

Discounting Cash Flow Method Application in Banking Evaluation

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Abstract

The DCF (Discounted Cash Flow) approach capitalizes prospectus earnings forecasts using comparable company DCF multiples. For both methods, the estimated values are compared to actual market prices to obtain a valuation error. The discounted cash flow method can be applied in the valuation of banking companies in this method all future cash flows are discounted to the present value. From a theoretical point of view, it is considered the most correct but perhaps also the most complex. Very important in this approach are the accuracy with which future revenue streams are estimated and the correctness of setting the discount rate level. This paper examines the accuracy of discounted cash flow (DCF) methods of equity valuation for firms that obtained listing on the bank. The DCF method is implemented by discounting cash flow forecasts based on information contained in listing prospectuses.

Key words: discount rate, net treasury, net working capital, discounted cash-flow

J.E.L. classification: M41, M19, G19

1. Introduction

This method is the most complex and perhaps the most modern method of valuation and represents the method of financial flows, or, in Anglo-Saxon terms, "discounted cash-flow" (DCF). In the French expression the wording "the method of updating future flows" is used (Allen, F., 2008, p 365-370). The theoretical methodological basis and mathematical calculation of the value of the enterprise through this method is the theory and practice of determining the economic efficiency of investments in general, and economic-financial calculations related to the feasibility of an investment project, in particular.

DCF method (discounted cash-flow) is similar to the method of determining economic efficiency, in that:

- Both are prospective methods, which take into account the economic future of the enterprise, based on investments by using resources from bank loans, loans on the capital market, share capital increases.
- The same calculation methods are used: net cash flow, residual value, discount rate, discounted value (or present).
- The expression of economic-financial indicators is done in current prices, so the influence of inflation is taken into account.
- For a price evolution eroded by a slight change in the inflation rate (Bhat, 2011), the valuation is made in constant prices; In situations with a fluctuating inflation rate, the assessment is made in a currency little affected by inflation. Regardless of the way cash flow is defined, it is practically the difference between the inflows (receipts) and the outflows (payments) made by a company in a period of time.

In the analysis of the annual financial situation of an enterprise, similar notions are used (Bleck, 2010), but different in scope:

- Net working capital (NWC)
- Required working capital (RWC)

- Net treasury (NT)

Working capital is the surplus of stable resources (shareholders' capital and long-term loans) over fixed assets (Morris, S., 2004, Review of Finance 8) (tangible, intangible and financial). It is calculated as:

$$\text{NWC} = \text{Current assets} - \text{Current liabilities}$$

$$\begin{aligned} \text{Current assets} \\ = \text{Stocks} \\ + \text{Claims} \\ + \text{Current accounts} \\ + \text{Short-term financial investments.} \end{aligned}$$

The required working capital expresses the part of the permanent capital that a company must use over the one allocated to financing:

$$\begin{aligned} \text{RWC} = \text{Stocks} \\ + \text{Receivables} \\ - \text{Short-term non-bank debt} \end{aligned}$$

Net treasury is calculated as the difference between the required working capital and the necessary working capital:

$$\text{NT} = \text{RWC} - \text{NWC}$$

2. Literature review

There is little empirical evidence on the effectiveness of equity valuation methods in international equity markets. Much of the evidence on equity valuation methods is from the relatively deep and liquid markets (e.g., Alford, 1992; Kaplan and Ruback, 1995; and Kim and Ritter, 1998). This paper is closely related to Kaplan and Ruback (1995), which indicates that both DCF and P/E methods provide reasonable estimates of value for a sample of large leveraged buy-outs. Whether their results provide unambiguous evidence regarding commonly used share valuation methodologies is unclear for several reasons. First, firms that undertake leveraged buy-outs are more likely to have stable operating cash flows (Opler and Titman, 1993). Valuing the firm cash flows is likely to be more accurate than valuing equity cash flows because flows from operations are less variable than equity flows. Both of these reasons suggest that the potential errors reported in Kaplan and Ruback (1995) are lower than errors obtained in a typical valuation. Third, we are able to use market prices as a benchmark, whereas the transactions valued by Kaplan and Ruback (1995) are performed off-market. Given the large number of market participants in public offerings, the market price is probably a less noisy benchmark. Finally, Kaplan and Ruback (1995) make an error in their valuation by determining the cash flow and the growth rate for their terminal value calculation as if they are independent. Our valuation models jointly determine the terminal cash flow and the future growth rate, because both depend on the level of cash flow retention in the terminal year (see Berkman, Bradbury and Ferguson, 1998).

