP schemes and benchmarks is considered, but not considered is whether then executives would be wanting and able to alter the subsequent volatilities and correlations which affect these incentive values.

The next section proposes closed-form solutions for simplified versions of the four generic property performance derivatives. The third section discusses some of the implications of restrictions on employees in valuing these derivatives. The fourth section shows the empirical applications of simplified versions of these derivatives to British property companies based on security prices and indices over the last five years. The last section summarizes the primary contributions of this study, and some of the unanswered questions.

2. Performance Models

2.1 Single Benchmark Criteria

Suppose that both the property asset value and the benchmark value follow different but possibly correlated geometric Brownian motion processes. Let V_t represent the property asset or security value and K_t the benchmark value. Assume that each variable follows a geometric Brownian motion of the form:

$$dV_t = \mu V_t dt + \sigma V_t dz_V \quad (1)$$

$$dK_t = \omega K_t dt + \alpha K_t dz_K \quad (2)$$

where μ and ω are the expected multiplicative trends of V_t and K_t, σ and α are the volatilities, and dz_V and dz_K the increments of a Wiener process. The two variables may be correlated with correlation coefficient ρ. Let the V_t and K_t drift in a risk-neutral world be

so that the asset and benchmark payouts or dividend yields, δ_V and δ_K, represent the difference between risk adjusted expected rate of returns and the drift rates. [In the case, where both the asset and the benchmark are total performance values (reinvested payouts), in a risk-neutral world μ and ω are assumed to be equal to the riskless interest rate, r.] The time subscripts are dropped hereafter for convenience.

The partial differential equation for a contingent claim on the outperformance of the asset value relative to the benchmark (equivalent to exchanging the benchmark value for the asset value) is:

$$\frac{1}{2}\left[\sigma^2 V^2 \frac{\partial^2 F}{\partial V^2} + \alpha^2 K^2 \frac{\partial^2 F}{\partial K^2} + 2\rho\sigma\alpha VK \frac{\partial F}{\partial V \partial K}\right] + (r-\delta_V)V\frac{\partial F}{\partial V} + (r-\delta_K)K\frac{\partial F}{\partial K} + \frac{\partial F}{\partial t} - rF = 0 \quad (3)$$

Assuming that V and K are homogenous of degree one[3], Margrabe (1978) showed that the European exchange option is worth:

$$F(V,K,\sigma,\alpha,\rho,\delta_V,\delta_K,t) = Ve^{-\delta_V t}N(d_1) - Ke^{-\delta_K t}N(d_2) \quad (4)$$

$$d_1 = \frac{\ln(V/K) + (\delta_K - \delta_V + 0.5\eta^2)t}{\eta\sqrt{t}} \qquad d_2 = d_1 - \eta\sqrt{t} \quad (5)$$

where $\eta^2 = \sigma^2 + \alpha^2 - 2\rho\sigma\alpha$, (6)

and N (.)=cumulative standard normal distribution function.

With slight modifications to this approach, Johnson and Tian (2000a) showed that where there may be an initial moneyness of the option represented by λ, or the specification is that the asset is required to grow by g over the benchmark, the general indexed asset option value is[4]:

$$F(V,K,V_0,K_0,\sigma,\alpha,\rho,r,\delta_V,\delta_K,t,\lambda,g) = [VN(d_1) - HN(d_2)e^{gt}]e^{-\delta_V t} \quad (7)$$

$$d_1 = \frac{\ln(V/H) + (-g + 0.5\sigma_a^{\ 2})t}{\sigma_a\sqrt{t}} \qquad d_2 = d_1 - \sigma_a\sqrt{t} \quad (8)$$

[3] See Adkins and Paxson (2006) for solutions where V and K are not homogeneous of degree one.

[4] Johnson and Tian (2000a) did not show that γ is equation 9, which is their equation 7b with g added to their second term, but this adjustment is consistent with their equivalent martingale measure, and also with all of the numerical results shown in their tables.

where $\gamma = (r - \delta_V) - \beta(r - \delta_K + g) + .5\rho\sigma\alpha(1-\beta)$ (9)

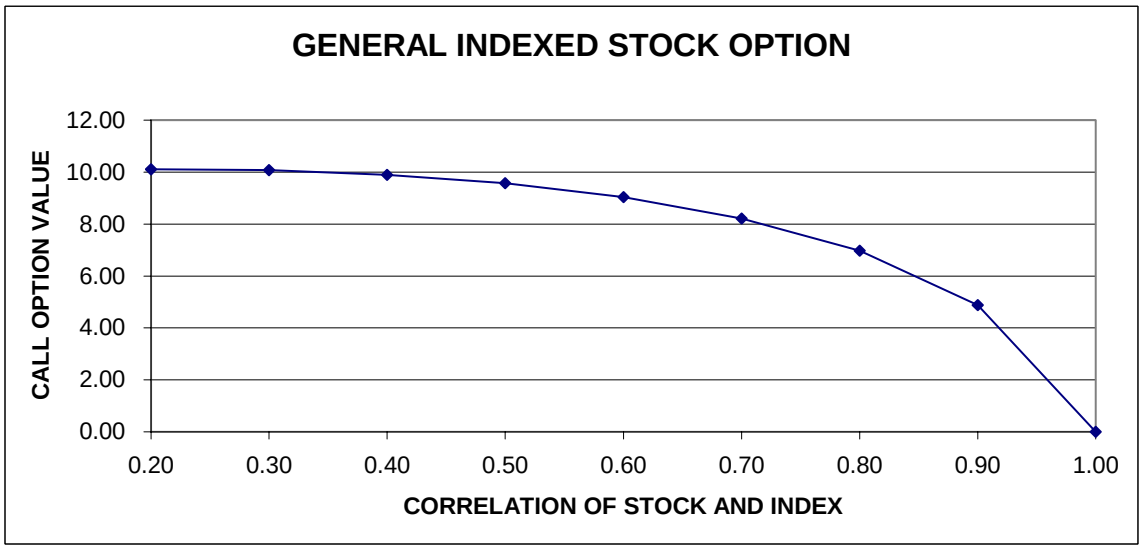
$$\beta = \frac{\rho\sigma}{\alpha} \tag{10}$$

$$\sigma_a = \sigma\sqrt{1-\rho^2} \tag{11}$$

and $H = \lambda V_0 \left(\frac{K}{K_0}\right)^{\beta} e^{(g+\gamma)t}$ (12)

This is a reformulation of the Margrabe (1978) exchange option, except that the exchange volatility is restated as equations 10 and 11, the benchmark is a function of the initial moneyness, λ, and growth, g, requirement, and the net cost of carry, the riskless interest rate, r, less the dividend yield, is explicitly considered.

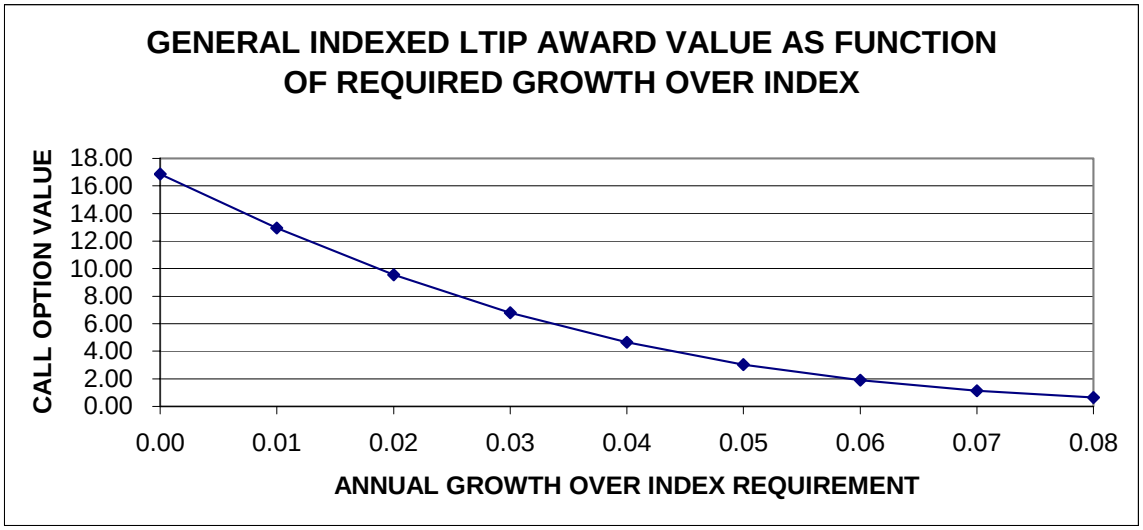
Figure 1



Property Stock V=100, Index K=100, T=10 years, riskless interest rate=2%, volatility V=20%, volatility K=15%, correlation as shown, yield V=2%, yield K=2%, initial index moneyness =1.0, g=.02.

Figure 1 shows the value of the option to receive V in excess of an index at the end of ten years, if the performance criteria is that $V>(1.02)^{10}$ K. Note that the higher the correlation of the property company stock and the property index, the lower is the value of property outperformance option. Naturally if V and K are perfectly correlated, and V must exceed K at termination, the option will be worthless.

Figure 2



Property V=100, Index K=100, T=10 years, riskless interest rate=2%, volatility V=20%, volatility K=15%, correlation=50%, yield V=2%, yield K=2%, initial index moneyness =1.0, annual g as shown.

