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THE IMPACT OF CAPITAL DISCLOSURES ON CAPITAL FLOWS IN INTEGRATED REPORTS OF PUBLICLY LISTED COMPANIES: EVIDENCE FROM POLAND

Summary

Purpose | The article aims to clarify the relationship between the number and form of capital disclosures and capital flows in integrated reports of the Polish listed companies. The study covers 45 reports of 23 companies listed on the WSE between 2020 and 2022, filling the research gap on the impact of disclosures on reporting capital flows.

Research method | The study was of a mixed nature. In the qualitative part, the content of the companies' reports was analysed, identifying disclosures of six forms of capital and classifying them in terms of occurrence and then form (quantitative or qualitative). Flows between the different forms of capital were identified through a coding procedure. In the quantitative part, Pearson correlation analysis was used to establish the relationship between the number of disclosures and the form of disclosure and the capital flows.

Results | The results indicate that more capital disclosures are associated with more frequent reporting of capital flows. Quantitative disclosures correlate more strongly with capital flows than qualitative disclosures, indicating their more significant role in reporting.

Originality/value/implications/recommendations | The results indicate that more capital disclosures are associated with more frequent reporting of capital flows. Quantitative disclosures correlate more strongly with capital flows than qualitative disclosures, indicating their more significant role in reporting.

Keywords: integrated reporting, six capitals, number of disclosures, capital flows, listed companies

JEL classification: D24, D89, G39, L29, L32, M42

1. Introduction

The modern business world is characterised by expanding complexity, which increases the demand for detailed information on companies' financial performance, management strategies, and commitment to sustainability [Frias-Aceituno et al., 2012; Lassini et al., 2016; Pistoni et al., 2018]. At the same time, investors are increasingly seeking data on value-creation mechanisms, as traditional financial reporting systems do not fully capture the intangible assets generated by companies [Wyatt, 2008; Cohen et al., 2012]. In addition, the dynamic development of financial markets and corporate transparency regulations have increased the importance of integrated reporting for effective stakeholder communication [Dyczkowska, 2015]. A key element of this process is the disclosure of corporate capital information [Bek-Gaik, Surowiec, 2023], which not only constitutes an essential source of knowledge for stakeholders but also influences investment decisions and the perception of companies on the capital market.

It has been noticed that financial statements, which are the end result of accounting activities and provide information to stakeholders, cannot fully satisfy their growing information needs [Michalczuk, 2016]. The communication process between a company and its stakeholders plays a key role in investor relations. In a narrower sense, these relationships focus on the communication of information required by law [Niedziółka, 2008]. On the other hand, in a broader context, they include not only the exchange of information but also activities of a legal and economic nature that aim to improve communication with capital market participants. Dziawgo [2009] emphasises this broader dimension of investor relations, defining it as a systematic and purposeful set of activities companies undertake to effectively communicate with investors. In recent years, the Polish listed companies, adapting to global trends in corporate reporting, have increasingly implemented the principles of integrated reporting, which is seen as the most comprehensive form of disclosure [Bek-Gaik, Surowiec, 2019]. The introduction of the six capitals model into integrated reporting was a response to stakeholder expectations of increased transparency in corporate reports [Lusher, 2012]. The integrated reporting framework, developed by the International Integrated Reporting Council (IIRC), considers the polymorphism of capital in six forms: financial, manufactured,

intellectual, human, social and relationship, and natural, the disclosures of which are key elements of corporate integrated reports [Sierra-García et al., 2015]. Capital is heterogeneous and can continuously transform and change from one form to another, which is understood as flow in the study.

Despite the growing interest in this topic, there is a lack of detailed analysis in the existing research on the quantitative aspects of disclosures and their impact on capital flows. Most literature focuses on the quality and detail of disclosures, neglecting their number and impact on reporting transparency. The main objective of this paper is to investigate whether the number and form of capital disclosures affect the reporting of capital flows in the integrated reports of the Polish listed companies. The analysis covers reports of 23 companies listed on the Warsaw Stock Exchange from 2020 to 2022. The paper attempts to determine whether organisations that disclose more information on individual capital also report more of their flows and whether the form of disclosure (quantitative or qualitative) affects the extent of capital flow information.

