BOMA International's
Asset Management Series:

Measuring Financial Returns

BOMA International

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Asset Management Series:

Creating a Pro-Forma Cash Flow Analysis

BOMA International

Objectives

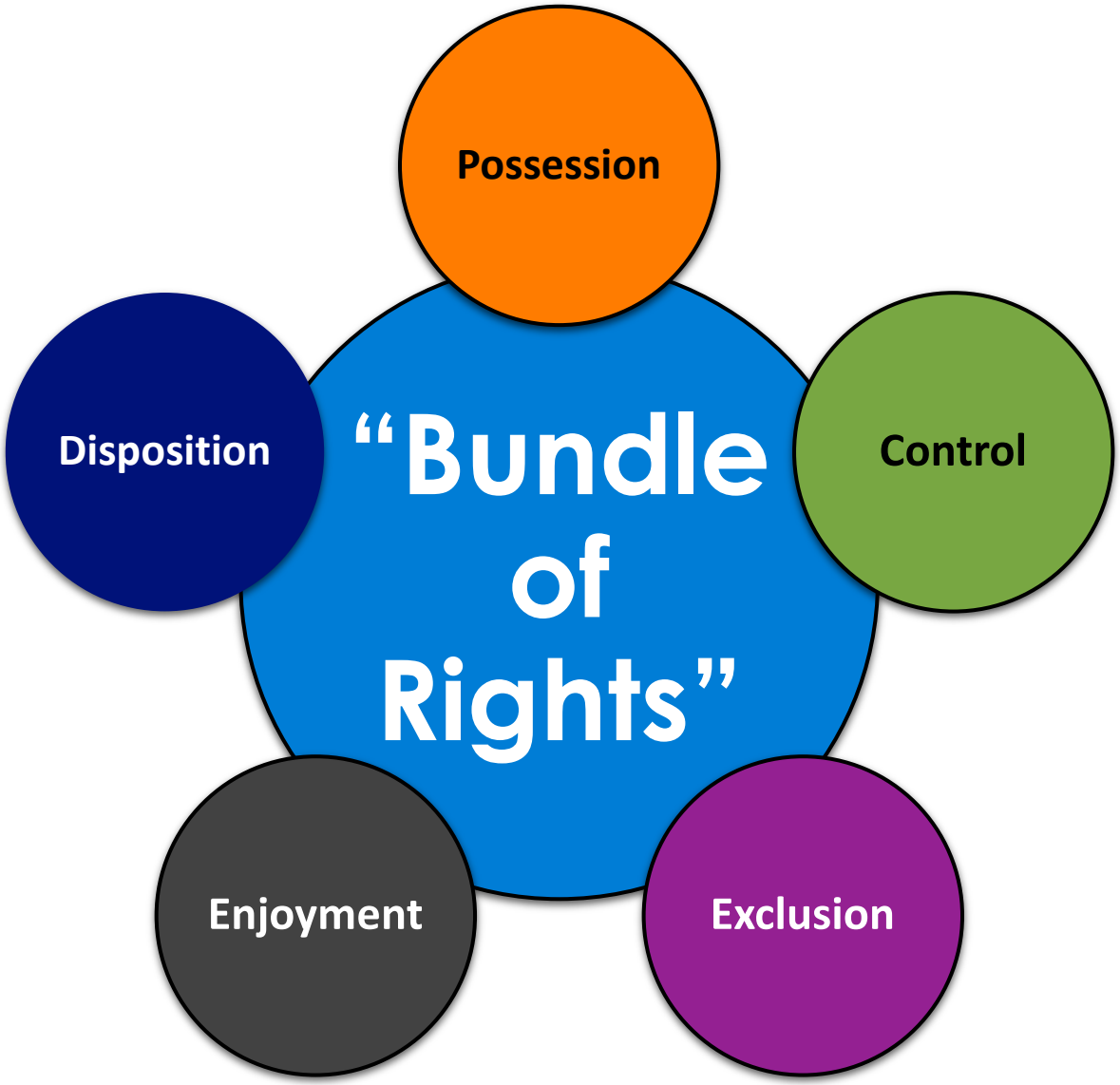
At the end of this session, the participant will be able to:

- *Calculate Net Operating Income (NOI) and Net Cash Flow (NCF)*
- *Evaluate market data and building characteristics to determine income and expense assumptions*
- *Create accurate capital expense assumptions*
- *Predict income and expenses for the future*
- *Use sensitivity analysis to adjust income and expense assumptions*

What are You Purchasing?

