A Mathematical Model To Compare Corporate Leasing Proposals From Lessor Perspective

Abstract

The purpose of this paper is to examine the perspective of the lessor in a corporate leasing deal and accordingly devise a formula that can equip the lessor to compare different proposals and make the most economically favorable decision. This study carefully identifies various factors associated with a corporate leasing scenario. Hereby, each identified factor is precisely defined and assigned a variable which relates to the corresponding factor. Natures of these variables are carefully studied and basis its type is then listed as either time value of money or money value of time. Subsequently, factors associated with both the types are then converted to a common unit and a linear equation is formed that can help lessor evaluate different proposals.

1. Introduction

A lease is a business relationship or an agreement between a tenant and a landlord. The lessee (user) gets to use the asset in return for periodic payment of lease rentals as per the contract. The lessee pays the lease rent to the lessor as regular fixed payments over a period of time. At the expiry of the lease the assets revert back to the lessor who is the legal owner of the asset.

Leasing is essential due its use as the method of financing by corporate real estate managers when acquiring additional real estate for use in the business operations in the firm. Leasing allows companies to finance their growth opportunities, have a lower level of debt when leasing is reported as off-balance sheet financing, obtain lower rental costs when they pass on capital allowances to the lessor, and increase their efficiency by treating property as a cost asset. However leasing can even be costly as by leasing rather than owning property, companies lose their ability to reduce their cost of debt through collateral and increase the risk of bankruptcy and associated costs because leasing has the highest priority structure [1].
2. Literature Review

- Leasing of the property is more beneficial for the company than owning the freehold property, Lasfer (2005) in his study highlighted few benefits of corporate leasing. These include greater capability of the company to use cash that would have been tied up in freehold property and thus to finance good investment projects, to reduce their leverage when leasing is reported as off-balance sheet financing, to save in taxes and increase their efficiency by treating property as a cost asset. He further stated that companies that report 100% leased property are found to generate higher total returns to their shareholders than companies that report only freehold property but even these 100% leased property companies do not generate the highest returns. Thus the relationship between firm value and leasing propensity is curve linear optimized at about 65%, after accounting for firm size, leverage, industry and other relevant factors. [1]

- Allen et al. in his findings suggested that the average impact on shareholder’s wealth on real estate lease announcement is positive. The observed positive effects on lease announcement is the increase in net operating cash either as a reduction of cost or due to increase in earnings further even market perceives it as a sound corporate decision. It indicates that the firm is pursuing a new and profitable stream of investment or reducing its future tax liabilities. [2]

- Lindholm et al. modelled the relationship between core and non core business in the context of real estate management and facilities management. In this model both the traditional tangible, short term effects and intangible long term effects of real estate decisions are included and the direct and indirect paths to influencing corporate wealth were mapped and these decisions must be taken considering overall long range strategic and financial plans. Increasing flexibility is one of the value adding attribute to the wealth maximization of the firm which suggests that the property should be leased instead of purchased when it is not essential to the core business. [3]

- The determinants of leasing are not homogeneous and it strictly depends upon the size of the firm. Similar study was made by Lasfer and Levis in which they described the leasing determinants of small and large companies. In small companies leasing contributes to the survival and to the financing of growth opportunities of the firm while taxation does not have a significant impact on the probability of leasing whereas taxation is the main determinant of large companies leasing decision. Further for small and medium-sized companies, leasing is a substitute for debt financing while for large firms, leasing is a complement to debt financing. [4]

- Linneman (1998) in his study mentioned several strategies of real estate leasing. Corporations should not commit to long term leases due to the changes occurring in the firm’s geographic focus, market share, requirements, capital needs, products being launched. Thus 3-7 year leases offer the best match to the firms changing needs. Further the cost of leasing short leases is relatively more calculable and manageable. The cost of leasing of long leases is not only the cost of unnecessary space acquired but also the foregone return from deploying the same capital in a more attractive business opportunity along with this there is loss in operating flexibility due to illiquid and immobile assets. [5]
• Ghyoot (2003) is his study mentioned several disadvantages of leasing. These include, the tenant has no stake in the capital value of the asset at the end of the lease, unless an option to buy was negotiated; in lease rent is a variable cost if the agreement allows for periodic rent increases; clauses in leases limits the flexibility; inability to expand space at will or to make improvements to the property; less control over adjacent occupants; if leased property is no longer required and sub-leasing is not possible, lease payments still must be maintained. [6]

