



## Research on the accounting quality of public listed companies at the Budapest Stock Exchange

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### Abstract

The operation of a financial reporting system is very expensive. In all areas where costs arise, it is important to examine whether the benefits exceed the costs or not. The objectives of financial reporting in Hungary are specified by Act C of 2000 on Accounting (HLA). In this paper, we will show these objectives and the defined accounting principles, as well. With the help of previous research, we have reviewed how accounting quality is measured. The aim of this research is to examine the difference in accounting quality between the publicly listed and private companies in Hungary and develop an evaluation process that takes due account of the complexity of the topic. To this end, we studied the separate (non-consolidated) financial statements of 63 Hungarian companies during the period of 1998–2016. Forty-seven percent of the statements were disclosed by public companies and fifty-three percent were disclosed by private companies. The examined financial statements were prepared in accordance with the HLA. To evaluate the data, we examined accruals, timely loss recognition, the volatility of earnings, cash flow and earnings management towards target. To summarize the results, we developed an evaluation model which is based on the basic accounting principles and the above-mentioned methods. We found that publicly listed companies have higher accounting quality compared to private companies.

**Keywords:** Accounting quality, BSE, Earning management, Jones Model, Timely Loss Recognition.

### Streszczenie

#### Badanie jakości rachunkowości spółek giełdowych na Giełdzie Papierów Wartościowych w Budapeszcie

System sprawozdawczości finansowej jest bardzo kosztowny. We wszystkich obszarach, w których powstają koszty, ważne jest oszacowanie, czy korzyści przewyższają koszty, czy też nie. Cele sprawozdawczości finansowej na Węgrzech reguluje ustawa C z 2000 roku o rachunkowości. W niniejszym opracowaniu zostaną one przedstawione oraz określone zasady rachunkowości. Na podstawie innych badań ustalono, w jaki sposób mierzona jest jakość rachunkowości. Celem tego badania jest wskazanie różnicy w jakości rachunkowości spółek notowanych na giełdzie i prywatnych przedsiębiorstw na Węgrzech oraz opracowanie procesu oceny, uwzględniającego złożoność tematu. W tym celu zbadano jednostkowe (nieskonsolidowane) sprawozdania finansowe 63 węgierskich spółek w latach 1998–2016. 47 procent sprawozdań zostało sporządzonych przez spółki publiczne, a 53 procent przez spółki prywatne. Zbadane sprawozdania finansowe zostały sporządzone zgodnie z postanowieniami HLA. Aby ocenić pozyskane dane, zbadaliśmy rozliczenia międzykresowe, terminowe rozpoznawanie strat, zmienność zysków, przepływ środków pieniężnych i zarządzanie zyskami pod kątem realizacji założonych celów. Aby podsumować wyniki, opracowano model ewaluacyjny, który opiera się na podstawowych zasadach rachunkowości i wymienionych metodach. Stwierdzono, że spółki notowane na giełdzie mają wyższą jakość rachunkowości w porównaniu ze spółkami prywatnymi.

**Słowa kluczowe:** BSE, manipulacja wynikami, model Jonesa, jakość rachunkowości, wykrywanie strat.

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## Introduction

The transition to the market economy began in Hungary in the late 1980s. It happened simultaneously with the regime change and caused further huge changes. Regulations, institutions and the political elite were replaced. The one-party dictatorships created by the Soviet pressure were changed into a parliamentary democracy based on the multi-party system, and the centrally planned economies founded on state ownership were substituted for market economies based on private ownership, as well (Romsics, 2014). Market economies require highly developed capital markets. In Hungary, the Stock Exchange was founded in Pest in 1864. It did not operate between 1948 and 1990, but after the regime change it was reestablished. Since then, electronic trading and the BUX index have been introduced (Korányi, 2005). According to the World Bank database, the trading value of the Budapest Stock Exchange was 10,382,730,752 in current US \$ in 2017. This amount is only a fraction of the Austrian (39,986,893,432) or the Polish (68,001,894 912) numbers, but not negligible. The total trading value (% of Hungarian GDP) of the Budapest Stock Exchange in 2016 was 6.2%, which is far below the pre-crisis level (33.81% in 2007, 26.88% in 2006) but still significant. High quality market information is necessary for the operation of a market economy. To ensure this, Act C of 2000 on Accounting (Hungarian Law of Accountancy, HLA) prescribes special obligations for publicly listed companies, for example, the obligatory audit. The main objective of this paper is to find out whether these special obligations and the demand for higher accounting quality lead to higher accounting quality for publicly listed companies in Hungary or not. Our secondary goal was to develop an evaluation process that takes due account of the complexity of the topic. We measured accounting quality with the help of the evaluation model developed by us which contains the results of the different methods used in prior research, so this approach is unique in this research field. The evaluation model was set up before the calculations to avoid damaging the independence of the evaluation process. Since accounting quality is a complex issue, such an approach is proposed in the future. We reviewed the literature and chose the relevant methods which are appropriate to use in the Hungarian environment in connection with the selected companies. The final evaluation model contains an examination of discretionary accruals, the volatility of earnings, timely loss recognition and earnings management towards target and cash flow.

### **1. Accounting quality according to the Hungarian Law of Accountancy**

To examine the quality of financial reporting, first, its objective has to be defined. According to the Hungarian Law of Accountancy, the operation of a market economy requires the availability of objective information regarding the assets and liabilities, financial position and profits and losses of businesses, non-profit oriented organizations and other types of economic operators, including trends and changes, so as to enable market players to make informed decisions relying on the information available.