Residential

Commercial


Possession
Disposition
"Bundle of Rights"
Control
Enjoyment
Exclusion

Ownership Options

Fee Simple Absolute	**Same Owner for Land & Improvements**
Ground Rent Ground Lease	**Separate Owners for Land & Improvements**

Approaches to Value

Sales Comparison

Cost Approach

Income Approach

Reconciliation to Arrive at Value

Overview: Income Approach

Gross Potential Income (GPI)

Less: Vacancy Loss

Less: Collection Loss

Effective Gross Income (EGI)

Less: Operating Expenses

Net Operating Income (NOI)

Calculating Value Using IRV

$$V = \frac{I}{R}$$

$$Value = \frac{Net\ Operating\ Income}{Owner's\ Desired\ Return\ (cap\ rate)}$$

1 | Putting it Into Practice

A property generates annual NOI of $250,000, and the owner's desired rate of return is 7%. What is the value of the asset?

$$V = \frac{I}{R}$$

$$Value = \frac{Net\ Operating\ Income}{Owner's\ Desired\ Return}$$

1 | Putting it Into Practice

A property generates annual NOI of $250,000, and the owner's desired rate of return is 7%. What is the value of the asset?

$$V = \frac{I}{R}$$

$$Value = \frac{\$250,000}{7\%}$$

1 | Putting it Into Practice

A property generates annual NOI of $250,000, and the owner's desired rate of return is 7%. What is the value of the asset?

$$V = \frac{I}{R}$$

$$\frac{\$250,000}{7\%} = \$3,571,429$$

2 | Putting it Into Practice

A property was sold recently for $3.9 million. The asset manager knows the NOI for the property is $280,000. He wants to determine the cap rate (the owner's desired rate of return) that was used for the sale. What was the cap rate?

$$V = \frac{I}{R}$$

$$Value = \frac{Net\ Operating\ Income}{Owner's\ Desired\ Return}$$

2 | Putting it Into Practice

A property was sold recently for $3.9 million. The asset manager knows the NOI for the property is $280,000. He wants to determine the cap rate (the owner's desired rate of return) that was used for the sale. What was the cap rate?

$$V = \frac{I}{R}$$

$$\$3,900,000 = \frac{\$280,000}{????}$$

2 | Putting it Into Practice

$$\$3,900,000 = \frac{\$280,000}{????}$$

$$\text{Cap Rate} = \frac{\$280{,}000}{\$3{,}900{,}000}$$

2 | Putting it Into Practice

$$\$3,900,000 = \frac{\$280,000}{????}$$

$$\textit{Cap Rate} = \frac{\$280{,}000}{\$3{,}900{,}000}$$

$$\frac{\$280,000}{\$3,900,000} = 7.18\%$$

3 | Putting it Into Practice

The asset manager knows a property sold for $8.2 million with a cap rate of 7.5%. What was the property's NOI?

$$V = \frac{I}{R}$$

$$Value = \frac{Net\ Operating\ Income}{Owner's\ Desired\ Return}$$

3 | Putting it Into Practice

$$\$8,200,000 = \frac{????}{7.5\%}$$

$8,200,000 x 7.5% = ????

