International Real Estate Society Conference '99

Co-sponsors: Pacific Rim Real Estate Society (PRRES)
Asian Real Estate Society (AsRES)

Kuala Lumpur, 26-30 January 1999

**PRICING LEASE COVENANTS: TURNING
THEORY INTO PRACTICE**

PATRICK ROWLAND

Department of Property Studies, Curtin University of Technology,

Perth, Western Australia.

Telephone: (08) 9266-7723, Fax: (08) 9266-3026, Email: rowlandp@cbs.curtin.edu.au

Abstract

The covenants of a lease influence the rent because they create opportunities and risks for the landlord and the tenant and because they shift responsibilities and risks between the parties. In recent years, quantitative models (some empirically tested) have been developed which suggest how the effects on rent of changes to many lease covenants can be measured. The clauses which are commonly recognised as modifying market rents are options to renew or break leases, the basis and frequency of rent reviews, leasing incentives, the liability for property responsibilities and expenses, limitations on use of the premises, the control of assignment and the strength of the tenant's covenant (and any rental guarantees).

With the exception of discounted cash flow analysis to adjust rents for leasing incentives, there appears to be little guidance to the parties and their advisers as to how to "price" lease covenants during their rental negotiations. This paper reviews the research into ways in which lease covenants alter rents. The paper then presents a prototype of a computer-based operational routine to help landlords, tenants and their professional advisers to assess the impact of changing lease terms on acceptable rents.

The decision framework is a multi-period model of the allocation of risks and responsibilities, partly based on equilibrium concepts and partly on each user's assessment of likely changes and benefits arising from particular covenants. The emphasis is on presenting the decision steps in a clear sequence and in a manner that is easy to understand, using a trace of humour to introduce practitioners to the key issues. Trials of this operational model are described. The trials show that the critical inputs are the expected change in market rents and the subjective assessments of the degree of uncertainty to which the landlord or tenant feel exposed.

Pricing lease covenants; turning theory into practice

Patrick Rowland, Department of Property Studies, Curtin University of Technology, Perth, Western Australia.

Part 1: Introduction

The negotiation of leases is reduced sometimes to agreeing the rent, with the parties assuming that all the other terms of the lease are immutable. On many other occasions, lease negotiations appear to be carried out in two stages, with the rent fixed before any other terms are considered. Although both these approaches have the advantage of simplifying lease negotiations, they are, in most cases, poor strategies for negotiation. Negotiations which are dominated by one point of contention are more prone to breaking down than those in which a range of issues are brought to the table (see, for example, Fisher et al., 1991: 61; Kozicki, 1993: 17). It is common to find that there are mutual benefits to be gained from trading terms and, when the focus of the negotiation moves away from the major point of contention, it is easier for each party to bend.

Differences in acceptable rents that appear to be irreconcilable may be overcome when changes to other lease covenants are considered at the same time as the rent. However, it is difficult for either landlords or tenants to negotiate a package of lease terms unless they all can be reduced to a common unit.[1] Business negotiations are more effective when each issue is expressed as a monetary equivalent because this encourages the parties to trade concessions to reach mutually beneficial agreements.

One reason why lease negotiations are restricted often to discussions of rent is that there are no established methods of converting changes in the other lease covenants to a rental equivalent (Lizieri et al., 1997: 32). Although the lack of clear methods for "pricing" lease covenants can be exploited by astute negotiators, it is likely to lead to many sub-optimal leases (because the parties do not realise the benefits to both of them from varying the standard covenants).

This paper presents the initial version of an operational model that reduces changes in lease covenants to their rental equivalent in order to help in lease negotiations. The second part of this paper reviews the recent advances in lease modelling and the pricing of lease covenants, which are largely academic to date. The third part explains the rationale and main features of the operational model. The fourth part of the paper outlines how the adjustments to rent are calculated for each of the major lease covenants. The fifth and final part describes some initial trials of the model, reports on the sensitivity of the variables and suggests how the model might be developed further.

Part 2: Pricing lease covenants: the literature.

The effects on rents of several lease covenants have been modelled in a wide variety of ways in recent years. Some approaches are of more practical application to lease negotiations than others. The covenants that have received most attention are options to

---

[1] Fisher et al. (1991: 89) talk of developing objective criteria to gauge the importance of each issue in a negotiation. Kozicki (1993: 75) suggests investigating four main issues and assessing their effects on the outcome from the negotiation.

renew or to break leases, the rent reviews provisions, leasing incentives and the liability for property responsibilities and expenses.[2]

Options to renew or break leases

The most extensively researched lease terms have been options to renew or to break the lease. These give tenants flexibility and, if the rent at the start of the option is a fixed amount, these options can be priced in a similar way to options or warrants to buy shares at an exercise price that is fixed when the option fee is paid (Grenadier, 1995: 298). The Black-Scholes and the binomial option-pricing models do not require a subjective risk-adjusted discount rate, assuming that the parties can arbitrage between taking an option and buying the asset combined with a risk-free investment or with a loan (see, for example, Hull, 1997: 156; Peirson et al., 1995: 477).

