

Lukasz Bryl, PhD

Poznan University of Economics and Business

Intangible assets disclosure by Polish enterprises

Introduction

The process of the growing importance of intangible factors in creating value for the company is gaining more rapid pace in the modern economy. Intangible assets gradually acquire the status of legal goods, i.e. those which can be objectively distinguished and receive legal protection (Golat, 2005, p. 15). Thus, on the theoretical ground it is possible to measure their values, as well as to analyze their significance in terms of changes in time. Increasing interest in intangible assets happens partly due to the fact that the market values of companies listed on stock exchanges are usually much higher than their book values (Tobin's q above 1), what suggests that companies may have other assets that are undervalued or partially hidden and thus not recognized in traditional reporting (Bryl, 2015; Rahman, 2012; Wachowiak, 2005). As the value of tangible assets is usually a fraction of the market value, the rest of the firm value presumably might come from intangible assets (Zhang, 2003, p. 38). This value is often called intellectual capital and described as the difference between market value and book value (Market Value Added). Part of the intellectual capital can be identified and valued using accountancy guidelines and techniques, and thus these items may be disclosed in the officially released corporate documents (annual reports, financial statements). They are called intangibles and belong to the broad category of the firm assets disclosed on the balance sheet.

The aim of the article is to determine what types of intangible assets are identified by Polish enterprises, what is their value in absolute and relative terms (in relation to total assets) and what is the trend in intangibles reporting. Moreover, research questions refer also to the problem of which industries disclose most intangible assets.

In many cases research on the reported intangibles may be beneficial for the entity. As some studies suggest (Low and Kalafut, 2006, p. 193), analysis of intangibles may help to determine the true value of the firm by stating if the share price of the publicly listed entities is undervalued or overvalued. Several

studies suggest also a significant positive relationship between intangible assets reported on the balance sheet and the enterprise market value (Berk, Green and Naik, 1999; Choi, Kwon and Lobo, 2000). Moreover, according to the study on the importance of intangible assets in the organizations, firms with greater intangible assets (hidden or identified in the financial reports) are more often covered by investing analysts (Barth, Kasznik and McNichols, 2001, p. 1).

The main contribution of the article is to provide a valuable insight into the reporting standards of intangible assets of Polish publicly listed entities in terms of: absolute values of disclosed intangibles and their changes over time, a well as types of intangibles and their reporting frequency among various industries.

The structure of this paper is the following: Section 1 is the introduction. Section 2 presents reporting standards of intangibles. Section 3 depicts prior research on the significance of intangible assets. Section 4 describes the studied sample and methods used in the study. Section 5 outlines the results. Section 6 provides discussion on the basis of the conducted study, whereas Section 7 summarizes conclusions, limitations of the study and future lines of research.

1. Theoretical background of intangible assets and their reporting standards

The concept of intangible assets is difficult to define. There are often interchangeably (and not entirely correctly) used similar terms such as: *intellectual capital*, *intellectual resources*, *knowledge assets*, *intangible resources* or *intangible assets*. As Dobija (2004, p. 38) suggests, *intangible assets* is the term widely recognized and used in accountancy, on the other hand *knowledge assets* is the term mostly economists refer to, whereas *intellectual capital* is the phrase mainly attributable to management experts and managers¹. Apart from the strict definitions, there can be also distinguished distinct approaches towards intellectual capital that may be divided into the perception perspectives of: economists, sociologist, management experts or accountancy specialists. However, no matter how different terms are being used, authors agree on the immaterial character of intangible assets without physical substance. Moreover, their importance may not be undervalued. The twenty-first century's economy is heavily reliant on intangibles for fostering economic growth and development. Intangible assets, widely understood as intellectual capital, are perceived as a creating force of competitiveness (Przybyszewski, 2007, p. 135). Lev and Zambon (2003) perceive investments in intangibles as important drivers of the firm growth.

Despite the crucial role of intangibles, Sydler, Haefliger and Pruksa (2013) noted that the field related to the measurement of firms' intangibles using publicly

¹ More about the differences between these terms: Roos, Pike and Fernstrom (2012, p. 29–37) or Węziak-Białowolska (2010, p. 26–27).

available data is underdeveloped. Most often, contemporary enterprises report on intangibles in the financial statement or in the annual report in the financial section. Broader approach to intangibles in the form of intellectual capital appears, apart from the above-mentioned documents, in CSR/sustainability reports. However, identification, valuation, information on amortization/depreciation and types of intangibles are presented mostly in financial statements². The supply of corporate financial documents is tightly regulated all over the world and keeps expanding in scope and complexity. Lev and Gu (2016) claim that the obligatory and publicly available financial statements and other corporate documents are losing their relevance. The authors even coin the term of the *fast-diminishing relevance of financial (accounting) information* to show, that, although many stocks and bonds investors, individuals and institutions seek information in the financial reports to find guidelines where and when to invest or lend, as well as major corporate decisions are also predicted with the help of financial report indicators, in fact this information in many cases may appear useless. As an example Lev and Gu (2016) provide the 2007–2008 financial crisis, pointing out that financial statements of troubled banks, such as: Citibank, AIG, Merrill Lynch and Lehman Brothers did not alert investors about the poor quality of their assets. What is more astonishing, the authors provide a study on the relevance of accounting and reporting standards issued by the Financial Accounting Standards Board (FASB) from its founding in 1973 till 2009. It turned out that 75% out of total 147 standards created so far appeared not to have any effect on the shareholders of the analyzed firm, whereas 13% of the rules created decreased shareholder value³. Among the shortcomings of traditional financial statements the following can be also distinguished (Samelak, 2013, p. 113):

- 1) high degree of their complexity, hence the difficulty of their interpretation;
- 2) no coherence between individual financial statements;
- 3) lack of information on the organization business model;
- 4) no information on key success factors;
- 5) lack of disclosure of the strategic plans of the entity;
- 6) lack of the possibility to determine the true market value of the company;
- 7) incomplete reporting on firm resources, e.g. lack of intellectual capital and intangibles disclosure.

² As it will be presented in the next parts of the article, main source of information will be financial statements, as these documents refer to the book values of intangibles, which is the subject of this paper.

³ In fact, Lev and Gu (2016) are not entirely against reporting. The authors suggest to improve the quality of disclosure by, instead of concentrating on the traditional accounting information, putting more stress on firm business model, its execution, fundamental indicators, accidents' frequency and severity. Lev and Gu urge also to adjust financial indicators to the analyzed sector in order to e.g. avoid the risk of improper valuation of the fast growing start-ups that do not generate profits yet.

