

Incorporating Soft Elements into Corporate Valuation: The DCF-S Model

Bachelor Thesis in
Corporate Finance

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Executive summary

Problem statement

The most widely used model in corporate valuation - the DCF model - is based on the assumption of a perfectly rational Homo Economicus. However, over time, more and more empirical evidence has accumulated about violations of this assumption. Contrary to the neoclassical belief not only rational, but also irrational elements appear to influence corporate valuation.

Surprisingly, compared to other fields, the DCF valuation has received relatively little attention from behavioral finance. This might be a result of the fact that the reconciliation of the two fields appears to be difficult. However, the importance of the DCF-model in theory and practice demands for answers to come up with.

Proceeding

Following the discussion of prior literature, violations of ‘rationality’ in the neoclassical sense are analyzed. As a result of the analysis, a terminology with hard and soft elements¹ is proposed, building the conceptual foundation of this work. Then based on reflection and empirical findings, the author introduces the DCF-S model - an extended DCF model that allows the incorporation of soft elements into the DCF valuation.

Technically, the extension is achieved by splitting the discount function into two separate components: a hard element and a soft element component. To account for the altering influence of the soft elements over time, a weighting function that allocates individual weighting-multipliers to the hard and soft element discount factors is introduced.

While the impact of hard elements is modeled by a conventional exponential discount function, there exist various possibilities to calibrate the soft element function. In this thesis, the soft element function is modeled by a hyperbola, whose calibration is based on empirical research from microeconomics.

Meanwhile the weighting function is calibrated by own analysis. To get the necessary data, DCF and DCF-S valuations are conducted for SMI companies at regular points in time between Dec 2004 and Jun 2009. Then the historically implied weightings are calculated under the assumption that the target prices gained with the DCF-S model should be equivalent to the observed share prices, if the weighting is correct. Finally the possibility of relating the implied weightings to an investor confidence index is examined.

¹ The term soft element summarizes behavioral and other seemingly irrational elements that cannot be explained by standard models in finance.

Results

The present formulation of the DCF-S model suggests that incorporating soft elements into the DCF framework is feasible. The proposed model appears to be conceptually sound and it accounts for both irrational as well as rational elements. While at this point in time a verification of the soft-function is not possible, the results of its calibration are interesting: They show that the proposed DCF-S model is able to explain share prices that deviate negatively from fundamental values. The explanatory range depends on the WACC as well as the FCF growth and is up to -11.3% under favorable conditions (with no FCF growth and 5% WACC).

Meanwhile, the results from the weight analysis do not match with expectations. Moreover, they do not seem to follow any pattern. Thus, with the present calibration it is not possible to establish a relationship between the calculated weightings and selected investor confidence indices.

Conclusion

With the accumulating evidence for soft elements in valuation, there clearly is a need for modified DCF models. The DCF-S model introduced in this thesis promises to remedy the deficiencies of conventional models, by accounting for both rational and irrational elements in valuation. The results of the calibration of the soft-function show that, assuming conceptual soundness, the DCF-S model is able to explain negative share price deviations. The model would additionally be able to predict future share prices more accurately, if a relationship between the weighting and some measurable indicator could be found and described. However, as shown above, the findings from the weight analysis do not help in this regard.

Hence, further research is necessary to cast light on that issue. Moreover, once the DCF-S is satisfactorily calibrated, research will also be able to verify the model by means of back-testing.