To complete this obligation, the economic entities shall prepare a financial statement – in the Hungarian language – on their operation and on their financial position and performance supported by an accounting system prescribed in the HLA, following the closing of the books pertaining to the financial year. The financial statement must give a true and fair view of the holdings of the economic entity and the contents (assets and liabilities), of its financial standing and profitability. The financial statement mentioned above could be an annual account, a simplified annual account, a consolidated annual account or a simplified report [HLA.8. §(2)]. Publicly listed companies shall prepare an annual account and a consolidated annual account as well [HLA.10. §(1)]. The business entities falling under the scope of Article 4 of Regulation No. 1606/2002/EC on the application of IFRS, prepare their consolidated annual account in accordance with the IFRS promulgated in the Official Journal of the European Union [HLA.10. §(2)]. In this paper we analyzed the annual account data, which is a separate (non-consolidated) financial statement of the companies. The annual account includes the balance sheet, the profit and loss account and the notes on the accounts [HLA.19. §(1)]. The cash flow is part of the notes on the accounts.

The HLA contains the so-called Accounting Principles, which are necessary to be completed to have high quality financial statements. The financial statements shall be drawn up and books shall be kept in compliance with these basic principles. Any derogation from the basic principles shall be made only as permitted by the HLA. These basic accounting principles are the principle of going concern, the principle of completeness, the “true and fair view” principle, the principle of clarity, the principle of consistency, the principle of continuity, the principle of matching, the principle of prudence, the principle of grossing up, the principle of accruals, the principle of substance over form, the principle of materiality, the principle of individual assessment and the principle of cost-benefit.

The accounting quality measuring methods examine the compliance of the financial reports with these basic accounting principles.

It is very important to explain the issue of true and fair view in the HLA. The HLA mentions it before the first chapter. The HLA states that it “contains accounting rules which are in harmony with the relevant directives of the European Communities, and with international accounting principles, and based upon which reliable information resulting in a true and fair view can be provided with respect to the profitability, financial position and performance, the assets and holdings, and the future plans of the enterprises falling under the scope of this Act”. The HLA should be used in this spirit. However, it is also a separate principle under the name “true and fair view” principle. It is necessary to emphasize the importance of this topic since this accounting principle governs the logic of the accounting system in the country. The HLA uses the following definition for “true and fair view” principle: “Assets shown in the books and contained in the financial report shall be such that they can be found and verified as in fact being in existence, tenable and verifiable. The measurement of such assets shall be carried out in accordance with the valuation principles prescribed in this Act, as well as with the relevant valuation procedures”.

Bankruptcy models examine the principle of going concern: “Drawing up the financial report and the accounting records shall be based on the assumption of the economic entity’s capacity to sustain operations in the foreseeable future and on its ability to continue its activity, and the termination of or a considerable reduction, for any reason, in the operation is not expected” [HLA.15.§(1)]. Valuation shall be based on the principle of going concern unless the enforcement of this principle is hindered by any provision to the contrary, or if any factor or circumstance prevails which contradicts the continuation of entrepreneurial activities.

Analyzing accruals, timely loss recognition, the volatility of earnings and the earning management toward targets test the fulfilment of the principle of matching and the principle of accruals. “When determining the profit or loss for a certain period of time, the revenues recognized for a given period of activities and the costs (expenditures) directly associated with such revenues shall be taken into account, regardless of financial settlement. The revenues and costs shall relate to the period in which they were incurred for economic purposes” [HLA.15.§(7)]. “The consequences of economic events concerning two or more financial years shall be recognized under the revenues and costs of the period in question in the proportion in which they are incurred between the underlying period and the accounting period” [HLA.16.§(2)].

With the help of conservatism, for example, timely loss recognition, the principle of prudence can be tested. “No profits shall be recognized where the financial realization of the revenues and certain items of income are uncertain. When determining the profit or loss for the year, foreseeable liabilities and potential losses shall be taken into account and shall be covered by provisions, even if such liabilities or losses become apparent only between the date of the balance sheet and the date on which it is drawn up. Depreciation and impairment losses shall be accounted for, regardless of whether the income statement for the year shows a profit or a loss” [HLA.15. § (8)]

The principle of completeness is analyzable with the help of the volatility of earnings, timely loss recognition, earning management towards small positive incomes and cash flow. “Economic entities shall keep account of all economic events, the effect of which on the assets and liabilities, as well as on profits are to be shown in the financial report, including the economic events which pertain to the financial year in question that became known after the balance sheet date but before the date of closing, as well as the ones generated by the economic events of the financial year ending on the balance sheet date, that had not yet taken place prior to the balance sheet date but became known prior to the closing date of the balance sheet” [HLA.15. §(2)].

The principle of materiality can be tested with the analysis of timely loss recognition and the earnings management towards small positive incomes. “For the purposes of the financial report, information is material if its omission or misstatement could influence – within reason – the economic decisions of users taken on the basis of the financial report” [HLA.16.§(4)].

In this paper, we tested the principle of matching, the principle of accruals, the principle of prudence, the principle of completeness and the principle of materiality.

## 2. Key factors of accounting quality

In connection with being publicly listed, transparency and the increase in accounting quality are benefits which are often mentioned. However, the quality of financial reports is affected by several factors.

The first figure shows the forces which shape accounting quality according to Soderstrom & Sun (2007).

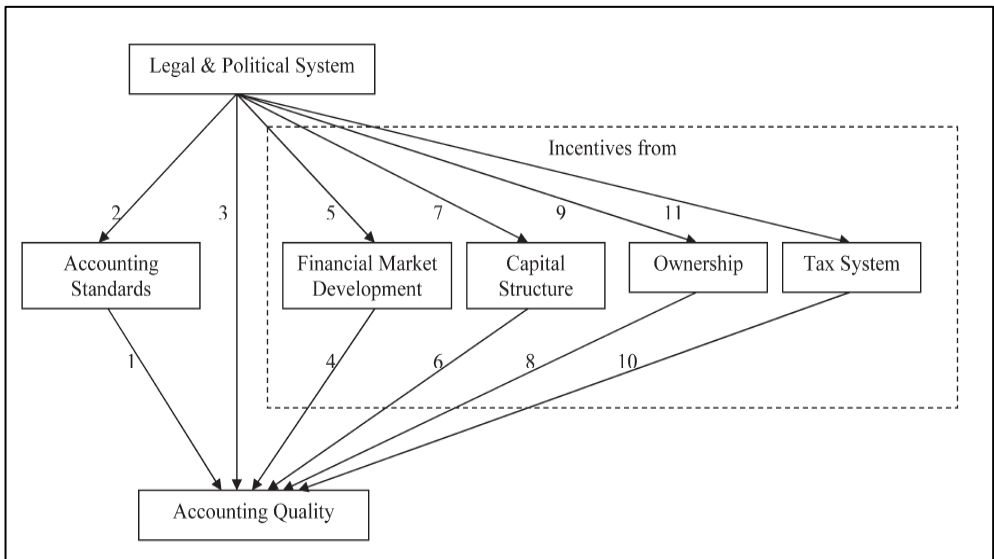
The Public policy paper of ICAEW, published in 2016, identified the following key factors:

