
An Analysis of External Cash Flows of Capital Groups*

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Abstract:

Purpose: The aim of the article is to analyze the external cash flows of capital groups. Cash flows have a double dimension, internal and external. Internal cash flows are of exclusive nature as they create private benefits as a result of achieving additional cash flows through commercial and civil law transactions between the parent entity and its subsidiaries or associates. External cash flows are part of financial reporting as they originate from economic events that are reflected in the accounting records, and when synthesized are reflected in the cash flow statement.

Design/Methodology/Approach: The article is based on two types of ratios, ratios calculated on the basis of the consolidated financial statements of the capital group and ratios calculated on the basis of separate financial statements of the parent company. The hypothesis put forward in the article is that the assessment of cash flows performed on the basis of a consolidated statement of the capital group differs from the assessment of cash flows of the parent company. Sufficiency and cash productivity ratios were used to assess cash flows of the Polish capital groups. The indicators are to enable the assessment of cash flows of the capital group in the context of the financial standing of the parent companies and other members of the capital group, mainly with respect to the financial liquidity and solvency of the entity.

Findings: The lack of correlation between the indicators from the parent company and the capital group indicates that the main motive for merging into capital groups is not the improvement of external financial results presented by cash financial indicators.

Practical Implications: The research results indicate that financial results are not the motive for combining enterprises into capital groups.

Originality/Value: The article examines the external cash flows (cash effects) of capital groups on the basis of consolidated and separate financial statements, assesses the cash efficiency and effectiveness of Polish capital groups.

Keywords: External Cash Flows, Cash Productivity of Sales (CPS), Cash Productivity of Assets (CPA), Cash Productivity of Operating Profit (CPOP).

JEL codes: G12, G310.

Paper type: Research article.

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1. Introduction

There are two types of cash flows in business entities operating in capital groups, i.e., internal and external cash flows. Internal cash flows are exclusive cash flows that create private benefits and are the result of achieving additional cash flows through commercial and civil law transactions between the parent entity and its subsidiaries or associates. External flows are part of financial reporting as they originate from economic events that are reflected in the accounting records, and when synthesized are reflected in the cash flow statement. This article aims to analyze external cash flows of capital groups in the years 2009-2018 on the example of Polish business entities listed on the Warsaw Stock Exchange in Poland. The analysis of internal cash flows is more difficult and is a different type of a research problem that was presented in the Author's previous studies (Mioduchowska-Jaroszewicz, 2013).

In order to verify the research hypothesis in question and to achieve the aim of the article, the following research stages were completed:²

- Literature studies.
- Collecting consolidated and separate annual reports from companies for the period of 2009-2018.
- Selecting the indicators and performing calculations for the studied group of companies.
- Determining the correlation between the indicators of cash sufficiency and productivity computed based on consolidated and separate financial statements.
- Conclusions.

2. Literature Review

A literature analysis shows that cash flow is a very important tool used to assess the performance of companies, their financial situation, the risk of bankruptcy and the possibility of development or dividend payment. Cash buffer is necessary for companies to finance their running costs and investment expenditure, and it is should be reinforced due to the uncertainty about future incomes and expenditures or future price levels (Skoczylas, 2013). The problem with the appropriate cash level occurs along with the changes in the macroeconomic and microeconomic environment. In times of crisis, financial institutions limit the access to loans, which may translate into payment bottlenecks (Karniewska-Mazur, 2012). Therefore, it is often stressed that profitability should be the focus of attention when liquidity is provided and the company is able to function freely (Skoczylas, 2013).

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Chang, Dasgupta, Wog, and Yao (2014) showed that more financially constrained firms allocate more transitory cash flow to cash savings and direct less toward investment than do less constrained firms, consistent with constrained firms accumulating liquidity to buffer against future financial constraints. Firms allocate a substantial part of an additional dollar of transitory cash flow to reduce external financing, suggesting that the “deleveraging” incentive is strong when profitability improves. Very little is paid out as dividends. A very robust pattern is that the financially more constrained firms invest less, accumulate more in cash holdings, and substitute more equity capital than do the financially less constrained firms. This result is consistent with the idea that financially more constrained firms expect to face tighter financial constraints in the future, thereby saving more cash out of additional cash flow for precautionary motives and enhancing the ability to raise external capital in the future.

