

# INTANGIBLE ASSETS REPORTING: THE CASE OF CHEMICAL AND PHARMACEUTICAL INDUSTRY IN THE CZECH REPUBLIC

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## Abstract

BOHUŠOVÁ HANA, SVOBODA PATRIK. 2018. Intangible Assets Reporting: the Case of Chemical and Pharmaceutical Industry in the Czech Republic. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 66(2): 431–439.

The cost structure of business entities has been changing in the span of time. Costs associated with intangible assets such as software, patents, licenses, copyrights and goodwill became an important item of costs in the recent days. The paper is focused on the evaluation of the share of intangible assets in total assets and the costs associated with intangible assets in business companies operating in the chemical and pharmaceutical industry in the Czech Republic. The analyzed sample of companies represents two groups of business entities: entities preparing financial statements in accordance with IFRS and the entities preparing financial statement according to the Czech Accounting legislation (CAL). The sample covers period after the mandatory implementation of IFRS for listed companies - starting in 2005 and ending in 2015. The aim of this paper is to evaluate the impact of intangible assets reporting methodology using criteria as the share of this category in assets of companies, its structure and its changes over time and to identify possible reasons for this situation. The analysis revealed that there is an increasing tendency in volume of IAs in companies listed in Prague Stock Exchange.

Keywords: Intangible Assets, Fixed Assets, GDP, Goodwill, IFRS, CAL.

## INTRODUCTION

The characteristics of the economy had changed from the industrial one to today's more service and information oriented during the past decades. Intangible assets (IAs) are considered as one of the most significant factors influencing the development and success of corporations in the market economy in the recent days. Assets without material substance become the main impetus in the creation of value in corporations. Much of the attention on IAs has been paid to research and development (R & D), key personnel and software. But the range of IAs is broader. OECD (2008, 2011) groups intangibles into three types: computerized information (such as software and databases), innovative property (such as scientific and nonscientific R & D, copyrights, designs, trademarks) and economic competencies

(including brand equity, firm-specific human capital, networks joining people and institutions, organizational know-how that increases enterprise efficiency, and aspects of advertising and marketing). These assets are getting such important, and their identification and measurement have become a point of high interest of all financial statements users, despite the fact that tangible assets often have been dominating to discussions of success factors up to now. It is clear that such tangible factors explain only part of the outcome, and for complete comprehension, organizations need to consider intangible success factors. Regarding to both types of long-term assets, organizations can obtain a complete picture for making comparisons and improvements in performance.

There are growing numbers of studies demonstrating the importance of intellectual

property in economy. With respect to conclusions of studies carried out on factors of companies' success, they are moving from tangible to intangible factors due to the realization of the high potential of intangible resources (Hand, 2001, Zigan and Zeglat, 2010). The shift towards consideration of power of IAs and their contribution to companies' economic growth is attracting attention of researchers (García and Ayuso, 2003, Vodák, 2011, Volkov and Garanina, 2007, Jerman *et al.*, 2010, Hussi and Ahonen, 2002, Gerpott *et al.*, 2008, Boekenstein, 2009).

Also Grüber (2014) concluded that major production inputs do no longer comprise of items, such as property, plant and equipment, but rather of brands, knowledge and other technological innovation and intangible values have continuously become significant value drivers of companies in today's economy, despite these facts, financial accounting and reporting still lacks to incorporate and to report such values properly. Academics and practitioners argue that the economic importance of intangible values in industrialized countries has increased significantly during the past decades. This phenomenon is mainly due to the notable growth of the tertiary sector, resulting in fundamental changes of the economy: the traditional industrial business model has continuously become less important, as economic wealth creation is more and more based on the exchange and manipulation of invisible or intangible values. The significant items that are key to a business and that drive revenues are brands, copyrights, patents, licenses and the like.