Nevertheless, there are several initiatives undertaken to present intangibles and integrate all intangible information in a single document. Nardo (2013, p. 26) proposes the Intangible Global Report (IGR) which is composed of five dimensions, three derived from the Intellectual Capital Report (human capital, structural capital, relational capital) and two from the Global Reporting Initiative (environmental, social). Each dimension is surveyed in terms of intangible resources, activities and impacts, measured by financial and non-financial indicators. The idea behind is to choose a starting point and integrate available information that shares the same features such as: the orientation towards stakeholders, the managerial approach, and the focus on intangible activities.

In German-speaking countries the approach introduced by the Work Group *Accounting and Reporting of Intangible Assets* of the Deutsche Schmalenbach Gesellschaft für Betriebswirtschaft eV (DSG) has received considerable attention. The group's classification procedure develops an intangible assets categorization proposal by Edvinsson and Malone (1997) to seven intangibles groups (Gerpott, Thomas and Hoffmann, 2008, p. 39). These are:

- 1) Human capital. This category highlights inherent knowledge and skills of the employees, firm's culture and working climate. The indicators of human capital are company and job tenure structures of a firm's employees, employee turnover rates, and job satisfaction levels.
- 2) Customer capital which consists of a firm's current customer base, market share, customer satisfaction and brand strength. Studies reveal that long-term relationships to contractually or emotionally bonded clients belong to the key intangibles.
- 3) Supplier capital that focuses on the procurement processes and outcomes of an enterprise. To the supplier capital indicators belong e.g. radio licence allocations or key suppliers.
- 4) Process capital that relates to the level of a company internal work sequences and management quality. Indicators of process capital are: information on sales network, planning and maintenance or management processes.
- 5) Innovation capital that relates to a firm's R&D capitalization which is reflected in a number and quality of patents or other intellectual property rights. Innovation capital ratios include absolute and relative R&D expenditures, patent portfolio structure or the ratio of sales generated by the new products within the last x years to the total sales value.
- 6) Location capital that focuses on the advantages related to the spatial location of the company and includes valuable transport routes or a low distance to the universities with outstanding graduates. Economically highly attractive places (e.g. airports, shopping centers) often offer the possibility of services rendered on an exclusive basis.
- 7) Investor capital that relates to the assets improving a company position on international debt markets. Investor capital indicators include a firm's credit

rating, shareholder structure (private vs. institutional capital), systematic risk or the number of investor relations analyst meetings within a reporting period.

In 2013 the International Integrated Reporting Council (IIRC) in the document “The International <IR> Framework” introduced the concept of Integrated Reporting (IIRC 2013). Integrated Reporting promotes a more cohesive and efficient approach to corporate reporting and aims to improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital (IIRC 2013). An integrated report includes eight Content Elements that are fundamentally linked to each other and are not mutually exclusive (IIRC 2013):

- 1) Organizational overview and external environment: What does the organization do and what are the circumstances under which it operates?
- 2) Governance: How does the organization’s governance structure support its ability to create value in the short, medium and long term?
- 3) Business model: What is the organization’s business model?
- 4) Risks and opportunities: What are the specific risks and opportunities that affect the organization’s ability to create value over the short, medium and long term, and how is the organization dealing with them?
- 5) Strategy and resource allocation: Where does the organization want to go and how does it intend to get there?
- 6) Performance: To what extent has the organization achieved its strategic objectives for the period and what are its outcomes in terms of effects on the capitals?
- 7) Outlook: What challenges and uncertainties is the organization likely to encounter in pursuing its strategy, and what are the potential implications for its business model and future performance?
- 8) Basis of presentation: How does the organization determine what matters to include in the integrated report and how are such matters quantified or evaluated?

Main features of the Integrated Reporting is that this type of disclosure contains a holistic set of information about the entity that enables to evaluate its performance in the financial, social and economic spheres by presenting financial and non-financial indicators. Integrated reporting is dedicated to different stakeholder groups focusing on value creation.

However, as Bek-Gaik (2015) suggests there are also problems and dilemmas related to integrated reporting. Essential problems are:

- 1) reliability of the presented data,
- 2) lack of a unified form of integrated reporting,
- 3) problems with creation of an appropriate database for integrated reporting,
- 4) too much information (information overload) and therefore difficulties with the filtering of information relevant for decision-making by investors,
- 5) great flexibility in “creating” non-financial information,
- 6) lack of a predefined set of business performance indicators.

Theoretical considerations lead to the conclusion that on the conceptual level there may be many intangible items identified and disclosed, however, the major obstacle appears in terms of proper valuation of the intangibles. Thus, many authors (e.g. Xiao, 2008; Yi and Davey, 2010; Singh and Kansal, 2011) claim that the level of intangible assets disclosure through the corporate documents by the companies is still unsatisfactorily low. Kaplan and Norton (2004) state that identifying and measuring intangibles is in fact *the holy grail of accounting*. To some extent this phenomenon is being solved by the two accounting standards referring to intangibles: IAS 38 and IFRS 3.

IAS 38 is a set of guidelines for intangible assets identification and valuation. IAS 38 state that an intangible asset is an identifiable non-monetary asset without physical substance (either being separable or arising from contractual or other legal rights). Intangible assets meeting the relevant recognition criteria are initially measured at cost, subsequently measured at cost or using the revaluation model, and amortized on a systematic basis over their useful lives (unless the asset has an indefinite useful life, in which case it is not amortized). The three critical attributes of an intangible asset are:

- 1) identifiability;
- 2) control (power to obtain benefits from the asset);
- 3) future economic benefits.

An intangible asset is identifiable when it is separable (capable of being separated and sold, transferred, licensed, rented, or exchanged, either individually or together with a related contract) or arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or from other rights and obligations. Intangibles can be acquired by:

- 1) separate purchase as part of a business combination;
- 2) government grant;
- 3) exchange of assets;
- 4) self-creation (internal generation).

Intangible assets are initially measured at cost. However, subsequent to acquisition, measurement should be based on cost or revaluation model, thus an entity is obliged to use either the cost model or the revaluation model for each class of intangible assets (IAS 38).

