Method of Banks Valuation

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ABSTRACT – Since there is not a special common framework for valuation banks and it gives possibilities to create establishment, improvement and adaptation of various approaches to measuring the value of banks and financial institutions.

Most approaches banks valuation note the strong dependence of financial institutions value from market interest rates (Mishkin, F., Miller, WD, Copeland, T., Koller, T., Damodaran, A., and others). Each approache reflects greater or lesser degree of accuracy depending on the method of determining resources for owners, the discount factor, approaches to defining the rate of growth and methods of measurement.

KEY WORDS: banks valuation methods, free cash flow equity, discounting factor, cost on equity, beta factor

Introduction

The issue of banks and financial institutions valuation have been written relatively few comprehensive theoretical and methodological work. The valuation is carried out by experts and expertise for different purposes and with varying degrees of methodological accuracy of the estimate of input factors. A significant shift in valuation theory and practice came when R. C. Merton (1973) [1], introduced the risk-neutral valuation model for financial assets. Bank valuation under this model can be interpreted as determining the value of a call option on the value of bank assets.[1]

Currently, (August 2009), R. C. Merton (2009) in the context of the financial crisis makes the promotion of a market valuation of banks and their components. It states that banks and entities that oppose the use of market valuation, are trying to hide the fall in prices. Equally critically views on issues of aid, saying that the government is trying to solve complex problems easily. He also expressed the desire to stimulate trading in securities market in order to restore the natural function of the market in setting prices. About using of derivatives, the lack of market information for investors blames frozen market.[2]

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[1] Merton, R. C. An intertemporal Capital Assets Pricing Model. Econometrica. Vol. 41, 1973. http://ideas.repec.org/a/ecm/emetrp/v41y1973i5p867-87.html

[2] Merton, R. C.: Mark it to market. August, 19, 2009. http://www.swampreport.com/investments/scholes-and-merton-mark-it-to-market/

A. Damodaran (2002) says, that „the fundamental valuation rules may be applied equally to companies such as to financial services institutions"[3], should be pointed here.

Some approaches to the bank valuation note the strong dependence of financial institutions value from market interest rates (Mishkin, F., Miller, WD, Copeland, T., Koller, T., Damodaran, A., and others).

Each approache reflects greater or lesser degree of accuracy depending on the method of determining resources for owners, the discount factor, approaches to defining the rate of growth and methods of measurement.

T. Copeland highlights that the interest rate risk should focus attention on 4 factors: 1 interest margin between the market rate and bank rate, as well as their flexibility to market developments, 2 dynamics of tidal funds, 3 degree of substitution of banking products and services as an alternative to interest-rate changes, 4 need to cover risks arising from maturity mismatch of assets and liabilities part of the profit.

Koch, T. W. (2005), Samuelson, Klein and Monti formulate a conclusion on the positive relationship between net income and the relative market power of banks. These theoretical ideas support empirical research work such as Damodaran, A., as well as other authors. A significant shift in valuation theory and practice came when R. C. Merton (1973) [2] introduced the risk-neutral valuation model for financial assets. Bank valuation under this model can be interpreted as determining the value of a call option on the value of bank assets.[4]

Valuation of banks and financial institutions by the yield method

Business valuation models are largely based on discounted cash flow approach (DCF model) and assume some growth stages, which is typical for different growth rate of cash flow or resources for owners.

Expression of FCFE (Free Cash Flow Equity) in financial institutions

The annual effect on the owner may be defined differently. This may be as free cash flow to shareholders (FCFE - Free Cash Flow Equity) generated as operating profit by reducing the costs that are not spending in the current period and the investment needed work and investment property for the operation.

According W.D. Miller, the desire is to move closer to the category income of owners net proceeds, which could be as bank potencial of dividends. Sometimes, in this case refers to the free cash flow to shareholders (Free Cash Flow Equity).

Using cash flow as a basis for calculating income of owners as dividend income potential for the owners of the bank is inappropriate for two reasons:

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[3] Damodaran, A.: Investment Valuation. 2-nd edition. John Wiley & Sons, 2002, 2002. ISBN 978-0-471-75121-2, page 603.

