BETWEEN PARCIMONY AND COMPLEXITY: COMPARING PERFORMANCE MEASURES FOR ROMANIAN BANKING INSTITUTIONS

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ABSTRACT: *The main objective of this study is to establish the relationship between traditional measures of performance (ROE, ROA and NIM) and EVA in order to gain some insight about the relevance of using more sophisticated performance measurements tools. Towards this end the study uses two acknowledged statistical measures: Kendall's Tau and Spearman rank correlation Index. Using data from 12 Romanian banking institutions that report under IFRS for the period 2006-2010 the results suggest that generally EVA is highly correlated with Residual Income in the years that present positive operational profits whereas for the years with negative outcome the correlation is low. ROA and ROE are the measure that best correlates with EVA for the entire period and thus -applying Occam's razor- could be used as a substitute for more complex shareholder earnings measures.*

1. INTRODUCTION AND LITERATURE REVIEW

The topic of bank performance assessment is the research agenda for much of the recent empirical studies. A great deal of studies use performance measures like return on equity (ROE), return on assets (ROA), net interest margin (NIM) but also economic measurements of profit like economic value added (EVA) gained increasing popularity in the field of performance assessment for financial institutions.

EVA – a trademark introduced by Stern Stewart in 1992 – assumes that the generated revenues must cover for operating expenses and the interest charges on debt

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and also it must compensate shareholder for the risks undertaken by investing equity. The key principle of EVA is to subtract from the Net Operating Profits after Tax (NOPAT) all debt and equity charge, thus providing shareholders with a threshold for a minimum level of operating profits. Unlike traditional measures, EVA raises attention to the issue highlighted by Modigliani and Miller (1958): not only debt holders expect a certain return but also shareholders of the bank expect a specific rate of return for assuming the risk of investing in the bank.

Uyemura et al. (1996) introduced the first comprehensive literature for EVA. The study was the first one to provide guidance on the accounting adjustments needed for customizing EVA for banks. Also, the study presented EVA's superiority over traditional performance measurements as it exhibits stronger correlation with bank market values than traditional accounting measures like ROA and ROE.

Fiordelisi (2007) develops a new measure of banking performance – shareholder value efficiency – based on the maximum possible EVA given particular inputs and outputs. Using financial information from banks operating in advanced European economies in the period 1997-2002, shareholder value efficiency is found to be the most important factor that explains value creation in European banking, cost and profit efficiency having only a marginal influence.

Fiordelisi and Molyneux (2010) investigate the value creation process in banking for 12 countries from EU-15 area, period 1998-2005. The study uses as bank performance measure EVA and implies that shareholder value creation is a linear function of various bank-specific, industry-specific and macroeconomic factors. The conclusions show that shareholder value has a positive relationship with cost efficiency changes while economic profits are linked to revenue efficiency changes.

Most EVA literature is written and tested for developed Anglo-Saxon economies. Therefore, implementing EVA in emerging economies brings into light problems regarding computing a reasonable cost of equity capital, establishing a convergence between the GAAP accounting basis which underlines the specific adjustments proposed by Stern Stewart and the national decisions regarding accounting standards adoption, determining the relevance of accounting adjustments.

Recent studies regarding the performance of banks in emerging markets discuss some of the details of EVA computation in banking institutions.

The study of Bhattacharyya and Phani (2004) explains the concept of EVA in the context of Indian banking institutions. The study strengthens that in the case of Indian banking system the computation of EVA can involve significant subjectivity and thus reduces its informative value. Nevertheless the adoption of EVA as a corporate philosophy improves productivity and shareholder value creation.

Teker et al. (2011) compute EVA for 11 quoted Turkish banks. A ranking of the performance of banks is provided by using different proxies such as net income, total equity, ROE, EVA and EVA/Total Equity profiles. The results indicate that although banks report high values in traditional performance measurement, some institutions fail to generate sufficient amounts of economic profit.

Costa (2012) establishes a framework for implementing EVA in Brazilian Banks. The research provides an alternative way to calculate EVA for banking institution by covering issues regarding the inputs used to calculate EVA (deciding

upon significant accounting biases over NOPAT and capital, estimating a credible cost of equity, considering the stylized facts of Brazilian economy and of the regulatory environment.

2. METHODOLOGY

The main objective of this study is to establish the relationship between traditional measures of performance (ROE, ROA and NIM) and EVA in order to gain some insight about the relevance of using more sophisticated performance measurements tools. In other words we try to answer a simple question: does the effort of computing a complex measure like EVA payoff?

Towards this end the study elaborates on the accounting adjustments that general theoretical literature debates upon. Although much literature exists in the field of EVA computation for non-financial companies, studies that are customized for banking institutions characteristics are scarce. Also, the complex nature of the banking industry makes it difficult for implementing EVA successfully.