There are some studies concerning the significance of IAs within European companies (Nell *et al.*, 2013, Jerman *et al.*, 2010). Nell *et al.* (2013) examine both the materiality of intangibles and the related disclosure quality under IFRS in the notes of firms on the German benchmark stock index DAX during the four-year period 2008–2011. The study of Jerman *et al.* (2010) aims the significance of IAs in transition economies like Croatia, Slovenia, the Czech Republic, Germany and USA. The study is based on data of the period 2004–2008. The results of the study prove that intangibles constitute an important asset for traditional market economies, while it was not proven for post-transition and transition economies. Despite the fact that many analyses underline their growing significance in today's business environment.

Also the studies of Dunse, Hutchinson and Goodacre (2004), Edvinsson (2000) proved that a creation of the future value is significantly based on IAs such as IP and goodwill. Company's IAs – specially those related to internally generated information technology and other internally generated IAs – are not well reported on corporate balance sheets according to these studies. The vast majority of intangible spending is expensed, due to strict criteria for recognition of IAs in an accord with IFRS or US GAAP (Lev, Daum, 2004).

According to García, Ayuso (2003), concluded that the research efforts conducted over the past

three decades have provided evidence especially that intangibles are fundamental sources of competitive advantages that must be identified, measured and controlled in order to ensure the efficient management of corporations and there is a lack of relevant and reliable information on the intangible determinants of the value of companies that actually results in significant damages for business firms and their stakeholders.

## MATERIALS AND METHODS

The paper is concerned with the significance of IAs in the Czech listed and non-listed companies operating in chemical and pharmaceutical industries. The main aim is to assess IAs reporting methodologies according to IFRS and CAL. The materiality and structure of IAs is researched (analyze relations between the development of level of IAs in analyzed companies and level of economic growth measured by changes in the Gross Domestic Product (GDP)).

Using application of Ministry of Finance (ARES) the companies operating in pharmaceutical industry were identified. There were identified 71 companies reporting according to CAL and operating in chemical and pharmaceutical industry and seven non-financial companies listed on primary market of PSE as at January 1, 2017. There are only 2 out of them operating in chemistry (Pegas Nonwovens, Unipetrol). The sample of companies was divided into two groups: companies reporting according to IFRS and companies reporting according to CAL.

The financial statements of companies were analyzed. The sample covers the period 2005–2015. For comparability of the results, the starting year was selected due to the fact that all consolidated financial statements of publicly traded companies are obliged to be prepared in an accord with IFRS since 2005 (Regulation of European Commission No. 1606/2002 of the European Parliament and of the Council on the application of international accounting standards). The companies which did not publish their financial statements in prescribed way for the entire period were excluded. The researched sample included 22 firm-years for the IFRS sample and 363 firm-years for the CAL sample.

Due to the possible conclusions comparison the methodology was based on the similar approach of Jerman *et al.* (2010). The share of IAs in balance-sheet total, share of IAs in Fixed Assets and the structure of IAs were analyzed.

$$IABTi(IA \text{ in Balance-sheet Total}) = \frac{\text{Net amount of IA}}{\text{Balance-sheet Total}} \quad (1)$$

$$IAFAi(IA \text{ in Fixed Assets}) = \frac{\text{Net amount of IA}}{\text{Net amount of Fixed Assets}} \quad (2)$$

Due to the significant differences in size of companies reporting according to the CAL the sample was divided according to their size to groups in accord to the Czech Accounting Act reflecting the Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings. The data was processed for individual categories and for entire sample.

## RESULTS AND DISCUSSION

Not all intangible items could be recognized as items of assets and could be reported in financial statements of companies. In terms of financial reporting by companies, this is bringing about a situation in which an increasingly large portion of elements which create value for a business, such as knowledge, technology and clients, are excluded from the balance sheet (B/S) pursuant to prevailing reporting practices.

