SILESIAN UNIVERSITY OF TECHNOLOGY PUBLISHING HOUSE

SCIENTIFIC PAPERS OF SILESIAN UNIVERSITY OF TECHNOLOGY 2024
ORGANIZATION AND MANAGEMENT SERIES NO. 210

ISSUES OF HUMAN CAPITAL ANALYSIS AND ASSESSMENT ON THE EXAMPLE OF REPORTS PUBLISHED BY LISTED COMPANIES

Tomasz L. NAWROCKI

Silesian University of Technology, Faculty of Organization and Management, Department of Economics and Information Science; Tomasz.Nawrocki@polsl.pl, ORCID: 0000-0002-2120-3494

Purpose: The aim of this article is to examine the information capacity (information policy) of publicly available reports published by enterprises from the point of view of various approaches to assessment of human capital, as well as its deeper analysis.
Design/methodology/approach: The listed companies' information policy assessment in the field of human capital carried out on the basis of annual reports and broadly understood ESG or CSR reports, published by 140 companies listed on the Warsaw Stock Exchange. In detail the research consisted in analysing the content and quality of the information presented in the reports in terms of the application of the criteria for assessing human capital by answering the 15 questions regarding different issues on this subject.
Findings: The research shows that the analysed companies listed on the Warsaw Stock Exchange are characterized by a rather diverse approach to information policy in the field of human capital, and in fact none of them conducts it in an unequivocally complete and transparent manner. Obtained results clearly indicate that their overall reporting in the field of human capital is quite average. The results for large companies and some industries are relatively better than the general average.
Research limitations: The research did not cover the entire population of companies listed on the Warsaw Stock Exchange but only companies from WIG-20, mWIG-40 and sWIG-80 indexes.
Practical implications: In order to improve the assessment and analysis of human capital in enterprises, a certain standard of data reporting in this area should be introduced.
Social implications: Improving enterprise reporting in the area of human capital would have a positive impact on the overall assessment of enterprises' involvement in socially responsible activities.
Originality/value: The conducted research, based on a relatively large (in comparison to other studies in this field) research sample and a detailed approach to the criteria for assessing human capital, allowed to verify the possibilities of practical application of the human capital assessment indicators postulated in the literature.
Keywords: human capital, ESG reports, human capital assessment, human capital ratios, information policy of listed companies.
Category of the paper: Research paper.

1. Introduction

Along with the changes in the socio-economic reality in recent decades, which were caused by, among others, globalization and the information and technological revolution, there has been a transition from an economy based on traditional material resources towards an economy based on intangible resources (the so-called knowledge-based economy). Thus, intangible resources are currently widely considered to be decisive for the competitive advantage of enterprises, pushing traditional material resources in the form of fixed assets into the background (Barney, 1991; DeNisi et al., 2003; Szwajca, 2012; Iwanowicz-Pałka, 2024). The role of the human (employee) has also increased, as one of the possible intangible resources, who began to be perceived as a component of various aggregate values related to the enterprise – intellectual capital, innovativeness, competitiveness, and finally value (Schultz, 1961; Becker, 1962; Dobija, 2005; Nawrocki, 2012). Several decades ago, the common opinion was that wages were only a payment for the work performed by employees, and the value of the enterprise was only increased by investments in fixed assets. Currently, which was largely influenced by the development of the resource-based view (RBV) concept, the forerunner of which is considered to be E. Penrose (1959), it is obvious that the employee is not only a workforce, but one of the most valuable resources of the enterprise. It is necessary for its proper functioning, and having a specific value verified on the market, it determines the economic potential of a given entity and allows for building its competitive advantage (Szopik-Depczyńska, Korzeniewicz, 2011) and improving its operational efficiency (Berk et al., 2010; Wang et al., 2014; Asare et al., 2017; Nawaz, 2019). Employees of an enterprise create developmental, creative assets that have the ability to continuously improve. For this reason, they contribute more than other resources to creating additional values for the enterprise (Wyrzykowska, 2008; Pocztowski, 2008; Dokurno, 2017), which is reflected in the literature in the term "human capital" for employees of a given organization (Haq, 2016).

With the growing interest in the importance of employees for the development of enterprises and the improvement of their performance, the term "human capital" has received many interpretations and measurement concepts (Jabłoński, 2021). As a result, we can currently encounter numerous approaches to this issue, which are very diverse in terms of detail and recommended assessment criteria. The methods of assessing or measuring human capital presented in the literature are in most cases based on very detailed, including not only quantitative, partial criteria. This naturally raises questions about their possible source of data and the real possibilities of widespread use (Folloni, Vittadini, 2010). On the other hand, the number of publications addressing the issue of reporting non-financial information on human capital is also growing, especially those taking into account Polish conditions (e.g. Czaja-Cieszyńska, 2020; Nakonieczny, 2018; Bagieńska, 2014). At the same time, however, the research presented in these studies is quite general in nature and does not answer

the question: to what extent is the information on human capital presented in non-financial reports useful from the point of view of the criteria for its assessment presented in the literature?

Therefore, the aim of this article is to examine the information capacity of publicly available reports published by enterprises from the point of view of various approaches to assessment of human capital, as well as its deeper analysis. Due to the specific information openness (the obligation to publish periodic reports), as well as the great diversity in terms of the type of business activity conducted and its scale, companies listed on the Warsaw Stock Exchange were accepted as the research subjects.

The article consists of a theoretical introduction and its expansion in relation to the perception of human capital and methods of its assessment and analysis, methodological part, research results and summary.

2. The concept of human capital and approaches to its assessment and deeper analysis

Although the idea of human capital dates back to the seventeenth century and is associated with researchers dealing with economic and financial issues (including William Petty, Adam Smith, William Farr), the beginnings of the theory of human capital as an organized discipline of knowledge date back to the turn of the 1950s and 1960s (Kiker, 1996). At that time, some scientists stated that knowledge, education, skills, and human health have production potential (Mincer, 1958; Schultz, 1961; Becker, 1962).

Human capital can be classified as a difficult concept to define. There are many definitions in the literature, depending on the perspective of consideration, i.e. management, accounting, radical or neoclassical economics (Jabłoński, 2021). For the purposes of this article, it was assumed that human capital is a resource of knowledge, skills, abilities, qualifications, attitudes, motivation, and health of employees, which is of significant importance in economic activity and is a source of future earnings (OECD, 1998, Fisher et al., 2006, Łukasiewicz, 2009).

In one of the general approaches, the concept of human capital can be considered from a macroeconomic and microeconomic perspective. From a macroeconomic perspective, human capital is identified as one of the basic resources of the economy, determining economic growth. In the microeconomic approach, the concept of human capital concerns an individual employee and is treated as an element of the intangible resources of the enterprise (Kucharcikova, 2011).

A company can seek competitive advantage based on properly trained, highly motivated and loyal staff (Noe et al., 2006; Bloisi, 2007; Gabcanova, 2011). Activities aimed at increasing the value of human capital include in particular (Nellis, Parker, 2006; Ackroyd et al., 2005; Zieliński, 2006):

- acquiring human capital (employing properly trained staff, replacing staff),
- maintaining human capital remaining within the company's control (through an appropriate motivation system and creating development opportunities),
- developing human capital within the company (training).

Some authors divide human capital into general capital and specific capital. General (universal) capital can be used in all types of economic activity, while specific capital determines the productivity in a given enterprise (McConnell, Brue, 1986).

From the perspective of the company, human capital is an element of intangible resources, and according to Edvinsson and Malone (2001), it is also a component of intellectual capital, which includes knowledge, experience, technology, relationships with customers and professional skills, which are a source of competitive advantage for the organization. Intellectual capital, apart from human capital, also includes structural capital, which is defined as everything that supports employee productivity and relational capital concerning all relationships with external stakeholders as well as reputation resulting from these relationships (Sydler et al., 2014; Bombiak, 2016; Hussinki et al., 2017).

Human capital, in addition to the characteristics brought by an employee to the organization (skills, knowledge, experience resulting from seniority, health, attitudes, values, etc.), also includes the ability of employees to learn, motivation (including sharing information), striving to achieve goals, or the ability to work in a team (Kiker, 1966; Hanushek, Woessmann, 2008; Antonelli et al., 2010; Flabbi, Gatti, 2018). Additionally, apart from the individual human capital of each employee, the human capital of an enterprise also includes the creativity and innovativeness of employee teams (Czechowska-Świtaj, 2005; Sokołowska, 2005; Król, 2006). It should also be emphasized that all of the above-mentioned issues are particularly important from the point of view of the Industry 4.0 concept, which has been popularized in recent years, one of the key conditions for its implementation is the acquisition of appropriate education and skills by employees (Flores et al., 2020, Singh et al., 2021).

