Leasing

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LECTURE 6: SOME LEASING ISSUES

1. LEASE TYPOLOGY & TERMINOLOGY

Definition: Contract between holder of property rights ("lessor"), and consumer/user of property rights ("lessee", or tenant), covering specified period of time.

- Normally, only possession (usage) rights, not development rights.
- Contract is exchange: rights for money.
- Money (price) is rent.

1.1 LEASE PAYMENT (RENT PATTERN) TYPES:

- Flat or Fixed - no rent change.
- Graduated - rent changes at times & $ amts specified in lease.
- Revaluation - rent changes at times specified in advance, $ amt depends on mkt.
- Index - rent changes at times specified in advance, $ amt based on a cost index.
- Percentage - rent $ amt based on % of revenues or inc. earned by tenant in space.

1.2 LEASE CHARACTERISTICS AFFECTING VALUE OR RENT:

- Space - location, size, shape, adjacent uses (synergy, externality).
- Lessee - credit quality, prestige, externalities.
- Date & Term (length of period covered).
- Rent terms.
- Concessions - e.g., free rent, tenant improvement allowance (TI), ...
- Covenants (who is responsible for what)
- Sublet (assignment) rights - permitted unless explicitly negated in contract.
- Options - e.g., renewal, cancellation, 1st refusal, etc

1.3 Handling of Operating Expenses . . .

- Gross Lease ("Full Service") - landlord pays operating expenses.
- Net Lease ("NNN", "Triple-net") - tenant pays operating expenses.
- Expense-stops - tenant pays increases in operating expenses.

2. EFFECTIVE RENT

Definition: Level annuity with PV equal PV of lease E[CF]s.

- Either the landlord's or tenant's perspective.
- Useful for comparing leases, but watch out...
- Effective rent may not quantify all relevant issues.

[Aside: In common practice, "effective rent" often defined ignoring present value discounting, summing all lease CFs divided by the lease term. This is obviously incorrect and can give misleading comparisons.]

2.1 Procedure for calculating effective rent . . .

Step 1) Compute PV of expected CF under the lease (LPV).
\[ LPV = CF_1 + \frac{CF_2}{1+k} + \frac{CF_3}{(1+k)^2} + \cdots + \frac{CF_T}{(1+k)^T} \]

where: \( T \) = the lease term;
\( CF_t \) = net cash flow to the landlord in year "t";
\( k \) = discount rate.

From tenant's perspective, CFs are tenant's gross cash outflows due to all space occupancy costs, including building operating expenses not covered by landlord (e.g., in a net lease).

In theory:
\( k \) = tenant's borrowing rate (loan similar duration to lease).

In practice:
\( k = 10\% \) (!!!) per annum, or \( (10/12)% \) per mo.

Caveat: if \( k \) not based on tenant risk (OCC), then effective rent does not measure impact of lease on value of the lessor's property.

Step 2) Calculate the Annualized Value ("Level Annuity Payment") of the LPV.

\[
\text{Effective Rent} = \frac{k(LPV)}{(1+k)[1-1/(1+k)^T]} \]

2.2 EFFECTIVE RENT NUMERICAL EXAMPLES . . .

(Assume \( k=10\% \).)

Lease "A":
Term: 5 years
Rent: $20/SF, net
Concessions: 1 year free rent, up front.
Tenant still pays oper. expenses during rent holiday.
\[
LPV = 0 + \frac{20}{1.10} + \frac{20}{(1.10)^2} + \frac{20}{(1.10)^3} + \frac{20}{(1.10)^4} = 63.40
\]

Effective Rent(A) = \( 63.40(.10)/\{1.10[1-1/(1.10)^5]\} = 15.20/SF \)

Lease "B":
Term: 6 years
Rent: $25/SF, net
Concessions: 2 years free rent, up front.
Tenant still pays operating expenses during rent holiday.
\[
LPV = 0 + \frac{0}{1.10} + \frac{25}{(1.10)^2} + \frac{25}{(1.10)^3} + \frac{25}{(1.10)^4} + \frac{25}{(1.10)^5} = 72.04
\]

Effective Rent(B) = \( 72.04(.10)/\{1.10[1-1/(1.10)^6]\} = 15.04/SF \)

Other things equal, the landlord would prefer Lease "A", because 15.20 > 15.04.
Effective rent for same leases from tenant’s perspective, assuming initial operating expenses are $10/SF, projected to grow at 2% per year . . .

