

THE RELATIVE VALUE RELEVANCE OF EARNINGS, BOOK VALUES AND CASH FLOWS IN THE POLISH BANKING SECTOR

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Abstract. The paper aims to investigate the relative value relevance of the fundamental items from the financial statements of banks: net earnings, book values of equity and cash flows in the context of the capital market of Poland. The examined sample covered all domestically-based banks listed on the Warsaw Stock Exchange over the period 1997–2014. The research methods employed involved parametric and non-parametric analyses of correlation, as well as simple and stepwise multiple linear regression. The obtained results are consistent with the findings of prior international studies and indicate that the market value of banks is most strongly related to book values of equity followed by net earnings. On the other hand cash flows reported by banks seem to be of a limited informativeness for equity investors as they do not provide any significant incremental explanatory power beyond that conveyed by book values of equity and net earnings.

Key words: value relevance, banks, book values, earnings, cash flows

INTRODUCTION

Despite being able to present only a historical view of enterprise's performance, financial statements are commonly recognised as the most important source of information supporting rational investment decisions in the capital markets. Among many useful data reported by the listed companies, the informational content of earnings, book values of equity, and cash flows appears to have a special significance for equity investors.

Earnings provide comprehensive information about the company's economic performance in the past that allows to formulate rational expectations about its future cash flows [Obinata 2002] or dividend payouts [Nichols and Wahlen 2004] required in many valuation models. Book value of equity is typically considered a proxy for abandonment or liquidation value of a firm [Subramanyam and Venkatachalam 1998]. In turn, cash flows show the actual movement of money in and out of a business, an should therefore be useful for financial forecasts prepared for valuation purposes.

Since the seminal study by Ball and Brown [1968] a considerable amount of research has been done on the relationship between the accounting numbers reported by the listed companies and their actual market value. One of the leading lines of research in this field aims at investigation of the relative value relevance of the aforementioned key items from financial statements. The results of these analyses are, however, ambiguous. Moreover, most studies focus on the non-financial enterprises, leaving the specific context of banking sector largely unexplored. The banking sector, however, seems to offer particularly favourable conditions for testing the value relevance of reported accounting numbers. First, because recognition of many banking operations and financial instruments in the accounting ledgers appears to be fairly coherent with the perspective of capital markets, and second, because banks' stocks are typically among the most frequently traded and liquid securities.

Given the mixed results of prior international studies and the apparent lack of similar works in the domestic setting, the present paper attempts to contribute to the existing literature by providing an empirical evidence on the relative value relevance of earnings, book values of equity and cash flows reported by commercial banks in the specific context of the emerging capital market of Poland.

The remainder of the paper is composed of four sections. The next section provides a review of the results of prior studies investigating the relative value relevance of earnings, book values and cash flows in the banking sector. Then, the third section describes the research design and the details of data selection procedures. The fourth section presents the key findings of the study and discusses their consistency with the results of the previous research. The paper is closed with a brief recapitulation summarising the obtained results and providing some suggestions for the directions of future research.

LITERATURE REVIEW

The international literature on the relative value relevance of diverse items from financial statements is quite extensive. The vast majority of studies, however, focus on the non-financial enterprises, while the banking sector appears to receive much lower attention.



Most studies examining the value relevance in the banking sector analyse the joint impact of book values and earnings on the market value [Abuzayed et al. 2009, Agostino et al. 2011] without assessing the relative explanatory power of each item. A distinctive exception from the above general rule is an extensive study by Anandarajan et al. [2011] who examined the data for 813 banking institutions from 38 countries finding that earnings have higher value relevance in market-based economies; in countries that have a common law background, and where ownership is mainly in British/American clusters. In turn, book values tend to be more value relevant in bank-based economies, code law countries, and where ownership is not British/American dominated.

The above findings appear to be partially consistent with the results of the study by Escaffre and Sefsaf [2011] who examined the value relevance of earnings and book values of financial institutions, including banks, in the US market and selected European markets. They found that under IFRS book value of equity was more value relevant than earnings in all examined European markets, except the Spanish one. In turn, under GAAP in the US market, the value relevance of earnings was higher than book values of equity.