It should also be noted that for a company, human capital is higher than the simple sum of the human capital of all employees. People are co-creators of processes, norms, build social relations and organizational systems. By reacting to changes in the environment and influencing them, they increase individual knowledge and shape skills (Storberg-Walker, 2004).

Attempts to measure human capital are generally based on treating employees as assets of the enterprise and measuring changes in their value. Many authors raise doubts about the possibility of measuring human capital, which focus on questions (Phillips et al., 2003):

- Can human capital be treated as a business asset at all?
- What human capital costs should be capitalized?
- How reliable are the methods for determining the value of human capital and their relationship to costs?

At the same time, the most commonly used methods of human resource valuation are valuations based on (Rogowski and Panfil, 2015):

- costs related to personnel policy (cost approach),
- market transactions (market approach),
- income generated by the employee (income approach).

In the case of estimating the value of human capital in accordance with the "cost" approach, the most frequently recommended concepts in the literature are: the historical cost method and the replacement cost method. In the first one, the value of human capital is reflected in the expenditure incurred on acquiring and training an employee, and in the second one, the expenditure on replacing the currently employed employee with another one. The main measures allowing for estimating the value of human capital in the case of using the historical cost method are: recruitment and selection costs and training costs, and in the case of the replacement cost method, additionally the cost of leaving a previous employee (Łukasiewicz, 2009; Samul, 2011; Czajkowski, 2012). Generally, however, taking into account the differences in the openness of information policy of enterprises (Nawrocki and Zieliński, 2013), the practical application of the above-mentioned cost concepts of estimating the value of human capital is quite difficult, mainly due to the problematic access to the required data. For this reason, a simplified approach is often used for research purposes, in which the value of human capital is assumed to be the data on the amount of remuneration and benefits for employees disclosed in the financial statements of companies – such an approach was used, for example, in the value added intellectual capital (VAIC) coefficient (Pulic, 2004).

The "market" approach to estimating the value of human capital is based on the analysis of market transactions that involved assets similar to those being valued, i.e. employees (Rogowski, Panfil, 2015). However, the price included in individual contracts is not always equal to the equilibrium price, which is why it is not identical to the value of an intangible asset, e.g. an employee. The price is influenced by non-market factors (such as negotiation skills or expected synergy effects) that affect the parties to the transaction. Changes in market conditions also mean that historical prices are not always a good indicator of value in new realities. Therefore, an indispensable element of valuation is the analysis of market and non-market conditions and the identification of those factors that may cause a deviation from the equilibrium price (Reilly, Schweihs, 1999). The basic problem with the "market" approach is the availability of complete data on transactions involving assets similar to those being valued. Hence, its practical application is most often limited to selected industries.

When estimating the value of human capital using the "income" approach, it is assumed that it is equal to the present value of future revenues for each employee (Rostkowski, 2011; Flamholtz, 2012). Estimations using the income method are also made difficult by changes in tangible assets (raw materials, technology) and intangible assets (organization and management), which, on the one hand, are unpredictable over a period of several decades, and on the other hand, significantly affect employee performance (Król, 2006; Łukasiewicz,

2009). Changes in the employment structure and staff turnover may also make it difficult to value human capital (Zieliński, 2008). A departing employee may take with them experiences related to the mechanisms of operation, informal connections with customers, suppliers, and other employees (Sokołowska, 2005), which results in disruptions in the functioning of the organization (Probst et al., 2004).

In addition to the three approaches to the valuation of human resources in an enterprise (cost, market and income) indicated above, the literature on intellectual capital management also indicates a number of concepts for assessing human capital as one of the components of intellectual capital, including:

- The Intangible Assets Monitor (Sveiby, 1997).
- The Skandia Monitor (Edvinsson and Malone, 2001).
- A set of indicators for measuring individual components of intellectual capital according to J. Mouritsen (1998) and Lim and Dallimore (2004).
- Sopińska and Wachowiak's intellectual capital measurement model (2003).
- A set of guidelines for reporting intangible assets proposed as part of the MERITUM project (Guimon, 2009).

Synthesizing the above-mentioned concepts of assessing human capital, Sopińska, Wachowiak and Mierzejewska (2015) draw the following conclusions and propose an original multi-indicator model of assessing human capital based on intellectual capital (Table 1):

- it is not possible to indicate one universal tool for identifying and measuring human capital,
- in most measurement concepts, a multi-indicator approach is used,
- in many cases, the proposed indicators for measuring human capital are given without specifying the exact method of their calculation,
- in the proposed models, emphasis is placed on various areas of human capital,
- in some approaches, separate indicators are proposed for individual categories of human resources, distinguished due to: the position held in the organizational structure or the form of employment,
- in most proposed methods for measuring human capital, qualitative and quantitative indicators occur in parallel.

The list of indicators for measuring human capital presented in Table 1 shows that this measurement does not have to be limited to the most popular and obvious categories such as the number of employees and their wage and benefit costs, but can be much broader and more detailed.

Table 1.
A multi-indicator model for measuring human capital through the prism of intellectual capital

Indicator Category	Indicator	Measurement method
Cost indicators	Employee acquisition cost index	Recruitment and selection costs per newly hired employee to the average total employee remuneration
	Training cost index	Training costs per employee
	Total wage cost ratio	Total salary costs per employee
	Employee leaving cost index	Employee leaving costs (e.g. employee severance pay) per employee
	Employee investment cost indicator	Training cost to Total wage cost ratio
	Employee replacement cost Indicator	Employee leaving cost index + Employee acquisition cost index
Time-quantitative indicators	Staff rotation rate	The number of employees leaving in a given period in relation to the total number of employees
	Human resource availability Indicator	Number of full-time employees in relation to the total number of employees
	Employee anchoring indicator	Number of employees employed for an indefinite period of time in relation to the total number of employees
	Training time indicator	Number of training days per employee
	Employee replacement time indicator	The average time needed to introduce a new employee to the tasks at positions in the company
	Professional development indicator	Number of employees covered by an individual professional development program in relation to the total number of employees
	Employee engagement rate in research and development activities	Number of employees in research and development departments in relation to the total number of employees
	Absenteeism rate	Average number of days of absence per employee in one year
Performance indicators	Employee creativity indicator	Number of reported initiatives per employee
	Employee creativity utilization rate	Number of implemented employee initiatives per employee
Financial indicators	Employee profitability indicator	Value added per employee
	Employee sales rate	The amount of sales revenue per employee
	Employee value generation indicator	Market value of the company per employee
Quality indicators	Industry experience index	Average number of years of work in the industry of employees employed in the enterprise
	Company experience index	Average number of years of work of employees in a given enterprise
	Age diversity index	Percentage of employees in each age group (e.g. every 10 years)
	Gender diversity index	Percentage of women and men in the total number of employees
	Education level indicator	Number of employees with higher education in relation to the total number of employees
	Competency match index	Number of employees employed according to their education in relation to the total number of employees
	Competence uniqueness index	Share of experts with a significant position in the industry in relation to the total number of employees
	Job satisfaction index	Number of satisfied employees in relation to the total number of employees
	Mentoring scope index	Number of employees mentored in relation to the total number of employees
	Employee attitude index	Number of employees showing high commitment to the employer in relation to the total number of employees

Source: Sopińska, Wachowiak, Mierzejewska, 2015, pp. 57-58.

At the same time, however, the question arises about the actual possibilities of practical application of all these indicators from the point of view of access to appropriate data. The desire to answer this question is both the main motivation and the main goal of this article. The following research hypotheses were also put into verification:

H1: Due to the development and great popularity of the CSR and ESG concepts in recent years, companies listed on the Warsaw Stock Exchange implement an open information policy in the field of human capital, which allows for its comprehensive and detailed analysis based on a number of indicators.

H2: The information policy of companies listed on the Warsaw Stock Exchange in the field of human capital varies depending on the size of the entity, which translates into greater information openness of large companies compared to medium and small companies.

H3: The information policy of companies listed on the Warsaw Stock Exchange in the field of human capital varies depending on the sector and industry affiliation of the entity, which translates into greater information openness in sectors associated with a higher level of human capital (technology, medicine, industry, finance).

3. Research methodology

The listed companies' information policy assessment in the field of human capital was carried out in October 2024 on the basis of annual reports and broadly understood ESG or CSR reports, including reports on non-financial information, integrated reports or sustainable development, published by companies listed on the Warsaw Stock Exchange that are also included in the WIG-20, mWIG-40 and sWIG-80 indices. Due to the adopted data source and the limitation of the research entities to the composition of the three indices, the research sample consisted of a total of 140 entities (132 domestic and 8 foreign) representing 8 sectors and 50 industries according to the Warsaw Stock Exchange list (WSE, 2024), which is illustrated in Fig. 1 (due to the large number of individual representatives of industries and their similar nature, it was decided to combine them into larger groups, which resulted in reducing the number of industries considered to 30).