There have been unsuccessful attempts to determine the association between dividend changes and cash flows (Fama and Babiak, 1968; Hagerman and Huefner, 1980; Crum *et al.*, 1988; Simons, 1994; Charitou and Vafeas, 1998). However, it does not conclusively hinder the ability of cash flows to explain dividend changes as they define cash flow as income plus depreciation. This measure is considered rather to be a complement to profitability and not liquidity (Largay and Stickney, 1980; Gombola and Ketz, 1983; Bowen *et al.*, 1986; Charitou and Vafeas, 1998). Simons (1994), Crum *et al.* (1988), and Charitou and Vafeas (1998) analysed the dividend changes–cash flow relationship with different cash flow measures. Crum *et al.* (1988) stated that the most crucial signs of dividend changes are prior year dividends, current net income plus depreciation and working capital from operations. Simons (1994) studied the dividend–cash flow relationship based on the companies with weak relationship between dividend changes and cash flow, but none of the three liquidity measures had an association with changes in dividend, given earnings, and he concluded that the relationship between dividend changes and cash flow remains elusive.

British researchers have also supported cash flow reporting since it limits arbitrary allocation of funds and, therefore, is useful to users of financial statements for estimating future dividend flows (Lawson and Stark, 1975; 1981). Lawson and Moeller (1996) question the opinion that historical cost retained earnings constitute internally generated finance and stated that periodic changes in earnings may not necessarily be accompanied by an equal liquidity change. Although Lawson (1996) proved that dividend policies are based on accrual earnings, he suggested that such policies are not consistent with an *ex ante* shareholder value creation (SVC) model because organizations should invest in projects with positive net present values (NPV) and consider firm liquidity to maximize firm value.

Olatundun (2003) has argued that the accrual component of earnings measure firm performance less reliably than the cash flow component. They argued that accruals are subject to manipulations by managers and that cash flows are a better measure of

liquidity. He studied was carried out by analysing the dividend changes cash flow relationship on a sample of 63 quoted firms in Nigeria over a wider testing period from 1984 to 1997. In addition to using a wider testing period than previous studies and more refined cash flow measures than previous studies, dummy variables were also introduced to capture economic policy changes in the economy.

Mohamed, Amel and Bouri (2013) present a literature review and classification scheme for investment cash flow sensitivity under behavioral corporate finance (hereafter, BCF). The former consists of all published articles between 2000 and 2011 in different journals that are appropriate outlets for BCF research. The articles are classified and results of these are presented and analyzed. The classification of articles was based on nine criteria; journals, date of publication, paper nature, the context of the study adopted behavioral biases, adopted approach, behavioral biases measurement, the adopted assumption, econometric approach, and empirical findings. Literature on investment cash flow sensitivity under behavioral corporate finance isn't well developed. In fact, the behavioral corporate finance is very young. Our review shows that behavioral biases (optimism and overconfidence) have an explanatory power and they can succeed in explaining the dependence of corporate investment on the internal cash flow availability. This result is protected in most cases by some restrictive assumptions: the absence of agency costs and asymmetric information. Based on the review, suggestions for future research are likewise provided.

Derouiche, Hassan, and Amdouni (2018) study investigates the effect of ownership structure on the use of cash flow in financing corporate investments the investment cash flow sensitivity in a concentrated ownership context. Using a sample of 6797 French listed firms from 2000 to 2013, results show that investment cash flow sensitivity decreases with the cash flow rights of the controlling shareholder and increases with the separation of its cash-flow and control rights (excess control rights). Firms are, thus, less likely to use cash flow in investments when the interests of controlling shareholders are aligned with those of minority shareholders. However, they appear to use considerable internal funds for their investments when they have severe agency problems, driven by excess control rights of the controlling shareholders.

The research conducted by Sikacz (2011) on the financial statements of subsidiaries separated according to specific criteria in the capital group in the years 2004-2006 allowed to verify the research hypothesis that the members of the capital group achieve different financial results and have different financial situation depending on the function of the group member, because subsidiaries and associates achieve better financial results in terms of financial liquidity, asset productivity, management performance and debt level. The above review of the selected literature sources indicates that there is a need to analyze cash flows of economic entities, and furthermore, in the current situation when there are many associated entities on the

market, one should pay attention to discrepancies between the financial results of the parent company and the capital group.