The equivalent of the fee for the option is the increase in the initial rent paid for the right to renew or to break. In equilibrium in a perfect market, these options do not create extra value but merely shift value from landlord to tenant, which should be reflected in increased rent.

An option to renew a lease can be evaluated as a call option for the tenant. The increase in rent will be determined by the present value of any difference between the market rent at the time of renewal and the "exercise price" being the agreed rent after renewal. The more uncertain is the difference between the market rent at renewal and the "exercise price", the greater is the value of the option to renew. Grenadier (1995; 316) does not offer a closed form solution to the pricing of options to renew or break but suggests simulation or numerical integration to price the option. Buetow and Albert (1998: 257) demonstrate the use of partial differential equations to price options to renew at a rent that it is based on an index such as the Consumer Price Index.

If the rent after renewal is the then current market rent, the option has no value using these option-pricing models (Buetow and Albert, 1998: 254). However, the option has a value to the tenant which is related to the present value of the reestablishment costs and the loss of locational goodwill. It has a possible cost to the landlord which is related to the adverse consequences of being tied to a renewal based upon the existing terms, apart from the rent. The option at market rent might prevent the landlord signing up a superior tenant or from switching to an alternative use. The addition to rent for an option to renew at market will be a negotiated agreement, dependent on the bargaining strengths of the parties.

The right for a tenant to break a lease can be evaluated as a put option (the tenant can elect to return the premises to the landlord, particularly if the continuing rent would be higher than the market rent for similar premises). The increase in the initial rent can be assessed in a similar manner to the option to renew (Grenadier, 1995: 317) or as the present value of the probable difference between the market rent at the break and the agreed rent if the lease is not broken (Herd and Lizieri, 1994: 131). There are further costs of the break clause that may have different value to the landlord (the costs of finding a new occupant) and the tenant (the costs of reestablishing elsewhere).

As well as these options, it is sometimes possible to price other clauses as embedded options, as described below. At this stage, there is virtually no evidence of the past

---

[2] This part of the paper contains material that has been updated from a fuller description of this literature in Rowland, 1997.

volatility of rents (or operating costs), nor any indication that they follow any of the common mean-reverting stochastic processes. The restrictive assumptions and lack of data make it difficult to apply these option-pricing models convincingly to lease clauses (Crosby et al., 1998: 23).

The rent review provisions

The frequency and basis of rent review under different leases can be compared either by finding the present value of the projected the cash flows over the period of the lease or algebraic models. Generally, landlords prefer frequent (upwards only) market rent reviews unless a large surplus of space is imminent, in which case fixed increases are favoured. Often, tenants argue for infrequent rent reviews tied to an index of affordability (consumer price inflation or as a percentage of the gross sales of the business).

The algebraic models of rental equivalents[3] are restricted to a constant change in rent, whereas discounted cash flow analysis can be used to evaluate any rental variations. Both approaches calculate equivalent rents for varying rent review periods, based upon a single estimate of the change in rent and an appropriate discount rate. Therefore, both ignore the uncertainty of different rental streams (and ignore the costs of negotiating the rent). Discounted cash flow analysis can incorporate the uncertainty of the changes in rent by using a higher discount rate for the less (or least) certain of the rental streams. Alternatively, the cash flows can be converted to stochastic variables and uncertainty quantified or simulated.

Rent reviews do not in themselves create options if both parties are obliged to accept a new rent set by a prearranged formula. However, Grenadier (1995: 321) shows how variable rent can be formulated as a series of options. Similarly, Chiang et al. (1986: 216) treat the tenant's obligation to pay percentage or turnover rent as if the landlord has a call option that is contingent upon the gross sales. In contrast, Lee (1995: 731) shows how a percentage rent in a retail lease shares the risks of the variations in the success of the tenant's business and how the expected rent should therefore be higher than a fixed rent.

An upward only rent review gives an option to the landlord to demand a rental increase unless market rents have declined since the start of the lease (or since the previous review). If there is a chance that the market rent may decline, an upward only rent review is a valuable option for the landlord. The consequent increase in rent may be valued as the probability and the amount of the decline in rent by the time of the rent review. Alternatively, it can be valued using stock option techniques. This may require a binomial model of the capitalised value of the property (Ward and French, 1997: 173), a simulation of a stochastic rent generating process (Ward et al., 1998: 450) or the Black-Scholes option-pricing equation (Ward and French, 1997: 177).

Most of these option-pricing models are based upon arbitrage and are therefore restricted in their applicability because full information and the absence of transaction costs are prerequisites (Chiang et al., 1986: 218; Grenadier, 1996: 337; Peirson et al., 1995: 471). As the majority of leases provide for periodic adjustments to the rent, option-pricing models become very complex and it is sometimes unclear whether it is the rent reviews or the lease expiry that gives rise to the more significant option(s).