The Polish economy is mostly bank-based and operating in a code law legal system. Moreover, since 2005, just like in the other EU member states, the listed banks in Poland are obliged to prepare their consolidated financial statements in conformity with IFRS [Regulation... 2002]. Therefore, in the light of the aforementioned studies it can be expected that in the Polish banking sector book values of equity should be more value relevant than earnings.

Other studies in the banking sector address the issue of the relative value relevance of earnings and cash flows. Barth et al. [1999] examined the listed companies representing 14 sectors in the US market and demonstrated that the impact of accruals and cash flows on the market value of financial institutions is significantly different from the one observed in the other sectors. Using the book values of equity and residual income as control variables in the regression analysis they found that, unlike in any other sector except the pharmaceutical one, the relationship between cash flows from operations and the market value in the financial sector was negative.

Ryan et al. [2006] investigated the value relevance of banks' trading operations and found that stock returns in the banking sector are more positively associated with the trading revenue (operating) component than with the principal cash flow (non-operating) component of those operations. Their results suggest a hybrid nature of such operations, that is not fully captured by the bank's cash flow statement framework.

The findings of Ryan et al. [2006] were corroborated by the results of a study on the value relevance of cash flows in the US banking sector by Gao et al. [2015] who claim that cash flows reported by banks are less value relevant than those of



non-financial enterprises, which implies a limited informativeness of banks' cash flow statements for equity investors. A likely explanation for this observation is the fact that the nature of cash flows in banks differs significantly from the one of non-financial enterprises. First, cash in banks reveals some similarity to manufactured goods in industrial companies, which limits the usefulness of standard cash flow statements. Second, for the purposes of assessment of liquidity and solvency banks' cash flows appear to be less effective than other sources of information, such as interest rate sensitivities and maturity schedules of assets and liabilities [Gao et al. 2015]. Finally, since most cash flows in banks are related to financial instruments, the distinction between operating, investing and financing cash flows, seems less informative than for non-financial enterprises.

A direct comparative analysis of the value relevance of earnings and cash flows for banks was conducted by Dimitropoulos et al. [2010] in the setting of the Greek capital market. Their findings indicate that earnings generally outperform cash flows in explaining variation in stock returns. Although, when earnings contain a high share of transitory components, cash flows tend to be more closely related to banks' market value.

Tjhoa and Hermawan [2014] examined the value relevance of earnings and cash flows in the selected countries of South-East Asia and found that in Malaysia cash flows from operations are more informative for equity investors than net earnings. In Thailand and Indonesia, however, net earnings appeared to be clearly more value relevant than cash flows.

The results of the previous international studies suggest therefore that the specificity of banks' operations limits the usefulness of their cash flow statements for equity investors and often makes cash flows less value-relevant than earnings.

The evidence on the value relevance of banks' financial reporting in the Polish capital market is still very modest. Recently several attempts to address this issue were made by Bolibok [2014a, b, 2015], indicating a statistically significant impact of book values of equity and earnings on the market value of listed banks. To date no study, however, attempted to directly compare the relative value relevance of fundamental items reported in banks' financial statements. Given the above, the present paper aims to fill this gap and thus to enhance the related domestic and international literature on the value relevance in the banking sector.

RESEARCH DESIGN

The conducted review of prior studies on the value relevance of key items from banks' financial statements suggests that the market prices of their stocks should be more closely related to the changes in book values of equity per share than



to variations in earnings per share. It might also be expected that net earnings should be more value relevant than cash flows. The above conjectures lead to formulation of the following set of hypotheses:

- Hypothesis 1. Book values of equity of listed banks in Poland are more value relevant than net earnings.
- Hypothesis 2. Net earnings of listed banks in Poland are more value relevant than cash flows.

