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Usefulness of comprehensive income reporting for dividend policy in the polish listed companies

This study examines the strength and character of relationship between dividend policy and comprehensive income in Polish manufacturing companies. We formulated two research questions:

1) does comprehensive income determine the ability to pay out a dividend?

2) what is the key role of comprehensive income in shaping a dividend policy?

To receive the answers to these questions, we put a research hypothesis stating that in the Polish listed companies a positive relationship between comprehensive income and dividend policy can be observed.

The research was conducted among the companies operating in the manufacturing sector (4xx of the Warsaw Stock Exchange (the WSE) classification). The analytical period is between 2009–2017 and reflects the current legal status of the financial reporting of public companies in Poland. Finally, our analysis comprised 83 manufacturing companies and 664 observations.

The study procedure was carried out in two stages. The first stage was to show the results of empirical research conducted among the analysed companies and regarding the variability of comprehensive income in comparison to net income (consequently other comprehensive income). At the second stage, we presented the results of investigation on the strength and character of an impact of comprehensive income on dividends. For that purpose, two research methods were used. Firstly, we calculated the Pearson's correlation coefficients between comprehensive income (and net income) and future dividend ratios, as well as the other company's performance and tested for significance using the t-Student test. Secondly, we used regression analysis and two one-equation models built for comprehensive income and net income. Moreover, we used descriptive statistics, t- Student test, and F-test.

The conducted research allowed us to draw two main conclusions: 1) there was a positive character of dependence between comprehensive income and future dividend, however, the correlation between them was very weak; 2) the impact of comprehensive income on future dividend ratio was positive, but we noted no statistical significance.

Keywords: *comprehensive income; comprehensive income reporting; dividends; dividend policy; other comprehensive income.*

Introduction. Comprehensive income (CI) is a relatively new, little recognized and researched, in the literature, accounting and economic category, which is the consequence of the implementation of International Accounting Standards (IAS). In Poland, it was entered into force on 1st January 2009. According to these regulations, Polish stock companies are required to report comprehensive income statement, together with its components.

The comprehensive income reporting in the financial accounting is related to the use of the valuation model, in which 'clean surplus accounting' is applied (Littleton, 1940; May, 1937; Paton, 1934). According to the concept of comprehensive income, a company has earned a profit when the net value of its assets (equity) has increased between the beginning and end of an accounting period. Positive change of equity is understood as equivalent to 'wealth' for shareholders and profit expresses the utility of using equity in a given period and shows the overall increase (or decrease) in shareholder's wealth (Epstein et al., 2010).

Therefore, the comprehensive income reporting and the construction of comprehensive income statement require showing on most items making up both company value and shareholder's value (Ramond et al., 2007). Additionally, it shall be pointed out that comprehensive income reduces agency problem and information asymmetry between managers and shareholders (Leuz and Verrechia, 2000; Bushman and Smith, 2001).

A key role in aspect of the agency relationship between principal and agents plays the dividend policy. The dividend policy mitigates the effects of agency problem mainly in good legally protected countries (La Porta et al., 2000), e.g. in Poland. The earnings related to dividend cover are relevant where there is a legal nexus between earnings and dividends (Bennett and Bradbury, 2007).

Having regard to the fact that dividend policy is an important agency problem we have two questions: Will comprehensive income determine the ability to pay out a dividend and what is the key role of CI in shaping dividend policy? In the literature the relation between CI and dividend policy has been generally ignored (Black, 2016) or it is assumed that dividend reflect the distribution of wealth but is uninformative for assessing wealth creation (Ohlson, 1999). A lot of analytical models assume that dividend payout policy has no consequences for shareholder's wealth (Black, 1976). DeAngelo et al. (1996) reported two arguments that dividend cannot be reliable signal in information asymmetry. Firstly, an overoptimism leads managers to overestimate future earnings. Secondly, managers make only modest cash commitments when they increase dividends. On the other hand, a lot of empirical studies have shown that companies follow deliberate payout dividend strategies (Lintner, 1956) and can signal future profitability (Miller and Modigliani, 1961). Additionally, the profits of dividend payers are more persistent than these of dividend non-payers (Skinner and Soltes, 2011).

The main purpose of the paper is to verify a research hypothesis stating that in the Polish listed companies a positive relationship between comprehensive income and dividend policy can be observed. It may be assumed that in current accounting period comprehensive income has a better predictive power for future dividend ratio than net income. Managers must take into account all components of comprehensive income in dividend policy, especially these which are included in other comprehensive income (OCI).

