



## ORIGINAL PAPER

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## The role of comprehensive income in predicting banks' future earnings based on the practice of banks listed on the Warsaw Stock Exchange

**JEL Classification:** G21; M41; M48

**Keywords:** *comprehensive income; net income; financial reporting; predictive power; banks*

### Abstract

**Research background:** In the economic literature there are many arguments presented by critical supporters and opponents of measuring and reporting comprehensive income. There is a justified need to examine the relevance and usefulness of comprehensive income, especially the predictive power of comprehensive income for forecasting future earnings. It may be assumed that the comprehensive income has a better predictive power for future bank performance than net income, because this measure includes many elements, which were previously presented in the statement of changes in equity.

**Purpose of the article:** The major subject of the theoretical-empirical study presented in this paper is the evaluation of the usefulness of comprehensive income for predicting banks' future earnings. Realization of the fundamental objective of this paper was centered around the main research hypothesis, stating that in economic practice of banks listed on the Warsaw Stock Exchange it can be assumed that there is a positive predictive power of financial result in forecasting financial standing of these entities.

**Methods:** The research comprised bank joint-stock companies listed on the Warsaw Stock Exchange (qualified on 15.09.2016). Empirical data for the study was obtained from the quarterly financial statements (the period from 2009 to 2015) from EMIS. The problem was realized in two analytical dimensions: absolute dimension financial results, and a relative dimension (return ratios). The research method was the regression analysis conducted by

means of Spearman's rank correlation coefficient and by two regression models in two versions.

**Findings & Value added:** The research showed that the analyzed bank companies were characterized by a diversity usefulness of comprehensive income for predicting banks' future earnings. Nevertheless, it must be stressed that the calculated Spearman's rank correlation coefficients confirm in most instances a positive character of dependence between the comprehensive income and future return ratios. The results of the estimation of econometric models shows the positive association of comprehensive income with future profitability of banks.

## Introduction

Profit of every economic entity is not a homogenous category, and it is not perceived in the same way. There is no doubt that it is a leading idea and an important tool in accomplishment of many operational and strategic goals of enterprises. Simultaneously, it is a subject and an instrument of economic-financial analyses that are used in financial management. It is also reflected in the perception of numerous profit functions and profit concepts as such. On the one hand, profit is a measurement of enterprise effectiveness, on the other, it is an instrument of wealth growth (Hendriksen & van Breda, 2002, pp. 294–295; Szychta, 2012, p. 66).

Within the first concept the results of board decisions that are directed at maximization of operational profit in a given period are regarded as a starting point in defining and measuring financial results. In these terms, a financial result that is calculated based on current operating profit is treated as a measurement of management effectiveness that undoubtedly concerns basic enterprise activity and is generally characterized by continuity and repetitiveness. Then, profit and loss account shows only effects of transactions, which are directly connected with financial result, whereas other changes in values of assets or liabilities are transferred to the statement of changes in equity, or directly to the balance sheet. Such items are regarded as dirty surplus accounting and are often hard to identify for readers of financial statements while creating opportunities to overestimate profit (Littleton, 1940, pp. 30–40; May, 1937, pp. 15–22; Paton, 1934, pp. 108–132).

According to the concept of comprehensive income, profit is generated when a value of net assets of entity (equity) at the end of accounting period is higher than their value at the beginning of that period. In these terms, capital is identified with wealth, and profit is an expression of benefits of using this capital in a given period and represents total growth (or decrease) of owners' wealth while expressing a value that was generated or lost by an enterprise in a given period. The range of comprehensive income is much

wider than net profit as it includes measurement of results of all transactions and events resulting in changes in equity, which reflects requirements of so-called clean surplus that is related to fair value i.e. a value determined in market conditions (Feltham & Ohlson, 1995, pp. 689–731; Ohlson, 1995, pp. 161–182; O’Hanlon & Pope, 1999, p. 459).

