ARGUS
Valuation - DCF™

Calculation Manual

April 25, 2011
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Chapter 1
Property Setup

ARGUS Valuation – DCF (referred to as ARGUS DCF) is a global solution for commercial real estate asset valuation and investment analysis. In order to make full use of its power and flexibility, several items should be examined prior to creating an ARGUS DCF file. These include country specific conventions such as currency and area measurements, as well as financial modeling conventions including the global growth rates.

Currency Conversion

ARGUS DCF has the capability to convert currency at a property and portfolio level. Each file uses a set of Input and Output Preferences to describe currency, area measurement, date format, and other configuration options.

These global configuration options are created within Country Setting categories accessible from the Global Categories menu. To set the base Country Settings category for your local market, highlight the appropriate category and click the Set Base button. This will establish the currency and area measure for that category as the default Input and Output Preference for each newly created ARGUS DCF file.
As illustrated below, other Country Settings categories can be set up to reflect the appropriate conversion rates to the base currency. A monthly conversion rate index is also available to forecast changing currency conversion rates over the projection period.
Example:

Base rent is entered as US$10,000 per year for a tenant in an ARGUS DCF file that is using the United States Input Preferences category. The Output Preferences for that same ARGUS DCF file are set to use the Japan Country Settings category, which specifies that US$0.009 = ¥1.00.

As a result the rents are converted from US Dollars to Japanese Yen on all reports, as seen below on the Individual Tenant Cash Flow & Summary report:

\[
\text{Rent} = \text{US$10,000 x (}\frac{¥1}{\text{US$0.009}}\text{)} = ¥1,111,111
\]
**Area Measurement Conversions**

ARGUS DCF will automatically convert area measure units between five standard measurement selections. Area Measurement units and conversion rates that are supported include:

<table>
<thead>
<tr>
<th></th>
<th>Square Foot</th>
<th>Square Meter</th>
<th>Tsubo</th>
<th>Pyong</th>
<th>Ping</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Square Foot</strong></td>
<td>1</td>
<td>0.092903</td>
<td>0.028103</td>
<td>0.028101</td>
<td>0.028109</td>
</tr>
<tr>
<td><strong>Square Meter</strong></td>
<td>10.763915</td>
<td>1</td>
<td>0.302498</td>
<td>0.302480</td>
<td>0.302571</td>
</tr>
<tr>
<td><strong>Tsubo</strong></td>
<td>35.583390</td>
<td>3.305807</td>
<td>1</td>
<td>0.999939</td>
<td>1.000242</td>
</tr>
<tr>
<td><strong>Pyong</strong></td>
<td>35.585922</td>
<td>3.306004</td>
<td>1.000061</td>
<td>1</td>
<td>1.000303</td>
</tr>
<tr>
<td><strong>Ping</strong></td>
<td>35.575794</td>
<td>3.305009</td>
<td>0.999758</td>
<td>0.999698</td>
<td>1</td>
</tr>
</tbody>
</table>

Measurement units can be selected through the Country Settings category. Different Country Settings categories can also be selected for the Input and Output Preferences for each newly created ARGUS DCF file. Input and Output Preferences can be changed at anytime through the Input and Output Preference tabs within the Property Description window in the ARGUS DCF file.
Inflation Rates

There are many places in ARGUS DCF where growth rates can be entered. However, an important hierarchy exists within the model that determines the application and precedence of certain rates and sets default growth rates for other items:

1. Detailed Inflation Rates
   Percent fields within Detailed Categories
   Detailed percents in Revenue and Expense windows

     overrides

2. Line Item Property Inflation

3. General Inflation
Summary of Inflation Hierarchy:

- The default growth rate for all ARGUS DCF projection amounts is General Inflation.
- Line item inflation rates for items such as Market Rent growth and CPI override the General Inflation rate with respect to inputs related to those specific data elements and assumptions.
- Finally, when entering detailed input assumptions, such as Market Rental rates, there is an opportunity to override the Line Item or General Inflation rates with a growth rate that only applies to those individual input assumptions or data elements.

Inflation Month

ARGUS DCF supports two methods for Inflation Month:

- **Analysis Start** – applies the inflation rates annually in the month corresponding to the analysis start date
- **Specific Month** – applies the inflation rates annually in the selected month of each of the analysis years. This selection changes the Year Ending Dates in the Inflation Table to correspond to the Inflation Month.

Additionally, ARGUS DCF supports a total of three reimbursement methods corresponding to various combinations of calendar and fiscal reimbursement and calendar and fiscal inflation methods.
Calendar Reimbursement Using Fiscal Inflation

- Inflation is applied to all reimbursable expenses in the first month of the second fiscal year and each fiscal year thereafter.
- Calendar year expenses for January through December are derived using the actual monthly values of various fiscal years. The calendar year used for each tenant depends on the calendar year in which the lease start date falls. This blended calendar year expense is used for calendar year expense reimbursement billing and for calculating tenants' base year expense stops.
- The amounts owed by tenants for each calendar year are applied in 12 equal installments over that calendar year.
- For property level reporting of the amounts collected, each monthly installment is gathered into the proper fiscal year and reported along with all other property level amounts.

Fiscal Reimbursement Using Fiscal Inflation

- All reimbursable expenses are inflated using the fiscal inflation method to arrive at fiscal year expenses.
- Reimbursements are based on the amount due for each fiscal year divided into 12 equal monthly installments and applied over that fiscal year. Fiscal year amounts are used for base years and expense reimbursements. The fiscal year in which a lease start date falls is the one used for the tenant's base year stop calculations.
- Fiscal reimbursements are reported in the same fiscal year along with all other property level fiscal amounts.
Calendar Reimbursement Using Calendar Inflation

- Inflation will be applied to all reimbursable expenses on a calendar year basis on the first January 1 of the analysis, and each January 1 thereafter. If the analysis begins in January, inflation will be applied in the second January of the analysis.
- The amount each tenant owes for the calendar year is applied in 12 equal installments over that calendar year. Calendar year amounts are used for base years and expense reimbursements. The calendar year in which a lease start date falls is used in tenant base year stop calculations.
- For property level reporting of amounts collected on a fiscal basis, each monthly installment is applied to the proper fiscal year and reported along with all other property level amounts.
Chapter 2

Operating Expenses

Operating Expenses are the costs incurred to the property owner for the maintenance and operations of the property. For office, retail, and industrial properties, these expenses may be classified as reimbursable or non-reimbursable.

ARGUS DCF supports a number of methods for describing and calculating these costs, including the simple input of currency amounts, amounts or rates per area, the detailed input of monthly amounts over time, and the ability to link these costs to other cash flow figures or occupancy using percentages.

% of EGR

The % of EGR option allows you to take a percentage of the Effective Gross Revenue as an operating expense, typically used as an Administrative or Management Fee.

Effective Gross Revenue is calculated to determine gross income, less only an allowance for vacancy and collection loss. This calculation does not include any deductions for operating expenses.

\[
\text{Effective Gross Revenue} = \frac{\text{Scheduled Base Rental Revenue} + \text{Other adjustment revenue} + \text{Total Reimbursement Revenues} - \text{Absorption and Turnover Vacancy}}{\text{Percentage of EGR}}
\]

In this example, a management fee has been set up to be calculated as 4% of the Effective Gross Revenue.
Please note that when expenses are calculated using a % of EGR and these same expenses are also included in the expense reimbursement revenue calculations, ARGUS DCF will iterate to derive the Effective Gross Revenue including the reimbursement revenues associated with those expenses.
% of Line

The % of Line option allows you to model revenues and expenses as percentages of other cash flow line items.

All percentage entries, including expenses and capital expenditures, are positive. Negative percentages may be entered by using negative sign before the percent entry. If the percentage does not apply to all component items within a parent Line Item, you can select Detail to apply the percentage(s) individually.

Detail

The Detail function allows specific Percent entries for individual line items within a line. If only one or part of the components of a line item should be included in the calculation, enter the percentage within the line detail.
Range
The Range function allows you to enter specific margins for a percentage calculation including Start and End Dates, Monthly Minimum and Maximum amounts, as well as the calculation method.

Applied
The Applied section allows you to specify how often the amount will be calculated.
- The Monthly option specifies monthly calculations.
- The Specify Date option applies the calculation on one specific date.
- The Set Period option allows you to further define when the revenue or expense percentages will be applied to the cash flow. Select the Set Period option and select an existing Period category from the drop-down field. Custom period sets may be created by choosing the Set Period option and then selecting Detail.
% Fixed

The % Fixed field determines if a portion of a revenue or expense amount is dependent on the occupancy of the property.

The default setting for this field is 100%, which will calculate the entire amount of the revenue or expense, regardless of the occupancy of the building. Variable expenses are calculated using the projected occupancy of the property.

**Example:**

Annual Potential Maintenance Expense: $10,000

- Fixed %: 0
- Occupancy Year 1: 75%
- Calculation: $10,000 \times .75
- Calculated Expense: $7,500

If a number between 0 and 100 is entered for the Fixed % field, the entry will represent the fixed (guaranteed) portion of the expense, and the remaining percentage of the expense will be variable (based on occupancy).

**Example:**

Annual Amount of Expense: $10,000

- Fixed %: 50%
- Calculation for Fixed portion: $10,000 \times .50
- Calculated First portion: $5,000
- Calculation for Variable portion: $10,000 \times .50
- Result: $5,000
- Occupancy Year 1: 75%
- Result at occupancy: $5,000 \times .75
- Calculated Second Portion: $3,750

Add Fixed and Variable Portions:

- Calculated Expense: $8,750
General Vacancy is a valuation related calculation that forces a minimum revenue deduction based on a projected annual vacancy rate. ARGUS DCF calculates the actual vacancy loss of each property including vacancy due to down time between leases and losses associated with vacant space prior to lease up. These losses are then subtracted from the projected General Vacancy Loss to determine the final General Vacancy Loss results for the model.