Lease A (tenant’s perspective):

\[ LPV = 10.00 + \frac{30.20}{1.10} + \frac{30.40}{(1.10)^2} + \frac{30.61}{(1.10)^3} + \frac{30.82}{(1.10)^4} = 106.63 \]

Tenant Effective Rent(A) = \( \frac{106.63 \times 0.10}{(1.10\times [1-1/(1.10)^5])} \) = $25.57/SF

--> Note: Tenant Effective Rent always > Landlord Eff.Rent, due to Oper.Expenses  <--

Lease B (tenant’s perspective):

\[ LPV = 10.00 + \frac{10.20}{1.10} + \frac{35.40}{(1.10)^2} + \frac{35.82}{(1.10)^3} + \frac{36.04}{(1.10)^4} = 122.13 \]

Tenant Effective Rent(B) = \( \frac{122.13 \times 0.10}{(1.10\times [1-1/(1.10)^6])} \) = $25.49/SF

Other things equal, the tenant would prefer Lease "B", because 25.49 < 25.57.

2.3 EFFECTIVE RENT AS A LEASE NEGOTIATION TOOL . . .

⇒ Lease negotiations purely on rent are "zero-sum" ("win-lose") games, lessor & lessee interests completely opposed: what one side gains the other loses. "Win-win" lease negotiations expand the issues under discussion beyond just rent (e.g., term length, options, services provided, etc).

⇒ Effective rent calculation may reveal asymmetries in preferences, which can assist in successful negotiations. For example, in the above example the landlord prefers Lease "A" slightly more than the tenant prefers Lease "B" (effective rent difference A>B for landlord is $0.16 while effective rent difference B<A for tenant is only $0.08). Full-info. Negotiation should lead to selection of Lease "A".

(One side or the other need only give up $0.08 to agree on lease of type A, whereas they would have to give up $0.16 to agree on a lease of type B.)

⇒ Effective rent calculation is a useful tool in lease negotiation if you calculate effective rent from both perspectives (lessor & lessee). For example, landlord might reduce Lease "A" rent offer and/or increase Lease "B" rent offer such that tenant is indifferent between the two, giving tenant more appealing options in the negotiation process.

That is, if an agreement is going to be possible (on either A or B), it is most likely to be possible (and most satisfactory across both parties) with Lease A, as revealed by the effective rent preference asymmetry.

E.g., \( $0.08(1.10/0.10)(1-1/1.1^5) = $0.33 \)

Landlord Ls.A LPV - $0.33 = $63.40 - 0.33 = $63.07.
\[\$63.07(0.10)/(1-1/1.1^4) = \$19.90.\]

Thus, landlord offers to reduce Lease A rent from $20 to $19.90. Now both landlord and tenant prefer Lease A.
APPENDIX A. Valuing a Lease Renewal Option . . .

Consider again Lease "A"...

Suppose landlord adds tenant option to renew after 5 years, for another 5-years, at $20/SF.

Simple valuation approach: "Decision Tree Analysis" . . .

Step 1) Describe Probability Distribution of Market Rents at time when option matures (expiration of lease, 5 years from now)

Subjective probabilities given today's information:

- $22/SF with 50% probability
- $18/SF with 50% probability

Market rents on new 5-year leases, 5 years from now:
Step 2) **Quantify conditional (future) PV of Option to holder under each Future Scenario:**

Tenant holds option. If Market Rents are $22/SF then option will be worth:

\[
\frac{22-20}{1+0.10} + \frac{22-20}{(1+0.10)^2} + \frac{22-20}{(1+0.10)^3} + \frac{22-20}{(1+0.10)^4} = 8.34
\]

If Market Rents are $18/SF then the option will be worth nothing.

So we have:

Subjective probabilities given today's information:

Future present value of renewal option 5 years from now (conditional):

\[
\begin{align*}
&\text{50%} \\
\text{Future present value of renewal option 5 years from now (conditional):} \\
\text{50%} \\
&\text{50%} \\
\end{align*}
\]

$8.34/SF

$0.00/SF
Step 3) **Quantify the Risk-adjusted PV today of the Future Renewal Option Value . . .**

3a) Discount the future conditional option values back to present at a high discount rate, because options are quite risky.

E.g., 20%, but it depends on how risky the option is: the greater chance the option will be exercised, the less risky it is. And note, this risk will probably change over time as you get new information relevant to the likelihood of option exercise.

(The main problem with the “decision tree” approach is it does not tell you what the correct discount rate is.)

Suppose the correct discount rate is 20%...

\[
PV($8.34 \text{ in 5 yrs}) = \frac{8.34}{(1.20)^5} = 3.35
\]

\[
PV($0.0 \text{ in 5 yrs}) = \frac{0}{(1.20)^5} = 0
\]

3b) Sum across the possible scenario present values, weighted by their subjective probabilities of occurrence:

\[(.50)3.35 + (.50)0 = 1.68.\]

This gives PV today of Lease Renewal Option (pos. to tenant, neg. to landlord).

Step 4) **Convert the Renewal Option PV to Impact on Effective Rent:**

PV Annuity (5 years, at 10%, in advance):

\[
$0.40 = (10\%) (\frac{1.68}{(1+10\%)[1 - 1/(1+10\%)^5]})
\]

So the impact of the renewal option is to reduce the Effective Rent of Lease "A" from $15.20 down to $14.80 for the landlord.