It can be assumed that comprehensive income that comprises traditional net profit and a range of other components (e.g. effect of valuation of fair value of company stake in other entities, exchange rate differences from calculations of foreign activities or application of instruments hedging future cash flows), can be a better measurement of future profitability of entity than a traditional financial result in the case of companies running financial activity (banks, in particular) which keep in their assets considerable unrealized financial investments, as well as those having foreign dependent companies. Banks use also hedge accounting (in the range in which hedge is effective) in a form of numerous derivatives to protect future cash flows, e.g. forward contracts to sell currency from anticipated revenues in this currency in the future.

The results of studies conducted so far show explicitly that the main components of other comprehensive income include: profits and losses resulting from overestimating components of financial assets available for sale, an effective part of profits and losses connected with a hedging instrument within cash flows hedges and profits and losses resulting from recalculation of items of financial statement of entity operating abroad (Sajnog, 2014, pp. 481–482).

The main purpose of the paper was to verify a research hypothesis stating that in economic practice of banks listed on the Warsaw Stock Exchange it can be assumed that there is a positive predictive power of comprehensive income in forecasting financial standing of these entities. It is expressed, on the one hand, by higher values of basic categories of financial results (e.g. net profit) in subsequent accounting periods, on the other hand, higher profitability of banks in the future is observed, which is measured, inter alia, by means of return on assets ratios. Justification of the purpose of study results from high usefulness of presenting comprehensive income in financial reporting not only in the banking sector (Eccher *et al.*, 1996; Evans *et al.*, 2014; Park *et al.*, 1999; Petroni & Wahlen, 1995; Venkatachalam, 1996). These aspects of comprehensive income of banks are a result of providing reliable information that shape a picture of future effects of activity of these entities, enabling to undertake and control creating and realization of future conditions, ways and results of action. Furthermore, revealing bank comprehensive income and its changes allows users of financial statements to make proper reclassification and calculation of

more adequate volumes of future earnings than while doing so based on a traditional profit and loss account. Ignoring some values in calculating net profit (loss) can, on the one hand, lead to manipulating or polishing financial results, on the other, it can limit access to important information that influence predictive value of presented results of activity and development of banks.

## **Research methodology**

Presented empirical research concerns banking companies listed on the Warsaw Stock Exchange (as of 15 September, 2016). In order to realize the aim of the study, a 7-year research period was adopted i.e. years between 2009–2016 in the aftermath of the need to prepare statements of comprehensive income by Polish listed companies from January 1, 2009. Thorough analysis covered quarterly financial statements of banks<sup>1</sup> where, due to availability of data, the last studied accounting period was the second quarter of 2016. Empirical data was taken from the EMIS (Emerging Markets Information Services) database and from the websites of analyzed companies.

The presented research problem is realized on the basis of evaluation of profitability of analyzed companies by means of traditional ratio analysis and using accounting measures. Enterprise profitability understood, in general, as an ability to generate profit (contrary to unprofitability that appears in case of a negative bottom line) can be determined in absolute or relative values (Preißler, 2008, p. 12). In applied system of evaluation of profitability two analytical dimensions were used. These were:

- absolute terms i.e. accounting value of financial result, and
- relative terms i.e. Return on Assets (*ROA*) ratio that is a relation of earnings to overall value of assets (calculated as an arithmetic average of assets at the beginning and the end of accounting period — in this case, a quarter).

Analysis of the dependencies between comprehensive income in a given reporting period and selected measures of profitability in absolute and relative terms in subsequent accounting periods, was conducted by means of Spearman's rank correlation coefficients while using *t* statistics to study significance of these dependencies.

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<sup>1</sup> For two banks (SANTANDER and UNICREDIT) due to lack of individual reports data from consolidated financial statements was used.

A leading dimension of evaluation of predictive power of comprehensive income in shaping future profitability of banks was oriented at using two single equation models (M1 and M2) in two versions (A and B) i.e. influence of comprehensive income in  $t$  period on profitability in  $t+1$  and  $t+2$  periods (Britten *et al.*, 2016, p. 290) (see Table 1). It must be emphasized that while constructing these models a natural logarithm of absolute values of individual categories i.e. both, net profit, comprehensive income and total assets was used.

