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THE ROLE OF ACCOUNTING VARIABLES IN VALUATION OF BANKS

ROLA DANYCH KSIĘGOWYCH W WYCENIE BANKÓW

Summary: The paper aims at assessment of the role of accounting variables in the valuation of banks. The study is based on the review of existing literature on the theoretical frameworks of bank valuation with a particular focus on their practical applicability, and the value relevance of accounting variables in the banking sector. The results of the research indicate that an idiosyncratic nature of banking activities and their recognition in accounting ledgers render the informational content of banks' financial statements particularly useful for valuation purposes. The investigation allowed to identify a comprehensive set of key value drivers determined by the accounting variables available in banks' financial reports, and to propose a conceptual model of their linkages to bank value under the major practically applied bank valuation techniques.

Keywords: banks, valuation, accounting information, financial reporting.

Streszczenie: Celem artykułu jest ukazanie roli danych pochodzących z systemu rachunkowości w szacowaniu wartości banków. Opracowanie powstało na bazie literatury dotyczącej metod wyceny banków ze szczególnym uwzględnieniem możliwości ich praktycznego zastosowania oraz znaczenia danych pochodzących z systemu rachunkowości dla wartości rynkowej w sektorze bankowym. Uzyskane rezultaty wskazują, że specyficzny charakter czynności bankowych i ich rozpoznawania w księgach rachunkowych sprawiają, że zawartość informacyjna sprawozdań finansowych banków jest szczególnie przydatna do wyceny. Przeprowadzone studia literaturowe pozwoliły na zidentyfikowanie kompleksowego zestawu kluczowych nośników wartości kształtowanych przez zmienne z systemu rachunkowości dostępne w sprawozdaniach finansowych banków, jak również opracowanie modelu koncepcyjnego ich powiązań z wartością banku w ramach wiodących technik wyceny banków stosowanych w praktyce.

Słowa kluczowe: banki, wycena, informacje z systemu rachunkowości, sprawozdawczość finansowa.

*Managers and investors alike must understand that accounting numbers
are the beginning, not the end, of business valuation*

Warren Buffet

1. Introduction

An idiosyncratic character and complexity of banks' activities place them amongst the most difficult businesses to value, especially from outside. As in the case of other industries, a fundamental role in valuation of banks is played by the data announced in their financial statements. The specificity of recognition of banks' operations in their accounting ledgers closely corresponds with the methodology of the major business valuation techniques and the perspective of the equity investors in the capital markets.

Given the above, the paper aims at the assessment of the role of accounting variables in valuation of banks. The study is based on a review of the existing literature on bank valuation and the value relevance of accounting information in the banking sector.

The remainder of the paper is organised in four sections. The next section discusses the specific features of bank valuation. Section 3 provides an overview of the major applied bank valuation techniques. The results of the prior studies on the value relevance of accounting variables are presented in Section 4. Section 5 outlines the conceptual framework of linkages between the accounting variables and the value of banks. The paper is closed with a conclusion recapitulating its main findings and providing some suggestions on the directions of the future research.

2. Specificity of bank valuation

Valuation of enterprises is one of the most difficult and complex areas of corporate analysis. This task seems even more challenging for banks, as they are much more sensitive to the course of the business cycle and exposed to various risks than other industries.

A key input in the valuation of banks is undoubtedly provided by the content of their financial reports. The view of banks' performance is, however, dependent on discretionary management decisions (e.g. recognition of asset impairment). Additionally, modern universal banks often engage in a wide range of activities requiring a separate analysis and valuation of each major business segment. Also, strong procyclicality of operations and high leverage make valuation of banks extremely contingent on changing economic circumstances [Koller et al. 2010]. Moreover, the recent global financial crisis demonstrated that unethical creative accounting practices of many prominent banks made their financial position

presented in the financial statements quite distant from the reality, as the announced reports gave little sign of financial distress [Grier 2011].

Unlike non-financial enterprises, banks are able to create value on both left and right-hand-side of their balance sheets [Gross 2006], as their operating and financing decisions are strictly interlocked and directly affecting the performance of the core business activity [Damodaran 2009].