[4] Merton, R. C. An intertemporal Capital Assets Pricing Model. Econometrica. Vol. 41, 1973. http://ideas.repec.org/a/ecm/emetrp/v41y1973i5p867-87.html

- Statement of cash flows in the banking business is not suitable for determining sources for owners, such as dividends as source for owners can be paid only from real net income after tax and not from the movement of cash (cash flow);
- Bank and company profits are not equally attainable by shareholders, in the bank there is no problem with the availability of cash to shareholders because of the nature of the vast majority of assets and liabilities, although other types of businesses can generate significant differences between cash flow and profits in the sense that the business generates profits, but not sufficient cash flow;
- The main source of income in banking is the differences between interest income and expense, as well as fees for services.

The valuation of financial institutions can not be made without respect of interest income and expense as the most significant component of their income and capital growth, or its renewal. The calculation of FCFE in banks and financial institutions can be implemented in two basic ways:

1-st method of expressing FCFE:

FCFE = net income - growth of capital + other income

It should be noted that net income is not equal to cash flow. With the growth of financial institutions should also increase its capital. Growth FCFE lowers the capital, because it means that the bank is inserted into the banking business of profits that would otherwise be paid to owners as dividends. Otherwise, if the bank's growth has not been accompanied by an adequate increase in the capital, it could happen to failure of financial institutions due to lack of solvency.

2-nd method of calculating FCFE:

FCFE = resources from issue of shares - preference shares + dividends - capital increase (+ decrease in capital)

Changes in bank capital are resulting from the relationship between balance, profit and loss statements, cash flow and value of financial institutions. Changes in assets and liabilities are reflected in changes in equity.

Equally polemical recommendation is adding into the value of cash flows the initial cash balance. The problem is the fact that they were a combination of yield method valuation and substance valuation method.

Since the yield valuation takes into account the future potential of banks, it leads to the discussions on the question of the length of the period under review (planning period).

For example, W. D. Miller (1995) [1] [5] advised to examine 10 years, others, such as M. Tucek [6] recommend 2-3 years. This follows from the specifics of the environment, for example, in U.S. valuation concerns small, local banks are not investment activities and

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[5] Miller, W. D.: Commercial Bank Valuation. John Villey and Sons, Inc., 1995, ISBN13 9780471128205, page 28.

[6] Hrdý, M.: Oceňování finančních institucí. Praha: Grada Publishing, 2005, ISBN 80-247-0938-4, page 35.

planning for 10 years it may be relatively simply. Banks in Slovakia perform mixed operations, and planning the future results for longer than 5 years could cause problems.

Net income as a basis for potential dividend or resource for owners by Koller, T., Goedhard, M. and Wessels, D. (2005) [1] can establish two basic ways: [7]

1. On net interest income, or
2. Model based on interest margins (Spread Model).

Determination of the discount factor

A particular problem is the correct determination of the discount factor to be within the individual models recommended. It is necessary to respect the logical links between the numerators and denominators and formulas used to discount the recommended indicators. There are different approaches for determining the interest rate for discounting, such as the determination of weighted average cost of capital. This method provides, in particular disposable cash flow for businesses, called the principle of Free Cash Flow of Firms (FCFF). The bank is not appropriate given the high gearing ratio (leverage). For the purposes of the valuation of banks need to set the cost of equity.

Estimate the required rate of return on equity r_e

In terms of banking, there are significant differences in the proportion of own and foreign sources of funding compared to other businesses. In the banking sector given the nature of the business of banking must accept a higher gearing ratio.

Cost of capital represents the expected rate of income investors given the risk level of the investment. Since any form of business is associated with a higher risk than when depositing money in the bank, then the expected return is higher than interest rates in the bank.

The role of the so-called risk-free rate r_f (free of risk) may be selected interest rates on government bonds or yield to maturity of these types of bonds. Yield to maturity is recommended to use as a discount factor such as for example M. Marik (2007) [1]: "as a source for safe return to the Czech capital market, we recommend using such proceeds to maturity of government bonds with maturities equal to ten or more years by source Patria Finance." [8]

The cost of capital must be re invariably higher than r_f in connection with the tax shield. Required rate of return on equity can provide a number of ways to serve its particular setting:

*   Gordon growth model,
*   CAPM (Capital Assets Pricing Model) or a model of capital assets
*   The average profitability
*   The cost of foreign funds

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[7] Koller, T., Goedhard, M., Wessels, D.: Valuation, Measuring and Managing the Value of Companies. Fourth Edition, Mc Kinsey & Company John Willey & Sons, Inc., 2005, ISBN: 978-0-471-70218-4, pages 670 - 671.