For example, profits and losses resulting from recalculating a position of financial statement of an entity active abroad, as well as an effective part of profits and losses connected with a hedging instrument within cash flow hedges will impact company's performance. Namely managers must consider both the internal and external factors (e.g. rate of exchange, fluctuations on the stock market etc.), that are likely to influence shareholder's value when making decisions. Including the sources both helps reduce information asymmetry and can impose self-control on managers involved in active financial management, and deter them from self-serving management of company's profits (Chambers et al., 2007; Hunton et al., 2006). The biggest benefit of comprehensive income from dividend policy perspective is that it can be expected to prevent the risk of 'creative accounting' and 'lack-of-transparency' problems from occurring (O'Hanlon, 2000). Comprehensive income shows therefore improvement of the quality of shareholder value management. Goncharov and Van Triest (2014) documented that it is connected with the consequences of introduction of fair value accounting. The nature of fair value, which is related to comprehensive income concept, impacts dividend distributions. In this case the variability of CI or OCI can be also relevant for agency costs related to dividend distributions (Black, 2016).

Usefulness of comprehensive income reporting. Reporting comprehensive income, together with the presentation of its components, is due to the necessity of fully presenting, properly reflecting and understanding the implemented various strategies of equity management (including the company's dividend policy), to increase the predictive power of comprehensive income and therefore future benefits for shareholders. Although, the information contained in the comprehensive income statement is undoubtedly essential for assessment of future shareholders' capital benefits, they cannot be seen as a substitute for the cash and accrual data, which are dominant in the financial statements so far.

The scope of comprehensive income, reported in the proper statement, not only has a broader problem area in comparison to the net profit, but also contains a number of significant effects of the value creation process and factors that drive the future company's performance. The outcome calculated on the basis of the comprehensive income concept includes the value of all changes in the prices of assets over the period, which are ignored in the traditional income statement. Therefore, it can be emphasized that its range, accuracy and information capacity creates the satisfying conditions of high information competences for stakeholders.

According to the concept of comprehensive income, a profit is understood as a growth in owners' wealth (Newberry, 2003; Delaney et al., 2002). In other words, comprehensive income is treated as a change in equity during the reporting period. The profit arises when the value of net assets (equity) at the end of the accounting period is higher than their value at the beginning of the period. The capital is identified with wealth, while profit is the expression of the benefits of the use of this resource in the period. Thus, comprehensive income takes into account the results of all transactions and events resulting in changes of equity, which meets the requirements of the so-called clean surplus (O'Hanlon and Pope, 1999).

It is worth emphasizing that CI is comprised of net income (NI) and other comprehensive income (OCI), which includes profits or losses not included in the net profit but in equity. In line with the changes of International Financial Reporting Standards (IFRS), the components of OCI should be classified by type and presented in two groups (IFRS, 2011):

- 1) the first group includes amounts of OCI income that will not be subsequently reclassified to profit or loss;
- 2) the second group includes elements of OCI that will be reclassified to profit or loss, but after meeting certain conditions (see Table 1).

Table 1

Grouping of OCI items under the amendments to IAS 1

Specification	Accounting regulation
OCI items that cannot be reclassified into profit or loss:	
Changes in revaluation surplus	IAS 16 and IAS 38
Actuarial gains and losses on defined benefit plans	IAS 19.93A
Gains and losses from investments in equity instruments measured at fair value through OCI	IFRS 9
For those liabilities designated at fair value through profit or loss, changes in fair value attributable to changes in the liability's credit risk	IFRS 9
OCI items that can be reclassified into profit or loss:	
Foreign exchange gains and losses arising from translations of financial statements of a foreign operation	IAS 21
Effective portion of gains and losses on hedging instruments in a cash flow hedge	IAS 39

Source: (IFRS, 2011)

The insightful characterization of all OCI components allows stating that all of them are characterized by the lack of durability over time, and almost all are beyond the control of managers (see Table 2).