---

[3] These are reviewed in Whipple,1995:226.

Leasing incentives

Leasing incentives are concessions given to tenants to entice them into signing new leases. In most instances, they can be priced by assessing their effects on the cash flow from the property (Bond, 1994; 7; Jefferies, 1994: 21). The controversies that surround "effective rents" centre on the choice of discount rate and whether they should be annualised over the period until the first market rent review or until the lease expires (the answer often lies in the wording of the review clause in the lease, statutory provisions or local case law).

The liability for property responsibilities and expenses.

Because property operating costs are uncertain, risk-averse landlords (or tenants) are willing to give up (or surrender) rent if the other party accepts responsibility for the operating costs. Albert and McIntosh (1989: 83) calculate equivalent net and gross rents by discounting the operating costs at a higher rate than the agreed rent[4] to reflect the uncertainty of operating costs. This justifies a bigger difference between net and gross rents than the expected operating costs. Their model assumes that unexpected changes in operating expenses are perfectly correlated with unexpected consumer price inflation, which can be hedged using commercial paper (Albert and McIntosh, 1989: 86). They conclude that either party will take on the responsibilities if compensated for the expected operating costs and the costs of the hedge.[5]

The maintenance and management of properties may be carried out inadequately when there is insufficient incentive for the responsible party to operate the property in the way that the other party would like (and there are difficulties in specifying, monitoring or enforcing[6] repair and management clauses).

Benjamin et al. (1995: 181 and 1998: 224) show that the tenant's inclination to overuse and/or undermaintain leased premises (which they refer to as an "incentive problem") imposes a cost, initially on the landlord that would be expected to "cause the market for leased space to fail". The tenant has no interest in preserving the residual value of the property and this neglect would not exist in owner-occupied properties. The authors search for lease covenants that lessen or remove the effects of the tenant's incentive to abuse the premises, rather than trying to price the effect of these "agency costs".

Similar "agency costs" may exist in leases under which the landlord carries out maintenance and management but recovers the cost by way of a service charge paid by the tenant. For example, Miceli and Sirmans (1995: 356) style the landlord of a shopping centre as a "common agent" managing the premises for a group of principals, being the tenants. Many tenants fear that landlords overspend when they can recover the full or increased costs from their tenants. This presumably lowers the rent that tenants are willing to pay. Although leases which may lead to tenant neglect or landlord overspending are common, there appears to be no easy way to price this aspect (Rowland, 1998).

---

[4] The financial leasing literature would suggest a corporate bond rate for the agreed rent excluding operating costs.

[5] In practice, only very imperfect hedges are available as the "basis risk" remains substantial, changes in operating costs being only weakly correlated with changes in inflation (Rowland, 1996; 22). Their model also assumes that all investors and tenants have a diversified portfolio of leases and are not concerned with variations in running costs between properties.

[6] Kanemoto (1990: 10) suggests that the major problem is proving to the satisfaction of an independent tribunal or official that repair or other covenants have been breached.

Glascock et al. (1993: 74) consider the case of owners who occupy part of a building and propose that these resident landlords are likely to exert greater maintenance effort than absentee landlords. Their algebraic model demonstrates that the leased offices of resident landlords will attract higher (gross) rents than those of absentee landlords. They attribute the higher rents to lower agency costs because potential tenants of buildings are less concerned about building neglect when the landlords are also occupants, partial occupancy by landlords being a signal to tenants of a commitment (by landlords) to maintain.

The length of the lease

The length of the lease has received little attention from researchers except for interest in the shortening average length of leases in the UK (Crosby et al., 1998). The length may be determined by particular needs of the landlord or the tenant (for example, the intention of the landlord to redevelop shortly or the temporary need for additional space for a business tenant). Generally, landlords are well served by longer leases and tenants argue for short leases with one or more option to renew. Although option-pricing models may give some insights into the relationship between rent and lease length[7], there is no easy way of defining an equilibrium rent that is dependent on the length of the lease.

It is likely that the most significant factors linking rents and lease length are the costs of moving and the costs of reletting, including periods of vacancy. Reletting costs may be incurred by either the landlord at the expiry of a short lease or by a tenant wishing to move before the lease expires. These costs may not simply shift from one party to another but may be minimised by mutual cooperation between the landlord and the tenant.

Other lease covenants

There have been no or few attempts to estimate the effects on rent of most other lease clauses. Landlords, tenants and valuers concur that limitations on use of the premises and control over assignment influence rent. In both cases, tighter controls might be expected to lower rent but it is unclear by how much.

The strength of the tenant's covenant (and any rental guarantees) would also be expected to affect rent. Some attempts have been made to predict how much default risk should lower rent, typically treating the rent as equivalent to a corporate bond payment. Grenadier (1996: 333) proposes an equilibrium framework to assess default risk.

Part 3: An operational model

The proposed operational model to price lease covenants draws upon a combination of the academic insights that have been outlined in Part 2 above and an understanding of requirements and level of sophistication of the likely negotiators of leases and their advisers. The model was conceived as an aid to lease negotiations.

