An ROE Decomposition Model for Banks

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Abstract

Fundamental financial statement analysis often excludes banks, as their financial statements do not adhere to a standard industrial model. This thesis derives a framework to analyze banks' financial statements analogously to ROE DuPont decomposition. The framework is evaluated regarding its ability to predict future profitability and future stock return using a fixed effect regression model. Significant improvements in estimating 12 and 24 month-ahead stock performance starting six month after annual closure can be shown by using components instead of ROE. Furthermore, a clear distinction in the importance of certain components for either stock investors or management is observed.

Executive Summary

Background

Banks play a very important role in global economy. Besides their crucial role in modern economies, banks massively contribute to the GPD of industrialized countries. In financial markets, banks account for approximately 30% of outstanding bonds worldwide.[1] Further, bank stocks account for about 8% of MSCI World Index.[2] Nevertheless, in most literature on accounting and fundamental analysis, banks are excluded due to the particularities of their business models and financial statements.

The existing literature on banks focuses on determinants of cross-sectional profitability. Examples include early papers such as Bourke (1989) or, more up to date, Dietrich and Wanzenried (2011). Both use ratios to determine current cross-sectional profitability, in particular ROE or ROA of banks. The models are advanced and can explain a considerable amount of banks' profitability by using firm specific and/or external ratios such as GDP growth or inflation. Although there is a reasonable amount of different combinations of ratios, most of the ratio selections are ad hoc. None of the papers use a systematic approach to derive the set of variables. Furthermore, ratios are, with some exceptions, not used to determine future profitability or even future stock return.

A second stream of research considered in this thesis is fundamental and ratio analysis. Within this area, many papers use ratios to determine mainly future stock performance and secondly profitability and other factors. Some of those papers use a systematically derived set of ratios in their analyses, which often follow the approach of DuPont. DuPont, an American company, developed a sophisticated framework starting with ROE, which is then systematically decomposed into lower hierarchical components. However, banks are systematically excluded from most of those analyses, as their financial statements do not adhere to a standard industrial model used. Accounting figures have to be interpreted differently since the profit generation process differs completely.

Besides the fact that banks are often excluded from these models, the variety of accounting attribute-based models is rather small. Richardson, Tuna, and Wysocki (2010) state that there exists very little research which combines accounting attributes to forecast future earnings or returns. According to them: "…current research does not fully exploit the wealth of information contained in general purpose financial reports" (Richardson, Tuna, and Wysocki (2010, p. 412)). They found that beyond the primarily financial statements, a large amount of contextual information can be found (e.g. via industry-specific ratios).

This thesis closes the gap left by these two fields of research. A systematic ratio framework for banks is developed following the approach of DuPont. The decomposition is then evaluated by

[1] Data obtained from Barclays Global Aggregated Corporate Index via Bloomberg on 27.11.2012.
[2] Data obtained from MSCI World Index via Bloomberg on 27.11.2012.

comparing its ability to forecast future profitability and future stock returns against a naïve mechanism. To the author's knowledge, no systematic decomposition of a bank's profitability on product basis which further uses different financial statement ratios to predict future profitability and stock performance has been developed before.

Methodology

The ratio framework distinguishes between different product classes as well as different financing properties. The focus on products enables a direct connection between the balance sheet and the income statement as the different revenue and expense accounts are connected to their balance sheet counterparts. The basis for the decomposition is a simplification of the banks' balance sheets and income statements, which summarizes similar elements into product groups. Using these asset, liability and income statement elements, an algebraic derivation of a systematic set of bank-specific ratios is shown.

In a next step, the decomposition model is tested using fixed effect regressions. A comprehensive data set of more than 18'000 firm/year observations of quoted banks is used. The fixed effect regression includes firm-specific factors. Six different stages of decomposition are tested, starting with ROE in level 0. In level 1, ROE is split up into asset leverage and ROA. From level 2 to level 4, the decomposition of ROA becomes more and more detailed. Additionally, in level 4a, asset leverage is separated into more detailed ratios. For each level, a separate regression is calculated. Either ROE, future ROE or future stock performance are used as dependent variable.

Using this data and the approach described above, the following research questions are to be answered:

1. *Does the systematic decomposition of ROE into lower hierarchical ratios and the use of contextual information out of financial statements lead to better information about future profitability and performance?*
2. *Can certain ratios obtained through the decomposition be identified as main drivers behind future profitability or performance?*

Results

The results show for both 24 month-ahead ROE as well as future stock performance a significant increase in goodness of fit in the model using more detailed ratios. This shows that contextual information can be obtained with the developed bank-specific ratio framework.

Furthermore, it could be shown that not all ratios are, besides the statistical properties, in the same way relevant. Especially the differences between the ROE and the return models are interesting. The weighting of the ratios is different for each model. Managers and investors seem to consider different factors when evaluating banks. While investors lay much more emphasis on

income from fees, profitability is much more determined by income from loans but also losses on loans. Also, financing is perceived differently. In managing profitability, this paper shows financing via debt to play a more important role compared to financing via deposits. Investors, in contrast, highly focus on deposits while debt does not seem to be a main determinant for future stock returns.

Considering asset leverage, the paper shows its unimportance when considered individually. However, if asset leverage and its substitutes are put into context with other ratios, it becomes very influential.

Conclusion

Financial statements provide a large amount of information about a company. Often, only a small part of this information can be extracted. The framework provided allows for an easily arranged set of important ratios and extracts more information about future stock returns and profitability. Models using the highest-detailed level of the decomposition show at least similar or, in the case of stock performance, much better properties than models using ROE only. This paper could therefore provide a contribution to literature analyzing future returns. Also, the importance and unimportance of different incomes and costs can be shown. It clearly demonstrates that different stakeholders, i.e. management and investors but also regulators, could have different points of view in assessing various key ratios.