Table 2

Characteristics of OCI items

OCI Item	Statement (Effective Date)	Degree of Persistence	Under Management Control	Results from Remeasurement
Foreign currency translation adjustments	SFAS 52 (1983)	Low	No	Yes
Gains/losses on foreign currency transactions that are effective as economic hedges of a net investment in a foreign entity	SFAS 52 (1983)	Low	No	Yes
Gains/losses on intracompany foreign currency transactions that are of a long-term-investment nature, when the entities to the transaction are consolidated, combined, or accounted for by the equity method in the reporting company's financial statements	SFAS 52 (1983)	Low	No	Yes
Gains/losses associated with pension or other postretirement benefits that are not recognized as a component of the net periodic benefit cost	SFAS 87 and 106 (1987, 1993)	Low	No	Yes
Prior service costs or credits associated with pension or other postretirement benefits	SFAS 87 and 106 (1987, 1993)	Low	Yes	No
Transition assets or obligations associated with pension or other postretirement benefits that are not recognized immediately as a component of the net periodic benefit cost	SFAS 87 and 106 (1987, 1993)	Low	Yes	No
Unrealized holding gains/losses on available-for-sale securities	SFAS 115 (1994)	Low	No	Yes
Unrealized holding gains/losses that result from a debt security being transferred into the available-for-sale category from the held-to-maturity category	SFAS 115 (1994)	Low	No	Yes
Other-than-temporary impairments that relate to all factors other than credit loss on debt securities that will not be sold	SFAS 115 (1994)	Low	No	Yes
Subsequent changes in the fair value of available-for-sale securities previously written down as impaired	SFAS 115 (1994)	Low	No	Yes
Gains/losses on derivative instruments that qualify as cash flow hedges	SFAS 133 (2000)	Low	No	Yes

Source: (Rees and Shane, 2012, pp. 796–797)

In the literature, there can be found a number of arguments to justify the weaknesses and strengths of comprehensive income in stock companies on the capital markets, especially in comparison to net profit (see Table 3) and will provide to owners and managers some arguments and counterarguments for the creation and implementation of specific equity management strategies. However, these empirical findings should not be regarded as undisputed testimony of the superiority of comprehensive income over net income and vice versa (compare: Sajnóg, 2017, pp. 489–492). The results of the studies of many other researchers, sometimes even supporters of the implementation of the comprehensive income category to the financial reporting, do not give a definite answer in this regard.

Table 3

The advantages and weaknesses of CI in comparison to NI

Advantages of CI in comparison to NI	Weaknesses of CI in comparison to NI
CI is more consistent with the price of shares and return on investment (Kanagaretnam et al., 2009), return on stocks (Dhaliwal et al., 1999) and return on shares (Biddle and Choi, 2006)	NI is more strongly associated with return on shares (Barton et al., 2010) and its amount is a better reflection of the company's final performance (Liu and Thomas, 2000)
CI has more power in prediction of future net earnings (Choi and Zang, 2006)	Investors are still using NI for information, valuation and prediction purposes (Goncharov and Hodgson, 2011)
Reporting of OCI in a separate statement helps analysts to detect the earnings management practice (Hirst and Hopkins, 2007)	Components of OCI have different usefulness in the creation of enterprise value (Louis, 2003)
CI is characterized by higher resistance to managers' manipulation (Chambers et al., 2007)	NI is a more important measure in terms of management contracts (Biddle and Choi, 2006)

Source: (Sajnóg, 2017, pp. 491–492)

The knowledge and analysis of these advantages and weaknesses of comprehensive income may have an important meaning for specific strategies of financial management, especially in the forecasting the future benefits for shareholders. A reporting and an approach to the issue of assessment of comprehensive income is very important, not only in the evaluation of the usefulness of these economic categories for forecasting future business efficiency, but also in the implementation of dividend strategies and finally measurable results in the form of benefits for shareholders, associated with an increase of their wealth. Paying attention to company's comprehensive income and considering it as a key determinant of changes in the value and structure of equity for the growth of shareholder value arises not only from its leading position in the financial reporting, but what is more important, also from the less prone to manipulation by the company's managers (Grabiński, 2012). Hirst and Hopkins (2007) emphasize that the presentation of OCI in the income statement instead of the statement of changes in equity is more effective from the point of view of revealing managerial earnings manipulation (Sajnóg and Sosnowski, 2018). For example, managers may tend to invest cash surplus in transferable securities or use excessively derivative instruments to hedge cash flows, however, they do not have any possibilities to directly influence the fluctuations in the market prices of such financial instruments. Similarly, companies may pursue an active foreign expansion, nevertheless, the results of the exchange rate changes tend to be beyond the control of managers.

Dividend policy and wealth creation. In neoclassical theory of economic, it is assumed that one of the basic goals of company is to maximize its profit (Begg et al., 2005). In pursuit of this goal, companies strive to determine the volume of production in such a way that the profit from the involvement of existing factors of production would be the highest (Begg et al., 2005). This translates into maximizing the earnings per share ratio (EPS), i.e. maximizing the net income (Megginson and Smart, 2008). In turn, according to the so-called financial theory of the company, the company is perceived as a form of investment for its owners who, by investing their capital and accepting a given level of investment risk, expect certain financial benefits to compensate for the opportunity cost and investment risk taken. In such a context, the basic goal of company's activities becomes maximizing its market value and, consequently, increasing the shareholder's value (Brigham and Daves, 2007). The benefits obtained by shareholders are defined as shareholder's wealth, which consists mainly of capital gains and dividends.