The article poses a research hypothesis that the number and form of capital disclosures in the integrated reports of the Polish listed companies affect the number of the reported capital flows. According to this hypothesis, companies that disclose information on individual capitals more frequently report more flows between these capitals. It is also hypothesised that the manner of disclosure – whether quantitative or qualitative – can affect the number of capital flows reported and how they are presented. The study allows to determine whether there is a relationship between the number of reported capital and the intensity of capital flows, which may have important implications for integrated reporting practice. The study's results may provide new information on the relationship between the number and form of capital disclosures and the reporting of capital flows in the six capital framework. They may also indicate whether a higher number of disclosures promotes greater transparency in reporting capital flows. This may provide an argument for standardising the scope and form of disclosures in corporate reports. In addition to its academic contribution, the study also has practical implications. The findings may be relevant to various stakeholder groups, including investors, regulators, and reporting practitioners, by providing evidence on how the structure and volume of disclosures affect transparency in capital flow reporting. This

knowledge can support better-informed decision-making, contribute to regulatory improvements, and assist companies in enhancing the usefulness of their integrated reports.

2. Capital disclosures in integrated reports – a review of studies

Integrated reporting (IR) plays an important role in companies' communication with stakeholders, combining financial and non-financial information to assess the organisation comprehensively [Piesiewicz and Kufel, 2025]. Research indicates that the decision of companies to implement integrated reporting is dictated by several factors, such as the size of the company, management structure, and level of commitment to corporate social responsibility [Frias-Aceituno et al., 2014]. In particular, large companies operating in a highly regulated environment and subject to stakeholder pressure are more likely to choose to implement integrated reporting [Piesiewicz et al., 2021] and disclose detailed information on individual capitals.

A review of the existing research indicates that financial capital disclosures include an organisation's cash, investments, and other financial resources. Santis and Bianchi [2020] noted that the financial sector emphasises financial capital disclosures, often overlooking different reporting aspects. Similar conclusions were drawn by Novaki et al. [2022], indicating that financial institutions focus on profitability ratios, dividends, and market analysis, marginalising disclosures on other capital. Kannenberg and Schreck [2019] add that the quality of financial reporting affects sustainable capital management strategies. New research by Boujelben, Hadriche, and Fourati [2024] suggests that the quality of integrated reporting positively affects stock market liquidity. However, it does not always translate into a reduction in the cost of capital. Furthermore, Kempf [2023] points out that financial capital disclosures have evolved historically, adapting to changing stakeholder requirements and market regulations. A study by Devarapalli et al. [2024] on the quality of financial capital disclosure in India indicated that while there was an overall improvement in reporting between 2020 and 2021, the individual reporting elements did not change significantly. This suggests the need for further standardisation and increased transparency of disclosures.

Manufactured capital includes fixed assets, infrastructure, and technologies used in the company's operations. On the other hand, Bikbulatova's [2022] research highlights the importance of disclosing the risks associated with manufactured capital and its impact on firm value. Furthermore, Grassmann et al. [2019] stressed the importance of connectivity between the manufactured capital and other capital to enhance reporting transparency. Kannenberg and Schreck [2019] point to the critical role of productive capital in the context of companies' long-term growth strategies. Additionally, research by Ahmed et al. [2023] shows that the organisational complexity of the firm affects the extent of working capital disclosures, especially in European firms using integrated reporting. Akpan et al. [2022] showed that manufactured capital disclosures in Nigeria's manufacturing sector contribute to the value of firms. However, many firms still overlook key aspects of long-term investments in infrastructure and technology.

Human capital disclosures include employee skills, competencies, and experience. Research by Muzira [2020] indicates that some industries focus more on human capital reporting than others, which affects their investment attractiveness. In addition, Anifowose et al. [2020] note that human capital is a key factor in improving the financial performance of companies through long-term investment in employee development. Gibassier et al. [2019] highlight that human capital plays a vital role in the uptake of integrated reporting in emerging markets.

Social and relationship capital refers to the company's interaction with stakeholders, reputation, and contribution to the community. Anifowose et al. [2020] noted that social capital reporting is essential in increasing corporate revenues. Furthermore, research by Grassmann et al. [2021] shows that the quality of social capital reporting significantly reduces information asymmetry between the company and investors. Kannenberg and Schreck [2019] add that social capital is key to building long-term corporate value in an integrated reporting approach.