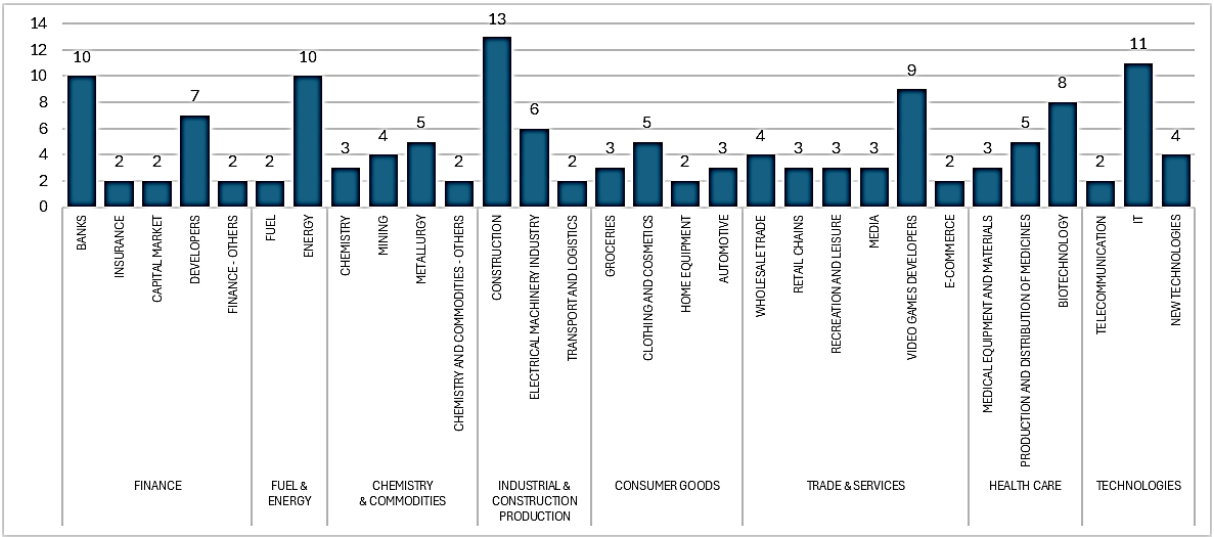

Figure 1. Division of the research sample into sectors and industries taking into account their quantity. Source: Own work based on data of WSE: https://www.gpw.pl/wskazniki.

The subject of the research for the above-mentioned sample was the information value of the annual reports published by the analysed companies and broadly understood ESG or CSR reports in the field of human capital, and its implementation was based on the previously used approach regarding the assessment of the information policy of listed companies in the field of innovative activity (Nawrocki, Żabka, 2011) and human resources (Nawrocki, Zieliński, 2013). In detail, the research carried out consisted in analysing the content and quality of the information presented in the reports in terms of the application of the criteria for assessing/valuing human capital mentioned in the previous point (Table 1). This analysis was conducted by answering the following questions (a total of 15, taking into account different variants in question 4):

1. In addition to the mandatory annual report, does the company also publish a broadly understood ESG report, including a report on non-financial information, an integrated report or a sustainable development report? (R?)
2. Does the company provide information on the number of employees in published reports? (NE?) If so, in what form is this presented (status at the end of the year in persons, average employment in persons, status at the end of the year in full-time positions, average employment in full-time positions)?
3. Does the company provide data on employee rotation in published reports? (ER?)
4. Does the company provide the employment structure in published reports according to:
   4.1. positions? (ES-p?)
   4.2. education? (ES-e?)
   4.3. age? (ES-a?)
   4.4. work experience? (ES-we?)
   4.5. gender? (ES-g?)
   4.6. type of contract, i.e. full-time, part-time, other? (ES-tc?)

4.7. duration of the contract, i.e. indefinite, fixed-term? (ES-cd?)
4.8. region? (ES-r?)

5. Does the company provide information in published reports about employment costs incurred in a given period (salaries and benefits for employees)? (EC?)
6. Does the company provide information in published reports about employee training? (ET?) If so, in what form is it provided (cost, time, people)?
7. Does the company provide information in published reports about employee accident statistics? (EAS?)
8. Does the company provide information in published reports about the feedback culture, i.e. periodic assessment of employees and assessments of their engagement and job satisfaction? (FC?)

Due to the form of the above questions, three possible answers were adopted for most of them: "no information", "general information" and "detailed information". At the same time, it should be noted that the answer option "general information" is actually only applicable to different variants of question 4 (employment structure) and 8 (feedback culture), because only in these areas there was a significant differentiation in the information provided by the analysed companies. In the remaining cases, the answers were on the basis of YES or NO, or it was in the form of a specific numerical value.

4. Results

The results obtained during the conducted research were presented in three perspectives.:

- the entire research sample,
- a distinction between large companies (WIG-20), medium companies (mWIG-40) and small companies (sWIG-80),
- a distinction between individual sectors and industries.

First, the percentage of responses to the questions indicated in the previous point was presented, which was obtained for all 140 listed companies analysed (Fig. 2).

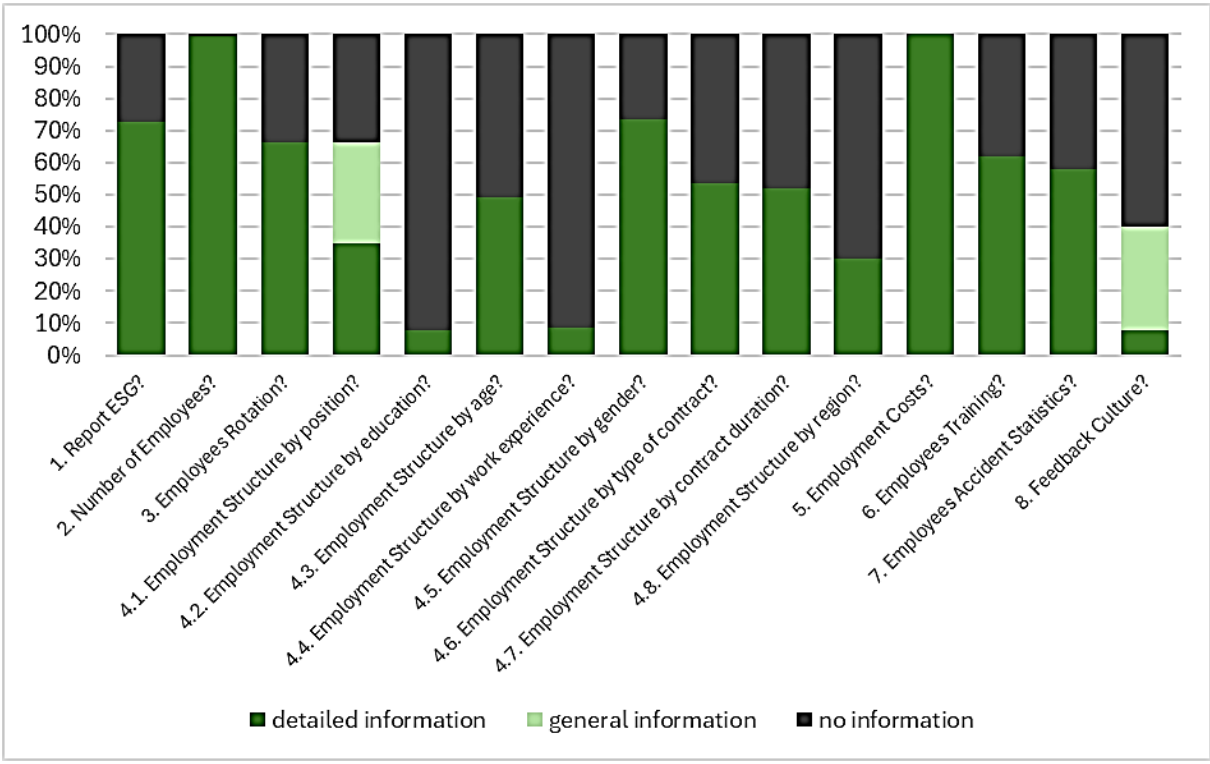

Figure 2. Results of the research on the information value of analysed companies listed on the Warsaw Stock Exchange reports from the point of view of specific issues related to human capital assessment.

Source: own calculations.

