What is Beta and Systematic Risk?

Worksheet

Beta is the ratio of an investment's price movements to market movements: β = Covariance(investment return, market return) / Variance(market return). β=1 moves with market; β>1 is more volatile; β<1 is less volatile.

Questions

1. Stock with β=1.2 and market up 10% → stock return approximately…

A) 12%
B) 10%
C) 8.3%
D) 1.2%

2. β=1 means…

A) moves with market
B) no risk
C) always positive return
D) outperforms market

3. Higher beta means…

A) safer investment
B) more volatile / higher risk
C) fixed dividend
D) lower market correlation

4. Systematic risk (beta) can be eliminated by…

A) diversification
B) holding government bonds
C) it cannot be eliminated
D) selling the stock

5. A tech stock with β=1.3 and market rises 10%. How much does stock rise?

6. Utility company stock has β=0.6. Market falls 20%. Stock decline?

7. Bond fund with β=0.4 in a 30% market crash. Loss?

8. Define: What is beta?

9. Define: What does β=1 mean?

10. Define: What does β>1 mean?

Answer Key

1. A) 12% — 1.2 × 10% = 12%. Stock amplifies market movements.
2. A) moves with market — β=1 is market average; investment tracks market returns.
3. B) more volatile / higher risk — β>1 amplifies market swings—both gains and losses.
4. C) it cannot be eliminated — Systematic risk affects whole market; diversification cannot remove it.
5. Stock return ≈ β × Market return Stock return ≈ 1.3 × 10% = 13% The stock is 30% more volatile than market.
6. Stock return ≈ 0.6 × (−20%) = −12% The stock is buffered; declines less than market.
7. Fund return ≈ 0.4 × (−30%) = −12% Fund is very defensive; preserves capital in downturns.
8. Measure of systematic risk; how much investment moves with market.
9. Investment moves exactly with market—market-level risk.
10. Investment more volatile than market—higher risk, higher returns.