- Managers' incentives,
- Institutions.

According to the findings of the ICAEW research, earnings tend to be managed

- if managers get bonuses after the reported earnings,
- if managers get bonuses affected by share prices,
- to avoid breaching debt covenants,
- to meet or beat market expectations,
- where there are political reasons to do so (Political costs), e.g. regulated market,
- where taxable profits and reported profits are linked,
- less in case of family-dominated listed companies.

**Figure 1.** The influencing factors of accounting quality



Source: Soderstrom, Sun (2007).

The relationship between bonuses and accounting quality was studied by Healy (1985), Erickson et al. (2004), Cheng et al. (2005), and Armstrong et al. (2010), among others.

According to Healy (1985), bonus schemes create incentives for managers to select accounting procedures and accruals to maximize the value of their bonus awards. He found a strong correlation between accruals and managers' income-reporting incentives under their bonus contracts. Managers are more likely to choose income-decreasing accruals when the upper or lower bounds of their bonus plans are binding, and income-increasing accruals when these bounds are not binding. Erickson's (2004) research dealt with the link between executive compensation and accounting fraud. They studied a hundred firms during the period 1996-2003. Fifty percent of the examined firms were accused of accounting fraud by the Securities and Exchange Commission (SEC) while fifty percent were not. The probability of accounting fraud increases in the percent of total executive compensation that is stock-based. Erickson et al. (2004) used governance characteristics, financial performance, financial distress, firm size, and the likelihood of management wanting to obtain external financing as control variables. Cheng's (2005) paper examined the effect of equity incentives on accounting quality. According to the results, stock-based compensation and ownership can lead to incentives for earnings management. Armstrong's (2010) paper brought different results compared to prior research. They found that firms with high stock-based incentives are less likely to commit accounting irregularities.

An increase in the tax rate does not necessarily results in an increase in the tax revenue. "Changes in tax rates have two effects on tax revenues: the arithmetic effect and the economic effect. The arithmetic effect is simply that if tax rates are lowered, tax revenues (per dollar of tax base) will be lowered by the amount of the decrease in the rate. The reverse is true for an increase in tax rates. The economic effect, however, recognizes the positive impact that lower tax rates have on work, output, and employment – and thereby the tax base – by providing incentives to increase these activities. Raising tax rates has the opposite economic effect by penalizing participation in the taxed activities. The arithmetic effect always works in the opposite direction from the economic effect. Therefore, when the economic and the arithmetic effects of tax-rate changes are combined, the consequences of the change in tax rates on total tax revenues are no longer quite so obvious" (Laffer, 2004, p.2). If the economic effect is strong, the financial statements cannot give a true and fair view of the holdings of the economic entity and the contents (assets and liabilities), of its financial standing or profitability. To sum up, if the tax rates are too high, it might lead to lower accounting quality.

Watrin et al. (2012) used the German corporate income tax reform (2001) to study the link between taxation and accounting quality. They used the Jones Model and found that accounting quality significantly increased after the tax reform. Private companies and companies with simpler ownership structures were less likely to manage their earnings because of tax purposes. Even if there is separate tax and financial accounting, an

aggressive taxation strategy can affect accounting quality. Firms with an aggressive tax position may choose a financial accounting method that conforms to the tax choice to increase the probability that the Internal Revenue Service (IRS) will allow the tax treatment. According to these results, managers try to use financial accounting to make tax savings and increase cash flow. Cloyd et al. (1996) found that medium and large-scale manufacturing companies often manage their earnings in a style that is typical of private companies. All in all, the taxation rules probably affect financial reporting; as it changes, the effects can change, as well.

Previous research, e.g., Basu et al. (2001), found that the size of the audit company affects accounting quality; thus, employing a larger audit company may lead to higher accounting quality. In contrast, Ball et al. (2004) examined the differences between the accounting quality of private and public companies and used the audit firm's size as an independent explanatory variable. In their study, audit firm size did not explain the difference between the accounting qualities of the two groups.

According to the ICAEW report (2016), listed companies and private companies have different incentives. Private companies have lower accounting quality than listed companies (also in the case of similar accounting regulations) because of the lower demand for high quality financial statements of private companies. This is not necessarily bad news. Accounting quality has a cost and the question is whether it is worth it or not having taken into consideration the "cost-benefit principle" (ICAEW, 2016).

### 3. Measuring accounting quality

Foreign researchers use generally accepted models and methods to measure accounting quality. Before the implementation of these methods, their usefulness in connection with Hungarian financial statements must be studied. We have reviewed the accounting principles of the HLA and matched these qualitative requirements with the accounting quality measuring methods. We studied and matched the accruals, cash flow, timely loss recognition, value relevance, earnings management towards small positive incomes, bankruptcy prediction models and the volatility of earnings. We found that these generally accepted models and methods are useful tools for measuring accounting quality in Hungarian environment, as well. This result was not surprising, since Hungary is an EU member state, therefore its regulatory environment is like the other EU members where these methods were used before.

Every single method is based on estimation. Previous research studied one of the following areas to measure accounting quality, among others:

- Accruals,
- Timely loss recognition,
- Earnings management towards target,
- Cash flow,

- Volatility of earnings,
- Value relevance,
- Bankruptcy forecast.