$8,200,000 x 7.5% = $615,000

IRV is Measured at a Singular Point in Time

But things can (and do) change:

- Tenants move out, move in, renew leases
- Rental rates change
- Spaces are (or become) vacant
- Operating expenses fluctuate
- Cap rate is variable

Use if you need a "rough" number - quickly

Net Cash Flow

Gross Potential Income (GPI)

Less: Vacancy Loss

Less: Collection Loss

Effective Gross Income (EGI)

Less: Operating Expenses

Net Operating Income (NOI)

Less: Capital Expenses

Less: Debt Service

Less: Non-Operating Expenses

Net Cash Flow (NCF)

Operating Expense Ratio (OER)

Ratio between the income a property generates and what it costs to operate it

A lower OER generally indicates the property is being managed efficiently – especially over time

$$\textit{Operating Expense Ratio (OER)} = \frac{\textit{Operating Expenses}}{\textit{Effective Gross Income}}$$

Putting it Into Practice

Assuming a property generates $1 million in effective gross income (EGI) and has operating expenses of $600,000, what would be its OER?

$$Operating\ Expense\ Ratio\ (OER) = \frac{Operating\ Expenses}{Effective\ Gross\ Income}$$

$$Operating\ Expense\ Ratio\ (OER) = \frac{\$600,000}{\$1,000,000}$$

$$\frac{\$600,000}{\$1,000,000} = \_\_\_\_\%$$

4 | Putting it Into Practice

Assuming a property generates $1 million in effective gross income (EGI) and has operating expenses of $600,000, what would be its OER?

$$Operating\ Expense\ Ratio\ (OER) = \frac{Operating\ Expenses}{Effective\ Gross\ Income}$$

$$Operating\ Expense\ Ratio\ (OER) = \frac{\$600,000}{\$1,000,000}$$

$$\frac{\$600,000}{\$1,000,000} = 60\%$$

Income & Expense Assumptions

Actual Results

Accounting reports
Historical data

Assumptions

Budgets
Income/Expense IQ

Predicting Income

Gross Potential Income (GPI)
Less: Vacancy Loss
Less: Collection Loss
Effective Gross Income (EGI)

1. Existing rent charges (rent roll)
2. Leasing projections (existing/potential vacancies)
3. Additional income
4. Operating expense reconciliations (deferred)
5. Calculate GPI
6. Calculate vacancy/collection losses
7. Calculate EGI
8. Compare information to
   A. Income/Expense IQ
   B. Historical data (subject property/similar properties)

Predicting Operating Expenses

Effective Gross Income (EGI)
Less: Operating Expenses
Net Operating Income (NOI)

1. Review budget, service contracts, and property files
2. Interview vendors/engineering team – look for efficiency improvements
3. Evaluate recurring v. non-recurring expenses
4. Evaluate real estate taxes (tax appeal)
5. Evaluate property insurance
6. Calculate NOI
7. Compare information to
   A. Income/Expense IQ
   B. Historical data (subject property/similar properties)

Income & Expense Estimates

Involve Property Management & Engineering Staff Members

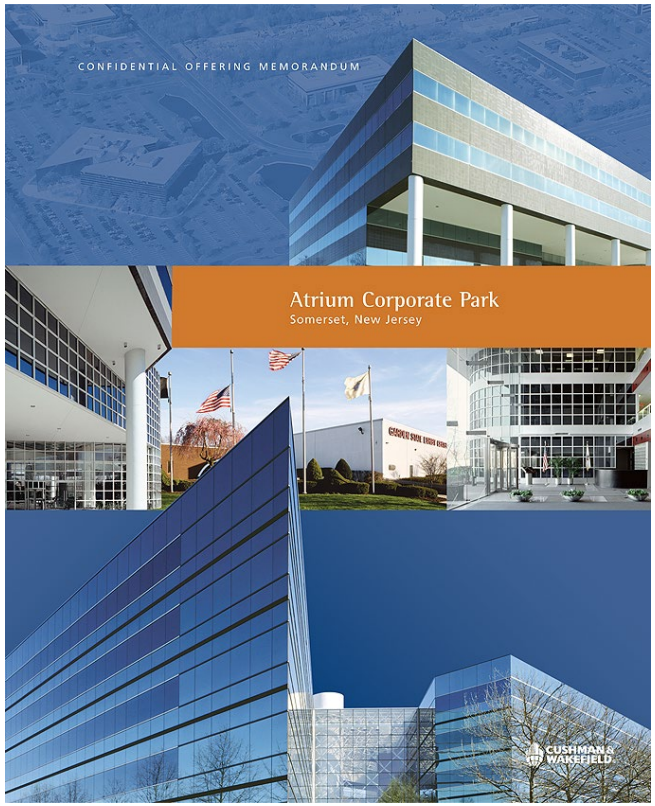
- Current property manager/engineering staff
- In case of sale, work with
  - Another PM/engineering team (maintain fiduciary)
  - Vendor network

Offering Memorandum (OM)

Detailed information about property for use by bidders

Remember: It's a sales document

- **Somewhat accurate**
- **Not grossly inaccurate**
- **Paints property performance in best light possible**



Don't Rely Exclusively on the Offering Memorandum (OM)

Russian Proverb:

Doverey, no proverey.

