

Example

- A trader has purchased on margin 1000 shares of a company at \$30 per share, paying a total purchase commission of \$10, with a leverage ratio of 1.25 and a call money rate of 10% annually. After 1 year, the trader receives a dividend 1\$ per share and immediately after that goes takes a short position in asset at \$40/share. Assuming that the sale and buy commissions are equal. What is the total rate of return for the investor after 1 year.

Sol:

- $Q = 1000, P_0 = 30, C_{buy} = 10, L = 1.2, r = 10\%$.
- $D = 1, P_1 = 40, C_{sale} = 10$.

$$L = \frac{1}{\text{Equity}} \rightarrow \text{Equity} = 0.8 \rightarrow \text{Debt} = 0.2$$

- Total Initial investment: $\text{Equity} * P_0 * Q + C_{buy} = 24000 + 10 = 24010$.
- End of period:
 - * Proceed on sales: $P_1 * Q = 40000$
 - * Loan payment = $\text{Debt} * P_0 * Q = 6000$
 - * Margin interest paid: $r * \text{Debt} * P_0 * Q = 600$
 - * Income from dividends: $D * Q = 1000$
 - * Sale commission: $C_{sale} = 10$
 - * Remaining equity: $40000 - 6000 - 600 + 1000 - 10 = 34390$
- Return of the investment

$$R = \frac{34390 - 24010}{24010} = \frac{10380}{24010} = 43.23\%$$

- Alternatively:

- * Trading gains/losses: $(P_1 - P_0) * Q = 10000$
- * Margin interest paid: 600
- * Income from dividends: 1000
- * commissions payment: 20
- * Equity gain\losses: $10000 - 600 + 1000 - 20 = 10380$
- * Return of the investment: $\frac{\text{Equity gain/losses}}{\text{Initial Investment}} = \frac{10380}{24010} = 43.23\%$