Moreover, since banks' core business activity depends on refinancing at mismatched maturities of assets and liabilities, an essential role in their operations is played by the management of financial liquidity. Banks' cash flows are also much more volatile and difficult to forecast than in other industries [Gross 2006]. Projection of banks' cash flows is also hindered by the problems associated with measuring reinvestment [Damodaran 2009]. Investments for future growth in the banking sector are largely oriented on intangible assets like brands or human capital and recognised as operating expenses. The very impact of these investments on banks' performance and value is also hard to gauge [Harasim 2008].

Additionally, in comparison to other businesses banks are more exposed to various risks, which makes forecasting their future performance more complicated, and contributes to higher volatility of their equity values [Gross 2006].

The specificity of their valuation results also from the fact that banks operate in a heavily regulated business environment, being required to maintain capital adequacy ratios, constrained in terms of allocation of capital, and strictly controlled by the regulatory authorities [Damodaran 2009].

3. Applied methods of bank valuation

Although the relevant literature identifies numerous theoretical approaches to bank valuation, the most frequently discussed applied techniques include:
- asset-based approach,
- discounted cash flow approach,
- residual income approach,
- relative approach.

In the first approach the value of a bank is proxied by its net asset value, i.e. the difference between the fair values of assets and liabilities. These values may be taken directly from bank's balance sheet, thus yielding net asset value equal to the book value of equity, or subjected to specific adjustments aimed at estimating their fair, replacement, or liquidation values. The asset-based approach plays, however, only an auxiliary role in valuation [Marcinkowska 2003; Deev 2011], as it neglects the value of future growth and resulting excess returns [Gross 2006].

The discounted cash flows (DCF) approach attempts to estimate the present value of bank's future cash flows. Given the interlocking operating and financing activities the most appropriate valuation technique is the equity DCF method [Damodaran 2009; Koller et al. 2010], under which the value of bank's equity is given by:

$$V_e = \sum_{t=1}^{n} \frac{CFE_t}{(1+k_e)^t} + \frac{TV_n}{(1+k_e)^n}$$

where: V_e – the present value of bank's equity, CFE_t – predicted cash flow to equity in year t, k_e – cost of equity, n – the number of years of the explicit forecast, TV_n – terminal value of bank's equity in year n (the value of CFE beyond the period of explicit forecast).

The future equity cash flows may be proxied by the expected stream of dividends [Damodaran 2009] or estimated on the basis of predicted net earnings, other comprehensive income and changes in the book value of bank's equity [Koller et al. 2010]:

$$CFE_t = NI_t - \Delta E_t + OCI_t$$

where: NI_t – net earnings in year t, ΔE_t – increase in the book value of equity in year t, OCI_t – other comprehensive income in year t.

The equity DCF models are frequently implying a constant growth in earnings (or dividends). If a given bank exhibits a relatively stable returns on equity and dividend payout ratios the rate of growth can be estimated using the following formula [Damodaran 2009]:

$$g = ROE \cdot (1 - DPR)$$

where: g – implied growth rate, ROE – return on equity, DPR – dividend payout ratio.

Valuation based on the concept of residual income is in fact an extension of the DCF approach, designed to improve the measurement and management of value creation [Gross 2006]. Theoretically, both equity DCF and RI valuation models should yield the same results.

Under the residual income approach the value of bank's equity is given by:

$$V_e = IE_0 + \sum_{t=1}^{n} \frac{RI_t}{(1+k_e)^t} + \frac{TV_n}{(1+k_e)^n}$$

where: V_e – the present value of bank's equity, IE_t – invested equity at the end of the year t, $RI_t = ANI_t - IE_{t-1} \cdot k_e$ − predicted residual income in year t, ANI_t – adjusted net income in year t, k_e – cost of equity, n – the number of years of the explicit forecast, TV_n – terminal value of bank's equity in the year n (the value of RI beyond the period of explicit forecast).

Adjusted incomes may be derived from net earnings [Beltrame, Previtali 2016] or the net operating profit after interest and taxes (NOPAIT) [Gross 2006], whereas the

invested equity is usually based on its book value. However, numerous accounting adjustments needed for the estimation of invested equity and residual incomes significantly reduce the possibilities of inter-bank comparisons and verification of the estimated value with the relative valuation approach [Marcinkowska 2003].