An indexed LTIP award vested according to a required annual growth over a property index, or property share index, is highly sensitive to the growth requirement. If there is no growth requirement, the value of such a LTIP is similar to that of a simple exchange option, dependent on the volatilities and correlation. If the growth required is high, with relatively modest volatility and positive correlation, the value of such a LTIP is very low, especially for a large property holding company with limited development opportunities, where relative rental growth would have to be large if g is significant, for the LTIP to be of much value.

The general index option model is appropriate for generic property performance derivative types I and II, where V is the asset value with cash flows (or the stock with dividends) reinvested, K is a similarly treated benchmark, λ=1, since usually the incentive relative returns are from a common base date for both the stock and the index, and g equals the specified x over the index value in three years at which the incentive shares are vested, at nil exercise price. Where the specification is (1+x) times the index, g is the compound growth that results in x. Where the specification is the mean of a number of comparable property companies, the benchmark is the arithmetic average of the total performance return of comparable stocks. The criteria of exceeding an index is also applicable to exceeding the median of a bespoke non-weighted arithmetic index of

comparable companies, if the number is odd and comparable performances are symmetrically (normally) distributed.

2.2 Orders Among Comparables

When the specification is an order ranking among comparable stock returns, then the single benchmark index option model is not appropriate. Instead order statistics are required (see David (1970), Karlin and Taylor (1981), Arnold et al. (1992) and Kotz et al. (2000)). Boyle (1989) provided a simple methodology for valuing European options with a nil exercise price on a maximum of n assets, with the same volatility and equicorrelated, which is the expected value of the highest order statistic, based on Owen and Steck (1962)[5]. Let $X^{(i)}$ be the i th order statistic from a multivariate normal distribution in the case of nil correlation among the comparable assets, and $Z^{(i)}$ be the corresponding order statistic from a multivariate normal distribution in the case of a common and equal correlation coefficient ρ among the comparable assets. Owen and Steck (1962) showed that the relation of the moments of X and Z are:

$$E(Z^{(i)}) = \sqrt{(1-\rho)}E(X^{(i)}) \tag{13}$$

$$E[\,Z^{(i)} - E(\,Z^{i}\,)\,]^2 = \rho + (1-\rho)[E(\,X^{(i)} - E(\,X^{(i)}\,)\,)^2\,] \tag{14}$$

$$E[\,Z^{(i)} - E(\,Z^{(i)}\,)\,]^3 = (1-\rho)^{3/2}\,[E(\,X^{(i)} - E(\,X^{(i)}\,)\,)^3\,] \tag{15}$$

$$E[\,Z^{(i)} - E(\,Z^{(i)}\,)\,]^4 = 3\rho^2 + 6\rho(1-\rho)E[\,X^{(i)} - E(\,X^{(i)}\,)\,)^2\,] + (1-\rho)^2\,E[(\,X^{(i)} - E(\,X^{(i)}\,)\,)^4\,] \tag{16}$$

Owen and Steck provided numerical tables (for ρ=0, .5, -1/(n-1)) of the first four moments of the extreme order statistics, which can be used to cross-check application of

[5] See also Kotz et al. (2000), pages 132-145 for similar approximations.

these moments about the origin[6]. Assuming a multivariate lognormal distribution of asset prices, the prices are standardized as: $Y_i = [X_i - (r - \sigma^2/2\ (T-t)]/\sigma^2(T-t)$ (17)
Assuming the variables Y_i have the same mean and same standard deviation and are equi-correlated, the value of a call option of a primary asset at a nil exercise price for a ranking of first among comparables is equal to the expected value of the highest extreme order statistic less the constructed forward price of the primary asset. Assuming that the central moments of a random variable are known, then the "expected" value of a function of that variable can be obtained from a Taylor series expansion, where $[V_T]$ is the expected present value of the possible values, assuming all assets are indexed at 100 at the award date, T=vesting date, and r=the riskless interest rate used for calculating the forward rate for a total performance asset.

$$E[V_T] = [V_t]\exp[\sigma E(Y) + \mu] + [V_t]\frac{1}{2}(\sigma^2)(Var(Y)) \tag{18}$$

$$+ [V_t]\exp(\sigma E(Y) + \mu)\frac{1}{6}\sigma^3(\mu_3(Y)) + [V_t]\ \exp(\sigma E(Y) + \mu)\frac{1}{24}\sigma^4(\mu_4(Y))$$

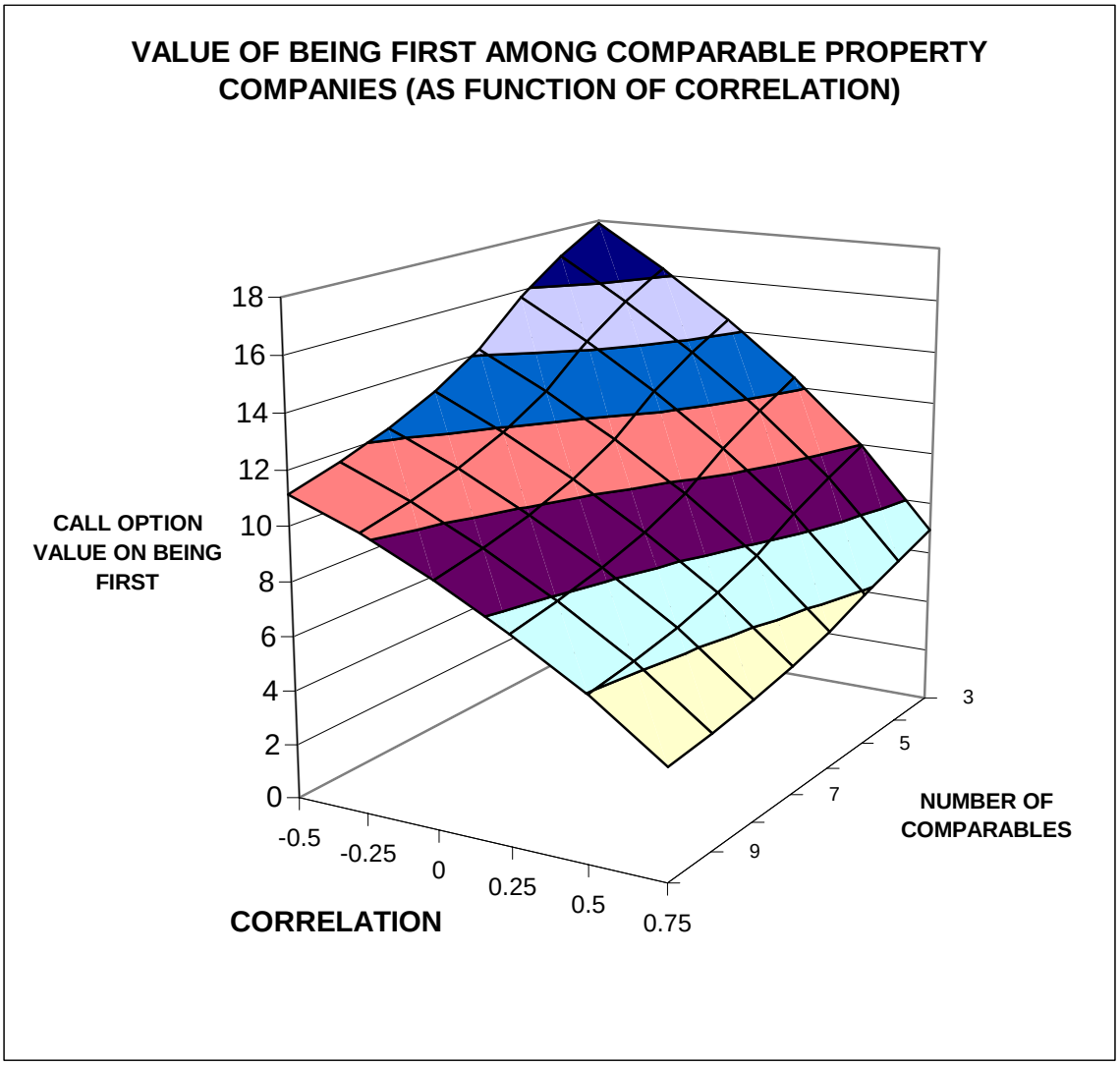
$$\text{LTIP Award Date Value} = E[V_T] - V_0 e^{rT} \tag{19}$$

If in a risk neutral world, n assets are all equally likely to be the best performing asset, an option on any asset ranking first among assets over a specified time period is 1/n times equation (19). This also assumes that volatilities and correlations remain constant over time, and that in a risk neutral world assets have a drift of $r - \delta$.

Figure 3 shows that while an option on the best of n assets at a nil exercise price increases with the number of assets, 1/n times that option, which is equivalent to an option on any one asset being first, declines with the number of assets, and decreases with increases in the equicorrelation of the assets.

[6] It is apparent from the results in Boyle (1989) that his second moment estimates were slightly biased, compared to the Owen and Steck (1962) tables (which have not yet been confirmed with the author). Also see similar approximations using a Taylor series in Arnold et al. (1992), pages 128-131. The Boyle (1989) article used this approximation method to value the quality option (minimum from set of deliverables) embedded in some futures contracts.