The presented results clearly indicate that despite the fact that approx. 73% of the analysed companies (102 out of 140) publish non-financial information, including information related to employees, in the form of broadly understood ESG reports, their overall reporting in the field of human capital is quite average, which also indicates only partial positive verification of the research hypothesis H1:

- Only detailed information on the size of human resources in the form of the number of employees (only in the case of 1 company out of 140 analysed there was a lack of information) and the costs of their maintenance, i.e. expenses and benefits for employees (full information for all 140 analysed companies) can be assessed as fully positive. It is also worth noting that the high percentage of positive indications regarding the above-mentioned categories results to a large extent from their obligatory nature, i.e. the requirement to disclose them in annual reports.
- Apart from the size of employment and its maintenance costs, only in the case of employment turnover, employment structure by job position and gender, as well as training and accident statistics, can one notice information openness clearly above average, i.e. over 50%, among the analysed companies. At the same time, it is worth noting that in relation to the employment structure by job position, only about 35% of them provide detailed information, and almost 31% limit themselves to general information in the form of a division into "blue-collar" and "white-collar" employees.

- At an average level, i.e. around 50%, the analysed companies disclose information on the employment structure by age, type of contract and its duration.
- As for the remaining types of information distinguished regarding human capital, the policy of their disclosure in the analysed companies is clearly weaker. Information on the employment structure by region is disclosed by about 30% of the analysed companies, on the feedback culture, i.e. employee opinion surveys on working conditions and place of work by about 40%, of which only 8% in detail (providing the results of the employee survey). The disclosure of information on the employment structure in terms of education (8%) and work experience (9%), which is one of the most important criteria for assessing human capital, is definitely the weakest in the analysed entities.

In addition, which is not visible in Fig. 1, it should be noted that in the case of 29 out of 140 companies analysed (21%), a minimalist approach to disclosing information on human capital was found, consisting in limiting only to mandatory information, i.e. the number of employees and the costs of their employment (14 cases, 10%) or at most one more category (15 cases, 11%), most often including the employment structure by position. The full scope of information on human capital, according to the list indicated earlier, was not provided by any of the analysed entities, and only 2 out of 140 (7%) could boast a single lack of information. At the same time, the largest group of entities in the research sample were those with 3 or 5 missing information (24 cases each, 17%), which certainly contributed to the fact that the average for the entire research sample was a fairly good 6.59 missing information, and in percentage terms 44% (i.e. on average in the case of the analysed companies, 8.41 out of a total of 15 questions from the list, i.e. 56%, had positive answers).

Taking into account the results regarding the assessment of the information policy of the analysed companies in the field of human capital (Fig. 2) and the list of indicators postulated for its analysis or assessment (Table 1), it can be concluded that the data on the area of employees published by companies listed on the Warsaw Stock Exchange would allow to a large extent, use indicators such as: Total wage cost ratio, Staff rotation rate, Gender diversity index, Training time indicator, Employee profitability indicator, Employee sales rate, Employee value generation indicator, and in a limited one: Training cost index, Employee investment cost indicator, Employee creativity indicator, Age diversity index, Human resource availability indicator, Employee anchoring indicator, Company experience index, Education level indicator, Job satisfaction index, Employee attitude index.

Concluding the conclusions regarding the approach covering the entire research sample, it is also worth paying more detailed attention to the way the analysed companies inform about the number of employees (Fig. 3) and their training (Fig. 4).

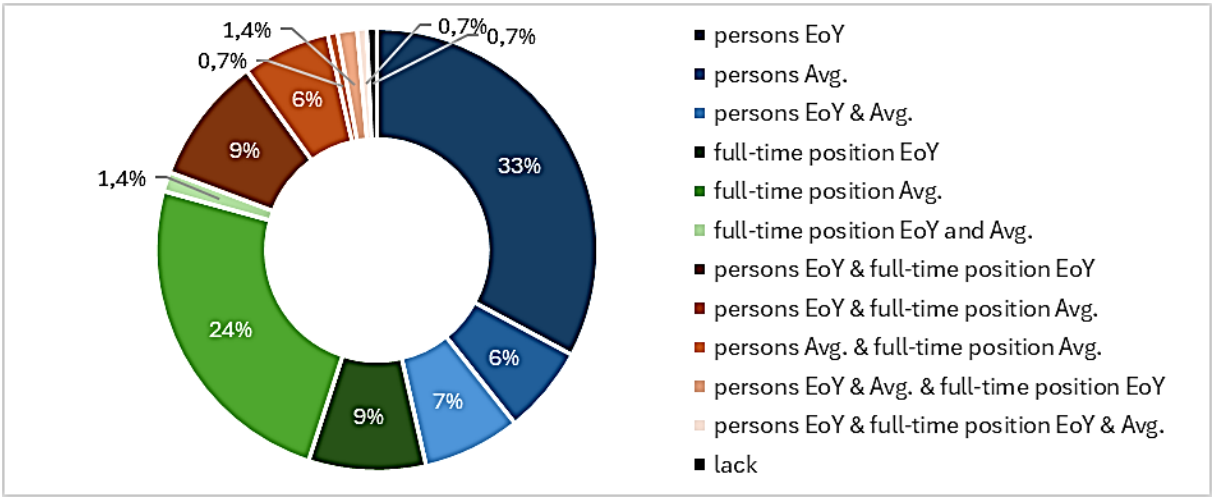

Figure 3. The method of reporting the number of employees by the analysed companies listed on the Warsaw Stock Exchange.

Source: own calculations.

As noted earlier, the analysed companies generally did not limit access to information on employment (only 1 entity in 140 did not disclose this information), and, as shown in Fig. 3, they did so in very different ways. In general, information on employment was provided in terms of persons or full-time positions and with regard to the end-of-year (EoY) or average (Avg.) status. Out of the 140 companies analysed, 80 (approx. 57%) disclosed information on employment in persons at the end of the year, 47 (approx. 34%) in persons on average, 27 (approx. 29%) in full-time positions at the end of the year, and 25 (approx. 18%) in full-time positions on average. It should also be noted that some entities provided employment in more than one way. At the same time the diverse approach to providing information on the size of employment creates certain problems with the comparability of some of the criteria for assessing human capital, where the number of employees is used as a component (e.g. work efficiency, employment costs per 1 employee). The differences between the appropriate approaches (persons and positions) and their status (end of the year and average) may not be particularly large (on average approx. 3%), but the change in the value of individual complex assessment criteria influences and distorts their comparability.

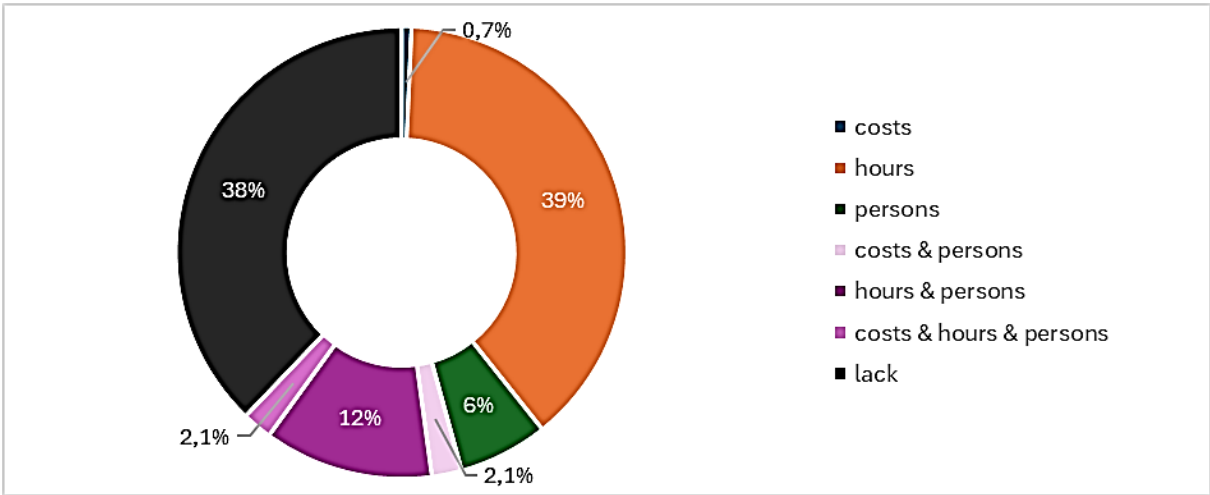

Figure 4. The method of informing about employee training by the analysed companies listed on the Warsaw Stock Exchange.

Source: own calculations.

In addition, in the context of employment data, attention should also be paid to the approach of various entities to the issue of identifying individual employees as employed persons. A review of the reports of the analysed companies shows that some entities include only persons employed under an employment contract in their employment data, while others also include co-workers employed under civil law or internship contracts. There are also often quite clear differences between employment data disclosed in the annual report and in the non-financial information report. The lack of a uniform approach in this area further affects the problems with the results comparability of some of the criteria for assessing human capital.