[8] Mařík, M.: Metody oceňování podniku. Druhé upravené a rozšířené vydání. Praha: Ecopress, 2007, ISBN 978-80-86929-32-3, page 218.

- APT model (Arbitrage Pricing Theory).

1. Gordon growth model is based on a calculation of the growth rate of dividends:

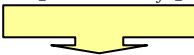$$r_e = \frac{dividends_{t+1}}{price\ of\ shares_t} + g$$

where:

r_e = rate of return required by shareholders (return on equity)

g = growth rate of dividends

2. CAPM is used frequently, although it also has some shortcomings. This model assumes that the risk premium is proportional in relation to systematic risk β. The CAPM can be re established as follows:

$$r_e = r_f + \beta.\left[E(r_m) - r_f\right]$$

Risk premium

where:

r_f = risk-free interest rate

r_e = rate of return required by shareholders (return on equity)

β = systematic risk

$E(r_m)$ = expected return on market portfolio

3. The derivation of the discount rate based on average profitability. Data on the average profitability of the industry are relatively accessible, and therefore in practice often used to determine the cost of equity. The disadvantage of this method is the impact on accounting practices can distort the indicator ROE. The downside is mainly the lack of data on market value of capital of financial institutions, as the book value of capital is not suitable for these purposes.

The basic conditions of DCF models include a requirement that the discount rate used to be in session with the risk profile of cash flow (for example: FCFF ↔ WACC or FCFE ↔ r_e).[9] For the valuation of banks is appropriate to use a model based on FCFE. FCFE is generally recommended to enjoy when financial leverage is stable and this is relatively high. Using the FCFE model is preferred and recommended if it can generate a large difference between the dividends and FCFE.

An alternative model is the dividend FCFE model. In practice, it could happen that the dividends could be higher than FCFE, the likely addition to the problems in the management of financial institutions and causing uncertainty in their valuations. It is recommended and preferred by Hrdý, M. (2005) [1] model for the dividend FCFE model.[10]

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[9] Kislingerová, E.: Oceňování podniku. 2. přepracované a doplněné vydání. Praha: C. H. Beck, 2001, ISBN 80-7179-529-1, page 160.

[10] Hrdý, M.: Oceňování finančních institucí. Praha: Grada Publishing, 2005, ISBN 80-247-0938-4, page 23., and Koller, T., Goedhard, M., Wessels, D.: Valuation, Measuring and Managing the Value of Companies. Fourth Edition, Mc Kinsey & Company John Willey & Sons, Inc., 2005, ISBN: 978-0-471-
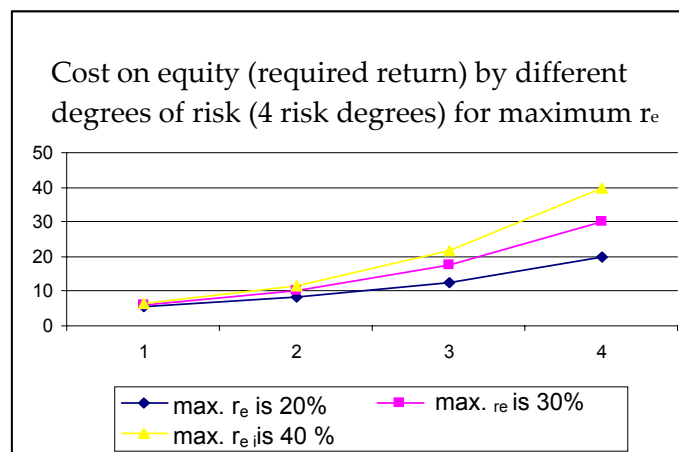
Using the FCFE valuation model, banks are avoiding the use of WACC.

The average weighted cost of capital - WACC is always lower than the cost of equity – r_e, which corresponds with the result that they are reduced by the so-called tax shield resulting from the use of foreign funds and netting interest expenses to the bank.