Figure 3



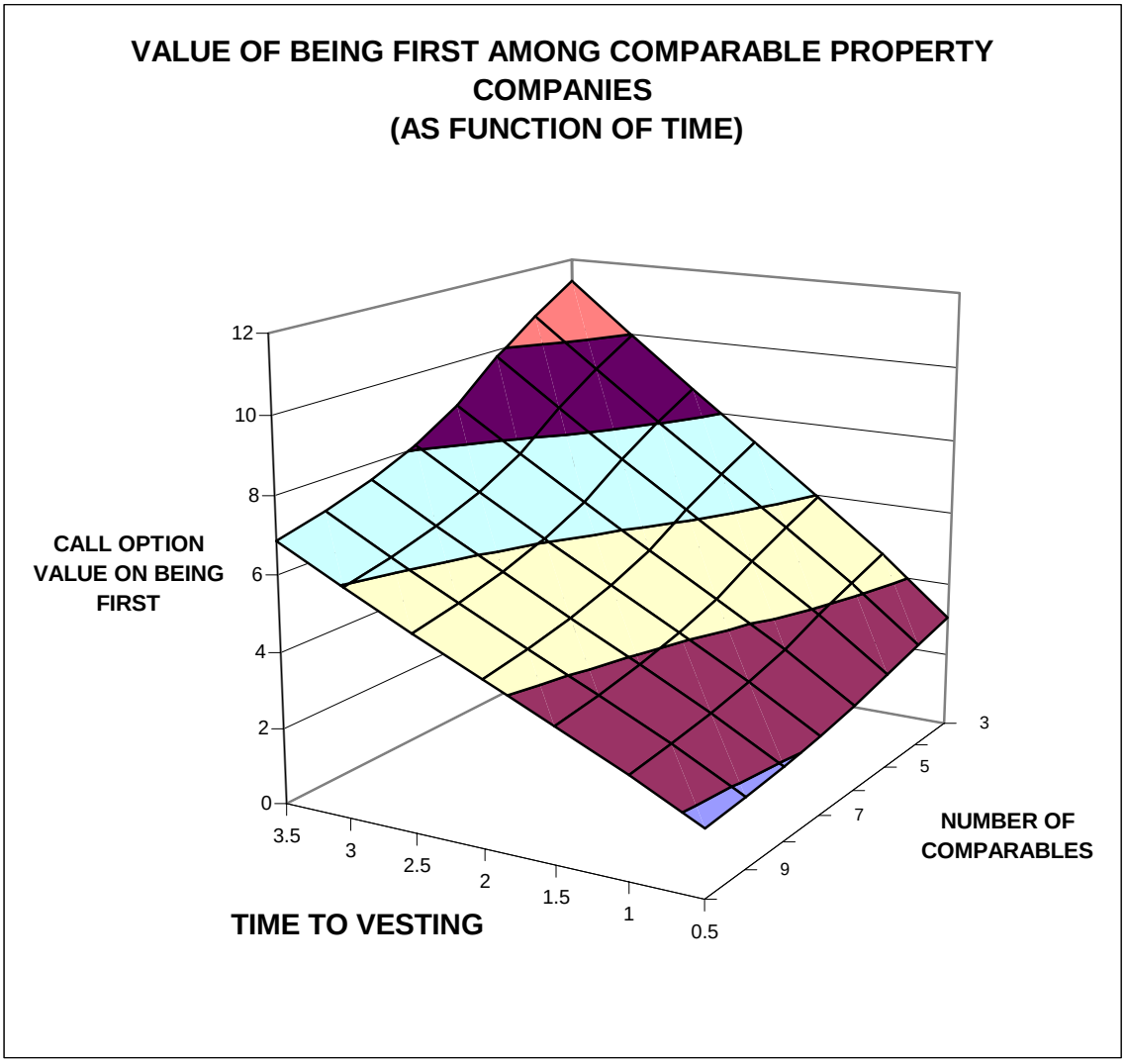
For all properties, V=100, volatility=20%, yield nil since V is a total performance value, riskless interest rate=10%, Time until vesting = 3 years, correlation of properties as shown.

The proportional increase in the LTIP as the number of comparables is decreased from ten to three is lower as the correlation declines, but the absolute increase is higher. The effect of the decrease of correlation on the LTIP is proportionally increased as the number of comparables declines, but the absolute effect is smaller.

The next four figures show the sensitivity of the value of being first among comparable property companies as a function of the time to vesting, the volatility of the underlying property securities, the initial (or subsequent) value of the primary property security

(taken as the property company issuing the LTIP), and the interest rate.

Figure 4

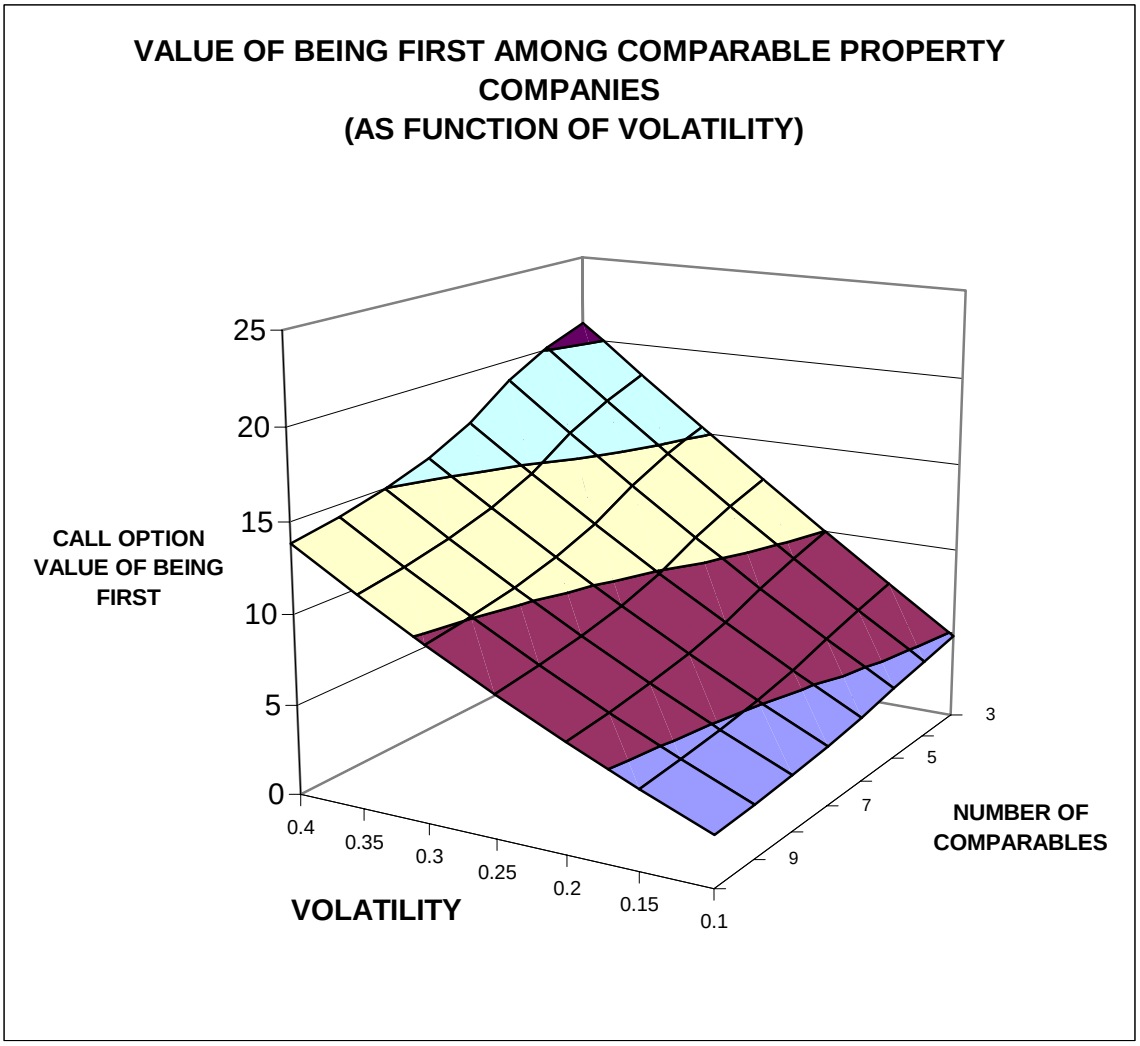


For all properties, V=100, volatility=20%, yield nil since V is a total performance value, riskless interest rate=10%, correlation of properties=50%, Time to vesting as shown.

As with vanilla European call options, the LTIP "theta" is negative, that is the value of the LTIP declines with the time to expiration (ignoring severance and liquidity considerations and assuming all comparables have identical payouts incorporated into total performance returns). Note that the increase of time to vesting has a significant

impact on the absolute LTIP value when the number of comparables is small, but liquidity concerns might offset some (or all) of this increased value[7].