Percent of Potential Gross Revenue

Potential Gross Revenue is defined as the income of a property at the highest probable occupancy and rent levels. Potential Gross Revenue includes the following items:

- Scheduled Base Rental Revenue
- Base Rental Step Revenue
- Porters’ Wage Revenue
- Miscellaneous Rental Revenue
- CPI & Other Adjustment Revenue
- Retail Sales Percent Revenue
- Expense Reimbursements
- Miscellaneous Revenues
- Parking Revenue

When you apply a primary Vacancy Loss rate to the Potential Gross Revenue, the projected cash flow of the property is capped at rate equal to one minus the General Vacancy loss rate.
Adjustments for Absorption & Turnover Vacancy

Reduce General Vacancy Result by Absorption & Turnover Vacancy

By default, ARGUS DCF subtracts Absorption & Turnover Vacancy, which is the projected vacancy loss associated with downtime between leases and losses incurred prior to the lease up of vacant space, from the initial General Vacancy result.

This adjusted General Vacancy result will then be subtracted from the cash flow. If the Absorption & Turnover Vacancy is greater than the initial General Vacancy result, the General Vacancy for that period will be completely offset.
**Formula:**

\[ GV = ((PGR + ATV) \times \%) - ATV \]

<table>
<thead>
<tr>
<th>Where...</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GV</td>
<td>General Vacancy</td>
</tr>
<tr>
<td>PGR</td>
<td>Potential Gross Revenue</td>
</tr>
<tr>
<td>ATV</td>
<td>Absorption Turnover Vacancy</td>
</tr>
<tr>
<td>%</td>
<td>Vacancy Rate</td>
</tr>
</tbody>
</table>

**Percent Based on Revenue Minus Absorption & Turnover Vacancy**

By default, ARGUS DCF will add back any Absorption & Turnover Vacancy losses before calculating the initial General Vacancy result. The result is an initial General Vacancy Loss result based on revenue for the building as if it were fully leased up.

Users have the ability to select the “Percent Based on Revenue Minus Absorption & Turnover Vacancy” option to force ARGUS DCF to calculate the initial General Vacancy result based on revenues less the projected Absorption & Turnover Vacancy. This results in a smaller initial General Vacancy loss result.

**Formula:**

\[ GV = PGR \times \% \]

<table>
<thead>
<tr>
<th>Where...</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GV</td>
<td>General Vacancy</td>
</tr>
<tr>
<td>PGR</td>
<td>Potential Gross Revenue</td>
</tr>
<tr>
<td>%</td>
<td>Vacancy Rate</td>
</tr>
</tbody>
</table>
Chapter 4
Rental Revenue

Rental revenue is cash flow related to tenants and leasing activities. Items that contribute to rental revenue include Base Rents, Step Rents, CPI Rents, Parking Revenues, Retail Sales, and Miscellaneous Revenues.

Lease Start Dates
ARGUS DCF supports two methods for entering start dates on the Rent Roll.

Relative Start Dates
Entering a month number (see illustration below) relative to the analysis start date will signify the month in which a tenant will begin a lease term and instruct ARGUS DCF to calculate absorption loss between the analysis start date and the lease start date.

Example:
ABC Corporation has a signed a lease and will move in July 2008. The space is currently empty, but it is available and ready for move-in by the tenant. As a result of these circumstances, six months of Absorption & Turnover Vacancy is considered appropriate for this space.
Absorption & Turnover Vacancy is calculated by using a weighted average market rate for the period of vacancy. In this example, new market rent is ¥17,500/Tsubo/Month and the renewal market rent is ¥17,000/Tsubo/Month. The renewal probability is 50%, resulting in the following:

\[
\text{Absorption & Turnover Vacancy} = (¥17,500 \times 50\%) + (¥17,000 \times 50\%) = ¥17,250/Tsubo/Month
\]

### Fixed Start Dates

Entering a calendar lease start date (i.e. YY/MM) instructs ARGUS DCF to ignore the vacancy loss associated with this scenario.

### Example:

ABC Corporation has a signed a lease but will not move in until July 2008. The space is under construction but will be ready at the end of June. As a result of these circumstances, six months of Absorption & Turnover Vacancy is not considered appropriate for this space.
Detailed Base Rent

The following formula is used to calculate a percent increase for a tenant’s base rent:

\[(\text{Percentage Increase}) \times (\text{Previous Rent}) = \text{Increase} \]
\[(\text{Increase}) + (\text{Previous Rent}) = \text{Rent Generated}\]

Percent Increase Annually

The % Inc, Annual option allows you to enter a set percentage in the Amount field. This percentage will be applied to the tenant’s rent on an annual basis.

**Example:**
Apply a 3% Annual Increase to Base Rent of $49,000

Year 1: Base rent = 49,000
Year 2: 49,000 x 1.03 = 50,470
Year 3: 50,470 x 1.03 = 51,984
Year 4: 51,984 x 1.03 = 53,543

% of Market

Base Rent can be linked to market rent entered in the Market Leasing Assumption category. The selection for this method is found within the Unit of Measure field, adjacent to the Base/Min Rent column on the Rent Roll and the Space Absorption windows.

When a percentage is entered in the Base/Min Rent field, ARGUS DCF will calculate the entry as a percentage of New Market Rent from the tenant’s Market Leasing Assumptions:
Example:

If the tenant is to pay 95% of Market and the new Market Rent is ¥17,500, then Base Rent is ¥16,625 (95% × ¥17,500).

CPI

The Consumer Price Index, or CPI, is an index that is often referenced in lease contracts to stipulate rent increases over time. In ARGUS DCF, the increase in the CPI index translates to a percentage increase in rent. More specifically, the CPI calculation is based on the sum of the previous year’s base rent and adjustments.

**Formula:**

\[
\text{[Prior Year Base Rent + Step Rent + CPI Rent]} \times \text{CPI Rate} = \text{CPI adjustment for this year}
\]

With the Lease Year CPI method, yearly CPI adjustments are added to the prior year CPI rent, and CPI is adjusted on the anniversary date of the lease for each year within the term.
When a CPI adjustment is applied, you have the option of entering any previously collected CPI adjustments prior to the analysis. If an amount is entered in the Current Amount field, ARGUS DCF will use this amount when calculating the next year’s CPI adjustment. When no amount is entered into the Current Amount field, the next year’s CPI adjustment is calculated on base rent only.

Example:
Rent = ¥120,000,000
Year 1 CPI = ¥0
Year 2 CPI = ¥120,000,000 * 3% = ¥3,600,000
Year 3 CPI = [(¥120,000,000 + ¥3,600,000) * 3%] + ¥3,600,000 = ¥7,308,000
Parking

ARGUS DCF supports multiple methods for projecting parking revenues at a property and tenant level.

Miscellaneous Parking Revenue

Property Level Parking can be entered as a miscellaneous revenue. Like other miscellaneous revenues, the parking revenues on this screen will be inflated throughout the valuation period. Furthermore, the parking revenues can be tied to occupancy by entering a figure of less than 100 in the % Fixed field.

Tenant Level Parking

Assigned tenant level parking can be entered within the Rent Roll and the Market Leasing Assumptions screen. The parking section of the Rent Changes screen allows you to enter tenant specific parking information. The parking revenues entered for tenants on the Rent Roll are not inflated during the tenant’s lease.

To calculate revenues generated by a tenant’s parking rents, enter the number of spaces the tenant leases and the monthly amount per space the tenant is charged.

- **Formula:**
  
Parking Revenues = Number of Spaces \times \text{Amount/Space/Month}
Example:
Annual Parking Revenue = (10 Spaces x ¥50,000/Space/Month) x 12 months = ¥6,000,000

It is also possible to detail the tenant parking assignments to reflect different rates on different types of parking spaces, such as covered, uncovered and reserved spaces.

At the end of the lease term, the parking revenue for the number of spaces assigned to the tenant will automatically calculate at the market parking rate specified on the main property level Parking Screen if the default “Continue Prior” selection is maintained in the corresponding Market Leasing Assumption for that lease.

In this example the project parking revenues for the renewal term will be equal to the number of assigned spaces in the original lease, multiplied by the market parking rate per month, described in the next section.

Property Level Parking
The third method for projecting parking revenue in ARGUS DCF is Property Level Parking. From the Tenant menu, the Parking Revenue screen may be selected:
This window defines the market parking rate per month, inflation (leave blank to default to General Inflation), the total number of spaces or stalls for the property including tenant assigned spaces, and the maximum occupancy of parking, which can exceed 100% to account for hourly or visitor parking.

While there is no relationship between the information entered on this screen and the Miscellaneous Parking Revenues described above, there is a very close relationship between the parking revenues derived with this information and the Tenant Level assigned parking described in the previous section, as seen below.

In this example, the property has 20 spaces total. Ten of these spaces have been assigned to a single tenant. Those ten assigned spaces are calculated as described previously. The remaining unassigned spaces are calculated at the market parking rate based on the remaining occupancy of the property, excluding the occupancy of tenants who have been assigned spaces at the tenant level.

If the example property is 90% occupied and the tenant with the 10 assigned spaces accounts for 50% of the total property area, then a portion the remaining 10 spaces adjusted for occupancy will be calculated at the market rate.
Example:

<table>
<thead>
<tr>
<th>Property Size:</th>
<th>1,000 Tsubos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Parking Rate:</td>
<td>¥60,000/Space/Month</td>
</tr>
<tr>
<td>Total Stalls/Spaces:</td>
<td>20</td>
</tr>
<tr>
<td>Total Property Occupancy:</td>
<td>90%</td>
</tr>
<tr>
<td>Assigned Spaces:</td>
<td>10</td>
</tr>
<tr>
<td>Occupied Area of Tenants with Assigned Spaces:</td>
<td>500 Tsubos</td>
</tr>
<tr>
<td>Parking Rate for Assigned Spaces:</td>
<td>¥50,000/Space/Month</td>
</tr>
</tbody>
</table>

Assigned Parking Revenue: 10 Spaces x ¥50,000/Space/Month = ¥500,000/Month

Unassigned Spaces:
| Occupied Area of Tenants without Assigned Spaces: | 10 (Total Stalls – Assigned Spaces) |
| % Occupancy of Area associated Unassigned Spaces: | 80% (400/500) |

Unassigned Parking Revenue: 10 Spaces x ¥60,000/Space/Month x 80% = ¥480,000/Month

At the end of the lease term for the space with 10 assigned spaces, parking revenues will be projected, by default, at the market parking rate (10 Spaces x ¥60,000/Space/Month).
Reimbursements

Revenues may be generated by recovering certain operating expenses from the tenants or by assessing service charges in addition to base rent. The recovery options are selected in the Tenant Rent Roll under the Reimbursements column. Three default options are available:

None
This option results in the absence of recovery charges for the tenant’s share of reimbursable operating expenses.