Determination of the beta coefficient

Another problem is the calculation of the beta coefficient. For example M. Hrdý (2005) [2] [11] recommends using a simplified assumption that β is equal to one, because it assumes that changes in the profitability of financial institutions are equal to changes in market portfolio returns.

Another argument in favor of simplifying the calculation of the beta coefficient is that fairly significant change of beta affects the overall change in the risk premium in the relatively small scale, and also a rather complex calculation of the coefficient beta. Above mentioned (the relatively low impact on the valuation premium) is shown on a graph.

Cost on equity (required return) by different degrees of risk (4 risk degrees) for maximum r_e

— max. r_e is 20%   — max. r_e is 30%
— max. $r_{e\,i}$is 40 %

If the valuation is performed in less stable conditions, or if there are other reasons to choose a more accurate calculation of β, we use these basic approaches:

1. Coefficient estimate based on historical data.
2. By analogy.
3. An analysis of factors.

Beta coefficient expresses sensitivity to market risk. Actions that have beta between 0 and 1.0 tend to move in the same direction as the market, but not to an extent.

Rapidly growing company has beta over 5 years at level 1.11. The market growth of 1 % will increase the company's stock price by 1.11 % or decrease by 2 % of the market reduces price of shares by 2.22 %. [12]

70218-4, page 668., and Mařík, M. and all.: Metody oceňování podniku. Druhé upravené a rozšířené vydání. Praha: Ekopress, 2007, ISBN 978-80-869929-3, page 206.

[11] Hrdý , M.: Oceňování finančních institucí. Grada Publishing, Praha 2005, ISBN 80-247-0938-4, page 10.

[12] Brealey, R. A., Myers, S. C.: Teorie a praxe firemních financí. Praha: East Publishing, 1992, ISBN 80-85605-24-4, page 153.

Beta coefficient may be measured on the basis of historical data and hence the change in performance of individual shares in the bank, depending on changes in market portfolio as follows:

$$\beta = \frac{n \times \sum R(S) \times R(mp) - \sum R(S) \times \sum R(mp)}{n \times \sum R(mp)^2 - (\sum R(mp))^2}$$

where:

β - a quantitative measure of the volatility of portfolio

$R(S)$ - return on shares of a particular bank

$R(mp)$ - return on market portfolio,

n - number of years of evolution.

The disadvantage of this method is that it is not possible to reliably use knowledge about the development of beta from past to the future.

The beta factor derives also by analogy from the following relationship by Marik, M. (2007) [2][13]

$$\beta_L = \beta_u \cdot \left(1 + (1-t) \cdot \frac{D}{E}\right) - \beta_d \cdot (1-t) \cdot \frac{D}{E}$$

Where:

B_U = Beta at zero debt (unlevered beta)[14]

B_L = beta entity debt (levered beta)

B_D = beta for debt = 0

t = tax rate

This method of determining the beta is an appropriate indicator in the valuation of banks. Beta coefficients are published for each industry and country.

As the beta for foreign capital is 0, the resulting relationship is:

$$\beta_L = \beta_u \cdot \left(1 + (1-t) \cdot \frac{D}{E}\right)$$

This relationship expresses the dependence of beta on the degree of indebtedness of the entity. With this option you can use data on individual sectors of beta. Coefficients are published for debted and indebted companies.

The objective determination of β is the world's best practice accepted valuation model CAPM. It is recommended that indicators of the environment of the U.S. market have been adjusted to current country risk. Capital costs are then expressed by:

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[13] Mařík, M.: Metody oceňování podniku. Druhé upravené a rozšířené vydání. Praha: Ecopress, 2007, ISBN 978-80-86929-32-3, page 225.

[14] Data on the average values of β coefficients for each industry states are published on website of Aswath Damodaran (www.damodaran.com , Section Updated Data). The average value of β in 2009 for European countries indicated 1.04 and the average β_U is at 0.80.

$$r_e = r_f + \beta \cdot RPM + RPC$$

Where:

RPM = market risk premium

RPC = country risk premium is recommended to calculate than 1.5 times the risk of failure in the country (0,7.1,5) + 0.6 difference between inflation in the U.S. and for example in Slovakia.