*Is a renewal option at “prevailing market rent” worthless? . . .*
3. BROADER LEASING STRATEGY CONSIDERATIONS (aka: things left out of the effective rent calculation):

Part 1: IMPLICATIONS FOR OPTIMAL TERM LENGTH & THE TERM STRUCTURE OF RENT...

Should you always choose the lease with the best effective rent?...

Answer: No!

So, What's left out of the effective rent calculation?...

Relating to lease term and rent:
Overview: Risk

Releasing costs
Flexibility (option value)
Expiration timing strategy

3.1) Risk...

Has risk been included at all in the effective rent calculation?...
(It depends on the “k” value that is used.)

If “k” based on tenant's borrowing rate, then risk factors included in loan OCC will have already been included and accounted for, that is, risk within the lease (relevant to “intra-lease discount rate”), including:

1. Interest rate risk
2. Tenant default risk

(Note: Default risk to the lessor may be less than default risk to lender: Landlord can lease space to another tenant.)

However, tenant's borrowing rate will not well reflect some other sources of risk for landlord (and tenant), in particular, sources which influence risk between leases (relevant for inter-lease discount rate).

Implication: longer-term leases reduce risk in a way that is not reflected in the effective rent calculation. Cet.Par., landlord prefers longer-term lease at same eff. rent, or is willing to accept lower eff. rent for longer-term lease, relative to a projection of what the future short-term (or "spot") rents will be.
APPENDIX B: NUMERICAL EXAMPLE OF LANDLORD LEASE TERM INDIFFERENCE RENT

Suppose:  
Intra-lease disc. rate (tenant's borrowing rate) = 8%.  
Inter-lease disc. rate (reflecting rental mkt risk) = 12%.  
"Spot rents" (short-term leases) expected to be $100/yr, net. 
No releasing costs or vacancy.

Bldg value to landlord is perpetuity of expected future rental payments. 
[Like PS#1 problem, annuity embedded in perpetuity using: 
\[ a + ad + ad^2 + ad^3 + \ldots + ad^{(N-1)} = a \frac{(1-d^N)}{(1-d)}. \] 
Here “g” = 0.]

1) Bldg val assuming short-term rental:

\[
V = \left[ \frac{1.08}{0.08} \left( 1 - \left( \frac{1}{1.08} \right) \right)^1 \right] \frac{100}{1.12} \left( \frac{1}{1.12} \right)^1 = \frac{100}{0.12} = $833.33
\]

2) Same bldg with 10-year leases.

\[
V = \left[ \frac{1.08}{0.08} \left( 1 - \left( \frac{1}{1.08} \right)^{10} \right) \right] \frac{100}{1.12} \left( \frac{1}{1.12} \right)^{10} = $954.30
\]

Long-term leases result in higher building value, even though expected rent is the same.
Thus, considering only inter-lease rental market risk and assuming constant projected future spot rents, landlords should be indifferent between shorter-term leases at higher rents and longer-term leases at lower rents.

In above example, rent in 10-year leases could be $833/954 = 87\%$ of short-term spot rent, and landlord would be indiff. betw 1-year lease and 10-year lease. If spot rents are $100, then the rent in a 10-year lease would be only $87.32 per year:

\[
V = \left[ \frac{1.08 \left( 1 - \left( \frac{1}{1.08} \right)^{10} \right)}{0.08} \right] \frac{87.32}{1.12} \left( \frac{1}{1.12} \right)^{10} = \$833.33
\]

**Implication for landlord lease term indifference rents:**
If future spot rents are projected to remain constant at the current level, then the indifference rent will assume a downward-sloping curve as a function of the lease term...

![Indifference Rent as a Function of Lease Term](image-url)
What about tenant’s perspective? . . .

Tenants preferences are symmetric to landlords in this issue. At same rent, tenants prefer shorter-term leases (by same dollar amount as landlords prefer longer-term leases).

PV of perpetual stream of rent payments is same to tenant as to landlord (only it’s a cost instead of a value: negative instead of positive).

So tenants have same downward-sloping lease term indifference rent curve (with constant spot rents)...

Example: Tenant produces widgets which are sold for $1 each with a variable production cost of $0.50 each. Expected production is 1000 widgets per year in perpetuity. Opportunity cost of capital for widget production investment (apart from rent) is 10% per year.

If rent is $100/yr then value of tenant firm is:

\[ V = \text{PV(widget net income)} - \text{PV(rent)} \]

\[ = \frac{500}{0.10} - \text{PV(rent)} \]

\[ = 5000 - 833 = 4,167, \text{if 1-yr leases @$100/yr} \]

\[ = 5000 - 954 = 4,046, \text{if 10-yr leases @$100/yr} \]

Tenant prefers short-term leases.