More insight into certain types of intangible assets allowed to identify and measure has been provided by the International Financial Reporting Standards (IFRS) Foundation. IFRS introduce a relatively broad spectrum of intangibles that may be identified, disclosed and valued by entities. According to IFRS 3 there are the following intangible assets distinguished (International Financial Reporting Standards 3, 2008, p. 113–118):

- 1) marketing-related (Trademarks, trade names, service marks, collective marks and certification marks, Trade dress, Newspaper mastheads, Internet domain names, Non-competition agreements);

- 2) technology-based (Patented technology, Computer software and mask works, Unpatented technology, Databases, including title plants, Trade secrets, such as secret formulas, processes and recipes);
- 3) customer-related (Customer lists, Order or production backlog, Customer contracts and related customer relationships, Non-contractual customer relationships);
- 4) artistic-related (Plays, operas and ballets, Books, magazines, newspapers and other literary works, Musical works such as compositions, song lyrics and advertising jingles, Pictures and photographs, Video and audiovisual material, including motion pictures or films, music videos and television programs);
- 5) contract-based (Licensing, royalty and standstill agreements, Advertising, construction, management, service or supply contracts, Lease agreements, Construction permits, Franchise agreements, Operating and broadcast rights, Servicing contracts, such as mortgage servicing contracts, Employment contracts, Use rights, such as drilling, water, air, timber cutting and route authorities).

These intangible assets may be identified on the company balance sheet, valued and prepared for the potential sale to the third parties. It should be noted that, according to the international standards of accounting, only these components of intangible assets can be reported in the financial statements (Nimtrakoon, 2015, p. 4). The remaining assets, whose separate identification is impossible, may be the subject of a sales transaction only within the sale of the whole company (Murawska, 2008, p. 50). One of such assets is called *goodwill*, which is defined as a difference between the purchase price of a particular entity or its parts and the fair value of the acquired net assets⁴ (Kołaczyk, 2007, p. 88). In other words, *goodwill* can be demonstrated in terms of accounting standards on the company's balance sheets when the entity is sold for a higher value than the total value of its assets including liabilities. Then the surplus is treated as an additional value and appears on the company balance sheet.

Nevertheless, many companies, for different purposes⁵ identify other intangible assets than those disclosed by the IFRS standards. For example, a study on the reporting approaches among Portuguese airlines showed a total possible number of intangibles to be disclosed up to 56 (Lopes, 2010, p. 3)⁶.

⁴ Net assets are defined as total assets less liabilities and provisions for liabilities, which is equal to the total equity. In other words, net assets correspond to the book value of the company.

⁵ The term *different purposes* is mainly understood as soft recognition of intangibles in CSR reports and companies performance presentations, or for scientific and research aims.

⁶ However, that great number can be questioned, due to the fact that some of the identified intangibles were artificially multiplied. For instance, *training programs* appeared four times, as they were divided into training programs for: pilots, cabin crew personnel, aircraft maintenance and land assistance. Similarly *databases* and *software* were divided into those acquired internally and externally (Lopes, 2010, p. 30).

2. Importance of intangibles – literature review

Studies on the significance of intangible assets underline their crucial importance for the development of an organization. Although there are a lot of studies concerning the extent of intangible assets disclosure within a firm (e.g. Goh and Lim (2004), Schneider and Samkin (2008), Yi and Davey (2010), Whiting and Woodcock (2011), Liao et al. (2013), Vishnu and Gupta (2014), Low et al. (2015)), research on the intangibles being simultaneously identified and valued are relatively scarce. Table 1 presents selected studies on the recognized and valued intangible assets.

Table 1
Selected studies on the identification and valuation of intangible assets

Authors	Sample	Study description
Low and Kalafut (2006)	S&P 500 entities	Research on the most important intangible assets reported by companies and their relevance to market value.
Wyatt (2005)	1366 Australian listed companies	Analysis of the types of disclosed intangibles and the importance of intangibles with the use of ratios.
Becker (2005)	DAX 30 entities	Study of the changes in the intangibles values and importance of intangibles with the use of ratios.
Al-Twaijry (2009)	384 Japanese companies	Analysis of the changes of values of intangibles, importance of intangibles with the use of ratios.
Ragini (2012)	100 Indian, 100 US, and 60 Japanese companies listed in the Fortune Global 500	Comparative study of cross-country companies on the types of disclosed intangibles and their changes over time.
Vallejo-Alonso, Garcia-Merino, Arregui-Ayastuy (2015)	369 Spanish firms	Research on the importance of intangibles with the use of ratios.

Source: own study on the basis of the above literature.

Early studies on the intangibles were conducted by Ragini (2012). The author analyzed 100 companies in India, 100 US, and 60 Japanese companies listed in the Fortune Global 500 World's Largest Corporations for a period of five years (2001–2005)⁷. The study examined the type and extent of information on intangibles (an extensive list of 180 items, including both mandatory as well as

⁷ Banking, insurance and financial companies were excluded from the purview of this paper because of different disclosure requirements.

voluntary disclosure items). The study shows that in the case of disclosure on 'goodwill and other intangibles', US companies overlap with the companies of the other two countries. For example, 84.80% of the US companies disclosed value of goodwill in their annual reports, whereas only 44% the Japanese and 30% of the Indian companies respectively disclosed the same. Expenditures on R&D were reported by 75.7% of Indian companies, 71.4% of Japanese entities and by only 40.9% of American firms. Software cost information was reported by 47.1% of Indian and 42.9% of Japanese companies. Less than 25% of American entities reported on software cost. Trademarks and trade names were valued and shown in corporate documents by 36.4% of American entities and less than 25% of Indian and Japanese companies. Moreover, Japanese companies showed the maximum improvement of 59% in the overall disclosure of intangibles followed by the US (42%) and Indian companies (31%).

Low and Kalafut (2006), analyzing US companies with a market value in excess of 100 mil USD included in the S&P index, found out that 35% of active investors decisions were based on a detailed analysis of intangible assets. Moreover, the same authors showed that the most important components of intangible assets were: patents, costs of research and development, and innovations. The authors also found out that intangible assets played an important role in increasing the market value (85% of the market value is attributable to intangible factors).

However, a study on 1366 Australian listed companies showed that the most frequent identifiable intangibles (excluding *goodwill*) were respectively: deferrals, patents, brands, trademarks and formation costs (Wyatt, 2005, p. 978–980). Furthermore, the same research suggested that the average ratio of intangibles to tangible assets was 10%, the share of research and development cost – 1% as well, whereas the share of *goodwill* in total intangibles amounted to 37.5%.

