Arbitrage

Arbitrage refers to the simultaneous purchase and sale in different markets to achieve a certain profit.

Gold

The traditional example of potential arbitrage is the gold market.

Suppose that gold is selling for $400 per ounce in London but for only $300 per ounce in Zurich.

Then an opportunity for profitable arbitrage exists: buy gold in Zurich and simultaneously sell gold in London. For every ounce bought and sold, one makes a $100 profit.

Market Equilibrium

In market equilibrium, there must be no opportunity for profitable arbitrage.

Otherwise one could make a certain profit by buying low (buying the relatively undervalued asset) and selling high (selling the relatively overvalued asset). There would be excess demand for the former and excess supply for the latter.

Gold

For gold, the no-arbitrage condition requires that the price of gold must be the same in London and in Zurich.

Relative Over- and Under-Valuation

For an arbitrage profit, what counts is *relative* over- or under-valuation. One always buys the asset that is relatively undervalued, and sells the asset that it relatively overvalued.

It does not matter whether either asset is correctly priced. What counts is only the *relative* value.

Gold

For example, in the gold example, one profits simply by buying low and selling high. It does not matter whether the correct price of gold is $200, $300, $400, or $500 per ounce. What matters is just that gold is relatively overvalued in London and relatively undervalued in Zurich.

Derivatives

That there must be no opportunity for profitable arbitrage leads to a theory of the pricing of a derivative.

Consider a derivative such that its value is derived from the value of an underlying asset. Then, unless the price of the derivative has a particular relationship to the price of the underlying asset, an opportunity for profitable arbitrage will exist.

Arbitrage and Present Value

The rate-of-return condition and the present-value condition are equivalent conditions for asset market equilibrium.

With certainty, one can see these conditions as a consequence of no-arbitrage. For example, suppose that one asset has a higher expected rate of return than a second asset. Then one can make an arbitrage profit by buying the first asset and selling the second asset short.

With uncertainty, however, these conditions are less fundamental than no-arbitrage. That one asset has a higher expected rate of return than a second asset does not imply that an opportunity for profitable arbitrage exists.