📘 **User Manual: Investment Metrics Explained**

# Net Present Value (NPV)

Think of NPV as: “How much is this stream of future profits worth today?”

* NPV > 0 → the investment is profitable
* NPV = 0 → the IRR is the return rate
* NPV < 0 → you’re losing money

### 🧮 Formula:

NPV = ∑ CFₜ / (1 + r)ᵗ - Initial Investment

# Internal Rate of Return (IRR)

Definition: Annualized return rate where NPV = 0

🧮 Formula: Use numpy or a financial calculator:

np.irr([-Initial Investment, CF1, CF2, ...])

# Return on Investment (ROI)

Definition: Total return relative to initial capital.

### 🧮 Formula:

ROI = (Total Return / Initial Investment) × 100

ROI includes:

* Appreciation
* Mortgage principal paydown • Net profit at sale

# Cash-on-Cash Return (CoC)

Definition: Measures the annual pre-tax cash flow relative to the initial cash invested.

### 🧮 Formula:

CoC = (Annual Pre-Tax Cash Flow / Initial Cash Invested) × 100

💡Example:

You put $40,000 down on a rental property and receive $3,600 in annual cash flow:

CoC Return = ($3,600 / $40,000) × 100 = 9%

# 🧾 Monthly Expenses

This includes recurring costs like:

* Property Taxes
* Home Insurance
* Maintenance & Repairs
* HOA Fees
* Miscellaneous Operating Costs

💡Tip: If unsure of monthly expenses, estimate as 25% of rent. Typical operating costs include:

* Property taxes
* Insurance
* Repairs & maintenance
* Vacancy buffer
* HOA fees or other recurring expenses

💡Example: If your rent is $2,000/month, typical expenses might be 25% or ~$500/month.

# Multi-Year Cash Flow & ROI

Cash Flow = Annual Rent – (Operating Expenses + Mortgage Payments) ROI = (Total Return / Initial Investment) × 100

What Counts as Cash Flow for CoC and ROI?

Cash-on-Cash Return uses Net Pre-Tax Cash Flow — not total rent.

🧮 Formula:

Cash Flow = Annual Rent – (Operating Expenses + Mortgage Payments)

When CoC = ROI (Year 1):

If there is no appreciation, mortgage paydown, or sale value yet, ROI = CoC.

But ROI becomes more powerful long-term, factoring in gains like:

* Equity from price appreciation
* Mortgage principal reduction
* Sale value of property

# 📊 Long-Term Metrics

■ IRR (%) – Internal Rate of Return

Definition Recap: IRR is the annualized rate where NPV of all cash flows becomes zero.

💡 Example:

You buy a rental with a $40,000 down payment.

Each year you receive $3,600 in cash flow.

After 5 years, you sell and receive $60,000 net profit.

💰Equity Multiple

Definition: How many times your original investment has grown.

Formula:

Equity Multiple = Total Cash Inflows / Total Cash Invested

💡 Example:

You invest $40,000 and receive $78,000 total (rent + final sale).

Equity Multiple = 78,000 / 40,000 = 1.95×   
  
  
Capital Improvement Tracker

💰 IRR (Operational) vs 💰 IRR (Total incl. Sale)

💡Understanding both forms of IRR helps investors distinguish between ongoing rental efficiency and total return over the full investment horizon.

We publish both IRR views so you can evaluate day to day rental efficiency and full life cycle return. Both now appear in the app’s **Long-Term Metrics**.

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| 🧠 **Why both matter?** |  | |
| IRR (Operational) | Return from yearly operations only (rent − expenses − mortgage). Excludes any sale/appreciation. | |
| IRR (Total incl. Sale) | Includes terminal sale proceeds or modeled appreciation at exit; reflects total holding period return. | |
| 🧪 **Typical Example (numbers are illustrative)** |  | |
| Down Payment | $40,000 | |
| Annual Net Cash Flow | $3,600 | |
| Exit (Year 5) Net Proceeds | $60,000 | |
| ⚙️ **Metric** | 💰**Cash Flows Considered** | **Approx.**  **Result** |
| IRR (Operational) | [-40,000, 3,600, 3,600, 3,600, 3,600, 3,600] | ≈ 8.7% |
| IRR (Total incl. Sale) | [-40,000, 3,600, 3,600, 3,600, 3,600, 3,600 + 60,000] | ≈ 17.7% |
| **👥 Who Uses Which IRR?** | | |
| 💰Investors — compare operational performance vs. total return across deals. | | |
| 💰 Lenders — evaluate steady cash flow and loan risk (Operational IRR). | | |
| 🧠 Analysts — model sensitivity to rent growth and exit value (Total IRR). | | |

💡Tip: In the app, you’ll now see both values under **Long** **Term Metrics**: **IRR (Operational)** and   
 **IRR (Total incl. Sale)**.