A study on a sample of German listed companies making up the DAX 30⁸ index showed that the importance of accounting value of intangible assets was relatively small and on average accounted for 4.4% in total assets⁹, however it was strongly dependent upon the industry (Becker, 2005, p. 86). Industries in which intangible assets had the largest value were respectively: telecommunications, energy and insurance. Furthermore, total assets of the studied entities increased during 5 years by 7.4%, whereas value of intangibles showed a stronger increase (38.8%). Reasons behind the changes of intangibles were: acquisitions (and thus increase in the *goodwill*), initial identification of relations with customers (especially in the telecommunication and software industry) and impairment tests.

⁸ DAX includes the following entities: Adidas, Allianz, BASF, Bayer, Beiersdorf, BMW, Commerzbank, Continental, Daimler, Deutsche Bank, Deutsche Borse, DHL, Deutsche Telekom, EON, Fresenius Medical Care, Fresenius, Heidelberg, Henkel, Infineon, Linde, Lufthansa, Merck, Muenchener Rueck, ProSieben, RWE, SAP, Siemens, ThyssenKrupp, Volkswagen, Vonovia.

⁹ The study covered the period 2000–2004. Despite the relatively small share in total assets, the absolute value of intangibles of the analyzed companies amounted to 176.6 billion EUR on average. At the same time, there was no clear trend of value changes in time.

The study of Al-Twajjry (2009) on 384 Japanese companies from major industries showed that, on average, intangible assets represented only about 1.2% of tangible assets and 1.3% of total sales. Moreover, the same study concluded that between 2001 and 2005 total investment in intangibles increased by 85%. In the analyzed entities, value of intangibles increased heavily between 2001 and 2005. The average increase from 2001 to 2002 was 19%, from 2002 to 2003 – 29%, sharply jumping to 294% from 2003 to 2004, and further increasing by 50% from 2004 in 2005. It is worth noting that one company invested a huge (80x more than in the previous year) amount of money in the year 2004.

Vallejo-Alonso, García-Merino and Arregui-Ayastuy (2015) in the study on 369 Spanish firms found out that the mean ratio of intangibles to tangibles was 2.9%.

Theoretical considerations on intangible assets lead to several conclusions. Firstly, traditional accounting does not fully utilize the potential to determine the fair value of intangibles in firms. As Jarugowa and Fijałkowska (2002, p. 58) state, valuation of intangibles reported on the balance sheet is mostly based on a cost model that does not reflect their true value. Secondly, although intangibles may be reported in many forms, the extent of disclosure is insufficient and varies among the studied enterprises. Moreover, intangibles share in total assets usually does not exceed 5%, what may lead to a wrong conclusion that intangibles do not play an important role in enterprises. Based on the literature studies, the following two hypotheses have been introduced:

H1: Although intangible assets seem to play a crucial role for enterprises, the share of intangible assets disclosed by the enterprises in total assets is low.

H2: As intangible assets play a crucial role for enterprises, their relative and absolute monetary value is growing regardless of industry.

3. Material and methods

The research method adopted for this study consists in: content analysis and tools of descriptive statistics. Content analysis is defined as a technique for collecting data (Abeysekera, 2007). The aim is to codify qualitative and quantitative data into pre-defined categories in order to receive quantitative scales of different levels of complexity (Guthrie et al., 2004; Guthrie and Petty, 2000; Abeysekera, 2007; Dumay and Cai, 2015). For data analysis, tools of descriptive statistics were used. In order to carry out the research process properly, the following assumptions were adopted:

- 1) Intangible assets were taken from the balance sheet position called: intangible assets (including *goodwill*);
- 2) The study originally consisted of 30 companies included in the Polish index WIG-30. Due to the nature of the study the sample selection was intentional.

Companies whose shares are included in one of the main indices of the Warsaw Stock Exchange are obliged to publish their activities strictly in the form of annual reports, which are also covered by the obligation of being audited. Thus reliable and valid data¹⁰ can be used in the study. Moreover, due to legal obligations, it may be assumed that the studied entities will report best on intangibles. However, in order to make a dynamic comparative analysis possible, two companies had to be excluded from the study, due to the fact that their shares were admitted to public trading during the analysis period¹¹. Furthermore, in one case, an examined company did not show any intangible assets except for one analyzed period, hence it was excluded from the analysis as well¹². Thus, the final size of the survey sample was 27 entities;

- 3) The basis for the analysis were consolidated financial statements and/or annual reports¹³;
- 4) The period of the analysis covered the years 2010–2014. Due to the fact that the composition of stock market indices may change and that WIG-30 is a relatively new indicator (launched in 2013) the basis for the selection of companies for the study was WIG-30 from 2015.

According to the Warsaw Stock Exchange, the WIG-30 includes the 30 largest by value and most liquid companies listed on the main market on the Warsaw Stock Exchange. This is a price index, meaning that in determining the final value only the prices of the transactions are taken into account without the income from dividends. The most important characteristics of the surveyed companies are shown in Table 2.

Table 2
Main indices of the surveyed enterprises

No. of companies	No. of industries covered	Total revenue (mil PLN)*	Total assets (mil PLN)**	Total capitalization (mil PLN)***
27	12	392 471	1 301 475	294 306

Comments:

* value for the whole 2014

** as at 31.12.2014

*** based on the stock prices on 25.09.2015

Source: own study.

¹⁰ The secondary aim was an attempt to determine how the financial reporting of Polish enterprises in the area of intangible assets is consistent with the guidelines of IFRS 3.

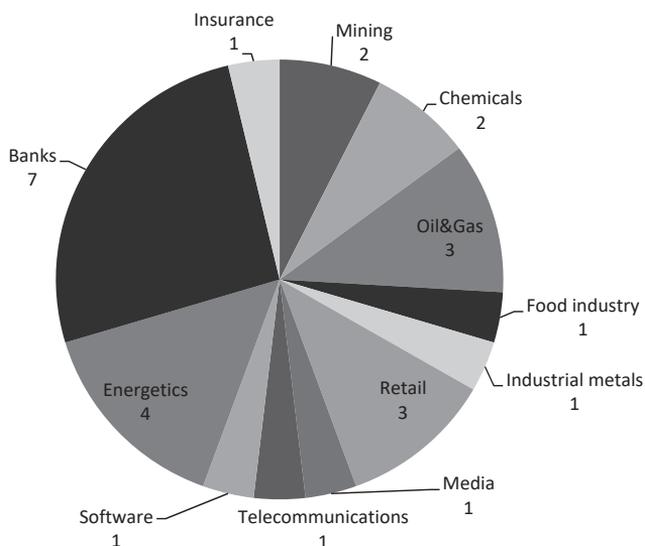
¹¹ These were respectively: JSW (IPO: July 2011) and PKP Cargo (IPO: October 2013).