The principal objective of the model is to enable landlords, tenants and their advisors to see quickly the effects on rent of changing any of the major lease covenants. The initial

---

[7] The expiry of the lease gives the landlord the option to find a new tenant at a revised rent (the landlord has a call option on the unencumbered freehold). Similarly, the expiry gives the tenant the option to surrender the premises (the tenant has a put option on the premises).

version of the model is limited to considering the lease length, options, rent review provisions, leasing incentives and property responsibilities. The model allows for changes to several of these lease covenants at one time, so that their combined effects can be seen. This enables the trading of concessions during lease negotiations to be priced.

This prototype is designed for use by tenants, although it can be adapted for use by landlords with comparatively little effort. It relies upon a mixture of equilibrium concepts (where changes are expected to have equal but opposite consequences for both landlords and tenants) and pricing benefits to the tenant. Further work is needed if the model is to estimate adjustments that may result from bargaining between the two parties.[8] To extend the outcomes from a single negotiation to estimate the effects of changing lease covenants on market rents would require a profile of the typical landlord and tenant.

The intention is that the model should be easy to use, with the derivation of the results clear to a business person without research training. The program should catch the attention if it is to bring landlords and tenants around to the notion that lease covenants can be priced for the benefit of both parties. Some sardonic comments and hints for the user appear when moving between screens and forms (these can be switched off when they become tedious).

Some element of the academic research described in Part 2 above have been incorporated in the model, although some of the abstract advances in pricing lease covenants do not lend themselves to practical applications. This is because many of their assumptions are breached, implausible or require data that is unavailable or unreliable as guides to future market conditions. It is considered more important for the model to be parsimonious and internally consistent than sophisticated. Wherever possible, the same inputs are used to price more than one lease covenant.

Changes to lease covenants have the effect of shifting risks and responsibilities. Some give one party an option to enhance their interest in the property. Therefore, most covenants can only be priced within a framework that recognises the uncertainty of future market rents, operating costs and required periods of occupation. The use of data showing past volatility of rents and operating costs was rejected as data of this kind is not available in most real estate markets and may not be indicative of future volatility. To keep the inputs simple, uncertain variables have been specified binomially with expected and pessimistic values, either with probabilities attached to each, priced by arbitrage or assuming a uniform distribution between the two values.

The model has been built on an Excel spreadsheet using a series of Visual Basic for Applications modules and user forms to automate the program and hide ugly blocks of calculation cells.

The benchmark for the model is a rent based upon the standard lease terms for the type of property in its current market. The rent and standard lease terms are specified by the user in the forms reproduced in Exhibit 1 (the exhibits and tables can all found at the end of the paper). The standard lease covenants are a starting point for adjustments to the rent. It does not matter whether the benchmark rent is an asking rent, a maximum

---

[8] Asymmetrical information, bargaining power and different attitudes to risk will influence the outcome of the lease negotiations (Benjamin et al., 1998: 230).

bid or market levels. If lease covenants are not uniform in any market, any lease structure that is common will suffice.

The user can then specify variations on the standard lease terms and the program computes a rent that reflects the benefits and risk of these variations. The user may be asked to forecast likely and adverse leasing conditions and operating costs, depending on which covenants are to be changed. As examples, two of the forms are reproduced in Exhibit 2.

Because variations in lease length, options, rent review provisions and leasing incentives change the rental stream, a multi-period model is essential. Annual compounding is used with any monthly amounts divided by 12 and allocated to the appropriate year. Adjustments that do not affect the rental stream evenly are discounted to a present value and then converted back to an even annuity. The annuity may run until the first market rent review, until the lease expires or until the end of any options, depending upon which covenant is changed, upon the wording of the covenant or sometimes upon whether the interest of the landlord or the tenant is under consideration.

The correct basis for choosing the discount rate would depend upon the approach used to calculate the rental equivalent. For example, leasing incentives might be adjusted at a cost of capital, options might be priced using a risk-free rate and uncertain additional receipts might be capitalised at a risk-adjusted rate. Rather than require the users of this program to enter several current rates, this version adopts a cost of borrowing for all conversions to even rental equivalents. The influence of the discount rate on the change in rent is tested in Part 5 below.

Part 4: Adjusting rent for each covenant

The program evaluates the effects of changing each lease covenant separately. The effects of the changes are aggregated and the program presents a summary as shown in Exhibit 3, together with the components of the rental adjustment for variations in the lease length and the basis of rent review. This displays the suggested rent based upon the revised terms and three broad components of the changes (to rent reviews, to leasing incentives and to the allocation of responsibilities). Further details and explanations are available on other screens and the program contains a table highlighting how the rental adjustments caused by each covenant have been calculated. This part of the paper expands upon these explanations and provides some justifications for the methods of finding rental equivalents.