A dividend can be defined in two areas, i.e. in the context of a relationship between dividend and net income, as well as in the context of a link between dividend and ownership. In the first case, a dividend is a part of net income paid out to shareholders (Mayo, 1997) or wider, net income or reserves distributed to shareholders, which have been created specifically for this purpose (Paramasivan and Subramanian, 2009). However, taking into account the ownership context, the dividend is understood as: a) a cost of using shareholder capital and a specific price that the company pays to investors for the purchase of its shares (Sierpińska, 1999); b) a direct

remuneration paid by the company to its shareholders (Baker and Powell, 2005); c) cash payments made by the company to its investors (Megginson and Smart, 2008). Dividend is therefore one of the owner's fundamental property rights. This right is absolute, which means that a shareholder may not be deprived of it by means of provisions in the company's articles of association or a resolution of the general meeting of shareholders. The realization of this right can take place using various forms of dividend payout, i.e.: cash dividend (ordinary, additional, special, liquidation or residual dividend) and non-cash dividend (asset or stock dividend). It is worth adding that the exercise of the shareholder's right to participate in net income takes place regardless of the form of dividend and – on the Warsaw Stock Exchange – can only take place in the case of a positive dividend sum¹.

In the case of regular dividend payouts, we talk about a dividend policy understood as a long-term strategy that concerns the division of net income into dividend and retained earnings. Dividend policy of regular payouts is crucial because if expected dividend is omitted a decrease in the market value of company may be observed (Michaely *et al.*, 1995, p. 574). In turn, if dividend occurs regularly, the investors usually treat it as a positive signal, which usually results in a higher market value of company (Hobbs & Schneller, 2012, p. 1401). Among the model dividend policy, we distinguish: constant dividend per share policy, constant dividend per share plus extra dividend policy, constant payout ratio policy, extreme dividend policy, residual dividend policy and hybrid or compromise dividend policy (Pieloch-Babiarz, 2018).

In the literature, views on the impact of dividend policy on wealth creation are divergent. The authors usually represent one of the three approaches to dividend policy, i.e. neutral, pro-dividend or anti-dividend policy.

Neutral policy, also called the views of the central group, states that dividend policy has no impact on the market value of company. The representatives of this group are M.H. Miller and F. Modigliani (1961), who formulated the irrelevance theory of dividend. This theory claims that the market value of company depends only on investment policy, not on financial and dividend policy. Miller and Modigliani model (MM model) is based on many assumptions that can be divided into 3 groups. First, the assumptions about the efficient capital market, including: the excellent market competitiveness and the lack of large investors that can shape share prices; lack of information asymmetry (all market participants have equal and free access to information); no transaction costs (related to purchasing, selling or issuing shares); no tax preferences (for distributed and retained earnings, as well as for dividends and capital gains). Second, assumptions about the rationality of investors who always prefer higher profits over lower profits and show no preferences as to the form of financial benefits. Third, full investor's awareness of the future profits of company and its investment policy as well as the possibility of implementing investment plans regardless of the distribution of net income into dividend and retained earnings. M. H. Miller and F. Modigliani (1961) argue that in the event of a shortage of investment capital, this capital can be easily supplemented by issuing new shares (assuming no transaction costs). Thus, a company can pay out dividend at any level, which will not affect the market value, because – according to the irrelevance theory of dividend – it is an investment policy, not a dividend, that creates market value of company. This relationship is illustrated by the following formula (Miller and Modigliani, 1961):

$$MV_t = \frac{NI_t - Inv_t + MV_{t+1}}{1 + \varphi_t}, \quad (1)$$

where:

MV_t – market value of company in year t,

Inv_t – the level of investment in year t,

φ_t – discount rate.

According to the approach of M.H. Miller and F. Modigliani (1961), an increase in the dividend rate (dy – dividend per share (d_t) to current market share price (P_0)), resulting from an increase in the dividend payout, causes a decrease in its growth rate (g) in such a way that these effects cancel each other out, whereby the rate of return on shares (k) does not change as a result of changes in the dividend policy (see Figure 1a).