Under both equity DCF and residual income methods the cost of equity might be estimated using the CAPM approach [Dermine 2009; Koller et al. 2010] or the opportunity rate being the sum of the risk-free rate and a risk premium based on investor-specific alternatives [Gross 2006].

Relative valuation assumes that the value of a bank related to a specific accounting number should be proportionate to analogous relations for comparable banks. The value estimate is obtained by multiplying the selected benchmark by a corresponding accounting item of a given bank. The most frequently applied multiples include [Marcinkowska 2003]:

- price to earnings (P/E),
- price to book value of equity (P/BV),
- price to revenues (interest, fee and commission income),
- price to income on banking activity,
- price to cash flows,
- price to total assets,
- price to liabilities,
- market value of total capital employed (equity and liabilities) to earnings.

The empirical evidence suggests that in the case of banks the multi-period fundamental valuation models perform significantly better than relative approaches [Gianfrante, Vicenzi 2013]. Relative methods are used by practitioners mostly to control for discrepancies between the estimated intrinsic value and the benchmark or to improve the accuracy of forecasts [Gross 2006; Koller et al. 2010].

As regards the practical implementation of bank valuation techniques Velasco and Wong [2014] demonstrate that professional stock analysts prefer the "sum of the parts" approach, valuing separately particular business lines or geographical areas of banks' activity with the equity DCF method. The analysts also rely on diverse relative valuation methods. Also a survey of European banks conducted by ECB [2010] revealed that proprietary valuation models used by the banks for their own purposes are based mostly on multi-stage discounted dividends or cash-flow models applied to different business lines.

4. The value relevance of accounting variables in the banking sector

Among the most frequently investigated accounting-based value drivers of banks are the book values of equity and earnings. The results of empirical studies indicate that increases in both these items are positively affecting bank market values [see e.g. Abuzayed et al. 2009; Agostino et al. 2011; Anandarajan et al. 2011; Bolibok 2015].

The empirical evidence also suggests that bank market values are driven by the relative performance measures, including ROA and ROE [Strumickas, Valančienė 2006; Bolibok 2016] and their components capturing the performance of the core banking activity [Chiou et al. 2014].

