

Paper P3

Performance Strategy

Typically, P3 focuses on dealing with the downside risks facing a business, but arbitrage – a method of making near-riskless upside gains – is a potentially important element of performance strategy, too

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It would be easy to assume that arbitrage does not form part of the P3 syllabus, as it involves making a profit from exploiting market price differentials. But performance strategy involves managing both the downside risks faced by a business (conformance issues) and the upside potential (performance issues). Good enterprise governance covers each of these components.

Arbitrage is closely associated with another key P3 concept: purchasing-power parity or the law of one price. Arbitrage opportunities exist only where the law of one price isn't operating. Arbitrage then causes the law to be effective. This means that it's only a momentary phenomenon where markets are in disequilibrium.

Arbitrage as an idea is comparatively simple: it involves buying something "cheap" in one market and simultaneously (or nearly simultaneously) selling it "dear" in another, making a riskless profit from the price difference. Two types of arbitrage situation are likely to arise in exam questions:

- A single asset that trades for different prices in different markets. This can be illustrated in the currency markets by considering triangular arbitrage – the subject of this article.
- A single asset with a difference between its known price now and the price it should be trading at (as implied by discounting its future price by the appropriate risk-free interest rate). Question 4 of the May 2008 paper covered this situation.

In both cases the same principle operates of first determining the two prices, comparing them to decide which is cheaper and then buying in the cheaper market while selling in the dearer market.

Some forms of arbitrage are deemed unethical. For instance, if I were the director of a plc, I could buy shares in my firm as soon as I find out about a takeover bid and then sell these at a profit as soon as the bid is publicised. In most countries such insider trading is illegal. This example might

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not seem to conform to our definition, as it looks as if the sale and purchase aren't simultaneous. And, apart from the risk of ending up in prison, there is an execution risk owing to the delay, as I would be holding the shares for a period during which events could conspire against me – the stock market might crash, for example. While that's relatively unlikely, it does show that arbitrage is not without risk and is a form of speculation, albeit at the safer end of the spectrum. But the existence of forward and futures markets makes it possible to buy and sell nearly simultaneously. I could enter a contract now to buy the shares at the future date at the current (cheap) price of the future or forward. Later I would either buy the shares (using the forward contract) and immediately sell them for a profit, or I would close out the future position, making a profit. Of course, it shouldn't be forgotten in the technical discussion of how to buy and sell simultaneously (and so minimise the execution risk) that this type of arbitrage profit is illegal, too.

Triangular arbitrage relies on inherent market inefficiency. The efficient-market hypothesis, which is also covered in the P3 syllabus (although it's more usually considered part of F3), suggests that most real markets are likely to be at least "semi-strong efficient". If this is the case, the chances to make arbitrage profits in spot markets are at best fleeting. Studies would seem to support this conclusion: as long ago as the late 1980s, empirical research by Mark Taylor ("Covered interest parity: a high-frequency, high-quality data study", *Economica*, November 1987) found little opportunity for consistent profitable arbitrage in spot markets.

Given that such profits are unlikely to arise, it's reasonable to use totally unrealistic values in the following example for the sake of simplicity (this type of arbitrage also involves the use of cross rates, which are also part of the P3 syllabus):

- The dealer has £100 available.
- £1.00 = \$2.00.
- \$1.00 = €4.00.
- And the current spot for pounds to euros is quoted as £1.00 = €6.00 (the "direct quote").

Step 1: calculate the cross rate

We can use the two rates to obtain a rate that can be achieved through the dollar market. In this example the dollar is the common denominator ▶

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and, by rearranging the information given, we have the following:

- \$1 = £0.50.
- \$1 = €4.00.
- Therefore £0.50 = €4.00 or £1 = €8. We now have our two prices with a price difference.

Step 2: compare the two rates

- £1 = €6 (direct quote): cheap price for pounds; dear price for euros.
- £1 = €8 (calculated in step 1): dear price for pounds; cheap price for euros.

To clarify: we could give up €6 to buy £1 or we could give up €8 for the same £1, so the cheaper price for the pound is the first one. In this case we'd buy pounds at the €6 rate, which also means that we're selling euros at this rate.

Step 3: write down in detail what to do

Buy pounds at the €6 rate (direct) and therefore sell euros at this rate. Sell pounds at the €8 rate (the deduced rate) and therefore buy euros at this rate – this is the starting point, as we have to buy the euros because we are in the UK.

Step 4: set out the transactions

Tabulate the steps in sequence as follows:

Start	Transaction	Rate	Calculation	Finish
£100	1: sell £s to get \$s through the cross rate	£1 = \$2	£100 × 2	\$200
\$200	2: sell \$s to get €s at the favourable rate for buying €s	\$1 = €4	\$200 × 4	€800
€800	3: sell €s to get £s at the favourable rate for selling €s	£1 = €6	€800 ÷ 6	£133.33

Step 5: deducting any transaction costs, calculate the profit

After this series of transactions we end up with a profit of £133.33 – £100 = £33.33 or 33.33 per cent. If only this were possible in real life.

The problem is that our actions will cause the rates to alter rapidly. By buying euros through the dollar market or cross rate we would cause the euro's price to rise in this market, whereas the act of selling it through the direct quote would cause its price to fall. In effect, this means that the pound rises in value through the dollar conversion in the cross market to, say, £1 = €7, but falls in the direct quote market to, say, £1 = €7. At this price the chance for arbitrage has disappeared. So arbitrage

opportunities in spot markets rely on the existence of temporary market imperfections and are therefore rare and fleeting.

One possible matter of concern might seem to be whether the currency we are initially based in makes any difference. The answer is that it doesn't matter: whatever the currency, the same actions can be performed, but starting at a different point in the cycle. Let's assume, for example, that we are now based in the eurozone and therefore have euros rather than pounds. When based in the UK, we sold pounds, then dollars and then euros. Now that we're in the eurozone, the sequence will be to sell euros, then pounds and then dollars.

We can start in this case from step 2, but we need to invert the exchange rates, because we're looking at the situation from the European perspective, and assume that there's a different amount of euros available to the dealer. In this example we can say that it's €300.

Step 2: compare the two rates

- €1 = £1/6 (direct quote): dear price for euros, cheap price for pounds.
- €1 = £1/8 (calculated in step 1): cheap price for euros; dear price for pounds.

So it makes more sense to sell euros at the rate of £1/6 and to buy euros at the rate of £1/8.

Step 3: write down in detail what to do

Sell euros at the €6 rate (direct) and therefore buy pounds at this rate. Sell pounds at the €8 rate (the deduced rate) and therefore buy euros at this rate by going through dollars.

Step 4: set out the transactions

Tabulate the steps in sequence as follows:

Start	Transaction	Rate	Calculation	Finish
€300	1: sell €s to get £s at the favourable rate for selling €s	€1 = £1/6	€300 × 1/6	£50
£50	2: sell £s to get \$s through the cross rate	£1 = \$2	£50 × 2	\$100
\$100	3: sell \$s to get €s at the favourable rate for buying €s	\$1 = €4	\$100 × 4	€400

Step 5: calculate the profit

In this case we have a profit of €400 – €300 = €100 or 33.33 per cent.

An article on the other form of arbitrage can be found at www.cimaglobal.com/P3articlepart2.