So, equilibrium rent term structure that would allow both landlords and tenants to be indifferent across leases of different term lengths is downward-sloping. Tenant firm value:

\[ V = 5000 - 833 = 4,167, \text{if 1-yr leases @$100/yr} \]

\[ = 5000 - 833 = 4,167, \text{if 10-yr leases @$87.32/yr} \]
3.2) Releasing costs:

1. Vacancy period (lost revenue)
2. Search cost (leasing commissions, own time)
3. Moving expenses (tenants inclu oper.disrupt., landlord reimburse?)

Landlord & Tenant affected in same direction by releasing costs:

*Re-leasing is cost to both sides.*

⇒ Both sides prefer longer lease terms (to minimize re-leasing cost).
3.3) Flexibility (option value) in leases

⇒ How does lease affect future decision flexibility? . . .

3.3.1) Expectations about the future rental market:

- If you expect rising rents, then landlord’s oppty cost rises with lease term, tenant’s oppty value of savings rises with lease term.
  ⇒ Rents must rise for longer-term leases (cet.par.).

  This offsets (partly or completely) risk-based declining term structure of rent.

  Opposite if rents are expected to decline.

_Suppose landlord and tenant expectations differ regarding the future direction of spot rents. . ._

“Complementary” expectations if:
- Tenant believes rents will _rise_ and
- Landlord believes rents will _fall_.
  ⇒ Then long-term lease agreement will be easier to negotiate.

“Conflicting” expectations if:
- Tenant believes rents will _fall_ and
- Landlord believes rents will _rise_.
  ⇒ Then long-term lease agreement will be more difficult to negotiate.

If space market expectations are conflicting and not reconcilable, then agreement will be facilitated by _reducing the lease term_ length, thereby reducing the impact of future changes in market rents on the opportunity cost of the lease, and _increasing option value_ for both the landlord and the tenant by providing more flexibility to take advantage of favorable developments in the rental market.
3.3.2) Tenant expectations about future space requirements:
Expectations regarding tenant future space requirements influence the ideal lease term length from the tenant’s perspective.
- If tenant knows they need space for exactly 3 years, then 3-year lease term is best.
- If the tenant expects to grow steadily in size, then shorter-term leases may be preferred in expectation of a future need to expand.
- Lease options on adjacent space or other space in the same building can sometimes also help with such expectations.
- More uncertainty about tenant’s future space needs ➔ greater value to tenant in retaining flexibility in space commitments ➔ greater option value to tenant in signing shorter-term lease.

(Note: it is not the lease itself that contains the option value, but rather the absence of a lease commitment that contains option value. The less space and time is encumbered under leases, the more option value remains.)

3.3.3) The landlord's redevelopment option:
- Lease encumbers property owner’s right to redevelop.
- Shorter term lease reduces length of time for which this right is relinquished, thereby preserving more flexibility (option value) for landlord.

(Once again, the option value lies not in the lease, but in the lack of lease, temporally speaking.)

Thus, shorter lease terms increase option value.

3.3.4) Cancellation options written into leases (on either or both sides) can preserve some or all of the flexibility option value for either (or both) the landlord and tenant.
3.4) Staggered lease expirations & releasing risk...

- Don’t just consider leases one at a time in isolation from each other.
- Do you want all the leases in a building expiring at the same time? ... Volatility in building's future cash flow can be reduced by staggering lease expiration dates more uniformly across time.
- Depending on what the future lease expiration pattern looks like in a given building, this may cause the landlord to prefer either a longer or shorter lease term length than would otherwise be the case in a given deal.

3.5 Summary: Optimal lease term length (and the term structure of rents)...

3.1) Inter-lease rental market risk ➔ Landlord’s prefer longer-term leases and tenants prefer shorter-term leases @ same rent. ➔ Equilibrium term structure of rents declining over lease term. Given that, ➔ lessors & lessees neutral with respect to lease term length.

3.2) Releasing costs ➔ longer-term leases preferred by both lessors & lessees, no implication for term structure of rents.

3.3) Flexibility ➔ shorter-term leases preferred by both lessors & lessees, no implication for term structure of rents.

3.4) Staggering expirations ➔ No general implication for term length or rent term structure.

Therefore, optimal lease term length is largely a tradeoff between considerations (3.2) and (3.3): releasing costs versus flexibility.

Result of this tradeoff:
Typical lease term length characterizes different types of space usage markets:

<table>
<thead>
<tr>
<th>Market Type</th>
<th>Lease Term Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel</td>
<td>1 day - 1 week</td>
</tr>
<tr>
<td>Apartment</td>
<td>1 year</td>
</tr>
<tr>
<td>Small retail</td>
<td>2-5 years</td>
</tr>
<tr>
<td>Office</td>
<td>3-10 years</td>
</tr>
<tr>
<td>Anchor retail</td>
<td>5-15 years</td>
</tr>
<tr>
<td>Industrial</td>
<td>5-20 years</td>
</tr>
</tbody>
</table>

General implication for rent term structure:
Market rents tend to be lower for longer-term leases (cet.par.), due to risk effect (3.1). (This general implication can be counteracted if spot rents are expected to rise in the future.)
Continuing with: BROADER LEASING STRATEGY CONSIDERATIONS (things left out of the effective rent calculation, Part 2...)