3. Methodology

The ratio analysis based on cash flows reflects a different picture of the financial standing of economic entities than that based on the balance sheet and the profit and loss account. This is confirmed by Bowen, Burgstahler, and Daley (1986) who drew the following conclusions from their studies:

- there is almost 100% correlation between the net financial result and cash flows (net profit plus depreciation and amortization);
- the correlation between operating flows (from the financial statements) and the financial result is weak;
- operating cash flows are weakly correlated with the change in working capital.

Austin and Bradbury (1995) drew similar conclusions from their research and confirmed the following hypotheses:

- operating cash flows significantly differ from the net financial result,
- cash flows calculated according to the simplified formula (net profit plus depreciation and amortization and adjusted for changes in working capital) significantly differ from net operating cash flows on the cash flow statement.

Analogous research conducted by Wędzki (2003) for the Polish economy indicates the need to prepare and analyze a cash flow statement since the conclusions drawn from the analysis of cash flows differ significantly from the financial result. In order to verify the research hypothesis, the indicators of cash sufficiency and productivity were used to assess the external cash flows of the capital group and the parent company. The article was based on two types of ratios:

- ratios calculated on the basis of the consolidated financial statements of the capital group;
- ratios calculated on the basis of separate financial statements of the parent company.

The formulas of the ratios are presented in Table 1.

Table 1. *A list of cash flow indicators used to assess external cash flows*

Short-form	Name of the ratio	Formula
Ratios calculated on the basis of the consolidated financial statements of the capital group		
CCSR	Cash Sufficiency Ratio of the capital group	consolidated cash flows from operating activities/total expenditure of the capital group on repayment of liabilities, dividends, investments in intangible assets and tangible fixed assets.
CCPS	Cash Productivity of Sales of the capital group	consolidated cash flows from operating activities /consolidated revenues from sales of goods, products and materials

CCPOP	Cash productivity of Operating Profit of the capital group	consolidated cash flows from operating activities/ consolidated operating profit
CCPA	Cash Productivity of Assets of the capital group	consolidated cash flows from operating activities / average total assets of the capital group
Ratios calculated on the basis of separate financial statements of the parent company		
CSR	Cash Sufficiency Ratio of the parent company	separate cash flows from operating activities/total expenditure on repayment of liabilities, dividends, investments in intangible assets and tangible fixed assets.
CPS	Cash Productivity of Sales of the parent company	separate cash flows from operating activities/revenues from sales of goods, products and materials
CPOP	Cash productivity of Operating Profit of the parent company	separate cash flows from operating activities/operating profit
CPA	Cash Productivity of Assets of the parent company	separate cash flows from operating activities / average total assets

Source: Authors' calculations.

The two groups of indicators divided into the consolidated and separate financial statements are intended to examine the external cash flows generated by the entire capital group and the external cash flows created by the parent company. The greater the difference between the indicators from both groups, the less the parent company is responsible for the liquidity and solvency of the entire capital group, which means that other entities take more responsibility for the financial result.

Cash sufficiency ratios are used to assess the ability of a company to cover the operational needs of the entire group of companies. Cash productivity ratios are designed to assess the cash efficiency of the analyzed cash flows from operating activities in terms of the amount of cash in sales revenue, the amount of operating profit translating into operating cash and the possibilities of financing the assets of the capital group from operating cash. Cash sufficiency ratios are defined as a cash payment capability ratio, showing the payment needs in terms of repayment of expenses and liabilities. Those ratios are used to assess the actual ability of the unit to service debt and pay dividends. The value of this indicator informs of the payment capabilities of the company and is a complement to the assessment of the static liquidity and solvency of the company (Czerwińska-Kajzer, 2018; Kirkham, 2012; Śpiewak, 2014). This indicator is considered to be a comprehensive measure of the ability of the company to cover all major expenditures with revenues from operating activities. The denominator of this ratio consists of the following expenditures (Czerwińska-Kajzer, 2018; Nowak, 2014; Jerzemowska, 2013):

- investment expenditures, including those on the acquisition of property, plant, and equipment (tangible assets) and intangible assets,

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- financial expenses, including debt service (repayment of loans, borrowings, and interests), the redemption of debt securities with interest, finance lease expenses and payment of dividends.