¹² It was a real estate company (GTC) that only in 2010 showed *goodwill* as an intangible and it did not appear in any of the later statements during 2011–2014.

¹³ Despite the above-mentioned scientific reservations about corporate publications, financial statements and other publicly available documents are the easiest to collect sources of relatively reliable data. Moreover, Guthrie and Petty (2000) regard the annual report of a company as generally the most widely distributed of all public documents; what is more, the management of a firm can control the reporting of information in this document.

The surveyed companies are among the largest entities in Poland. In 2014 they generated total revenues at the level of 392.5 bil PLN, their total assets amounted to 1.302 trillion PLN and market capitalization to 294.3 bil PLN. 27 surveyed companies came from twelve different industries (Figure 1)¹⁴.

Figure 1
Industry breakdown of surveyed entities



Source: own study.

The largest group were: banks – 7 companies (respectively: Alior, BZ WBK, Bank Handlowy, ING Bank Slaski, Mbank, Bank Pekao and PKO Polish Bank) and energy companies – 4 (ENEA, Energa, PGE, Tauron). The following industries had three representatives, respectively: Oil&Gas (PKN Orlen, PGNiG, Lotos) and Retail (CCC, Eurocash, LPP). Each of the following industries had two representatives: mining (KGHM, Bogdanka) and chemicals (Grupa Azoty, Synthos). Branches: software (Asseco Poland), telecommunications (Orange), media (Cyfrowy Polsat), insurance (PZU), metal industry (Boryszew) and food producers (Kernel) were represented by one entity each.

¹⁴ It is a common study approach to identify and quantify intangibles in the sectors which are more knowledge-dependent (such as pharmaceuticals, ICT etc). However, in recent years there has been a growing interest in research on intangibles also in other industries, traditionally associated with greater role of physical assets (oil&gas, energetics) (Britto et al. 2014, p. 333). The study conducted in this article is based on the second approach.

4. Results

The study was conducted in three stages. In the first stage, the values of the total assets and the values of intangible assets for all examined years were determined. Then the share of intangibles in the total assets was calculated (Table 3).

Table 3
The value of total and intangible assets (mil PLN)

	2010	2011	2012	2013	2014	Mean
Intangible assets	19 942.8	25 101.6	28 712.9	31 189.3	52 947.1	32 087.1
Total assets	887 918.9	1 001 222.8	1 040 600.7	1 136 114.8	1 301 472.5	1 063 538.1
Ratio of intangibles to tangibles	9.5%	14.4%	15.5%	15.2%	18.1%	14.5%
Share of intangibles in total assets	6.3%	8.3%	9.0%	8.7%	9.0%	8.3%

Source: own study.

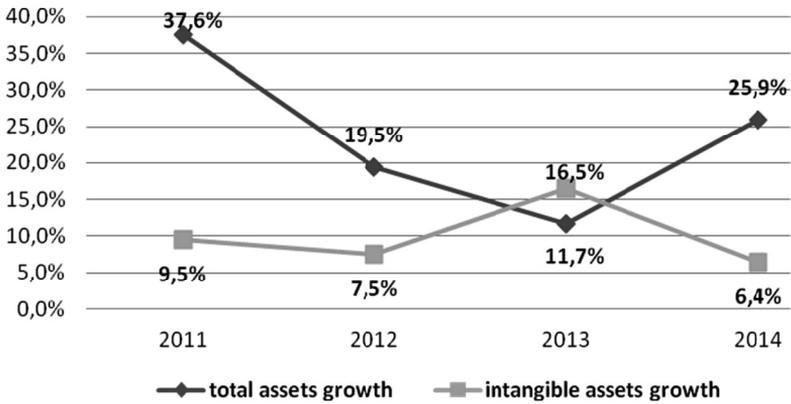
The analysis of the data in Table 3 shows that the total value of the intangible assets of the surveyed enterprises amounted to 19.9 billion PLN in 2010 and increased to 52.9 billion PLN in 2014. At the same time, due to the observed increase in the value of total assets, the value of intangible assets calculated for financial reporting purposes represented a small share in the total assets (6.3% in 2010 and up to 9.0% in 2012 and 2014). Similarly, there was an increase in the ratio of intangibles to total tangibles (from 9.5% in 2010 to 18.1% in 2014)¹⁵. In terms of absolute values, an increase in both total and intangible assets was observed in the analyzed period (Figure 2).

In three out of the four studied years, the growth rate of total assets exceeded the growth of intangible assets (respectively for the years: 2011, 2012 and 2014). Only in 2013 there was a larger increase in intangible assets than in total assets. The greatest increase in total assets took place in 2011 (37.6%), whereas the smallest in 2013 (11.7%). CAGR for total assets growth amounted to 23.7%, whereas CAGR for intangible assets was 10%. The greatest growth of intangibles value took place in 2013 (16.5%, whereas the smallest in 2014 – 6.7%).

In the second stage of the study the total value of intangible assets by industry was calculated for each year (Figure 3).

¹⁵ However, it should be noted that the studied group demonstrated extreme values of both ratios of: intangibles/tangibles and intangibles/total assets. The coefficient of variation for intangibles/tangibles ranged from 273% to 225%, whereas coefficient of variation for intangibles/total assets ranged from 183% to 169%.

Figure 2
 Change of total and intangible assets (yoy)



Source: own study.