4. OTHER LEASING & RENT ISSUES (besides term structure)

4.1) Externalities, Synergies, & Tradeoffs across tenants & spaces...

- **Who is the best tenant for a given space?**

  *(Not always the one willing to pay highest effective rent.)*

- **What is relationship between space size & rent?**

  **Optimal space size:**
  - Rent/SF tends to decline with size of leased space.
  - Smaller spaces (i.e., greater numbers of tenants) ⇒ higher management costs (per SF) for the landlord.
  - Difficult to find tenants for particularly small or irregularly shaped spaces.

  **Tenant mix synergies:**
  Some tenants generate positive “externalities” by enabling other nearby tenants to earn higher profits. (The opposite can also happen.) Examples:
  - **Anchor** tenant in retail center draws customers who then shop at smaller tenants' stores.
  - Anchor (**building name**) tenant in office building adds prestige to building.

  *Therefore,*
  Landlord can capture such positive externalities in rents charged to non-anchor tenants.

The art of tenant mixing extends not only to matching the right sort of anchors together with the right sort of non-anchor tenants, but also includes optimal mixing, matching, and location of the non-anchor stores. Use of short lease terms and/or renewal and cancellation options on both sides is common in many retail centers to enable tenant mix to be constantly optimized in the dynamic retail market where flexibility is particularly important.

4.2) Why percentage rents? (Optimal rent structure?... )

(a) **Incentive compatibility:** Percentage rents give the landlord a direct incentive to help maximize store revenues. Landlord's have some influence over store revenues because landlords control the **tenant mix** in the shopping center, and some mixes provide more synergy and positive externalities than others. Without sufficient incentive, landlords might not optimize the tenant mix.

(b) **Risk reduction:** Many retail tenants are small businesses, and rent may be a larger portion of the total operating expenses of small retail businesses than in other types of firms. This makes such firms more sensitive to the leveraging up of their business operating risk caused by fixed rents. If rent is proportional to revenue, then this leveraging effect is reduced.
Note, by increasing the fixed base rent component and decreasing the variable percentage component, the resulting increased operating leverage places the retail tenant under more pressure and more incentive to maximize revenue. The landlord may want to place some tenants under such pressure and incentive, if the tenants are financially strong enough to handle the risk, and if by increasing their revenues the tenant will increase total shopper flow-through in the center, thereby bringing positive externalities to the other stores. This argument will tend to apply more to anchor tenants and tenants that are large national chains.

4.3) Why concessions?...

e.g., why does the $20/SF Lease "A" not simply charge the tenant $15.20/SF every year for 5 years starting immediately, rather than take no cash flow at all for the first year?...

1) Some up-front concessions match the timing of expenses incurred by the tenant, thereby making it easier for the tenant to move into the space (e.g., TIs, Moving allowances).

2) There may be some strategy in the timing of cash flow receipt. Higher future cash flows may make it easier to sell the building at a higher price or to refinance the loan on the building, if these events are more likely to occur in the future than in the near-term. This might make sense if the landlord is more liquid at present than he expects to be in the future. It might also make sense if the capital market is irrational, susceptible to rental "illusions" in which property buyers or lenders are ignorant of the typical use of concessions on the part of property owners and sellers. This does not sound very likely, but even if there is only a small chance of getting away with such illusion, why throw away that chance?

3) The quoted rent (i.e., the $20/SF) is what gets reported to the public and to the other tenants. The concessions are usually much more a private matter between the lessor and lessee. Thus, concessions are a way of concealing from other existing or prospective tenants (and from competing landlords, or perhaps even potential investors), exactly how low a rent the tenant is paying and how soft is the demand for the building.

4.4) Optimal asking rent & optimal vacancy. . .

Isn’t the optimal vacancy rate 0% vacant? . . .

Why not? . . .

Suppose, on average, 10% higher rents could be charged if landlord absorbed 5% average vacancy (by taking enough time to search for more eager or appropriate tenants when previous leases expire)?...

Result would be 5% higher net CF for building.

Optimal vacancy rate = Rate which results from value-maximizing management of the building.

Another way to focus on this same question:
What is optimal asking rent? . . .

Consider effect of:
"Noisy price information" . . .

Tenants & buildings are each (somewhat) unique.

This makes rental market "thin".

Thinness causes a lack of perfect information about the nature of the rental market for any given building at any given point in time.