The situation is similar when it comes to informing by the analysed companies about employee training. The results of the information value among the analysed companies presented in Fig. 2 show that about 62% of them inform about employee training. At the same time, however, taking into account the different ways of providing this information (Fig. 4), it can be seen that this can also create problems in terms of comparability. Out of the 140 analysed companies, 74 (53%) inform about training in terms of hours, 32 (about 23%) in terms of people, and only 7 (about 5%) in terms of costs or value, i.e. how much PLN was spent on employee training. It should also be noted here that some entities provided information about employee training in more than one way.

Although the conclusions presented above are not particularly optimistic, when presenting the results obtained during the research divided into specific groups of companies, certain positive aspects can be seen.

Fig. 5 shows the percentage of responses to the formulated questions divided into large companies (WIG-20), medium companies (mWIG-40) and small companies (sWIG-80). Taking into account the presented results and comparing them with the overall results discussed earlier (Fig. 2), it should be noted that large companies (WIG-20) present themselves most favourably in terms of reporting on human capital, although at the same time this is not

reporting that could be described as "fully open" (on average approx. 4 information gaps in relation to the list of 15 examined issues concerning human capital, i.e. approx. 26%) - none of them provides the employment structure by age, only approx. 10% of them provide the employment structure by education, and approx. 50% by region. Large companies also "lose" to medium-sized companies in terms of information on the employment structure by position. At the same time, in terms of other issues related to human capital raised in the research, large companies in most cases present themselves clearly better than medium-sized companies (on average about 5 information gaps, i.e. about 34%), and especially small companies (on average more than 7 information gaps, i.e. about 49%). Therefore, the research hypothesis H2 can be verified as true.

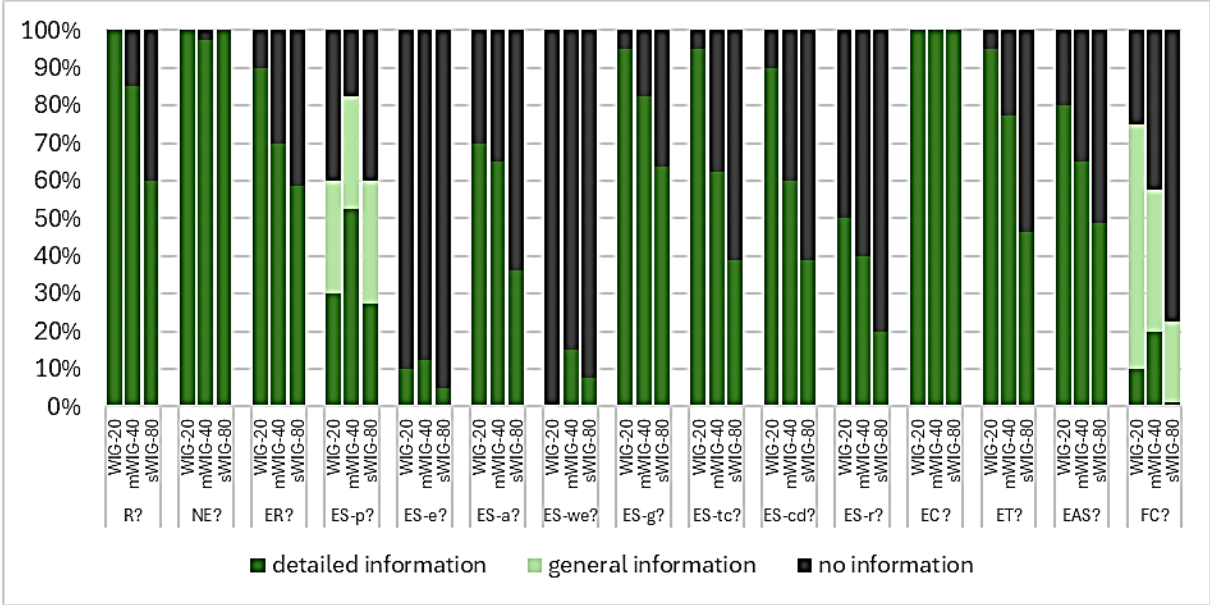

Figure 5. Results of the research on the information value of analysed companies listed on the Warsaw Stock Exchange reports from the point of view of specific issues related to human capital, divided into large companies (WIG-20), medium-sized companies (mWIG-40) and small companies (sWIG-80).

Source: own calculations.

In addition to the division presented above, significant differentiation in the reporting of human capital in the analysed companies can also be observed depending on their sector affiliation, as illustrated in Fig. 6.

Among the eight sectors considered, the information policy in the field of human capital should be assessed most favourably in relation to FINANCE (F), INDUSTRIAL & CONSTRUCTION PRODUCTION (I&CP) as well as FUEL & ENERGY (F&E), although it is not a fully open policy (slightly more than 5 information gaps, i.e. approx. 35/36%) and is characterised by some diversification in terms of the information disclosed.

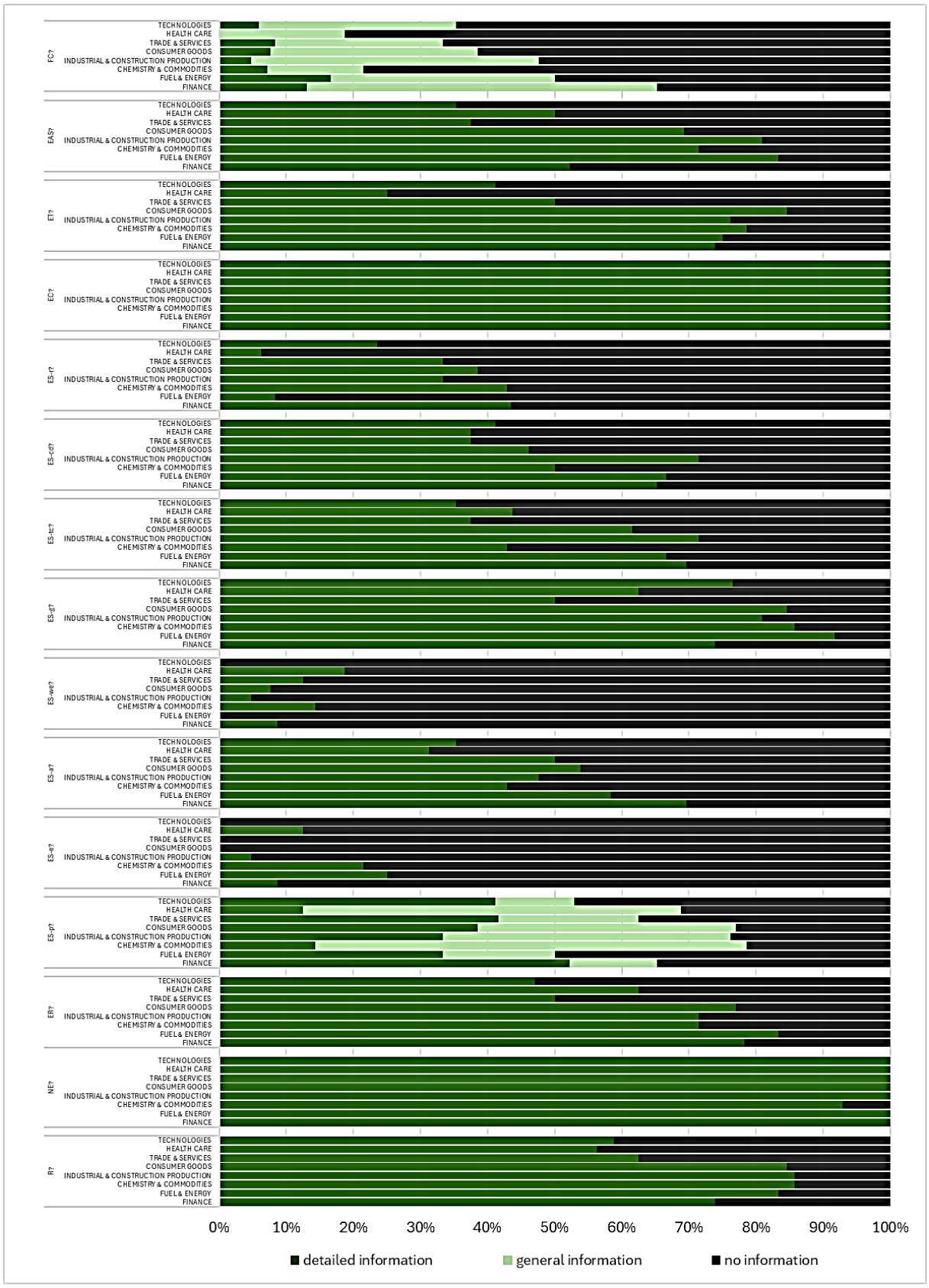

Figure 6. Results of the research on the information value of analysed companies listed on the Warsaw Stock Exchange reports from the point of view of specific issues related to human capital, depending on the sector.