The rent review provisions, the lease and option length

(i) Expected pattern of rental stream

Alternative basis and dates of rent reviews will change the stream of rental payments. As well as the rent review provisions, changes to the length of the lease or option will influence the years in which rent is adjusted to market level, to an index or in accordance with a percentage specified in the lease. The standard and revised rental stream are forecast, based upon the length of the lease and option, the rent review provisions and the expected growth in market rental levels. If leases of different lengths (including their option periods) are being compared, the rent until the revised length is considered. This may require an assumption that the standard lease would be renewed on the same terms.

The consequences of revising the rent review provisions or the lease or option length are calculated as the difference in the present values of the projected rental streams on standard and revised basis, annualised over the revised period of the lease and option.

(ii) Consequences of vacating the property

It is assumed that the tenant prefers the flexibility of option(s) to renew without the commitment of a long lease. Vacating before the end of the lease or in the midst of the option period will incur reletting costs and possibly several months before an assignee takes over rental payments. If the tenant wishes to remain after the lease and options expire, the tenant is in a weak bargaining position and may be obliged to accept a higher rent.

For the model to price these effects, the tenant specifies the likely minimum and maximum period for which the property will be required. The program assumes an equal probability of the tenant wishing to move at the end of any year in this period.

The consequences of an early move are calculated as the present value of the reletting costs in any year, multiplied by the probability of a move, annualised over the combined period of the revised lease and option. The consequence of the lease and options expiring before the tenant wishes to move are calculated as the present value of any additional rent paid because of the weak bargaining position of the tenant, multiplied by the probability of the tenant wishing to renew the lease. This present value is annualised over the combined period of the revised lease and option.

(iii) An option to renew at market rent

An option to renew at market rent strengthens the tenant's bargaining position when the lease expires (assuming that the tenant wishes to remain in occupation). It avoids any danger that the landlord may insist on a higher than market rent if the lease is to be renewed. Under some circumstances, the landlord may be able to extract a higher rent from a sitting tenant with no rights of renewal than the "open market rent".

The consequence of taking an option to renew at the market rent is found as the present value of any rent savings created by the secure bargaining position of the tenant, multiplied by the probability that the tenant wishes to renew the lease. This present value is annualised over the revised period of the lease and option.

(iv) An option to renew at a fixed rent

The value of an option to renew at a fixed rent depends on the probability that the fixed rent is below the market rent when the option is exercised. The rental value of this option is assessed by a binomial option-pricing model based on the expected market rent when the option would be exercised, the possible decline in market rents by then and the fixed rent.

The use of a risk-free interest rate to price this option is inappropriate without some adjustment for the rental return from or benefits of occupying the property (the equivalent of a dividend in pricing a stock option or warrant). When the expected growth is treated as an uncertain return and is less than the risk-free rate, standard option-pricing models give implausible answers. A further input of a higher than

expected growth might be used in a binomial model.[9] In this version of the model, a dubious simplifying assumption is made that, in equilibrium, the return in rent or benefits of occupation is at the same rate as the cost of borrowing. From this is follows that the rental portion of the return roughly cancel out the interest cost. It is then possible to approximate the value of the binomial option from the expected increase in rent, the possible decline in rent and a discount rate of 0 per cent. The "price" of this "call option" is then converted to its annual equivalent over the period of the lease at the cost of borrowing.

(v) A rent review clause with an upward only restriction

An upward only rent review clause protects the landlord against any decline in rent until the lease expires. Although the future rent is uncertain, the landlord can be sure of receiving no less than the current rent after the rent review. The landlord therefore has an option either to continue receiving the same rent or, if market rents have increased, a higher rent.

In this model, the rental adjustment for an upward only restriction at rent review is assessed by a similar binomial option-pricing approach to that used for an option to renew. This is based upon the expected market rent when the rent would be reviewed and the possible decline in market rents by then. The discount rate is 0 per cent (based upon the assumption explained above that in equilibrium the rent and the cost of borrowing would be the same). The "price" of this "call option" is then converted to its annual equivalent until the first rent review.

Initial leasing incentives

Although these incentives or leasing concessions can take many forms, this program requires that they be specified as initial dollar amounts that the tenant will receive or that will save the tenant expenses and periods at or before the start of the lease free of rent.

The rental value of changing the incentives is found by allocating the amounts to the appropriate year and finding their present value. As a default, this present value is annualised (or amortised) over the period until the lease expires. However, the wording of the lease or legislation may dictate that the present value should be annualised over the period until the first market rent review or even until the end of an option to renew.

Responsibility for property operations

(i) Changing liability for operating costs

Switching between gross and net (or full repairing and insuring) leases changes the full liability for operating costs. Adopting a "gross plus increases" basis changes the liability for either the current or base year's operating costs (switching from net or FRI) or the forecast increases in operating costs (switching from gross).

---

[9] Alternatively, the expected growth might be a "drift" term in a Black-Scholes formulation, with the possible decline used to estimate the standard deviation of the rent.

The rental value of changing the liability for operating costs is calculated as the present value of the current and future expected operating costs, annualised over the period of the lease.

