

What is the Efficient Frontier and Optimal Portfolio?

Worksheet

The Efficient Frontier is the curve of optimal portfolios maximizing return per unit of risk — the boundary of all feasible, rational investment choices.

Questions

1. If Portfolio A has 10% return and 15% risk, and Portfolio B has 12% return and 20% risk...
 - A) A is better (lower risk)
 - B) B is better (higher return)
 - C) Impossible to say without more info on the frontier
 - D) Both are equally efficient
2. A 'suboptimal' portfolio is...
 - A) below the efficient frontier
 - B) impossible to own
 - C) the safest option
 - D) always unprofitable
3. What creates the Efficient Frontier shape (curved upward)?
 - A) Higher risk always means higher return (linear)
 - B) Diversification effects + diminishing return per unit risk
 - C) Bonds always outperform stocks
 - D) Inflation and interest rates
4. To move your portfolio onto the Efficient Frontier...
 - A) increase risk to match return
 - B) rebalance assets to optimize risk-return trade-off
 - C) hold cash
 - D) follow index funds always
5. Portfolio A: 60% stocks, 40% bonds. Return 10%, risk 12%. Portfolio B: 80% stocks, 20% bonds. Return 12%, risk 16%. Which is on the efficient frontier?
6. Your portfolio has 8% return and 14% risk. A friend's has 8% return and 12% risk. Who is better positioned?
7. An advisor proposes a portfolio with 20% return and 30% risk. What do you need to know?
8. Define: What is the Efficient Frontier?
9. Define: What does 'optimal' mean for portfolios?
10. Define: Can a portfolio be above the Efficient Frontier?

Answer Key

1. C) Impossible to say without more info on the frontier — Efficiency depends on the full frontier, not just these two — we need to compare to other portfolios with the same risk or return.
2. A) below the efficient frontier — Suboptimal portfolios are below the frontier — you sacrifice return or risk unnecessarily compared to frontier portfolios.
3. B) Diversification effects + diminishing return per unit risk — The curve bends because diversification reduces risk, and as risk increases, investors demand proportionally more return.
4. B) rebalance assets to optimize risk-return trade-off — Rebalancing toward a diversified mix that maximizes return per unit of risk moves you to the frontier.
5. Compare risk-adjusted return (return per unit of risk). A: $10\% / 12\% = 0.83$ return per risk. B: $12\% / 16\% = 0.75$ return per risk. Portfolio A is better risk-adjusted and on/closer to the frontier.
6. Both have same return (8%). Friend's portfolio: lower risk (12% vs 14%). Friend is on the efficient frontier; yours is below it. You should rebalance to reduce risk without sacrificing return.
7. High return + high risk could be on the frontier. But if similar risk portfolios earn 15–18%, this is above the frontier (impossible). Verify whether the return is realistic by comparing to other assets with similar risk.
8. The curve of optimal portfolios offering the highest return for each risk level, or lowest risk for each return.
9. A portfolio has the best risk-return trade-off — you cannot increase return without increasing risk.
10. No — portfolios above the frontier are impossible (they violate the risk-return relationship).

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