Natural capital comprises the environmental resources used by a company. Pardo [2023] pointed out the need to standardise natural capital disclosures to avoid using reporting to shape stakeholder views. Additionally, Muzira [2020]

showed that environmentally sensitive sectors significantly differ in the extent of natural capital disclosures, indicating the need for more regulation and standardisation. Grassmann et al. [2019] highlighted that high-quality natural capital reporting increases investor confidence in sustainable companies.

Most studies of capital disclosures in integrated reports focus mainly on disclosures about individual capitals, often overlooking their interrelationships. Meanwhile, according to the IIRC, while capitals may function independently, the flows between them, which reflect their interactions and transformations, are also crucial to the value-creation process in an organisation. Due to several factors, analysing and identifying these linkages poses a significant research challenge. These include the diverse approaches companies use to reporting capital flows, the lack of uniform standards for their presentation, and the difficulties associated with quantifying the relationships between different capitals [Muzira, 2020]. Moreover, these flows are often dynamic and multidimensional, making assessing and measuring them difficult. An additional challenge is that most companies do not directly disclose how individual capitals transform into other capitals, complicating their identification and preventing comparison between organisations. According to Almasan et al. [2019], effective management of capital flows leads to the improved financial performance of the organisation and increased market value. For example, financial capital can be transformed into manufactured capital by investing in modern technology, which affects the firm's operational efficiency. Similarly, intellectual capital can support human capital development through training and competence development of employees. In contrast, research by Kannenberg and Schreck [2019] indicates that organisations that effectively report capital flows can better optimise their use of resources and adapt to changing market conditions. Transparent disclosures in this regard also reduce information asymmetries between the company and investors and enable more informed decision-making by stakeholders. The existence and extent of capital flows indicate how a company transforms resources into long-term stakeholder value. Despite this assumption, research on capital flows is marginal and does not include a quantitative analysis of disclosures, and most available work focuses on a qualitative view of individual capital reporting [Kannenberg and Schreck, 2019; Almasan et al., 2019].

A review of the literature reveals the existence of a cognitive gap related to the focus of research on the quality and content of capital disclosures while neglecting the quantitative dimension of reporting and its impact on how capital flows are disclosed. To date, it has not been established whether the number of capital disclosures affects the extent of the disclosed capital flows – most studies focus on the importance of individual capitals to the company but do not analyse whether the intensity of reporting translates into the quantity of flows. Nor has it been determined whether the manner of disclosure – quantitative or qualitative – affects the reporting of capital flows. Although the literature highlights the differences between descriptive and quantitative data, their impact on reporting these flows' transparency remains incompletely explained. Additionally, the Polish listed companies have not been included in the research to date, so the analysis of integrated reporting in the context of the Polish capital market and non-financial reporting regulations is still insufficiently recognised.

3. Research methods and tools

In the first stage of the study, a qualitative analysis of integrated reports was carried out to identify the disclosures of the six capitals and their form, followed by the identification of capital flows in the studied reports of listed companies on the WSE. The analysis covered 45 integrated reports published by 23 companies listed on the Warsaw Stock Exchange (WSE) across three reporting years: 2020, 2021, and 2022. The companies came from various industry sectors, including construction, mechanical engineering, mining, chemicals, metallurgy, energy, telecommunications, finance, insurance, retail, transportation, and digital services. They represented different segments of the WSE, including large-cap and mid-cap issuers.

The number of the analysed reports per company ranged from one to three, depending on whether a given company published an integrated report in all three years. For example, Budimex, Grupa Azoty, and KGHM submitted reports for each year, while others, such as LPP or BNP Paribas Bank Polska, were included based on the availability of a single report. A detailed list of companies, sectors, and years of reporting is presented in Table 1.

TABLE 1.