(ii) Changing the risk of unexpected increases in operating costs

It is assumed that both landlords and tenants are averse to taking risks and therefore they will accept the responsibility for uncertain operating costs only if they receive a "risk premium" (the expected operating costs will be less than the required increased rent for the landlord or the rent saving for the tenant). A "certainty equivalent" is approximated by giving additional weight to an estimate of possible higher costs and their probability.

The risk premium for taking responsibility for uncertain operating costs is calculated as the average of the expected operating costs and the possible higher costs, weighted by their probability. This annual amount is converted to an even amount over the period of the lease.

(iii) Potential overspending by the party controlling property operations

If the landlord operates the property but can recover the costs from the tenant, there may be a tendency to overspend. If the tenant is concerned about this, less rent will be paid to cover the costs of monitoring the landlord's operations or to reflect unnecessarily high recovery of operating costs

The tendency to overspend is approximated as the expected operating costs, multiplied by a percentage of overspending. This annual amount is converted to an even amount over the period of the lease.

(iv) Potential neglect by the party responsible

The party operating the property may have little incentive to spend the full amount needed to keep it in proper order or may be careless in its treatment of the property. Tenants may be inclined to neglect premises, particularly towards the end of the lease. Landlords may be inclined to neglect the premises, particularly if the lease or rent is fixed for many years.

The tendency to neglect is approximated as the expected rent under the revised lease, multiplied by a percentage of reduced value or benefits from the property caused by possible neglect. This annual amount is converted to an even amount over the period of the lease.

Other lease covenants

At this stage, no other lease clauses are incorporated in the program.

Part 5: Evaluation and further development of the model

The model is raw, naïve in its formulation of some risks and in need of further checking. However, it is sufficiently developed to assess whether it is worth refining. A few informal trials by colleagues who negotiate leases as or on behalf of tenants suggest

that it is too complicated and the methods of calculating rental adjustments were obscure. Some further guidance and clearer wording will help.

Tests of the sensitivity of the principal variables were carried out. The scale and direction of the variations are as expected. The amounts of the variations are determined by the user's predictions of such factors as growth in rents, consequences of vacating and the degree of uncertainty of rental changes and operating costs. Exhibits 4 to 9 tabulate the most enlightening of the sensitivity tests but the results are of meaning only in the context of the current settings for the many interrelated variables.

All the tests relate to a property which can be leased for $50,000 per annum on the usual terms for that market. The usual terms are a five year lease with a market rent review after 3 years and an option to renew for a further two years at the then market rent. 5 per cent per annum rental growth and a loan interest rate of 7 per cent per annum are assumed.

Exhibit 4 shows the effects on rent of a longer lease, discounting at various interest rates. The changed rent is determined largely by the likelihood of a move and the subjective assessment of its consequences. Longer leases justify a lower the rent from the tenant's perspective. The interest rate has comparatively little effect, with higher rates reducing the effect on rent slightly. Exhibit 5 displays the change in rent if the rent review frequency is changed from the standard three years, with a higher rent payable for less frequent reviews and a larger difference as rental growth estimates increase. This and the following two exhibits confirm the importance of the expected market rental growth in determining the rental adjustment for changed lease covenants.

Exhibit 6 shows the benefits of upward only rent reviews using the form of binomial option-pricing described in Part 4 above. A higher (initial) rent would be affordable if there is a chance that rent might decline at the review. This effect is more prominent if higher rental growth is expected. Exhibit 7 illustrates further the effect on rent of switching from an upward only rent review to one permitting a lower rent after review. These rental adjustments confirm that the benefit of upward only reviews increase the bigger is the range between the expected growth and the possible decline.

Exhibit 8 shows the relative significance of leasing incentives paid at the start of the lease and those given by way of rental concessions during the lease. Exhibit 9 is a matrix of the effects of changing the basis of allocating responsibilities amongst four common lease structures. The exhibit explains the assumptions that have been made about operating costs, their increases and volatility and the "agency costs" as defined in Part 4.

Many of the variations in rent are relatively small ($1,000 being only 2 per cent of the rent on standard terms). It might be argued, since it is often impractical to adjust rent with such precision for any physical or locational attributes, it is unrealistic to try pricing these lease covenants. However, in those markets in which there are no guides or "rules of thumb" at present, any model in which market participants gain confident will make lease negotiations more flexible.

The particular areas of the model that are priorities for further attention are

• to consider alternative inputs to represent uncertainty;

- to carry out more trials of different option-pricing formulations that require only simple inputs (or can be reduced realistically to simple inputs);

- to clarify the on-screen guidance to users; and

- to extend the model to specify the bargaining positions of both parties (and later market outcomes).

The last goal may enable the model to reveal whether standard lease terms in some markets are "inefficient" (in the sense that revised terms may be favoured by both parties but inertia or institutional rigidity prevents change). If the model is to have practical relevance, it must be set up to help overcome the reluctance of many landlords and tenants to negotiate anything but the rent. They must acknowledge that leases on unusual terms may benefit both parties and that rent can be adjusted to reflect changing lease covenants. Lease negotiation will then be more than negotiating the rent.

