

Corporate Finance, Module 22: "Real Options"

Readings for the Fourteenth Edition (2022) of the Brealey, Myers, Allen, and Edmans text

(The attached PDF file has better formatting.)

The sections in this posting are for the *fourteenth* edition of the Brealey, Myers, Allen, and Edmans text. You may also use the seventh through thirteenth editions; final exam problems can be answered from any edition.

{The Brealey, Myers, Allen, and Edmans textbook is excellent. We say to read certain sections and to skip others. This does not mean that certain sections are better; it means that the homework assignments and exam problems are based on the sections that you must read for this course. Some of the skipped sections are fascinating, but they are not tested.}

The introduction on page 666 lists five types of real options. We cover three in this module, which are applicable to insurance companies and actuarial consulting firms: the options to expand, wait, and abandon. We do not cover the options for research and development or to vary the mix of output or the firm's production method, which do not apply to actuarial applications.

Final exam problems may ask to identify real options and to price real options. Identifying real options is not hard, and Brealey, Myers, Allen, and Edmans give many examples. Pricing real options is hard, since we rarely know the needed parameters.

Read section 23.1, "The Option to Expand." This option is relevant for insurance pricing, since an insurer selling a new product or in a new location generally loses money the first few years, but may make money in later years. In addition, the sale of one product to a customer, such as an auto insurance policy, is often the best way to sell other products, such as life insurance, Homeowners insurance, health insurance, or investment products. The textbook shows how to evaluate the value of a product with expansion possibilities.

Skip section 23.2, "Options in research and development." These options are critical for high-tech firms and manufacturers of complex equipment, but insurers do little R+D. This topic is fascinating, though, and you may want to read this section anyway.

Read section 23.3, "The Timing Option." The discussion forum has a common example using trade fairs to show the value of this option. Timing options are particularly important for industries with profitability cycles (such as the property-casualty underwriting cycle) combined with lag times to raise volume (caused by the high customer loyalty to insurance suppliers).

Read section 23.4, "The Abandonment Option." Abandonment options are particularly important for direct writers, who face large fixed costs setting up distribution systems (captive agents).

Skip section 23.5, "Flexible Production." This real option is relevant to manufacturers, not to insurers.

Read section 23-6 Valuing Real Options. Note the three problems on page 684: real options are difficult to value, lack structure, and apply to all competitors. Because of these problems (and the lack of a reliable pricing method), real options are rarely tested on final exams for this course.

Review end of chapter problems 1, 2, and 4.

Illustrative test questions, problems, and homework assignments are shown separately on the discussion forum.