In the absence of perfect information about the price at which a given space can rent, it makes sense to spend some time searching, probing the market.

Consider simple optimal asking rent model . . .
This appendix presents a simple numerical example of optimal landlord behavior searching for tenants, in the form of a model of optimal asking rent.

Consider the following simplified model of optimal asking rent for a landlord with an empty space...

1) Potential tenants “arrive” (or are found) randomly at an average rate of one per month. The expected wait time until the first potential tenant is found is 1 month, until the 2nd is found is 2 months, etc...

2) The ex ante probability distribution of the maximum rent each potential tenant will accept is a Normal probability distribution with mean $10/SF/yr and standard deviation ±$1/SF/yr (5-year lease terms, annual rent, payments at beginnings of years). The landlord only finds out what each tenant is willing to pay when that tenant “arrives”.

3) If the tenant refuses the landlord’s asking rent, the landlord has to wait until the next potential tenant arrives, and the space remains vacant during the wait time. When the space leases, it will always lease at the landlord’s asking rent.

4) When a lease expires, this process repeats (no renewals), in perpetuity.

5) The intra-lease discount rate is 8%; the inter-lease discount rate is 12%.

6) What asking rent will maximize the present value of the building?...

Answer...

Let:
A=asking rent.
N(A;10,1)=Cumulative normal probability less than A when mean is 10 and STD is 1.
[Note: in Excel this is found by the formula “=NORMDIST(A,10,1,1)”.]
p= Probability tenant refuses landlord’s offer. = N(A;10,1).
w= Expected wait time (in years) until space is leased (average length of vacancy period between leases).
L= PV of each lease at time of signing (intra-lease discounting).
V=PV of building (perpetuity).
vac=Expected vacancy rate for building.

Then:
$$w = \frac{1}{(1-p)^{12}} + \frac{2}{12}p(1-p) + \frac{3}{12}p^2(1-p) + \frac{4}{12}p^3(1-p) + \ldots$$

This is an infinite series but it has a simple finite value, namely:
$$w = \frac{1}{((1-p)12)}.$$

$$L = A(1.08)[1-(1/1.08)^{5}]/(0.08) = PV(.08,5,A,0,1)$$ in Excel.
$$V=[L/(1.12)^w] / [1 - (1/1.12)^{(w+5)}]$$
$$vac = w/(w+5)$$

This model can be easily solved quantitatively in a computer spreadsheet.

Try some values of A until you find the one that maximizes V...
Thus, the optimal asking rent in this case is $10.60/SF (to the nearest dime), which gives a building value of $97.75/SF. At this rent the expected waiting time until you find a tenant that takes the rent (expected vacant period between leases) is: \( w=0.304 \) years, between 3 and 4 months. This implies an optimal (long-term average) vacancy rate of: \( \text{vac}=0.304/5.304 = 5.7\% \).

Now repeat this example only suppose the landlord’s ex ante uncertainty surrounding the rent the potential tenants will take is doubled. That is, assume everything is the same except the standard deviation of the normal probability distribution is $2/SF instead of $1/SF. Thus: \( p=N(A;10,2) \). Now we find that the optimal rent is $11.80/SF, giving a building value of $104.87/SF with an average vacant period of 0.453 years (about 5 months) and average vacancy of 8.3%.

Note that the optimal asking rent, the optimal vacancy rate, and the building value, all increase with the uncertainty or range in the maximum rent the potential tenants are willing to accept. This is a general result. The two cases examined here are shown in the graph below. (The numbers on the left-hand vertical scale refer to $/SF for the top (solid) lines indicating property value, and this same scale refers to average percent vacancy for the bottom (dashed) lines. The triangle markers indicate the case with the lower rent uncertainty.) The general shapes of the curves in this graph are also a general result for typical realistic numbers.

<table>
<thead>
<tr>
<th>A</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10.00</td>
<td>$95.48</td>
</tr>
<tr>
<td>$11.00</td>
<td>$96.04</td>
</tr>
<tr>
<td>$12.00</td>
<td>$54.64</td>
</tr>
<tr>
<td>$10.90</td>
<td>$96.87</td>
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<tr>
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<td>$97.40</td>
</tr>
<tr>
<td>$10.70</td>
<td>$97.68</td>
</tr>
<tr>
<td>$10.60</td>
<td>$97.75</td>
</tr>
<tr>
<td>$10.50</td>
<td>$97.65</td>
</tr>
</tbody>
</table>
From the above analysis we can derive several results about the optimal asking rent for the landlord in this simple model:

i) Other things equal, the optimal asking rent is higher the more uncertainty there is about the rental market;

ii) The greater is the rental market uncertainty, the more "forgiving" is the negative impact on property value due to an equal dollar magnitude error on the landlord's part in not selecting the optimal asking rent (i.e., the curve is "flatter" for higher variance in the rent distribution).

iii) The effect on property value is relatively forgiving for erring on the side of asking too low a rent, while the negative value impact of asking too high a rent can be much more severe, especially when there is little uncertainty about the rental market;

iv) Other things equal (such as the mean expected rent), and assuming optimal landlord behavior, the property is more valuable the greater is the uncertainty in the rental market, but this value effect is small even though our model ignores the effect of rent uncertainty on the inter-lease discount rate (which might dampen or reverse this result).