Determination of the cost of equity based on CAPM (on the example of Slovakia)

Current risk-free return is 3.5 %;

The risk premium for the capital market in Slovakia 7.21 % [15]

Country risk premium 2.21 %

Unlevered beta for specialized banking services 0.23 %,

The ratio of debt and equity 0.95 %.

$$\beta_L = \beta_u \cdot \left(1 + (1-d) \cdot \frac{D}{E}\right) = 0{,}23 \cdot (1 + (1-0{,}19) \cdot 0{,}95) = 0{,}41$$

$$r_e = r_f + \beta \cdot RPM + RPC = 3{,}5 + 0{,}41 \cdot 7{,}21 + 2{,}21 = 8{,}67$$

The cost on equity methods based on CAPM model, are assuming the input data set to 8.67 % in Slovakia.

Practical problems and procedures of bank valuation

A key practical problem when evaluating the bank will determine the future anticipated net effect on the owner, plans for future net earnings.

Future development of profit can be detected in two ways:

- Regression analysis;
- A financial plan based on data compiled from balance sheet and profit and loss account.

The method of regression analysis is appropriate for the valuation of banks' long-term stable conditions, and operating in developed economies. Regression analysis is more suitable for banks than for companies, because regulatory frameworks for business banking ensure continuous development without major fluctuations.

Nevertheless, the most accurate and most reliable way to estimate deemed dividend potential is derived from the financial plan for the bank. The expert must be able to assess future development of bank finances and key items of bank profits. The aim should be to approximate the planned balance sheet and profit and loss account over the next 5 years. Important indicators are known profit generators such as loans and other earning assets, recently banks have a large proportion of income from fees for services, which should also be included in the calculations.

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[15] http://pages.stern.nyu.edu./adamodar/

The task of valuing the bank by the yield method is ultimately provided by continuing value to the bank. The formula for calculating the discounted value of continuing is as follows:

$$CV = \frac{Div_5 \cdot (1 + g)}{(i - g)} \cdot \frac{1}{(1 + i)^5}$$

Where:

    CV - continuing value of bank

    Div_5 - Expected dividend paid in the 5-th year

    i - Interest rate used to discount

    g - Expected dividend growth rate per year

With a similar approach is also encountered in determining the value of ongoing (Continuing Value) in the work by T. Koller, M. Goedharda and D. Wessels (2005) [2]: [16]

$$CV = \frac{NI \cdot \left(1 - \dfrac{g}{RONE}\right)}{(k_e - g)}$$

Where:

    NI - expected net revenue in 1-st year after the end the projected period

    g - expected dividend growth rate per year

    k_e - cost of equity (required return)

    $RONE$ - increasing the return on new capital

Conclusions – why is bank valuation important

At present, confidence in the banking and financial sector is simulated by states and their guarantees. Experience of banking sector restructuring in SR gives an example of how many banks are able to operate with inadequate or even having a negative value of capital.

If it is well known that a major bank failure is undesirable because it would cause serious economic problems, then a function of confidence in the bank does not perform as bank capital, as some fiction or a social agreement, which may have different real form.

The question arises whether the trust bank can reliably operate on this basis. It is undisputed and confirmed that the practice in the short term is possible. In the medium and long term, it is only a matter of time before such a basis for confidence in a banking institution is exhausted and positive incentives will be more costly than alternative problems for radical action against the bank.

Such confidence is not inexhaustible; its boundaries are identical with states and capabilities of countries. There is a risk of such an approach, on the other hand, if the banks do not use this second chance, the financial crisis could be even greater.

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[16] Koller, T., Goedhard, M., Wessels, D.: Valuation, Measuring and Managing the Value of Companies. Fourth Edition, Mc Kinsey & Company John Willey & Sons, Inc., 2005, ISBN: 978-0-471-70218-4, page 669.

At present, the consequences of the financial crisis occurred requirements (for example, Merton R.C.) to value banks by the market valuing approach, which uncovered a genuine reality and lead to more real situation on the financial and banking market. Such an approach would certainly be very appropriate.

Valuation of banks' issues are important because the focus has to be not on profit growth, but on growth of stability and hence the value of the bank. Banks managers also should not have rewards based on profit but on the basis of value growth of institution, which they manage.