Taking into account the fact that enterprise profitability is associated with productivity of specific outlays (assets, capital, sales) and determines a scale of generated profits, the measures of bank profitability in absolute and relative terms used in these models were calibrated by means of volume of total wealth of a given bank (Britten *et al.*, 2016, p. 290). This type of approach is justified by excluding the possible impact of scale of conducted activities on bank comprehensive incomes.

In the abovementioned models time asymmetry between periods that were profitable for banks (profits) and unprofitable (losses) should be taken into consideration (Basu, 1997, pp. 3–37). However, bearing in mind the values of quarterly earnings generated by 16 analysed banks, in which in 95% of analyzed accounting periods positive financial results were noted, it was assumed that the problem of asymmetry was minimized and what followed, no additional artificial variables were introduced (Braumoeller, 2004, pp. 807–820).

In the empirical research measures of descriptive statistics i.e. classical and positional measures of location and differentiation were also used and *Statistica 12* software to conduct relevant calculations.

## **Predictive power of comprehensive income — the literature overview**

Total financial result, defined in the literature as global and overall, is also referred to as comprehensive income<sup>2</sup>. It is understood as a change in equity that appeared as a result of transactions and events other than changes resulting from transactions with owners acting as shareholders (Buk, 2013, p. 9). It is presented in a statement of comprehensive income that is prepared by companies according to the International Accounting Standards (IASs) from January 1, 2009. It can be stated that comprehensive income

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<sup>2</sup> The term “comprehensive income” suggests that it is a positive value but income can take either positive or negative value. Moreover, income is a tax law category. Taking that into consideration, the author used a notion of “comprehensive income”, but understood as result (or profit), not income.

comprises all elements of profit and loss account as well as “other comprehensive income”, which includes: changes from revaluation of wealth elements, actuarial profits and losses from programs of specific employee benefits, profits and losses resulting from recalculating a position of financial statement of an entity active abroad, profits and losses from revaluation of elements of financial assets available for sale as well as an effective part of profits and losses connected with a hedging instrument within cash flow hedges. While taking into consideration an enterprise lifecycle, its overall performance equals a net value of income and expenditure of financial means, excluding financial means (and equivalent of financial means in a form of non-cash assets) transferred and distributed by owners (Rees & Shane, 2012, p. 792).

It should be emphasized that financial result determined in profit and loss account as well as its structure confirm the enterprise profitability achieved in a given period. Other comprehensive income provide information about potential profits or losses, which an entity realizes in the subsequent periods, and which already caused these changes in a current period (see Figure 1).

It is assumed that comprehensive income determined by a fair value is connected with a value of expected cash flows, which is a basis to make decisions by investors (Barth, 2014). Moreover, it allows readers of financial statements to understand achieved financial results better as well as to prepare better forecasts. At the same time, it can be assumed that there is bigger predictive power of comprehensive income than net profit.

It must be mentioned that comprehensive income is a more transparent financial result for users of statements as, *inter alia*:

- it includes all items of revenues and costs which are a result of both, transactions made by an entity as well as changes in equity value,
- it comprises items of profits and costs while taking into consideration accrual basis, regardless of cash basis,
- it takes into consideration final positions regardless of the fact whether they are a results of repeatable transactions or extraordinary ones.

Unquestionably, the scope of comprehensive income presented in the statement of comprehensive income is much bigger than net financial result, which poses the main advantage of usefulness of this economic category. Statement of comprehensive income, contrary to a traditional profit and loss account, comprises the majority of sources of creating a value in enterprise while obliging entity management to take into consideration all factors that influence this value. Comprehensive income is a clearer financial result for users of reporting as, among others, it expresses a bigger potential of enterprise to generate profits in the future (Kanagaretman *et al.*,

2009, p. 352), is more consistent and compliant with the theory of enterprise valuation (Dhaliwal *et al.*, 1999, p. 45), shows a higher correlation with rates of return on shares (Biddle & Choi, 2006, pp. 1–32), and above all, it seems to be less vulnerable to accounting manipulations and implementation of a strategy of legal or illegal management of financial result (Chambers *et al.*, 2007, p. 561).