Figure 5



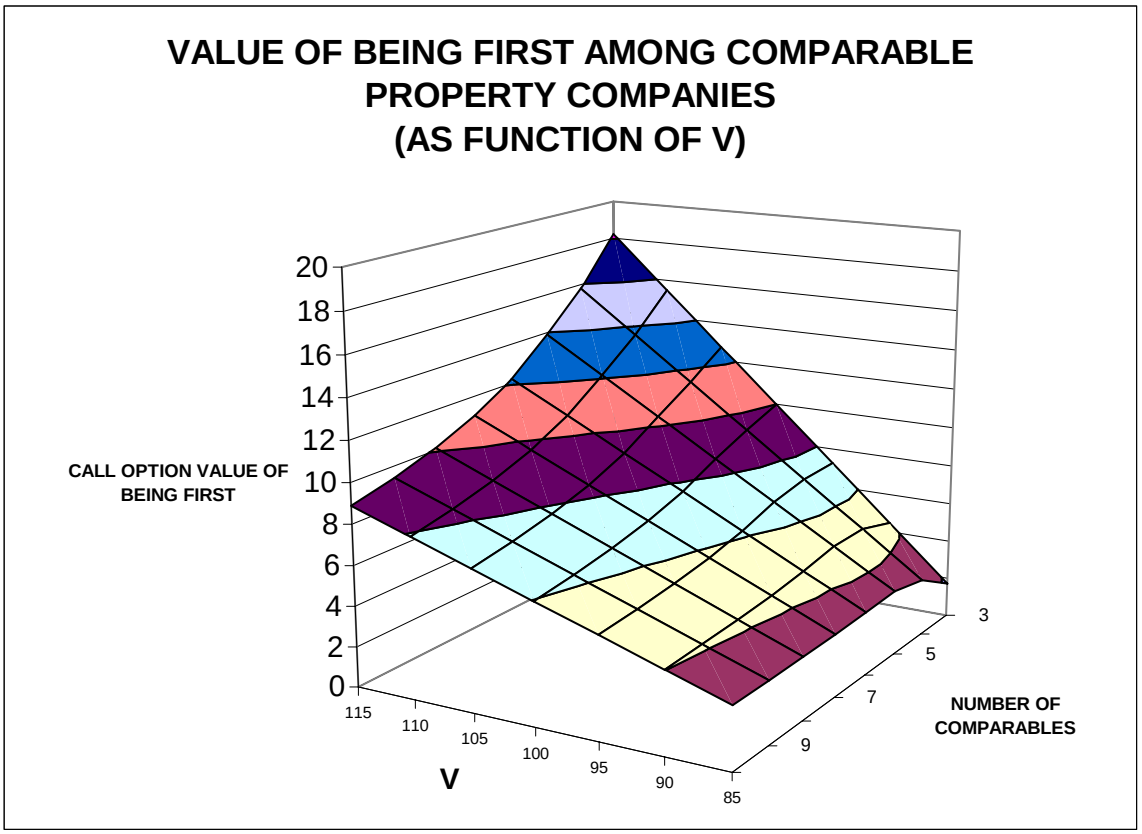
For all properties, V=100, volatility as shown, yield nil since V is a total performance value, riskless interest rate=10%, correlation of properties =50%, Time to Vesting =3 years.

As with vanilla options, the value of a LTIP is highly sensitive to changes in volatility, with the proportional increase greatest when the number of comparables is greatest, although the absolute increase is slightly higher for a lower number of comparables.

[7] For instance, an increase of the advantage of longer time to vesting from 2 to 3 years, would be offset if the severance rate is over 27.5%.

Note that the "vega" (sensitivity of LTIP to changes in equi-volatility) is also sensitive to the equi-correlation and "moneyness" parameters (here assumed to be unity).

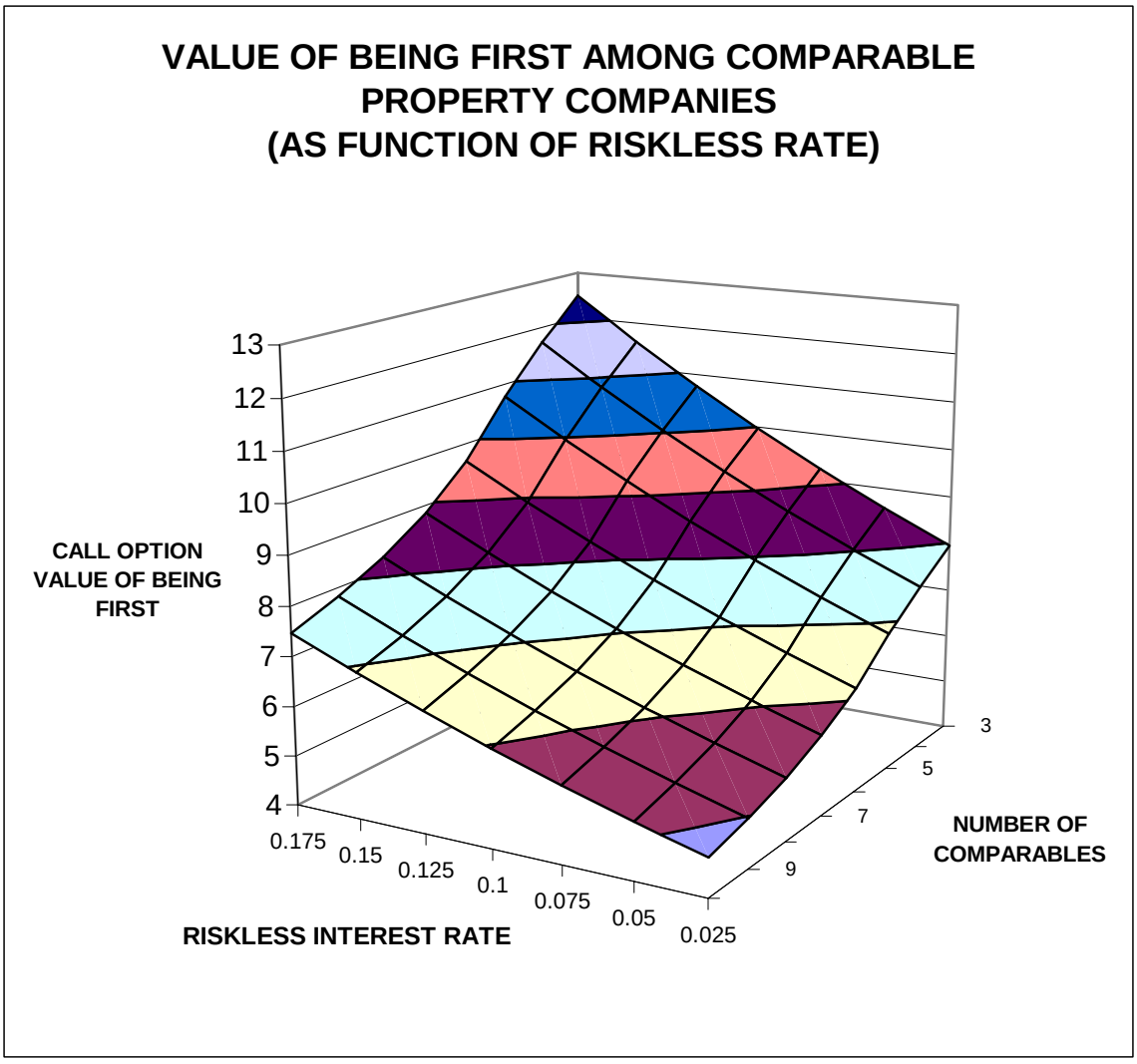
Figure 6



For all properties, V as shown, volatility =20%, yield nil since V is a total performance value, riskless interest rate=10%, correlation of properties =50%, T=3 years.

For this range of the number of comparables and stated parameters, the equivalent "delta" (sensitivity of the LTIP to changes in V) is around 20%. However, the increase in LTIP for a given increase in V is higher for a small number of comparables when the issuing company V exceeds the average of the other comparable V's, but decreases for out-of-the-money LTIP as the number of comparable companies is reduced to three.

Figure 7



For all properties, V=100, volatility=20%, yield nil since V is a total performance value, riskless interest rate as shown, correlation of properties=50%, Time to Vesting=3 years.

As with vanilla options, the value of LTIP increases with increases in the riskless interest rate, sharply when the number of comparables is low.

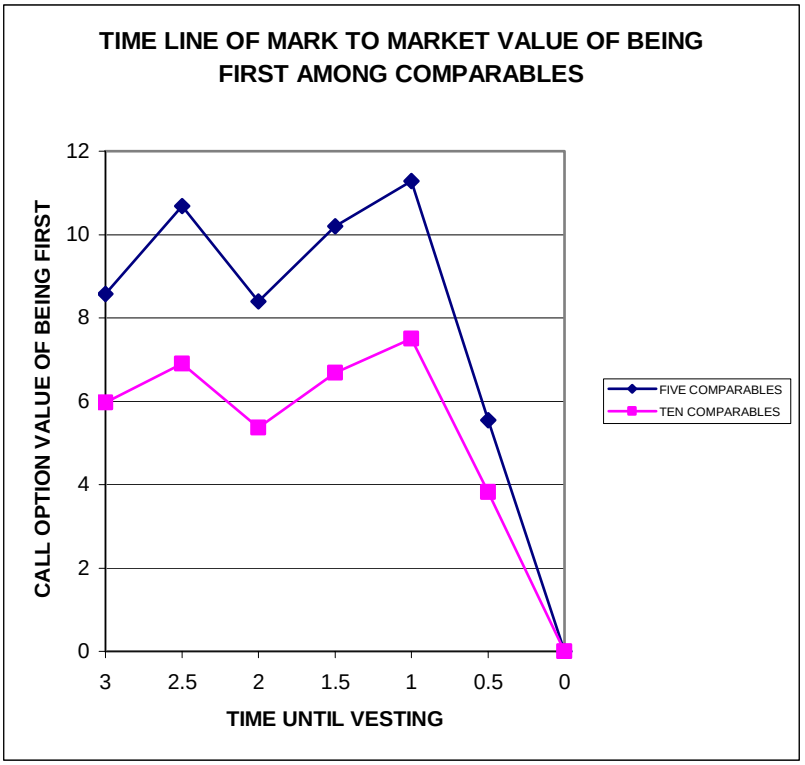
As shown above, it is feasible to mark LTIP to equivalent market (initially ignoring severance and liquidity considerations) over time, as option parameters change, especially the time to vesting. Using the equi-correlation and equi-volatility approach, Figure 8 is an illustrated time line for half-yearly valuations of a simple LTIP, that is the option value at nil exercise price of being first among comparables. The base parameters

are V=100, initial T= 3 years, riskless interest rate = 10%, equi-correlation = .5, and equi-volatility =20%. At the end of the first half year, V of the LTIP issuer increases to 110, with 2 years remaining interest rates fall to 5%, with 1.5 years remaining volatility of all comparables increases to 30%, with one year remaining the equi-correlations fall to nil, with one-half year remaining V falls to its original value 100, and at the vesting date, all parameters return to the base parameters. Since the LTIP issuer has not outperformed comparable companies, the then intrinsic value of the LTIP is nil.