The world's most significant reporting systems define intangible assets in the following way:

International Accounting Standards Board (IASB) standard 38 (IAS 38) defines an intangible asset as: "an identifiable non-monetary asset without physical substance." Despite the fact that IAS 38 defines in §9 intangible assets as scientific or technical knowledge, design and implementation of new processes or systems, licences, intellectual property, market knowledge, customer loyalty, customer lists, not all of these items meet the criteria for their recognition. The criteria require a *past event* that has given rise to a resource that the entity *controls* and from which *future economic benefits* are expected to flow. Moreover, there is an extra requirement for an intangible asset under IAS 38. This is *identifiability*. This criterion requires that an intangible asset is separable from the entity or that it arises from a contractual or legal right. IAS 38 contains examples of intangible assets, including: computer software, copyright and patents. The special attention the IAS 38 devotes to internally generated intangible assets. In some cases, it is difficult to assess whether an internally generated IAs are qualified for recognition (it is necessary to decide whether the IAs will generate future economic benefits and to determine the cost properly). For this reason, it is necessary to distinguish the development of internally generated IAs into two phases:

- a research phase,
- a development phase.

During the research phase no any IAs shall be recognized. All expenditure incurred is recognized as an expense of the period. An IA arising from development phase shall be recognized if an entity can demonstrate:

- that the completion of IA is technically feasible,
- the IA will be available for use or sale,

- the way in which the IA will generate future economic benefits,
- the availability of resources for completion of the development,
- the ability to measure reliably the expenditure connected to IA development.

The internally generated IAs are measured at the sum of expenditure incurred from the date when the intangible asset first meets all the recognition criteria (general criteria – future economic benefits, cost can be measured reliably, and all special above mentioned conditions).

Accounting for IAs in a business combination is a sensitive area of financial reporting; it is regulated by IFRS 3 Business Combinations. According to Grand Thornton (2008), an "intangible economic resource" is not recognised as an IA, it is subsumed into goodwill. Goodwill – the special item of intangibles – is recognized and reported only due to business combinations, in individual companies could not be recognized despite the fact that it is clear that there are some factors of success of the firm which could not be described by current accounting treatments. Goodwill is initially calculated and recognised as a residual of the consideration exchanged for the combination less the fair value of all identifiable net assets acquired in the business combination. Its subsequent measurement policy is commonly referred to as the "impairment only approach" goodwill is not amortised (it is tested for impairment).

The importance of this special item of intangibles became apparent in mergers and acquisitions. Acquisitions reveal the hidden value of IAs (Boekenstein, 2009, Sedláček *et al.*, 2014), that did not meet the criterion for their recognition previously. The results of Boekenstein's study (carried out for pharmaceutical sector) revealed that in mergers and acquisitions the total value of the acquired company increases approximately six times.

According to Zaroni (2009) six components of goodwill emerging from business combinations are identified. He breaks down the goodwill emerging from a business combination in overpayment, synergies between the target and the acquiring firm, revaluation, newly identified IAs, and internally generated goodwill.

The CAL defines intangible assets in the decree 500/2002 Sb., as individual items with the useful life over one year. IAs according to the CAL include intangible results of research and development, software, valuable rights, goodwill, allowances for greenhouse gas emissions and preferential limits. The intangible results of research and development and software are recognized as IAs only if they are acquired from other entities or internally generated for trading. Internally generated IAs are measured at cost. The cost includes all direct cost and indirect cost (overheads) connected to internal development of IAs during the whole process of development.