The optimal value of the cash sufficiency ratio is 1 as it allows the company to finance all its current financial and investment expenditures from its operating cash flows in a given year. When the value of the indicator is higher than 1, it means that the company has the cash operating over-liquidity and there is no need to search for additional external funds to cover expenses. However, Śnieżek and Wiatr (2014) indicated that such a value is rare in economic practice, and thus a level of 0.4 is considered satisfactory. If the ratio is below this level, the entity must obtain other sources to cover the cash shortfall, for instance, by increasing debt, contributing to the share capital, issuing or selling tangible or financial assets. It is also possible to cover the deficit from cash surplus from previous periods (Olzacka and Płaczyńska-Gościńskiak, 2003; Jerzemowska, 2013). On a cash basis, the indicators of cash productivity inform of the rate of return on sales, and the assets of a company. It should be stressed that a high value of this group of indicators is positively evaluated. These measures are helpful in assessing the financial flexibility of a given entity, thus giving the opportunity to receive cash in unforeseen situations (Maślanka, 2008).

Hence, these measures examine the ability to generate cash and the ability to create positive cash flows. They are a necessary complement to the analysis of liquidity and profitability of an entity and they provide a different view on analytical areas. (Śnieżek and Wiatr, 2011).

Cash productivity of sales (CPS) is characterized by the so-called quality of revenue generated by the sales of products, goods and materials, namely the level of their realization in cash. In other words, it informs of the amount of cash collected from each accrual unit of sales. The changes in the size of the indicator only show the lack of relationship between the two values being compared.

Hence, the evaluation of percentage fluctuations of sales revenues and changes in accrual income from sales is the only basis for a positive or negative analysis of cash productivity of sales. In fact, the level of this measure is considered sufficient when its value varies from 0.15-0.20. It is crucial that, at a given time, only a portion of generated revenues is transformed into cash (trade credits, contracts with partners, extended payment terms). Furthermore, in a given period, an entity also shows expenses from operating activities, most of them financed by current inflows (Śnieżek and Wiatr, 2011).

Cash productivity of assets (CPA) shows the totality of possibilities of company's assets to generate positive cash flows from net transactions. It answers the question of what amount of cash surplus or deficit from the core operations there is per one unit (one złoty) of assets. In this case as well, a higher value of the indicator is

preferred. In practice, the most satisfactory level of this measure is 0.3-0.35. In a way comparable to ROA, the rate of cash productivity of assets is sensitive to factors, such as the possibility of the company to obtain a positive net cash flows from operating activities, and the value of assets. The lower the level of assets generates cash, the better a situation for an entity is, but only when it has an economic explanation (Śnieżek and Wiatr, 2011).

Cash productivity of operating profit (CPOP) is referred to as a quality indicator of operating profit or as a piece of information on the effectiveness of operating profit. The value of the indicator shows what part of the accrual result, in this case, the operating profit, is a source of cash, or how much greater the operating cash is than the results presented by companies on paper. When the value of the indicator is close to 1 then the accrual financial result is similar to the one generated by the core activity (Maślanka, 2008).

The indicators adopted for the study are the basic ratios used to assess the cash flow statement. The interpretation of the ratios does not change if different sources of analysis and evaluation of the ratios are used, i.e. consolidated financial statements or separate financial statements. To assess financial indicators based on both types of financial statements one should be aware of what is being assessed; if it is a capital group formed from at least two business entities or a single entity.

4. Objectives

This article aims to analyze external cash flows of capital groups in the years 2009-2018 on the example of Polish business entities listed on the Warsaw Stock Exchange in Poland. The study was based on the financial statements of 94 companies in the years 2009-2018. Currently, the Warsaw Stock Exchange lists 460 companies³. Hence, the study focuses on 20% of all the companies listed on the WSE. Among the 460 companies listed on the stock exchange, there are 429 enterprises that can be described as non-financial. The Warsaw Stock Exchange lists 31 companies engaged in finance, 15 banks, 5 insurance companies, 8 companies from the capital market sector and companies providing security and factoring services. This means that the selected research sample shows 22% of all non-financial companies listed on the Warsaw Stock Exchange. Table 2. presents the structure of the companies according to the sectors.