Figure 8

MARK-TO-MARKET (LTIP)

	VALUE			CHANGE	
TIME	**COMP5**	**COMP10**	CHANGE	**COMP5**	**COMP10**
3	8.573	5.964	BASE		
2.5	10.682	6.904	V=110	-2.109	-0.940
2	8.393	5.366	r=.05	2.289	1.537
1.5	10.193	6.687	σ=.30	-1.799	-1.321
1	11.279	7.500	ρ=0	-1.086	-0.813
0.5	5.545	3.827	V=100	5.734	3.673
0	0.000	0.000	BASE	5.545	3.827
			CUM	8.573	5.964



If the LTIP were "marked-to-market" (ignoring severance and liquidity considerations), the issuing company would count £5.96 per £100 worth of incentive shares (N) (the number of shares awarded times the initial share price), assuming there are ten comparable property companies, as an initial expense[8]. At the end of the first half year, the issuer would add £.94 N as an expense, but at the end of the first year would reduce expenses by £1.54 N, and so on. Severance and liquidity could be considered reducing over time as both severance and liquidity as absolute factors are reduced, also noting any changes in the expected severance rate over the time remaining to vesting. Note that the issuer does not eventually issue any shares, since the performance requirement is not met, so the initial expense is eventually recovered. In this illustration, V of the issuer is not assumed to be affected by the changing LTIP expense for any period. To the extent that LTIP constituted most of the property expenses[9], this assumption would not be valid. A large scale LTIP might serve as a "natural" hedge for the issuer, since the expense of a LTIP would be reduced as TSR decreases, thereby modifying the decline.[10]

2.3 Varying Correlation Among Comparables

Boyle and Tse (1990) developed an algorithm for computing the values of options on the maximum of several assets, using the accurate approximation in Clark (1961) and Afonja (1972) for the first four moments of jointly normal variates with different volatilities and correlations[11]. The Clark algorithm can be used to derive the first four moments of a pair of jointly normal variates, and then obtain an adjusted correlation

[8] Some companies and accountants may believe it is appropriate to spread this expense over the time to vesting, with appropriate mark-to-market adjustments affecting the spread scheme. Possibly only the current "intrinsic value" of LTIP contingency is considered an expense, calculated each of three years based on the assumption that the year's relative performance is maintained (see Buck et al. , 2003).

[9] Derwent Valley Report and Accounts 2005 noted that "the group's major expense is employment costs".

[10] Interesting considerations if such similar outperformance schemes were traded would be the conceivable opposite positions (writing such outperformance contingent claims or forward sales of share-index spreads) taken by executives, which would reduce some of the liquidity problems (and incentives), while creating other liquidity issues (such as margin calls for time periods 2.5, 1.5 and 1 years remaining until vesting), and severance constraints.

[11] Boyle and Tse (1990) showed that the relative error using the Owens and Steck (1962) approximation is less than .005% for up to ten comparables. The Clark (1961) approximation has a relative error of less than .002% for (in and at the money) calls on a maximum of three assets compared to the closed-form solution of Johnson (1987).

coefficient between the maximum of that pair, and a third normal variate. Then the method proceeds recursively, adding variates.

Let the first four moments around zero of Y be denoted by MOM_j j=1,2,3,4. Then

$$MOM_1 = \mu_1 N(h) + \mu_2 N(-h) + \sigma\phi(h) \tag{20}$$

$$MOM_2 = (\mu_1^2 + \sigma_1^2)N(h) + (\mu_2^2 + \sigma_2^2)N(-h) + (\mu_1 + \mu_2)\sigma\phi(h) \tag{21}$$

$$\begin{aligned} MOM_3 &= (\mu_1^3 + 3\mu_1\sigma_1^2)N(h) + (\mu_2^3 + 3\mu_2\sigma_2^2)N(-h) \\ &+ [(\mu_1^2 + \mu_1\mu_2 + \mu_2^2)\sigma + (2\sigma_1^4 + \sigma_1^2\sigma_2^2 \\ &- 2\sigma_1^3\sigma_2\rho - 2\sigma_1\sigma_2^3\rho - \sigma_1^2\sigma_2^2\rho^2)(1/\sigma)]\phi(h) \end{aligned} \tag{22}$$

$$\begin{aligned} MOM_4 &= (\mu_1^4 + 6\mu_1^2\sigma_1^2 + 3\sigma_1^4)N(h) + (\mu_2^4 + 6\mu_2^2\sigma_2^2 + 3\sigma_2^4)N(-h) \\ &+ \{(\mu_1^3 + \mu_1^2\mu_2 + \mu_1\mu_2^2 + \mu_2^3)\sigma - 3h(\sigma_1^4 - \sigma_2^4) \\ &+ 4\mu_1\sigma_1^3[3(\sigma_1 - \rho\sigma_2)(1/\sigma) - (\sigma_1 - \rho\sigma_2)^3(1/\sigma^3)] \\ &+ 4\mu_2\sigma_2^3[3(\sigma_2 - \rho\sigma_1)(1/\sigma) - (\sigma_2 - \rho\sigma_1)^3(1/\sigma^3)]\}\phi(h) \end{aligned} \tag{23}$$

where $\sigma^2 = \sigma_1^2 - 2\sigma_1\sigma_2\rho + \sigma_2^2$

$$h = (\mu_1 - \mu_2)/\sigma$$

$\phi(.)$ is the univariate standard normal density, and N(.) is the cumulative standard normal distribution function. If the correlation between X_i and a third variable X_3 is $\rho_{i,3}$ following Clark, the correlation coefficient between $Y_1=(X_1, X_2)$ and X_3 is $\rho_{Y,3}$.

$$\rho_{Y,3} = \frac{\sigma_1\rho_{1,3}N(h) + \sigma_2\rho_{2,3}N(-h)}{(MOM_2 - MOM_1^2)^{.5}} \tag{24}$$

After determining the first four moments for the first pair $Y_1=(X_1, X_2)$ of comparable property companies, we proceed recursively to determine the first four moments of $Y_2=(Y_1,X_3)$ and so on. This allows for different volatilities and correlations among comparable property companies, for the purpose of determining the value of being first among n comparables, being second and so on. Then using the Taylor expansion (18), the value of being first among comparables is (19) for a total performance comparison.

Where there are vesting criteria for multiple rankings, equivalent statistics can be adjusted, such that for example 100% if first and 0% if last among five equally likely comparables, is equivalent to 20% if first only, and so on, for some types of distributions.

As the number of comparable property companies increases, as the performance criteria becomes more complex, such as multiple outperformance criteria and different percentages of the total possible award for different rankings, numerical solutions are required.

3. Restrictions on Employee Property Performance Derivatives

In December 2004, the U.S. Financial Accounting Standards Board ("FASB") issued SFAS No. 123R, "Share-Based Payment" that addresses all forms of share-based payment awards including employee stock options, restricted stock and stock appreciation rights. It is not clear whether complex property or stock performance incentive plans are specifically included under SFAS 123, apart from plan disclosure requirements. Under SFAS 123R companies are required to record compensation expense in the year the option is awarded[12] for all share based payment awards measured at fair value, disclosing the expected future volatility and expected life of the options. The typical disclosure (and now expense calculation) is as in Hammerson 2005:

> The fair value of the various options is expensed over the service period, based on a Black-Scholes model, assuming for the grants during the current year, a risk-free rate of 4.5%, expected volatility of 30%, and expected dividend yield of 2%. 5% of the three year options and 7% of the five year options are assumed to lapse as employees leave.

Most large British property companies will be reporting under the International Financial Reporting Standards in 2006, which have similar requirements as SFAS 123R. IFRS 2, Share-based Payment, requires an expense to be recognised in respect of share options granted after November 2002, based on the fair value of the options granted and spread over the vesting period. It is not clear how the fair value of performance based stock awards is to be calculated or disclosed.

Most employee stock options are restricted in terms of forfeiture, earliest exercise dates, and liquidity. The option is usually terminated if the employee is terminated

[12] Curiously, subsequent adjustments are not necessarily made in future years as option parameters change, or as the forfeiture, any other restrictions, are altered, even though a writer of a call option is exposed to gains and losses through-out the life of an option as parameters change (which might be modified through delta hedging and other risk management practices).

