Alternative Investments

Alternative Investment Performance and Returns

Exam Focus

- Describe the performance and appraisal of alternative investments.
- Calculate and interpret investment returns before and after fees.

Investment Life Cycle

Capital commitment
- Limited partners commit capital to private equity projects
- Capital is not invested immediately; LPs receive capital calls
- Returns are usually negative in this early phase, before capital deployment

Capital deployment
- Capital is called and deployed in the projects
- For example: infrastructure construction or investing in a start-up
- Cash outflows exceed cash inflows

Investment Life Cycle
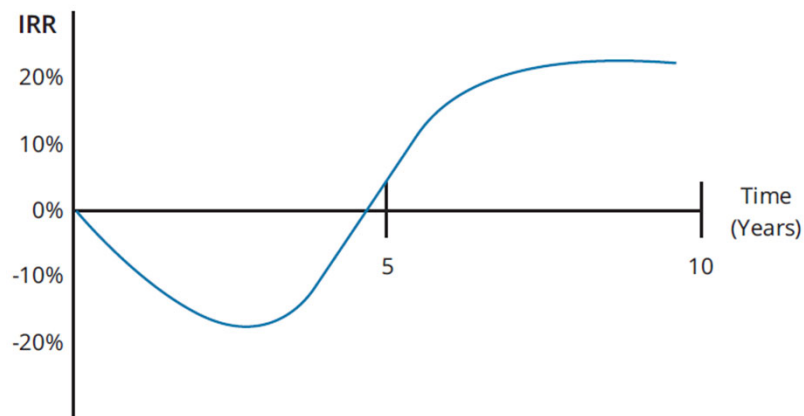
Capital distribution

- Successful projects generate positive cash flows and the underlying assets increase in value, causing **fund returns to accelerate**.
- Successful projects may realize substantial capital gains, especially if the exit strategy is a successful **initial public offering (IPO)**.
- Not all new ventures and turnarounds of mature companies are successful.

J-curve effect

- Initial negative returns in the *capital commitment* and *deployment phases*
- **Internal rate of return (IRR)** is used to measure project's returns

J-Curve Effect

Internal Rate of Return: Example

Peterburgh Capital

Year	Cash Inflow (USD)	Cash Outflow (USD)
0	0	2,500,000
1	0	4,000,000
2	0	1,700,000
3	500,000	1,000,000
4	1,000,000	
5	3,000,000	
6	12,500,000	

CF Worksheet

CF0 – 2.5m

C01 – 4.0m

C02 – 1.7m

C03 – 0.5m

C04 1.0m

C05 3.0m

C06 12.5m

IRR CPT

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Multiple of Invested Capital

Multiple of invested capital (MOIC) is a shortcut methodology often used by private equity and real estate managers (a.k.a. **money multiple**)

$$MOIC = \frac{realized\ value\ of\ investment + unrealized\ value\ of\ investment}{total\ invested\ capital}$$

- Total invested capital = paid-in capital, less management fees and fund expenses
- MOIC ignores the timing of the cash flows and is easier to calculate
- For example: a 2x return, but is this over 3 years or 14 years?

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Multiple of Invested Capital: Example

Example: Himitsu makes an initial investment of JPY 3.8 billion into ZZZ company in year 0. Additional capital investments are made in Year 2 and Year 3 of JPY 1.2 billion and JPY 200 million respectively.

After eight years, Himitsu sells its stake in ZZZ for JPY 8.5 billion.

Calculate the multiple of invested capital.

Multiple of Invested Capital: Solution

$$MOIC = \frac{\text{realized value of investment} + \text{unrealized value of investment}}{\text{total invested capital}}$$

$$MOIC = \qquad\qquad =$$

-1

Multiples: Question

Why is IRR preferred for performance measurement for alternative investments?

A. IRR is commonly used for other asset classes.

B. IRR is easy and intuitive to calculate.

C. IRR takes into account the timing of cash flows in long-lived alternative investments.

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Use of Borrowed Funds

Alternative investments: may use borrowed funds to increase investment returns

• **Financial leverage** magnifies both gains and losses

• Leverage **increases exposures** beyond equity capital

Types of leverage

• **Borrowing capital** to invest directly in securities

• **Using derivatives** requires a small initial margin to gain greater exposure

• **Margin financing:** a prime broker lends any securities needed, in return for collateral deposited into a margin account

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Use of Borrowed Funds

Leveraged return

- Increases the exposure to the underlying assets

$$r_L = r + V_b / V_c \left(r - r_b \right)$$

- r_L leveraged return, r asset return
- r_b borrowing cost
- V_b amount borrowed, V_c equity

Leveraged Return: Example 1

A hedge fund, Lupulus Opportunity Fund LLC has USD 100 million of capital. Lupulus uses leverage to invest in a variety of equity-linked notes.