From an accounting perspective, EVA is simply the adjusted net operating profit after taxes less the cost of capital:

$$1. \quad EVA_t = adjustedNOPAT_t - (Ke_t * adjustedRisk\ Capital_t)$$

In the absence of accounting adjustments we can compute the Residual Income measure which is simply a non-adjusted EVA:

$$2. \quad Residual\ Income_t = NOPAT_t - (Ke_t * Risk\ Capital_t)$$

From the finance perspective EVA is used for determining firm value as it is directly related with value creation through NPV.

$$3. \quad Bank\ value = Capital + NPV_{EVA},$$

where NPV_{EVA} represents the net present value of expected EVA.

K_e reflects the cost of equity and Risk Capital reflects the capital needed in order to account for the riskiness of the specific banking operation. Main stream financial literature suggests the estimation of the cost of equity by using a Capital Asset Pricing Model (CAPM), there remains a lot of controversy regarding the application of this method for emerging markets considering the high volatility of this particular type of financial market. In the particular case of Romania because of the fact that from a maximum of 42 banking institutions only 4 banks are listed the computation of CAPM seems to have little relevance for the entire banking sector. In order to have reliable estimation on the cost of equity this study used as a proxy a yearly average of the interbank market rate (ROBOR) starting with the values from 2006. This choice is supported by a similar study for EVA in emerging markets (Costa, 2012) that suggests the using of the interbank market rate as a good cost of equity benchmark.

In the case of banking institutions there is a fundamental difference between cash capital (shareholder equity) and risk capital. Risk capital is specific to the risk profile of the bank and is determined by the structure of the assets portfolio. Basel II Accord established the minimum 8% ratio coefficient between equity capital and risk

weight assets. In order to arrive to the value of risk capital this study uses bank specific Tier1 ratio to compute the value of risk-weight assets:

4. $$Tier1_t = \frac{Cash\ Capital_t}{\alpha_t\ Total\ Assets_t}$$

5. $$Risk\ Capital_t = \frac{Cash\ Capital_t}{\alpha_t}$$

where α_t represents the bank specific risk-weigh that accounts for the structure of the asset portfolio.

In practical terms the first step in calculating EVA is to make some adjustments to NOPAT. The inventor of EVA, Stewart (1992), based the logic of the measurement starting from generally accepted accounting principles (GAAP). They advocated that adjustments to net income are to be made because of the conservative bias that characterizes GAAP which distorts the current economic reality. Stewart (1992) al has identified more than 160 potential adjustments that a company can make to its net income. However, most companies require no more than about ten adjustments to produce a sufficiently accurate EVA figure. The present study integrates the adjustments proposed by Uyemura (1996), Fiordelisi (2008) and Costa (2012):

Table 1. Accounting adjustments made to move book values closer to economic values

NOPAT$_t$	
Loan loss provisions	+Value of charge-offs from t
Deferred tax balances	+(-)Δ deferred tax liabilities/assets t/t-1
R&D expenses and Training expenses	+R&D, training expenses in t
Non-recurring events	case-by-case decision
Security accounting	+- amortization of gain/losses over the remaining live
INVESTED CAPITAL	
Loan loss provisions	+ value of loan loss reserve t-1
Deferred tax balances	+ - deferred tax liabilities/assets t-1
R&D expenses and Training expenses	+ capitalized R&D, training expenses over 5 year period -amortization of R&D, training expenses for year t
Non-recurring events	case-by-case decision

Source: integration of Stewart (1992), Uyemura (1996), Fiordelisi (2007), Costa (2012)

3. DATA

The present study uses financial data from balance sheet and income and loss statement from 12 banking institutions that operate on the Romanian territory. The criteria for selections were straightforward: only banks that offered financial disclosure under IFRS rules for the entire period 2006-2010 were taken in consideration. Also, in order to have a good representativeness of the sample the 12 selected banks accumulate almost 80% of the net banking assets.

Important variables that were taken into account are: Impairment of loans and advances to customers, net loans, gross loans, operating profit/loss, deferred taxes, shareholder equity, interest income/expenses, operational expenses like advertising and promotion, administrative expenses like training of staff. In this respect it was important that all this variables to be estimated on the same accounting principles and to be publicly available.

All the data were obtained from the financial statements (annual reports) posted on the official site of the banks.

4. RESULTS

As recent literature regarding national accounting characteristics suggest, the most important adjustments were made for loan loss and for deferred taxes. Also, adjustments for the cost of advertising and for training expenses were made, but the value of these categories may remain insignificant compared to total expenses. An important methodological issue regarding the latter categories is reflected by the fact that not all banking institutions declare a distinct position of the cost of advertising and especially costs of staff training. In order to have a good representation of these costs in our EVA measure, the adjustments were made only if the financial statement recognized such costs as distinct administrative and other operational costs.

The important aspect that must be observed is the similar trend described both by EVA and by the Residual Income Indicator (RI). This situation could suggest that in the light of similar trend behavior RI could be a good substitute for EVA.