3. Financial diagnosis of the evaluated enterprise as a research method

The knowledge of the evaluated object (of the evaluated company) is made by studying both the annual financial statements and some information regarding the change of the share capital.

The main documents used to prepare this diagnosis as a research method are the balance sheet and the profit and loss account (Plantin, G., 2008, p 52). The balance sheet is the most important accounting document for the appraiser, because it provides a clear picture of the patrimony accumulated by the organization during its existence, as well as of the financial results obtained in the financial year that ended. The balance sheet analysis performed by the appraiser takes into account the statement of assets and financial results.

Table no. 1. Consolidated balance sheet

Assets	31st December 2018 RON '000	31st December 2019 RON '000
Cash and cash equivalents	5 947 596	4 824 755
Financial assets held for trading	44 806	41 275
Derivatives held for risk management	52 077	1 770
Loans and advances granted to banks	359 973	1 603 003
Loans and advances granted to customers	10 960 548	8 777 265
Securities	1 197 530	569 413
Shares	44 099	44 400
Tangible assets	373 703	310 321
Intangible assets	104 758	103 886
Deferred tax, assets	6 864	-
Profit tax receivables	747	1 203
Other assets	276 354	195 654
Total assets	19 369 055	16 472 945

Source: Raiffeisen Annual Report, 2019

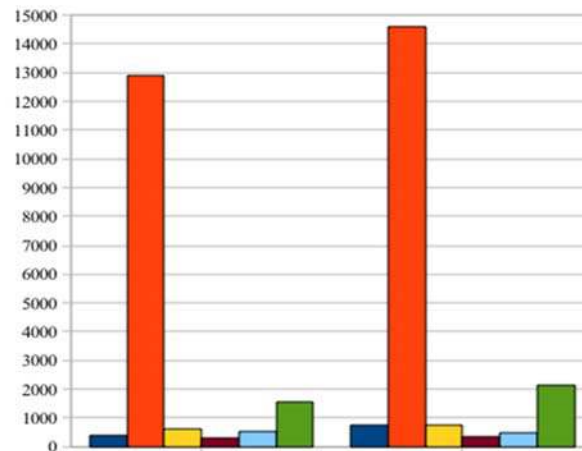
Details regarding the assets evolution:

Raiffeisen Bank's total assets increased by RON 2.5 billion in 2007, an increase of 18.23% compared to 2016. The increase was due in proportion of 45% to the retail business, the corporate business and the treasury contributing with 20%, respectively 10%.

The growth was supported by the development of the network of units (167 new units) and its specialization (at the end of the year there were 46 Mortgage Corners and 15 Mortgage Centers). The total assets of the Raiffeisen Group in Romania increased in 2018 by RON 2.9 billion, representing an increase of 17.58% compared to 2017. Loans and advances to customers increased by 25%, the increase being due in proportion of 45% to the corporate customer segment and 55% to the retail customer segment. The growth was supported by the further development of the network of units (122 new units) and its specialization (at the end of the year there are 21 Mortgage

Center units).

Figure no. 1. Asset structure



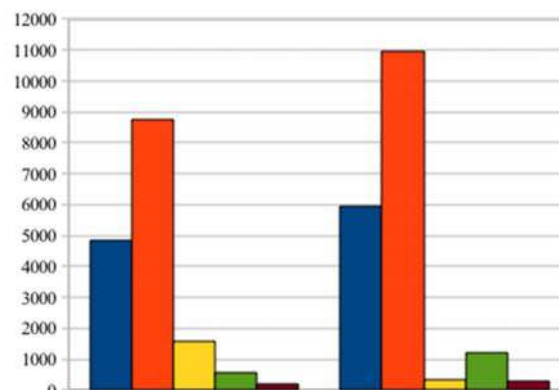
■ Bank deposits ■ Customer deposits ■ Loans from banks and other financial institutions
■ Subordinated debts ■ Other debts ■ Equity