Lupulus adds USD 50 million leverage, at a funding cost of 4%.

Scenario 1: The underlying assets earn an 8% return.

Calculate the leveraged return.

Leveraged Return: Solution (1)

Scenario 1: The underlying assets earn an 8% return.

$$r_L = r + V_b / V_c \left(r - r_b \right)$$

$$r_L = \qquad\qquad\qquad =$$

-1

Leveraged Return: Example 2

A hedge fund, Lupulus Opportunity Fund LLC has USD 100 million of capital. Lupulus uses leverage to invest in a variety of equity-linked notes.

Lupulus adds USD 50 million leverage, at a funding cost of 4%.

Scenario 2: The underlying assets incur a loss of 2%.

Calculate the leveraged return.

Leveraged Return: Solution (2)

Scenario 2: The underlying assets incur a loss of 2%.

$$r_L = r + V_b / V_c \left(r - r_b \right)$$

$$r_L = \qquad\qquad =$$

-1

Leveraged Return: Example 3

A hedge fund, Lupulus Opportunity Fund LLC has USD 100 million of capital. Lupulus uses leverage to invest in a variety of equity-linked notes.

Lupulus adds USD 50 million leverage, at a funding cost of 4%.

Scenario 3: If the underlying assets make a gain of 6%, what is the **breakeven borrowing rate**, at which Lupulus is indifferent to adding leverage?

Leveraged Return: Solution (3)

Scenario 3: The underlying assets earn a return of 6%.

The breakeven borrowing cost is 6%:

- If the asset return is 6%
- If the borrowing cost is 6%

There is no additional benefit from borrowing to invest. Leverage only magnifies returns if the asset return > borrowing cost.

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Valuation

The fair value of an investment is a market-based measure based on observable or derived assumptions that market participants use to exchange an asset or liability.

Fair value hierarchy

- Level 1   *Quoted prices* in active markets for identical assets or liabilities
  - Example: exchange-traded public equities
- Level 2   *Inputs other than* direct market prices, directly or indirectly observable
  - Example: OTC derivatives
- Level 3   *Unobservable inputs* for assets and liabilities with little market activity
  - Example: private equity and real estate

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Valuation of Private Equity and Real Estate

Level 3 asset pricing: challenging due to the lack of recent market transactions
- Values may be anchored to the original cost
- Returns may be **"smoothed"** and the **volatility of returns understated**
- In the absence of transactions, appraisals are often used instead

Challenges
- Potential **conflicts of interest** arise when applying estimates of value
- Estimates are not true values; **market transactions** better reflect true values
- **Data issues:** smoothed volatility and artificially low correlations

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Alternative Investment Fees

Alternative investment fees: different from those in traditional asset classes
- Traditional asset classes typically involve a **flat management fee**
- Alternative asset classes typically also include an additional **performance fee** based on fund returns

Fees may also vary per investor
- Which investor has invested?
- How much was invested?
- When was the investment made? (e.g., early phase, later phases)
- Invested at a high or low point?

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Hedge Fund Fees

Hedge fund strategies often have a **higher degree of complexity** and require more sophisticated portfolio management tools, making them **more expensive** to manage.

Customized compensation arrangements are used to align the interests of the investors and manager:

- Reward investors for **early involvement** and **larger investments**
- Reward investors for **longer lockup periods**
- Reward managers for excess returns above the **hurdle rate**
- **Redemption fees** discourage withdrawals; **gates** limit withdrawals

Custom Fee Arrangements

Alternative investments often have **custom fee arrangements** that vary based on the size, timing, and levels of investor participation.