3. Mathematical Model
This research was conducted taking into consideration the interest and perspective of the investor who seeks to generate higher returns via rental income through investment in corporate office space. There exist different opinions of different investors for the same market situation in the real estate industry due to complexity in the factors associated with it. Many a times, reason for incorrect decision has been intuition and emotion which results in ignorance of some major factors. Evaluating an interpretation about a market situation and considering it wrong is also subjective to a variety of factors and perspectives. Thus, giving weightage to each factor on the basis of its financial consequence also plays a major role in making correct interpretation about market situation of corporate leasing industry and evaluating an interpretation of the same. Next challenge we face is that how should we assign weightage to each of these factors. This calls for need to identify a suitable method to assign weightage to the associated factors without ignoring its financial repercussions. Identifying a relevant method might also invite some associated assumptions which might negate its financial repercussions. Thus, the best solution to this problem is to simultaneously consider both money value of time and time value of money. This solution will not only ignore the effect of such assumptions but will also give direct correlation to financial impact of respective factor. Various factors associated with a corporate leasing market situation is given in Table 1

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Rent</td>
<td>Monthly revenue paid by the lessee to the lessor</td>
</tr>
<tr>
<td>2.</td>
<td>Brokerage</td>
<td>Amount paid by the lessor to the broker</td>
</tr>
<tr>
<td>3.</td>
<td>Security Deposit</td>
<td>Amount paid by the lessee as the security to the lessor</td>
</tr>
<tr>
<td>4.</td>
<td>Premise Condition Cost</td>
<td>Furnishing cost of the office place paid by the lessee or lessor</td>
</tr>
<tr>
<td>5.</td>
<td>Rent Free Period Cost</td>
<td>Cost associated with the time taken to furnish the office space</td>
</tr>
<tr>
<td>6.</td>
<td>Lock in Period</td>
<td>Time Period before which lessee and lessor both can not terminate the lease</td>
</tr>
<tr>
<td>7.</td>
<td>Escalation</td>
<td>Percentage increase in the rent</td>
</tr>
<tr>
<td>8.</td>
<td>Notice period</td>
<td>Time period given to the lessee to leave the office space after lock in period</td>
</tr>
<tr>
<td>9.</td>
<td>Stamp Duty</td>
<td>Official cost involved in the lease paid equally by lessee and lessor</td>
</tr>
<tr>
<td>10.</td>
<td>Power Back Up</td>
<td>Amount paid by the lessee</td>
</tr>
<tr>
<td>11.</td>
<td>Air Conditioning Maintenance</td>
<td>Amount paid by the lessee</td>
</tr>
<tr>
<td>12.</td>
<td>Car Parking Cost</td>
<td>Amount paid by the lessee</td>
</tr>
</tbody>
</table>

As our research has been conducted considering the interest of the lessee so from the above mentioned factors we are considering the ones which are of financial significance for the investor. Using the factors a function Z has been formed which shows the three yearly revenue generated by
the considered corporate deal. The function Z not only helps us to interpret the current market situation but also evaluate the existing interpretation. The various variables used in the function Z are described in the Table 2