Net
This option results in the tenant paying their full pro rata share of the reimbursable operating expenses.

Base Stop
This option results in the tenant paying their pro rata share of expenses in excess of a base year amount. The tenant’s base year amount or stop is determined by the reimbursable operating expenses in the first year of the lease. Recovery charges are calculated for the tenant when future reimbursable expenses exceed the expense level in the base year of the lease term.

In this example, ABC Inc. occupies 40% of the property and pays their pro rata share of reimbursable expenses over a base year stop.
In year 1 of the analysis, maintenance expenses for the property are ¥4,200,000. Based on a 3% projected growth rate, year 2 expenses are expected to be ¥4,326,000. The tenant’s pro rata share of the increase in expenses in year 2 over the base year is ¥50,400 / Year \((¥4,326,000 - 4,200,000) \times 40\%) or ¥4,200 / Month.

Simple Reimbursement Amounts
Alternatively, simple service charge amounts may be entered directly into the Reimbursement column. These amounts can be entered as yearly or monthly rates and as either currency amounts or currency per area rates.
Leasing Costs

ARGUS DCF supports a number of different methods for calculating leasing commissions:

- **Percentage** - percentage of base rent, step rent and free rent over the entire lease term
- **Currency per Area** - this amount will inflate from the start of the analysis by the leasing cost inflation rate or the general inflation rate
- **Currency Amount** - this amount will inflate from the start of the analysis by the leasing cost inflation rate or the general inflation rate
- **Number of Months** - the product of this entry times the base rent in the first month of the lease
- **Lease Year Percentage** - percentage of base rent, step rent and free rent for each year of the lease up to 10 years; the percentage for year 11 will be used for year 11 and all subsequent years in a longer term lease
- **First Month and Percent of Remaining** - a percentage of the first months base rent, step rent and free rent, and a different percentage of the remaining months in the lease
- **1st Yr + % Mkt. Review** - percentage of base rent, step rent and free rent for the first year, and a separate percentage of rent increases for the remaining years
ARGUS DCF support two basic methods for calculating tenant improvements. Tenant improvements can be entered as simple currency amounts or currency per area rates.

**Space Absorption**

The Space Absorption window is used to enter information about currently vacant space that will be absorbed during the analysis period. When entering these vacant blocks, there are three date fields: Date Available, Begin Leasing, and Create Leases.

The **Date Available** field determines when ARGUS DCF will begin calculating potential rent for the space. ARGUS DCF calculates potential rent at the average market rental rate for space that is available for leasing, but is currently vacant. This potential rent is offset on the cash flow by a corresponding absorption and turnover vacancy amount. Leave this field blank to use the analysis start date as the Date Available.

**Formula:**

Average Market Rent=(Renewal Market Rent x Renewal %) +(New Market Rent x (1-Renewal %))

The **Begin Leasing** field determines when ARGUS DCF will begin leasing the space.

The **Create Leases** field determines how often ARGUS DCF creates leases from the Total Area available based on the Number or Size of Leases indicated. The first lease will be created on the Begin Leasing date, and subsequent leases will be created monthly, quarterly, semi-annually or annually.

In this example, a 100 Tsubo area will be divided into 4 leases. The first lease will be created in April and subsequent leases will begin in each of following 3 months. Because these spaces are not available until February, absorption loss is not calculated for the first month.
## Tenant Potential Gross Revenue

<table>
<thead>
<tr>
<th>Period</th>
<th>Month 1</th>
<th>Month 2</th>
<th>Month 3</th>
<th>Month 4</th>
<th>Month 5</th>
<th>Month 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Rental Revenue</td>
<td>0</td>
<td>410,250</td>
<td>410,250</td>
<td>417,500</td>
<td>417,500</td>
<td>427,500</td>
</tr>
<tr>
<td>Absorption &amp; Turnover Vacancy</td>
<td>0</td>
<td>(47,250)</td>
<td>(47,250)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Base Rent Abatements</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Scheduled Base Rental Revenue</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>417,500</td>
<td>417,500</td>
<td>427,500</td>
</tr>
</tbody>
</table>

### Notes
- The values in the table are in USD.
- The software interface shown is for demonstration purposes and may not reflect actual data entry or calculation methods.
- The **ARGUS Valuation – DCF Calculation Manual** is used as a reference for understanding the valuation process.
Chapter 5
Market Leasing Assumptions

Market Leasing Assumptions allow you to set up the market conditions that ARGUS Valuation DCF will use after the current lease expires. Market Leasing Assumptions are needed for all tenants, even if the tenants do not renew in the analysis time frame.

Renewal Probability

Renewal Probabilities are used to weight the New and Renewal entries of the following Market Leasing Assumption categories: Market Rent, Months Vacant, Tenant Improvements, Leasing Commissions, Rent Abatements, and Security Deposits.

The entry in the Renewal Probability field represents the likelihood that a tenant will renew their lease upon expiration.

- **Formula:**

  \[
  \text{Market Rate for the category} = \left( \% \text{ Probability} \times \text{Renewal Market category} \right) + \left( 100\% - \% \text{ Probability} \right) \times \text{New Market category}
  \]

In the above screenshot, the Market rate for the Market Rent category is calculated as follows:

\[
(75\% \times $26) + (25\% \times $28) = $19.5 + $7 = $26.50
\]
**Months Vacant**

The Months Vacant field determines the downtime between leases. With the Upon Expiration field set to Market, the Months Vacant entry will be weighted by the Renewal Probability to determine the amount of downtime that will be applied to leases that are expiring.

When entering the downtime to apply, fractional months may be specified. However, ARGUS Valuation DCF always applies a whole number of months. After weighting the entry, ARGUS Valuation DCF rounds the fractional months to the nearest whole month.

**Example:**

<table>
<thead>
<tr>
<th></th>
<th>New Market</th>
<th>Renewal Nkt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewal Probability</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Market Rent</td>
<td>MKT RENT 1</td>
<td></td>
</tr>
<tr>
<td>Months Vacant</td>
<td>4.5</td>
<td>0</td>
</tr>
</tbody>
</table>

This example shows 4.5 months of vacancy between leases. With a renewal probability of 50%, the weighted average of downtime is calculated as follows:

\[(50\% \times 0 \text{ months}) + (50\% \times 4.5 \text{ months}) = 0 + 2.25 = 2.25 \text{ months vacancy}\]

When applying downtime in the valuation, ARGUS Valuation DCF will round to the nearest whole number of months, 2 months in this case.
Upon Expiration

The **Upon Expiration** field determines what happens to the space when the current lease expires. You may choose from the following options:

- **Market**: Selecting this option indicates that the space will be re-leased according to the weighted average parameters in the associated Market Leasing Assumptions. If you select *Market*, you can enter a renewal probability percentage in the **Renewal Probability** field. After the first lease expires, the space will be re-leased using the information in the Market Leasing Assumptions.

- **Renew**: Selecting this option indicates that the space will be re-leased according to the parameters in the associated Market Leasing Assumptions. The lease will have a 100% probability of renewing. The renewal probability in the Market Leasing Assumptions will not be used after the lease expires, i.e., the first rollover. Only the renewal values in the Market Leasing Assumptions will be used for the first rollover. No weighting with the new values will occur. After the first rollover, the space will be re-leased using the weighted average of the information in the Market Leasing Assumptions. (I would change the Renew entry to follow this as well).

- **Vacate**: Selecting this option indicates that the space will be re-leased according to the assumptions for new tenants in the associated Market Leasing Assumptions. The lease will have a 0% probability of renewing; the renewal probability in the Market Leasing Assumptions will be ignored for the first rollover. In other words, only the new values in the Market Leasing Assumptions will be used for the first rollover, no weighting with the renewal values will occur. After the first rollover, the space will be re-leased using the weighted average of the information in the Market Leasing Assumptions.
Option: Selecting this option indicates that an option lease will be created. Option leases display the word *Option* in the *Lease Type* field. An option is a continuation of the original lease. You cannot enter the start date for an option lease. It will begin in the month following the expiration of the original lease. When the option lease is created, it copies the same entries listed on the original lease except for the *Lease Type*, *Start Date*, and *Upon Expiration* fields. You can change any other fields to reflect the information in the lease clauses, such as leasing commissions and tenant improvements.

ReAbsorb: Selecting this option ends revenue from the space when the lease expires. To re-lease the space, you must enter it again on either the Rent Roll or the Space Absorption window. This selection is useful for splitting a large tenant's space into space for smaller tenants or combining several small spaces into a single space for a large tenant.

Non-Contiguous: This option allows you to link multiple lines on the Rent Roll into one lease. To enter non-contiguous leases, you should select this option for the first lease entered. If you select this option, the *Renewal Probability* field for the first line will be unavailable and another line will be created with the word *Continuation* displayed in the *Lease Type* field. In addition, the *Start Date* and *Expiration* fields in the new line will be unavailable. Non-contiguous leases run at the same time as the first lease, not after the first lease. You will enter the renewal probability for the entire lease on the last line for that lease. You may report all lease lines that are part of the same lease on one sheet by choosing the *Combine Non-Contiguous Leases* option on the Individual Tenant Reports window.

Renewal Probability
The Renewal Probability field is used to override the probability entry in the Market Leasing Assumption for the first lease expiration. It provides you with tenant-by-tenant control of the first rollover without creating a large number of Market Leasing Assumption categories.