Research sample details

Company	Industry	Reporting Years
BUDIMEX S.A.	General construction	2020, 2021, 2022
ERBUD S.A.	Industrial construction	2020
FAMUR S.A.	Mechanical equipment	2020
GRENEVIA S.A.	Mechanical equipment	2021, 2022
GRUPA AZOTY S.A.	Basic chemicals	2020, 2021, 2022
GRUPA KĘTY S.A.	Non-ferrous metallurgy	2022
GRUPA LOTOS S.A.	Extraction and production	2020
KGHM POLSKA MIEDŹ S.A.	Metal mining	2020, 2021, 2022
LPP S.A.	Apparel and footwear	2020/2021
LUBELSKI WĘGIEL BOGDANKA S.A.	Coal mining	2020, 2021
ORANGE POLSKA S.A.	Telecommunications	2020, 2021, 2022
PGE POLSKA GRUPA ENERGETYCZNA S.A.	Energy	2021, 2022
PKP S.A.	Transport	2022
POLSKI KONCERN NAFTOWY ORLEN S.A.	Extraction and production	2020, 2021, 2022
POZNAŃSKA KORPORACJA BUDOWLANA PEKABEX S.A.	Building materials	2020, 2021, 2022
TAURON POLSKA ENERGIA S.A.	Energy	2022
TIM S.A.	Electrical equipment	2020, 2021, 2022
BNP PARIBAS BANK POLSKA S.A.	Commercial banking	2022
ING BANK ŚLĄSKI S.A.	Commercial banking	2022
GIEŁDA PAPIERÓW WARTOŚCIOWYCH W WARSZAWIE S.A.	Stock exchanges and brokerage	2021, 2022
MBANK S.A.	Commercial banking	2020, 2021
POWSZECHNY ZAKŁAD UBEZPIECZEŃ S.A.	Insurance companies	2020, 2021, 2022
WIRTUALNA POLSKA HOLDING S.A.	Online media	2022

Source: the author's own elaboration.

This variation in the number of reports per company was methodologically accounted for by treating each report as an independent unit of analysis. The results and correlations were therefore based on the characteristics of individual reports rather than on aggregated company-level data, ensuring analytical consistency and avoiding bias from overrepresentation. 62 integrated reports prepared by 26 companies were published in the studied period, but only those published in PDF format were included in the analysis. This choice was dictated by the need for transparency and a consistent data structure, which allowed for uniform interpretation. Although online-only reports are becoming more common, they were not included in this study. Their content tends to be scattered, with inconsistent formatting and navigation structures, which makes reliable comparisons difficult. Choosing PDF reports helped to maintain consistency and clarity across the sample. However, this approach may have excluded certain valuable elements available in more interactive digital formats – such as expandable sections, hyperlinks, or embedded data tables. Given the growing shift toward HTML-based reporting, future research should explore how such digital formats affect the way information is presented and understood. This exploratory stage formed the basis for further quantitative verification of the hypotheses.

The qualitative analysis process consisted of several key steps. Firstly, the content of the integrated reports was reviewed in detail, focusing on identifying disclosures relating to six capitals, in line with IIRC guidelines, i.e., financial, manufactured, intellectual, human, social and relationship, and natural capitals. For each report, all relevant fragments were marked and counted to establish the number of disclosures for each capital.

In the second stage, each identified fragment was categorised according to its form – quantitative (e.g., metrics, indicators, financial figures) or qualitative (e.g., narrative descriptions, strategic intentions). This classification made it possible to assess how the form of disclosure might influence the visibility and measurability of capital flows. In total, 2 225 quantitative and 1 316 qualitative disclosures were identified across the analysed reports.

The next step was to code the capital flows present in the reports. These flows were defined as all relationships and interactions between capitals whereby

a capital influenced another in the process of the company's operations. For example, the conversion of financial capital to the manufactured capital could be identified through information on investments in infrastructure, while the flow of intellectual capital to human capital could be captured through the description of training programs and knowledge transfer within the organisation. The identification of capital flows was based on analysing the content of the reports and assigning them to the relevant disclosure categories. Each identified flow was codified and described in terms of its nature. In total, 485 instances of capital flows were identified and classified according to the direction and type of interaction between capitals (e.g, financial → manufactured, intellectual → human). Atlas.ti software was used to analyse the content of the reports, which enabled the systematic coding of data and assigning relevant categories to capital disclosures and their interrelationships. This tool allowed the research material to be structured and helped in better understanding of the presentation of capitals and their interactions in the integrated reports. By using this method, it was possible to capture more precisely the relationship between disclosures and capital flows, which increased the validity and reliability of the performed analysis.