Although the model on which these conclusions are based is a simplification of reality, the first three conclusions above are fairly robust if one interprets them broadly or "figuratively". For example, they can be paraphrased in the following two more general principles of optimal tenant search and leasing strategy for a landlord:

i) "Be a bit daring and aggressive in pursuit of good leasing deals if you have a lot of uncertainty about the rental market." [This is a generalization of both (i) and (ii) above.]

ii) "Be conservative and play it safe if the landlord is very risk averse or if the rental market is very obvious, with little uncertainty about market rents." [This is a generalization of (iii).] inter-lease discount rate).
Study Questions

1. Terms and definitions to know and understand:
   - Percentage lease
   - Effective Rent
   - Gross Lease
   - Expense Stops
   - Renewal Option
   - Intra-lease discount rate
   - Tenant mix
   - Indifference rent
   - Thin markets
   - Tenant search (optimal vacancy, optimal asking rent)
   - Complementary expectations
   - Concessions
   - Releasing costs
   - Net Lease
   - Tenant Improvement Allowance
   - Right of First Refusal
   - Inter-lease discount rate
   - Term structure of rents
   - Noisy price information
   - Anchor tenant
   - Conflicting expectations

2. Under what conditions are rent concessions typically offered?

3. Why do landlords usually offer rent concessions, such as free rent up front, when supply exceed demand, rather than just reducing the rent?

4. Why might a landlord prefer a lease with a lower effective rent?

5. Calculate the effective rent of the following leases from the landlord's perspective assuming the tenant faces a 10% borrowing rate:

   (a) 5-year net lease, $15/SF, 1 year free rent up front.

   (b) 5-year net lease, starting at $10/SF, with step-ups of $1 each year.

   (c) 5-year net lease, starting at $10/SF, CPI-adjustments every year equal to 50% of the change in the CPI. CPI change (inflation) is expected to be 5% per year.

   (d) 5-year gross lease, $20/SF, expenses expected to be $8/SF initially, growing at 3% per year.

   (e) 5-year gross lease, $20/SF, expense stop at $8/SF, expenses expected to grow at 3% per year.

   (f) 6-year net lease, $15/SF, Tenant improvements paid by landlord $20/SF at beginning.

*6. Use the methodology described in Appendix A to quantify the impact on the effective rent of the lease in question 5(a) above, if the lease also includes a renewal option for the tenant, giving the tenant the right (but not obligation) to renew the lease after 5 years at $16.00/SF. Assume that the present subjective probability regarding the market effective rents for new 5-year leases, 5 years from now, is that there is a 50 percent chance that the market rent will be $18/SF, and a 50 percent chance that it will be $14/SF. Discount existing lease cash flows at 10% for purposes of determining effective rent or existing lease present value, and future option values at 20% per year for purposes of determining risk-
adjusted present value.

*7. You are representing a landlord in a lease negotiation with a prospective new tenant who would occupy a vacant space in a newly completed building. You have proposed a 10-year lease at an effective rent of $18.00/SF. The tenant is interested, but has indicated they might prefer a shorter-term lease. You believe the rental market is currently "in balance" and will remain so over the foreseeable future (i.e., future spot rents will remain about the same as they are today). Assuming a tenant borrowing rate of 8% and an inter-lease discount rate of 12%, what effective rent on a 5-year lease would be equally desirable for your client as the $18/SF rent you proposed on the 10-year lease? [Hint: Use the procedure described in Appendix B.]

*8. You are a leasing agent working for a landlord who has some vacant space to fill. You believe you can find potential tenants at an average rate of two per month. Typical leases in this market are for 5 years, with net effective rent around $15/SF per year (annual payments in advance, with 8% tenant borrowing rate and 12% landlord required return between leases). Based on your knowledge of the rental market you feel that the typical potential tenant you would find for this space would have a normal probability distribution of acceptable rent ranging around the $15/SF figure with a standard deviation of ±$3/SF. What is the optimal asking rent so as to maximize the landlord's present value of his building, and what can you tell him about how long to expect until you get a tenant? [Hint: Use the model described in Appendix C.]

9. Discuss why there is often a common prevailing lease term in a given rental market?

10. Explain how rental market risk would typically cause the landlord to prefer longer-term leases and the tenant to prefer shorter-term leases holding effective rent constant. [Hint: consider inter-lease or rental market risk and how this affects building value from the landlord's perspective and how it affects the value of the tenant's firm assuming value-additivity as described in Brealey-Myers.]