The Renewal Probability field is only available when the Upon Expiration field is set to Market. If the Renewal Probability field is left blank, ARGUS Valuation DCF will calculate the market rates using the renewal probability in the associated Market Leasing Assumption.
Intelligent Renewals

Intelligent Renewal categories provide you with flexibility in determining the renewal base rent for tenants. They allow you to renew a lease base rent using the lesser or greater of the last month's rent, a contract rent rate, or a Market Leasing Assumption category. Also, you can use Intelligent Renewal categories to compare the last, contract, and market renewal rates. You can then preset the renewal to use the larger or smaller of the two sets of rates.

Intelligent Renewals are created by clicking Detail on the Upon Expiration field.

Last or Contract Rent
This section determines the rent renewal rate based either on the rate during the last month of the tenant’s lease, or a specified contract rate.

New Rent Based On
This section determines whether the Last or Contract Rent section or the Market Rent section will be used to determine a renewal rent.

Market Rent
The Market Rent section allows you to select the weighted renewal rent rate from the tenant’s Market Leasing Assumption category for the renewal rent. You may also use the weighted renewal rent from a different Market Rent category.
**Example:**

A property has $20 per square foot base rent with a 2 year lease. The Use % Of field in the Last or Contract Rent section is set for 50%. The **Contract** radio button is active with a rate of $10 per square foot.

The renewal probability in the Market Leasing Assumption is set for 65%, with a renewal rent of $15 per square foot and a market rent of $10. This gives a weighted renewal rent of $13.25.

If the **Lesser** option is active in the New Rent Based on section, ARGUS will use a base rent amount of $5 per square foot rent to renew the lease beginning in Year 3. The figure was obtained by multiplying the $10 contract rate and the use % of figure of 50%. The result, $5 per square foot, was smaller than the $13.25 per square foot market leasing rate.

If the **Greater** radio button is active, ARGUS will use the $13.25 per square foot market rent for the renewal, since it is larger than the contract rate of 50% of $10, or $5.

**Note:** Intelligent Renewals can affect other items besides base rent in a report. Items influenced by the base rent rate will be affected. These may include CPI, miscellaneous rent, abatements, expenses, and retail sales.
Chapter 6
Purchase and Resale

Yields may be calculated for the Purchase and Resale of a property.

Current Value
On the Property Purchase window, an amount may be entered for the purchase of the property. This purchase amount is assumed at the analysis start for the valuation. By default, the Purchase Price is used as the Initial Equity in the IRR calculations. However, you can change the Initial Equity calculation using the Current Value for IRR Calculations section.

Inflate Purchase Price
Select the Inflate Purchase Price option to determine current value of the property by inflating the initial purchase price. You may specify an inflation rate for the purchase amount, or leave the field blank to use the general inflation for the purchase amount.

Current Amount
Select the Current Amount option to directly enter the current value of the property. This initial equity value should be entered as of the reporting start date as it is not affected by inflation.
The Modified Internal Rate of Return (MIRR) is an alternative method of calculation that in some circumstances may provide you with a more accurate reflection than the internal rate of return.

The MIRR calculation requires a reinvestment rate and a safe rate. This rate will be reported beneath the IRR on the unleveraged and leveraged cash flows.

**Formula:**

\[
MIRR = \left[ \frac{\sum_{s=1}^{n} (CF_s)(1+r)^s}{CF_0} \right]^{1/n} - 1
\]

**Where...**

- \(CF_s\) = Cash Flows in period \(S\)
- \(CF_0\) = Initial Cash Flow (Cost)
- \(n\) = Number of Periods
- \(r\) = Reinvestment Rate
- \(s\) = Current Period
Chapter 6

Property Purchase Price & Current Value

- Property Purchase Price:
  - Initial Amount
  - Direct Cap Value as of Analysis Start

Current Value for IRR Calculations:
- Initial Purchase Price:
- Current Amount
- Cumulative Costs
- Direct Cap Value as of Reporting Start

Press this button to input MRR information.

Modified Internal Rate of Return

- Reinvestment Rate
- Safe Rate

Enter the interest rate received on the cash flows reinvested (for example 10.50)
Capitalize Net Operating Income

When determining the resale value of the property, a common method of calculation is Capitalizing the Net Operating Income (NOI). The value is determined by dividing the NOI by the entered cap rate.

Formula:
Net Operating Income ÷ Cap Rate = Resale Value
Example:

Resale Calculation = Capitalize Net Operating Income
Cap Rate = 10%
NOI = $1,211,948
Gross Proceeds from Sale = NOI ÷ Cap Rate = $12,119,480
Capitalize Cashflow after Leasing Costs

When determining the resale value of the property, you may wish to account for Leasing and Capital Costs. The CAP Cash Flow after TIs and LCs option determines the resale value by dividing the cash flow before debt by the cap rate.

**Formula:**

\[
\text{Value for Resale Calculation} = \frac{\text{Net Operating Income} - \text{Tenant Improvements} - \text{Leasing Commissions} - \text{Capital Expenditures} - \text{Development Costs}}{\text{Cap Rate}}
\]

\[
\text{Resale Value} = \frac{\text{Value for Resale Calculation}}{\text{Cap Rate}}
\]
Grossed Up to Stabilized Market Vacancy

When calculating the resale value for the property, the Grossed Up to Stabilized Market Vacancy option allows you to enter a stabilized market vacancy rate and cap rate, while also grossing up expenses.

The Stabilized Market Vacancy rate is the single average market vacancy for the entire holding period. This vacancy rate may be different from the value entered in the General Vacancy window.

By using this resale method, the resale year’s NOI will automatically be adjusted to stabilized occupancy prior to capitalization.
Capitalization Method

The Capitalization Method option allows you to perform property valuations using the market rent capitalization method. When this method is selected, you must specify if the Gross method (market rent includes additional revenues) or the Net method (market rent does not include additional revenues) will be used for the calculation.

**Formula:**

![Property Resale Window]

![Capitalization/Discount Rates Window]
Chapter 7
Depreciation and Taxes

The Depreciation and Taxes window allows you to control depreciation of various items and determine the tax rate for a property. The ARGUS DCF reports, including the Depreciation Schedule and Income Statement are affected by the depreciation and tax data.

Name
The Name column lists the items you can depreciate. You may depreciate any of the following items: Property, Capital Expenditures, Development Costs, Debt Interest, Leasing Commissions, or Tenant Improvements.

Method
The Method field contains a drop-down list of the available depreciation methods. You can also enter detail for specific user-defined depreciation percentages over time. You may select from the following options: None, Expense, Straight Line, Amortization, Double Declining, Capitalize, or Detail.
**Straight Line Depreciation**

The Straight Line Depreciation option is used when you want to divide the cost of a tangible asset by the asset’s useful life.

- **Formula:**

  \[
  \text{Depreciation per Year} = \frac{\text{Cost of Asset}}{\text{Useful Life in Years}}
  \]

- **Example:**

  A building has a useful life of 40 years and has a value of $1 million. The depreciation will use the formulas and produce these results.

  \[
  \frac{$1,000,000}{40 \text{ Years}} = $25,000 \text{ per year for 40 Years}
  \]

**Double Declining Depreciation**

This option is double the results of Straight Line Method.

- **Example:**

  \[
  \frac{(100 \% \div \text{Useful Life}) \times 2}{\text{Double Declining Percentage}}
  \]

  \[
  \text{Depreciation Input Previous} - \text{Year Depreciation (Zero for Year 1)}
  \]

  \[
  \frac{\text{Amount to Depreciate} \times \text{Double Declining Percentage}}{\text{Depreciation Value}}
  \]
**Capital Gains Tax**

Capital Gains Tax: A tax on profits from the sale of Real Estate or Investments. It is a tax charged on capital gains, the profit realized on the sale of a non-inventory asset that was purchased at a lower price. The most common capital gains are realized from the sale of stocks, bonds, precious metals and property. For most people, the capital gains tax rate is currently 15% for an elapsed time between purchase and sale of more than one year, and your normal tax rate for an elapsed time of 1 year or less.

**Value Added Tax**

Value Added Tax: is tax on exchanges. It is levied on the added value that results from each exchange. It differs from sales tax because a sales tax is levied on the total value of the exchange. For this reason, a VAT is neutral with respect to the number of passages that there are between the producer and the final consumer. A VAT is an indirect tax, in that the tax is collected from someone other than the person who actually bears the cost of the tax (namely the seller rather than the consumer). To avoid double taxation on final consumption, exports (which by definition, are consumed abroad) are usually not subject to VAT and VAT charged under such circumstances is usually refundable.

In ARGUS DCF, The Value Added Taxes (VAT) window, which you can access by selecting the corresponding menu option on the Yield menu, allows you to enter various VAT amounts. This window is very similar to the other revenue and expense windows. Entries on the Value Added Taxes window will be available on the Percent of Line Entries window in revenues and expenses.
Chapter 8
Valuations and Returns

Unleveraged Present Value

The annual, end-point on Cashflow and Resale method discounts all cash flows from the end of the year they are received to the reporting start date using the number of months left in the year. The cash flow for Year 1 will be discounted to the start of the reporting period. A short first year is discounted by adjusting for the number of months in the first year. The resale proceeds are discounted back to the reporting start date from the end of the holding period.