However, practical application of comprehensive income in studying profitability of enterprises creates a range of difficulties and proves to be highly controversial. The studies conducted by Polish listed companies on assessment of the concept of comprehensive income indicate occurrence of numerous complex substantive, methodical and practical problems, which impedes formulating convincing arguments for accepting comprehensive income as priority and crucial criterion of evaluation of enterprise profitability. They can be specified in a form of five basic statements, namely (Sajnog, 2013, p. 260):

1. in economic practice not all listed companies show comprehensive incomes in financial reporting,
2. companies use various terminology of components of comprehensive income, which may adversely influence comparability of presented financial information,
3. there is diversified transparency of elements of comprehensive income, which may not provide users of financial statements with information useful to make financial decisions,
4. very often a traditional financial result does not differ from comprehensive income,
5. comprehensive incomes are not necessarily connected more strongly with market measures compared to traditional net profit.

In turn, foreign literature provides some statements that comprehensive incomes are an irrelevant and inconstant resulting item (elements of other comprehensive income are characterized by the biggest volatility) (Goncharov & Hodgson, 2011, pp. 27–59), to a slight extent they are linked to a rate of return on shares, they are unreliable reflection of final measurement of enterprise performance as well as they do not help to forecast future flows and revenues (Dhaliwal *et al.*, 1999, p. 45; Barton *et al.*, 2010, pp. 753–89). Statement of comprehensive income additionally includes external and unclear components (Rees & Shane, 2012, p. 794), which diminish a possibility of predicting long-term results (O’Hanlon & Pope, 1999, pp. 459–482) and show different usefulness in creating enterprise value (Louis, 2003, pp. 1027–1047).

Critics of the category of comprehensive income also indicate that changes in fair value that is a base for evaluation of comprehensive income,

are only temporary and related to short-term movements in the market, which have not much in common with expectations concerning future financial results (Chisnall, 2001). As a result, comprehensive income is more volatile than categories of traditional financial results (Barth *et al.*, 1995; Hodder *et al.*, 2006) and is subject to a bigger measurement error that weakens reliability and predictive value of this economic category (Landsman, 2007). Furthermore, there is an opinion that using a fair value to evaluate enterprises contributed to market crash in the years 2007–2009, forcing, first of all, banks to use unjustified corrections down to fair values of assets, leading at the same time to a diametrical decrease in market value (Bhat *et al.*, 2011; Bowen, & Khan 2014).

Leaving aside the abovementioned discussions, it can be assumed that using a concept of asset valuation according a fair value (compliant with the concept of comprehensive income) can correlate with bigger predictive power of comprehensive income related to shaping future financial results, contrary to traditional net profit. In spite of the fact that comprehensive income, due to various components, is assumed to be a more volatile financial category, it is not negligible in predicting future financial results (Olson, 1999). It happens, for example, because of unrealized gains and losses cumulated in time, which can significantly determine future financial standing of enterprise. For instance, based on the studies of selected British companies (Aboody *et al.*, 1999) it must be pointed out that revaluation of fixed assets (referred to capital from revision of evaluation that is a medium of comprehensive income) refers to a large extent to changes in operating profit and operating cash flows in the future. Moreover, it is emphasized in the literature that aggregate corrections of fair value relating to investments in securities are connected with future rates of return on these securities (Park *et al.*, 1999; Evans *et al.*, 2014). Empirical studies also show that evaluation of bonds according to fair value is positively related to future interests from these instruments. Similarly, changes in fair value of some futures hedging cash flows can also be reflected in future gains (Campbell, 2015).