Liquidity
- Fees may vary depending upon the liquidity terms the investor is willing to accept
- Longer lockups, lower fees

Asset size
- Management fees for large LP investors are likely to be lower; fee discounts

Founder class shares
- Founder class shares entitle investors to a lower fee structure (1.5/10 vs. 2/20)
- Fees may also be reduced once the fund achieves key performance targets

Custom Fee Arrangements

Either/or fees

- Charge **either** a fixed management fee **or** a variable performance fee

Example

- *In down years:* charge a lower fixed management fee (e.g., 1%)
- *In up years:* charge a higher incentive fee (e.g., 30% above a hurdle rate)
- Managers charge whichever is greater

Larger investors may negotiate custom fee agreements, whereas smaller investors accept traditional fee structures.

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Alternative Investment Return Calculations

Components of return and fees

- Beginning-of-period assets: P_0, end-of-period assets: P_1
- GP management fees, a fixed % of assets under management r_m
- GP performance fee: p

General partner's return:

$$R_{GP} = (P_1 \times r_m) + \left[(P_1 - P_0) \times p \right]$$

Investor's periodic return:

$$r_i = \frac{(P_1 - P_0 - R_{GP})}{P_0}$$

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Alternative Investment Returns: Example 1

Kettleside Timberland LP is an investment management organization with USD 100 million of initial investment capital.

It charges a 1% management fee, based on year-end AUM and a 20% performance fee.

In Year 1, the return generated is 30%.

Q1. Calculate **Kettleside's fees** if the performance fee and management fee are calculated **independently**.

Q2. Calculate the **investor's effective return** given this fee structure.

Alternative Investment Returns: Solution 1

Answer:

Q1. GP return $R_{GP} = (P_1 \times r_m) + \left[(P_1 - P_0) \times p\right]$

$R_{GP} = \qquad + \qquad =$

Q2. Investor's return

$r_i = \dfrac{(P_1 - P_0 - R_{GP})}{P_0}$ $r_i = \qquad =$

-4

Alternative Investment Returns: Example 2

Kettleside Timberland LP is an investment management organization with USD 100 million of initial investment capital.

It charges a 1% management fee, based on year-end AUM and a 20% performance fee.

In Year 1, the return generated is 30%.

Q3. Calculate **Kettleside's fees** if the performance fee is calculated from the return **net of the management fee**.

Q4. Calculate the **investor's effective return** given this fee structure.

Alternative Investment Returns: Solution 2

Answer:

1% AUM fee is deducted, before the incentive fee calculation

Q3. GP return net

$$R_{GP} = \qquad + \qquad\qquad\qquad =$$

Q4. Investor's return

$$r_i = \frac{(P_1 - P_0 - R_{GP})}{P_0} \qquad\qquad r_i = \qquad\qquad =$$

-4

Alternative Investment Returns: Example 3

Kettleside Timberland LP is an investment management organization with USD 100 million of initial investment capital.

It charges a 1% management fee, based on year-end AUM and a 20% performance fee paid above the **hurdle rate of 6%.**

In Year 1, the return generated is 30%.

Q5. Calculate **Kettleside's fees** if the performance fee is calculated from the return **net of the management fee**.

Q6. Calculate the **investor's effective return** given this fee structure.

Alternative Investment Returns: Solution 3

Answer:

Q5. GP return net

> Incentive fee paid on returns above the hurdle rate

$$R_{GP} = \qquad + \qquad\qquad\qquad\qquad =$$

Q6. Investor's return

$$r_i = \frac{(P_1 - P_0 - R_{GP})}{P_0} \qquad\qquad r_i = \qquad\qquad =$$

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Alternative Investment Returns: Example 4

Kettleside Timberland LP is an investment management organization with USD 100 million of initial investment capital.

It charges a 1% management fee, based on year-end AUM and a 20% performance fee. The end of Year 1 value net of fees is USD 122.7 million.

In Year 2, the fund value declines to $110 million. The fee structure in Q1 also includes a **high-water mark, calculated net of fees**.

Q7. Calculate **Kettleside's fees** if the performance fee is calculated as in Q1.

Q8. Calculate the **investor's effective return** given this fee structure.

Q9. Calculate the **ending fund value** at the end of Year 2, after fees.

Alternative Investment Returns: Solution 4

Answer:

Q7. GP return with a high-water mark

$$R_{GP} = (P_2 \times r_m) + (P_2 - P_{HWM}) \times p$$

$$R_{GP} = \qquad + \qquad =$$

> Incentive fee is zero, assets under HWM, only AUM fee paid

Q8. Investor's return

$$r_i = \frac{(P_2 - P_1 - R_{GP})}{P_1} \qquad r_i = \qquad =$$

-4

Alternative Investment Returns: Solution 4

Answer:

Q9. Ending fund value Year 2, after fees

Beg value Yr 2

= End value Yr 1 – fees   =   =

End value Yr 2

= $110 million – fees   =   =

-2

Alternative Investment Returns: Example 5

Kettleside Timberland LP is an investment management organization with USD 100 million of initial investment capital.