In turn, representatives of the pro-dividend approach (the so-called conservative group) claim that investors prefer dividend to capital gains and therefore dividend payout should result in an increase in the market value of company, and thus in an increase in shareholder's value. J. Lintner (1956) and M.J. Gordon (1959) contributed the most to this issue. Bird in the hand theory was created. This theory states that investors prefer to receive dividends now than wait for future capital gains. Moreover, an increase in the dividend *ceteris paribus* may lead to an increase in the market value of company as: a) the higher current dividends will reduce uncertainty about future cash flows; b) the high dividend payouts may reduce the cost of capital and lead to an increase in the market share price. M.J. Gordon (1962) supplemented these considerations with a theoretical model. He assumed that the market share price is equal to the discounted dividend stream in subsequent years. His discussion was described by the following model:

¹ A dividend sum is an amount to be divided among shareholders, which consists of the net income for the last financial year increased by undistributed profits from previous years as well as by the supplementary and reserve capital. This amount should be reduced by uncovered losses, own shares and by amounts that which should be allocated from net income to supplementary or reserve capitals (Commercial Companies Code, art. 348)

$$P_0 = \sum_{t=1}^{\infty} \frac{d_0(1+g)^t}{(1+\varphi)^t} = \frac{d_1}{\varphi-g}, \quad (2)$$

where:

P_0 – current market share price,

d_0 – dividend in the base year,

d_1 – dividend in the next year,

g – dividend growth rate,

others as above.

Thus, the Gordon model shows that the market value of company will be higher if a company pays out higher dividend in the base year (d_0) and if dividend growth rate (g) is higher. Graphically, the essence of this approach is shown in Figure 1b.

The third approach describing the impact of dividend policy on the market value of company is called the anti-dividend approach. Its representatives R.H. Litzenberg and K. Ramaswamy (1979) argue that low dividends reduce the cost of capital and lead to an increase in market share prices, and as a result contribute to an increase in shareholder's value. This approach takes into consideration the existence of a tax system that treats dividends and capital gains differently and introduces so-called tax preferences theory related mainly to the American market in the 1970s, where dividend income was taxed higher than capital gains income, and quarterly paid dividends caused the shareholder to pay taxes four times a year (Damodaran, 2001). Due to the reforms of tax systems and equalization of taxation of dividends and capital gains in many countries, new arguments have been put forward to prove the negative impact of dividend payout on the market value of company. Among them were those drawing attention to the time when the tax liability arose. Capital gains were to have an advantage over dividend, since the tax is collected on them at the end of the tax year, which would create a possibility of postponing the tax payment, and its subsequent payment – in accordance with the time value of money – causes that its present value compared to the tax value on dividend is lower. A graphical illustration of the anti-dividend approach is shown in Figure 1c.

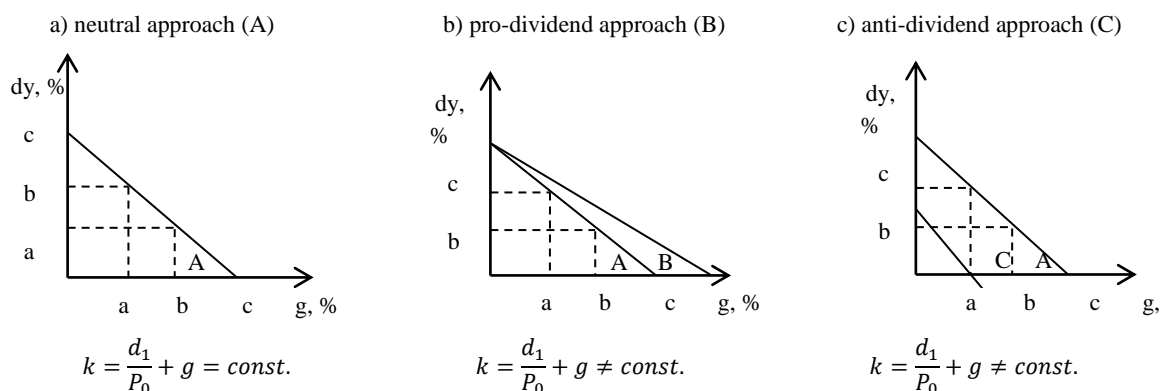


Figure. A graphical illustration of dividend policy theories

Source: own preparation based on Brigham (1996)

In recent years, there have been conducted many research regarding the shaping of the market share price of dividend payers. These investigations, basing on the information asymmetry and signaling theory (Bhattacharya, 1979; Miller and Rock, 1985), focuses mainly on analyzing the short-term response of capital markets to the information on changes in dividend policy. These studies usually support the pro-dividend approach. In particular, a large part of the studies is dedicated to the market value of company after the announcement of the decision to pay out an initial or maiden dividend (Lipson et al., 1998; McCaffrey and Hamill, 2000). This information is usually positively received by investors, which means that it results in an increase in the market value of company, which is in line with the signaling theory (Hobbs and Schneller, 2012). Most research, based on the cumulative abnormal return (CAR), have showed a positive response of capital markets to the information about: a) an initial dividend payout (Lacina and Zhang, 2008; Sare et al., 2014; Goel, 2015); b) an increase in dividend payment (Dasilas and Leventis, 2011; Sare et al., 2014). In turn, the information about a reduction or cessation of dividend payout usually results in a decrease in the market value of company (Healy and Palepu, 1988; Michaely et al., 1995; Kumar, 2017).