(sometimes with and sometimes without cause) or dies, there are usually vesting periods (which convert these options into forward start options), and employees are not usually allowed to sell (or re-sell) these options or short-sell the stock or similar options. These restrictions may have led early accounting standards commissions to believe that employee stock option fair values were too difficult to calculate, and thus should not be expensed in the year of grant. Numerous authors such Carpenter (1998), Ingersoll (2002), Pandher (2003), Hull and White (2004), Ammann and Seiz (2004), Cai and Vijh (2005), Sircar and Xiong (2005) and Hodder and Jackwerth (2005) provide views on these fair values.

SFAS 123R suggests allowance for the vesting period might simply be accounted for by using the Black-Scholes model for a European option, since European options cannot be exercised during the vesting period. The American aspects from vesting date until expiration date are addressed in numerous articles such as Carpenter (1998), considering that an employee with undiversified wealth or liquidity requirements might want to exercise prior to the otherwise optimal exercise date for an American option. Carpenter (1998) suggested that an extended American model with a modelled stopping time is appropriate, which approximately reduces the fully tradeable American call option (and also the dividend adjusted Black-Scholes value) by 25%, following empirical observations of actual exercise practices in a survey of U.S. companies from 1979 to 1994. SFAS 123R suggests that the company-wide average employee exit rate might be used to adjust that expected life of an option. For an exit rate of 3% over three vesting years, the option value is multiplied by $(1-.03)^3$ for a fair value calculation. Then there is the problem of employees leaving after the vesting period, when they could realise any intrinsic option value, and also the cost of any stock holding restrictions on options exercised early. Pandher (2003) suggests modelling severance risks using the stochastic Poisson process, with the option value reduced to nil upon severance.

This study allows for some restrictions on LTIP: the effect of multiple severance risks on the fair value of LTIP; and the estimated discount due to the illiquidity of contingent share awards. Assumed exit rates for executives entitled to LTIP are applied to reduce the unrestricted LTIP value at award date; and simple liquidity discounts (25%) are applied against the approximated value of LTIP, considered as a European option that

cannot be exercised prior to the earliest vesting date. These simple measures of severance and illiquidity discounts, due to the complexity and heterogeneity of LTIP conditions in the UK, indicate scope for further research. For instance, some LTIP specify that upon vesting participants receive the dividends paid on incentive shares during the vesting period; some LTIP enable vesting upon retirement or certain types of severance such as death, so even vesting horizons are uncertain for some participants; and sometimes shares received upon vesting subject to lock-up provisions (see Appendix A). Also, it is conceivable that there may evolve certain re-actions in new or revised LTIP over time, such as resetting the benchmark or benchmark exceedance conditions for "underwater" LTIP, similar to the reset, re-load and re-issue practices emerging for ESO[13].

Interesting extensions are studies which attempt to measure the impact on company and company stock performance of various stock award or stock option award incentives. Johnson and Tian (2000b) calculate the deltas of some six non-traditional executive stock option plans as a proxy for the incentive value.

4. Empirical Comparisons Among British Property Companies

This section studies the performance of leading British property companies over the past five years, compared to real estate stock indices and the proprietary IPD index.[14] Figure 9 shows the performance of five large "comparable" British property companies, primarily focused on London office buildings.[15] Land Securities is the largest British property company, British Land the second largest by market capitalisation, and

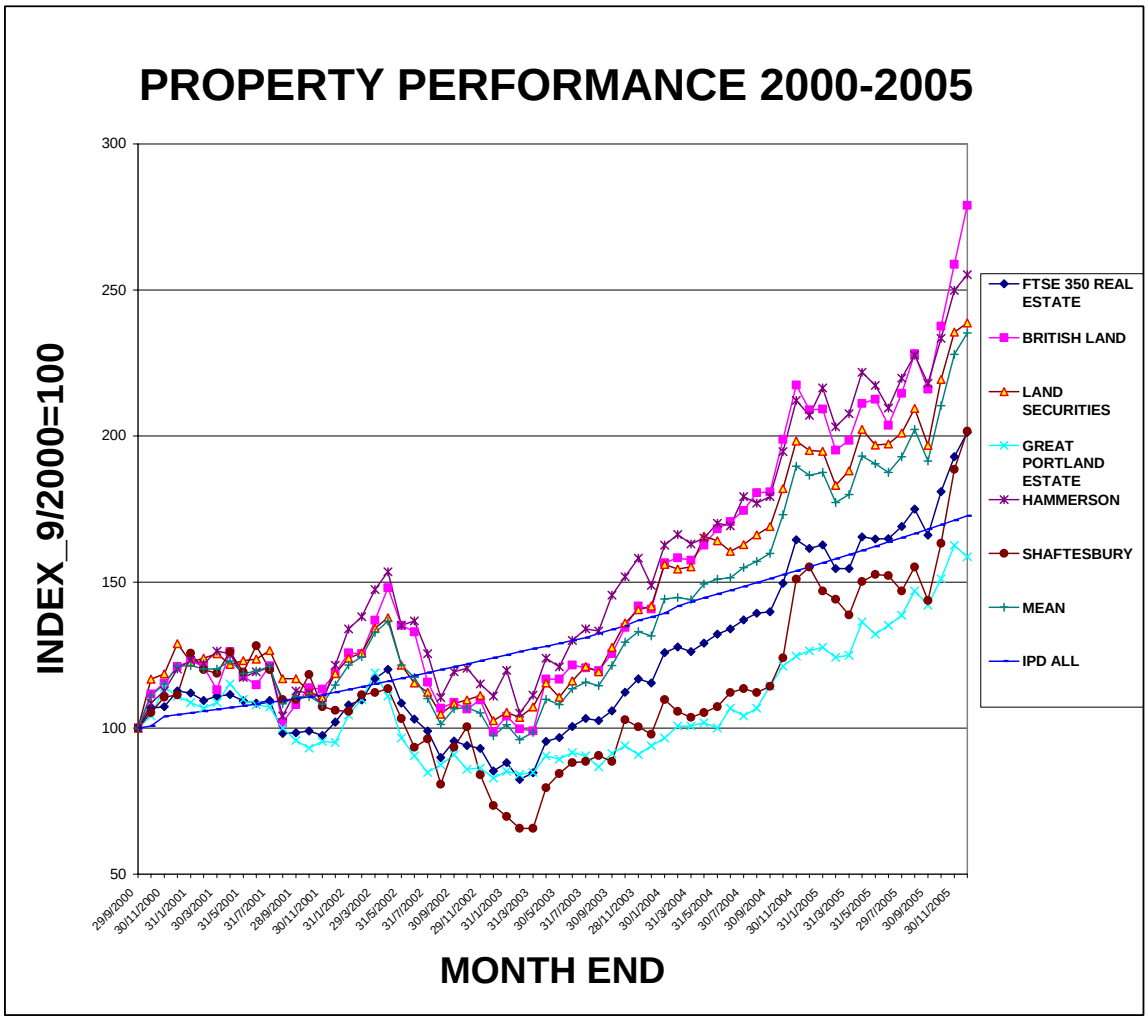
[13] See Sircar and Xiong (2005) for some resetting and reloading provisions for U.S. companies.

[14] IPD is the abbreviation for Investment Property Databank, which provides an annual index of various categories of UK properties, and also a monthly index covering some 2700 properties with a combined capital value of around £20 billion (2004). Since the IPD indices are proprietary, and not publicly disclosed, some missing monthly data entries are estimated in this study using bootstrap techniques.

[15] Liberty International is the third largest British property company by market capitalisation as of end 2005, and Slough Estates is the fifth largest, but Liberty is focused on mega shopping centres, and Slough on industrial estates and overseas properties. Shaftesbury properties consist 70% of restaurants and shops in the West End, while the other four large companies considered own primarily offices. The appendix notes that British Land, Great Portland and Land Securities were included in the list of property companies that Shaftesbury considered comparables.

Hammerson the fourth largest. Great Portland Estates and Shaftesbury are smaller (but with market capitalisations of around £700 million each). These five companies hold around £25 billion of properties and have an annual share trading volume of the same magnitude. Over the last five years, the very large companies, British Land, Hammerson and Land Securities have outperformed the FTSE 350 Real Estate Index[16], which includes smaller and industrial property companies. All of these companies and the real estate stock index have outperformed the IPD index, except for Great Portland Estates.

Figure 9



[16] The FTSE 350 Real Estate Index is a capitalisation-weighted index of 22 companies, based on 1000 end-December 1985; the five companies considered herein constituted 54.22% of the index end-October 2005.

However, it should be emphasized that the IPD index is an opaque appraised group of properties, while the quoted property company valuation is a stock market value, based on some transparent properties (locations, type, size, and often appraised valuation, or valuation dimension). The property companies are leveraged and engage in property development as well as other activities such as property management for third parties.

