Problem Set 5: Intermediary Corporate Real Estate

Self-Correcting, Hyperlinked File

Overview

The purpose of this problem set is to extend basic Time Value of Money (TVM) concepts to a range of corporate real estate decisions. At this stage, it is assumed that students have mastered the basic "Six Functions of a $1" and can visualize how various problems are set up. As such, the interactive solutions will provide "Calculator Summary" tables that indicate the basic inputs.

Use of File

To use this file and its hyperlinks, read each question and try to work the answer. When you finish, or to sneak a look, click on the link to the answer. Read the steps and the solutions. To return to question, click the Return to Problem links.

Hyperlinked Table of Contents: Problem Statements

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Problem 1. Lease Renegotiation and New Facility

Assume you have been asked to develop a 10 year strategy for leasing your corporate headquarters. Your current space is adequate, but showing some signs of "age" due to a combination of older materials and a relatively inflexible configuration. On the other hand, changing traffic patterns in the community have increased the attractiveness of the location, especially relative to the limited alternatives you have found. You current landlord is very anxious to have you renew your lease, especially in light of weakening market conditions. He is worried about losing you as an anchor tenant and has approached you with "such a deal" that he thinks is a win/win for both parties. He has been a good owner and has always delivered on his promises and you want to see if his deal makes sense. Your current lease runs for another 3 years at $30 per square foot. You have 200 employees at an average of 260 SF/employee.

Problem 1 (a). Current Rental Pattern

Assume you renew your current lease at the same fixed rate for another 7 years on top of your remaining 3 years. What would the combined leases cost you in PV over the 10 years if your cost of capital is 8% annual, compounded monthly?

Click here for Answer 1 (a)

Problem 1 (b). Overall Rental Pattern

As an alternative to merely renewing the current lease, the landlord has put together a package to make sure you remain his tenant. First, he will lower your rent to $18/SF for the remaining 3 years. Second, he will build a new building in the same office park as your current location, adding amenities and more flexible design to meet your needs. This new, more flexible space will accommodate your 200 workers in 220 SF/employee due to greater efficiency. Third, he will charge you the same rent as you are currently paying ($30) plus a premium equal to the PV of the savings you will realize on the 3 year renegotiated lease. What would the rental pattern be for the full 10 year agreement? The tenant moves from the old building to the new building at the end of the 3rd year.

Click here for Answer 1 (b)

Problem 1 (c). Cost of Modified Lease

What would the total PV cost of the 10 year agreement be to you if your cost of capital is 8% annual, compounded monthly?

Click here for Answer 1 (c)

Problem 1 (d): Tenant Improvement Allowance

What would your PV cost be if your landlord agreed to provide you with a tenant improvement (TI) allowance of $50/SF to cover improvements to the new space and moving expenses?

Click here for Answer 1 (d)

Problem 1 (e). TI's Plus Free Rent

What would it cost you in PV if your landlord agreed to give you 6 months of free rent when you move into the new building on top of the TI allowance?

Click here for Answer 1 (e)

Problem 1 (f). Rental Extension

Assuming you were able to negotiate a 5 year extension after the 10 year term of the combined leases. This new lease will be set at an annual CPI adjustment based off of the beginning lease rate for the 7 year term and CPI is expected to average 4% annually (annual compounding for inflation). What would the new lease rate be?

Click here for Answer to 1 (f)

Problem 2. Green Building and Life Cycle Costing

Problem 2 (a). HVAC Expense Reduction

Assume that your total HVAC costs for your headquarters building run $25,000 per month. You have been asked to consider the total life cycle cost of various energy-saving HVAC alternatives. One of the proposals you have received promises to reduce costs by 20% with no degradation in service. If your cost of capital is 10% annual, compounded monthly, how much would be justified in paying for the new system if you want to recover the expense over a 10 year holding period?

Click here for Answer 2 (a)

Problem 2 (b). HVAC Financing

In conducting your research, you have discovered a low-cost energy program that will finance 80% of the total cost at 4% annually, compounded monthly for a 10 year term. Assuming you take the financing, what PV savings would you realize on your investment and energy savings at your 10% annual, compounded monthly rate?