I: *Treatments for IAs reporting comparison*

Item	IFRS	CAL	difference
<b>Treatment for IAs</b>	IAS 38, IFRS 3	Decree 500/2002, CAS 13	Special treatment for IAs in IFRS, common treatment for IAs and tangible assets in CAL
<b>IAs definition</b>	An identifiable non-monetary asset without physical substance	No special definition, only list of items	Similar items are considered as IAs, in CAL goodwill is IAs while in IFRS is recognized separately from IAs
<b>IAs recognition</b>	Basic criteria (past event, control, future benefit, measure ability) Special criteria for internally generated IAs (see above)	No basic criteria for all IAs. Special criteria for internally generated R&D and software	In comparison to IFRS there is no conceptual framework defining basic elements of B/S. There are more strict criteria for internally generated IAs recognition in IFRS (some items could be recognized according to CAL but not according to IFRS).
<b>IAs measurement at recognition</b>	IAs acquired are measured at cost Internally generated IAs are measured in sum of expenditure incurred from the date when the IA first meets the recognition criteria	IAs acquired are measured at cost Internally generated IAs are measured in a sum of expenditure	The value of internally generated IAs reported on B/S could be higher according to CAL than according to IFRS
<b>Goodwill – definition</b>	Is not considered as IA. It is treated by IFRS 3	Goodwill is a part of IAs.	–
<b>Goodwill amortization</b>	Not amortized. Only tested for impairment.	Amortized.	–

Source: IAS 38, IFRS 3, Decree 500/2002 Col.

The IAs are regulated by the Czech Accounting Standards in the standard Nr. 13, in the common way for tangible and intangible assets.

Goodwill according to CAL is considered as IAs. It is defined as a positive or negative difference between the valuation of a business entity acquired and the sum of its individually revalued assets less the assumed debts. Goodwill is amortized evenly within 60–120 months after acquisition. Negative goodwill is depreciated on a straight-line basis within 60–120 months of the acquisition of the business to income.

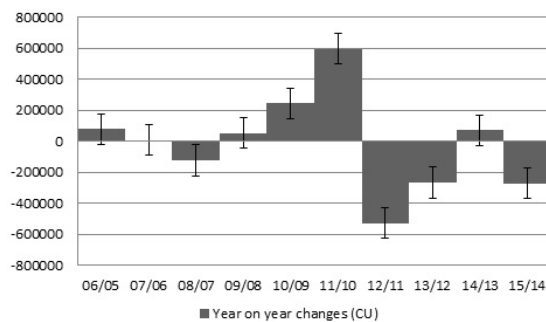
It is evident that criteria for recognition and ways of measurement differ in each above described system of reporting.

Due to the fact, that not all IAs could be recognized on the B/S according to IFRS or US GAAP, the world's accounting standard setters are considering how to address this issue in the most suitable way. In the interests of greater transparency and comparability in financial records, companies are encouraged to disclose information about all the assets that are used in the business, but not shown on the B/S. IAs can be categorized in two subgroups should be distinguished within Intangible Assets: recognized Intangible Assets and non-recognized Intangible Assets in bookkeeping and accounting.

Also according to Hussi (2004), the current reporting methods are not able to capture intellectual capital. This hidden part determines the future

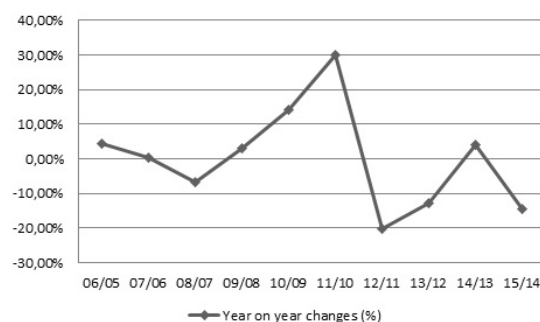
success of company. Investments in intellectual capital are reported as costs, they are reported as short-term expenses, even though they should be seen as essential investments from the new value creation perspective. Intellectual capital is complementary, not subordinate, to financial information. Intangible resources can include skills, human assets, information and organizational assets, and relational and reputational assets. These all represent what a firm has. Another class of intangible resource is capabilities or competences that represent what a firm does. The importance of this special item of intangibles became apparent in mergers and acquisitions. Acquisitions reveal the hidden value of IAs (Boekenstein, 2009, Sedláček *et al.*, 2014), that did not meet the criterion for their recognition previously. The results of Boekenstein's study (carried out for pharmaceutical sector) revealed that in mergers and acquisitions the total value of the acquired company increases approximately six times.