We wanted to use all methods, but we had to reject two of them. To use value relevance, stock prices are necessary, which are not available for non-listed companies. Bankruptcy forecasting models require a completely different sample than the other methods, so the use of these models was rejected as well.

We studied accruals, timely loss recognition, earnings management towards target, cash flow and the volatility of earnings, so in the following part, these five areas will be described.

Accounting systems can be divided into two main groups: cash basis and accrual basis. In the case of cash basis accounting, revenues are recognized when cash is received, and expenses are recorded when cash is paid. In the case of accrual basis accounting, revenues are recognized when earned and expenses are recorded when incurred. In 1985, Healy used accruals 6 years before the most commonly known Jones model (1991). He defined accruals as the difference between reported earnings and cash flow from operations. These accruals were used to analyze earnings management. Healy (1985) did not split the accruals into discretionary and non-discretionary accruals, he just compared the values of the different groups. Jones (1991) set up a regression model which divides the accruals into discretionary and non-discretionary accruals. This standard Jones (1991) model is the most popular discretionary model (Islam et al., 2011). For example, Tendeloo & Vanstraelen (2005) used the standard Jones model to detect earnings management. Dechow (1995) created the modified Jones model, which has a lower measurement error compared to the standard Jones model. Among others, Watrin et al. (2012) and Koster (2016) used the modified Jones model, as well. Kothari et al. (2005) suggest that performance matching is crucial to the design of well-specified tests based on discretionary accruals, which was later confirmed by Keung & Shih (2014). Yoon et al. (2006) set the Jones model for Korean companies. Islam et al. (2011) found that the modified Jones model is not effective for companies listed on the Dhaka Stock Exchange; however, with the inclusion of few factors, for example, retirement benefit expenses or asset disposal gains and/losses, it can be an effective tool for detecting earnings management. We have the necessary data to use the standard (1991) or the modified (1995) Jones model. We have chosen to use the modified model proposed by Dechow et al. (1995) because it is more effective at detecting earnings management. The use of accruals as an earnings management proxy has a long history and it still seems popular. Perotti & Wagenhofer (2014), for example, suggest accruals measures as measures of earnings quality after studying the effectiveness of earnings management proxies.

This method tests the principle of matching and the principle of accruals. Accruals are not observable; they have to be calculated. Jones (1991) used the following equation:



$$TACC_t = \Delta CASS_t - \Delta CASH_t - \Delta CLIAB_t - DEPR\&AMOREXP_t \quad (1)$$

Where:

$TACC_t$  – Total accruals in year t.;

$\Delta CASS_t$  – Change in current assets in year t.;

$\Delta CASH_t$  – Change in cash in year t.;

$\Delta CLIAB_t$  – Change in current liabilities in year t.;

$DEPR\&AMOREXP_t$  – Depreciation and amortization expenses in year t.

Using the Jones (1991) model, accruals are dividable into discretionary and nondiscretionary accruals. After calculating the discretionary accruals, the studied groups can be analyzed.

$$\frac{ACC_t}{TA_{t-1}} = \alpha + \beta_1 \frac{1}{TA_{t-1}} + \beta_2 \frac{\Delta REV_t}{TA_{t-1}} + \beta_3 \frac{PPE_t}{TA_{t-1}} + \varepsilon_t \quad (2)$$

Where:

$ACC_t$  – Accruals in year t.;

$TA_{t-1}$  – Total assets in year t-1.;

$\Delta REV_t$  – Change in revenues in year t.;

$PPE_t$  – Gross property, plant and equipment in year t.

Dechow et al. (1995) improved this model by changing the second explanatory variable:

$$\frac{ACC_t}{TA_{t-1}} = \alpha + \beta_1 \frac{1}{TA_{t-1}} + \beta_2 \frac{\Delta SALES_t - \Delta REC_t}{TA_{t-1}} + \beta_3 \frac{PPE_t}{TA_{t-1}} + \varepsilon_t \quad (3)$$

Where:

$\Delta SALES_t$  – Change in net sales in year t.;

$\Delta REC_t$  – Change in receivables in year t.

$$\begin{aligned} \Delta TACC_t &= TACC_t - TACC_{t-1} \\ &= (DACC_t - DACC_{t-1}) + (NDACC_t - NDACC_{t-1}) \end{aligned} \quad (4)$$

Where:

$\Delta TACC_t$  – Change in total accruals in year t.;

$TACC_{t-1}$  – Total accruals in year t-1.;

$DACC_t$  – Discretionary accruals in year t.;

$DACC_{t-1}$  – Discretionary accruals in year t-1.;

$NDACC_t$  – Nondiscretionary accruals in year t.;

$NDACC_{t-1}$  – Nondiscretionary accruals in year t-1.

Previous research, e.g., Hoeve (2009), Lang et al. (2003), Christensen et al. (2015), Paananen (2008), and Ball et al. (2004), used timely loss recognition to measure accounting quality. This method tests the principle of completeness, the principle of matching, the principle of prudence, the principle of materiality and the principle of accruals. With the help of the LNEG dummy variable, the large losses can be analyzed. Hoeve (2009):

$$\frac{NI_t}{TAS_t} \leq -0,2 \rightarrow LNEG_t = 1 \quad (5)$$

$$\frac{NI_t}{TAS_t} > -0,2 \rightarrow LNEG_t = 0 \quad (6)$$

Where:

$NI_t$  – Net income in year t.;

$TAS_t$  – Total assets in year t.;

$LNEG_t$  – Dummy variable.

Previous research, e.g. Lang et al. (2003), Paananen (2008) and Hoeve (2009), used earnings management towards targets to measure accounting quality. This method tests the principle of completeness, the principle of matching, the principle of materiality and the principle of accruals. With the help of the SPO dummy variable, earnings management toward small positive incomes can be analyzed.