Source: Raiffeisen Annual Report, 2019

Details regarding the liabilities evolution:

Deposits attracted from customers exceeded RON 12.9 billion at the end of 2017, 30% more than in December 2016. Over 40% of this amount represent resources attracted from individuals, large corporations and financial institutions also having a share of 35% in total customer deposits. Deposits attracted from customers exceeded RON 14.6 billion at the end of 2008, 13% more than in December 2007. Of this amount, the term deposits of the clients represent 65%, while the demand deposits 35%. The retail segment has a share of 40% of the total resources attracted from customers of the corporate segment 60%.

Figure no. 2. The structure of liabilities and equity



■ Cash and cash equivalents ■ Loans and advances granted to customers ■ Loans and advances granted to banks
■ Securities ■ Other assets

Source: Raiffeisen Annual Report, 2019

Net income:

Operating income increased by over 30% compared to 2016, with interest income having a share of 45%, and those from commissions of 40% in total. Lending to individuals and the trading part of legal entities had the largest contribution to the increase in income. On the expenditure side, personnel expenses registered the largest increase (+ 30%), the development of the network being the main factor. In 2017, the Bank registered a profit 75% higher than the previous year.

Operating income increased by 46% compared to the previous year, net interest income having a share of 44%, and those from commissions 37% in the total amount. Personnel expenses increased by 22%, and administrative expenses increased by 29%, the development of the network being the main factor. However, the revenue / expenditure ratio has improved to 56%. In 2018, the Raiffeisen Group in Romania registered a net profit 92% higher than the previous year.

Table no. 2. Consolidated profit and loss account

	31st December 2018 RON '000	31st December 2019 RON '000
Interest income	1 581 454	1 059 184
Interest expense	664 091	392 127
<u>Net interest income</u>	<u>917 363</u>	<u>667 057</u>
Income from fees and commissions	836 800	606 746
Expenses with fees and commissions	68 579	51 411
<u>Net income from fees and commissions</u>	<u>768 221</u>	<u>555 335</u>
Net trading income	409 758	200 776
Net expenses from other financial instruments at fair value through profit or loss	39 449	4 490
Other operating income	46 640	21 643
<u>Operating income</u>	<u>2 102 533</u>	<u>1 440 321</u>
Operational expenses	662 182	511 660
Salary expenses	506 223	416 478
Net expenses with provisions for the depreciation value of financial assets	193 357	115 378
Losses from participations in associated entities	12 617	438
<u>Profit before tax</u>	<u>728 154</u>	<u>396 367</u>
Income tax expense	114 149	76 758
<u>Profit for the financial year</u>	<u>614 005</u>	<u>319 609</u>

Source: Raiffeisen Annual Report, 2019

4. Application of the Discounted Cash-Flow method for the evaluation of the banking company

Table no. 3 Availability from the beginning of 2018 and 2019

Assets	31st December 2018 RON '000	31st December 2019 RON '000
Cash and cash equivalents	5 947 596	4 824 755
Financial assets held for trading	44 806	41 275
Derivatives held for risk management	52 077	1 770
Financial liabilities held for trading	3 306	2 315
TOTAL	6 047 785	4 870 115

Source: Raiffeisen Annual Report, 2019

Table no. 4. Revenues in 2007 and 2008

	31st December 2018 RON '000	31st December 2019 RON '000
Interest income	1 581 454	1 059 184
Income from fees and commissions	836 800	606 746
Net trading income	409 758	200 776
Other operating income	46 640	21 643
TOTAL	2 874 652	1 888 349

Source: Raiffeisen Annual Report, 2019

Table no. 5 Expenditures in the form of expenses in 2019 and 2018

	31st December 2018 RON '000	31st December 2019 RON '000
Interest expenses	664 091	392 127
Expenses with fees and commissions	68 579	51 411
Net expenses from other financial instruments at fair value through profit or loss	39 449	4 490
Operational expenses	662 182	511 660
Salary expenses	506 223	416 478
Net expenses with provisions for the depreciation of the value of financial assets	193 357	115 378

Losses from participations in associated entities	12 617	438
TOTAL	2 146 498	1 491 982

Source: Raiffeisen Annual Report, 2019

Total income for the year 2018: 1 888 349 thousands RON.
Total expenses for the year 2018: 1 491 982 thousands RON.
The result before tax for the year 2007: 396 367 thousands RON.
Income tax in the year 2018: 76 758 thousands RON.
Result after tax (net) in 2018: 319 609 thousands RON.