Click here for Answer 2 (b)

Problem 2 (c). Appreciation Benefits

Assume that you anticipate selling the building at the end of the 10th year. Your broker has talked to a number of experts who argue that your building would sell at a premium equal to the value of the lower utility costs spread over a 7 year holding period. If the most probable buyer for your space has a relatively low cost of capital of 6%, what premium would the property sell for at the end of the 10th year and what would be the PV of that at your 10% annual, compounded monthly rate?

Click here for Answer 2 (c)

Problem 2 (d). Total Cost Life Cycle Cost

Given the assumptions in 2a-c, what would the HVAC upgrade cost you? Note: the $5,000 savings per month justified the cost of the HVAC upgrade. Thus, the "cost" would be the PV of any savings and/or other benefits you would reap from the deal from the favorable financing and the premium sales price at the end of the 10 year lease at your 10% annual, compounded monthly rate.

Click here for Answer 2 (d)

Problem 3. Leasehold Interest

One of your divisions is located in a very strong market, with rental rates having been pushed up over the term of your original 10 year lease. You have 6 years remaining on your 100,000sf lease, which you were able to negotiate at a fixed rate of $25 per year, payable monthly for the full term of the lease. Since you entered the agreement, rents in the market have increased at a compound rate of 10% per year. Assuming your cost of capital is 7%, what is the leasehold interest worth to your company if you sublet at the end of the 4th year?

Click here for Answer 3

Problem 4. Workplace Flexibility

Your company is in a relatively dynamic industry which has dictated major changes in workplace configuration every 3 years. This situation has been expensive in your current space, since the building configuration makes changes very expensive. Your lease will be up shortly and you have been asked to recommend how the company should handle its real estate needs over its 10 year planning horizon.

Problem 4 (a). Workplace Reconfiguration for Inflexible Space

At the current time, your company employees 300 workers, with an average of 240 SF per employee. On average, you anticipate spending $10,000 for each workplace reconfiguration in present value, and that costs will rise 4% per year. Given the strategic plan of you company and industry dynamics, you estimate reconfigurations would occur at the end of the 3rd and 6th years and affect 2/3 of your employees. If your current 10 year fixed lease costs you $20/sf per year paid monthly, what is the "effective cost" of staying in the space if your cost of capital is 8% annual, compounded monthly cost of capital? (Note: effective cost relates to the equivalent cost when other factors are averaged into the results)

Click here for Answer 4-a

Problem 4 (b). Flexible Workplace

Assume that you are looking at alternative space that has been recently built to accommodate change. Given the cabling, flooring and column/wall systems, the cost of changing workplaces is estimated to come in at $2,500 per station and the workplace size will drop to 200sf/employee. The new space would cost you $25/sf fixed for the 10 year term of the lease. How much will this option cost you per square foot at your 8% cost of capital?

Click here for Answer 4-b

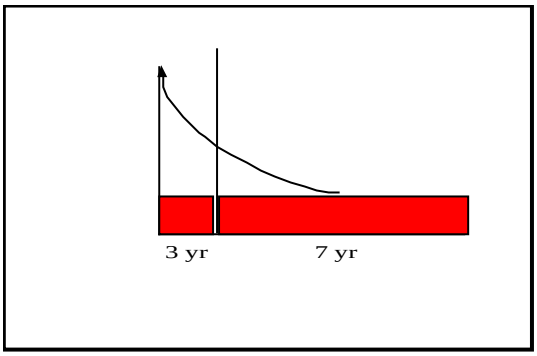
Problem 5. Referral Business

Assume that you are negotiating a 10 year lease for $28/sf annual, paid monthly on a 120,000 sf lease. One of your potential landlords has agreed to let your company provide consulting services with a total cost of $500,000 per year payable monthly. Based on what you know about your corporate financials, your profit margin is 40% on such business. What are your savings in PV terms? What is your total "effective cost" if you consider the referral business as an offset against the rent if your cost of capital is 8% annual, compounded monthly?

Click here for Answer 5

Answer 1 (a): Rental Pattern

Assume you renew your current lease at the same fixed rate for another 7 years on top of your remaining 3 years. What would the combined leases cost you in PV over the 10 years if your cost of capital is 8% annual, compounded monthly?