Table 2. The evolution of value creation by Romanian banking institutions

Indicator	Category	2006	2007	2008	2009	2010
EVA	Value creators	8	8	6	7	9
	Value destroyers	4	4	6	5	3
	TOTAL	*12*	*12*	*12*	*12*	*12*
RI	Value creators	7	5	5	5	6
	Value destroyers	5	7	7	7	6
	TOTAL	*12*	*12*	*12*	*12*	*12*

Source: Own calculations

At a closer view the mean values presented by EVA seem to be higher than the values of the economic profit obtained by computation of R.I. This is a straightforward result as the value of adjusted NOPAT under EVA is significantly higher than unadjusted NOPAT. Nevertheless, as numbers point out the minimum and maximum value of EVA is higher than the minimum and maximum value of RI suggesting a greater polarization banking institution when computing shareholder value by using EVA.

Table 3. Descriptive statistics on Economic Value Added and Residual Income

		2006	2007	2008	2009	2010
Mean	EVA	119,126.10	155,431.80	311,783.60	359,727.40	401,034.90
	RI	92,019.14	114,175.40	168,327.20	9,550.98	9,910.97
Maximum	EVA	780,288.00	1,114,393.00	2,141,961.00	1,710,780.00	1,620,332.00
	RI	700,310.00	1,015,076.00	1,561,080.00	1,132,109.00	992,125.30
Minimum	EVA	-60,192.22	-66,060.11	-182,847.70	-56,697.81	-67,183.13
	RI	-65,790.63	-117,643.00	-224,225.60	-368,010.40	-255,185.20

Source: Own calculations. Values are expressed in thousand RON

One of the most interesting aspects regarding the measures of performance is to establish how they relate to each other. In order to find the correlation between the rankings that result by using different approaches to measurement we evaluated the association in time between EVA and other performance measures like: ROA, ROE and NIM.

Table 4 and 5 reports two measures of rank correlation: Spearman's rank correlation and Kendall's Tau. Both measures are nonparametric (distribution-free) rank statistics that measure of the strength of the associations between two variables by taking values in the interval [-1; +1]. The value of -1 denotes completely negative association while the value +1 denotes completely positive association. The value 0 indicates the absence of correlation.

Table 4. Spearman Rank Correlation Coefficient

	EVA_2006	EVA_2007	EVA_2008	EVA_2009	EVA_2010
RI	0.9790	0.8322	0.9091	0.3007	0.1818
ROE	0.7483	0.6154	0.6713	0.8601	0.5664
ROA	0.7203	0.8252	0.7832	0.8462	0.5734
NIM	0.1189	0.7203	0.2308	0.0070	0.4825

Source: Own calculations.

At the first glance the numbers suggest that EVA best correlates with R.I for the years that both indicators have most of the positive values and the correlation seems to become weaker in the case of the years when losses are observed. Also, EVA

values from 2006-20010 best correlates with the RI value from 2006 suggesting that the values recorded in 2006 are the most representative for the entire period considering the evolution of shareholder value creation. The relationship of EVA with traditional measures of performance presents contextual correlations. For the year 2006-2010 EVA best correlates with ROE and ROA even in the case of the negative outcomes. The Spearman rank coefficient can be interpreted as follows: in the year 2007 the ranking of the banking institution in the sample provided by both EVA and ROE displays similar outcomes in 86.01% of the cases. The relationship between EVA and NIM is also of interest since more and more studies consider NIM as a performance measure. The results show that correlation is random: for the year 2007 in almost 72.03% of similar ranked cases when we obtain positive value of EVA the value of NIM has to be a high one as for the year 2009 in just 72.03% of similar ranked cases when we obtain positive value of EVA the value of NIM has to be a high one

Kendall's Tau rank correlation coefficient suggests a similar pattern. Though Kendall's Tau is viewed as a superior rank correlation measure, statistical literature suggests as valid the lowest value of the two indicators.

Table 5. Kendall's Tau Rank Correlation Coefficient

	EVA_2006	EVA_2007	EVA_2008	EVA_2009	EVA_2010
RI	0.939394	0.69697	0.818182	0.272727	0.212121
ROE	0.666667	0.515152	0.484848	0.666667	0.424242
ROA	0.606061	0.666667	0.575758	0.636364	0.424242
NIM	0.090909	0.515152	0.181818	-0.0303	0.333333

Source: Own calculations.

5. CONCLUSION

By comparing the rank correlation obtained by using EVA versus traditional performance indicators the objective of this study was to gain some insight about the relevance of using more sophisticated performance measurements tools like. Towards this end we used two acknowledged statistical measures: Kendall's Tau and Spearman rank correlation Index. The results suggest that generally EVA results are higher that RI results but the rank correlation is higher when the value of NOPAT is positive. Because EVA boosts NOPAT values when adjusting the book values in the years of negative outcome the two performance indicators exhibit lower correlation. ROA and ROE is the measure that best correlates with EVA for the entire period. Nevertheless, ROE should be viewed cautious as banks are highly leveraged institutions and all other things being equal, higher financial leverage will pump up ROE, and will mask a deterioration of the capital base and the (re)consolidation of off-balance sheet commitments.

6. ACKNOWLEDGMENTS

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