Table 2. The structure of the companies according to sectors

Name of the Industry	% (out of total 94)
Sales and letting of real estate	3
Computers/electronics	4
Non-ferrous mining	8
Food & beverage	9

³As of 13 September 2019.

Clothing manufacturing	10
Building materials	11
Construction	22
Others	33
TOTAL	100

Source: Authors' calculations.

Table 2 shows the structure of the companies according to the sectors. Most of the companies come from the construction sector (22%), followed by the building materials sector with 11%, clothing and food manufacturing sectors with 10% and 9% respectively. Other sectors are scarcely represented.

4.1 Research Hypotheses

H0: The values of the ratios analysed based on the cash flows of the capital group are higher than the values of the cash flow ratios of the parent company.

H1: The values of the total sufficiency ratio of the capital group (CCSR) are higher than the values of the total sufficiency ratio of the parent company (CSR).

H2: The values of the cash productivity of sales of the capital group (CCPS) are higher than the values of the cash productivity of sales of the parent company (CPS).

H3: The values of the cash productivity of assets of the capital group (CCPA) are higher than the values of the cash productivity of assets of the parent company (CPA).

H4: The values of the cash productivity of operating profit of the capital group (CCPOP) are higher than the values of the cash productivity of operating profit of the parent company (CPOP).

5. An Analysis of Cash Sufficiency and Productivity Ratios

5.1 Descriptive Statistics

The first stage of the research aimed to verify the research hypotheses based on the analysis of the indicators of cash sufficiency, cash productivity of sales, assets and operating profit of the capital groups using the consolidated financial statements. The second stage was the calculation of the same ratios on the basis of the data of the parent company only. All the ratios were calculated for 10 annual research periods as the study was carried out based on annual reports.

Finally, the values of the indicators with the same content were compared based on the calculation of two different sources of information and from a different level of gradation. The results obtained from the calculated ratios are presented in Appendix. On the basis of these results the median for the years 2009-2018 was calculated. The results are presented in Table 3.

Table 3. Medians of the cash indicators

Ratio	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CCSR	0.40	0.54	0.36	0.53	0.47	0.30	0.39	0.40	0.54	0.36
CCPS	0.09	0.04	0.03	0.05	0.06	0.05	0.06	0.07	0.05	0.05
CCPA	0.09	0.05	0.04	0.06	0.07	0.06	0.07	0.07	0.05	0.06
CCPOP	1.26	0.79	0.79	1.08	1.00	1.00	1.03	1.13	0.94	0.94
CSR	0.34	0.26	0.22	0.36	0.34	0.35	0.35	0.22	0.33	0.16
CPS	0.07	0.03	0.03	0.03	0.07	0.05	0.06	0.06	0.07	0.02
CPA	0.06	0.03	0.03	0.04	0.05	0.04	0.05	0.03	0.04	0.02
CPOP	0.88	0.67	0.77	0.83	1.11	0.80	1.13	0.81	0.78	0.49

Note: *all results summarized in the table were based on the calculated indicators set out in the Appendix

Source: Authors' calculations.

Table 3 shows the median calculated for all the examined indicators. The medians of cash sufficiency ratios in the capital group and the parent company indicate that there is no cash sufficiency in the analyzed entities, however, cash sufficiency is better in the capital group than in the parent companies. Cash productivity of sales of the capital group (CCPS) was the highest in 2009 as it amounted to 9%, whilst in the parent companies it was only 7%. The highest cash productivity of assets of the capital group (CCPA) was 9%, and in the parent companies it was 6%. The medians of cash productivity of sales and assets deteriorated significantly during the period considered. The median for the cash productivity of operating profit in the capital group was higher than in the parent companies. These values indicate a fairly good quality of operating profit because the medians are close to unity. In the parent company, the situation is worse as regards the quality of the operating profit, as the values are more likely to deviate from unity. The next stage of the study was a statistical analysis of the indicators (the calculations are presented in the Appendix) conducted in a comprehensive way without a division into annual periods (Table 4).