The cash availabilities at the end of the two years are represented by the difference between the total receipts and the total payments made by the enterprise during a financial year.

Total income for the year 2018: 2 874 652 thousands RON.
Total expenses for the year 2018: 2 146 498 thousands RON.
The result before tax for the year 2018: 728 154 thousands RON.
Income tax in the year 2018: 114 149 thousands RON.
Result after tax (net): 614 005 thousands RON.

Determining the change in the required working capital

In the analysis of the annual financial situation of an enterprise, similar notions are used, but different in scope:

- Net working capital (NWC);
- Required working capital (RWC);
- Net treasury (NT).

4.1. Working capital:

$$\text{NWC} = \text{Current assets} - \text{Current liabilities}$$

Current assets
= Stocks
+ Claims
+ Current accounts
+ Short-term financial investments.

Working capital in the year 2017: 15 817 481 thousands RON - 739 347 thousands RON
= 15 078 134 thousands RON.

Working capital in the year 2018: 18 562 530 thousands RON - 509 412 thousands RON
= 18 053 118 thousands RON.

4.2. Required working capital (RWC):

RWC = Stocks
+ Claims
- Short-term non-bank debt

RWC 2007 = Stocks	0
+ Claims	10 380 268
- Short-term non-bank debt	2 315
RWC 2007 = 10 377 953 thousands RON.	

RWC 2008 = Stocks	0
+ Claims	11 320 521
- Short-term non-bank debt	3 306
RWC 2008 = 11 317 215 thousands RON.	

Table 4.4. Receivables situation

Assets	31st December 2018 RON '000	31st December 2019 RON '000
Loans and advances granted to banks	359 973	1 603 003
Loans and advances granted to customers	10 960 548	8 777 265
Total	11 320 521	10 380 268

Source: Raiffeisen Annual Report, 2019

Table 4.5. Short-term debt situation

Liability	31st December 2018 RON '000	31st December 2019 RON '000
Financial liabilities held for trading	3 306	2 315

Source: Raiffeisen Annual Report, 2019

4.3. Net treasury (NT):

$$NT = NWC - RWC$$

$$\begin{aligned} NT 2007 &= 15\,078\,134 \text{ thousands RON} \\ &- 10\,377\,953 \text{ thousands RON} \\ &= 4\,700\,181 \text{ thousands RON.} \end{aligned}$$

$$\begin{aligned} NT 2008 &= 18\,053\,118 \text{ thousands RON} \\ &- 11\,317\,215 \text{ thousands RON} \\ &= 6\,735\,903 \text{ thousands RON.} \end{aligned}$$

5. Conclusions

Our results show that the best DCF valuations have similar accuracy. The methods have median absolute valuation errors of around 15 % and explain around 60 % of the variation in market price scaled by book value. Market and transaction DCF estimates using market-based estimates are the most accurate methods. Industry -based DCF estimates yield larger valuation errors. We attribute the poor industry results to the inability to find appropriate comparable firms in the thin bank market.

The purpose of valuing a commercial company with the object of banking activity is to establish the overall value of the entity as a whole by highlighting the financial position of the entity given the value of indicators such as:

- Fixed assets (physical and moral wear and tear, their economic profitability).
- The degree of indebtedness towards the Central Bank, towards the clients, towards other banking institutions and towards other economic agents.
- The level of the minimum required reserve, the level of cash.
- Ability to mediate economic activities and cash flows.
- Equity, financing methods, shareholding.

The application of the discounted cash flow method in our opinion as a result of the research can ensure the fulfillment of all the conditions in order to ensure a correct and real evaluation of a banking entity (A.C. Kolasinski, 2011, p 1-14).

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