Among the 12 surveyed industries, the greatest value of intangible assets in one year was recorded in the media industry. Interestingly, this industry is represented by only one company (Cyfrowy Polsat) whose intangible assets reached a record value in 2014 (19.7 billion PLN)¹⁶. What is also interesting, apart from one industry (software¹⁷), all other sectors showed an increase in the cumulative value of intangibles during 2010–2014¹⁸. The mean increase in the value of intangibles was 3 916.5%. The largest (percentage) increase was in the case of insurance (19 639%¹⁹), media (26 006%²⁰) and mining (523%²¹). The rise of total intangibles value in the banking industry in 2013 was due to the fact that Kredyt Bank SA was taken over

¹⁶ This was the result of the acquisition of the telecom operator Polkomtel by Cyfrowy Polsat, which led to the introduction of the positions: customer relationships worth 4.2 billion PLN and *goodwill* – 10.8 billion PLN into the balance sheet, and at the same time increasing the existing intangibles category of software to 2.8 billion PLN

¹⁷ In fact, software industry as a whole experienced a loss in the total value of intangibles by 11.1% during 2010–2014.

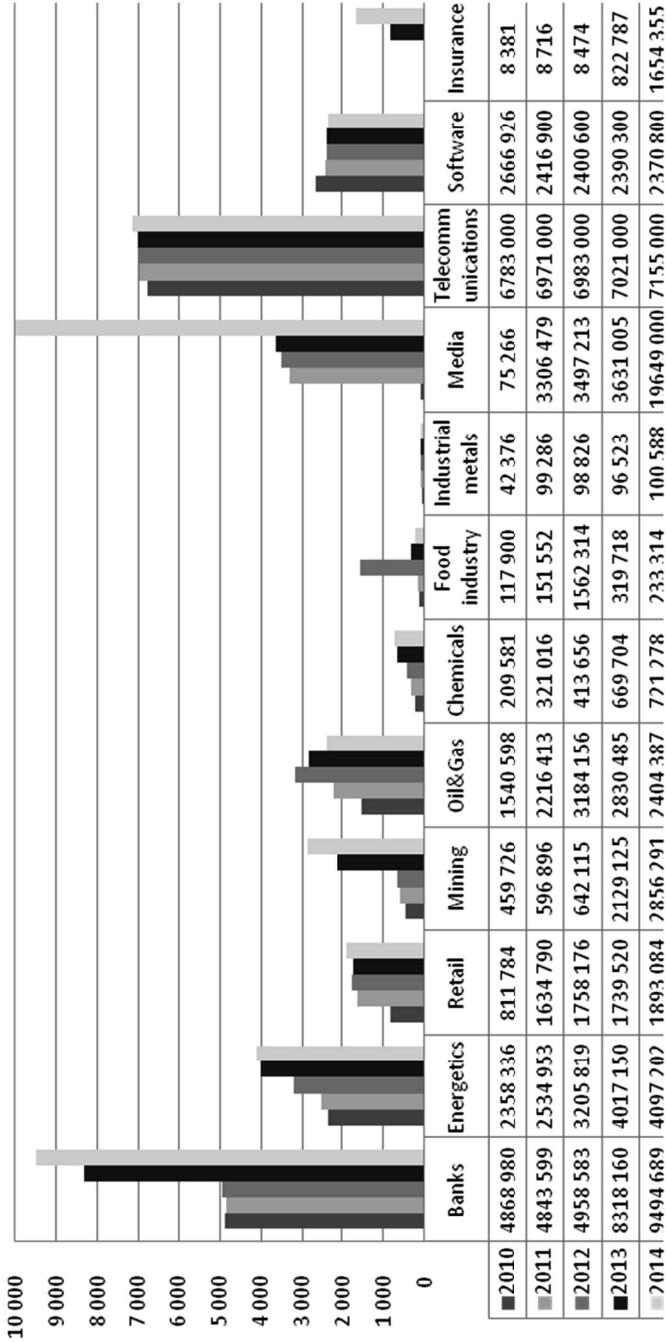
¹⁸ Data refer to the cumulated values of all entities in a given industry, thus it may happen that the industry showed an increase in general, whereas not all firms included experienced an increase. This happened in the case of three companies: PKN Orlen (-42.4%), Asseco (-11.1%) and Pekao (-10.1%).

¹⁹ There was one company representing the insurance industry, which was PZU. Enormous increase in the intangible assets value was the result of the undertaken acquisitions. In 2014 PZU acquired the following entities: Lietuvos Draudimas AB, Link4, Oddział Codan, AAS Balta and other smaller medical enterprises. As a result, the value of goodwill amounted to 785.7 mil PLN (in 2013 8.6 mil PLN).

²⁰ A consequence of the above-mentioned acquisition of Polkomtel by Cyfrowy Polsat

²¹ There was one company responsible for the intangible assets increase (KGHM). In 2013 the category of geological information, valued at 1 529 mil PLN, was introduced into the balance sheet. In 2014 these assets were revaluated to 2 105 mil PLN. According to the corporate documents these were the costs of search and evaluation of the natural resources in: Sudbury (Canada), Ajax Project, Weisswasser (Germany), Synklina Grodziecka (Poland) and in Radwanice-Gaworzyce (Poland).

Figure 3
Industry breakdown of total intangible assets of Polish enterprises (mil PLN)



Source: own study.

by BZWBK, and thus *goodwill* value in the balance sheet of BZWBK increased by 2.5 billion PLN. The value of total intangibles increased in 2014 in comparison to 2010 by 163.9%. It should, however, be noted that some industries were represented by more than one company, so it is reasonable to determine the average value of intangible assets in each of the studied years for the industry (Table 4).

Table 4
Industry breakdown of mean intangible assets of Polish enterprises (mil PLN)

	2010	2011	2012	2013	2014
Banks (n=7)	695 569	691 943	708 369	1 188 309	1 356 384
Energetics (n=4)	589 584	633 738	801 455	1 004 288	1 024 301
Retail (n=3)	270 595	544 930	586 059	579 840	631 028
Mining (n=2)	153 242	198 965	214 038	709 708	952 097
Oil&Gas (n=3)	513 533	738 804	1 061 385	943 495	801 462
Chemicals (n=2)	104 791	160 508	206 828	334 852	360 639
Food producers (n=1)	117 900	151 552	1 562 314	319 718	233 314
Industrial metals (n=1)	42 376	99 286	98 826	96 523	100 588
Media (n=1)	75 266	3 306 479	3 497 213	3 631 005	19 649 000
Telecommunications (n=1)	6 783 000	6 971 000	6 983 000	7 021 000	7 155 000
Software (n=1)	2 666 926	2 416 900	2 400 600	2 390 300	2 370 800
Insurance (n=1)	8 381	8 716	8 474	822 787	1 654 355

Source: own study.