In order to test both hypotheses, the analyses of correlation and regression between the market prices of banks' stocks and the examined items from their annual financial statements were conducted. First, the Pearson's linear correlation and Spearman's rank correlation coefficients were calculated and tested for statistical significance. Then, the following linear regression models were used to assess the relative value relevance of particular accounting items:

- Model 1: $p_t = \alpha_0 + \alpha_1 \cdot BVPS_t + \varepsilon_{1t}$
- Model 2: $p_t = \beta_0 + \beta_1 \cdot EPS_t + \varepsilon_{2t}$
- Model 3: $p_t = \gamma_0 + \gamma_1 \cdot OCFPS_t + \varepsilon_{3t}$
- Model 4: $p_t = \delta_0 + \delta_1 \cdot NCFPS_t + \varepsilon_{4t}$

where:

p_t – closing price of a bank's share at the end of period t ,

$\alpha_0, \beta_0, \gamma_0, \delta_0$ – intercepts,

$\alpha_1, \beta_1, \gamma_1, \delta_1$ – structural parameters (regression coefficients),

$BVPS_t$ – book value per share at the end of period t ,

EPS_t – net earnings per share for the period $(t - 1; t)$,

$OCFPS_t$ – operating cash flows per share for the period $(t - 1; t)$,

$NCFPS_t$ – net cash flows per share for the period $(t - 1; t)$,

$\varepsilon_{1t}, \varepsilon_{2t}, \varepsilon_{3t}, \varepsilon_{4t}$ – error terms.

The estimates of the parameters $\alpha_1, \beta_1, \gamma_1, \delta_1$ were expected to be positive since higher book values of equity, net earnings and cash flows should intuitively correspond with a higher market value of an enterprise. The error terms were introduced to capture the impact of other determinants of banks' stock prices than those included in the models. The above procedure aimed at ranking the selected accounting variables according to the estimated values of the models' coefficients of determination (R^2), thus allowing to assess the relative value relevance of particular items from banks' financial statements.

Finally, a stepwise multiple regression analysis was employed to evaluate the incremental explanatory power of each of the selected accounting numbers. Using the best-fit model from the previous step as the starting point, the remaining explanatory variables were consecutively added to the regression until the resulting change in the value of R^2 turned out to be statistically insignificant.



The data used in the analysis covered all domestically-based commercial banks listed on the Warsaw Stock Exchange over the period 1997–2014. Given numerous mergers and acquisitions within the sector, the final sample comprised of 18 banks. The data on annual financial statements were collected from the Notoria Serwis SA database provided by ISI Emerging Markets (http://site.securities.com/cgi-bin/comp_profiles/94dec/PL/comp_profiles.html, accessed: 15.09.2015). The data on historical stock prices came from the database of the Brokerage House of Bank Ochrony Środowiska SA (<http://bossa.pl/notowania/metastock>, accessed: 15.09.2015). The combined data on book values of equity, net earnings, operating cash flows, net cash flows, and stock prices yielded the final pooled samples of 235 bank-year observations for separate financial statements and 216 bank-year observations for the consolidated ones. Key descriptive statistics of the examined variables are shown in Table 1.

TABLE 1. Descriptive statistics of the examined variables (pooled sample)

Statistic	Separate statements					Consolidated statements				
	p_t	$BVPS_t$	EPS_t	$OCFPS_t$	$NCFPS_t$	p_t	$BVPS_t$	EPS_t	$OCFPS_t$	$NCFPS_t$
Mean	111.26	59.57	6.28	-0.39	0.52	115.46	61.70	6.59	0.66	2.78
Median	54.85	42.49	2.68	0.01	0.51	60.45	43.87	2.81	0.29	2.81
Min	1.08	-0.72	-21.10	-281.73	-258.11	1.31	0.56	-21.16	-266.45	-255.66
Max	926.50	417.99	53.98	432.10	239.88	926.50	434.34	57.89	438.51	158.38
Std. dev.	157.51	69.83	10.26	55.62	39.18	162.81	73.45	11.03	57.88	29.65
N	235	235	235	235	235	216	216	216	216	216

Source: Own elaboration.

RESULTS

Table 2 presents the results of estimation of the Pearson's linear correlation and Spearman's rank correlation coefficients between the examined items from banks' separate and consolidated annual financial statements and the year-end stock prices over the entire analysed period.

Regardless of the employed measure of correlation and type of data used (separate or consolidated) banks' stock prices turned out to be most strongly positively related to the level of their book values of equity per share. A weaker, yet also statistically significant, positive relationship, was found for net earnings per share. In contrast, all the estimated correlations between banks' market value and cash flows were either insignificant (cash flows from operations and net cash flows from separate statements) or very weak (consolidated net cash flows).

