METHODS OF BANK VALUATION: A CRITICAL OVERVIEW

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Abstract: The article discusses common valuation methods in order to find the most appropriate ones through the analysis of advantages and disadvantages of each approach. The main criterion for critical discussion on the valuation approaches is how their usage captures the specific characteristics of banking. The reached conclusion establishes the basis for further work on the subject – the search for the most accurate valuation model for banks.

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JEL Classification: G21, G29

Introduction

Value of company is a relatively informal term, which is typically used to determine the financial health and welfare of a firm (in our case, a bank) in the long run. The term *economic value* (or *shareholder value*) is an essential part of the concept of value-based management, commonly utilized by academic researchers and business practitioners. According to this concept, the valuation of a bank is an estimation of its market value in terms of money on a certain date, taking into account the factors of aggregate risk, time and income expectations. Therefore, the valuation of banks requires specific expertise in two special subjects: an in-depth knowledge of valuation techniques and a deep understanding of the banking industry and the bank-specific characteristics of valuation.

The basic principles of valuation apply as much to banks as to other firms. There are, however, few aspects relating to banks that could affect how they are valued. Definition of these specific characteristics of the banking business allows for the selection of the most accurate valuation method. Hence, the key question of the article is whether the valuation methods exemplify and consider the special characteristics of banking.

Aim and methodology

The aim of the article is to provide an overview of the most common valuation techniques that apply to the banking industry. The analysis of the bank valuation is to be provided through a thorough and practical discussion on an appropriate application of bank valuation methods, their advantages and disadvantages. In order to settle the issues of the article, studies of relevant literature and financial analysts' valuation reports were conducted. The information collected was analyzed and conclusions have been made on the basis of the analysis.

General discussion

There are several discussions on specific approaches to bank valuation, which differ by assumptions and characteristics they are based on. However, it is possible to distinguish a general outline for discussion. The most important performance dimensions for banks are profitability and risk (and not production possibilities and technology); that makes bank a business corporation organized for the purpose of maximizing the value of the shareholders' wealth invested in the firm at an acceptable level of risk. [15, p.150]

Copeland et al. (2000), authors of the standard work on valuation, devote only one chapter to the specifics of valuing financial institutions. They suggest that the major issue is a transfer pricing between three bank business units: a retail bank, a wholesale bank and a treasure. Therefore, the valuation process should take into consideration the determined business model of banking. *"It is difficult, if not impossible, to value the bank's equity by first valuing its assets (that is, its lending function) by discounting interest income less administrative expenses at the weighted average cost of capital, then subtracting the present value of its deposit business (interest expenses plus consumer bank administrative costs, discounted at the cost of debt)."* [5, p.498]

Copeland et al. also paid attention to the fact that bank liabilities consist of customer deposits and borrowings on funds market, which apparently perform the same function, but with a different margin. As a result, the spread between the interest received on loans and the cost of capital is so low that small errors in estimating the cost of capital can result in huge swings in the value of the bank.

Damodaran (2002) considers the valuation of financial service firms with the special role of debt in their functioning (similar to opinions of Copeland; Adams, Rudolf). What is special about Damodoran's opinion is that he sees debt for financial service companies as a raw material and not as a source of capital. "*Debt is something to be molded into other financial products that can be sold at a higher price and yield a profit. Consequently, capital at financial service firms is more narrowly defined as including only equity capital. This definition is reinforced by the regulatory authorities.*" [6, p. 576-577]

Damodaran also stated two practical problems in valuating banks. The first is that the estimation of cash flows could not be performed without estimating reinvestments; the second is that estimating expected future growth becomes more difficult if the reinvestment rate cannot be measured. Hence, it makes more sense to value equity directly at banks, rather than the entire firm.

Adams and Rudolf (2010) distinguish the characteristics of banking business into four categories, motivating a distinct valuation approach. First, banking is a heavily regulated industry. Second, banks operate on both sides of their balance sheets, actively seeking profits not only in lending but also in raising capital. Third, banks are exposed to credit default risk, but they also actively seek risk as a part of their business model. Last but not least, the profit and the value of a bank are much more dependent on interest rate risk than other industries. [1, p.2]

Analyzing the revealed characteristics of banking (risk, business model, regulation), it should be stated that only the models, which reflect these characteristics, should be chosen for valuation.