Trust but verify.

Ronald Reagan

Capital Expenses

1. Improve value of asset or extend useful life of building system
2. Recorded on balance sheet
3. Include
   A. Asset acquisition
   B. Capital improvements
   C. Tenant improvements and leasing costs
4. Capitalized = expense spread over useful life (depreciation)

5 | Putting it Into Practice

The IRS allows non-residential real property to be depreciated over a 39-year period. What is the annual straight-line depreciation for an asset worth $24 million?

$$\frac{Cost}{Depreciation\ Timeline} = Annual\ Depreciation$$

5 | Putting it Into Practice

The IRS allows non-residential real property to be depreciated over a 39-year period. What is the annual straight-line depreciation for an asset worth $24 million?

$$\frac{\text{Cost}}{\text{Depreciation Timeline}} = \text{Annual Depreciation}$$

$$\frac{\$24 \text{ million}}{39 \text{ years}} = \_\_\_\_\_$$

5 | Putting it Into Practice

The IRS allows non-residential real property to be depreciated over a 39-year period. What is the annual straight-line depreciation for an asset worth $24 million?

$$\frac{\text{Cost}}{\text{Depreciation Timeline}} = \text{Annual Depreciation}$$

$$\frac{\$24 \text{ million}}{39 \text{ years}} = \$615,385$$

6 | Putting it Into Practice

The landlord replaces the building's chiller at a cost of $700,000. The new chiller has an expected lifespan of 30 years. What is the annual straight-line depreciation for the new chiller?

$$\frac{\text{Cost}}{\text{Depreciation Timeline}} = \text{Annual Depreciation}$$

$$\frac{\$700,000}{30 \text{ years}} = \$\_\_\_\_\_$$

6 | Putting it Into Practice

The landlord replaces the building's chiller at a cost of $700,000. The new chiller has an expected lifespan of 30 years. What is the annual straight-line depreciation for the new chiller?

$$\frac{\text{Cost}}{\text{Depreciation Timeline}} = \text{Annual Depreciation}$$

$$\frac{\$700,000}{30 \text{ years}} = \$23,333$$

Capital Expenses & Asset Value

Existing roof expected to last 25 years

For Discussion

What is the impact on the asset value if:

1. **It fails prematurely and needs to be replaced at 20 years?**
2. **It is maintained well, and replacement can be deferred until year 30?**

Predicting Non-Operating Expenses

Net Operating Income
Less: Capital Expenses
Less: Debt Service
Less: Non-Operating Expenses
Net Cash Flow (NCF)

1. Evaluate capital expenses – create long-term capital expense plan
2. Evaluate debt service
3. Evaluate non-operating expenses
4. Calculate NCF

Life Cycle Costing

Evaluate entire cost of a project over its life

The least expensive installation cost might not be the best option

$$Life\ Cycle\ Cost = \frac{Installation\ Cost + Operating\ Cost + Maintenance\ Cost}{Anticipated\ Useful\ Life\ or\ Investor's\ Hold\ Period}$$

Life Cycle Costing

Think about flooring options and their respective life cycle costs

1. "Apartment-grade" carpeting
2. Carpeting for tenant space
3. Carpeting for common areas
4. Hard surface flooring

7 | Putting it Into Practice

For the main lobby, the designer wants to use granite tile. The installation cost is expected to be $10 per square foot, and the annual maintenance is expected to be $0.05 psf. The flooring is predicted to last 25 years. What is the life cycle cost of this flooring product over the investor's 10-year hold period?