The results of estimation of the constructed regression models are shown in Table 3. The regressions using book values of equity and net earnings per share



TABLE 2. Correlation matrix of the examined variables (pooled sample)

Variable	Separate statements					Consolidated statements				
	p_t	$BVPS_t$	EPS_t	$OCFPS_t$	$NCFPS_t$	p_t	$BVPS_t$	EPS_t	$OCFPS_t$	$NCFPS_t$
Pearson's correlation										
p_t	1.000	0.907**	0.826**	-0.045	-0.074	1.000	0.912**	0.842**	-0.049	0.152*
$BVPS_t$		1.000	0.807**	0.003	-0.066		1.000	0.819**	0.016	0.211**
EPS_t			1.000	-0.044	-0.207**			1.000	-0.049	0.005
$OCFPS_t$				1.000	0.417**				1.000	0.190**
$NCFPS_t$					1.000					1.000
Spearman's rho										
p_t	1.000	0.920**	0.807**	0.014	0.065	1.000	0.918**	0.824**	0.043	0.237**
$BVPS_t$		1.000	0.790**	-0.010	0.054		1.000	0.786**	0.042	0.277**
EPS_t			1.000	-0.023	0.028			1.000	-0.007	0.197**
$OCFPS_t$				1.000	0.474**				1.000	0.384**
$NCFPS_t$					1.000					1.000

** correlation is significant at the 0.01 level (2-tailed); * correlation is significant at 0.05 level (2-tailed).

Source: Own elaboration.

as explanatory variables (Models 1 and 2) were statistically significant at the 1% level. As expected, the estimates of regression coefficients α_1 and β_1 were positive. Judging by the values of coefficients of determination it seems that consolidated data is of slightly higher value relevance to equity investors.

The best fit to the empirical data was found for Model 1. The changes of BVPS were able to explain more than 80% of the variation in banks' stock prices. In the pooled sample, an increase in BVPS by 1 PLN resulted on average in a 2 PLN increase in stock prices. In turn, using EPS as a single explanatory variable allowed to explain about 70% of variation in stock prices. On the other hand, an average responsiveness of banks' market value to changes in EPS was much higher than the one observed for BVPS, as an increase of EPS by 1 PLN caused a more than 12 PLN increase in the stock price.

The estimated regressions using with flows as explanatory variables (Models 3 and 4) revealed a very poor fit to the empirical data. Solely Model 4 estimated for the consolidated data turned out to be statistically significant at the 5% level, however the changes in consolidated net cash flows were able to explain only about 2% of the variation in banks' stock prices.

The final stage of the analysis involved a stepwise multiple regression aimed at capturing the incremental explanatory power of each of the examined items from the banks' financial statements (Table 4).

The results of the F-test for the change in the coefficient of determination indicate that introduction of EPS as an additional explanatory variable to Model 1 provided a relatively small, yet statistically significant, improvement of its



TABLE 3. Estimations of basic regression models (pooled sample)

Parameter / Statistic	Separate statements			Consolidated statements		
	estimate value	std. error	p-value	estimate value	std. error	p-value
Model 1: $p_t = \alpha_0 + \alpha_1 \cdot BVPS_t + \varepsilon_{1t}$						
α_0	-10.608	5.707	0.064	-9.212	5.967	0.124
α_1	2.046	0.062	0.000	2.021	0.062	0.000
R ²	0.823			0.831		
Adj. R ²	0.822			0.830		
F-statistic	1 079.871		0.000	1 052.443		0.000
N	235			216		
Model 2: $p_t = \beta_0 + \beta_1 \cdot EPS_t + \varepsilon_{2t}$						
β_0	31.545	6.801	0.000	33.636	6.991	0.000
β_1	12.687	0.566	0.000	12.422	0.545	0.000
R ²	0.683			0.708		
Adj. R ²	0.682			0.707		
F-statistic	502.172		0.000	519.331		0.000
N	235			216		
Model 3: $p_t = \gamma_0 + \gamma_1 \cdot OCFPS_t + \varepsilon_{3t}$						
γ_0	111.214	10.286	0.000	115.555	11.091	0.000
γ_1	-0.127	0.185	0.494	-0.139	0.192	0.470
R ²	0.002			0.002		
Adj. R ²	-0.002			-0.002		
F-statistic	0.469		0.494	0.523		0.470
N	235			216		
Model 4: $p_t = \delta_0 + \delta_1 \cdot NCFPS_t + \varepsilon_{4t}$						
δ_0	111.417	10.270	0.000	113.142	11.023	0.000
δ_1	-0.296	0.263	-0.261	0.834	0.371	0.026
R ²	0.005			0.023		
Adj. R ²	0.001			0.018		
F-statistic	1.267		0.261	5.051		0.026
N	235			216		