The chemical and pharmaceutical industry is a subject of the research of IAs over the world. The high number of researches is concerned with companies reporting according to IFRS or US GAAP. However, the majority of the Czech companies are reporting according to the national GAAP. Due to this fact, the sample is divided into two groups. The first one covers only 2 companies operating in chemistry which are reporting in accord to IFRS in the Czech Republic. Pegas Nowovens



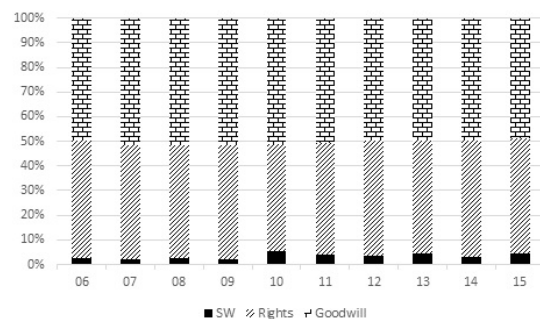
1: Total changes in value of IAs in CU

Source: Own processing



2: Relative changes in value of IAs in %

Source: Own processing



3: Average structure of IAs in %

Source: Own processing

operates primarily in the production of nonwoven textiles. The share of software and valuable rights is insignificant in this company. The IA is represented by goodwill recognized as a result of business combinations (97.3 to 99.9%).

Unipetrol is mainly engaged in refining and petrochemical production activities. Based on sales, the company is one of the ten largest Czech companies. The value of IAs has continuously increased in the researched time series. Within IAs, goodwill was recognized only between the years 2007–2011, this item was not important category (only 2–3% of the total fixed assets). In 2007, the Group acquired insignificant share (0.225% of the share capital) of the company Czech Rafinérská, Inc.

In practice of the Czech companies operating in chemical and pharmaceutical industry is the average share of IAs including goodwill in a range from 2,28% to 37,03% and from 0,04% to 4,30% (goodwill excluding) for the case of publicly listed companies. These results approved the conclusions of Boekenstein's study (2009). The majority of value creating factors is not recognized by the common financial reporting treatments and they are revealed only due to business combinations. The share of IAs is increasing during the first six years of the researched period and then started the slight decrease. The factors influencing the development of the position of IAs in the companies' assets should have been researched in detail in the further



II: Share of IAs on B/S total (%)

Company/Year	05	06	07	08	09	10	11	12	13	14	15
<b>Comp 1</b>	2,28	2,42	2,63	2,76	2,86	3,11	4,39	3,91	3,44	3,69	2,78
<b>Comp 1*</b>	2,28	2,42	2,56	2,67	2,78	3,02	4,30	3,91	3,44	3,69	2,78
<b>Comp 2</b>	N/A	33,93	33,10	34,81	37,26	37,03	29,91	24,85	23,88	23,63	22,52
<b>Comp 2*</b>	N/A	0,04	0,07	0,10	0,09	0,18	0,23	0,19	0,16	0,14	0,60

Source: Own processing

\*) Goodwill excluded out of IAs

research concerning the position of IAs as factors of value creation in economy. There are some theories that the position of IAs in B/S is connected to situation in the national economy (OECD 2008, 2011, Corrado *et al.*, 2005, Andrews and Serres, 2012, Roth and Thum, 2010).

Based on the researched data set, there was revealed that the total value capitalized in IAs (according to the Czech Accounting legislation) is increasing during the whole period. The only exceptions are in the years 2009 and 2010, the slight decrease is supposed to be connected to the beginning of the economic crisis, as seen from Figures 1, 2 and Tab. II.