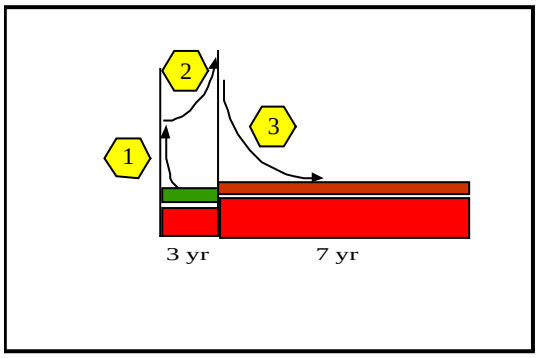
Rent/SF/Year	$30.00
Rent/SF/Month	$2.50
Number of Employees	200
Square Feet/Employee	260
Total Square Feet	52,000
Total Monthly Rent	$130,000
Total Outlay in Nominal $	$15,600,000

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	10	
Present Value	PV		$10,714,793
Payment	PMT	$130,000	
Future Value	FV	$0	
Interest Rate	i	8%	

Click here to return to Problem 1 (a)

Answer 1 (b): Overall Rental Pattern

As an alternative to merely renewing the current lease, the landlord has put together a package to make sure you remain his tenant. First, he will lower your rent to $18/square foot for the remaining 3 years. Second, he will build a new building in the same office park as your current location, adding amenities and more flexible design to meet your needs. This new, more flexible space will accommodate your 200 workers in 220sf/employee due to greater efficiency. Third, he will charge you the same rent as you are currently paying ($30) plus a premium equal to the PV of the savings you will realize on the 3 year renegotiated lease. What would the rental pattern be for the full 10 year agreement?



This problem is fairly straightforward, once you understand or can visualize the question. In the first step, calculate the PV of the lowered rent. In the second step, carry that PV forward to a FV lump. Finally, calculate the periodic payment (PR) that FV can support. At these rental levels, the tenant will be indifferent to this step lease or the fixed rate in terms of PV.

	Current	Stage 1	Stage 2
Number of Employees	200	200	200
SF/Employee	260	260	220
Total Building Size	52,000	52,000	44,000
Rent/SF/Year	$30.00	$18.00	??
Term of Lease	3	3	7

Step 1-a: Lower Rent

	Current	Proposed
Rental Levels	$1,560,000	$936,000
Annual Rent Savings		$624,000
Monthly Rent Savings		$52,000

Step 1-b: PV of Lower Rent

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	3	
Present Value	PV		$1,659,414
Payment	PMT	$52,000	
Future Value	FV	$0	
Interest Rate	i	8%	

Step 2: FV of Rent Savings

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	3	
Present Value	PV	$1,659,414	
Payment	PMT	$0	
Future Value	FV		$2,107,849
Interest Rate	i	8%	

Step 3: PMT Premium Over Remaining Lease

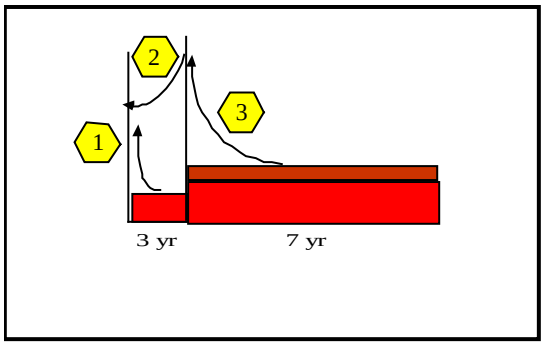
Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	7	
Present Value	PV	$2,107,849	
Payment	PMT		$32,853
Future Value	FV	$0	
Interest Rate	i	8%	

($32,853 / 44,000)	Premium/SF/Month	$0.75
	Premium/SF/Year	$8.96
	Total Rent/SF/Year	$38.96

Click here to return to Problem 1 (b)

Answer 1 (c): Cost of Modified Lease

What would the total PV cost of the 10 year agreement be to you if your cost of capital is 8% annual, compounded monthly?



Once the pattern of payments has been established, merely reverse engineer the problem by calculating the present value of the two components. Before calculating the cost, the per square foot rent must be converted to the total rent for the two stages. Note that in the second stage, the square feet per employee is reduced from 260 to 220 due to higher efficiency.