Therefore, the states and supervisory institutions to carefully analyze the effectiveness of its intervention measures to support banking and financial market and take such measures that would prevent the repeat similar problems. Access to regulate the banking sector varies depending on the distance of negative experiences. This area will be clearly show degree of risk in dealing with its negative consequences. Addressing the negative consequences of the risks of using public funds is a sign that many economic entities, in principle, are not able to cover all the risks that they may occur, and therefore in my view, essential is that such entities to regulate the rate of risk-taking potential exist. It is necessary to believe that negative experiences will serve as a warning against gambling of people and countries, as in the historical experience translated it into a collective sacrifice of wealth necessary to prevent fatal consequences of similar threats.

References

Adams, M., Markus, R.: *A new Approach to the Valuation of Banks.* http://www.campus-forfinance.com/fileadmin/content/cffrc/documents/2007/Banking_I_Adams.pdf

Allen, F., Galle, D.: *Comparing Financial Systems.* Cambridge: MIT Press 2000. ISBN 0-262-01177-8.

Benninga, S.: *Bank Valuation.* New York Instirute of Finance Course in Singapore, www.wharton.upenn.edu, February 13, 2001.

Benninga, S. , Sarig, O.: *Bank Valuation.* February 13, 2001. http://senverb.boun.edu.tr/pdf/Bank%20Valuation.pdf

Brealey, R. A., Myers, S. C.: *Teorie a praxe firemních financí.* Praha: East Publishing 1992, ISBN 80-85605-24-4.

Calomiris, Ch. W., Doron Nissim: Activity *Based Valuation of Bank Holding Companies.* Working Paper 12918. http://www.nber.org/papers/w12918.

Davis, S. I.: *Bank Mergers. Lessons for the Future.* London: Macmillan 2000. ISBN 0-333-91260-8.

Damodaran, A.: *Investment Valuation. 2-nd edition.* John Wiley & Sons 2002. ISBN 978-0-471-75121-2. www.damodaran.com (sekcia Updated Data). http://pages.stern.nyu.edu./adamodar/

Freixas, X., Rochet, J. CH.: *Microeconomics of Banking.* Cambridge: MIT Press 1998. ISBN 0-262-06193-7.

Horvátová, E.: *Bankovníctvo.* Žilina: GEORG 2009. ISBN 978-80-89401-03-1.

Hrdý, M.: *Oceňování finančních institucí.* Praha: GRADA Publishing, 2005. ISBN 80-247-0938-4,

Kidwll, D. S., Peterson, R. P., Blacwell, D.W.: *Financial Institutions, Markets and Money.* Forth Worth: The Dryden Press 1993.

Koller, T., Goedhard, M., Wessels, D.: *Valuation, Measuring and Managing the Value of Companies. Fourth edition.* Mc Kinsey & Company John Willey & Sons, ISBN 0471702188, ISBN: 978-0-471-70218-4.

Levy, H., Sarnat, M.: *Kapitálové investice a finanční rozhodování.* Praha: Grada Publishing 1999. ISBN 80-7169-504-1.

Kislingerová, E.: *Oceňování podniku.* Praha: C. H. Beck, 2001. ISBN 80-7179-529-1.

Mařík, M.: *Metody oceňování podniku*. Druhé upravené a rozšířené vydání. Praha: Ecopress 2007, ISBN 978-80-86929-32-3.

Merton, R. C.: *An intertemporal Capital Assets Pricing Model.* Econometrica. Vol. 41, 1973. http://ideas.repec.org/a/ecm/emetrp/v41y1973i5p867-87.html

Merton, R. C.: *Mark it to market*. August, 19, 2009. http://www.swampreport.com/investments/scholes-and-merton-mark-it-to-market/

Miller, W.D.: *Commercial Bank Valuation.* John Wiley and Sons, Inc., USA 1995, ISBN13 9780471128205.

Mishkin, F.: *Economics of Money, Banking and Financial Markets.* Reading: Addison-Wesley 2003. ISBN 0-321-20049-7.

Rose, P. S., Hudgins, S. C.: *Bank Management and Financial Services.* Boston: McGraw Hill 2005. ISBN 0-07-286163-0.

Sharpe, W.F., Alexander, G.J.: *Investice.* Praha: Victoria Publishing 1993. ISBN 80-85605-47-3.

Sinkey, J. F.: *Commercial Bank Financial Management.* London: Prentice Hall 1998. ISBN 0-13-521048-8.