### Table 3.2: Description of the variables used in the function Z

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Factor</th>
<th>Variable</th>
<th>Variable definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Rent</td>
<td>F1</td>
<td>n yearly revenue generated by the corporate deal at the considered rent rate. (n= lock in period)</td>
</tr>
<tr>
<td>2.</td>
<td>Brokerage</td>
<td>F2</td>
<td>Brokerage amount involved in the deal</td>
</tr>
<tr>
<td>3.</td>
<td>Security Deposit</td>
<td>F3</td>
<td>Interest on security amount for n years.</td>
</tr>
<tr>
<td>4.</td>
<td>Premise Condition Cost</td>
<td>F4</td>
<td>Cost associated with the furnishing of the office space</td>
</tr>
<tr>
<td>5.</td>
<td>Rent Free Period Cost</td>
<td>F5</td>
<td>Cost associated with the time taken to furnish the office space</td>
</tr>
<tr>
<td>6.</td>
<td>Escalation</td>
<td>F6</td>
<td>Increase in revenue due to escalation</td>
</tr>
<tr>
<td>7.</td>
<td>Miscellaneous Costs (other costs)</td>
<td>F7</td>
<td>Miscellaneous Costs</td>
</tr>
</tbody>
</table>

Other variables:
y = 1 if the premise condition cost amount is paid by the lessor

y = 0 if the premise condition cost amount is paid by the lessee

\[ Z = F1 - F2 + F3 - (F4)\cdot y - F5 + F6 \pm F7 \]  

#### 4. Case Study

This case study inculcates data pertaining to a corporate suite at Copia Towers, Jasola Vihar, New Delhi-110025 (India). Data pertaining to the above mentioned particulars are collected in order to simultaneously analyze three proposals which the lessor has received from three prospective lessees, evaluate the same and come with the most economically fruitful proposal and sign the deal. The given three proposals are the final three offerings which the lessor has received and has to compare the same in order to conclude any one of the three. The major challenge which almost every lessor faces is to comparatively analyze different offerings wherein factors associated with both money value of time and time value of money simultaneously have to be taken into consideration and the most economically favorable deal is to be signed. Thus, this is where the above mentioned formula comes into picture and strengthens the accuracy of lessor's decision making analysis.

### A. Rent

Rent is the amount paid by the lessee to the lessor for the temporary use of his property and thus it is the form of income derived from the ownership of the land for the lessor. Table 3 shows revenues generated by renting the property by the lessor. Different rents per sq. ft. (for office area 3350 sq. ft.) are considered corresponding to which monthly, yearly and three yearly revenues are being calculated.

### Table 4.1: Revenues as per the different rents per sq.ft.

<table>
<thead>
<tr>
<th>Rent per sqft.</th>
<th>Rs 110</th>
<th>Rs 115</th>
<th>Rs 120</th>
<th>Rs 125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Revenue</td>
<td>368500</td>
<td>385250</td>
<td>402000</td>
<td>418750</td>
</tr>
<tr>
<td>Yearly Revenue</td>
<td>4422000</td>
<td>4623000</td>
<td>4824000</td>
<td>5025000</td>
</tr>
<tr>
<td>3 Year Revenue</td>
<td>13266000</td>
<td>13869000</td>
<td>14472000</td>
<td>15075000</td>
</tr>
</tbody>
</table>
B. Brokerage

Brokerage is the amount paid to the broker for facilitating the leasing of the property between a lessor and a lessee. Table 4 shows brokerage amount paid by the lessor to the broker corresponding to different rent per sq. ft. area.

<table>
<thead>
<tr>
<th>Rent per sqft.</th>
<th>Rs 110</th>
<th>Rs 115</th>
<th>Rs 120</th>
<th>Rs 125</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Days Rent (Brokerage)</td>
<td>184250</td>
<td>192625</td>
<td>201000</td>
<td>209375</td>
</tr>
<tr>
<td>30 Days Rent (Brokerage)</td>
<td>368500</td>
<td>385250</td>
<td>402000</td>
<td>418750</td>
</tr>
</tbody>
</table>

C. Security Deposit

Security deposit is the amount paid by the lessee to the lessor as proof of intent. It is refunded back to the lessee after the end of lease or may even be used to repair the damage caused. Table 5 shows the security deposit collected by the lessor corresponding to the different rent per sq. ft. area.