The second sample covers especially small and medium companies. In case of companies operating in pharmaceutical industry and reporting according to CAL, the average share of IAs in the B/S total is described in the Tab. II. The share of IAs in B/S total differs significantly in particular companies (from 0.0% to 69% in 2005, and from 0% to 77% in 2015). The results were compared to the general results of study of Jerman, Kavčíč, Kavčíč (2010) concerning the Czech Republic (publicly traded companies reporting according to IFRS) and to results of study carried out by Bohušová, Svoboda (results not published yet) in the Czech publicly traded companies. According to results of the fore-mentioned studies, the share for the companies was 6.01% for the year 2005 up to 6.40% in 2008 (Jerman, Kavčíč, Kavčíč, 2010), and from 8.67% in 2005 to 19.81% in 2008 (according to above mentioned study of Bohušová, Svoboda).

Despite this fact there are some differences in recognition and measurement of IAs reported according to CAL, the share of IAs on B/S total in pharmaceutical companies reporting according to CAL is lower in comparison to companies reporting according to IFRS. It could be caused by the fact that the sample covers companies reporting according

to CAL i.e. small and medium-sized entities. These companies have usually not such possibilities of increasing of equity or liabilities for financing investment to intangible assets in comparison to large listed companies. The criteria for the recognition and measurement are so not as strict as in IFRS (R&D, start-up cost (till 2016), internally generated IAs. Due to fore-mentioned different condition for doing business for different size of companies, the companies were sorted according to balance sheet total to micro, small, medium-sized and large groups. The criteria level is an accord to the Czech Accounting Act.

The results of the analysis of the IAs in the Czech pharmaceutical companies reporting according to CAL are in line with these conclusions (only exception 2015). The analysis made by Jerman, Kavčíč, Kavčíč (2010) proves that IAs are becoming more and more important for today's business environment, but there is still a significant difference between different types of economies. The detail analysis in Tab. 1 and Fig. 3 describes the development of the particular categories of companies.

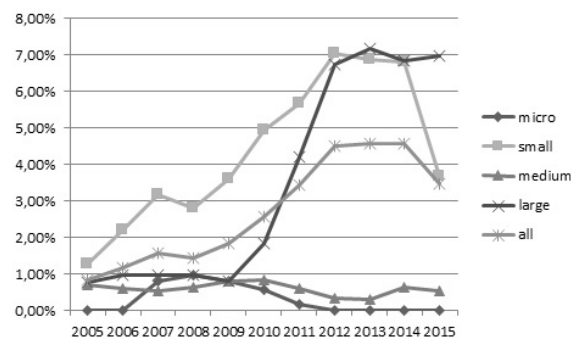
The closer analysis of the structure of IAs carried out revealed quite different structure of the IAs in each company. The average structure of IAs in their development over time describes the Fig. 4. It is evident that the most significant item of IAs is software (the share is from 55.8% in 2005 to 50.2% in 2015), followed by rights and patents (from 12.0% in 2005 to 24.6% in 2013) and results of research and development (from 0.02% in 2011 to 7.7% in 2006).

Our research concerns the companies operating in the pharmaceutical sector in the Czech Republic and the importance of intangible assets in these companies. It is desirable to increase the Return on IAs indicator continuously. In the observed time series, this indicator has fluctuated considerably (Fig. 5). Since the level of the indicator is affected in

III: Share of IAs in B/S total by categories in %

Type/Year	05	06	07	08	09	10	11	12	13	14	15
<b>micro</b>	0,00	0,00	0,82	0,96	0,82	0,56	0,16	0,01	0,00	0,00	0,00
<b>small</b>	1,26	2,22	3,17	2,81	3,61	4,93	5,67	7,05	6,88	6,82	3,67
<b>medium</b>	0,71	0,62	0,54	0,63	0,81	0,82	0,61	0,35	0,31	0,65	0,55
<b>large</b>	0,77	0,97	0,98	0,96	0,81	1,85	4,20	6,73	7,16	6,86	6,96
<b>All</b>	0,85	1,18	1,56	1,45	1,83	2,59	3,43	4,51	4,57	4,56	3,49