	Stage 1	**Stage 2**
Number of Employees	200	200
SF/employee	260	220
Total Building Size	52,000	44,000
Term of Lease	3	7
Phase 1 Rent	$ 18.00	
Phase 2 Base Rent		$ 30.00
Rent Premium		$ 8.96
Total Rent/Year		$ 38.96
Total Rent/Month	$78,000	$142,853

Step 1: PV of Phase 1 Rent

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	3		
Present Value	PV		$2,489,121	$2,489,121
Payment	PMT	$78,000		
Future Value	FV	$0		
Interest Rate	i	8%		

Step 2: PV of Phase 2 Annuity

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	7	
Present Value	PV		$9,165,343
Payment	PMT	$142,853	
Future Value	FV	$0	
Interest Rate	i	8%	

Step 3: PV of Phase 2 Lump

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	3		
Present Value	PV		$7,215,459	$7,215,459
Payment	PMT	$0		
Future Value	FV	$9,165,343		
Interest Rate	i	8%		

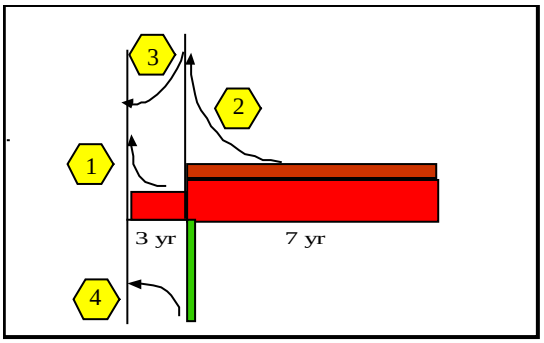
Total PV	$9,704,579
Total SF	44000
PV/SF	$220.56

In addition to present value, the choice would depend on the level of cash flows and other business factors. As suggested in these calculations, when managing a real estate portfolio with multiple leases in multiple buildings in multiple markets, a corporate real estate executive can "manage" current real estate costs. However, this "management' exercise can be at the expense of placing upward pressure on future rents. Thus, in "valuing" real estate costs, attention should be paid to the level of future obligations relative to current ones. This basic principle also underlies the importance of duration matching and of establishing the appropriate term of leases given strategic and tactical business and financial considerations.

Click here to return to Problem 1 (c)

Answer 1 (d): Tenant Improvement Allowance

What would your PV cost be if your landlord agreed to provide you with a tenant improvement (TI) allowance of $50/SF to cover improvements and moving expenses?



This question builds on the rental pattern established in Problem 1 (a) and involves the "reverse-engineering" of that pattern to establish the present value or cost of the outlay. The difference in this problem is that the PV of the lease payments is offset somewhat by the PV of the tenant improvement (TI) allowance at the end of the first 3 years.

Total Tenant Improvement (TI) Allowance

Building Square Feet	44,000	
Allowance	$50.00	
Total Allowance		$2,200,000

Net Cost After TI

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	3		
Present Value	PV		$1,731,960	$1,731,960
Payment	PMT	$0.00		
Future Value	FV	$2,200,000		
Interest Rate	i	8.00%		

Present Value Cost w/o TI	$9,704,579
Less: TI Savings	($1,731,960)
Net Cost After TI	$7,972,619

Square Feet	44,000
PV/SF	$181.20

Click here to return to Problem 1 (d)

Answer 1 (e). TI's Plus Free Rent

What would it cost you in PV if your landlord agreed to give you 6 months of free rent when you move into the new building on top of the TI allowance?

Note that in this case, the overall process is similar to the previous question; the only difference is that there is a six month gap in payments at the inception of the new lease 3 years out.