The market value of banks is also determined by diverse measures of efficiency. The empirical evidence indicates that bank market values are negatively related to the C/I ratio [see e.g. Gosh 2009; Bolibok 2016] and positively associated with x-efficiency (lower relative costs), net interest margins, and non-interest income [Jordan et al. 2011].
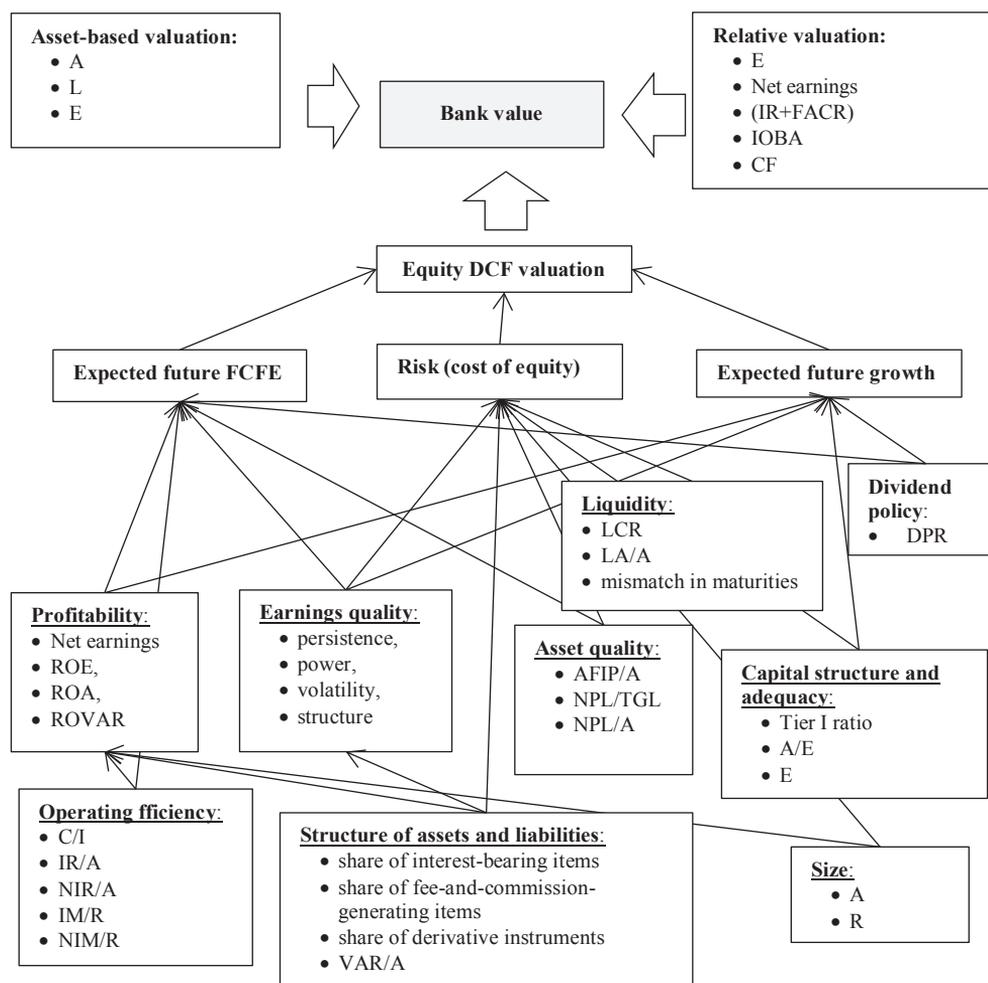
As the value of banks is inherently dependent on the quality of their assets and risk management efficiency, numerous studies document a negative impact of impairment provisions on bank values [Strumickas and Valančienė 2006; Chiou et al. 2014; CFA Institute 2014; Bolibok 2016]. In addition, Chiou et al. [2014] find that larger banks are punished more severely by the capital markets for the asset impairment. The empirical evidence also confirms a negative association between bank market values and their market risk exposure measured with the extent of trading activities. For instance, Wang [2014] finds that the relation of trading volume of derivatives to total assets exerts a negative impact on bank values.

The evidence on the impact of changes in banks' size on their value is mixed. In general, for larger banks this relationship seems to be negative [Gosh 2009; De Nicoló 2000; Fortin et al. 2011], while for smaller ones it may be positive [Gosh 2009] or statistically insignificant [Chiou et al. 2014]. Although financial structure is often listed among the key performance and shareholder value drivers in the banking sector [see e.g. Fiordelisi, Molyneux 2006], the results of empirical investigations of its value relevance are ambiguous. For instance, Jordan et al. [2011] and Wang [2014] report a positive impact of bank capital ratios on market values, while Fortin et al. [2011] demonstrate an exactly opposite relationship. In turn, Calomiris and Nissim [2014] argue that prior to the recent global financial crisis higher leverage was positively associated with banks' market values, while since its oncoming, this association has reversed. These findings indicate that the perception of some value drivers may depend on contextual factors related in particular to the current level of risk aversion in capital markets.

5. Accounting variables in the bank valuation framework

The review of the literature on bank valuation techniques and the value relevance of accounting variables in the banking sector allows to identify the linkages between the key value drivers, their accounting determinants and bank value in the three most frequently applied valuation frameworks (Fig. 1).

Undoubtedly, a key role in bank valuation should be assigned to the reported earnings which constitute the basis for projections of future cash flows. Formulation of accurate forecasts requires an in-depth analysis of earnings quality, aiming at

Fig. 1. Conceptual model of linkages between accounting variables, key value-drivers and bank value

Source: own study.

assessment of their persistence and identification of non-recurring, discretionary and unusual components [Gibbs 2008]. Sustainability of earnings is dependent primarily on the share of core banking income, as well as its volatility and sensitivity to the course of the business cycle. A crucial role in valuation is also attributable to earnings components related to the efficiency of bank's operating activities (e.g. interest and non-interest margins, C/I ratio) and risk management (impairment provisions). Reduction in bank's costs (cost efficiency and its components) and improvement of productivity (TFP and its components) are in fact key performance drivers that determine the size and efficiency of bank's profits, and ultimately its shareholder value [Fiordelisi, Molyneux 2006].