## **Results of empirical studies**

The results of empirical studies presented in Figure 2 show that as an effect of separating items of other comprehensive income in the examined eight-year period there occurred differentiation in the value of comprehensive income (*CI*) in relation to net income (*NI*). An important point is that mean



values of financial results of analyzed banks did not show a considerable dominance of one category over the other (see Figure 2).

On the basis of observations of basic statistics it must be noted that occurrence of bigger volatility of comprehensive incomes than net results, which is proved by calculated values of quartiles, standard deviations as well as coefficients of variation (see Table 2).

On the basis of observations of basic statistics, it must be noted that occurrence of bigger volatility of comprehensive incomes than net results, which is proved by calculated values of quartiles, standard deviations as well as coefficients of variation (see Table 2).

Calculated Spearman's rank correlation coefficients indicate a positive character of dependencies between comprehensive income achieved by examined banks in a given quartile ( $CI_t$ ) and future net income ( $NI_{t+1}$  and  $NI_{t+2}$ ). What is important, the analyzed dependencies turned out to be statistically significant and showed a considerable impact of comprehensive income on the future profitability of banks in absolute terms (see Table 3).

A similar situation was observed in the case of subsequent dependencies, namely between comprehensive income and predicted profitability of banks in relative terms, expressed as future return on total assets ( $ROA_{t+1}$  and  $ROA_{t+2}$ ). However, in both cases, although the values of correlation coefficients proved statistically important, they indicated a moderate dependence between analyzed categories (see Table 3).

The conducted analysis of multiple regression that was necessary to evaluate four single equation economic models (M1A, M1B, M2A, M2B), with one dependent variable and four independent variables showed that directions of impact of the main independent variable ( $\ln CI_t$ ) on dependent variables ( $\ln NI_{t+1}$ ,  $\ln NI_{t+2}$ ,  $ROA_{t+1}$ ,  $ROA_{t+2}$ ) were positive, and estimated parameters at this variable proved statistically significant at confidence level of 0,05. At the same time, it can be indicated that future profitability of analyzed banks, both in absolute and relative terms, was positively influenced comprehensive income (see Table 4).

It has to be undeniably emphasized that the values of estimated parameters at the  $\ln CI_t$  variable were, yet, lower than at  $\ln NI_t$  and  $\ln ROA_t$ , whose influence on dependent variables also proved statistically significant. This situation can be translated into slightly weaker predictive power of comprehensive income in forecasting bank profitability, contrary to net income and return on total assets, calculated by means of a traditional financial result. It is worth stressing that in the fourth model (M2B) a direction of influence of  $ROA_t$  variable on dependent variables was negative. However, in this only model, the estimated parameters at all independent variables

proved statistically insignificant at the confidence level of 0.05, thereby, the relations between examined categories cannot be unequivocally confirmed.

With a view to influence of additional control variables ( $\ln A_t$ ,  $\ln NI_t \times \ln A_t$  and  $ROA_t \times \ln A_t$ ) on independent variables, their different character of influence must be emphasized. Estimated values of  $\ln A_t$  variable indicated a positive influence on profitability of banks in M1A and M1B models, whereas, in subsequent two models (M2A and M2B) the situation was quite reverse. However, directions of influence of independent variables  $\ln NI_t \times \ln A_t$  as well as  $ROA_t \times \ln A_t$  on dependent variables were in general negative, but at assumed confidence level of 0.05 they turned out to be statistically insignificant in majority of cases. Thereby, the direction and strength of their influence on bank profitability in the analyzed eight-year period cannot be unequivocally indicated.

## **Conclusions**

The presented results of the studies on the role and significance of comprehensive income in forecasting profitability of selected banks indicate numerous important and complex problems concerning a process of management of information about financial results of entities. An important role of comprehensive income in shaping future gains is visible in increasingly wider application of fair value as a basis for evaluation of elements of assets and liabilities of economic entities in recent years.