In general terms, there are four approaches to valuation with numerous sub-approaches within each. The first, asset-based (or accounting) valuation, is built around valuing the existing assets of a firm, with accounting estimates of value or book value often used as a starting point. The second, market (or relative) valuation, estimates the value of an asset by looking at the pricing of 'comparable' assets relative to a common variable like earnings, cash flows, book value or sales. The third, income approach (or, specifically, discounted cash flow valuation), relates the value of an asset to the present value of expected future cash flows on that asset. The fourth approach, contingent claim

valuation[6], uses option pricing models to measure the value of assets that share option characteristics. Each approach is applicable for bank valuation with several conditions.

Asset-based approach

The asset-based valuation of a bank requires valuing the loan portfolio of the bank (which comprises its assets) and subtracting the outstanding debt to estimate the value of equity. It is frequently used to establish the liquidation value of a bank for possible legal proceedings. However, the value-based approach is difficult to apply when the bank enters multiple businesses (commercial banking, investment banking, etc.) or regions (countries).

The necessity of the asset-based approach in bank valuation also lies in the testing of the bank's actual book value until the valuation moment, and, consequently, it is a meaningful instrument at the negotiation (especially, to prove the value of the bank's intangible assets).

Market approach

The market (or relative valuation) approach is probably the simplest way to value a bank. Analysts' conclusions based on this approach could be easily found in business reports on a regular basis, where reasonably comparable guideline companies are defined primarily by expert opinions and multiples' comparisons. The most sufficient multiples for bank valuation are the price-earning ratio (P/E) and the price-to-book value ratio (P/BV). P/E ratio, as a function of three variables – the expected growth rates in earnings, the payout ratio, and the cost of equity, depicts some specific characteristics for bank valuation revealed previously.

The choice of comparable banks will include banks with similar historical growth rates and risk profiles. The differences between the subject of valuation and the comparable banks should be thoughtfully incorporated into the valuation analysis by several adjustments.

Damodaran (2002) calls attention to the choice of a relevant comparable. Modern banking is a business mix of retail banking, private banking, corporate and investment

[6] Contingent claim valuation is based on the same principles as the income approach, and therefore, should be considered as its expansion.

banking, and trading activities. Also, to find a comparable bank with the same proportions in the banking business model from the outside is relatively hard. As for the P/E ratio specifically, it is liable to a high volatility due to the bank policy to report a profit while creating provisions for credit losses.

Income approach

The income approach focuses on the conversion of expected future economic benefits into their present value. The discounted cash flow valuation gets the most play in academic research and comes with the best theoretical credentials. It is relevant to concentrate on cash flow and dividends as cash flow proxies for bank valuation.

The common free cash flow on equity (FCEE) method is highly valid for bank valuation, also because it reflects the fact that banks can create value from the liability side of the balance sheet. Figure 1 reveals the logic of the FCFE calculation.

The alternative representation of FCFE is the summation of dividends paid, potential dividends, and equity repurchases and issues.

The dividend discount model (DDM) is another theoretical extension of the neo-classical discounted cash flow models, which applies to banks since they are publicly traded companies. The general form of the model is presented by the formula:

$$\text{Value per share of equity} = \sum_{t=1}^{t=\infty} \frac{DPS_t}{(1+k_i)^t}$$

where DPS_t – expected dividend per share in period t;

k_i – cost of equity.