Formula:

\[
PV = \left( \sum_{t=1}^{np} \frac{CF_t}{(1 + r)^{\frac{m}{n}}} \right) + \left( \frac{CF_{tn}}{(1 + r_n)^{tn}} \right)
\]

<table>
<thead>
<tr>
<th>Where...</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>Present Value of cash flows; Target Initial Investment</td>
</tr>
<tr>
<td>CF0</td>
<td>Initial investment at time ‘0’ or Reporting Start</td>
</tr>
<tr>
<td>CFt</td>
<td>Cash Flow at year defined by t</td>
</tr>
<tr>
<td>CFtn</td>
<td>Resale Value</td>
</tr>
<tr>
<td>np</td>
<td>Number of periods</td>
</tr>
<tr>
<td>t</td>
<td>Time</td>
</tr>
<tr>
<td>tn</td>
<td>Resale Period</td>
</tr>
<tr>
<td>r</td>
<td>Discount rate; Target IRR</td>
</tr>
<tr>
<td>r_n</td>
<td>Resale Discount rate</td>
</tr>
<tr>
<td>m</td>
<td>Number of months to discount; Endpoint</td>
</tr>
<tr>
<td>n</td>
<td>Number of months in one year for endpoint calculation</td>
</tr>
</tbody>
</table>
Example:

Below is the ARGUS DCF Present Value Report and calculations using the above endpoint PV formula. The cash flow consists of 3 (12 month) years with resale occurring at the end of the third year. The Discount Rate used for each cash flow year and net resale is at 14%.

ARGUS DCF Present Value Report:

<table>
<thead>
<tr>
<th>Analysis Period</th>
<th>Annual Cash Flow</th>
<th>P.V. of Cash Flow @ 14.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>($617,011)</td>
<td>($541,238)</td>
</tr>
<tr>
<td>Year 2</td>
<td>612,350</td>
<td>471,184</td>
</tr>
<tr>
<td>Year 3</td>
<td>781,188</td>
<td>527,279</td>
</tr>
<tr>
<td>Total Cash Flow</td>
<td>778,527</td>
<td>457,225</td>
</tr>
<tr>
<td>Property Resale @ 10% Cap Rate</td>
<td>$6,405,143</td>
<td>$4,323,269</td>
</tr>
<tr>
<td>Total Property Present Value</td>
<td>4,780,514</td>
<td>=</td>
</tr>
</tbody>
</table>

Formula:

\[
\begin{align*}
\text{Year 0 : PV} & = \frac{-541,237.72}{1.14^{12}} + \frac{617,011}{1.14^{12}} + \frac{612,350}{1.14^{24}} + \frac{781,188}{1.14^{36}} + \frac{6,405,143}{1.14^{36}} \\
\text{Total} & = 4,780,514
\end{align*}
\]
Leveraged PV

To calculate the leveraged present value of a property, you can select from the following methods below. The name of the method you select will be printed at the top of all Prospective Present Value Summary reports.

Anually (Mid-Point on CF/End-point on Resale)
This method uses mid-point discounting for the cash flow from the middle of the year received to the reporting start date. The cash flow for Year 1 will be discounted six months if the first year is a full 12 months. A short first year is discounted by adjusting for the number of months in that short year. The resale proceeds are discounted back to the reporting start date from the end of the holding period.

**Formula:**
\[
PV = \frac{FV}{(1+i)^r}
\]
Direct Cap Value

The **Direct Capitalization** option on the **Yield** menu allows you to determine the value of a property by directly capitalizing the first year of the reporting period.

**Cash Flow to Capitalize**

Select the cash flow item you wish to capitalize. You may choose from the following options:

- **No Capitalization Calculation**: This option, which is the default, indicates that capitalization will not be calculated.
- **Net Operating Income**: Select this option to capitalize net operating income.
- **NOI at Stabilized Market Vacancy**: Select this option to capitalize net operating income at stabilized market vacancy. This option is only available when you choose Year One in the Capitalization Period section. In addition, this option is not available for properties in hotels and general properties where it is not available as a resale method.
- **NOI less Capital Costs**: Select this option to capitalize net operating income less capital costs (e.g., tenant improvements, preparation costs in multi-family, leasing commissions).

**Formula:**

Direct Cap = NOI ÷ Value of Property
Percentage Value Distribution

Assured Income
Assured Income reflects the cash flow that is achievable assuming that all tenants in place as of the analysis start date finish their current terms and vacate. Any lease that begins after the analysis start date is not part of Assured Income. Only expenses attributable to a specific tenant are subtracted from that tenant’s revenue. This is the amount of income that would be derived from the existing tenants until they have vacated their space at the end of the analysis.

Prospective Income
Prospective Income includes the cash flows for the renewal, rollover and option terms of current tenants. It also includes leases from the Space Absorption window and leases on the Rent Roll that begin after the analysis start date. All Capital Expenditures & Revenues are also considered prospective.

Prospective Property Resale
Prospective Property Resale equals the Property Resale amount @ x% / Total Property Present Value @ x%.
Rolling PV

Rolling Present Value creates a Future Present Values report that shows the present value of the cash flow and the resale amounts for each year of the reporting period.

The first column on the report shows the dates of projected property resale. The second shows the property resale amounts. The third column shows the dates to which the present value is being discounted. The fourth column shows the combined cash flows discounted to the dates in the third column. The fifth column shows the amounts of property resale discounted to the
dates in column three. The sixth column shows the combined present values of the cash flow and the resale. The last two columns show the total percentages that the cash flow and resale represent.

### Annual IRR

The Internal Rate of Return is the Discount Rate when the calculated Net Present Value is equal to ‘0’. ARGUS DCF calculates the IRR in the same manner as the \( =\text{IRR}(x_1:x_n) \) function found in Microsoft Excel. ARGUS needs a calculated initial investment from the Purchase Price window to calculate along with annual total cash flows for each year. If activated, a calculated resale may also be added to the final year’s cash flow for the IRR calculation.

#### Unleveraged

ARGUS DCF, at the Reporting Start date, needs a calculated initial investment entry from the Purchase Price window. ARGUS DCF then calculates the twelve month totals for each year; adding the resale to the final year’s cash flow.

#### Example:

Below is a sample cash flow, where in ARGUS DCF, $8,000,000 was entered as the Purchase Price (CF0). The annual cash flows (CF1 - CF5) is the investment upkeep in that the final year (CF5) is the sum of the calculated resale $9,327,859 and the final cash flow $954,478.

<table>
<thead>
<tr>
<th></th>
<th>CF0</th>
<th>CF1</th>
<th>CF2</th>
<th>CF3</th>
<th>CF4</th>
<th>CF5</th>
</tr>
</thead>
<tbody>
<tr>
<td>$</td>
<td>($8,000,000)</td>
<td>($517,560)</td>
<td>$894,111</td>
<td>$894,296</td>
<td>($113,040)</td>
<td>$10,282,337</td>
</tr>
</tbody>
</table>

Excel formula:

\[
\text{IRR} = \text{IRR}(\text{CF}2: \text{CF}5) = 7.75\%
\]
**Leveraged**

ARGUS DCF uses the same calculation for the Leveraged IRR, the only difference being that the program takes debt into consideration for this calculation. This includes any debt that is withdrawn at the Reporting Start date, debt service for each year and any debt retirement in the year of resale.

### Example:

Same cash flow as the unleveraged example above, but with debt financing.

<table>
<thead>
<tr>
<th>CF0</th>
<th>CF1</th>
<th>CF2</th>
<th>CF3</th>
<th>CF4</th>
<th>CF5</th>
</tr>
</thead>
<tbody>
<tr>
<td>($8,000,000)</td>
<td>($517,560)</td>
<td>$894,111</td>
<td>$894,296</td>
<td>($113,040)</td>
<td>$10,282,337</td>
</tr>
<tr>
<td>4,000,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>($4,000,000)</td>
<td>($805,344)</td>
<td>$606,327</td>
<td>$606,512</td>
<td>($400,824)</td>
<td>$6,272,379</td>
</tr>
</tbody>
</table>

Excel formula: \[ \text{Excel } f(x) = \text{IRR}(\text{CF}_0: \text{CF}_5) \]  

Leveraged IRR = 9.17%
To solve for IRR in ARGUS DCF:

\[ 0 = NPV = -CF_0 + \sum_{t=1}^{n} \frac{CF_t}{(1 + r)^t} \]

<table>
<thead>
<tr>
<th>Where...</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NPV</td>
<td>Net Present Value of cash flows</td>
</tr>
<tr>
<td>CF0</td>
<td>Initial investment at time ‘0’ or Reporting Start</td>
</tr>
<tr>
<td>CFt</td>
<td>Cash Flow at year defined by t</td>
</tr>
<tr>
<td>n</td>
<td>Number of periods</td>
</tr>
<tr>
<td>t</td>
<td>Time represented as years (year 1, year 2...)</td>
</tr>
<tr>
<td>r</td>
<td>Discount rate; IRR</td>
</tr>
</tbody>
</table>

ARGUS DCF iterates multiple guesses for r until the IRR has been reached or NPV=0. At that point: IRR= r.

You can also calculate r as the IRR, where:

\[ CF_0 = \sum_{t=1}^{n} \frac{CF_t}{(1 + r)^t} \]
Example:
Using the above formula and a sample of the discount rate guesses at 7% – 8.5%.

\[
\begin{align*}
\text{NPV} &= \frac{-8,000,000}{(1+0.07)^1} + \frac{894,111}{(1+0.07)^2} + \frac{894,296}{(1+0.07)^3} + \frac{-113,040}{(1+0.07)^4} + \frac{10,282,337}{(1+0.07)^5} \\
\text{NPV} &= \frac{-8,000,000}{(1+0.08)^1} + \frac{894,111}{(1+0.08)^2} + \frac{894,296}{(1+0.08)^3} + \frac{-113,040}{(1+0.08)^4} + \frac{10,282,337}{(1+0.08)^5} \\
\text{NPV} &= \frac{8,000,000}{(1+0.07)^1} + \frac{894,111}{(1+0.07)^2} + \frac{894,296}{(1+0.07)^3} + \frac{-113,040}{(1+0.07)^4} + \frac{10,282,337}{(1+0.07)^5} \\
\text{NPV} &= \frac{-8,000,000}{(1+0.09)^1} + \frac{894,111}{(1+0.09)^2} + \frac{894,296}{(1+0.09)^3} + \frac{-113,040}{(1+0.09)^4} + \frac{10,282,337}{(1+0.09)^5} \\
\text{NPV} &= \frac{8,000,000}{(1+0.06)^1} + \frac{894,111}{(1+0.06)^2} + \frac{894,296}{(1+0.06)^3} + \frac{-113,040}{(1+0.06)^4} + \frac{10,282,337}{(1+0.06)^5}
\end{align*}
\]

**IRR Calculation Result:**

\[
\begin{align*}
\text{NPV} &= 8,000,000 - 8,000,000 = 0 \\
\text{When } r &= 7.75% \\
\end{align*}
\]
Monthly and Quarterly IRR

The concept and the calculation of the Monthly/Quarterly Internal Rate of Return calculations are very similar to the Annual Internal Rate of Return that was covered in the prior section. Like the annual IRR, the monthly and quarterly IRRs are calculated in ARGUS DCF in the same way they are in Excel (=xirr(x1:xn,d1:dn,r)). The formula that is used in ARGUS DCF is a daily calculation based on a 365 day year.