The analysis of the average values of intangible assets during the period 2010–2014 shows that the average intangible assets were the greatest in: telecommunications industry (6.9 bil PLN), media (6.0 bil PLN) and software (2.5 bil PLN). On the other hand, the lowest value was recorded in: industrial metals (87.5 million PLN) and chemicals (233.5 mil PLN).

In the third stage of the study it was examined which specific intangible assets (categories) were most commonly reported on the balance sheets of companies in the period 2010–2014 (Table 5), what was their value and what was the share of intangible assets in the total assets (Figure 4).

The most often exhibited intangible assets in the group of the surveyed companies were: *goodwill* (on average 23 companies reported this particular intangible asset during the 2010–2014 period) and others (on average 21). Similarly, the studied entities often showed on their balance sheets: royalties, patents and trademarks (on average 19), costs of research and development (18) and software and licences (17). The least appearing intangible assets were: customer relationships (on average 2) and geological information (4). However, the disclosure was different among firms. The industry breakdown of intangible assets reporting is presented in Table 6.

Table 5
The frequency of each intangible asset appearing on the balance sheets
of the studied companies with the share in the total studied sample (%)

	2010	2011	2012	2013	2014	Average
<i>Goodwill</i>	19 (70.4%)	22 (81.5%)	23 (85.2%)	24 (88.9%)	26 (96.3%)	23 (85.2%)
Royalties, patents, trademarks	16 (59.3%)	18 (66.7%)	19 (70.4%)	20 (74.1%)	21 (77.8%)	19 (70.4%)
Software and licences	19 (70.4%)	15 (55.6%)	16 (59.3%)	17 (63.0%)	16 (59.3%)	17 (63.0%)
Trademark/brand	7 (25.9%)	8 (29.6%)	8 (29.6%)	8 (29.6%)	9 (33.3%)	8 (29.6%)
Costs of research	18 (66.7%)	17 (63.0%)	19 (70.4%)	20 (74.1%)	18 (66.7%)	18 (66.7%)
Geological information	2 (7.4%)	4 (14.8%)	4 (14.8%)	4 (14.8%)	4 (14.8%)	4 (14.8%)
Customer relationships	0 (0.0%)	2 (7.4%)	2 (7.4%)	3 (11.1%)	5 (18.5%)	2 (7.4%)
Perpetual usufruct of land	6 (22.2%)	6 (22.2%)	8 (29.6%)	8 (29.6%)	8 (29.6%)	7 (25.9%)
Others	21 (77.8%)	21 (77.8%)	22 (81.5%)	21 (77.8%)	22 (81.5%)	21 (77.8%)
Total	108	113	121	125	129	119

Source: own study.

In the total studied sample during the analyzed period *goodwill* was the most often reported intangible asset. However, among the industries, its frequency of disclosure was the highest in: energetics, food producers, industrial metals, media, telecommunications, software and insurance (all studied enterprises reported on *goodwill* during each year within the years 2010–2014). The second most often reported category of intangibles was *others* with the greatest disclosure values in the following industries: energetics, food producers, industrial metals, media, telecommunications and insurance. The least often reported intangible asset (geological information) was reported only by the companies from mining and oil&gas industry.

In addition to the disclosure frequency, studies of various intangible assets and their shares in the total intangible assets were also conducted. On average, during the 2010–2014 period the value of intangible assets amounted to 31.6 billion PLN, and the largest part of it was generated by: *goodwill* (15.1 billion PLN) and software and licences (5.0 billion PLN). The average share of these categories stood at 47.4% in case of *goodwill* and 16.3% for software and licences (Figure 4).

Costs of research (2%) and customer relationships (2.3%) had relatively the smallest shares in total intangible assets. Given the dynamics of various categories

Table 6
 The industry breakdown of the frequency of each intangible asset reported
 by the companies with the share in a given industry (%)

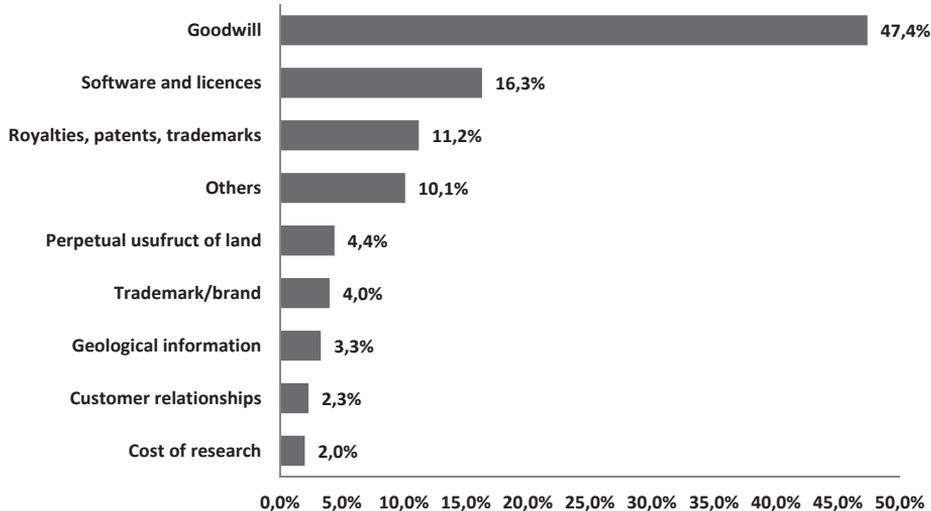
	<i>Goodwill</i>	Royalties, patents, trademarks	Software and licences	Trademark / brand	Costs of research	Geological information	Perpetual usufruct of land	Others
Banks	82.9%	57.1%	71.4%	14.3%	71.4%	nd*	nd	71.4%
Energetics	100.0%	75.0%	60.0%	nd	75.0%	nd	80.0%	100.0%
Retail	66.7%	100.0%	33.3%	100.0%	53.3%	nd	nd	33.3%
Mining	50.0%	100.0%	100.0%	nd	50.0%	90.0%	nd	90.0%
Oil&Gas	80.0%	66.7%	60.0%	nd	73.3%	33.3%	46.7%	100.0%
Chemicals	62.5%	100.0%	50.0%	62.5%	100.0%	nd	nd	80.0%
Food producers	100.0%	nd	nd	100.0%	nd	100.0%	100.0%	100.0%
Industrial metals	100.0%	100.0%	100.0%	nd	100.0%	nd	100.0%	100.0%
Media	100.0%	nd	100.0%	100.0%	100.0%	nd	nd	100.0%
Telecommunica- tions	100.0%	100.0%	100.0%	nd	nd	nd	nd	100.0%
Software	100.0%	nd	100.0%	100.0%	100.0%	nd	nd	nd
Insurance	100.0%	100.0%	100.0%	nd	100.0%	nd	nd	100.0%

*nd – no disclosure at all

Source: own study.

of intangible assets, the largest increase in the analyzed period was noted in: customer relationships (456.8%) and geological information (134.7%). The slowest growth occurred in the case of: software and licences (10.2%) and others (12.1%).