Step 1: PV of Phase 1 Rent

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	3		
Present Value	PV		$2,489,121	$2,489,121
Payment	PMT	$78,000		
Future Value	FV	$0		
Interest Rate	i	8.00%		

Step 2: PV of Phase 2 Annuity for 6.5 Years

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	6.5	
Present Value	PV		$8,666,591
Payment	PMT	$142,853	
Future Value	FV	$0	
Interest Rate	i	8.00%	

Step 3: PV of Phase 2 Lump 3.5 Years Removed

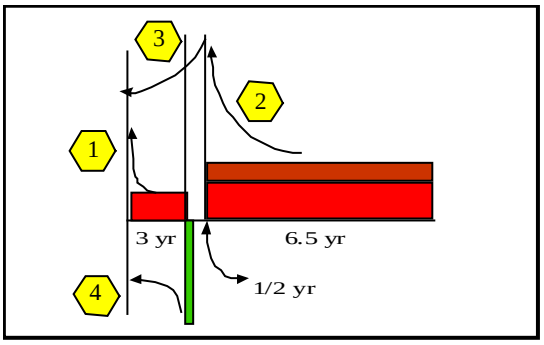
Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	3.5		
Present Value	PV		$6,556,157	$6,556,157
Payment	PMT	$0		
Future Value	FV	$8,666,591		
Interest Rate	i	8.00%		

Step 4: PV of Tenant Improvements

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	3.0		
Present Value	PV		$1,731,960	($1,731,960)
Payment	PMT	$0		
Future Value	FV	$2,200,000		
Interest Rate	i	8.00%		

PV with TI Only	$7,972,619	
PV with TI & 6 Months of Deferred Free Rent		$7,313,318
Net Benefit or Deferred Free Rent		($659,301)

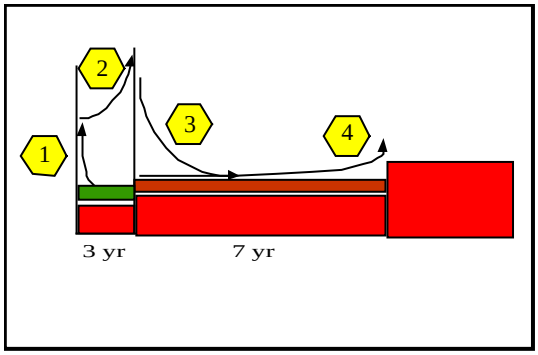
Cost per Square Foot		
Square Footage		$44,000
Effective Cost/sf After TI Free Rent	12	$166.21



Click here to return to Problem 1 (e)

Answer 1-f: Lease Extension

Assuming you were able to negotiate a 5 year extension after the 10 year term of the combined leases. This new lease will be set at an annual CPI adjustment based off of the beginning lease rate for the 7 year term and CPI is expected to average 4% annually. What would the new lease rate be?



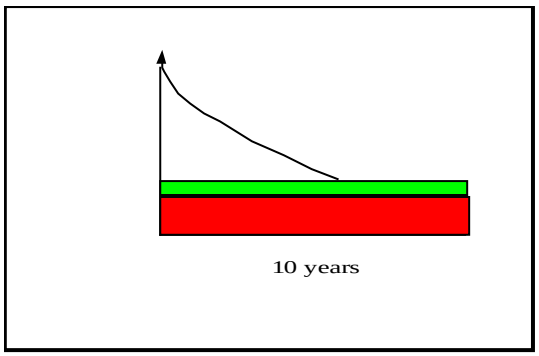
Factor	Code	Initial	Answer
Compounding / Period	m	1	
Term	t	7	
Present Value	PV	$38.96	
Payment	PMT	$0	
Future Value	FV		$51.27
Interest Rate	i	4.00%	

	Current	Stage 1	Stage 2	Stage 3
Number of Employees	200	200	200	200
SF/Employee	260	260	220	220
Total Building Size	52,000	52,000	44,000	44,000
Rent/SF/Year	$30.00	$18.00	$38.96	$51.27
Term of Lease	3	3	7	7

Click here to return to Problem 1 (f)

Answer 2 (a): HVAC Expense Reduction

Assume that your total HVAC costs for your headquarters building run $25,000 per month. You have been asked to consider the total life cycle cost of various energy-saving HVAC alternatives. One of the proposals you have received promises to reduce costs by 20% with no degradation in service. If your cost of capital is 10% annual, compounded monthly, how much would be justified in paying for the new system if you want to recover the expense over a 10 year holding period?



Current Utility Costs	$25,000
% Savings from Upgrade	20%
Total Savings	5,000

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	10	
Present Value	PV		$378,356
Payment	PMT	$5,000	
Future Value	FV	$0	
Interest Rate	i	10.00%	

Click here to return to Problem 2 (a)

Answer 2 (b): HVAC Financing

In conducting your research, you have discovered a low-cost energy program that will finance 80% of the total cost at 4% annually, compounded monthly for a 10 year term. Assuming you take the financing, what PV savings would you realize on your investment and energy savings at your 10% annual, compounded monthly rate?