Source: own calculations.

Apart from the size of employment and related costs (which all but one of the analysed companies fully report), entities from the above-mentioned sectors are in the lead in terms of issues such as: publication of non-financial reports (especially I&CP and F&E), employees rotation, employment structure by position (I&CP only), education (F&E only), age, gender (especially F&E), type and duration of the contract, as well as training, employees accident statistics (I&CP and F&E only) and feedback culture (especially F). Entities from the CONSUMER GOODS (CG) and CHEMISTRY & COMMODITIES (CH&C) sectors are only slightly behind the above-mentioned sectors in terms of openness of information policy regarding human capital – on average there are less than 6 information gaps, i.e. 37/38%. Entities from these sectors can also be considered among the leaders in terms of publishing non-financial reports and reporting on employees rotation, employment structure by position, education (only CH&C), age (only CH&C) and gender, as well as employees training (only CG). In the case of entities from the remaining three sectors, i.e. TRADE & SERVICES, HEALTH CARE and TECHNOLOGIES, information gaps exceeded 7 on average and in percentage terms ranged from 49-51%, with the weakest being in technology companies.

From a more detailed perspective, i.e. industries within individual sectors, the results of the analysis are presented only as the percentage of positive responses to questions from the list concerning human capital issues in terms of minimum (Min), maximum (Max) and average (Mean), as illustrated in Fig. 7.

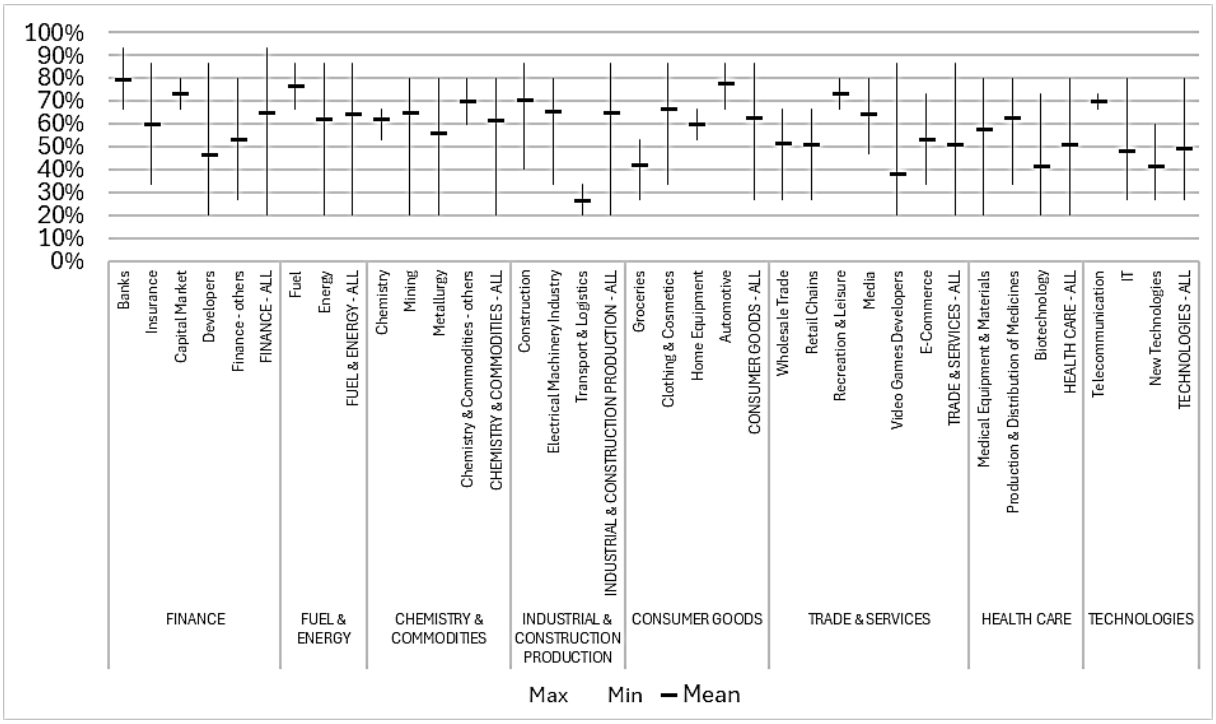

Figure 7. Results of research on the information value of analysed companies listed on the Warsaw Stock Exchange reports from the point of view of human capital assessment criteria divided into sectors and industries (Max, Min, Mean).

Source: own calculations.

As can be seen in Fig. 7, within each of the sectors considered, there is considerable variation in the assessment of information policy regarding issues related to human capital for individual industries. The clear leaders in this respect, with a percentage of positive indications to questions from the list regarding issues related to human capital of at least 70%, are banks and entities related to the capital market (FINANCE sector), fuel (FUEL & ENERGY sector), chemical (CHEMISTRY & COMMODITIES sector), construction (INDUSTRIAL & CONSTRUCTION PRODUCTION sector), automotive industry (CONSUMER GOODS sector), recreation & leisure industry (TRADE & SERVICES sector) and telecommunications entities (TECHNOLOGIES sector). On the other hand, the least information about human capital, with a percentage of positive indications to the questions from the list under consideration below 40%, is provided by entities from the transport & logistics industry (INDUSTRIAL & CONSTRUCTION PRODUCTION sector) and video games developers (TRADE & SERVICES sector). At the same time, it should be noted that in the case of several industries, there is an exceptionally high differentiation of entities in terms of information policy in the field of human capital (the range between the highest and lowest percentage of positive indications to the questions from the list under consideration is over 50 percentage points). This group includes insurers, developers, other financial companies (FINANCE sector), energy entities (FUEL & ENERGY sector), mining and metallurgical entities (CHEMISTRY & COMMODITIES sector), entities from the clothing & cosmetics industry (CONSUMER GOODS sector), video games developers (TRADE & SERVICES sector), entities from the medical equipment & materials as well as biotechnology industry (HEALTH CARE sector) and finally IT companies (TECHNOLOGIES sector).

Taking into account the above-mentioned results (Fig. 6 and Fig. 7), the research hypothesis H3 can be verified only as partially true. While entities from the financial and industrial sectors, i.e. FINANCE, FUEL & ENERGY, CHEMISTRY & COMMODITIES as well as INDUSTRIAL & CONSTRUCTION PRODUCTION, with minor industry exceptions (developers, transport & logistics, groceries), actually present themselves most favourably in terms of the openness of information policy regarding human capital, the poor results of companies from the HEALTH CARE and TECHNOLOGIES sectors, including in particular such industries as biotechnology, IT and new technologies, are somewhat surprising.

5. Summary and discussion

The research shows that the analysed companies listed on the Warsaw Stock Exchange are characterized by a rather diverse approach to information policy in the field of human capital, and in fact none of them conducts it in an unequivocally complete and transparent manner. In this respect, it can be said that the situation is quite similar to the state diagnosed

by the author in a similar research about 11 years ago (Nawrocki, Zieliński, 2013), as well as research results of other authors (Surowiec, Skowron-Grabowska, 2022; Czaja-Cieszyńska, 2020; Bagieńska, 2018). On the other hand, in the meantime, the concept of CSR – Corporate Social Responsibility has gained in importance and popularity, which then evolved into the ESG model – Environmental, Social, Governance (Włoch, 2021), along with which more and more entities listed on the capital market publish broadly understood reports on non-financial information, taking into account, among others, issues related to employees, where quantitative data are provided according to the unified standards of the Global Reporting Initiative (GRI, 2024). For this reason, the method of presenting information on employees or human capital has noticeably improved, which can be seen in the percentage of entities publishing reports or extended non-financial information (approx. 73% in 2024 vs approx. 8% in 2013), as well as disclosing data on employment (approx. 99% in 2024 vs approx. 89% in 2013), employee rotation (approx. 66% in 2024 vs approx. 12% in 2013), employment structure by work experience (approx. 9% in 2024 vs approx. 5% in 2013), or employee training (approx. 62% in 2024 vs approx. 10% in 2013). It is true that it should be remembered that the research presented here concerned 140 entities from the WIG-20, mWIG-40 and sWIG-80 indices, and the 2013 research concerned all 438 entities listed at that time, which certainly, due to the greater share of small entities, translated into lower percentages of positive answers to individual questions. However, in the case of questions regarding non-financial reporting, employee turnover and training, the difference in results is so large that even if we assume that the remaining listed companies in 2024 did not provide this information, the percentage of positive indications for the 2024 research would still be significantly higher than for the 2013 research. Additionally, it should be noted that in the currently published reports on non-financial information, new categories of information have also appeared, which were not previously provided, or if they were provided, then only sporadically, i.e. employee accident statistics and employee satisfaction assessments with the workplace and their engagement (feedback culture).

