

# The Risk and Return of Arbitrage in Dual-Listed Companies

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## How to compute deviations from theoretical price parity

We extract information about the theoretical price ratio of the twin prices from corporate annual reports, the merger prospectus, the equalization agreement, and/or the unification prospectus. For 6 out of 12 twins (BHP Billiton, Dexia, Fortis, Merita Nordbanken, Rio Tinto, and Smithkline Beecham), the theoretical price ratio is equal to 1:1. For the other six twins, either a fixed theoretical price ratio that is different than 1:1 applies, or *total* dividends – instead of dividends per share – to the shareholders of both parent companies are paid out in a fixed ratio. In the latter case, we apply the procedure outlined in Rosenthal and Young (1990, p. 129) for the calculation of the theoretical price ratio.

For example, the 2001 annual report of Royal Dutch / Shell describes its structure as follows: “The numerous companies in which Royal Dutch and Shell Transport own investments are collectively referred to as the Royal Dutch/Shell Group (...). The Group has grown out of an arrangement made in 1907 (...), by which the two companies agreed to merge their interests on a 60:40 basis while keeping their separate identities.”

Hence, the cash flows to the shareholders of Royal Dutch and Shell Transport are distributed in the ratio 60:40, which implies that the ratio of the dividends per share (and hence the theoretical price ratio) depends on the number of shares outstanding for both DLC parents. In principle, this ratio varies over time with variations in both numbers of shares outstanding. However, Datastream adjusts its price series (Datatype “P”) ex post for changes in the number of shares outstanding, so we can conveniently use the number of shares outstanding on the last day of the sample period (October 3, 2002) for Royal Dutch (2,126,646,000) and Shell (9,730,124,000) to arrive at a theoretical price ratio of 6.86:1. Note that small changes in the number of shares outstanding (due to e.g. executive stock option exercises) can lead to minor differences in the computed deviations from parity using different end dates. For example, our original computations show a price gap of -11.67% on January 1, 1980, but our updated analysis as of July 2005 yields a price discrepancy of -12.25% on January 1, 1980. Fortunately, these differences are very small and are unlikely to affect our results.