What is the difference between performance calculation time-weighted return and IRR or XIRR?

Time-weighted return (TWR) and Internal Rate of Return (IRR) or Extended Internal Rate of Return (XIRR) are both methods used to measure the performance of investment portfolios, but they differ in their calculation methodologies and the insights they provide. Let's explore the differences between them:

1. **Time-Weighted Return (TWR):**
    - **Definition**: Time-weighted return is a method of calculating the return on investment that eliminates the distorting effects of external cash flows. It measures the compound growth rate of a portfolio over a specified period, assuming that the portfolio's value is reset to its starting value at the beginning of each sub-period.
    - **Calculation**: TWR is calculated by compounding the sub-period returns geometrically. It involves calculating the return for each sub-period, compounding those returns, and then combining them to determine the overall return for the entire period.
    - **Use Case**: TWR is commonly used to evaluate the performance of investment managers or investment funds over time, as it provides a measure of the investment performance that is independent of the timing and size of cash flows into or out of the portfolio.
2. **Internal Rate of Return (IRR) and Extended Internal Rate of Return (XIRR):**
    - **Definition**: Internal Rate of Return (IRR) is a method of calculating the annualized rate of return generated by an investment, taking into account the timing and size of cash flows into and out of the investment. Extended Internal Rate of Return (XIRR) is a variation of IRR that allows for irregular intervals between cash flows.
    - **Calculation**: IRR and XIRR are calculated by solving for the discount rate that equates the present value of cash flows from the investment to zero. They take into account both the timing and magnitude of cash flows, including initial investments, periodic contributions or withdrawals, and the final value of the investment.
    - **Use Case**: IRR and XIRR are commonly used to evaluate the performance of individual investments or investment opportunities, such as real estate projects, private equity deals, or venture capital investments. They provide a measure of the investment's profitability and help investors assess whether the returns justify the risks taken.

Key Differences:

- TWR measures the performance of an investment portfolio over time, independent of external cash flows, while IRR and XIRR calculate the annualized rate of return for individual investments, taking into account cash flows.
- TWR is useful for evaluating the performance of investment managers or funds, while IRR and XIRR are used to assess the profitability of individual investments or projects.
- TWR assumes that the portfolio's value is reset to its starting value at the beginning of each sub-period, while IRR and XIRR take into account the timing and magnitude of cash flows.

In summary, while both TWR and IRR/XIRR are methods used to measure investment performance, they differ in their calculation methodologies and the insights they provide. TWR is suitable for evaluating the performance of investment portfolios, while IRR and XIRR are used to assess the profitability of individual investments or projects.