Table 4. Descriptive statistics

Ratio	Obs.	Mean	Median	Std.Dev.	Min.	Max.
CCSR	6485	0.347	0.394	1.508	-14.612	13.084
CCPS	6483	-0.010	0.051	2.847	-78.471	9.819
CCPA	6485	0.069	0.061	0.146	-0.393	2.319
CCPOP	5814	-1.82	0.996	77.004	-2104.5	232.325
CSR	7817	0.133	0.284	40.872	-872	810
CPS	7836	-0.243	0.0468	10.767	-208.64	125.99
CPA	7847	0.1403	0.039	2.088	-1.33	60.32
CPOP	7138	2.3227	0.8424	35.67028	-95.64	821.43

Note: *all results summarized in the table were based on the calculated indicators set out in the Appendix

Source: Authors' calculations.

Based on the results of the analysis of the descriptive statistics presented in Table 4, it can be concluded that the average value of cash sufficiency ratio of the capital group (CCSR) is shaped at the level of 0.35-0.40, which indicates low self-

sufficiency of the examined enterprises. Cash sufficiency level of the parent company (CSR) is even lower, as it ranges from 0.13-0.28. The low value of the indicator indicates a lack of cash self-sufficiency. In the parent companies, the variability of the values is much higher than in the capital groups, because the deviation reaches the level of almost 11. The median of cash productivity of sales of the capital group (CCPS) and the parent company (CPS) is at a similar level of 0.05, which indicates low cash productivity of sales, as only in sales revenues there is 5% of cash. The arithmetic mean of the ratios shows an even worse picture, as it takes negative values. An average cash productivity of assets of the capital group (CCPA) is at 0.06-0.07, whilst the average cash productivity of assets of the parent company (CPA) is twice as high, and the median is at 0.04. The average deviation of this ratio is the lowest when compared to other indicators, which shows the most constant value of this ratio at the level of the capital group (CPA). The level of CCPA is at a similar level as in the USA in the years 1990-2009 (Nguyen et al., 2017). Cash productivity of operating profit of the capital group (CCPOP) and the parent company (CPOP) informs of the effectiveness of obtaining an operating profit. The median of CCPOP and CPOP is highly satisfactory because it is close to unity, i.e. the most beneficial value. Achieving the value close to 1 by the ratios of cash productivity of sales and assets shows a high quality of operating profit in terms of the level of cash in operating profit.

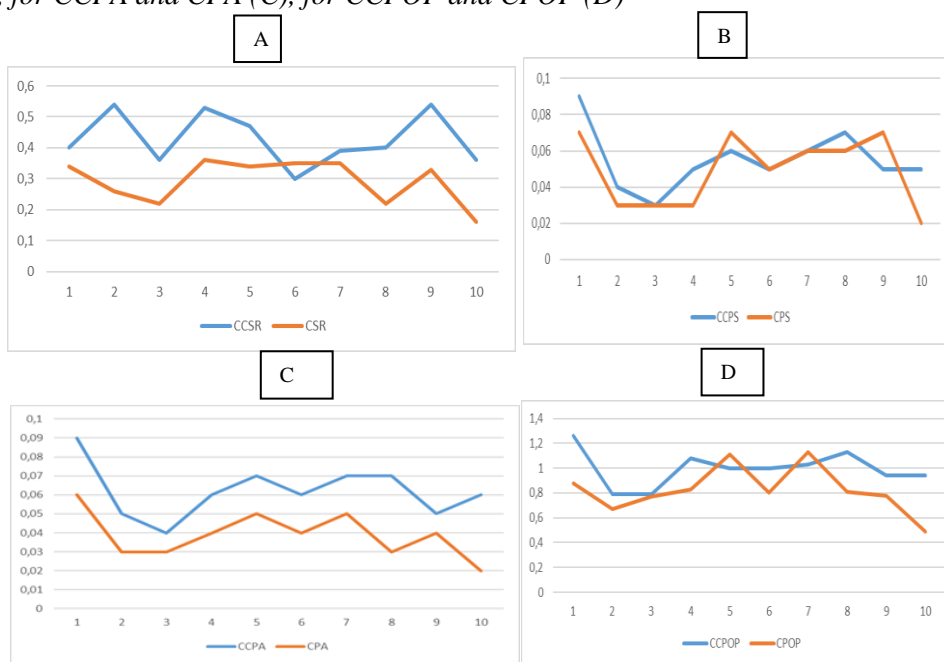
5.2 Relationship between the Studied Variables