At the same time, however, despite the positive direction of changes in the information policy of listed companies in the area of non-financial issues, including in particular human capital, it is still quite average (an average of 6.59 information gaps in the analysed entities out of 15 categories considered, which gives a percentage of disclosed information of only about 56%), which resulted in the lack of confirmation of hypothesis H1. It is true that when considering the results of the study taking into account the division by company size or industry, one can find some positives, i.e. large companies from the WIG-20 index, which means confirmation of hypothesis H2, or in terms of industry, banks, companies related to the capital market, fuel, chemical, construction, automotive, recreation & leisure and telecommunications, which means partial confirmation of hypothesis H3.

In the information policy of the surveyed entities regarding human capital, certain shortcomings, that persist over time, should be noted, i.e. a large degree of freedom in the scope of information disclosed by companies and the manner of its provision, which makes it difficult to carry out an objective assessment and comparison of human capital for a larger number of entities according to the same set of indicators.. Undoubtedly, a major step towards solving this problem would be to introduce the obligation for companies to report according to a certain universal template.

Finally, it should be noted that the strengths of the conducted study include a relatively large, compared to studies by other authors, research sample and the detail of the subject of the study, i.e. the criteria for assessing human capital. In the context of further research directions, it can be indicated to expand the subjects of the study to include smaller companies, outside the WIG-20, mWIG-40 and sWIG-80 indices, and to verify, according to the applied methodology, the information policy in the area of human capital in companies listed on foreign markets.

Acknowledgements

This research was funded by Silesian University of Technology, Poland, grant number BK-264/ROZ1/2024 (13/010/BK_24/0081).

References

1. Ackroyd, S., Batt, R., Thompson, P., Tolbert, P.S. (2005). *Work and Organization*. Oxford: Oxford University Press.
2. Antonelli, G., Antonietti R., Guidetti, G. (2010), Organizational change, skill formation, human capital measurement: evidence from Italian manufacturing firms. *Journal of Economic Surveys, Vol. 24, No. 2*, pp. 206-247, doi: 10.1111/j.1467-6419.2009.00615.x
3. Asare, N., Alhassan, A.L., Asamoah, M.E., Ntow-Gyamfi, M. (2017). Intellectual capital and profitability in an emerging insurance market. *Journal of Economic and Administrative Sciences, Vol. 33, No. 1*, pp. 2-19. https://doi.org/10.1108/jeas-06-2016-0016.
4. Bagieńska, A. (2014). Raport roczny jako narzędzie pozyskania informacji o kapitale ludzkim przedsiębiorstwa – wyniki badań spółek z Respect Index GPW S.A. *Przegląd Organizacji, No. 3*, pp. 10-17. DOI: 10.33141/po.2014.03.02.
5. Bagieńska, A. (2018). Kapitał ludzki w raporcie zintegrowanym przedsiębiorstwa. In: P. Zwiech (Ed.), *Współczesne wyzwania dla przedsiębiorstw* (pp. 118-129). Szczecin.

6. Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, Vol. 17, No. 1*, pp. 99-120.
7. Becker, G.S. (1962). Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy, Vol. 70, No. 5*, pp. 9-49. http://dx.doi.org/10.1086/258724
8. Berk, J.B., Stanton, R., Zechner, J. (2010). Human capital, bankruptcy and capital structure. *Journal of Finance, Vol. 65, Iss. 3*, pp. 891-926. https://doi.org/10.1111/j.1540-6261.2010.01556.x.
9. Bloisi, W. (2007). *An Introduction to Human Resource Management*. London: McGraw-Hill.
10. Bombiak, E. (2016). Kapitał intelektualny jako specyficzny zasób współczesnych organizacji. *Zeszyty Naukowe Uniwersytetu Przyrodniczo-Humanistycznego w Siedlcach. Seria*: *Administracja i Zarządzanie, No. 36.* Uniwersytet Przyrodniczo-Humanistyczny, pp. 105-119.
11. Czaja-Cieszyńska, H. (2020). Kapitał ludzki jako obszar raportowania niefinansowego na przykładzie wybranych spółek notowanych na Giełdzie Papierów Wartościowych w Warszawie. *Zeszyty Teoretyczne Rachunkowości, No. 108*, pp. 23-40.
12. Czajkowski, Z. (2012). Kapitał ludzki – pojęcie i miary. *Prace i Materiały Instytutu Gospodarki Światowej SGH, No. 312.* Retrieved from: https://ssl-kolegia.sgh.waw.pl/pl/KGS/struktura/IGS-KGS/publikacje/Documents/Z._Czajkowski_312.pdf, 20.03.2022.
13. Czechowska-Świtaj, T. (2005). *Zarządzanie kapitałem intelektualnym w organizacji*. Warszawa: Oficyna Wydawnicza WSM.
14. DeNisi, A.S., Hitt, M.A., Jackson, S.E. (2003). The knowledge based approach to sustainable competitive advantage. In: S.E. Jackson, M.A. Hitt, A.S. DeNisi (Eds.), *Managing knowledge for sustained competitive advantage* (pp. 3-33). San Francisco: Jossey Bass.
15. Dobija, M. (2005). Teoretyczne podstawy płacy (Część I). *Ekonomika i Organizacja Przedsiębiorstwa, No. 5*, pp. 3-11.
16. Dokurno, Z. (2017). *Modelowanie kapitału ludzkiego w gospodarce opartej na wiedzy*. Warszawa: PWN.
17. Edvinsson, L., Malone, M.S. (2001). *Kapitał intelektualny*. Warszawa: PWN.
18. Fisher, C.D., Schoenfeldt, L.F., Shaw, J.B. (2006). *Human Resource Management*. Boston/New York: Houghton Mifflin Company.
19. Flabbi, L., Gatti, R. (2018), A Primer on Human Capital. *Policy Research Working Paper, no. 8309,* World Bank Group.
20. Flamholtz, E.G. (2012). *Human Resource Accounting*: *Advances in Concepts, Methods and Applications.* Springer Science & Business Media.
21. Flores, E., Xu, X., Lu, Y. (2020). Human Capital 4.0: a workforce competence typology for Industry 4.0. *Journal of Manufacturing Technology Management, Vol. 31, No. 4*, pp. 687-703.

22. Folloni, G., Vittadini, G. (2010). Human Capital Measurement: A Survey. *Journal of Economic Surveys, Vol. 24, No. 2,* pp. 248-279, https://doi.org/10.1111/j.1467–6419. 2009.00614.x
23. Gabcanova, I. (2011). The Employees – The Most Important Asset in the Organizations. *Human Resources Management and Ergonomics, Vol. 5, No. 1*, pp. 1-13.
24. GRI (2024). *Global Reporting Initiative standards*. Retrieved from: https://www.globalreporting.org/standards/, 14.11.2024.
25. Guimon, J. (2009). MERITUM and Danish Guidelines for Reporting on Intangibles: A Comparative Research. *The Icfai University Journal of Accounting Research*. *Vol. VII, No. 2*, pp. 17-29.
26. Hanushek, E.A., Woessmann. L. (2008), The Role of Cognitive Skills in Economic Development. *Journal of Economic Literature, Vol 46, No. 3,* pp. 607-668. doi:10.1257/jel.46.3.607
27. Haq, M. (2016). Human capital resources: a review and direction for future research. *International Journal of Management Development, Vol. 1, No. 4,* pp. 261-286. doi:10.1504/IJMD.2016.10004241
28. Hussinki, H., Ritala, P., Vanhala, M., Kianto, A. (2017). Intellectual capital, knowledge management practices and firm performance. *Journal of Intellectual Capital, Vol. 18, Iss. 4*, pp. 904-922, doi: 10.1108/JIC-11-2016-0116.
29. Iwanowicz-Pałka, A. (2024). Kapitał ludzki Polski na tle państw Unii Europejskiej. *Przedsiębiorczość – Edukacja, Vol. 20, No. 1*, pp. 11-27.
30. Jabłoński, Ł. (2021). Ewolucja podejść do kapitału ludzkiego w naukach ekonomicznych. Gospodarka Narodowa. *The Polish Journal of Economics, Vol. 306, No. 2*, pp. 91-120. doi:10.33119/GN/134630
31. Kiker, B.F. (1966). The historical roots of the concept of human capital. *The Journal of Political Economy, Vol. 74, No. 5*, pp.481-499.
32. Król, H. (2006). Kapitał ludzki organizacji. In: H. Król, A. Ludwiczyński (Eds), *Zarządzanie Zasobami Ludzkimi. Tworzenie kapitału ludzkiego organizacji* (pp. 92-119). Warszawa: PWN.
33. Kucharcikova, A. (2011). Human Capital – definitions and approaches. *Human Resources Management and Ergonomics, Vol. V, No. 2*, pp. 60-70.
34. Lim, L.L.K., Dallimore, P. (2004). Intellectual Capital: Management Attitudes In Service Industries. *Journal of Intellectual Capital, Vol. 5, No. 1*, pp. 187-190.
35. Łukasiewicz, G. (2009). *Kapitał ludzki organizacji. Pomiar i sprawozdawczość*. Warszawa: PWN.
36. McConnell, C.R., Brue, S.L. (1986). *Contemporary Labor Economics*. New York/ St. Louis: McGraw-Hill.
37. Mincer, J. (1958). Investment in human capital and personal income distribution. *The Journal of Political Economy, Vol. 66, No. 4*, pp. 281-302.