Justified Cost of HVAC Upgrade	$378,356	
Sources of Capital		
Low Rate Financing % of Total	80%	$302,685
Interest Rate on Low Rate Financing	4%	
Equity Cost		
Equity Investment	20%	$75,671
Equity Cost of Capital	8%	

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	10		
Present Value	PV	$302,685		
Payment	PMT		$3,065	$3,065
Future Value	FV	$0		
Interest Rate	i	4.00%		

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	10		
Present Value	PV	$75,671		
Payment	PMT		$1,000	$1,000
Future Value	FV	$0		
Interest Rate	i	10.00%		

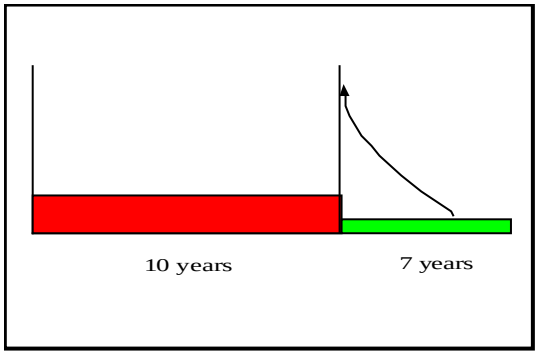
Payment to Cover Debt and Equity Returns	$4,065
Energy Savings	$5,000
Net Benefit/Month	$935

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	10		
Present Value	PV		$70,788	$70,788
Payment	PMT	$935		
Future Value	FV	$0		
Interest Rate	i	10.00%		

Click here to return to Problem 2 (b)

Answer 2 (c): Appreciation Benefits

Assume that you anticipate selling the building at the end of the 10th year. Your broker has talked to a number of experts who argue that your building would sell at a premium equal to the value of the lower utility costs spread over a 7 year holding period. If the most probable buyer for your space has a relatively low cost of capital of 6%, what premium would the property sell for at the end of the 10th year and what would be the PV of that at your 10% annual, compounded monthly rate?



Premium Sales Price

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	7	
Present Value	PV		$342,265
Payment	PMT	$5,000	
Future Value	FV	$0	
Interest Rate	i	6%	

PV of Premium Sales Price

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	10	
Present Value	PV		$126,435
Payment	PMT	$0	
Future Value	FV	$342,265	
Interest Rate	i	10%	

Click here to return to Problem 2 (c)

Answer 2 (d): Total Cost Life Cycle Cost

Given the assumptions in 2a-c, what would the HVAC upgrade cost you? Note: the $5,000 savings per month justified the cost of the HVAC upgrade. Thus, the "cost" would be the PV of any savings and/or other benefits you would reap from the deal from the favorable financing and the premium sales price at the end of the 10 year lease at your 10% annual, compounded monthly rate.

Payment to Cover Debt and Equity Returns	$4,065
Energy Savings	$5,000
Net Benefit / Month	$935

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	10		
Present Value	PV		$70,788	$70,788
Payment	PMT	$935		
Future Value	FV	$0		
Interest Rate	i	10%		

Premium Sales Price

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	7	
Present Value	PV		$342,265
Payment	PMT	$5,000	
Future Value	FV	$0	
Interest Rate	i	6%	

PV of Premium Sales Price

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	10		
Present Value	PV		$126,435	$126,435
Payment	PMT			
Future Value	FV	$342,265		
Interest Rate	i	10%		

Total Savings / Cost	$197,223

Click here to return to Problem 2(d)

Answer 3: Leasehold Interest

One of your divisions is located in a very strong market, with rental rates having been pushed up over the term of your original 10 year lease. You have 6 years remaining on your 100,000 SF lease, which you were able to negotiate at a fixed rate of $25 per year, payable monthly for the full term of the lease. Since you entered the agreement, rents in the market have increased at a compound rate of 10% per year. Assuming your cost of capital is 7%, what is the leasehold interest worth to your company if you sublet at the end of the 4th year?