The next fundamental part of the study concerns the relationship between the ratios from the capital group and the parent company. The first step in the study of these relationships was to present the medians of the calculated ratios in annual periods (Table 3) on Figure 1. Each line chart presents the medians of indicators divided into the types of the ratios from the capital group and the parent company. The medians of cash sufficiency ratios (CCSR and CSR) and cash productivity of assets (CCPA and CPA) show visible differences between the values in the capital group and the parent company.

The results show that the first (H1) and third (H3) hypothesis can be positively confirmed, as the ratios relating to the capital group are above the ratios of the parent company. A different situation is illustrated by the median chart showing cash productivity of sales (CCPS and CPS) and cash productivity of operating profit (CCPOP and CPOP). The medians of the values of these ratios do not show a clear trend as the lines of these values cross and it cannot be concluded whether the values of the ratios of the capital group are higher than those of the parent company, which means that the second (H2) and fourth (H4) hypothesis cannot be confirmed, and thus it shows that the values of cash productivity of sales of the capital group (CCPS) are not higher than those calculated for the parent company, and that the values of cash productivity of operating profit of the capital group (CCPOP) are not higher than those of the parent company.

The next step was to analyze the correlation with regard to annual periods. The Pearson's correlation coefficient was calculated to assess and confirm the relationship between the indicators of the capital group and the parent company (see Tables 4-5). The correlation analysis uses different measures defined by features (quantitative/qualitative), presentation of statistical data (individual data, correlation tables) and the association or relationship between variables (linear, curvilinear) (Sobczyk, 2006). When the two features are quantitative, and their association is linear, the most widely used measure is the Pearson's product-moment correlation coefficient.

Figure 1. Medians of the cash indicators for CCSR and CSR (A), for CCPS and CPS (B), for CCPA and CPA (C), for CCPOP and CPOP (D)



Source: Authors' elaboration.

Table 4. The results obtained from PPMCC to compare CCSR, CCPS, CCPA, CCPOP and CSR, CPS, CPA and CPOP

Variable x	Variable y	Pearson's correlation coefficient									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CCSR	CSR	0.24	0.20	0.08	0.70	0.75	0.24	-0.02	0.44	0.66	0.48
CCPS	CPS	-0.01	0.37	0.01	0.02	0.08	0.17	0.18	0.14	-0.08	0.07
CCPA	CPA	0.4	0.3	0.07	0.63	0.42	0.61	0.45	0.35	0.37	0.02
CCPOP	CPOP	0.05	-0.28	0.07	0.09	0.23	0.07	-0.12	0.02	0.2	-0.003

Source: Authors' elaboration.

The results of the correlation between the ratios for the years 2019-2018 do not have an unambiguous direction and strength. Very positive strong correlations occur in 2012-2013 between cash sufficiency ratios (CSR/CCSR), and in 2012-2015 for cash productivity of assets (CPA/CCPA). A low or almost no relationship, or even a reverse relationship, occurs when the ratios of cash productivity of sales (CPS/CCPS) and cash productivity of operating profit (CPO/CCPOP) are examined. The analysis of Pearson's correlation in the years 2009-2018 indicates that there is little or no correlation between the ratios used to evaluate the condition of cash in the capital groups (cash sufficiency, cash productivity) and ratios used to measure cash flows in the parent company. Additionally, it is not possible to determine an unambiguous direction of the relationship between the said indicators. A more detailed analysis of the correlation results may suggest that the highest and most frequently occurring relationship is between the indicators of cash sufficiency. In half of the studied years, the relationship between the cash sufficiency of the capital group and the parent company is significant. The least closely related are cash productivity of sales (CPS) and cash productivity of operating profit (CPOP). In seven out of ten years, there is a correlation between the cash productivity ratios of assets in the capital group and the parent company. The analysis of correlation was also presented in a more general manner (i.e. comprehensive, matrix), without considering the annual differences (Table 5).