The analysis of past trends and composition of the key performance measures, including ROE, ROA, and ROVAR should, in turn, prove useful in calibration of valuation models, by providing guidelines for proper linkages between the predicted changes in volumes of assets, liabilities and earnings. Projected ROE, dividend policy and regulatory capital requirements are also essential for the estimation of the implied rate of future growth.

Another crucial value-relevant accounting variable is the book value of equity. Given the fact that the majority of bank assets and liabilities are recognised at amortised cost or at fair values through profit and loss, the book value of equity might serve as a proxy of bank's liquidation value, thus setting the lower bound of valuation interval. This view is particularly explicit in the residual income valuation. Book value is also an important parameter in the equity DCF valuation, being a determinant of implied ROE, future growth and risk related to the capital requirements. Additionally, P/BV is one of the most frequently applied relative valuation multiples. According to Dermine [2009] it might also be viewed as an indicator of the adequacy of loan-loss-provisioning policy.

Although the empirical evidence indicates that book values of equity are positively related to bank market values, the impact of capital structure seems to be dependent on specific contextual factors related to an overall level of risk aversion in the capital markets. In particular, in times of contraction and increased uncertainty more leveraged banks are perceived as being more risky, which should be reflected in the higher cost of equity.

Similarly, the impact of changes in the size of banks' operations on the perceived risk may depend on a particular valuation context. Following the evidence in the literature it appears that for larger banks growth might create additional risks.

A special focus should also be put on the composition of bank's assets (e.g. share of interest-bearing items) and their quality (e.g. share of non-performing loans, ratio of asset impairment), as they influence both the predicted cash flows and the riskiness of operations.

Financial reports are also providing other accounting-based measures for the assessment of bank risk exposures that might prove useful for the estimation of

the cost of equity, e.g. capital adequacy ratios, share of trading assets, or share of derivative instruments.

Given the Basel III requirements which put much stress on the issue of bank liquidity, its accounting-based proxies (e.g. LCR, share of liquid assets, mismatch in maturities of assets and liabilities) should be taken into account in forecasting the future asset structure, cash flows and cost of bank's equity. Additionally, new regulations strongly promote the market valuation approach to banks' assets and liabilities which might contribute to a higher value relevance of both balance sheet items and earnings [Grier 2011].

Although accounting variables play a key role in valuation process, their practical use by external analysts might involve some difficulties. The value relevance of accounting data depends largely on their quality, i.e. comparability, verifiability, timeliness and understandability, with a particular emphasis on the reliability and objectivity of the applied criteria of recognition and measurement of assets, liabilities, revenues, and costs, as well as on the methods of their presentation in financial statements. Moreover, due to opaqueness and complexity of banking activities the informational content of standard financial reports might prove insufficient for valuation purposes, unless banks themselves are willing to enhance it with value-relevant voluntary disclosures. Finally, the usefulness of announced accounting data is always strongly determined by the expertise and analytical skills of their users [see: Marcinkowska 2010].

6. Conclusions

The specific features of banking activities and their recognition in banks' accounting ledgers render the data available in financial reports of banks particularly important for valuation purposes.

The results of the study demonstrate that accounting variables play a key role not only in auxiliary valuation techniques, like asset-based and relative approaches, but also provide an instrumental informational input for the predominant income-based approaches.

The examination of the major practically applied bank valuation techniques and the value-relevance studies allowed to identify a comprehensive set of key value drivers determined by accounting variables available in banks' financial statements, i.e.: profitability, earnings quality, operating efficiency, asset quality, liquidity, dividend policy, capital structure, size and the structures of assets and liabilities.

Each of those value drivers and their underlying accounting-based determinants is, in turn, linked to one or more components of bank value under the commonly applied equity DCF approach: expected future cash flows to equity, risk, and implied rate of growth. Given the complexity of the identified set of linkages and interdependencies between the identified elements of the bank valuation framework,

the future research should focus on a detailed exploration and discussion of the impact of particular accounting variables on each of those value components.

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