International financial markets

Finance

Lecturer: Using examples, explain the relevance of arbitrage (or “ no arbitrage in the following contexts; (a) The Arbitrage Pricing Theory(APT);

Arbitrage involves acquisition of positive estimated returns from overpriced or underpriced items in the inefficient market devoid of any incremental risk and any extra investments (KHAN and JAIN, 2004) .

In APT context, arbitrage involves trading of two items where at least one of the items has been mispriced. The arbitrageur sells the comparatively more costly item and uses the amount earned, to buy the comparatively cheaper item. The arbitrager creates a portfolio, which they use to make a risk free profit. For instance, when the current price is too low, it means that by the end of the period, the portfolio will have appreciated according to the rate predicted by the APT model. Meanwhile, the mispriced item will have appreciated at a rate higher than that of the portfolio. The arbitrageur could thus short sell the portfolio at the present price and use the amount obtained to purchase the mispriced item. At the end of the period, the arbitrageur will sell the mispriced item, purchase back the portfolio, and then keep the difference as his profit.

References

KHAN, M. Y., & JAIN, P. K. (2004). Financial management ; Text, problems and cases. New Delhi, Tata McGraw-Hill

(b) The pricing of currency forwards.

In this context, the arbitrageur utilizes the interest rates difference between two countries to make risk free profit. By the use of a forward contract to eliminate the threat of exchange rates, the arbitrageur makes profit from the fact that interest rates difference does not always hold(TEALL, 2013).

According to economists, factors such as fluctuating frequencies of time series data and diverse aspects of assets contribute to changes in interest rates. An example of an investor exploiting such an arbitrage opportunity due to pricing forwards;

The investor borrows 800, 000 of currency Y @ 2% per annum. This implies that that by the end of year, he will be required to pay 816, 000. Currency X offers a higher one-year interest and therefore the investor converts the 800, 000 currency Y to X at a spot rate of 1. 00.

The investors lock in the 4% rate on the deposit of the 800, 000X and concurrently enters into a forward contract which, converts the full maturity amount of the deposit,(832, 000X) into currency Y at the one-year forward at a rate of Y= 1. 0125X. After one year, the investor settles the forward contract at the agreed rate (1. 0125). The investor remains with 821, 728Y and after repaying his 816, 000Y loan, he remains with 5728Y as his profit.

References

TEALL, J. L. (2013). Financial trading and investing. Amsterdam, Academic Press.

(c) The binomial option pricing model

There may be various arbitrage opportunities according to the binomial pricing model. For instance, a situation where stock price is (ST)at time (T)and there are only two time periods; (T= 0 and T = 1). Starting stock price can be written as (So) . There are only two possibilities, going up to (u· S0) or down to (d · So); where (u > 1. 0 and d < 1. 0). Moving up and down (So),, the price is always indicated as (S1). The interest rate for the single period is defined to be (r), assuming continuous discounting. Ultimately, the risk-neutral probabilities of moving up or down are defined as (qu and qd) (SHREVE, 2004).

The arbitrage opportunities are then explored;

Arbitrage Opportunity 1

If (erT > u)

This is proven by the fact that

(erT > u)

(So . erT > So . u

(So . erT > So. d)

An initial portfolio is created less one share of stock at (So) and put the amount obtained into the bank. At Maturity (time T), the stock at price (ST) is bought to cover this position. Meanwhile, the money in the bank has grown to (So. erT). It is intuitive that (ST) can be either, (So . u or So. d.) Therefore, the ultimate portfolio value at any given place becomes (So. erT - ST > 0), making it possible to obtain risk free profit.

Arbitrage Opportunity 2

If (erT < d)

The same method employed in opportunity 1 is used here but this time, a portfolio long1 share of stock is opened at (So) and borrowed at ($So). At Maturity (time T), the portfolio will be worth (ST) and less (erT. So). Therefore, this case also presents an opportunity for obtaining risk free profit since (ST - erT. So> 0).

References

SHREVE, S. E. (2004). The binomial asset pricing model. New York, NY [u. a.], Springer.