It charges a 1% management fee, based on year-end AUM and a 20% performance fee.

In Year 3, the fund value increases to $128 million. The fee structure in Q1 also includes a high-water mark, calculated net of fees.

Q10. Calculate **Kettleside's fees** if the performance fee is calculated as in Q1.

Q11. Calculate the **investor's effective return** given this fee structure.

Q12. Calculate the **new high-water mark** to be applied the following year.

Alternative Investment Returns: Solution 5

Answer:

Q10. GP return with a high-water mark $R_{GP} = (P_3 \times r_m) + (P_3 - P_{HWM}) \times p$

$R_{GP} =$ $+$ $=$

> $128m > HWM of $122.7, so incentive fee paid

Q11. Investor's return

$r_i = \dfrac{(P_3 - P_2 - R_{GP})}{P_2}$ $r_i =$ $=$

-4

Alternative Investment Returns: Solution 5

Q12. Answer: new high-water mark, Year 4 onward

Beg value Yr 3

= End value Yr 2 – fees   = $110 million – $1.1 million = $108.9 million

End value Yr 3

= End value Yr 3 – fees   = $128 million – $2.34 million = $125.66 million

New high-water mark   = **$125.66 million**

Clawback: Example

Tenderledge Opportunity Fund LP invests $20 million in new investments, evenly divided between $10 million into Arguston Inc. (a leveraged buy-out) and $10 million to Heartfield Digital (an early-stage venture).

After one year, Arguston is sold for $22 million after costs. Two years later, Heartfield Digital fails losing all the original investment.

Tenderledge's fee agreement as a GP provides a 20% performance fee of **aggregate profits**, with a **clawback provision**.

Q1. Calculate the value of the **performance fee** due to Tenderledge after any clawback.

Clawback: Solution

Answer:

The Arguston investment has a gain of $22 million – $10 million = $12 million

The Heartfield Digital investment has a loss of $10 million

The **aggregate gain** (after two years) is **$2 million**

Year 1: performance fee =   (held in escrow, not paid)

Year 2: aggregate performance fee is

Clawback =

-3

Alternative Investment Benchmarks

Comparing relative returns

- **Traditional** investment funds are compared to market benchmarks with similar *investment styles* and *exposures* to calculate **relative returns**.
- **Alternative** investment funds are more difficult to compare to benchmarks:
  - For private equity, compare returns by vintage year
  - Lockups and illiquidity vary

Hedge fund indices

- **Survivorship bias:** data only includes surviving funds; failed funds deleted
- **Backfill bias:** only report the successful new funds, a few years after inception

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Solutions

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Internal Rate of Return: Example

Peterburgh Capital

Year	Cash Inflow (USD)	Cash Outflow (USD)
0	0	2,500,000
1	0	4,000,000
2	0	1,700,000
3	500,000	1,000,000
4	1,000,000	
5	3,000,000	
6	12,500,000	

CF Worksheet

CF0 – 2.5m

C01 – 4.0m

C02 – 1.7m

C03 – 0.5m

C04 1.0m

C05 3.0m

C06 12.5m

IRR CPT 14.596%

-1

Multiple of Invested Capital: Solution

$$MOIC = \frac{\text{realized value of investment} + \text{unrealized value of investment}}{\text{total invested capital}}$$

$$MOIC = \frac{8.5}{3.8 + 1.2 + 0.2} = 1.63x$$

-1

Multiples: Question

Why is IRR preferred for performance measurement for alternative investments?

A. IRR is commonly used for other asset classes.

B. IRR is easy and intuitive to calculate.

C. IRR takes into account the timing of cash flows in long-lived alternative investments.

IRR is seldom used to measure the investment performance of other asset classes with publicly quoted market prices. Although IRR is complicated to calculate and involves assumptions on opportunity costs and reinvestment rates, it is the best metric to evaluate long-lived alternative investments because it takes into account the unique timing of cash flows in the investment life cycle of alternative investments.