Source: Own elaboration.

predictive power. The R² of the model increased by 2.6 p.p. for the data from the separate financial statements and by 2.7 p.p. for the consolidated ones. A likely explanation of the low incremental explanatory power of net earnings over book values of equity might be a strong positive correlation between these variables in the examined sample (see Table 2).

TABLE 4. The results of a stepwise multiple regression (pooled sample)

Parameter / Statistic	Separate statements			Consolidated statements		
	estimate value	std. error	p-value	estimate value	std. error	p-value
Model 1: $p_t = \alpha_0 + \alpha_1 \cdot BVPS_t + \varepsilon_{1t}$						
α_0	-10.608	5.707	0.064	-9.212	5.967	0.124
α_1	2.046	0.062	0.000	2.021	0.062	0.000
R ²	0.823			0.831		
Adj. R ²	0.822			0.830		
F-statistic	1 079.871		0.000	1 052.443		0.000
Model 1-2: $p_t = \alpha_{01} + \alpha_{11} \cdot BVPS_t + \alpha_{21} \cdot EPS_t + \varepsilon_{12t}$						
α_{01}	-7.361	5.314	0.167	-4.953	5.515	0.370
α_{11}	1.552	0.098	0.000	1.497	0.100	0.000
α_{21}	4.168	0.664	0.000	4.257	0.663	0.000
R ²	0.848			0.858		
Adj. R ²	0.847			0.857		
R ² change	0.026			0.027		
F-statistic	648.487		0.000	645.652		0.000
F-statistic change	39.353		0.000	41.193		0.000
Model 1-2-4: $p_t = \alpha_{02} + \alpha_{12} \cdot BVPS_t + \alpha_{22} \cdot EPS_t + \alpha_{32} \cdot NCFPS_t + \varepsilon_{12t}$						
α_{02}	-7.531	5.313	0.158	-4.770	5.558	0.392
α_{12}	1.532	0.099	0.000	1.485	0.107	0.000
α_{22}	4.370	0.688	0.000	4.321	0.697	0.000
α_{32}	0.120	0.107	0.260	0.047	0.152	0.756
R ²	0.849			0.858		
Adj. R ²	0.847			0.856		
R ² change	0.001			0.000		
F-statistic	433.262		0.000	428.642		0.000
F-statistic change	39.353		0.260	0.097		0.756
Model 1-2-3: $p_t = \alpha_{03} + \alpha_{13} \cdot BVPS_t + \alpha_{23} \cdot EPS_t + \alpha_{33} \cdot NCFPS_t + \varepsilon_{23t}$						
α_{03}	-7.467	5.304	0.161	-5.096	5.487	0.354
α_{13}	1.560	0.098	0.000	1.515	0.100	0.000
α_{23}	4.098	0.665	0.000	4.128	0.664	0.000
α_{33}	-0.099	0.073	0.174	-0.131	0.073	0.073
R ²	0.849			0.861		
Adj. R ²	0.847			0.859		
R ² change	0.001			0.002		
F-statistic	434.549		0.000	436.058		0.000
F-statistic change	1.861		0.174	3.247		0.073

Source: Own elaboration.