Paananen (2008):

$$0 < \frac{NI_t}{TAS_t} \leq 0,01 \rightarrow SPO_t = 1 \quad (7)$$

$$\frac{NI_t}{TAS_t} \leq 0 \text{ or } \frac{NI_t}{TAS_t} > 0,01 \rightarrow SPO_t = 0 \quad (8)$$

Where:

$SPO_t$  – Dummy variable.

A low negative correlation between cash flow and accruals is normal; a significant diversion from it means lower accounting quality. Paananen & Lin (2009) Barth et al. (2007) Christensen et al. (2015) Hoeve (2009), Lang et al. (2003) Liu et al. (2011), and Paglietti (2010) used cash flow-based methods to measure accounting quality.

The examination of the volatility of earnings is a very popular accounting quality measuring method. Higher volatility means higher accounting quality, since management prefers not to report outrageous results. There are critics, such as Perotti & Wagenhofer (2014), but this method has been used in several studies. The examination of

volatility of earnings was used by Lang et al. (2003), Ball & Shivakumar (2005), Barth et al. (2007), Hoeve (2009), Paananen & Lin (2009), Paglietti (2010), Liu et al. (2011), Ames (2013), and Christensen et al. (2015).

Ball R. & Shivakumar L. (2005):

$$|\Delta NI_{it}| = \left| \frac{NI_{it} - NI_{it-1}}{TAS_{it}} \right| \quad (9)$$

Where:

$NI$  – net income;

$TAS$  – total assets.

## 4. Methodology

### 4.1. Research design

The quality of financial reporting is affected by different factors, such as geographic location, cultural environment, legal environment, accounting rules, company size, ownership structure, stock market presence or lack thereof, the business activities of the company, tax strategy, future goals, and applied management incentive system etc. (Singleton-Green, 2016) This also shows the complexity of the subject and draws attention to the need to properly design the sample. To study the effect of a single factor, the other quality influencing factors must be eliminated. The elimination of the effect of other quality influencing factors can happen in two ways. First, when compiling the sample, the influencing factors are taken into account and the database is compiled so that these factors affect the two groups equally. The influencing factors, which cannot be eliminated this way, should be integrated into the model; thereby, the impact could be quantified. In this paper, the stock market presence was examined while the other factors identified were eliminated and their impact minimized. All selected companies operate in Hungary, so the effects of different geographic locations, cultural environments and legal environments are automatically eliminated. During the examined period, the publicly listed companies prepared their separate financial statements according to the HLA. This ensures comparability between the separate financial statements' data of the listed and private companies. The other factors are either eliminated by sample matching or quantified by being integrated into the regression equations. Companies from the financial sector are excluded because of their significantly different reporting obligation. Each public company has a private company as a match. The matched private company must be as similar to the private company as possible. To select a private company for the sample, it must be like the public company in company size, foundation date, type of disclosed financial statement and main business activity. We used

registered capital to measure the size. We selected registered capital because it is relatively constant and it describes the firm's willingness to take risks. Each selected private company was founded after 2002. This is necessary to have the required number of financial statements and assure that the selected financial statements fulfill the “going concern principle”. A further condition was that the matched companies cannot disclose simplified financial statements. This was essential to have the necessary information to carry out the calculations. The final selection criterion was the registered main business activity of the company.

**Table 1.** Sample matching

<b>Publicly listed company</b>		
<b>Company name</b>	<b>Main business activity</b>	<b>Registered capital (Ft)</b>
Örmester Nyrt.	8010'08 Private security activities	259,830,000
<b>Private company</b>		
<b>Company name</b>	<b>Main business activity</b>	<b>Registered capital (Ft)</b>
G4S Készpénzlogisztikai Kft.	8010'08 Private security activities	469,600,000

Source: Author's own elaboration.

The above-mentioned conditions must be met at the same time. Table 1 illustrates the selection process of the private companies through an example.

#### **4.2. The matching of accounting quality measuring methods and the basic accounting principles of the Hungarian Law of Accountancy**

The Hungarian Law of Accountancy defines the objectives of financial reporting, the basic accounting principles and the qualitative characteristics which are necessary to have high quality financial statements. We have matched these basic accounting principles and the accounting quality measuring models. We could match it to one of the principles, the analysis of discretionary accruals, small positive incomes, large negative incomes, the volatility of earnings and the relationship between accruals and cash flow. Table 2 shows the results of the matching process. From the table it can be seen that not every basic accounting principle can be tested, but every method tests at least one of the basic accounting principles. To test the going concern principle, bankruptcy forecasting models are appropriate. None of the models used are bankruptcy forecasting models, so we solved the problem of testing this principle with the help of the collecting sample. The sample contains financial statements which are made in the fiscal years between 1998 and 2016. Since it is 2018 now and the examined companies are still operating (according to the database of Opten Kft.), the going concern principle is fulfilled.

The principle of clarity as well as the principles of consistency, continuity, grossing up, substance over form, individual assessment and the principle of cost-benefit cannot be tested with the help of the sample matching process or the above-mentioned methods.

Six basic accounting principles can be tested with these five methods and with the help of the sample matching process.

**Table 2.** The matched principles and methods

<b>Basic accounting principles</b>	<b>M1</b>	<b>M2</b>	<b>M3</b>	<b>M4</b>	<b>M5</b>
Principle of going concern					
Principle of completeness	X	X		X	X
“True and fair view” principle	X	X	X	X	X
Principle of clarity					
Principle of consistency					
Principle of continuity					
Principle of matching	X	X			
Principle of prudence				X	X
Principle of grossing up					
Principle of accruals	X	X			
Principle of substance over form					
Principle of materiality			X	X	X
Principle of cost-benefit					
Principle of individual assessment					

Legend:

M1: discretionary accruals,

M2: volatility of earnings,

M3: timely loss recognition,

M4: earnings management towards small positive incomes,

M5: analysis of cash flow.

Source: Author’s own elaboration.