Table 1

Volatility and Correlations of British Property Companies and Indices 2000-2005

	FTSE 350 RE	BRITISH LAND	GREAT PORTLAND	HAMMERSON	LAND SECURITIES	SHAFTESBURY	MEAN	IPD:ALL:TOT
VOLATILITY	16.29%	22.06%	16.10%	20.90%	18.02%	27.04%	17.10%	1.22%
CORRELATION								
FTSE 350 REAL ESTATE		86.45%	60.31%	87.41%	86.86%	71.71%	96.00%	6.65%
BRITISH LAND			54.44%	78.28%	74.03%	56.65%	88.70%	8.52%
GREAT PORTLAND ESTATE				49.81%	56.22%	37.25%	68.67%	26.79%
HAMMERSON					76.14%	56.53%	87.94%	9.26%
LAND SECURITIES						51.52%	85.66%	6.73%
SHAFTESBURY							77.92%	3.40%
MEAN								12.00%

Table 1 shows that (naturally) the annualised volatility of the most heavily traded British property companies exceeds the three indices, the broad FTSE 350 Real Estate index, a constructed equally weighted index of these large London property companies ("MEAN"), and the IPD All Property Total Return Index. Great Portland is slightly less volatile than the other companies over this period. Of course, the leading British property companies are highly correlated with the FTSE RE index, and with the MEAN index, but hardly correlated with the appraised, less transparent IPD All Property Index, which also includes retail and industrial properties. The average correlation among these five comparable British property companies is around 66%, and the average historical volatility is around 20%, which are used as base parameters below in comparing the possible values of alternative property performance incentive scheme values for the last two Derivatives III and IV, in Table 4.

Table 2 is based on some common assumptions, primarily that: (i) the property security and benchmark volatility are from Table 1; (ii) for property performance derivatives I and II it is assumed that the vesting period is three years, the vesting criteria is simply exceeding the benchmark index, the expected volatility of the property security is the five year historical volatility, the expected volatility of the benchmark is the five year historical volatility, and the expected correlation of the security and the benchmark

is the five year historical correlation. There is no security or benchmark yield, since the securities and benchmark are "total performance measures". For derivative types I and II the criteria of being above the index is also the same as being above the median of comparables (in a bespoke non-weighted arithmetic index) if n is odd, and comparable performances are symmetrically (normally) distributed.

Table 2 shows that for Land Securities, a LTIP derivative I with the criteria of exceeding the IPD Index at the end of three years, is initially over twice as valuable as derivative II with the criteria of exceeding the FTSE RE index, especially if the incentive affect of the LTIP is nil. LTIP unrestricted considers the derivative as a European exchange option at a nil exercise price. LTIP restricted multiplies the LTIP unrestricted by $(1\text{-severance})^T$ and by (1-liquidity).

Table 2

Comparison of Different Derivative Performance Incentives Among Companies

	BR LAND	GR PORT	HAMMER	LAND	SHAFTES	BR LAND	GR PORT	HAMMER	LAND	SHAFTES
DERIVATIVE TYPE	I	I	I	I	I	II	II	II	II	II
V: BASE VALUE	100	100	100	100	100	100	100	100	100	100
K: INDEX BASE VALUE	100	100	100	100	100	100	100	100	100	100
TIME / YEARS	3	3	3	3	3	3	3	3	3	3
INDEX GROWTH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VOLATILITY V	0.2206	0.1610	0.2090	0.1802	0.2704	0.2206	0.1610	0.2090	0.1802	0.2704
VOLATILITY K	0.0122	0.0122	0.0122	0.0122	0.0122	0.1629	0.1629	0.1629	0.1629	0.1629
CORRELATION V & K	0.0852	0.2679	0.0926	0.0673	0.0340	0.8645	0.6031	0.8741	0.8686	0.7171
H	92.194	68.228	91.562	100.089	103.770	96.700	107.269	97.664	100.740	96.313
YIELD V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
YIELD K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SEVERANCE	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
LIQUIDITY	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
BENCHMARK	IPD	IPD	IPD	IPD	IPD	FTSE	FTSE	FTSE	FTSE	FTSE
LTIP UNRESTRICTED	18.735	32.540	18.321	12.334	17.026	9.288	5.994	8.155	5.824	14.653
LTIP RESTRICTED	**12.047**	**20.924**	**11.781**	**7.931**	**10.948**	**5.973**	**3.854**	**5.244**	**3.745**	**9.422**

LTIP vesting period 3 years, historical Vand K volatility and correlation over 5 years, riskless rate =5%,
I benchmark the IPD All Property Index and II FTSE RE Index. Criteria I and II outperform benchmark.

As shown in Table 2, the type I LTIP will be much more valuable for Great Portland Estates executives than for those at Land Securities, assuming that superior property expertise has no affect on the future market price of the security, if despite (or perhaps because of) the failure of this type of award against effort, their forfeiture rates are the same. Relatively high correlation with a low volatility index and no excess growth requirement reduces γ (equation 9) and H (equation 12).

Using this approach with a superior growth requirement, Table 3 simply increases the first benchmark volatility to 10% and imposes a required growth over the benchmark

of 4% per annum. Now, the order of some of LTIP restricted values is reversed, with Shaftesbury executives having the highest relative initial LTIP value for derivative I and II, but for all large property companies derivatives I and II are less highly valued[17].

Table 3

Comparison of Different Derivative Performance Incentives Among Companies, With a Superior Growth Requirement

	BR LAND	GR PORT	HAMMER	LAND	SHAFTES	BR LAND	GR PORT	HAMMER	LAND	SHAFTES
DERIVATIVE TYPE	I	I	I	I	I	II	II	II	II	II
V: BASE VALUE	100	100	100	100	100	100	100	100	100	100
K: INDEX BASE VALUE	100	100	100	100	100	100	100	100	100	100
TIME / YEARS	3	3	3	3	3	3	3	3	3	3
INDEX GROWTH	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
VOLATILITY V	0.2206	0.1610	0.2090	0.1802	0.2704	0.2206	0.1610	0.2090	0.1802	0.2704
VOLATILITY K	0.1000	0.1000	0.1000	0.1000	0.1000	0.1629	0.1629	0.1629	0.1629	0.1629
CORRELATION V & K	0.0852	0.2679	0.0926	0.0673	0.0340	0.8645	0.6031	0.8741	0.8686	0.7171
H	124.800	117.026	124.619	126.979	127.945	94.739	112.597	96.250	101.214	94.138
YIELD V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
YIELD K	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SEVERANCE	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
LIQUIDITY	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
BENCHMARK	IPD	IPD	IPD	IPD	IPD	FTSE	FTSE	FTSE	FTSE	FTSE
LTIP UNRESTRICTED	4.509	2.405	3.919	2.285	6.854	4.962	1.807	3.817	1.801	10.513
LTIP RESTRICTED	**2.899**	**1.547**	**2.520**	**1.469**	**4.407**	**3.191**	**1.162**	**2.454**	**1.158**	**6.760**

LTIP vesting period 3 years, historical V volatility and correlation over 5 years, riskless rate =5%, K volatility 10% in I, historical in II, I benchmark a hypothetical All Property Index, II FTSE RE Index, criteria I and II outperform growth of benchmark by 4% per annum.

Table 4

Comparison of Different Derivative Performance Incentives Among Companies, Criteria Being First Among Comparables

	BR LAND	GR PORT	HAMMER	LAND	SHAFTES	EQUI-CORR & VOL	
DERIVATIVE TYPE	III	III	III	III	III	III	IV
V: BASE VALUE	100	100	100	100	100	100	100
TIME / YEARS	3	3	3	3	3	3	3
VOLATILITY V	0.2206	0.1610	0.2090	0.1802	0.2704	0.20	0.20
CORRELATION						0.66	0.66
SEVERANCE	0.05	0.05	0.05	0.05	0.05	0.05	0.05
LIQUIDITY	0.25	0.25	0.25	0.25	0.25	0.25	0.25
BENCHMARK	COMP5	COMP5	COMP5	COMP5	COMP5	COMP5	COMP10
LTIP UNRESTRICTED	6.254	5.918	6.378	5.759	5.959	5.974	4.120
LTIP RESTRICTED	**4.021**	**3.805**	**4.102**	**3.703**	**3.832**	**3.842**	**2.649**

LTIP vesting period 3 years, historical V volatility and correlation matrix over 5 years, riskless rate =5%, III 5 Property Securities, the next to last column assuming equi-correlation and equal volatilities, IV 10 Property Securities, assuming equi-correlation and equal volatilities. Criteria III and IV first among comparables.

[17] Those executives and readers should be reminded of the assumptions implicit in these tables.

Table 4 shows the results for derivative types III and IV, where the criteria of being in the upper quintile (or decile) is equal to being first among five (or ten) comparables, assuming that there are no other vesting criteria. For the last two columns, the mean historical volatilities and mean historical correlations for all comparables are used. For the first five columns, the historical volatilities and correlation matrix for each property security are used. It is assumed that there are no a priori expected drifts among comparables (otherwise investors would have priced this expectation into current stock prices). The value of the LTIP depends on the specific mix of correlations and volatilities. The least favourable incentive is the requirement of being first among a large number of comparables.

All executives being rewarded would have an incentive to choose the IPD index as benchmark, rather than the FTSE Real Estate Index or a large number of comparable property companies, especially if the criterion is simply to exceed the IPD index against ranking first among comparables. For ranking criteria LTIP, the least unfavourable incentive is being first among a small number of comparables, with a low correlation between the incentive issuer and all of the other comparables, a high relative volatility for the issuer, and a high interest rate. The value of a long time to vesting depends on the trade-off between the positive effect on the LTIP unrestricted and the negative effect on the severance and liquidity constraints.