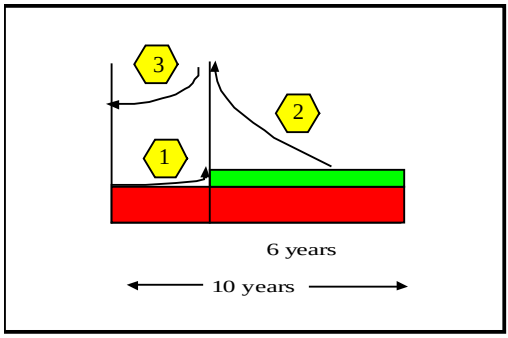
Rent/SF/Year	$25
Rentable Square Feet	100,000
Total Rent/Year	$2,500,000
Total Rent/Month	$208,333

Calculate Future Market Rent

Factor	Code	Initial	Answer
Compounding / Period	m	1	
Term	t	4	
Present Value	PV	$208,333	
Payment	PMT	$0	
Future Value	FV		$305,020
Interest Rate	i	10.00%	

Inflation Adjusted Market Rent Premium if Sublet

$305,020 - $208,333 = $96,687



Step 2: Calculate PV of Remaining Term Lagged 4 Years

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	6	
Present Value	PV		$5,671,123
Payment	PMT	$96,687	
Future Value	FV	$0	
Interest Rate	i	7.00%	

Step 3: Calculate PV of Deferred Sublease

Factor	Code	Initial	Answer
Compounding / Period	m	12	
Term	t	5.0	
Present Value	PV		$4,000,439
Payment	PMT	$0	
Future Value	FV	$5,671,123	
Interest Rate	i	7.00%	

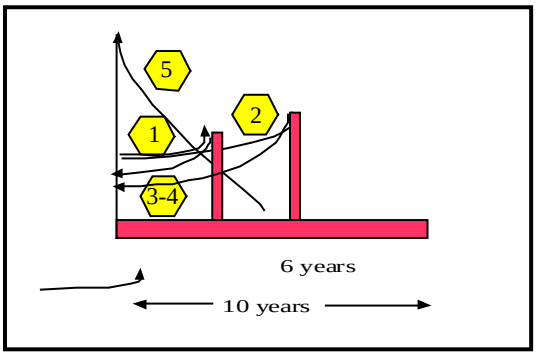
Click here to return to Problem 3

Answer 4-a: Workplace Reconfiguration for Inflexible Space

At the current time, your company employs 300 workers, with an average of 240 SF per employee. On average, you anticipate spending $10,000 for each workplace reconfiguration in present value, and that costs will rise 4% per year. Given the strategic plan of your company and industry dynamics, you estimate reconfigurations would occur at the end of the 3rd and 6th years and affect 2/3 of your employees. If your current 10 year fixed lease costs you $20/SF per year paid monthly, what is the "effective cost" of staying in the space if your cost of capital is 8% annual, compounded monthly cost of capital? (Note: effective cost relates to the equivalent cost when other factors are averaged into the results)

While the problem might seem complicated, it is actually fairly straightforward. In Step 1 and Step 2, calculate the inflated cost of the reconfiguration at the end of the 3rd and 6th years. In Step 3-4, calculate the PV of those two lump outlays. In Step 5, calculate the PV of the fixed rental payments.

Number of Employees	300
Square Feet per Employee	240
Total Square Feet	72,000
Configuration Cost per Workplace	$10,000
% Employees affected	66.67%
Total Employees Affected	200
Current Cost of Reconfiguration	$2,000,000



Step 1: Reconfiguration Cost at Stage 1

Factor	Code	Initial	Answer	
Compounding / Period	m	1		
Term	t	3		
Present Value	PV	$10,000		
Payment	PMT	$0		
Future Value	FV		$11,249	$11,249
Interest Rate	i	4.00%		

Total Cost of Reconfiguration at Stage 1

200 * $11,249 =	$2,249,728	$2,249,728

Step 2: Reconfiguration Cost at Stage 2

Factor	Code	Initial	Answer	
Compounding / Period	m	1		
Term	t	6		
Present Value	PV	$10,000		
Payment	PMT	$0		
Future Value	FV		$12,653	$12,653
Interest Rate	i	4.00%		

Total Cost of Reconfiguration at Stage 2

200 * $12,653 =	$2,530,638	$2,530,638

Answer 4-a: (cont.)