The principle of cost-benefit and the principle of individual assessment are not qualitative characteristics, so the testing of these principles is not necessary.

### **4.3. The framework of the evaluation process**

Accounting quality is not directly observable; measuring it requires estimations. Previous researchers used one of these methods and made their decision indicating that according to (for example) discretionary accrual, the accounting quality of the studied group is higher or lower. We were striving to use more accounting quality measuring

models. To this end, we have developed an evaluation model which contains different methods – as many as possible. Every method has an output, as shown in Figure 2. The equation of the evaluation model in a general form using  $n$  methods is the following:

$$H_x = S_1 \times M_1 + S_2 \times M_2 + \dots + S_{(n-1)}M_{(n-1)} + S_nM_n \quad (10)$$

$$H_x \leq 0 \rightarrow \text{we reject hypothesis, otherwise we do not find a reason to reject } H_x \quad (11)$$

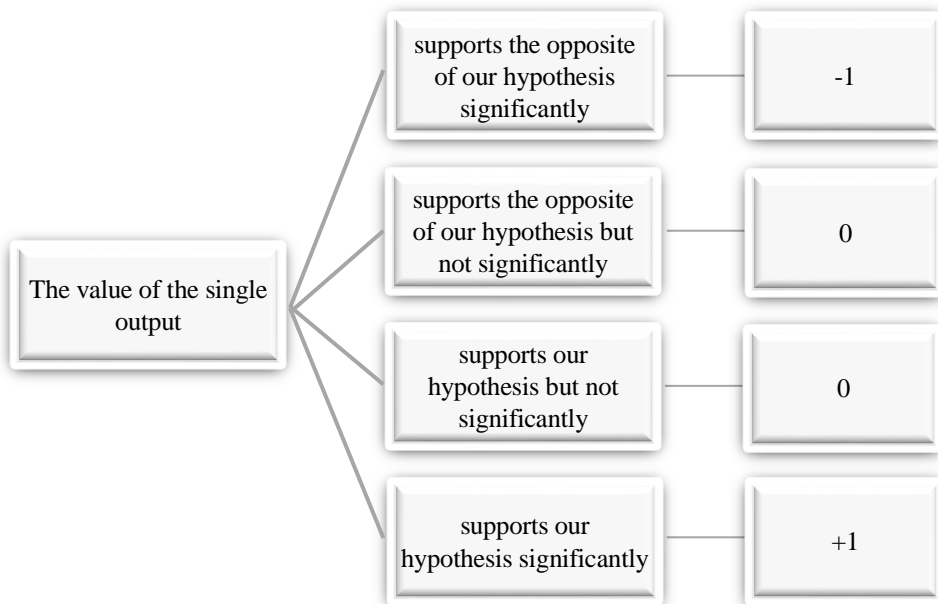
Where:

$H_x$  – Studied hypothesis;

$S$  – The weight of the single output;

$M$  – The output of the applied model, according to the next figure.

**Figure 2.** The different scenarios and the values of their output



Source: Author's own elaboration.

#### 4.4. Weighting the output of the applied methods

We analyzed financial statements with the help of different methods. During the evaluation process we used the evaluation model described above. This model uses weighting, which is based on the number of the measured basic accounting principles and the frequency of their measurement. Measuring frequency is necessary to avoid the asymmetric measurement of the studied basic accounting principles. The following equation describes the logic of the weighting:

$$S_{Mx} = \frac{M_{xAE1} \times MK_{AE1} + M_{xAE2} \times MK_{AE2} + \dots + M_{xAE14} \times MK_{AE14}}{\sum_{AE1}^{AE14} M_1 \times MK + \sum_{AE1}^{AE14} M_2 \times MK + \dots + \sum_{AE1}^{AE14} M_6 \times MK} \quad (12)$$

Where:

$S_{Mx}$  – The weight of method x in the evaluation model;

$AE$  – Basic accounting principles from 1 to 14;

$M_{xAE_{1-14}}$  – Dummy variable, which is 1 if method x measures the studied basic accounting principles, 0 otherwise;

$MK_{AE_{1-14}}$  – The correction of the weighting, to ensure that the basic accounting principles are measured equally. For example, the principle of completeness is measured by only 83 percent of the methods; however, since the principle of accruals is measured by 100 percent of the methods, the principle of completeness has to be corrected to be in the evaluation model with the same weight.

**Table 3.** The calculated weights of the methods

	<b>M1 (DACC)</b>	<b>M2 (NI)</b>	<b>M3 (LNEG)</b>	<b>M4 (SPO)</b>	<b>M5 (CF)</b>
Final weight	0.2417	0.2417	0.0889	0.2139	0.2139

Source: Author's own elaboration.

Because of the logic of the weighting, this evaluation model is suitable only for the examination of financial statements made according to the HLA.

#### 4.5. Accruals

First, we divided the accruals into two groups, discretionary and nondiscretionary accruals, then with the help of equations (13) and (14), the influencing factors were analyzed. We used the modified Jones model proposed by Dechow et al. (1995).

$$\begin{aligned} TACC_{it} = & \alpha_0 + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 DISSUE_{it} \\ & + \beta_4 GROWTH_{it} + \beta_5 TURN_{it} + \beta_6 CF_{it} + \beta_7 LIST_{it} + \beta_8 AUD_{it} \\ & + \beta_9 BIG4_{it} + \beta_{10} TAX_{it} + \beta_{11} EU_{it} + \beta_{12} \Delta GDP_{it} + \varepsilon_{it} \end{aligned} \quad (13)$$

$$\begin{aligned} |DACC_{it}| = & \alpha_0 + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 DISSUE_{it} \\ & + \beta_4 GROWTH_{it} + \beta_5 TURN_{it} + \beta_6 CF_{it} + \beta_7 LIST_{it} + \beta_8 AUD_{it} \\ & + \beta_9 BIG4_{it} + \beta_{10} TAX_{it} + \beta_{11} EU_{it} + \beta_{12} \Delta GDP_{it} + \varepsilon_{it} \end{aligned} \quad (14)$$