Table 5. Correlation matrix

	CCSR	CCPS	CCPA	CCPOP	CSR	CPS	CPA	CPOP
CCSR	1	0.359	0.374	0.038	0.012	0.017	0.024	0.021
CCPS	0.359	1	0.995	-0.001	0.002	0.007	0.004	0.002
CCPA	0.374	0.995	1	-0.003	0.001	0.004	0.003	0.003
CCPOP	0.038	-0.001	-0.003	1	0.000	0.115	-0.002	0.006
CSR	0.012	0.002	0.001	0.535	1	0.107	0.675	0.535
CPS	0.017	0.007	0.004	-0.001	0.107	1	0.154	0.115
CPA	0.024	0.004	0.003	-0.002	0.675	0.154	1	0.779
CPOP	0.021	0.002	0.003	0.003	0.535	0.107	-0.002	1

Source: Own study.

Table 5 presents pairwise correlations of variables for our sample of nonfinancial Polish of Capital Groups from 2009-2019. Data is taken from Stock Exchange in Poland. All variables are defined in Table 1. The analysis of correlation results between the variables analysed in a general (comprehensive, matrix) manner, considering the entire research period, reveals other conclusions than those with the division into annual periods. Low correlation occurs between the indicators assessing the quality of operating flows in capital groups, which indicates that, in this case, the selection of indicators was correct, since the areas of assessment represented by these indicators do not overlap. There is one exception which indicates a high correlation between the ratios of cash productivity of sales (CCPS) and cash productivity of assets (CCPA) in a capital group, however, this high correlation for the parent companies is not confirmed. A highly significant correlation exists between the parent company's cash sufficiency (CSR) and the cash

productivity of the operating profit of the capital group (CCPOP) and the parent company's operating profit (CPOP), as well as between the parent company's cash sufficiency and cash productivity of sales (CPS). The results of the correlation do not confirm the significant correlation between the values of indicators in the capital group and the parent company.

The main research hypothesis (H0) was not confirmed since the analysis of the values of the selected cash ratios shows that there is no clear difference and no correlation between the ratios.

6. Conclusions

Capital groups are an example of synergy in business activity. The synergy effect in capital groups should be associated with an increase in the market price and an improvement of values of the traditional financial ratios, but also increased cash capacity of capital groups. For this purpose, an analysis of the ability to generate cash was carried out on the basis of the consolidated and separate financial statements.

The main research hypothesis (H0) that the values of the ratios analysed based on the cash flows of the capital group are higher than the values of the cash flow ratios of the parent company was not confirmed. The rejection of the main research hypothesis (H0) was supported by the negative verification of the detailed research hypotheses (H1-H4), which were not confirmed by the conducted studies. It cannot be unequivocally stated that the values of general cash sufficiency ratios of the capital groups are higher than the values of the parent company. Nor is there a significant correlation throughout the research period between the values of cash productivity of sales of the capital group and those of the parent company.

However, the cash productivity of assets of the capital group is fairly well correlated with the cash productivity of assets of the parent company. There is no correlation between the value of cash productivity of operating profit of the capital group and the value of cash productivity of operating profit of the parent company. The rejection of the hypotheses is also confirmed by Sikacz's (2011) studies, although they covered only the structure and dynamics of assets, revenues and costs, liquidity, turnover, profitability, capital ties between entities in a capital group, the impact of these entities on the financial result of the group and the rights of minority shareholders. The research was carried out for four capital groups in the years 2002-2005, including the assessment of the financial statements of all subsidiaries within the capital groups.

The lack of correlation between the indicators from the parent company and the capital group indicates that the main motive for merging into capital groups is not the improvement of external financial results presented by accrual (Sikacz, 2011) and cash (research in this article) financial indicators. This must be due to some other aspects of activities of affiliated entities. One certain reason, among other

things, is the generation of additional cash flows, i.e. internal cash flows, which increase the value of an entity in a capital group. Initial research on this subject was conducted in the book *Cash Flows in Capital Groups* (Mioduchowska-Jaroszewicz, 2013) and it will certainly be the focus of further research.

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