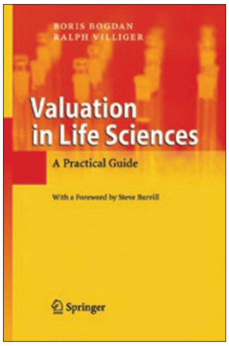
Adding value to valuation



Valuation in Life Sciences: A Practical Guide

by Boris Bogdan & Ralph Villiger

Springer, 2007
249 pp, hardcover, $69.95
ISBN 9783540455653

Reviewed by Rudolf Gygax

Finding appropriate valuations for life science projects, pipelines, licensing contracts and whole companies on rational grounds is a desirable goal. Although quantitative models underlying the valuation process are helpful, they may not be deterministic by nature and can be intrinsically subject to nonquantifiable elements such as market trends, competition and project-specific risks. Black-box methods can produce seemingly accurate numbers, but are of limited benefit to users who are not familiar with the underlying engine and specific sensitivities driving the valuation.

Valuation in Life Sciences: A Practical Guide opens up the black box and describes, step by step, a relatively simple procedure for quantitative valuation in the life sciences. The book guides the reader through the recommended procedure of quantitative valuation, which is based on (i) considering volatility by using a tree structure, (ii) the customary discounting of cash flows over time and (iii) using the concept of real options.

In a typical life science project, the time axis begins with various cost-driven phases ranging from preclinical and clinical stages to market launch, followed by a sales curve characterized by increasing sales, up to peak sales and a degradation of revenue after patent expiry. For the model, the time axis is split into equal steps—typically six months to one year in duration—leading from milestone to milestone. Progression to the next phase is subject to probabilities, for which relatively accurate estimates exist for typical pharmaceutical development processes. Volatility is introduced by applying, for each time step, a variation of the targeted peak sales value in either upward or downward direction, resulting in a binominal-like tree structure, which spreads as a function of the square root of time. Value calculations are performed for each node, working up the tree until the value of the root is arrived at, adding up all pathways with the correct statistical weight. The tree is pruned where its branches pass through negative values, because at these particular nodes, continuation of the project is not warranted on financial grounds. Such explicit calculation along the tree replaces the Monte Carlo approach frequently used for similar tasks.

The style of the book is instructive and deductive; that is, formulas and suggested parameter values are given without much derivation or quoting of sources, and the focus lies on application. Early chapters explain fundamentals of development projects in the drug and medical device industry as well as basic principles of the valuation procedures. In later chapters, these principles are meticulously applied to case examples that cover a remarkable scope, ranging from the prototype case, valuation of a single development project, to more complex situations such as licensing deals, portfolio valuations and valuation of drugs with multiple indications. For example, for the valuation of a licensing deal between a biotech company and a big pharma company, different parameters are applied while using the same model: it is assumed that lower peak sales, sequential launch and—based on higher risk—a higher discount rate applies, if a biotech conducts the project further, resulting in a low bracket value of the license deal. A pharma-led project, with higher peak sales, parallel launch and lower discount rates, results in the high bracket value. This opens up a negotiation space. Rationally, if the deal value were below the lower bound, biotech would be better off carrying the project forward itself, whereas above the upper boundary, the deal would be too expensive to pharma as compared to a project generated in-house.

Sophisticated software packages such as Palisade's @Risk or Decisioneering's Crystal Ball would also be suitable for applying the described principles and much beyond, but as stipulated in the book, spreadsheet software is sufficient and adequate for the implementation of the wide range of cases and examples described. The authors have made a case study with spreadsheet solution available on their website (http://www.avance.ch/). For cases requiring trees of higher dimension, such as the above-mentioned example of a multi-indication drug product, the spreadsheet is at its limit, and a sample Visual Basic code is provided instead.

This book is recommended to those who would like to acquire a profound understanding of quantitative valuation and use a simple spreadsheet approach to their own cases. It is a clear-cut guide to the basic principles employed in valuation of life science projects, and proves its worth in demonstrating how easily these relatively simple methods can be applied to a wide variety of situations, if done properly.

At the start of a valuation task, one may have an expectation or even a wish for it to fall into a certain range. Do not rely too much on the quantitative outcome of a numbers-crunching exercise. Its result may give you too much confidence or too much alarm relative to your expectation. On the other hand, do not dismiss quantitative methods either on the grounds that they cannot be deterministically accurate. Through the systematic and value-oriented elaboration of different future scenarios, including the exploration of their sensitivities, quantitative valuation helps to gain insight into why your expectation may be right, too high or too low. If thus understood as a principle rather than as a calculation, the approach described in this book can add a lot of value to valuation.

Rudolf Gygax is at Novartis Venture Fund, Novartis Campus, CH-4056 Basel, Switzerland.

COMPETING INTERESTS STATEMENT
The author declares no competing financial interests.