APT:
- Factor loadings quantify systematic risk
- Risk premia measure the reward of an additional unit of syst. risk
- Arbitrage opportunities exist if systematic risk adjusted returns are not equal
- To construct the arbitrage portfolio, total systematic risk must be zero. Need to also confirm it satisfied zero initial outlay and risk-free conditions.

ECON30024
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Tutorial 7 (for Week 8)

1. Review questions in the mid-semester exam.[1]

2. Review Quiz 7 questions.

3. The following information is provided for a stock market in which asset returns respond to two factors:

Asset	b_{j1}	b_{j2}	μ_j
A	1.2	0.4	16%
B	0.8	1.6	26%
r_0	0	0	6%

   Notations: b_{j1} and b_{j2} for $j =$ A, B denote the responses of the rates of return on assets A and B to the factors; μ_j is the expected rate of return on each of the assets; and r_0 is the risk-free rate of return.

   (a) If the APT holds in this market, calculate the risk premia corresponding to the two factors.

   (b) Asset C is also traded in this market and yields an average return of 12% with $b_{C1} = 1.0$ and $b_{C2} = 0.5$. According to the APT, is asset C over-priced or under-priced? How to interpret this result?

4. Suppose asset returns follow a single-factor model where the factor is denoted as F_1. The risk-free rate of return is 5%. Portfolio A and B are both well-diversified portfolios. Portfolio A has a factor loading of 1.2 and an expected return of 14%. Portfolio B has a factor loading of 0.7 and an expected return of 9%.

   (a) Is there an arbitrage opportunity? How do you take advantage of the arbitrage opportunity?

   (b) Formally construct an arbitrage portfolio based on the arbitrage opportunity, and show that it is indeed an arbitrage portfolio.[2]

[1] We do not have time to go through all the Mid-semester exam questions in tutorials. But our tutor Kelly will record a video to briefly go through the questions in the exam. Please watch the video and ask any remaining questions in your tutorial class or post your questions on the discussion board.

[2] To check your understanding of this question, think about the following question: is it possible to construct an arbitrage portfolio of portfolio A and B?