Fig. 1 Free cash flow to equity (bank shareholders)

Balance sheet		**Income statement**
Liabilities	**Assets**	
Growth of shareholders' funds (equity)	New loans	+ Net interest income
- Provisions and unearned income	+/- Securities held (increase/decrease)	+ Net fees and commissions
+/- Deposits (increase/decrease)	+/- Accounts receivable	+/- Securities trading (gains/loses)
+/- Liabilities from dealing activities	+/- Fixed assets (increase/decrease)	+/- Loan loss provision
+/- External debt (increase/decrease)	+/- Net intangible assets	+ Net non-interest income
+/- Accounts payable (increase/decrease)	+/- Cash reserve (increase/decrease)	- Taxes
= Changes in liabilities	= Changes in assets	= Net income
Change in Assets – Change in Liabilities = Growth (change) of capital + Net income = FCFE		

Source: Adapted from Copeland et al. (2000), Antill, Lee (2008) and Beninga (2008)

The discussion on inputs and special cases (such as stable growth) could be found in Damodaran (2002). To value a stock, using the dividend discount model, the estimates of the cost of equity, the expected payouts ratios, and the expected growth rate in earnings per share over times are needed. The expected dividend per share in a future period can be written as a product of the expected earnings per share in that period and the expected payout ratio. It allows us to focus on the expected growth in earnings (more accessible and reasonable data) and change the payout ratio over time (to reflect changes in growth and investment opportunities). However, the calculation of the discount factor for the model leads to some complications and shortcomings.

The major discussion on the income approach concerns the possibilities of estimating the cost of equity. The cost of equity for a bank has to reflect the portion of the risk in the equity that cannot be diversified away by marginal investment in the stock. Several methods are available to calculate the expected return on equity or discount rate for banks:

- Gordon Growth Model
- An average profitability
- The cost of foreign funds
- Capital Asset Pricing Model (and its extensions)

- Arbitrage Pricing Theory model (and its modifications, such as Build-Up). [11, p. 55]

The influence of risk on the cost of capital is the main concern for researchers. Traditionally, risk is estimated by beta (in CAPM) or betas (in a multifactor or arbitrage pricing model). The estimation of beta-coefficient is usually conducted by regressing the securities' excess return on the market excess return. Some researchers, such as Fama and French (1996), argued against the ability of CAPM to predict returns; nevertheless, the beta-coefficient is widely used to estimate the excess return and the cost of equity.

Damodaran (2002) usually argues the use of regression betas because of the noise in the estimates (standard errors) and the possibility that the firm has changed over the period of the regression. As for usage of regression betas for the valuation of banks, his empirical research suggests that such beta estimates are valid for large and stable financial institutions and if regulatory restrictions have remained unchanged over the period and are not expected to change in the future. He also suggests using the average levered beta for comparable firms as the bottom-up beta for the firm being analyzed. [6, p.581]

The income-based approach is a well-recognized and frequently used valuation methodology, which has received wide application in practice, mostly because the bank's value is determined by its future performance, which is of significant concern for shareholders and other suppliers of capital. However, studying the literature and analyzing the empirical findings leads to the conclusion that the value obtained by this approach may be rather subjective, since it is based to a great extent on the appraiser's consideration about the bank's future return and the associated risks. Small modifications of the input variables affect the final value significantly. Moreover, the income approach does not entirely consider the specific characteristics of banking mentioned previously.

Contingent claim valuation

Up to this point we have discussed the classical approaches to valuation. In recent years, option pricing models (binominal, Black-Scholes-Merton, etc.), based on more advanced mathematical appliance, have been introduced. We suppose that they might be used for bank valuation as well.

The Black-Scholes-Merton model is a function of six input factors: the current price of the underlying stock (S), the dividend yield of the underlying stock (R), the option strike price (X), the risk-free rate over the life of the option contract (e_f^{-Rt}), the time remaining until option expiration (t), and the price volatility of the underlying stock (σ). In terms of the six inputs, the formula for the pricing of a call option on a single share of common stock is

$$P = S * N(d_1) - Xe_f^{-Rt} * N(d_2),$$

where N(d1) and N(d2) – the conditional density functions of the normal distribution with sigma representing stock price volatility, which is calculated by

$$d_{1,2} = \frac{\ln(S/X) \pm (R^f + \sigma^2/2)t}{\sigma\sqrt{t}}.$$

The Black-Scholes model is appropriate for valuation of companies, which assets and liabilities measures are comparable by significance. Undoubtedly, the model is feasible for usage in bank valuation, since operations on both assets and liabilities are significant for the banking business structure.