The qualitative stage formed the basis for further quantitative analysis, providing key information on the frequency of each capital and the nature of its flows. The data structure enabled statistical verification of the research hypotheses, focusing on the links between the number of capital disclosures and the extent of capital flow reporting. Accordingly, this article hypothesises that organisations that disclose more information about individual capitals are simultaneously more likely to report flows between them. This assumption became the basis for the formulation of hypothesis H1.

H1: There is a relationship between the number of capital disclosures and the number of capital flows in the integrated reports of the Polish listed companies.

The second examined relationship, which has also not yet been addressed in the literature, concerns the impact of the form of disclosure on the number of capital flows in the integrated reports of the Polish listed companies. According to the theory of integrated reporting, organisations presenting information in numerical and descriptive forms provide a more comprehensive and complete picture of their activities. In view of the above, hypothesis H2 was formulated:

H2: There is a relationship between the form of capital disclosure and capital flows in the integrated reports of the Polish listed companies.

In order to empirically verify hypothesis H2, it was decomposed into two sub-hypotheses:

H2a: There is a relationship between the quantitative form of capital disclosures and the number of capital flows in the integrated reports of the Polish listed companies.

H2b: There is a relationship between the qualitative form of capital disclosures and the number of capital flows in the integrated reports of the Polish listed companies.

Pearson correlation was used to assess the relationship between the variables. This is a commonly used statistical method to assess the strength and direction of a linear relationship between two quantitative variables [Peternek and Kosny, 2011]. A Pearson correlation coefficient value of $r = 1$ indicates a perfect positive correlation, while $r = 0$ indicates no linear relationship between variables [Mukaka, 2012]. This measure is particularly useful for identifying linear relationships between variables, which is necessary when analysing quantitative data with a normal distribution [Schober et al., 2018]. A test of the statistical significance of this coefficient was also performed. In the Pearson correlation coefficient significance test, the null hypothesis (H_0) assumes the absence of correlation ($r = 0$), while the alternative hypothesis (H_1) assumes the existence of correlation ($r \neq 0$). Hypothesis verification is based on the critical values for Student's t -distribution, converted into a p -value.

4. Research findings and conclusions

To empirically verify the set hypotheses, a statistical analysis was conducted, the results of which allowed for the assessment of the relationship between the number and form of capital disclosures and the reported capital flows in the integrated reports of the Polish listed companies. Firstly, hypothesis H1 concerning the impact of the number of capital disclosures on the extent of disclosed capital flows was assessed. A Pearson correlation analysis was conducted between the number of capital disclosures and the number of reported capital flows to verify it. The results show a strong positive correlation

between the number of capital disclosures and the number of capital flows, confirming the statistical significance of this relationship. Pearson's correlation coefficient was 0.83997739, and the result of the Student's t -test $t(43) = 10.1509$ at $p \leq 0.00001$, which allows for the rejection of the null hypothesis and confirms the existence of a relationship. These results suggest that companies that disclose more information on six capitals are also more likely to report capital flows, indicating greater transparency in their reporting.

Another analysed relationship relates to hypothesis H2, which assumes that there is a relationship between the form of capital disclosure and capital flows in the integrated reports of the Polish listed companies. According to the theory of integrated reporting, organisations that present information in both numerical and descriptive form, offer a more comprehensive and complete picture of their activities. Two variables were used to test hypothesis H2: the number of quantitative disclosures and the number of qualitative disclosures correlated to the number of capital flows. To further investigate this relationship, hypothesis H2 was split into two more sub-hypotheses H2a and H2b. Hypothesis H2a assumes the existence of a relationship between the quantitative form of capital disclosures and the number of capital flows in the integrated reports of the Polish listed companies. The correlation analysis showed a Pearson's correlation coefficient value of 0.80829147, indicating a strong positive relationship between the number of quantitative capital disclosures and the number of capital flows in the integrated reports. The result of the statistical test $t(43) = 9.00217$, with a p -value of less than 0.00001, allows us to reject the null hypothesis and confirm the statistical significance of this correlation. These results suggest that a higher number of quantitative capital disclosures is correlated with an increase in the number of capital flows disclosed in the integrated reports.