**Monthly IRR**

Approximately every 30 days, ARGUS DCF will calculate a NPV for one period. The IRR is only displayed at the end of the year.

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$40,029</td>
<td>($89,579)</td>
<td>$37,979</td>
<td>$37,989</td>
<td>($74,442)</td>
<td>$48,907</td>
<td>$7,179,009</td>
</tr>
</tbody>
</table>

**Quarterly IRR**

Approximately, every 90 days ARGUS DCF will calculate a NPV for one period. The IRR is only displayed at the end of the year.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$40,029</td>
<td>($89,579)</td>
<td>$37,979</td>
<td>$37,989</td>
<td>($74,442)</td>
<td>$48,907</td>
<td>$7,179,009</td>
</tr>
<tr>
<td>$18,993</td>
<td>($7,440)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$7,151,474</td>
</tr>
</tbody>
</table>

**Formula:**

\[
0 = NPV = -CF_0 + \sum_{t=1}^{n} \frac{CF_t}{(1 + r)^{\left(\frac{d_n - d_0}{365}\right)}}
\]

**Where...**

| NPV       | Net Present Value of cash flows |
| CF0       | Initial investment at time ‘0’ or Reporting Start |
| CFt       | Cash Flow at year defined by t |
| n         | Number of periods |
| t         | Time represented as days (day 31, day 90...) |
| r         | Discount rate; IRR |
| dn        | Day of Cash flow |
| d0        | Reporting Start date or Time ‘0’ |
Chapter 9
Sources and Uses of Capital

The Sources and Uses of Capital report describes the inflow and outflow of funds to the property and ends in the final year of the analysis.

**Initial and Required Equity**

*Initial Equity Contribution* - Purchase price – Debt funding in Month 1. This will be shown only if the purchase price is greater than the debt funding.

*Required Equity Contribution*

The Required Equity Contribution line will appear anytime there is negative cash flow in a given time period. This line shows the amount of money the property owner will need to contribute to cover costs, payments, etc.

**Formula:**

\[
\text{Defined Sources of Capital} - \text{Total uses of Capital} = \text{Required Equity Contribution}
\]

**Cash to Initial Equity**

The Leveraged Cash on Cash Return line shows the relationship between the initial investment and the profit or loss generated by the property.

**Formula:**

\[
\frac{\text{Cash Flow Distributions}}{\text{Initial Equity}} \text{ or } \frac{\text{Required Equity Contribution}}{\text{Initial Equity}} = \text{Leveraged Cash on Cash Return}
\]

This annual calculation depends on whether the cash flow in each particular year is positive or negative.
Cash to Purchase Price

The Unleveraged Cash on Cash Return indicates how stable the cash flow is compared to the value of the building.

- **Formula:**

\[
\text{Unleveraged Cash on Cash Return} = \frac{\text{Net Operating Income}}{(\text{Property Purchase Price} + \text{Leasing and Capital Costs})}
\]

Net Operating Income to Book Value

NOI to Book Value is the ratio of the Net Operating Income to the cumulative Purchase Price, Leasing Costs, and Capital Expenditures.

- **Formula:**

\[
\text{NOI to Book Value} = \frac{\text{NOI}}{\text{Property Purchase price} + \text{Accumulated TI’s, LC’s, and Capital costs}}
\]
Example:
569,940/ 5,000,000 + 900,000 + 181,000 = 9.37%

Cash to Imputed Equity

The Imputed Equity Level is only displayed when there is no purchase price entered and ARGUS DCF determines that the present value is lower than the debt funding in month 1. Imputed equity indicates the negative value of the property because more is owed on the property than it is worth.
Chapter 10
Debt Financing

Debt structures for a property may be entered in the Debt Financing windows.

% of Price or PV
With the % of Price or PV option selected, ARGUS DCF bases the loan amount on a percentage of the current value of the property. Enter the amount as a positive number between 1 and 100, or less than 1 (5 or .05 = 5%).

■ Formula:
   Loan = % Entered × Purchase Price or Present Value

The property value depends on the entry in the Property Purchase Price field on the Property Purchase Price and Current Value window. If there is no entry in the Property Purchase Price field, the current value of the property is determined as the lowest present value. If the purchase price is zero, and there are no entries for the present value, the note amount is zero.

If the note start date is a date other than the analysis start date, ARGUS DCF will calculate the unleveraged present value as of the note start date, based on a future holding period equal to the length of the analysis. ARGUS DCF will use the entry in the Primary Discount Rate field on the Present Value Discounting window to calculate the present value. If you did not enter a discount rate, the value of the property will be represented by the sum of the undiscounted cash flows for the relevant period.

Loan Constant
Calculation of the loan constant amount:

   Original Principal Balance
   × Loan Constant
   = Loan Constant Amount

The amount paid is divided among interest payments and principal reductions that are calculated as follows:

   Loan Constant Amount
   - Interest Payments
   = Principal Reductions
### Interest & Principal Payments

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Monthly Principal Payment</td>
</tr>
<tr>
<td>P</td>
<td>Principal, Initial Amount of the loan</td>
</tr>
<tr>
<td>I</td>
<td>Annual Interest Rate (1 to 100 Percent)</td>
</tr>
<tr>
<td>J</td>
<td>Monthly Interest in Decimal Form = I / (12 x 100)</td>
</tr>
<tr>
<td>N</td>
<td>Number of Months that Loan is Amortized = L x 12</td>
</tr>
</tbody>
</table>

**Interest Payment:**

\[
P \times \frac{J}{12}
\]

**Principal Payment:**

\[
M = P \times \frac{J}{1 - (1 + J)^{-N}}
\]
<table>
<thead>
<tr>
<th>Category</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash to Total Interest Charged:</td>
<td>NOI in Year X</td>
</tr>
<tr>
<td></td>
<td>Interest Payments in Year X</td>
</tr>
<tr>
<td>Cash to Minimum Debt Service:</td>
<td>NOI in Year X</td>
</tr>
<tr>
<td></td>
<td>Interest Payments in Year X</td>
</tr>
<tr>
<td>Loan to Purchase Price:</td>
<td>Beginning Principal Balance</td>
</tr>
<tr>
<td></td>
<td>Purchase Price</td>
</tr>
<tr>
<td>Loan to Capitalized Value:</td>
<td>Beginning Principal Balance in Year X</td>
</tr>
<tr>
<td></td>
<td>(Twelve Months NOI / Cap Rate)</td>
</tr>
<tr>
<td>Loan to Low Present Value:</td>
<td>Beginning Principal Balance in Year X</td>
</tr>
<tr>
<td></td>
<td>Lowest Present Value</td>
</tr>
<tr>
<td>Loan to High Present Value:</td>
<td>Beginning Principal Balance in Year X</td>
</tr>
<tr>
<td></td>
<td>Highest Present Value</td>
</tr>
</tbody>
</table>
Lender’s IRR

The Lender’s IRR is the lender’s yield at the end of an analysis, including the maturity of any debt notes, prepayment penalties, and origination fees.

**Formula:**

\[ T = \text{The time between the first cash flow} \]

\[ X = \text{Dev Costs, Capital Costs, TIs, LCs, Debt Interest} \]

\[ Y = \text{Prepay penalties, Origination Fees} \]

\[
\left[ (\text{Initial Value} + X + Y) - \text{Final Value} \right] \div (1+\text{IRR})^T = 0 \\
\text{or} \\
\left[ \text{Initial Value} \times (1+\text{IRR})^T \right] - \text{Final Value} = 0
\]

\[ \text{Initial} \times (1+\text{IRR})^T = \text{Final} \\
(1+\text{IRR})^T = \frac{\text{Final}}{\text{Initial}}
\]

\[ \text{IRR} = \left( \frac{\text{Final}}{\text{Initial}} \right)^{\frac{1}{T}} - 1 \]
Macaulay’s Duration

To derive the result for Macaulay's Duration, you must first identify the present value of the debt service payments for all months in the term of the loan using the following formula:

■ Formula:

\[ PV_n = \frac{FV_n}{(1+(D/12))^n} \]

Where...

<table>
<thead>
<tr>
<th>n</th>
<th>= Month number</th>
</tr>
</thead>
<tbody>
<tr>
<td>FV_n</td>
<td>= Debt Service in Month n</td>
</tr>
<tr>
<td>D</td>
<td>= Interest rate on the loan</td>
</tr>
</tbody>
</table>

The Macaulay's Duration is the ratio of the sum of all \( PV_n \) results times the month number to the product of the total present value of debt service payments multiplied by the term of the note in months:

\[ \text{Macaulay's Duration} = \frac{\text{Sum of } PV_n \text{ terms } \times n}{(\text{Total PV of Debt Payments}) \times \text{Term in Months}} \]

Example:

<table>
<thead>
<tr>
<th>Month</th>
<th>Debt Service</th>
<th>PV_n</th>
<th>PV x n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1000</td>
<td>990.10</td>
<td>990.10</td>
</tr>
<tr>
<td>2</td>
<td>1000</td>
<td>980.30</td>
<td>1960.59</td>
</tr>
<tr>
<td>3</td>
<td>1000</td>
<td>970.59</td>
<td>2911.77</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2940.99</td>
<td>5862.46</td>
</tr>
</tbody>
</table>

\[ \text{Macaulay's Duration} = \frac{5862.46}{2940.99 \times 3} = 0.6644 \]
Chapter 11
Calculation Switches

The Calculation Switch tabs allow you to modify some of the default settings within ARGUS.