Step 3 Calculate PV of Stage 1 Reconfiguration

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	3		
Present Value	PV		$1,771,109	$1,771,109
Payment	PMT	$0		
Future Value	FV	$2,249,728		
Interest Rate	i	8.00%		

Step 4: Calculate PV of Stage 2 Recongfiguration

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	6		
Present Value	PV		$1,568,413	$1,568,413
Payment	PMT	$0		
Future Value	FV	$2,530,638		
Interest Rate	i	8.00%		

Step 5: Calculate PV of Lease Payments

Total Square Feet	72,000	
Rent/SF/Year	$20	
Total Rent/SF/Year		$1,440,000
Rent/Month		$120,000

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	10		
Present Value	PV		$9,890,578	$9,890,578
Payment	PMT	$120,000		
Future Value	FV	$0		
Interest Rate	i	8.00%		

Total PV Cost	$13,230,100
Total PV Cost/sf	$183.75

Click here to Return to Problem 4-a

Answer 4-b: Flexible Workplace

Assume that you are looking at an alternative space that has been recently built to accommodate change. Given the cabling, flooring and column/wall systems, the cost of changing workplaces is estimated to come in at $2,500 per station and the workplace size will drop to 200sf/employee. The new space would cost you $25/sf fixed for the 10 year term of the lease. How much will this option cost you per square foot at your 8% cost of capital?

Problem 4-b: Flexible Space

Step 1: Establish Cost of Reconfiguration

Number Workstations Affected	200
Fixed Cost/Workstation	$2,500
Total Cost	$500,000

Step 2: Calculate PV of Stage 1 Reconfguration

Factor	Code	Initial	Answer
Compounding/Period	m	12	
Term	t	3	
Present Value	PV		$393,627
Payment	PMT	$0.00	
Future Value	FV	$500,000	
Interest Rate	I	8.00%	

$393,627

Step 3: Calculate PV of Stage 2 Reconfiguration

Factor	Code	Initial	Answer
Compounding/Period	m	12	
Term	t	6	
Present Value	PV		$309,885
Payment	PMT	$0.00	
Future Value	FV	$500,000	
Interest Rate	I	8.00%	

$309,885

Step 4: Calculate PV of Lease Payments

Number of Employees	300	
Flexible SF/Employee	200	
Total SF	60,000	
Rent/sf/year	$ 25.00	
Total Rent/sf/year		$1,500,000
Rent/month		$125,000

Factor	Code	Initial	Answer
Compounding/Period	m	12	
Term	t	10	
Present Value	PV		$10,302,685
Payment	PMT	$125,000	
Future Value	FV	$0	
Interest Rate	I	8.00%	

$10,302,685

Total PV Cost	$11,006,197
Total PV Cost/sf	$ 183.44

Click here to Return to Problem 4-b

Answer 5: Referral Business

Assume that you are negotiating a 10 year lease for $28/SF annual, paid monthly on a 120,000 SF lease. One of your potential landlords has agreed to let your company provide consulting services with a total cost of $500,000 per year payable monthly. Based on what you know about your corporate financials, your profit margin is 40% on such business. What are your savings and reduction in "effective cost" if you consider the referral business as an offset against the rent if your cost of capital is 8% annual, compounded monthly?

Annual Rent/SF	$28
Total Square Footage	120,000
Total Rent/Year	$3,360,000
Rent/Month	$280,000

Referral Business	$500,000
Profit Margin	40%
Net Profit/Year	$200,000
Profit/ Month	$16,667

Step 1: Cost of Lease

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	10		
Present Value	PV		$23,078,015	$23,078,015
Payment	PMT	$280,000		
Future Value	FV	$0		
Interest Rate	i	8.00%		

Step 2: Offset of Profit

Factor	Code	Initial	Answer	
Compounding / Period	m	12		
Term	t	10		
Present Value	PV		($1,373,719)	($1,373,719)
Payment	PMT	($16,667)		
Future Value	FV	$0		
Interest Rate	i	8.00%		

Net Effective Cost	$21,704,296
Savings Percent	5.95%

Click here to Return to Problem 5

Click here to go to beginning