References

Albert, J.D. and McIntosh, W., 1989 "Identifying Risk-Adjusted Indifference Rents for Alternative Operating Leases", *The Journal of Real Estate Research*, Vol. 4 (3) 81-93.

Benjamin, J.D., de la Torre, C. and Musumeci, J. (1995) "Controlling the Incentive Problems in Real Estate Leasing", *Journal of Real Estate Finance and Economics*, Vol. 10 (2) 177-191.

Benjamin, J.D. de la Torre, C. and Musumeci, J. (1998) "Rationales for Real Estate Leasing versus Owning" *Journal of Real Estate Research*, Vol. 15 (3) 223-238.

Bond, S. (1994) "Rental Valuations with Inducements: An Update", *Journal of Property Valuation and Investment*, Vol. 12 (2) 7-18.

Buetow, G.W. and Albert, J.D. (1998) "The Pricing of Embedded Options in Real Estate Lease Contracts", Journal of Real Estate Research, Vol. 15 (3) 253-266.

Chiang, R., Lai, T-Y and Ling, D.C. (1986) "Retail Leasehold Interests: A Contingent Claim Analysis", *AREUEA Journal*, Vol. 14 (2) 216-229.

Fisher, R, Ury, W. and Patton, B. (1991) *Getting to Yes*, 2nd edition, Business Books Limited.

Glascock, J. L., Sirmans, C. F. and Turnbull, G. K. (1993) "Owner Tenancy as Credible Commitment under Uncertainty", *AREUEA Journal*, Vol. 21 (1) 69-82.

Gredanier, S.R. (1995), "Valuing lease contracts: A real-options approach", *Journal of Financial Economics*, Vol. 38 297-331.

Grenadier, S.R. (1996) "Leasing and credit risk", *Journal of Financial Economics*, Vol. 42 333-364.

Herd, G. and Lizieri, C. (1994) "Valuing and Appraising New Lease Forms: The Case of Break Clauses in Office Markets", in the Proceedings of "The Cutting Edge" conference, Royal Institution of Chartered Surveyors, 127-143.

Hull, J.C. (1997) *Options, Futures and Other Derivatives*, 3rd edition, Prentice-Hall.

Jefferies, R.L. (1994) "Leasing Incentives and Effective Rents: A Decapitalization Model", *Journal of Property Valuation and Investment*, Vol. 12 (2) 21-42.

Kanemoto, Y. (1990), "Contract Types in the Property Market", *Regional Science and Urban Economics*, Vol. 25 355-372.

Kozicki, S. (1993) *The Creative Negotiator*, Gower Publishing.

Lee, K. (1995) "Optimal retail lease contracts: The principal-agent approach", *Regional Science and Urban Economics*, Vol. 25 739-757.

Lizieri, C., Crosby, N., Gibson, V., Murdoch, S. and Ward, C. (1997) *Right Space: Right Price?*, Royal Institution of Chartered Surveyors.

Miceli, T.J. and Sirmans, C.F. (1995) "Contracting with spacial externalities and agency problems: The case of retail leases", *Regional Science and Urban Economics*, Vol. 25 355-372.

Peirson, G., Bird, R., Brown, R. and Howard, P. (1995) *Business Finance*, 6th edition, McGraw-Hill.

Rowland, P. (1996) "Comparing net with gross rents", *Journal of Property Valuation and Investment*, Vol. 14 (3) 20-32.

Rowland, P. (1997) "Economic analysis of contracts; the case of property leases", paper published in the proceedings of the Third Pacific Rim Real Estate Society Conference, Queensland University.

Rowland, P. (1998) "Testing for Agency Costs in Property Transactions", paper published in the proceedings of the Fourth Pacific Rim Real Estate Society Conference, Curtin University of Technology.

Ward, C., Hendershott, P.H. and French, N. (1998) "Pricing upwards-only rent review clauses: an international perspective", *Journal of Property Valuation and Investment*, Vol. 16 (5) 447-454.

Ward, C.W.R. and French, N.S. (1997) "The Valuation of Upwards Only Rent Reviews", *Journal of Property Valuation and Investment*, Vol. 15 (2) 171-182.

Whipple, R.T.M. (1995) *Property Valuation and Analysis*, The Law Book Company.

Exhibit 1

Exhibit 2

Changing the lease/option length   ×

Proposed lease length   `8`   years

Proposed option length   `2`   ☑ at market rent

To use this screen, you must have some idea of how long you plan to stay and the consequences of vacating or renewing.

Likely shortest period of occupation   `5`

Likely longest period of occupation   `15`

Costs of finding a new tenant $ `10000`

?

Probable period of vacancy   `3`   months

?