Inflate Market Rent Monthly

The Inflate Market Rent Monthly option indicates to ARGUS DCF to inflate the market rent on a monthly basis. This will change the rent for any tenant not renewing in the first month of the inflation year. This feature is useful in aggressive markets with rapidly rising inflation.

[Image of the Calculation Switches window]

Check this to inflate market rent monthly. This will change the rent of all tenants not renewing in the first month of the inflation year.
Chapter 12
Tenant Reports

Individual tenant reports show various cash flow and reimbursement reports that can be sorted by tenants.

Occupancy and Absorption in Supporting Schedules

This report does not show tenants. It includes a row for each month, and a column for each year of the analysis. The occupancy of the property is reported for each month of the analysis. Below the months, the Average Occupied for the Year is reported. Below this line are several lines that show the net absorption for the year, both on an annual and monthly basis. The second block of the report contains the same information expressed as a percentage of the property size.

The capital value of an investment property is calculated by capitalizing the net rental income stream from the property.
Supporting Schedule, Weighted Average Per Sf Ratio

Square footage reports will sum the value for each tenant in the group and divide the total by the sum of the square footage occupied by each tenant in the group.

You may also create Supporting Schedule reports a per tenant measurement unit (e.g., per tenant square foot) basis for office, retail, and industrial properties. To access these reports, choose Per Tenant Area from the Supporting Schedules sub-menu. The following reports are available:

- Prevailing Market Rate per Measure
- Scheduled Base Rental Revenue
- Base Rent Abatements
- Absorption & Turnover Vacancy
- Base Rental Step Revenue
- CPI & Other Adjustment Revenue
- Retail Sales Percent Revenue
- Expense Reimbursement Revenue
- Tenant Improvements
- Leasing Commissions
- Retail Sales per Foot
- Porters' Wage Revenue
- Miscellaneous Revenue
- Non-Refundable Deposits
- Earned Interest
- Security Deposits
- Investment of Capital
- Distribution of Investment
- Deposit Refund
Partnerships for a valuation may be entered in the Partner Equity Contribution window. This window allows you to account for any cash or non-cash contributions for the valuation.

In addition to accounting for contributions, you may also account for profit and resale distributions to those contributors.

**Cash Flow Distribution – Begin & End IRR**

The Cash Flow Distribution window determines how cash is distributed to partners as a property or as development generates enough cash flow for such a distribution.

**Begin IRR**
Enter an IRR rate as a decimal then select IRR in the corresponding **Units** field. If you use this method, ARGUS DCF will begin distributions when distributions to the partners selected in the **After Distributions** field reach the specified amount.

**End IRR**
Enter an IRR rate as a decimal then select IRR in the corresponding **Units** field. If you use this method, ARGUS DCF will begin distributions when distributions to the partners selected in the **Until Distribution to** field reach the specified amount.
Resale Distribution – Type of Return IRR

This window determines how cash is distributed to partners upon resale of a property.

Type of Return
This field is where you specify how the return on the partner's investment is determined. Select one of the following options from the drop-down list in the Type of Return field:

- **Percentage of Investment**: This option returns an annual percentage of the partner’s cumulative equity and is not affected by input to the Reduce Equity field. If a partner only adds equity to a property in the first year, that amount is used to determine the partner’s distributions for later years.
- **Percentage of Adjusted Investment**: This option returns a certain percentage of the partner’s adjusted equity. The adjusted equity is the cumulative equity minus the sum of any distributions that are defined to reduce equity. If adjusted equity is negative, the partner will not receive a distribution.
- **Percentage of Cash Remaining**: This option returns a certain percentage of the cash available for distribution.
- **Return Investment**: If you select this option, ARGUS DCF interprets the entry in the Amount field as a monthly percentage of cash flow and uses that to distribute the total amount of the equity the partner has invested in the property. ARGUS DCF will decrease the cash flow each period of calculation by the specified percentage until the investment is fully distributed back to the partner. This option will not distribute cash to a partner whose investment has already been returned due to previous distributions at a different preference level.
- **Amount per Year**: This option returns a fixed amount of money from the cash flow.
- **Percent of Prior Equity**: This option takes the entry in the Amount field as a percentage of the equity of the partner that receives distributions at the same preference level and is located in the prior line item on the Equity Contributions window.

Note: When a partner has more distribution scheduled than there is money available in the cash flow, ARGUS DCF will allocate the available funds to partners depending on their preference level. The undistributed cash flow will not reflect negative amounts. If you select the Yes option in the Cumulative field, then the funds owed will be paid when money is available in the cash flow. If not, the partner will only receive the funds available at the time of distribution.
Example:

Partner 1 has $1 million invested. Partner 2 has $500,000. Partner 1 has a distribution of $50,000 with a preference level of 1. Partner 2 has a distribution of 50% of prior equity with a preference level of 1 and is located on the line directly below Partner 1. Partner 2 will receive distribution of 50% of $50,000, or $25,000.
Partner’s Returns Report – IRR, PV

To display the Partner Reports window, from the Reports menu, choose Distributions.

Partner Returns
This report shows specifically the cash that was returned to partners and the time at which it was returned.

Equity Investment
This line shows the cash invested by a partner in the property.

Cumulative Investment
This line shows the cumulative amount of cash invested in by a partner.

Taxes
This line shows the total amount of income and capital gains tax paid on the partner distribution. Taxes are split based on the cash received.

\[
\text{Partner's Cash ÷ Total Cash} \times \frac{\text{Total Taxes}}{\text{Partner's Cash Burden}}
\]

Cash Distributed
This line shows the cash returned to the partner throughout the time period of the report.

Net Inflow
This line shows the results from the following equation:
Cash Distributed - Taxes - Equity Investment = Net Inflow

Cumulative Inflows
This line shows the accumulation of the net inflows over the time period displayed.

Annual Return
This line shows the annual return of investment for a partner.

Cumulative Return
This line shows the cumulative percentage of the annual return.

Property Resale
This line shows the amount of cash returned to a partner at the time the property is sold. This money may reflect all or part of the cash that was not distributed due to a deficit in the cash flow.
**Present Value**

The Present Value report includes several items relating to report cash flow and distribution. It is similar to the Present Value report.

The items included in the report are:

- Annual Cash Flow
- P.V. of Cash Flow @ Percentage Rate
- Total Cash Flow
- Total Property Present Value
- Per SqFt
Waterfall Distribution

Preference Level
This field is where you specify disbursement priorities. This is used when the cash flow cannot support all disbursements entered in the Cash Flow Distributions window.

Line items with lower numbers receive cash before those with higher numbers. Items with equal numbers receive distributions proportionate to their respective scheduled distributions.

Example:
In this example, Partner 1 is scheduled to receive $6,000, and Partner 2 is scheduled to receive $3,000. Both distributions are at the same preference level.

<table>
<thead>
<tr>
<th>Partner</th>
<th>Type of Return</th>
<th>Amount</th>
<th>Cumulative</th>
<th>Interest Rate</th>
<th>Preference Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner 1</td>
<td>Amount per Year</td>
<td>6,000</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Partner 2</td>
<td>Amount per Year</td>
<td>3,000</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

If there is only $1,000 available for distribution, it would be divided in the following manner.

<table>
<thead>
<tr>
<th>DISTRIBUTABLE CASH FLOW</th>
<th>$1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARTNER DISTRIBUTIONS</td>
<td></td>
</tr>
<tr>
<td>Partner 1</td>
<td>667</td>
</tr>
<tr>
<td>Partner 2</td>
<td>333</td>
</tr>
</tbody>
</table>
Cumulative Costs for IRR

This option allows you to include development costs, capital costs, tenant improvements, leasing commissions, and debt interest as part of the initial investment in the calculation of IRR. To specify that certain types of capital be accumulated as the current value, select this option, and then choose the IRR button to select the types of capital to be used. You may elect to calculate IRR starting at the reporting start date, or at a date of your choosing.

**Formula:**

\[ T = \text{The time between the first cash flow} \]
\[ X = \text{Dev Costs, Capital Costs, TIs, LCs, Debt Interest} \]

\[
\left[ (\text{Initial Value} + X) - \text{Final Value} \right] \div (1+IRR)^T = 0 \text{ or } \\
\left[ \text{Initial Value} \times (1+IRR)^T \right] - \text{Final Value} = 0 \\
\text{Initial} \times (1+IRR)^T = \text{Final} \\
(1+IRR)^T = \text{Final/Initial} \\

\text{IRR} = (\text{Final/Initial})^{(1/T)} - 1
\]

The IRR button on the Property Purchase Price & Current Value window allows you to include development costs, capital costs, tenant improvements, leasing commissions, and debt interest as part of the initial investment in the calculation of IRR. You may elect to calculate IRR at the analysis start date, or for a date of your choosing. This feature is available in all property types other than portfolios. Portfolios will be unaffected by the use of this feature in component properties.

To calculate development IRR, choose the IRR button on the Property Purchase Price & Current Value window.
Calculate IRR Using
Select the cost components you wish to include in the initial investment for the calculation of IRR. You may choose to include any or all of the following costs in the initial investment.

- Land/Acquisition Costs
- Hard/Construction Costs
- Soft/Development Costs
- Capital Expenditures
- Tenant Improvements
- Leasing Commissions
- Interest Carry (accrued, unpaid interest)
- Property Purchase Price

**Note:** Depending upon the property type, some cost components may not be available. For example, leasing commissions and tenant improvements are not available in unit sales properties.

Use Costs up to this Date
Enter either a fixed date (MM/YY) or a date relative to the analysis start date through which costs should be included in the initial investment for the calculation of IRR. Note that you cannot use dates occurring either before the analysis start date or after the analysis end date.