$$Life\ Cycle\ Cost = \frac{Installation\ Cost + Operating\ Cost + Maintenance\ Cost}{Anticipated\ Useful\ Life\ or\ Investor's\ Hold\ Period}$$

$$Life\ Cycle\ Cost = \frac{\$10 + (\$0.05\ x\ 25)}{25\ years}$$

7 | Putting it Into Practice

For the main lobby, the designer wants to use granite tile. The installation cost is expected to be $10 per square foot, and the annual maintenance is expected to be $0.05 psf. The flooring is predicted to last 25 years. What is the life cycle cost of this flooring product over the investor's 10-year hold period?

$$Life\ Cycle\ Cost = \frac{Installation\ Cost + Operating\ Cost + Maintenance\ Cost}{Anticipated\ Useful\ Life\ or\ Investor's\ Hold\ Period}$$

$$\frac{\$10 + (\$0.05\ x\ 25)}{25\ years} = \$0.45\ per\ year$$

Total Life Cycle Cost (over 10 years) = $4.50 per square foot

8 | Putting it Into Practice

For the common area corridors, the designer wants to use a high-end carpeting. The installation cost is expected to be $5 per square foot, and the annual maintenance is expected to be $0.05 per square foot. The flooring is predicted to last 7 years. What is the life cycle cost of this flooring product over 10 years (assuming the replacement cost will increase to $7 per square foot in year 8)?

$$Life\ Cycle\ Cost = \frac{Installation\ Cost + Operating\ Cost + Maintenance\ Cost}{Anticipated\ Useful\ Life\ or\ Investor's\ Hold\ Period}$$

$$\frac{(\$5 + (\$0.05 \text{ x } 7)) + (\$7 + (\$0.05 \text{ x } 7)\ (3 \text{ years}/7 \text{ years})}{10 \text{ years}} = \$\_\_\_ \text{ per year}$$

8 | Putting it Into Practice

$$\frac{(\$5 + (\$0.05\ x\ 7)) + (\$7 + (\$0.05 \text{ x } 7)\ (3 \text{ years}/7 \text{ years})}{10\ years} = \$\_\_\_\ per\ year$$

$$\frac{(\$5.35) + (\$7.35)\ (42.86\%)}{10\ years} = \$\_\_\_\ per\ year$$

$$\frac{(\$5.35) + (\$3.15)}{10\ years} = \$\_\_\_\ per\ year$$

$$\frac{\$8.50}{10\ years} = \$0.85\ per\ year$$

Total Life Cycle Cost (over 10 years) = $8.50 per square foot

9 | Putting it Into Practice

To illustrate the impact of the owner's hold period on the life cycle cost analysis, let's evaluate the life cycle cost for the high-end flooring example above – except that the owner's hold period is reduced to only 5 years. How does that impact the owner's cost over the hold period?

$$Life\ Cycle\ Cost = \frac{Installation\ Cost + Operating\ Cost + Maintenance\ Cost}{Anticipated\ Useful\ Life\ or\ Investor's\ Hold\ Period}$$

$$\left(\frac{(\$5 + (\$0.05\ x\ 7))}{7\ years}\right)\left(\frac{5\ years}{7\ years}\right) = \$\_\_\_\ per\ year$$

$$\left(\frac{\$5.35}{7}\right)(71.43\%) = \$0.55\ per\ year$$

Total Life Cycle Cost (over 5 years) = $3.80 per square foot

Capital Expense Plan

- Long-term (10 years) – even beyond hold period
- Revised annually
- Property Condition Assessment (PCA) as a guide
  - Revise annually
  - Include contingency
  - Impact of inflation
  - Don't forget "soft costs"
- Strategic repairs to extend life of building systems
- Account for inflation

10 | Putting it Into Practice

Assume you are putting together a 10-year cash flow projection for an asset you would like to acquire

Relevant deal terms are included in your textbook

10-Year Cash Flow

(Details on Page 30)