Source: own work based on annual reports



4: IAs/Balance sheet total

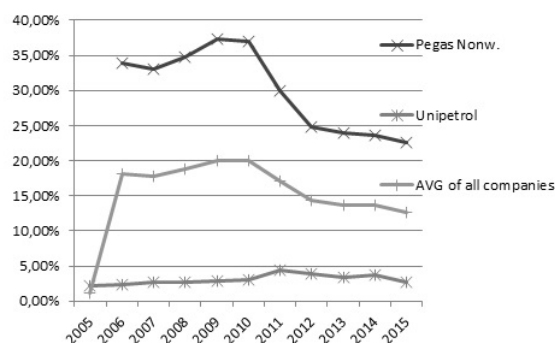
Source: own work based on annual reports

both by the amount of revenue and the amount of input IAs involved, the influence of the factors will be examined in a future research.

According to the conclusions of the study of Jerman, Kavčič, Kavčič (2010), goodwill is the most important item of IAs intangible asset. Goodwill gathers the not recognized intangible capital in business companies which arise due to business combinations. In companies without business combinations in analyzed period the intangible capital such as knowledge, human capital, education and training, R&D are not recognized despite their possible existence. Similarly to results of this study an increasing share of goodwill is evident. It is due to business combination undertaken in the analyzed period. The conclusions concerning the structure of IAs in our research are almost identical with this study.

The analysis made by Jerman, Kavčič, Kavčič (2010) proves that IAs are becoming more and more important for today's business environment, but there is still a significant difference between different types of economies.

It is clear that from the Fig. 5 that the overall trend in the share of IAs in total assets is rather growing, however, for all companies the development differs significantly in the analyzed period. The analyzed period was affected by global economic crisis, with its first symptoms in 2007 and continuing in 2008 and 2009. For this reason it was deduced that the volatility could be influenced by this situation. Therefore, a measurement of correlation between the share of IA in Fixed Assets and the development of the economy measured by changes in GDP was evaluated.



5: The share of IA on B/S total Development

Source: own work based on annual reports

## CONCLUSION

The paper is the initial part of research concerning the role of intangible assets in economics of business companies and possible ways of their measurement. In recent days, the accounting treatment of intangibles in IFRS has begun to change, with the decision to capitalize expenditures connected to intangibles. Recently, it has been proposed to extend the capitalization of intangibles to expenditure on research and development (R & D). There are not any treatments for reporting the majority of intangible capital (knowledge, human capital, education, training, market position, etc.) in financial statements of companies according to current financial reporting treatments. Only due to business combination these items are released as an item of goodwill.

The research carried out was concentrated on the comparison of accounting treatments, development and structure of IAs of publicly traded companies reporting in an accord with IFRS and companies reporting according to CAL operating in chemical and pharmaceutical industry in the Czech Republic. The IAs category is getting more significant in a span of time. The prevailing item in IA is goodwill which represents intangible capital which is not recognized by standard methods of financial reporting. Only business combinations undertaken reveal these factors. There is an increasing tendency in volume of IAs in companies listed in Prague Stock Exchange. Any common relation between a volume of IAs and the economic growth was not confirmed. Comparing the results of our analysis to the similar analysis carried out on highly developed market economies Jerman *et al.* (2010), Niebel *et al.* (2016), Su and Wells (2015) there is a significant difference in the share of intangibles between market economies and the Czech Republic.

While the conclusions of this study are influenced by the limited number of selected companies that are listed on the Prague Stock Exchange reporting according to the IFRS, the sample of the companies reporting according to the CAL is robust enough to serve reliable information and the conclusions could be considered significant and will be subject to the further research.

#### Acknowledgements

The paper is the result of the GA ČR no. 15-24867S „Small and medium size enterprises in global competition: Development of specific transfer pricing methodology reflecting their specificities“.

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