The further attempts to enhance the predictive power of the model through introduction of net cash flows (Model 1–2–4) and cash flows from operations (Model 1–2–3) proved to be unsuccessful. For each of the models the estimated change in the coefficient of determination turned out to be statistically insignificant at the 5% level. Although, if the 10% level of significance was allowed the introduction of consolidated net cash flows could marginally improve the predictive power of the model (increase in the value of R^2 of 0.2 p.p.). From the practical point of view the incremental explanatory power of consolidated net cash flows over book values of equity and net earnings appears, however, to be quite irrelevant.

The obtained results clearly support both hypotheses of the present study and are generally consistent with the findings of the relevant international and domestic literature. First, the empirical evidence shows that book values of equity of banks are more value relevant than net earnings. The earnings, however, have a relatively low yet statistically significant explanatory power over book values, and therefore seem to provide the equity investors in the banking sector with some useful information.

Second, given the specificity of their operations the informational content of banks' cash flow statement seems to be of limited usefulness to equity investors also in the Polish capital market. The results of the analyses conducted in the present study showed that the ability of cash flows from operations and net cash flows to explain the variations in banks' stock prices is either statistically insignificant or almost irrelevant from the practical perspective. Moreover, the aforementioned items do not reveal any significant explanatory power beyond the information provided by book values of equity and net earnings.

CONCLUSIONS

The results of the conducted analyses indicate that book values of equity and net earnings of banks listed on the Warsaw Stock Exchange are value relevant. Both these variables revealed a strong, statistically significant positive correlation with banks' market value over the analysed period. As expected, a stronger relationship occurred in the case of book values of equity, and therefore the changes in their levels were able to explain a higher portion of variation in banks' stock prices. The results of a stepwise multiple regression analysis demonstrate, however, that net earnings reveal a statistically significant, incremental explanatory power over book values of equity.

The above findings are generally consistent with the evidence found in the prior international and domestic literature and indicate that also in the context of the Polish banking sector book values of equity are more value relevant than net earnings, which supports the first hypothesis of the present study.



Moreover, consistent with expectations and the findings of the prior studies, the results of the research clearly demonstrate that cash flows reported by banks in their financial statements are of limited informativeness for equity investors. In general, the correlations between cash flows from operations or net cash flows and banks' stock prices in the examined sample turned out to be either statistically insignificant or very weak. It also appears that cash flows do not have any significant incremental explanatory power over book values of equity and net earnings in the Polish banking sector.

Given the pioneering nature of the present study in the context of the Polish banking sector it was focused specifically on investigating the relative value relevance of the key aggregate accounting numbers reported by banks in their financial statements. The further research in this field might therefore try to examine the problem more deeply, and attempt to assess the relative value relevance of particular components of those aggregate items.

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ZNACZENIE ZYSKOWNOŚCI, WARTOŚCI KSIĘGOWEJ ORAZ RACHUNKU PRZEPŁYWÓW PIENIĘŻNYCH W POLSKIM SYSTEMIE BANKOWYM

Abstrakt. Celem artykułu jest zbadanie względnego znaczenia fundamentalnych pozycji ze sprawozdań finansowych banków: wyników finansowych netto, wartości księgowej kapitałów własnych i przepływów pieniężnych w warunkach polskiego rynku kapitałowego. Próba badawcza objęła wszystkie banki z siedzibą w Polsce notowane na Giełdzie Papierów Wartościowych w Warszawie w okresie 1997–2014. Zastosowane metody badawcze obejmują parametryczne i nieparametryczne analizy korelacji, jak również prostą i wieloraką krokową regresję liniową. Uzyskane wyniki są spójne z wnioskami poprzednich opracowań w literaturze międzynarodowej i wskazują, że wartość rynkowa banków najsilniej powiązana jest z wartością księgową kapitałów własnych, a w dalszej kolejności z wynikami finansowymi netto. Raportowane przez banki przepływy pieniężne wydają się jednak mieć ograniczoną przydatność informacyjną



dla inwestorów na rynkach kapitałowych, gdyż nie oferują istotnego przyrostu zdolności predykcyjnej ponad tę wynikającą z wartości księgowej kapitałów własnych i wyników netto.

Słowa kluczowe: znaczenie dla wartości rynkowej, banki, wartość księgowa, wyniki finansowe, przepływy pieniężne