11. What factors would tend to make both landlords and tenants prefer shorter-term leases, ceteris paribus?

12. What factors would tend to make both landlords and tenants prefer longer-term leases, ceteris paribus?

13. Discuss the pros and cons of a simple definition of "effective rent", such as the undiscounted sum of all the rental payments divided by the lease term, versus a DCF defined effective rent based on the tenant's borrowing rate as the intra-lease discount rate.
Selected Answers

5a) \[ \frac{15}{1.10} + \frac{15}{1.10^2} + \frac{15}{1.10^3} + \frac{15}{1.10^4} = \$47.54 \]

\[ (0.10)\frac{47.54}{1.10[1-1/(1.10)^5]} = \$11.40 = \text{Effective Rent} \]

5b) \[ \frac{11}{1.10} + \frac{12}{1.10^2} + \frac{13}{1.10^3} + \frac{14}{1.10^4} = \$49.25 \]

\[ (0.10)\frac{49.25}{1.10[1-1/(1.10)^5]} = \$11.81 = \text{Effective Rent} \]

5c) \[ \frac{10.25}{1.10} + \frac{10.51}{1.10^2} + \frac{10.77}{1.10^3} + \frac{11.04}{1.10^4} = \$43.63 \]

\[ (0.10)\frac{43.63}{1.10[1-1/(1.10)^5]} = \$10.46 = \text{Effective Rent} \]

5d) \[ \frac{11.76}{1.10} + \frac{11.51}{1.10^2} + \frac{11.26}{1.10^3} + \frac{11.00}{1.10^4} = \$48.18 \]

\[ (0.10)\frac{48.18}{1.10[1-1/(1.10)^5]} = \$11.55 = \text{Effective Rent} \]

5e) \[ \frac{12}{1.10} + \frac{12}{1.10^2} + \frac{12}{1.10^3} + \frac{12}{1.10^4} = \$50.04 \]

\[ (0.10)\frac{50.04}{1.10[1-1/(1.10)^5]} = \$12.00 = \text{Effective Rent} \]

5f) \[ \frac{-5}{1.10} + \frac{15}{1.10^2} + \frac{15}{1.10^3} + \frac{15}{1.10^4} + \frac{15}{1.10^5} = \$51.86 \]

\[ (0.10)\frac{51.86}{1.10[1-1/(1.10)^6]} = \$10.83 = \text{Effective Rent} \]
5(f). Calculator steps below for three calculators.

<table>
<thead>
<tr>
<th>HP-10B</th>
<th>HP-12C</th>
<th>TI-BAlI PLUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEAR ALL</td>
<td>f CLX to clear</td>
<td>Reset ENTER</td>
</tr>
<tr>
<td>1 = P/YR</td>
<td>5 then CHS g CFo</td>
<td>P/Y = 1 ENTER</td>
</tr>
<tr>
<td>5 +/- CFj</td>
<td>15 g CFj</td>
<td>QUIT</td>
</tr>
<tr>
<td>15 = CFj</td>
<td>5 g Nj</td>
<td>CF 5 +/- ENTER</td>
</tr>
<tr>
<td>5 = Nj</td>
<td>10 i</td>
<td>C01 = 15 ENTER</td>
</tr>
<tr>
<td>10 = I/YR</td>
<td>f NPV result is 51.86</td>
<td>F01 = 5 ENTER</td>
</tr>
<tr>
<td>NPV = 51.86</td>
<td>6 N</td>
<td>NPV</td>
</tr>
<tr>
<td>= PV</td>
<td>PMT result is -11.91</td>
<td>I = 10 ENTER</td>
</tr>
<tr>
<td>6 = N (not Nj)</td>
<td>1.1 ÷ result is -10.83</td>
<td>CPT (NPV=51.86)</td>
</tr>
<tr>
<td>PMT = -11.90</td>
<td>CE/C</td>
<td>CPT (PMT=-11.91)</td>
</tr>
<tr>
<td>÷ 1.1 = -10.83</td>
<td>PV (PV=51.86)</td>
<td>÷ 1.1 = -10.83</td>
</tr>
<tr>
<td>Alt.: set BEG/END to &quot;BEGIN&quot;, then:</td>
<td></td>
<td>Alt.: BGN SET (set to &quot;BGN&quot;) QUIT, then:</td>
</tr>
<tr>
<td>6 = N</td>
<td>10 = I/YR</td>
<td>CPT PMT (PMT=-10.83)</td>
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<tr>
<td>PMT = -10.83</td>
<td>CPT PMT (PMT=-11.91)</td>
<td>÷ 1.1 = -10.83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alt.: BGN SET (set to &quot;BGN&quot;) QUIT, then:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPT PMT (PMT=-10.83)</td>
</tr>
</tbody>
</table>