The analysis of collected and processed figures concerning the examined banks points out that there are positive dependencies between comprehensive income and future gains of these entities, both in absolute and relative terms. The estimated coefficients of correlation confirmed that there is a positive relation between analyzed categories, however, the character of these relations was either significant or moderate, but, what is important, statistically significant. Estimated values of parameters of four economic models also indicated a positive direction of influence of comprehensive income on future financial net results and return on total assets, which is confirmed by the set research hypothesis about a positive predictive power of comprehensive income in shaping future financial standing of entities.

While forecasting bank profitability, it must be emphasized that there is a certain dominance of net income category and return on assets over comprehensive income, which enables to reflect, among others, the effects of combined influence of many media and components of profitability, which however, create premises of conducting further deepened theoretical-empirical studies. Hence, presented results should be regarded as a founda-

tion for further theoretical studies as well as empirical studies on the predictive power of comprehensive income, its components, in particular, in shaping future financial results of bank. They cannot, yet, claim to be regarded as generalized reflections and scientific conclusions.

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## Annex

**Table 1.** Analytical forms of applied single equation models

Model version	Analytical form
M1A	$\ln NI_{t+1} = \alpha_0 + \alpha_1 \times \ln NI_t + \alpha_2 \times \ln CI_t + \alpha_3 \times \ln A_t + \alpha_4 \times (\ln NI_t \times \ln A_t) + \mu$
M1B	$\ln NI_{t+2} = \alpha_0 + \alpha_1 \times \ln NI_t + \alpha_2 \times \ln CI_t + \alpha_3 \times \ln A_t + \alpha_4 \times (\ln NI_t \times \ln A_t) + \mu$
M2A	$ROA_{t+1} = \alpha_0 + \alpha_1 \times ROA_t + \alpha_2 \times \ln CI_t + \alpha_3 \times \ln A_t + \alpha_4 \times (ROA_t \times \ln A_t) + \mu$
M2B	$ROA_{t+2} = \alpha_0 + \alpha_1 \times ROA_t + \alpha_2 \times \ln CI_t + \alpha_3 \times \ln A_t + \alpha_4 \times (ROA_t \times \ln A_t) + \mu$

Marks:

$NI_t$  – net income in  $t$  period,

$NI_{t+1}$  – net income in  $t+1$  period,

$NI_{t+1}$  – net income in  $t+2$  period,

$CI_t$  – comprehensive income in  $t$  period,

$ROA_t$  – return on assets in  $t$  period,

$ROA_{t+1}$  – return on assets in  $t+1$  period,

$ROA_{t+2}$  – return on assets in  $t+2$  period.

Source: own study on the basis of Bratten *et al.* (2016).

**Table 2.** Basic statistics of examined categories (in millions of PLN)

Categories	NI	CI	A	ROA (in %)
Mean	268,1	272,3	173610,9	0,41
Median	120,5	127,0	52351,0	0,20
Lower quartile	29,6	21,6	21126,6	0,06
Upper quartile	366,7	438,4	120846,2	0,37
Standard deviation	490,5	501,9	327563	2,05
Coefficient of variation	183	184,3	188,7	502,17

Source: own study on the basis of quarterly financial reports of companies available in EMIS.

**Table 3.** Spearman's rank correlation coefficients between analyzed categories

Relations	Values of correlation coefficients	Statistical significance (level 0,05)
$CI_t$ vs. $NI_{t+1}$	0,799	YES
$CI_t$ vs. $NI_{t+2}$	0,784	
$CI_t$ vs. $ROA_{t+1}$	0,448	
$CI_t$ vs. $ROA_{t+2}$	0,444	

Source: own study on the basis of quarterly financial reports of companies available in EMIS.