38. Mouritsen, J. (1998). Driving Growth: Economic Value Addend versus Intellectual Capital. *Management Accounting Research, Vol. 9, Iss. 4,* pp. 461-482. https://doi.org/10.1006/mare.1998.0090
39. Nakonieczny, J. (2018). Raportowanie aktywów i kapitału ludzkiego przedsiębiorstwa – studium przypadku. *Marketing i Rynek, No. 9,* pp. 673-688.
40. Nawaz, T. (2019). Exploring the nexus between human capital, corporate governance and performance: Evidence from Islamic banks. *Journal of Business Ethics, Vol. 157, Iss. 2,* pp. 567-587. https://doi.org/10.1007/s10551-017-3694-0.
41. Nawrocki, T. (2012). *Innowacyjność produktowa przedsiębiorstw*. Warszawa: CeDeWu.
42. Nawrocki, T., Żabka, A. (2011). Działalność innowacyjna spółek giełdowych. *Ekonomika i Organizacja Przedsiębiorstwa, No. 11,* pp. 3-12.
43. Nawrocki, T., Zieliński, M. (2013). Information policy of listed companies regarding human resources – evidence from Poland. *Human Resources Management and Ergonomics, Vol. 7, No. 1,* pp. 45-56.
44. Nellis, J.G., Parker, D. (2006). *Principles of Business Economics*. Harlow: Pearson Education.
45. Noe, R.A., Hollenbeck, J.R., Gerhart, B., Wright, P.M. (2006). *Human Resource Management*. Boston: McGraw-Hill/Irwin.
46. OECD (1998). *Human Capital Investment, An International Comparison.* Paris: OECD Publishing. https://doi.org/10.1787/9789264162891-en
47. Penrose, E. (1959). *The Theory of the Growth of the Firm*. Oxford: Basil Blackwell.
48. Phillips, J.J., Stone, R.D., Pulliam-Phillips, P. (2003). *Ocena efektywności w zarządzaniu zasobami ludzkimi. Praktyczny podręcznik pomiaru efektywności inwestycji*. Kraków: Human factor.
49. Pocztowski, A. (2008). *Zarządzanie zasobami ludzkimi. Strategie – Procesy – Metody.* Warszawa: PWE.
50. Probst, G., Raub, S., Romhardt, K. (2004). *Zarządzanie wiedzą w organizacji*. Kraków: Oficyna Ekonomiczna.
51. Pulic, A. (2004). Intellectual Capital – Does it Create or Destroy Value? *Measuring Business Excellence, Vol. 8, No. 1,* pp. 62-68.
52. Reilly, R.F., Schweihs, R. (1999). *Valuing Intangible Assets.* New York: McGraw Hill.
53. Rogowski, W., Panfil, M. (2015). Pomiar wartości aktywów ludzkich z punktu widzenia wartości całego przedsiębiorstwa. In: Ł. Sienkiewicz (Ed.), *Pomiar kapitału ludzkiego przedsiębiorstwa – perspektywy badawcze*. Warszawa: PARP.
54. Rostkowski, T. (2011). Wycena kapitału ludzkiego przedsiębiorstwa. In: M. Panfil, A. Szablewski (Eds.), *Wycena przedsiębiorstwa. Od teorii do praktyki*. Warszawa: Poltext.
55. Samul, J. (2011). Pomiar zarządzania kapitałem ludzkim z wykorzystaniem HR Scorecard – studium przypadku. In: B. Urbaniak (Ed.), *Efektywność zarządzania zasobami ludzkimi* (pp. 61-78). Łódź: Wydawnictwo Uniwersytetu Łódzkiego.

56. Schultz, T.W. (1961). Investment in human capital. *American Economic Review, Vol. 51*, pp. 1-17.
57. Singh, R.K., Agrawal, S., Modgil, S. (2021). Developing human capital 4.0 in emerging economies: an industry 4.0 perspective. *International Journal of Manpower*, *Vol. 43*, *Iss. 2*, pp. 286-309. https://doi.org/10.1108/IJM-03-2021-0159
58. Sokołowska, A. (2005). Wiedza jako podstawa efektywnego zarządzania kapitałem intelektualnym. In: K. Perechuda (Ed.), *Zarządzanie wiedzą w przedsiębiorstwie* (pp. 127-171). Warszawa: PWN.
59. Sopińska, A., Wachowiak, P. (2003). Istota kapitału intelektualnego przedsiębiorstwa – model pomiaru, In: R. Borowiecki, M. Kwieciński (Eds.), *Informacja w zarządzaniu przedsiębiorstwem. Pozyskiwanie, wykorzystanie i ochrona* (pp. 101-130). Kraków: Kantor Wydawniczy Zakamycze.
60. Sopińska, A., Wachowiak, P., Mierzejewska, W. (2015). Pomiar i raportowanie kapitału ludzkiego z perspektywy kapitału intelektualnego przedsiębiorstwa. In: Ł. Sienkiewicz (Ed.), *Pomiar kapitału ludzkiego przedsiębiorstwa – perspektywy badawcze* (pp. 57-58), Warszawa: PARP.
61. Storberg-Walker, J. (2004). *Towards a Theory of Human Capital Transformation Through Human Resource Development.* Swanson & Associates.
62. Surowiec, A., Skowron-Grabowska, B. (2022). Procesy raportowania kapitału intelektualnego polskich spółek giełdowych. *ZN Wydziału Zarządzania GWSH*, *No. 18*, pp. 66-77. DOI: 10.53259/2022.18.07.
63. Sveiby, K.E. (1997). The Intangible Assets Monitor. *Journal of Human Resource Costing and Accounting*, *Vol. 2*, *No. 1*, pp. 73-97.
64. Sydler, R., Haefliger, S., Pruksa, R. (2014). Measuring intellectual capital with financial figures: Can we predict firm profitability? *European Management Journal*, *Vol. 32*, *Iss. 2*, pp. 244-259, doi: https://doi.org/10.1016/j.emj.2013.01.008.
65. Szopik-Depczyńska, K., Korzeniewicz, W. (2011). Kapitał ludzki w modelu wartości przedsiębiorstwa. *Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania Uniwersytetu Szczecińskiego*, *No. 24*, pp. 177-203.
66. Szwajca, D. (2012). *Zasoby marketingowe przedsiębiorstwa jako źródło przewagi konkurencyjnej*. Gliwice: Wyd. Politechniki Śląskiej.
67. Wang, Z., Wang, N., Liang, H. (2014). Knowledge sharing, intellectual capital and firm performance. *Management Decision*, *Vol. 52, No. 2,* pp. 230-258. https://doi.org/ 10.1108/MD-02-2013-0064.
68. Włoch, J. (2021). *Od CSR do ESG, czyli ewolucja raportów niefinansowych*. Retrieved from: https://www.parkiet.com/felietony/art19656851-od-csr-do-esg-czyli-ewolucja-raportow-niefinansowych, 12.11.2024.

69. WSE (2024). *Lista spółek notowanych na rynku regulowanym GPW w Warszawie z podziałem na branże i sektory*. Retrieved from: https://www.gpw.pl/wskazniki, 5.11.2024.
70. Wyrzykowska, B. (2008). Pomiar kapitału ludzkiego w organizacji. *Ekonomika i Organizacja Gospodarki Żywnościowej*, *No. 66*, pp. 159-170.
71. Zieliński, M. (2006). Human Capital in Small Enterprises. In: K. Heffner, K. Malik (Eds.), *Human Capital as Development Factor on the Region: Macro- and Microeconomic Approach* (pp. 176-181). Warszawa: Polish Academy of Sciences, Committee for Spatial Economy and Regional Planning.
72. Zieliński, M. (2008). Kapitał ludzki jako składnik niematerialnych aktywów przedsiębiorstw. *Zeszyty Naukowe Politechniki Śląskiej, Seria: Organizacja i Zarządzanie*, *No. 47*, pp. 63-79.