Moreover, there are some studies regarding the value creation using regular dividend payouts conducted in the long-term investment horizon. However, their results are contradictory. Research conducted by Hobbs and Schneller (2012) showed no differences in the market value of dividend payers and dividend non-payers. In turn, the research by How et al. (2011) and Nguyen (2014) indicated that after five years of regular dividend payouts, the average monthly rate of return is higher for dividend companies. The research conducted by Pieloch-Babiarz

(2018b) showed that the average buy-and-hold abnormal return (BHAR) is higher for companies regularly paid out dividend than the same rate calculated for the WIG index. She also proved that if the number of years of regular dividend payouts increases, the buy-and-hold abnormal return also increases.

The results of empirical studies. The conducted empirical research comprised the manufacturing sector (4xx of the Warsaw Stock Exchange – the WSE classification), in which the biggest number of companies listed on the WSE was found. What is more, this type of limitation enables us to avoid the issue of sample heterogeneity when assessing the dividend policy. Among 110 companies qualified to this sector (on 1st June 2018), these selected for the research were the companies that presented their financial statements in accordance with IFRS for the period between 2009–2017 (this sample period reflects the current legal status of the financial reporting of public companies in Poland). Finally, an analysis comprised 83 manufacturing companies. Empirical data was taken from the Thomson Reuters or Notoria Serwis database and from the websites of analysed companies.

The research procedure was executed in two parts. The first part includes the results of empirical research conducted among the analysed companies and regarding the variability of comprehensive income in comparison to net income (consequently other comprehensive income), whereas the other one presents the results of investigation on the strength and character of an impact of comprehensive income on dividends. For that purpose we used two methods:

a) firstly, we calculated the Pearson's correlation coefficients between CI (and NI) and future dividend ratios as well as the another company's performance and tested for significance using the t-Student test,

b) secondly, we used regression analysis and two one-equation models (M1 and M2). They were built for comprehensive income (1) and net income (2) and were applied to determine the effect of both types of impact: CI in current accounting period on dividend ratio in the accounting period t+1 and NI in current period on dividend ratio in the period t+1 (see Table 4).

Table 4

Analytical forms of applied single equation models

Model version	Analytical form
M1	$DIV_{t+1} = \alpha_0 + \alpha_1 CI_t + \alpha_2 SIZE_t + \alpha_3 BVMV_t + \alpha_4 DR_t + \mu_t$
M2	$DIV_{t+1} = \alpha_0 + \alpha_1 NI_t + \alpha_2 SIZE_t + \alpha_3 BVMV_t + \alpha_4 DR_t + \mu_t$

Marks:

DIV – dividend ratio/dividend yield (dividend per share compared to market share price),

CI – comprehensive income (standardized by total capital),

NI – net income (standardized by total capital),

SIZE – firm size (natural logarithm of total assets),

BVMV – book to market value ratio,

DR – debt to equity ratio

Considering that the financial effectiveness of a company is determined by its profitability, both the comprehensive income and net income values were adjusted for companies' total capital to separate them from the influence of business volumes (Bratten et al., 2016). As a result, we got two rates of return on capital (RoC), calculated as CI and NI in relation to average total capital. On the basis of other studies, which are connected with the usefulness or predictive power of comprehensive income (Kanagaretnam et al., 2009; Dhaliwal et al., 1999; Liu and Thomas, 2000; Louis, 2003; Biddle and Choi, 2006; Choi and Zang, 2006; Hirst and Hopkins, 2007; Chambers et al., 2007; Barton et al., 2010; Goncharov and Hodgson, 2011), the following information on companies was selected as control variables:

1) SIZE – firm size represented by the natural logarithm of company's total assets,

2) BVMV – book to market value ratio related to Tobin's Q ratio,

3) DR – debt to equity ratio showing the relationship between total liabilities and total assets.