**Table 4.** Results of estimation of M1A, M1B, M2A, M2B models

Model version (dependent variable)	Independent variables	Parameter values	t Statistics	Test significance level	Critical value $t_{\alpha}$ when $\alpha = 0,05$	Coefficient of determination $R^2$
M1A ( $\ln NI_{t+1}$ )	$\ln NI_t$	<b>0,775</b>	2,846	0,005	1,960	0,69
	$\ln CI_t$	<b>0,180</b>	2,964	0,003		
	$\ln A_t$	<b>0,483</b>	2,960	0,003		
	$\ln NI_t \times \ln A_t$	-0,030	-1,154	0,249		
M1A ( $\ln NI_{t+2}$ )	$\ln NI_t$	<b>0,615</b>	2,266	0,024		
	$\ln CI_t$	<b>0,396</b>	6,613	0,000		0,70
	$\ln A_t$	<b>0,512</b>	3,148	0,002		
	$\ln NI_t \times \ln A_t$	-0,035	-1,385	0,167		
M1B ( $ROA_{t+1}$ )	$ROA_t$	<b>3,290</b>	7,363	0,000		
	$\ln CI_t$	<b>0,242</b>	3,327	0,001		0,43
	$\ln A_t$	<b>-0,205</b>	-2,481	0,014		
	$ROA_t \times \ln A_t$	<b>-0,387</b>	-5,899	0,000		
M2B ( $ROA_{t+2}$ )	$ROA_t$	-0,268	-0,851	0,395	0,29	
	$\ln CI_t$	0,031	0,609	0,543		
	$\ln A_t$	-0,042	-0,736	0,462		
	$ROA_t \times \ln A_t$	0,088	1,889	0,060		

Note:

Statistically significant independent variables are shown in bold.

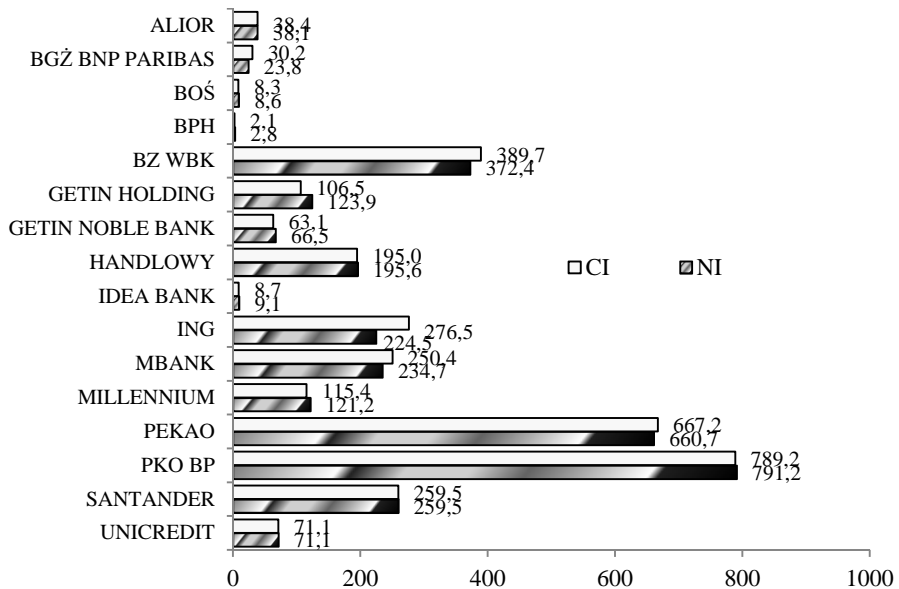
Source: own study on the basis of quarterly financial reports of companies available in EMIS.

**Figure 1.** Comprehensive income against changes in equity

Changes in equity			
Comprehensive income			Investments and payments for owners
Resulting income/costs	Capital income/costs		
Net income		Balance sheet corrections of current period	Other changes in equity (not for owners)
Income	Aggregate effects of changes in equity resulting from accounting policy		

Source: Gerbaulet (1999, p. 54).

**Figure 2.** Mean values of comprehensive income (CI) and net income (NI) in analysed banks (in millions of PLN)



Source: own study on the basis of quarterly financial reports of companies available in EMIS.