Where:

$SIZE_{it}$  – The natural logarithm of total assets of company  $i$  at fiscal year-end  $t$ ;

$LEV_{it}$  – Total liabilities divided by equity book value of company  $i$  at fiscal year-end  $t$ ;

$DISSUE_{it}$  – Percentage change in total liabilities of company  $i$  at fiscal year  $t$ ;

$GROWTH_{it}$  – Percentage change in revenues of company  $i$  at fiscal year  $t$ ;

$TURN_{it}$  – Revenues of company  $i$  at fiscal year  $t$  divided by total assets of company  $i$  at fiscal year-end  $t$ ;

$CF_{it}$  – Cash flow of company  $i$  at fiscal year  $t$  divided by total assets at fiscal year-end  $t$ ;

$LIST_{it}$  – Indicator variable that equals one if the firm is listed on the Budapest Stock Exchange;

$AUD_{it}$  – Indicator variable that equals one if the firm is audited;

$BIG4_{it}$  – Indicator variable that equals one if the firm is audited by KPMG, PWC, Deloitte or Morgan Stanley, zero otherwise;

$TAX_{it}$  – The calc. corporate income tax rate in Hungary in year  $t$ .

$EU_{it}$  – Indicator variable that equals one if the financial statement was disclosed after 2004;

$\Delta GDP_{it}$  – Percentage change in the Hungarian gross domestic product in year  $t$ .

The taxation of corporate incomes in Hungary is regulated by Act LXXXI of 1996 on Corporate Tax and Dividend Tax. During the studied period it has been modified five times. The rate of corporate income tax decreased in Hungary during this period. Since 2006 there have been two rates in use at the same time, so we have to calculate an effective tax rate. There are several ways to calculate effective tax rate, e.g., per company per year, using the income and tax rate data, or per company per year, using the profit before and after-tax data. Since we are examining the effect of the regulation we have chosen profit before tax and the tax rates to calculate the effective tax rate. Equation (14) shows our method which used the cumulated data of our sample equal to the Jones Model.

$$TAXRATE_{c_{it}} = \frac{TAXBASE_{1_{it}} \times TAXRATE_{1_{it}} + TAXBASE_{2_{it}} \times TAXRATE_{2_{it}}}{TAXBASE_{1_{it}} + TAXBASE_{2_{it}}} \quad (15)$$

Where:

$TAXRATE_{c_{it}}$  – The calculated tax rate of company  $i$  at fiscal year  $t$ ;

$TAXBASE_{1_{it}}$  – The first tax base defined by the 19<sup>th</sup> section of Act LXXXI of 1996 on Corporate Tax and Dividend Tax of company  $i$  at fiscal year  $t$  (up to 5M HUF between 2006 and 2007, up to 50M HUF between 2008 and 2010, up to 500M HUF between 2011 and 2016);

$TAXRATE_{1_{it}}$  – The first tax rate defined by the 19<sup>th</sup> section of Act LXXXI of 1996 on Corporate Tax and Dividend Tax of company  $i$  at fiscal year  $t$  (eighteen percent between 1997 and 2003, sixteen percent between 2004 and 2005, ten percent between 2006 and 2016);

$TAXBASE_{2_{it}}$  – The second tax base defined by the 19<sup>th</sup> section of Act LXXXI of 1996 on Corporate Tax and Dividend Tax of company  $i$  at fiscal year  $t$  (tax base part of the above the tax base<sub>1</sub>);

$TAXRATE_{2_{it}}$  – The second tax rate defined by the 19<sup>th</sup> section of Act LXXXI of 1996 on Corporate Tax and Dividend Tax of company  $i$  at fiscal year  $t$  (sixteen percent between 2006 and 2009, nineteen percent between 2010 and 2016);



The change in gross domestic product may explain the change in cash flow or the change in net income. To quantify the effect of economic growth we use the change in GDP as an explanatory variable.

#### 4.6. Timely loss recognition

We analyzed the influencing factors and timely loss recognition with the help of equation (16).

$$\begin{aligned} LIST(0,1)_{it} = & \alpha_0 + \beta_1 LNEG_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 DISSUE_{it} \\ & + \beta_5 GROWTH_{it} + \beta_6 TURN_{it} + \beta_7 CF_{it} + \beta_8 LIST_{it} + \beta_9 AUD_{it} \\ & + \beta_{10} BIG4_{it} + \beta_{11} TAX_{it} + \beta_{12} EU_{it} + \beta_{13} \Delta GDP_{it} + \varepsilon_{it} \end{aligned} \quad (16)$$

#### 4.7. Earnings management towards target

We analyzed the influencing factors and the earnings management towards target with the help of equation (17).

$$\begin{aligned} LIST(0,1)_{it} = & \alpha_0 + \beta_1 SPO_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 DISSUE_{it} \\ & + \beta_5 GROWTH_{it} + \beta_6 TURN_{it} + \beta_7 CF_{it} + \beta_8 LIST_{it} + \beta_9 AUD_{it} \\ & + \beta_{10} BIG4_{it} + \beta_{11} TAX_{it} + \beta_{12} EU_{it} + \beta_{13} \Delta GDP_{it} + \varepsilon_{it} \end{aligned} \quad (17)$$

#### 4.8. Cash flow

Equations (18) and (19) help us to examine the correlation between cash flow and accruals.

$$\begin{aligned} CF_{it(PUB)} = & \alpha_0 + \beta_1 TACC_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 DISSUE_{it} \\ & + \beta_5 GROWTH_{it} + \beta_6 TURN_{it} + \beta_9 AUD_{it} + \beta_{10} BIG4_{it} + \beta_{11} TAX_{it} \\ & + \beta_{12} EU_{it} + \beta_{13} \Delta GDP_{it} + \varepsilon_{it} \end{aligned} \quad (18)$$

$$\begin{aligned} CF_{it(PRIV)} = & \alpha_0 + \beta_1 TACC_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 DISSUE_{it} \\ & + \beta_5 GROWTH_{it} + \beta_6 TURN_{it} + \beta_9 AUD_{it} + \beta_{10} BIG4_{it} + \beta_{11} TAX_{it} \\ & + \beta_{12} EU_{it} + \beta_{13} \Delta GDP_{it} + \varepsilon_{it} \end{aligned} \quad (19)$$

#### 4.9. Volatility of earnings

We used the following equation to analyze the influencing factors of the volatility of earnings.