Variability of comprehensive income and other comprehensive income. While assessing the role and importance of comprehensive income in dividend policy, we must stress the shaping of other comprehensive income (understood as a difference between comprehensive income and net income) in the analysed companies. The detailed analysis of financial statements of examined manufacturing companies indicated that not all entities decided to show the components of other comprehensive income. Such a neutral strategy of comprehensive income reporting was noted in 456 observations, which makes 58,9 %. Therefore, the other comprehensive income value different from zero was noted only in 318 cases (see Table 5).

Table 5

Character of spread between comprehensive income and net income in the period 2009–2017

Years	Comprehensive income > Net income		Comprehensive income < Net income		Comprehensive income = Net income	
	Number of observations	Percentage	Number of observations	Percentage	Number of observations	Percentage
2009	16	18,6	6	7,0	64	74,4
2010	15	17,5	13	15,1	58	67,4
2011	9	10,5	14	16,3	63	73,2
2012	18	20,9	9	10,5	59	68,6
2013	21	24,4	22	25,6	43	50,0
2014	14	16,3	26	30,2	46	53,5
2015	27	31,4	16	18,6	43	50,0
2016	20	23,2	25	29,1	41	47,7
2017	17	19,8	30	34,9	39	45,3
Total	157	20,3	161	20,8	456	58,9

Source: own study

On the basis of statistical analysis of comprehensive income value it must be stated that generally, in the analysed period 2009–2017 the level of comprehensive income is significantly varied and ranges from -6,02 to 101,00 million PLN, with the median of 0,03 and mean of 0,13 million PLN. This variability is also demonstrated by the interquartile range or standard and the quarter deviations, amounting to 0,06, 3,82 and 0,03 million PLN, respectively (see Table 6).

Table 6

Selected statistics on comprehensive income, net income and other comprehensive income (in million PLN)

Statistics	Comprehensive income	Net income	Other comprehensive income
Mean	0,125	0,125	0,143
Median	0,033	0,035	0,000
Minimum	-6,021	-7,656	-2,652
Maximum	101,000	101,000	101,000
First quartile	0,006	0,007	0,000
Third quartile	0,067	0,067	0,000
Standard deviation	3,817	3,820	3,796
Quartile deviation	0,030	0,030	0,000

Source: own calculations

As it can be seen, in manufacturing companies there is not stronger differentiation in comprehensive income in comparison to net income as evidenced by the statistical measures, which were calculated for other comprehensive income. Although the level of this category ranges from -2,65 to 101,00 million PLN, with the mean of 0,14 million PLN, but the median as well as the first and third quartile is zero.

Relationships between comprehensive income and dividend. The empirical results of our two regression models were preceded by the analysis of key descriptive statistics of variables and the results of correlations between the firm performances and future dividend ratios. Table 7 presents the descriptive statistics of the main and control variables. Although the dividend per share compared to market share price, on average, amounts only 2,07, it does not mean that these all companies have practiced the similar dividend policy. The median of this variable is 0 and ranges from 0 to 115,90. One can definitely observe a very diversified dividend policy. This character of volatility follows from the fact that the standard deviation of DIV ratio is 5,81.

The amount of CI ranges from -7,66 to 1,51, but in comparison to net income, it does not mean that this category has a significantly higher volatility during the analysed period. It follows from the fact that both the mean and median of OCI are zero, additionally the standard deviation of this variable is only 0,14.

Table 7

Descriptive statistics

Statistics	DIV	NI	CI	OCI	SIZE	BVMV	DR
Mean	2,067	-0,018	-0,017	0,000	12,250	1,310	0,469
Median	0,000	0,033	0,035	0,000	12,205	0,990	0,404
Maximum	115,900	1,514	1,514	2,421	15,562	14,286	5,615
Minimum	0,000	-6,021	-7,656	-2,652	7,355	0,063	0,005
Standard deviation	5,444	0,422	0,445	0,141	1,136	1,172	0,412

Source: own calculations

Regarding control variables, the SIZE ratio, on average, is about 12,25, with a median of 12,20, and it varies from 7,36 to 15,56. The mean of book to market value ratio is about 1,31, with the minimum value of 0.06 and maximum value of 14,29. All manufacturing companies used debt in the analysed period. The average of DR ratio is 0,47, while the median is slightly lower.

The conducted empirical research showed that the manufacturing companies were characterized by a diversity of dependencies between CI or NI and DIV in the period t+1 (see Table 8). Nevertheless, it must be stressed that the Pearson's correlation coefficients confirm a positive character of dependence between the analysed variables, but it is of very low strength. On the basis of presented findings, it can be observed that the value of correlation coefficient between DIV(t+1) and CI is only of 0,09 and between DIV(t+1) and NI is of 0,10. In spite of the fact that we observed statistically significant measures at the 5 % level, but these results proved no relation between these categories².

