# Real options method in Mergers & Acquisitions: the case of SWISS & Lufthansa

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## Executive Summary

Investment activities in the aviation industry possess special attributes. They are capital intensive, in general at least partial irreversible and mostly company specific. Furthermore, the industry deals with great uncertainty market-wise as well as regulatory-wise. One can already assume now that traditional valuation methods, like the most used technique in modern finance, the DCF method, are not able to comprehensively regard the specific characteristics within this industry. The most stated point of criticism about the static DCF method comes along with the fact that the management is denied every kind of managerial flexibility, in other words the possibility to react on changing conditions.

Under certain circumstances, the real options approach may remedy, as an alternative valuation method, the disregard of managerial flexibility and instead constitute the prevalent uncertainty and flexibility as a future opportunity for action.

In the context of the presented thesis, the author aims to examine whether and how the real options approach actually appears as an appropriate and feasible method to value corporations, respectively investments. Additionally it is analyzed whether the real options approach provides a value added to analysts, management and the like compared to the traditional DCF valuation method.

The thesis is divided into six chapters. It begins with a brief introduction about the research questions, aim and structure of the thesis. In chapter 2 an introduction to M&A is undertaken with a focus on the background and history of mergers and acquisitions, including a short delineation of recent merger waves, and various theories are presented that underlay merger motives. Aside the rational, value maximizing motives like the synergies-/ market power-/ or diversification theory just to name but a few, also either not value maximizing- or irrational motives are introduced, including manager-/ hubris-/ and the economic disturbance theory.

Chapter 3 consists out of two main areas. The first area covers the history, the present and the future of the aviation industry by mentioning the very first days of the industry, the crucial impact from deregulation in the 1970s for today's aviation and the challenges lying ahead in the future are outlined. Furthermore, the M&A activities and the related strategic rationale within the aviation industry are shown, mainly focussing on the last decade where several grand-scale mergers and acquisitions have taken place.

The second area provides a thorough introduction into the case study with some information about the short independent history of SWISS and the integration into the Lufthansa Group. Supplementary details are provided on the acquisition concerning the parties involved in the deal, the deal structure and most importantly the financial aspect of the transaction.

In the subsequent chapter, the real options approach is examined carefully. First, the analogy and distinction to financial options are revealed. Then after a breakdown into different types is done and it is shown, when the real options method could and should be used. For the evaluation of real options, the three established methods (Black-Scholes formula, binomial model, replicating portfolio technique) are analysed and rationale are given why the chosen methods are seen as the most appropriate approaches for the underlying thesis.

After then having carefully defined several crucial parameters as well as the underlying assumptions for the DCF analysis, the computed results from the just mentioned DCF calculation are presented in chapter 5. Subsequently, the real options inherent in this acquisition are highlighted followed by the determination of the assumed variables and eventually the options are being valued. Thereupon, the results from the DCF valuation are compared with the results from the real option analysis, where the additional insights of the real options approach can be observed. In a final step, possible reasons are outlined on how the difference in SWISS' value between the computed results and the actually paid price could be justified.

Ultimately, chapter 6 provides a conclusion over the gained insights and an outlook for further research within this area.

Within the scope of the scrutinized case study, it is revealed that the consideration of real options increases SWISS' value significantly since the presumed value of flexibility can be incorporated. Moreover, the added value of real options turns the initially negative DCF value into a positive company value, thus leading from a rejection to an approval of the project according to the theory, when taking into account the inherent real options. Consequently, it can be recorded that the real options analysis is able to offer a better basis of decision-making, compared to traditional valuation methods. Nevertheless, it must be disclosed that the quantitative study, using a sensitivity analysis within the DCF valuation, determines that either a sharp rising WACC and/or a significant lower than expected revenue growth results in the fact that also the real options approach would not convey a crucial value added.

However, to value entire corporations according to the real options approach, it is essential to consider all divisions and investments separately. Especially with grand-scale companies this leads to a complex and very time consuming procedure and a fair likelihood exists that by far not all real options are revealed. In addition, the transfer from a real world state of affairs into an appropriate real options setting turns out to be arduous. Furthermore the computed value of real options is highly sensitive towards the determination of input parameters. As a result, a thorough understanding of the company, the investment and option valuation methods is needed in order to provide meaningful and not misleading results.

The stated drawbacks, especially the conceptual complexity as well as the extent of the approach, could be an explanation for the scarce spread of this approach up to the present although the advantages, compared to traditional approaches, are clearly on hand.