10-Year Cash Flow Analysis

Square Feet	100,000

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Income										
Rent	$ 2,000,000	$ 2,060,000	$ 2,121,800	$ 2,185,454	$ 2,251,018	$ 2,318,548	$ 2,388,105	$ 2,459,748	$ 2,500,000	$ 2,575,000
Operating Expense Recovery	$ 1,623,000	$ 1,671,450	$ 1,721,351	$ 1,772,747	$ 1,845,683	$ 1,882,704	$ 1,938,858	$ 1,996,695	$ 2,056,263	$ 2,147,617
Parking Garage Income	$ 280,000	$ 287,000	$ 294,175	$ 301,529	$ 309,068	$ 316,794	$ 324,714	$ 332,832	$ 341,153	$ 349,682
Overtime HVAC Income	$ 38,000	$ 38,950	$ 39,924	$ 40,922	$ 41,945	$ 42,994	$ 44,068	$ 45,170	$ 46,299	$ 47,457
Total Income	**$ 3,941,000**	**$ 4,057,400**	**$ 4,177,250**	**$ 4,300,652**	**$ 4,447,713**	**$ 4,561,040**	**$ 4,695,745**	**$ 4,834,444**	**$ 4,943,716**	**$ 5,119,755**
Expenses										
Recurring Operating Expenses	$ 1,200,000	$ 1,236,000	$ 1,273,080	$ 1,311,272	$ 1,350,611	$ 1,391,129	$ 1,432,863	$ 1,475,849	$ 1,520,124	$ 1,565,728
Parking Garage Repairs	$ -	$ -	$ -	$ -	$ 20,000	$ -	$ -	$ -	$ -	$ 30,000
Roof Repairs	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 7,500	$ 7,500	$ 7,500	$ 7,500	$ 7,500
Insurance	$ 18,000	$ 18,450	$ 18,911	$ 19,384	$ 19,869	$ 20,365	$ 20,874	$ 21,396	$ 21,931	$ 22,480
Real Estate Taxes	$ 400,000	$ 412,000	$ 424,360	$ 437,091	$ 450,204	$ 463,710	$ 477,621	$ 491,950	$ 506,708	$ 521,909
Total Operating Expenses	**$ 1,623,000**	**$ 1,671,450**	**$ 1,721,351**	**$ 1,772,747**	**$ 1,845,683**	**$ 1,882,704**	**$ 1,938,858**	**$ 1,996,695**	**$ 2,056,263**	**$ 2,147,617**
Net Operating Income										
Net Operating Income	**$ 2,318,000**	**$ 2,385,950**	**$ 2,455,899**	**$ 2,527,905**	**$ 2,602,030**	**$ 2,678,336**	**$ 2,756,887**	**$ 2,837,750**	**$ 2,887,452**	**$ 2,972,138**
Capital Expenses | Non-Operating Expenses | Debt Service										
Tenant Improvement	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,000,000	$ -
Leasing Commissions	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,400,000	$ -
Capitalized Leasing Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 120,000	$ -
Asphalt Overlay	$ -	$ -	$ -	$ -	$ -	$ 410,000				
HVAC Replacement	$ -	$ -	$ -	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ -	$ -	$ -
Non-Operating Expenses	$ 100,000	$ 103,000	$ 106,090	$ 109,273	$ 112,551	$ 115,927	$ 119,405	$ 122,987	$ 126,677	$ 130,477
Debt Service	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000	$ 980,000
Net Cash Flow	**$ 1,238,000**	**$ 1,302,950**	**$ 1,369,809**	**$ 1,188,633**	**$ 1,259,479**	**$ 922,409**	**$ 1,407,482**	**$ 1,734,762**	**$ (4,739,225)**	**$ 1,861,661**

Sensitivity/What If? Analysis

Changing one variable (or, with specialized software, more than one variable) at a time in order to evaluate the effect of that change on the investment – AM can review impact of any proposed changes

- What if a tenant does not renew its lease?
- What if the asset manager holds the building for six years instead of five?
- What if the proposed roof replacement can be deferred a year?
- What if the lease rate for the proposed tenant is $25 per square foot instead of $30 per square foot?

Discounted Cash Flow

Our 10-year Cash Flow does not account for the Time Value of Money (TVM)

Money available at present time is worth more than the same amount in the future – it is worth more the sooner it is received

To account for TVM, investors use Discounted Cash Flow (DCF) – which will be covered in more detail in session 4