The second detailed hypothesis, H2b, which also resulted from the decomposition of hypothesis H2, assumes that there is a relationship between the number of qualitative disclosures and the number of capital flows in the integrated reports of the Polish listed companies. The correlation analysis showed the value of the Pearson correlation coefficient equal to 0.65617708, which means a moderate positive correlation between qualitative capital disclosures and the number of capital flows in the integrated reports. This means that an

increase in the number of qualitative disclosures is associated with an increase in the number of capital flow disclosures. In this analysis, the null hypothesis assumed no correlation between the studied variables ($r = 0$). The result of the statistical test $t(43) = 5.7021$, with a two-sided critical area $p \leq 0.00001$, allows for the rejection of the null hypothesis, which indicates the statistical significance of this correlation. These results suggest that organisations more likely to make qualitative disclosures are also more likely to report capital flows in their integrated reports. As a result, hypothesis H2b was confirmed, which indicates the importance of qualitative disclosures in the context of the overall picture of capital flows in the integrated reports.

To confirm the obtained results from a statistical perspective, the additional (robustness) analysis was conducted. Firstly, the normality of the used variables was verified, according to the assumptions of the Pearson correlation coefficient. The p-values of the normality test are presented in Table 2.

TABLE 2

Verification of the normality of used variables

Variable	p-value	Decision at 1%	Decision at 5%
Number of capital flows	0.1499	not rejection (normality)	not rejection (normality)
Number of capital disclosures	0.0204	not rejection (normality)	rejection (non-normality)
Number of quantitative disclosures	0.0186	not rejection (normality)	rejection (non-normality)
Number of qualitative disclosures	0.0140	not rejection (normality)	rejection (non-normality)

Source: the author's own elaboration.

The results of the normality verification suggest that the number of capital flows (used in all three Pearson's coefficient calculations) has the properties of a normal distribution. The remaining variables (number of capital disclosures, qualitative and quantitative disclosures) have a normal distribution according to a 1% level of significance. At a 5% level of significance, the null hypothesis needs to be rejected, which means a lack of normality. This inconclusive situ-

ation encouraged the use of the Spearman correlation coefficient (which does not have the normal distribution assumptions). The correlation between the number of capital flows and the number of capital disclosures, as measured by the Spearman coefficient, is 0.8225 and is statistically significant. The same conclusions were obtained for the correlation between the number of capital flows and the number of quantitative disclosures (0.7870) and the number of qualitative disclosures (0.5171). The results of the robustness analysis confirmed the findings of the primary research.

5. Conclusions

Integrated reporting is becoming an increasingly key tool in enterprise communication with stakeholders, and its role in shaping the transparency of financial and non-financial information is still growing. This study proved that how companies disclose capital significantly impacts the scope of reporting on their interconnections.

Empirical analysis has shown that the number of capital disclosures is strongly related to the number of the reported flows, which suggests that companies reporting capital more broadly also care for a better presentation of their mutual relations. Additionally, it has been shown that the form of disclosures also matters – reports containing quantitative data are more likely to include detailed information on capital flows. In contrast, qualitative disclosures do not correlate equally strongly with the transparency of reporting these relationships.

The study results indicate that in the practice of integrated reporting, there is the potential to standardise the approach further to disclosing capital and its flows. Standardising the methods of presenting this information could increase its comparability and facilitate the assessment of the value created by enterprises in the long term. The obtained results may constitute a significant contribution both to further academic research and to the practice of corporate reporting. On the one hand, they indicate the importance of the number and form of disclosures for the transparency of reports; on the other hand, they suggest that further research could also cover different aspects of integrated

reporting, such as the impact of reporting standards on the quality of disclosures or the relationship between reporting transparency and the financial results of enterprises.

This study highlights the key role of precise and numerical disclosures in building a reliable and comprehensive picture of enterprise activities as part of the integrated reporting. As the importance of this approach increases, it becomes necessary to improve the reporting methods further so that stakeholders have access to more detailed and transparent information about the organisation's functioning. Furthermore, the findings should be interpreted in the context of Poland as an emerging market economy, where the maturity of capital markets and institutional frameworks may shape disclosure practices and their effects. It is therefore possible that the results could differ in countries with more or less advanced market structures. This opens an interesting avenue for future comparative research on integrated reporting and capital flows across various economic and regulatory environments.

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