Figure 4
Mean share of each intangible asset in total intangible assets



Source: own study.

5. Discussion

As a result of the empirical study undertaken, it has been determined that the disclosed values of intangibles of Polish companies making up the WIG-30 play on average a smaller role than tangible assets in accounting terms. The 14.5% ratio of intangibles to tangibles coincides with the previous findings of Wyatt (2005), however at the same time being much higher than the findings of Vallejo-Alonso, García-Merino and Arregui-Ayastuy (2015) and Al-Twajjry (2009). The mean 8.3% ratio of intangibles to total assets was also a score twice higher than in the studied sample of German entities by Becker (2006). It shall be stated that, although the values of average shares do not seem high, in comparison to prior research on German, Spanish and Japanese entities, the ratios of the studied Polish firms were moderate. However, among the studied enterprises great differences of ratios were observed.

In terms of the changes of intangibles in time, 89% of the studied entities achieved an increase in the absolute value of intangibles. The intangible assets of the surveyed companies showed a rising trend, what is in line with the findings of Al-Twajjry (2009) on the sample of Japanese entities, however, there was

a significant difference in the pace of the intangible assets growth (10.0% vs. 98.0%). The largest (percentage) increase was in the case of insurance, media and mining, while the lowest in the case of telecommunications and oil&gas industry. However, the vast majority of the studied companies achieved an increase in intangible assets. The largest absolute value of intangibles was recorded in telecommunications, banking and energy, which partly coincides with the research on a sample of German companies by Becker (2006). The percentage increase in the total value of intangibles was greater than the increase in total assets (163.9% vs. 46.6%), what is similar to the findings of Becker (2006). However, the pace of change was much faster in Polish entities than in German ones. The study found out that most of the intangible assets increase originated from the acquisitions and the introduction of new categories into the balance sheets (it appeared that the most valuable were: goodwill, relations with customers and geological information). Moreover, there was also an increase observed in the ratio of intangibles to tangibles, as well as in the share of intangibles in total assets, which suggests a growing importance in the intangibles perception and thus reporting by the companies.

As an additional result of the study it was also determined that the most frequently reported intangible assets appeared to be *goodwill* and royalties, patents and trademarks (together). These categories were disclosed by 23 and 19 studied entities respectively. The most important (most valuable) assets proved to be again *goodwill* and software and licences. These two categories were responsible on average for more than 60% of the value of all intangible assets. *Goodwill* as the most often disclosed type of intangibles corresponds with the findings of Ragini (2012) concerning US companies²². However, the importance of *goodwill* in total intangible assets appeared to be relatively similar to the findings of Wyatt (2005) on the sample of Australian companies. Software and licences were reported more frequently than by any entity studied by Ragini (2012), although a smaller difference was observed in terms of Indian firms (63% vs. 47.1%). Expenditures on R&D showed lower frequency than in Indian and Japanese entities but at the same time higher than in American firms. On the contrary, trademarks reporting frequency (29.6%) was higher than in the case of Indian and Japanese companies (both less than 25%), but lower than in the case of American entities (40.9%).

²² However, it shall be stated here that almost the same frequency of *goodwill* disclosure (85.2% by Polish entities and 84% by the entities of the Ragini (2012) studied sample) refers actually only to American enterprises. The research revealed that Japanese and Indian companies reported *goodwill* less frequently (44% and 30% respectively).

Conclusions

The paper examined the rising importance of intangible assets and their types reported on balance sheets by the publicly listed entities from various industries. However, final conclusions derived from the study on the intangible assets disclosure shall not be referred to the general population, due to the fact that the study consisted of the largest, well-known Polish entities, listed on the stock exchange and thus, according to law, obliged to periodically issue corporate documents. Due to these reasons, there is a strong presumption that other enterprises (e.g. not publicly listed or listed on the alternative stock exchange, NewConnect) may report much worse on intangibles than WIG-30 firms. On the contrary, the studied enterprises should be perceived as a benchmark for other companies in terms of intangibles reporting and their valuation.

The paper contributes in numerous ways. Firstly, the research outcomes might help to develop the understanding of the phenomenon of intangible assets and enhance the investment decision-making. Moreover, by showing different extent of intangibles disclosure among industries and the rising trend in reporting, the results may give incentives for companies to improve their disclosure quality on intangible assets. Finally, the data provided may foster the discussion among scientists and executives on the significance of intangible assets reporting.

The research conducted in the paper has its limitations which certainly are: a small sample size and a relatively short analysis period. Furthermore, by increasing the number of studied entities it would also be possible to determine in detail the significance of intangible assets among the industries. Moreover, future studies could investigate the impact of reported intangibles on the company performance (profits, sales), as well how different types of disclosed intangibles influence profitability of enterprises.

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Intangible assets disclosure by Polish enterprises

Summary

The purpose of this paper is to investigate the importance of intangible assets of Polish companies listed on the Warsaw Stock Exchange included in the WIG-30 index. Using publicly available data (financial statements), 30 stock listed entities were studied for the years 2010–2014 in terms of: share of intangible assets in total assets (total and by industry), direction and dynamics of changes in their value, and types of intangible assets most frequently disclosed in the reports. Tools of descriptive statistics were used in the analysis. During the analyzed period both intangible assets and tangible assets showed a positive growth dynamics, whereas the growth of tangibles value showed greater dynamics. The reported share of intangibles in total assets was relatively small, ranging from 6.3% in 2010 to 9.0% in 2014. The value of intangible assets is strongly dependent upon the industry. The intangibles most often disclosed in the financial statements were: goodwill, royalties, patents, trademarks and costs of research respectively.

Keywords: intangible assets, intellectual capital, *goodwill*, enterprise value