The model might be adopted for bank valuation by the following procedures:

1. The risk-free rate is accepted at the same level as in the income approach.
2. The price volatility is calculated from the annual bank statistics. The usage of relatively stable market indexes is also appropriate[7].
3. Instead of Macalay duration, we suggest to use the weighted average debt turnover s debt duration.
4. S and X variables are determined by the asset-based approach. [7, p.6-7]

Results of empirical studies on the option pricing model applied to bank valuation (such as Giammarino, Schwartz, Zeichner, 1989) imply that the valuation technique should not replace conventional methods of monitoring financial institutions (as a

[7] The critic of using the market indexes is based on the fact that indexes generally include non-banking companies.

regulation procedure), and do not depict the regulation impact on the performance of banks.

Nevertheless, the special characteristics of banking might be adequately considered in the valuation of banks. Absent attributes should be respected in valuation by the inclusion of additional variables in the model. Adams and Rudolf (2010) proposed a valuation model for banks derived from Merton's (1974) structural model of a firm, Black-Scholes pricing model and concept of matched maturity marginal value of funds (MMMVF). Applying the MMMVF transfer pricing framework and dividend discount model, the proposed model divides the bank's economic value into three separate values: the value of deposit business, the value of loan business and the value of asset-liability management. To acquire each value the special valuation procedures are performed separately. However, the model has a few shortcomings: (1) it is abstracted from taxes, reserve requirements, minimum capital requirements and other regulatory factors, and (2) it does not include non-cash items in valuation (depreciation, amortization, etc.).

The revealed advantages and disadvantages of each valuation approach with regard to banks are summarized in Figure 2. It is worth mentioning, that each approach is suitable in a specific range of situations. For example, an application of income and contingent claim approaches is limited for banks functioning in emerging markets, due to the lack of information for calculations of the discount factor and the market return.

Fig 2 Advantages and disadvantages of the valuation approaches

Valuation Approach	Advantages	Disadvantages
Asset-based approach	- Simple for understanding and practical usage - Does not require guesswork and assumptions	- The most simplified valuation model - Requires access to all of the bank's internal data - Does not consider the long-term development perspectives
Market approach	- Uses actual data - Simple application (derives estimates of value from relatively simple financial ratios) - Does not rely on explicit forecasts - Considers market reaction on bank performance - Reflects the M&A practice	- Most of the important assumptions are hidden (bank's expected growth in earnings, risk and margins) - No good guideline companies exist (therefore, expertise and additional adjustments are required) - Laborious and time-consuming (an immense amount of data has to be processed) - Based on the present situation, resulting in losing long-term trends
Income approach	- Flexible for changes - Considers future expectations - Considers market performance (through excess return on market)	- Controversial results (requires projections of future economic benefits) - Requires estimates of appropriate discount rates (also subject to controversy) - Partially based on probabilities and expertise - Problems with application in the emerging markets (due to the lack of market information) - The valuation results can be easily manipulated
Contingent claim valuation	- Captures the specific characteristics of banking better than any other approach -	- Regulatory factors are not included - Possible problems with application (requires the building of a mathematical model)

Source: Author's table

Conclusion

The discussion in this article has given an overview of valuation approaches which are applicable to banks. Generally, the methodology of bank valuation is significantly difficult and insufficiently studied. A variety of valuation techniques are employed in practice, and there is no single method that clearly dominates others. In fact, since each approach involves different advantages and disadvantages, there are gains to considering several approaches simultaneously. However, even a preliminary study, such as the one reported here, highlights the requirement of more innovative methods to detect changes in bank performance and regulation framework.

Recently, as an impact of the financial crisis, banks have suffered from losses, which have significantly decreased their economic value. As a result, shareholders' and customers' confidence in profitable bank performance has diminished. Nevertheless, if banks consider the growth of their economic value as a crucial part of their business strategy (which might be shown by using the discussed valuation approaches), the confidence in further banking system development will be regained. For that purpose, banks should monitor management decisions and regulation framework through their impacts on the economic value of the bank.

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