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Leveraged Return: Solution (1)

Scenario 1: The underlying assets earn an 8% return.

$$r_L = r + V_b / V_c \left(r - r_b \right)$$

$$r_L = \frac{0.08 + 50}{100 \left(0.08 - 0.04 \right)} = 10\%$$

-1

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Leveraged Return: Solution (2)

Scenario 2: The underlying assets incur a loss of 2%.

$$r_L = r + V_b / V_c \left(r - r_b \right)$$

$$r_L = \frac{-0.02 + 50}{100 \left(-0.02 - 0.04 \right)} = -5\%$$

Alternative Investment Returns: Solution 1

Answer:

Q1. GP return

$$R_{GP} = \left(P_1 \times r_m \right) + \left[\left(P_1 - P_0 \right) \times p \right]$$

$$R_{GP} = \left(130 \times 1\% \right) + \left[\left(130 - 100 \right) \times 20\% \right] = \$7.3m$$

Q2. Investor's return

$$r_i = \frac{\left(P_1 - P_0 - R_{GP} \right)}{P_0}$$

$$r_i = \frac{130 - 100 - 7.3}{100} = 22.7\%$$

Alternative Investment Returns: Solution 2

Answer:

Q3. GP return net

1% AUM fee is deducted, before the incentive fee calculation

$$R_{GP} = (130 \times 1\%) + \left[(130(0.99) - 100) \times 20\% \right] = \$7.04\,m$$

Q4. Investor's return

$$r_i = \frac{(P_1 - P_0 - R_{GP})}{P_0}$$

$$r_i = \frac{130 - 100 - 7.04}{100} = 22.96\%$$

-4

Alternative Investment Returns: Solution 3

Answer:

Q5. GP return net

Incentive fee paid on returns above the hurdle rate

$$R_{GP} = (130 \times 1\%) + \left[(130(0.99) - 100(1.06)) \times 20\% \right] = \$5.84\,m$$

Q6. Investor's return

$$r_i = \frac{(P_1 - P_0 - R_{GP})}{P_0}$$

$$r_i = \frac{130 - 100 - 5.84}{100} = 24.16\%$$

-4

Alternative Investment Returns: Solution 4

Answer:

Q7. GP return with a high-water mark $\quad R_{GP} = (P_2 \times r_m) + (P_2 - P_{HWM}) \times p$

$$R_{GP} = (110 \times 1\%) + (110 - 122.7) \times 0.20 = \$1.1m$$

Incentive fee is zero, assets under HWM, only AUM fee paid

Q8. Investor's return

$$r_i = \frac{(P_2 - P_1 - R_{GP})}{P_1} \qquad r_i = \frac{110 - 122.7 - 1.1}{122.7} = -11.247\%$$

-4

Alternative Investment Returns: Solution 4

Answer:

Q9. Ending fund value Year 2, after fees

Beg value Yr 2

= End value Yr 1 – fees $\quad$ = $130 million – $7.3 million = $122.7 million

End value Yr 2

= $110 million – fees $\quad$ = $110 million – $1.1 million = $108.9 million

-2

Alternative Investment Returns: Solution 5

Answer:

Q10. GP return with a high-water mark $\quad R_{GP} = (P_3 \times r_m) + (P_3 - P_{HWM}) \times p$

$$R_{GP} = (128 \times 1\%) + (128 - 122.7) \times 0.20 = \$2.34\,m$$

> $128m > HWM of $122.7, so incentive fee paid

Q11. Investor's return

$$r_i = \frac{(P_3 - P_2 - R_{GP})}{P_2}$$

$$r_i = \frac{128 - 108.9 - 2.34}{108.9} = 15.39\%$$

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Alternative Investment Returns: Solution 5

Q12. Answer: new high-water mark, Year 4 onward

Beg value Yr 3

= End value Yr 2 – fees $\quad$ = \$110 million – \$1.1 million = \$108.9 million

End value Yr 3

= End value Yr 3 – fees $\quad$ = \$128 million – \$2.34 million = \$125.66 million

New high-water mark $\quad$ = \$125.66 million

Clawback: Solution

Answer:

The Arguston investment has a gain of $22 million – $10 million = $12 million

The Heartfield Digital investment has a loss of $10 million

The **aggregate gain** (after two years) is **$2 million**

Year 1: performance fee = 0.20 × $12m = $2.4 million (held in escrow, not paid)

Year 2: aggregate performance fee is $2 million × 0.2 = $0.40 million

Clawback = **$2 million**

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