IRR Calculation Method
Choose one of the IRR calculation methods below. The selection in the Discount Method field on the Present Value discounting window will determine whether IRR is calculated annually, monthly, or quarterly.

Calculate IRR at selected date using costs up to selected date
This option allows you to use the selected costs to calculate the IRR as of the date entered in the previous field.

- **Unleveraged IRR:** When calculating unleveraged IRR, the total selected capital items will be used as the initial investment. The cash flow before debt service from the month after the specified date to the end of the analysis and the net proceeds from resale are used as the incoming cash flow.

- **Leveraged IRR:** When calculating leveraged IRR, the total selected capital items up to the specified date minus debt funding up to that date will be used as the initial investment. The cash flow after debt service from the month after the specified date to the end of the analysis and the net cash flow from resale are used as the incoming cash flow.

Calculate IRR at start of the reporting using costs up to selected date
This option allows you to use the selected costs to calculate the IRR as of the reporting start date.

- **Unleveraged IRR:** When calculating unleveraged IRR, the total selected costs up to the specified date will be used as the initial investment. The IRR calculation will put the initial investment in month zero. The cash flow before debt service (not factoring selected costs
from month 1 up to the specified date) and the net proceeds from the reporting start date are used as the incoming cash flow.

- **Leveraged IRR:** When calculating leveraged IRR, the total selected costs up to the specified date minus debt funding up to that date will be used as the initial investment. The IRR calculation will put the initial investment in month zero. The cash flow after debt service (not factoring selected costs from month 1 up to the specified date) and the net cash flow from resale at the reporting start date are used as the incoming cash flow.
Double Declining Depreciation

This option is used when you need to double the results of the straight line method.

Straight line Method: Divide the cost of a tangible asset by the asset’s useful life.

\[
\frac{100\% \text{ Cost} \div \text{Useful Life}}{2}
\]

Double Declining Percentage

Example:

\[
(1,000,000 \div 40 \text{ Years}) \times 2 = 50,000 \text{ per year for 40 years worth of months}
\]

PV as Of

The PV as Of field allows you to determine the value of the property at any point in the future. Entries on this window will not affect any of the standard present value or resale results. ARGUS Valuation DCF will calculate a new resale value and present value amount and report them on the Present Value As Of report.

ARGUS Valuation DCF does not adjust the discount rate for partial discounting periods. Instead, ARGUS Valuation DCF adjusts the amount of time that is used to discount the future value. This can best be illustrated by using the following simple example. An annual rate of 12 percent is not the same as a 1 percent rate used every month of the year (12 times). By adjusting the discount rate in this manner, the present value of the future cash flows is understated since there is no compounding. To account for this, ARGUS Valuation DCF adjusts the time period that is used to discount the future value, and an accurate present value is the result.
Formula:

\[
P V = \frac{F V}{(1 + d)^{\frac{m}{n}}}
\]

Where...

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>Present value of the cash flow</td>
</tr>
<tr>
<td>FV</td>
<td>Future value of the cash flow</td>
</tr>
<tr>
<td>d</td>
<td>Annual discount rate</td>
</tr>
<tr>
<td>m</td>
<td>Number of months in discounting period</td>
</tr>
<tr>
<td>n</td>
<td>Number of months in a year</td>
</tr>
</tbody>
</table>

**Start Date**

Enter the start date as month and year (MM/YY) or as the number of months from the reporting start date. The start date of the secondary discount period must be within the analysis discount period. ARGUS Valuation DCF will calculate PV (perspective Present Value) of property based on this date instead of Analysis Start Date. For example, if we enter 1/08, ARGUS Valuation DCF will calculate PV by discounting the annual cash flow and Resale value to 1/08 instead of 1/07.

**End Date**

The end date is determined by the entries in the **Start Date** and the **Length** fields. This field is informational and cannot be edited.

**Length**

Enter the length of the secondary discount period as a number of years. Fractional years are not permitted. The entry in this field determines the end date. The length together with the length of the analysis discount period length cannot exceed 40 years. Based on this entry (i.e. 5), ARGUS Valuation DCF will calculate PV for five years.
Example:
A 12 percent discount rate is being used to discount the cash flows from an 18-month analysis. The discount method is annual end-point. The first six months of the analysis produce a $10,000 cash flow; months seven through 18 produce a $20,000 cash flow. The formula would be as follows:

\[ PV = \frac{10,000}{(1+.12)^{\frac{6}{12}}} + \frac{20,000}{(1+.12)^{\frac{12}{12}}} \]

\[ PV = 9,449 + 16873 \]

\[ PV = 26,322 \]

Present Value by Source

The Present Value (PV) by Source feature allows you to specify changing discount rates for items used to calculate the present value of a property. You may use tenant groups, industry groups, user-defined groups, other revenues, expenses, capital costs, development costs, and debt and resale. This feature also includes a report type that shows the present value by source.

To use this feature, you must first create the industry, tenant, or user-defined groups you wish to use and then base the PV by Source on the desired group.

Available Groups and Included Groups

Depending upon the property type, this feature allows you to enter discount rates for tenant groups, industry groups, user-defined groups, or unit groups. To choose a group you can either double-click it, or click the group and then choose Include.
Discount Rate
Once the selected group is listed in the Included Groups section on the right side of the window, you may enter a discount rate for the group in the corresponding Discount Rate field. This rate will be applied to all tenants assigned to the selected group on the More/Notes window accessed from the Rent Roll.

Exclude Upon Rollover
This field allows you to specify that ARGUS Valuation DCF should use the speculative revenue discount rate to calculate the revenue of excluded tenants when their leases roll over.

Advanced Present Value Discounting
The Advanced tab in the Present Value Discounting window is where you can enter different discount rates for the leveraged and unleveraged calculations. The Cash Flow Rate field in the Unleveraged Discount Rates section displays the primary discount rate entered on the Discount Rates and Method tab.

The advanced section enables ARGUS Valuation DCF to calculate two sets of Present Value Reports: Unleveraged and Leveraged. You may enter various discount rates for Leveraged and Unleveraged value and, based on this entry, ARGUS Valuation DCF will calculate two sets of present values.
Unleveraged Annual MIRR

This returns the modified internal rate of return for a series of periodic cash flows. MIRR considers both the cost of the investment and the interest received on reinvestment of cash. MIRR adjusts for the pitfall of traditional IRR analysis which assumes all cash flows are reinvested at the calculated ITT rate. Therefore, traditional IRR analysis may misstate the implicit return for a project by failing to quantify the effect that earned cash flows during the project are not reinvested at a projects’ IRR but rather a corporate reinvestment rate (estimated at the Corporate Weighted Average Cost of Capital).

The Modified IRR corrects this misstatement by converting a projects’ cash flows to a zero coupon security. The projects future cash flows are compounded to the final period at the reinvestment (WACC) rate. Using the initial cash outflow, the yield on the zero coupon security is then calculated (MIRR). The equation for MIRR is as follows:

\[
MIRR = \left[ \frac{\sum_{s=1}^{n} \left(\frac{CFS_s}{CF_0}\right)(1+r)^s}{n} \right]^{1/n} - 1
\]

Where...

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF_s</td>
<td>Cash Flows in period S</td>
</tr>
<tr>
<td>CF_0</td>
<td>Initial Cash Flow (Cost)</td>
</tr>
<tr>
<td>n</td>
<td>Number of Periods</td>
</tr>
<tr>
<td>r</td>
<td>Reinvestment Rate</td>
</tr>
<tr>
<td>s</td>
<td>Current Period</td>
</tr>
</tbody>
</table>

To solve for MIRR:

\[
MIRR = \left[ \frac{M}{P} \right]^{1/n} - 1
\]
# Modified Internal Rate of Return

- **Reinvestment Rate:** 10%
- **Safe Rate:** 9%

Enter the interest rate received on the cash flows reinvested (for example 10.50).

---

## View Reports

### Prospective Property Resale

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Resale Amount</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Proceeds from Sale</td>
<td>$8,958,484</td>
<td>$9,343,983</td>
<td>$9,073,579</td>
<td>$8,986,079</td>
<td>$10,617,595</td>
</tr>
<tr>
<td>Commissions &amp; Adjustments</td>
<td>(299,955)</td>
<td>(280,532)</td>
<td>(251,207)</td>
<td>(377,831)</td>
<td>(408,571)</td>
</tr>
<tr>
<td>Escrow Balance</td>
<td>7,653</td>
<td>15,714</td>
<td>24,389</td>
<td>6,314</td>
<td>15,253</td>
</tr>
<tr>
<td><strong>Net Proceeds From Sale</strong></td>
<td>8,737,469</td>
<td>9,063,451</td>
<td>8,752,372</td>
<td>8,708,248</td>
<td>10,208,064</td>
</tr>
<tr>
<td><strong>Outstanding Debt Retirement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Principal Balances</td>
<td>(6,461,122)</td>
<td>(6,772,688)</td>
<td>(6,276,200)</td>
<td>(6,170,652)</td>
<td>(6,055,094)</td>
</tr>
<tr>
<td><strong>Net Resale Proceeds After Debt</strong></td>
<td>$2,275,340</td>
<td>$2,290,763</td>
<td>$2,476,172</td>
<td>$2,537,596</td>
<td>$4,153,970</td>
</tr>
</tbody>
</table>

### Unleveraged Annual IRR
- Year 1: 1.82%
- Year 2: 3.2%
- Year 3: 8.17%
- Year 4: 8.11%
- Year 5: 15.16%

### Unleveraged Annual MIRR
- Year 1: 1.92%
- Year 2: 7.43%
- Year 3: 8.33%
- Year 4: 8.95%
- Year 5: 14.50%

### Leveraged Annual IRR
- Year 1: (15.38)%
- Year 2: 3.43%
- Year 3: 6.37%
- Year 4: 8.53%
- Year 5: 25.24%

### Leveraged Annual MIRR
- Year 1: (15.38)%
- Year 2: 3.45%
- Year 3: 6.45%
- Year 4: 8.61%
- Year 5: 24.61%