<table>
<thead>
<tr>
<th>Rent per sqft.</th>
<th>Rs 110</th>
<th>Rs 115</th>
<th>Rs 120</th>
<th>Rs 125</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Months Rent</td>
<td>1105500</td>
<td>1155750</td>
<td>1206000</td>
<td>1256250</td>
</tr>
<tr>
<td>6 Months Rent</td>
<td>2211000</td>
<td>2311500</td>
<td>2412000</td>
<td>2512500</td>
</tr>
</tbody>
</table>

The security deposit has to be refunded to the lessee after the leasing period ends which is three years in this case. Thus security deposit can be of financial significance for the lessor if he deposits the amount in a bank and earns interest on it for three years. Table 5 shows interest for three years on security deposit corresponding to different rents per sq. ft. area. The interest rate considered is 9% per annum compounded annually.

<table>
<thead>
<tr>
<th>Rent per sqft.</th>
<th>Rs 110</th>
<th>Rs 115</th>
<th>Rs 120</th>
<th>Rs 125</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Months Rent</td>
<td>326154.6</td>
<td>340979.8</td>
<td>355805</td>
<td>370630.2</td>
</tr>
<tr>
<td>6 Months Rent</td>
<td>652309.1</td>
<td>681959.5</td>
<td>711609.9</td>
<td>741260.4</td>
</tr>
</tbody>
</table>

D. Premise Condition Cost

When the property is put on lease it may or may not require furnishing cost which is paid by either lessee or lessor depending upon the leasing agreement. Three conditions has been considered as mentioned below along with the cost associated with each.

i. **Fully Furnished:** Furnishing cost in case fully furnished office is nil.

ii. **Semi Furnished:** Furnishing cost in case of semi furnished office space is Rs 335000.

iii. **Bare Shell:** Furnishing cost in case of bare shell office space is Rs 3350000.

E. Rent Free Period

During furnishing of the offices space, monthly rent is not paid by the lessee. This rent free period depends upon the furnishing time of the office space. Three situations has been considered depending upon the office space furnishing condition as mentioned below:

i. **Fully Furnished:** In fully furnished office space the rent free period is of 0 days

ii. **Semi Furnished:** In fully furnished office space the rent free period is of 45 days

iii. **Bare Shell:** In fully furnished office space the rent free period is of 90 days
F. Escalation

Monthly rent is usually increased in the leasing period according to the lease agreement. The two escalation cases has been considered here which are 5% increase in monthly rent each year and 10% increase in monthly rent after two years. Table 6 shows increase in three yearly revenue due to escalation corresponding to different rents per sq. ft. area.

<table>
<thead>
<tr>
<th>Rent per Sq.ft.</th>
<th>Rs 110</th>
<th>Rs 115</th>
<th>Rs 120</th>
<th>Rs 125</th>
</tr>
</thead>
<tbody>
<tr>
<td>5% each year</td>
<td>674355</td>
<td>70507.5</td>
<td>735660</td>
<td>766312.5</td>
</tr>
<tr>
<td>10% after two years</td>
<td>442200</td>
<td>462300</td>
<td>482400</td>
<td>502500</td>
</tr>
</tbody>
</table>

Case 1:
- In the first case rent is taken as Rs 115 per sq. ft area and the different variables used in the formula has been calculated.
  F1= Rs 13869000
- Brokerage considered is 30 days rent.
  F2= Rs 385250
- Security Deposit collected is 3 months rent.
  F3= Rs 340979.8
- Office space is semi furnished and cost associated with it is paid by the lessee
  F4= Rs335000
  Y=0
- The time required to furnish the office space is 45 days.
  F5= 1.5*115*3350= Rs 577875
- Escalation considered is 10% after two years.
  F6= Rs 462300
- No miscellaneous has been considered.
  F7= Rs 0
- Putting the value in equation number 1 we get,
  Z= Rs 44,63,454.8

Case 2:
- In the second case rent is taken as Rs 120 per sq. ft area and the different variables used in the formula has been calculated.
  F1= Rs 14472000
- Brokerage considered is 15 days rent.
  F2= Rs 201000
- Security Deposit collected is 6 months rent.
  F3= Rs 711609.9
- Office space is semi furnished and cost associated with it is paid by the lessee
  F4= Rs335000
  Y=0
- The time required to furnish the office space is 45 days.
  F5= 1.5*120*3350= Rs 603000
- Escalation considered is 5% each year.
  F6= Rs 735660
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- No miscellaneous has been considered.
  \[ F_7 = \text{Rs } 0 \]
  Putting the value in equation number 1 we get,
  \[ Z = \text{Rs } 54,67,269.9 \]