Captured tenant % excess   `5`

Different rent review pattern   ×

Proposed basis of review

○ Market   ☐ Upward only

◉ CPI   `CPI`

○ Percentage

Proposed frequency of review   `1`

Reminder

Standard basis of review   `Market`

Standard frequency of review   `3`

Exhibit 3

The effects on rent

Changed rent $ | 46065

Summary of changed terms

Length	8
Option	2
Rent review	1	CPI

Incentives $ | |
| | months |

Review changed lease terms

Influence of each change

| Rent reviews | -3935 |

including lease length and options

| Incentives | 0 |

| Responsibilities | 0 |

Guidance

Rent review, lease length and options: rental adjustments ☒

?	Pattern of rental change	-8928
?	Upward only rent review	5785
?	Lease and option length	-792
?	including an option at market rent	
?	Option at fixed rent	0

Exhibit 4

The effect on rent of changing the lease length, using different interest rates

Interest rate	5 years	6years	7 years	8 years	9 years	10 years
3%	$0	($659)	($579)	($532)	($1,347)	($1,222)
5%	$0	($625)	($561)	($539)	($1,299)	($1,197)
7%	$0	($592)	($543)	($542)	($1,250)	($1,167)
9%	$0	($561)	($525)	($541)	($1,201)	($1,134)
11%	$0	($530)	($507)	($539)	($1,152)	($1,099)
13%	$0	($502)	($489)	($534)	($1,104)	($1,063)
15%	$0	($474)	($471)	($526)	($1,055)	($1,025)

Exhibit 5

The effect on rent of changing the rent review frequency, based on different expected rental growth rates

Rental growth	1 year	2 year	3 year	4 year	5 year
0%	$0	$0	$0	$0	$0
2%	($736)	($299)	$0	$293	$838
4%	($1,521)	($609)	$0	$586	$1,710
6%	($2,359)	($932)	$0	$879	$2,616
8%	($3,254)	($1,266)	$0	$1,172	$3,556
10%	($4,212)	($1,614)	$0	$1,462	$4,532
12%	($5,236)	($1,976)	$0	$1,751	$5,545

Exhibit 6

The effect on rent of switching from an upward only rent review (after three years) to one permitting a lower rent after review, using different expected rental growth rates

	1 year	1 year	3 year	3 year
Rental growth	Upward only	Rent may decline	Upward only	Rent may decline
0%	$0	$0	$0	$0
2%	($736)	$1,591	$0	$1,326
4%	($1,521)	$1,803	$0	$1,894
6%	($2,359)	$1,519	$0	$2,209
8%	($3,254)	$977	$0	$2,409
10%	($4,212)	$263	$0	$2,547
12%	($5,236)	($582)	$0	$2,648

Exhibit 7

The effect on rent of switching from an upward only rent review to one permitting a lower rent after review, using different expected and possible declines in rent, based upon a five year lease with a rent review after three years

Expected rental growth per annum	Possible decline per annum in rents					
	0%	**2%**	**4%**	**6%**	**8%**	**10%**
0%	$0	$0	$0	$0	$0	$0
2%	$0	$1,105	$1,474	$1,657	$1,767	$1,840
4%	$0	$1,474	$2,209	$2,650	$2,942	$3,151
6%	$0	$1,657	$2,650	$3,309	$3,779	$4,130
8%	$0	$1,767	$2,943	$3,779	$4,404	$4,888
10%	$0	$1,841	$3,151	$4,130	$4,889	$5,492
12%	$0	$1,893	$3,307	$4,403	$5,275	$5,984

Exhibit 8

The effect on rent of changing the rent review frequency, based on different expected rental growth rates, based on a five year lease and 7 per cent interest rate

Initial concession to tenant	Months free of rent at the start of the lease					
	0 months	**3 months**	**6 months**	**9 months**	**12 months**	**24 months**
$0	$0	$2,849	$5,698	$8,548	$11,397	$22,048
$5,000	$1,219	$4,069	$6,918	$9,767	$12,616	$23,267
$10,000	$2,439	$5,288	$8,137	$10,986	$13,836	$24,487
$20,000	$4,878	$7,727	$10,576	$13,425	$16,275	$26,926
$30,000	$7,317	$10,166	$13,015	$15,864	$18,713	$29,365
$50,000	$12,195	$15,044	$17,893	$20,742	$23,591	$34,242

Exhibit 9

The effect on rent of changing the allocation of responsibilities, based on $15,000 per annum expected operating costs, expected to grow at 3% pa but possibly $16,000 in the "base" year and possibly growing at 7% pa. The "tendency to overspend" was set at 5% of these costs and the "tendency to neglect" at 2% of rent

Revised terms	Standard terms			
	Gross	**Gross plus increases**	**Net with service charge**	**Full repairing and insuring**
Gross	$0	$1,734	$16,848	$17,112
Gross plus increases	($1,734)	$0	$15,250	$15,514
Net with service charge	($16,848)	($15,250)	$0	$264
Full repairing and insuring	($17,112)	($15,514)	($264)	$0