Since these are generic derivative models, perhaps similar traded property derivatives could be based on some of the same conditions. Outperformance derivatives for a particular property security against a group of comparable securities would have the advantage of (some) option writers being able to directly or indirectly replicate delta hedging in traded securities with large daily liquidity (stock market makers could establish short or long security positions), so that hedging inefficiencies and transaction costs could be considered. Accountants could compare any disclosed "fair values" with market prices. Whether property companies issuing such LTIP, or executives receiving LTIP awards, would be able (or allowed) to establish positions in traded or private

markets offsetting their embedded company positions, and whether that would alter the perceived incentive effects, remains an open question.

5. Conclusion

In many large British property companies, an executive is awarded a number of shares times the initial price (at the time the incentive is set) equal to a percentage of base salary. These are vested after T years if and only if the total shareholder return exceeds various criteria and benchmarks: (I) $(1+x)^T$ times an index, (II) a mean or median of a benchmark group of comparable firms, (III) vesting 100% if in the top quartile of comparables, and then pro-rata for other quartiles, (IV) vesting 100% if first of comparables, and then pro-rata for other rankings. This study provides general closed-form solutions for these four generic derivatives. Derivatives I and II are closest to performance-vested options as modelled by Johnson and Tian (2000a), with some simplifying assumptions. Derivatives III and IV are closest to order statistics models of Boyle (1989), with some simplifying assumptions, and Boyle and Tse (1990).

This study incorporates some of the discounts applied to employee stock options to these complex property performance incentive plans in order to derive some illustrative results for the leading British property companies, who obviously consider LTIP important. An important result is that the initial value of a LTIP is highly sensitive to the expected volatility of the property security and the related benchmark, and correlation. Any required growth over benchmark may be a significant depressant on LTIP value for certain property company executives. Possibly, some executives should welcome IPD benchmarking with a nil or low relative growth requirement, rather than the requirement of being ranked high among a large number of comparable UK companies.

Extensions and refinements to this study are: considering implied future volatilities and correlations, including stochastic volatilities and correlations, in complex models; considering complex multiple ranks for LTIP vesting, under different distributions; and modelling the severance, liquidity and undiversified executive wealth aspects, which are problematical for all employee share option and incentive share schemes. There is apparently limited evidence outside of the U.S. of the severance likelihood of executives participating in LTIP. There is the problem of the transparency

of property appraisal indices used as benchmark for compensation schemes, which might be a problem for audited compensation expenses following international accounting standards. Finally, the actual incentive affect of various LTIP on the eventual performance of the property company, and modifications of those incentives, if and as executives might undertake opposite positions in traded or private markets, is an open question.

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Appendix A Examples of British Property Performance Derivatives

I Since 2003, British Land has awarded either (but a minimum one-third of each) the "market value" of options or performance shares up to 150% of base salary. The performance condition for both awards is that growth in NAV exceeds that of the capital growth component of the IPD annual index for a minimum proportion of the options to be exercised and/or performance shares to vest according to a scale whereby 100% vest if the exceedance is 5% down to 10% if less than 1%.

Land Securities have awarded executive bonuses since 2002 which are performance related. The maximum bonus is 100% of salary, 25% payable in shares deferred for three years. This deferred element is matched by an award of performance related (two shares for each deferred share) half dependent on the real increase in the NADEPS (normalised adjusted diluted earnings per share) over three years, and half subject to LS's total property return equalling or exceeding the IPD Index over a three year rolling period (vesting 25% if LS is equal to index, 100% if LS is 1% over the index, and pro rata between these limits). Land Securities compares total property returns by sector, and overall, to the IPD returns, and overall returns to the FTSE100 and FTSE Real Estate Index returns. As well, total shareholder returns are compared to both stock indices. As of 2005, under the IFRS accounting requirements, employee stock options are valued using the Black-Scholes method (but the assumed volatility is not disclosed), and the fair value when issued is recognized through the income statement. The values are amortised through the income statement over the vesting period of the options and other grants, reversed if it appears probable that the applicable performance criteria will not be met. Share based payment arrangements are treated as treasury shares and deducted from equity. No profit or loss is recognised in the income statement on their sale, re-issue or cancellation.

For LTIP awards in 2004 and 2005, Brixton may grant conditional awards over shares worth up to 200% of basic salary, which vest only if Brixton's total property return ("TPR") outperforms by x the IPD All Fund UK Industrial benchmark over a fixed three-year period following the grant, where if x=2%, 33.33% becomes exercisable, and if x=7.5%, 100% becomes exercisable.

II In 2005, Shaftesbury adopted a LTIP whereby one-half of the award is based on an average NAV growth of RPI plus 3% to RPI plus 7% over three years, and one-half requiring TSR against the FTSE 350 Real Estate Index to match or exceed it by 5.5%. TSR is share price plus dividends reinvested over the three months prior to the start and end of the performance period.

There are three types of awards: conditional allocations, nil cost options (participant can decide when to exercise his award for 6 months after vesting), and forfeitable shares. Conditional allocations and options do not confer any shareholder rights until vesting, while holders of forfeitable share will have shareholder rights, but are required to waive their rights to receive dividends. All participants receive in cash or shares, after vesting, the dividends payable on those shares during the vesting period.

Executive directors are required to accumulate shareholding exceeding 100% of base salary. Awards are not transferable except on death, and lapse upon the participant leaving employment, except under normal retirement or some other conditions.

In 2003, Quintain Estates and Development adopted a LTIP whereby two executive directors were granted 500,000 share rights, subject to the company achieving an increase of NAV plus dividends of 10% above the RPI and the company outperforming the average IPD return, with staged vesting periods from 2008 to 2012, and subject to lock-in arrangements. The cumulative notional gain on unexercised rights is disclosed year end.

III In 2002, Capital and Regional adopted a LTIP where share awards of up to 100% of basic salary may be granted, subject to performance conditions. In 2005, the vesting of the LTIP awards have been linked (50%) to the post tax return on equity, with a differential of vesting between 10% and 18%, and (50%) to Total Shareholder Return (TSR) over three years relative to the FTSE Real Estate Index. There is no award if TSR is below the median of index companies; 25% if above; 100% if in the upper quartile, and otherwise pro rata.

Derwent Valley made LTIP awarded shares released after three years, subject of half the shares conditional on growth in NAV compared to the IPD Central London

Offices Total Return index, 25% if equal and 100% if equal to the upper quartile, and half conditional on TSR exceeding the median (for 25% vest) up to 100% vest above the upper quartile of companies comprising the FTSE Real Estate Index. The fair value of the conditional awards of shares granted under the LTIP at the date of grant are expensed on a straight-line basis over the vesting period, and at each reporting date, the non-market based performance criteria of the long-term incentive plan are reconsidered and the expense is revised as necessary.

Grainger Trust criteria for vesting after three years are 100% if the TSR exceeds the upper quartile of 20 comparable companies, pro-rata down to 0% if below the median.

Rugby Estates made 50% of the 2004 LTIP awards (as 100% of basic salary) conditional on growth in adjusted net assets per share exceeding by 5% the IPD All Property Capital Growth Index, and 50% conditional on TSR exceeding the upper quartile of companies comprising the FTSE Real Estate Index, over three years from the LTIP award date.

IV In 2003, Hammerson adopted a LTIP whereby employees were awarded a combination of performance shares and options, both with the same performance targets based on NAV growth. The options are valued using the Black-Scholes model for a disclosed option life, share market price and exercise price at the time of issue, assumed riskfree rate, expected volatility and dividend yield (and disclosed calculated value). In addition, deferred shares up to 95% of salary are awarded to executives based on comparative total shareholder return against a peer group of the eight largest quoted UK property companies, 100% vested if ranking 1st, down to 50% if 4th.

Great Portland introduced a Long Term Incentive Plan in 2002, which awarded shares to management up to 125% of a participant's salary, which vest after three years provided performance conditions are met, which are contingent on the real growth of net assets per share by at least 2%, and if so, total shareholder return over the three years relative to a bespoke comparator group of 20 companies in the FTSE Real Estate Index. The percentage vesting is according to a scale from 100% if ranking 2nd or better in the comparator group, down to 0 if below 11th in the group.

In 2001, Shaftesbury used a discretionary share option scheme, vested according to performance conditions as follows: over an initial three year period, the growth in net asset value per share prior to distributions was compared to a twelve peer group of listed real estate companies including British Land, Great Portland and Land Securities (but not Hammerson, probably given its revaluation policy at the time), so that 100% were exercisable if in the upper quartile, 30% if over the median, and pro-rata if between. If the performance is not met in full after three years, it is retested at the end of the fourth and fifteen financial years, and if the performance target is not met, the option will lapse.

V Slough Estates ("delivering our vision") adopted an absolute performance scheme in 2004 whereby incentive shares vested according to a weighted performance target, 60% on the real growth in adjusted diluted EPS, and 40% adjusted diluted NAV over three years. The required growth for the low hurdle (20% vesting) is 4% EPS and 4% NAV growth, and for the high hurdle (100%) 11% EPS and 8% NAV growth. Slough stated that "NAV change from year to year depending on valuers' view of capitalisation rates prevalent in the marketplace on a certain date…and executives should be rewarded for the creation of sustainable growing cash flows…if the end of the three-year period coincided with a cyclical reversal in valuation capitalisation… executives may not, subject to the Trustees' discretion, lose their awards entirely."