Table 8

Correlation matrix

Variables	DIV(t+1)	CI	NI	SIZE	BVMV	DR
DIV(t+1)	1,000					
CI	0,091**	1,000				
NI	0,099***	0,916***	1,000			
SIZE	0,085**	0,213***	0,205***	1,000		
BVMV	-0,101***	-0,181***	-0,207***	-0,032	1,000	
DR	-0,104***	-0,280***	-0,301***	0,197***	0,035	1,000

*, ** and *** represent statistical significance at the 0,1, 0,05, and 0,01 levels.

Source: own calculations

Additionally, the conducted empirical research shows that the manufacturing companies are characterized by a diversity of correlation between another key firm performances. It must be stressed that the statistically significant correlation coefficients confirm a positive character of dependence between CI and SIZE. On the other hand, it can observe a negative but statistically significant correlation between this ratio and debt to equity ratio (DR) or book to market value ratio (BVMV). Particularly noteworthy is a positive and statistically significant value of the Pearson's correlation coefficient, which suggest a very strong dependence between CI and NI, but it is connected to the fact that NI is included in CI.

² The strength of dependence between analysed variables was determined at the following assumptions:

- if coefficient is below 0,2 – there is no relation between analysed variables,
- if it falls within the range (0,2–0,4) – the dependence is clear but low
- if it falls within the range (0,4–0,7) – the dependence is moderate,
- if it falls within the range (0,7–0,9) – the dependence is significant,
- it is above 0,9 – the dependence is very strong,

Compare: S. Ostasiewicz, Z. Rusnak, U. Siedlecka (2003), *Statystyka. Elementy teorii i zadania*, Wydawnictwo Akademii Ekonomicznej im. Oskara Langego we Wrocławiu, Wrocław, p. 311

Results of Panel Least Squares regression

Specification	Coefficient	t-Statistic	Prob. (t-Statistic)	Adjusted R-squared	F-Statistic	Prob. (F-Statistic)
M1 – dependent variable DIV_{t+1}						
Intercept	-2,549	-0,999	0,318	0,317	50,672	0,000
CI	0,307	0,467	0,641			
SIZE	0,510**	2,399	0,017			
BVMV	-0,429**	-2,249	0,025			
DR	-2,126***	-2,696	0,007			
M2 – dependent variable DIV_{t+1}						
Intercept	-2,494	-0,980	0,328	0,319	50,986	0,000
NI	0,427	0,583	0,560			
SIZE	0,504**	2,368	0,018			
BVMV	-0,422**	-2,199	0,028			
DR	-2,084***	-2,622	0,009			

*, ** and *** represent statistical significance at the 0.1, 0.05, and 0.01 levels.

Source: own calculations

The assessment of two regression models are presented in Table 9. On the basis of these results we observed a positive but statistically insignificant relationship between CI (or NI) and DIV in the period $t+1$. We didn't notice an advantage of CI over NI. Additionally, three following facts deserve our attention:

- 1) a positive and statistically significant impact of SIZE on DIV in the next period,
- 2) a negative and statistically significant influence of BVMV on DIV in the period $t+1$,
- 3) a negative and also statistically significant relationship between DR and the future DIV.

Conclusion. The conducted empirical research, which aim was to confirm the hypothesis on the existence of positive relationship between the comprehensive income and dividend policy in Polish listed companies, allows us to state that the analysed relationships were quite positive but very low. The analysis of correlation coefficients indicated a positive character of dependence between comprehensive income and future dividend. Although the calculated correlation coefficients were statistically significant, they were at a very low level. Admittedly, the impact of comprehensive income on future dividend ratio was positive, but in these cases we noted no statistical significance. It must be indicated that the presented assessment of dependence between comprehensive income and future dividend ratios did not support our research hypothesis. Additionally, on the basis of the examined period it can be supposed that both comprehensive income and net income do not determine the dividend policy, which is expressed in value of future dividends.

In summary, it should be pointed out that the presented results of the empirical research can only serve as a basis for a more comprehensive study on the long-term changes in dividend strategies based on the accounting firm performances or their impact on the market value of companies listed on the stock exchange. In the future, the thorough analysis of the relationship between the fluctuation of comprehensive income and dividend policy, e.g. in all Polish stock companies from all sectors, may have an important significance for the usefulness of comprehensive income reporting in Poland.

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Стаття надійшла до редакції 20.09.2019.