**Case 3:**
- In the third case rent is taken as Rs 125 per sq. ft area and the different variables used in the formula has been calculated.
  \[ F_1 = \text{Rs } 1507500 \]
- Brokerage considered is 30 days rent.
  \[ F_2 = \text{Rs } 418750 \]
- Security Deposit collected is 3 months rent.
  \[ F_3 = \text{Rs } 370630.2 \]
- Office space is semi furnished and cost associated with it is paid by the lessee
  \[ F_4 = \text{Rs } 335000 \]
- \( Y = 0 \)
- The time required to furnish the office space is 45 days.
  \[ F_5 = 1.5 \times 125 \times 3350 = \text{Rs } 1256250 \]
- Escalation considered is 10% after two years year.
  \[ F_6 = \text{Rs } 502500 \]
- No miscellaneous has been considered.
  \[ F_7 = \text{Rs } 0 \]
  Putting the value in equation number 1 we get,
  \[ Z = \text{Rs } 4223130.2 \]

**G. Comparison between deal 1 and 2**

Three yearly revenue of deal 1 (Z1) = Rs 4463454.8
Monthly Revenue of deal 1 = \( Z_1/12 = \text{Rs } 371954.5 \)

Three yearly revenue of deal 2 (Z2) = Rs 5467269.9
Monthly Revenue= \( Z_2/12 = \text{Rs } 455605.8 \)

Time value of money for Z1, Z2 = \( Z_1 - Z_2/(\text{Monthly revenue of deal 2} ) \)
\[ = 2.203 \text{ months} \]

2.203 months is the breakeven time period which means that deal 2 is only lucrative for the lessor if the lease commences before 2.203 months after the lease commencement of deal 1. If lease of deal 2 commences any time later than 2.203 months after lease commencement of deal 1 then deal 2 becomes unfavorable and it is advisable to go for deal 1.

**H. Comparison between deal 1 and 3**

Three yearly revenue of deal 1 (Z1) = Rs 4463454.8
Monthly Revenue of deal 1 = \( Z_1/12 = \text{Rs } 371954.5 \)

Three yearly revenue of deal 3 (Z3) = Rs 4223130.2
Monthly Revenue of deal 3= \( Z_3/12 = \text{Rs } 351927.5 \)

Time value of money for Z1, Z3 = \( Z_1 - Z_3/(\text{Monthly revenue of deal 1} ) \)
Similar to the first comparison, Break even time period is 0.646 months and deal 1 is a relatively better proposal.

I. Comparison between deal 2 and 3

Three yearly revenue of deal 2 (Z2) = Rs 5467269.9
Monthly Revenue= Z2/12= Rs 455605.8

Three yearly revenue of deal 3 (Z3) = Rs 4223130.2
Monthly Revenue of deal 3= Z3/12 = Rs 351927.5

Time value of money for Z2, Z3 = Z2 - Z3/(Monthly revenue of deal 2 )
= 2.730 months

Similar to the above two comparisons, Break even time period is 2.730 months and deal 2 is a relatively better proposal.

5. Conclusion

This case study is performed to identify and analyze various factors associated with a corporate leasing scenario and accordingly evaluate different proposals in order to stick to the most favorable one. The three corporate proposals are considered in the case study and then comparisons are made among the proposals. In each comparison a better deal is stated with break-even time period. Although this is one of the first attempts to focus on investors perspective in a corporate leasing deal, academicians and practitioners could use this study for future study in other types of leasing in not only real estate industry but also in other industries.

Future research can be conducted by using developing methodologies in order to devise a mathematical model that not only generates more accurate results but also takes into consideration various qualitative aspects of the deal like goodwill of the perspective lessees.

References