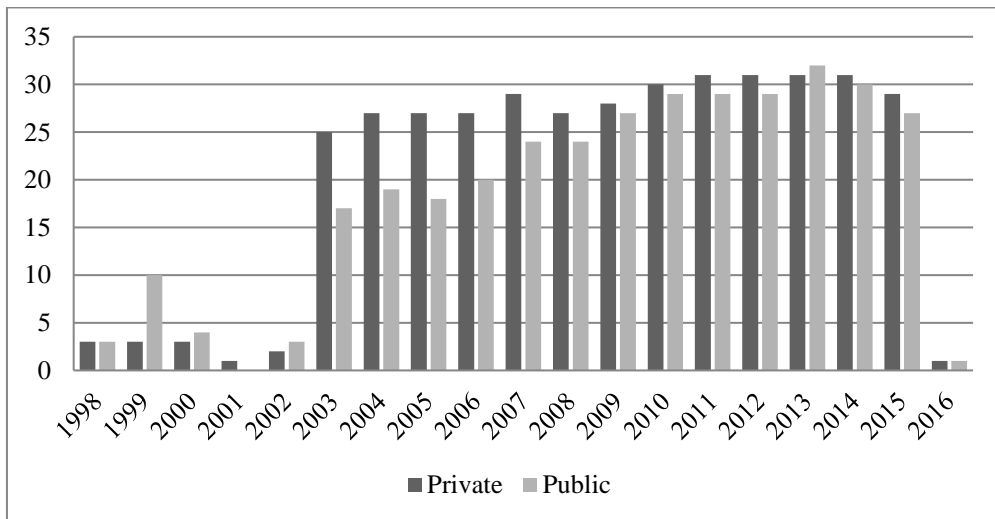
$$\begin{aligned} |\Delta ANI_{it}| = & \alpha_0 + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 DISSUE_{it} \\ & + \beta_5 GROWTH_{it} + \beta_6 TURN_{it} + \beta_7 CF_{it} + \beta_8 LIST_{it} + \beta_9 AUD_{it} \\ & + \beta_{10} BIG4_{it} + \beta_{11} TAX_{it} + \beta_{12} EU_{it} + \beta_{13} \Delta GDP_{it} + \varepsilon_{it} \end{aligned} \quad (20)$$

## 5. Results

### 5.1. Sample

Since we analyzed separate financial statements, finding counterparts for the publicly listed companies did not cause a problem. We used control variables for the most important financial characteristics, for example, for the size of the company. This ensures that the difference between the analyzed groups is not because of the difference of their size or other characteristics. The sample contains financial statement data of 63 companies. The selected companies operate in Hungary and disclosed the studied financial statements about the fiscal years between 1998 and 2016, which means 732 examined financial statements. Forty-seven percent of the statements were disclosed by public companies and fifty-three percent were disclosed by private companies. The difference between the two groups was caused by missing data in the statements. Figure 3 shows the financial statements per year.

**Figure 3.** Financial statements per year



Source: Author's own elaboration.

In accordance with the regulation, every financial statement prepared by a publicly listed firm is audited. Due to the sample matching process, ninety-nine percent of the financial statements prepared by private companies were audited, as well. The big four audit companies audited forty percent of the financial statement disclosed by public firms and forty-five percent of the financial statements disclosed by private companies. Forty-seven percent of the financial statements were disclosed after Hungary became an EU member state.

## 5.2. Partial results

The table 4 shows the results of the methods. We studied total accruals and discretionary accruals with the help of equations (13) and (14). Total accruals have no significant association with any variables and the R-square value of the equation is very low: 0.11; the adjusted R-square is 0.10, and the standard error is 1.27. We cannot draw conclusions from these results. The results of equation (14) are more impressive. The R-square is 0.17, the adjusted R square is 0.16 and the standard error is 0.55. There is a negative correlation between being listed and discretionary accruals. Since the value of significance is lower than 0.05, we reject  $H_0$ . According to the results of this research, there is a significant negative correlation between discretionary accruals and being publicly listed. Listed companies use discretionary accruals less frequently than private companies. The accounting quality of publicly listed companies is higher.

**Table 4.** Partial results

Methods:	M1 (DACC)	M2 (NI)	M3 (LNEG)	M4 (SPO)	M5 (CF)
hypotheses					
$H_0$ :	$\beta_7 = 0$	$\beta_8 = 0$	$\beta_1 = 0$	$\beta_1 = 0$	$\beta_1 = 0$
$H_1$ :	$\beta_7 \neq 0$	$\beta_8 \neq 0$	$\beta_1 \neq 0$	$\beta_1 \neq 0$	$\beta_1 \neq 0$
Test on individual regression coefficients (t test) of LIST dependent binary variable					
t value:	-2.85	1.76	3.14	-1.73	-0.55
significance value:	0.005	0.078	0.002	0.085	0.498 & 0.583

Source: Author's own elaboration.

There is a positive correlation between being public and the volatility of earnings. The value of significance is higher than 0.05, so we do not find a reason to reject  $H_0$ . Our results suggest that there is positive correlation between the volatility of earnings and being publicly listed, but this is not significant.

Listed companies report large losses more frequently than private companies. Since the value of significance is lower than 0.05, we reject  $H_0$ . According to the results of this research, there is a significant positive correlation between timely loss recognition and being publicly listed. The accounting quality of listed companies is higher.

According to the results of this research, there is a negative correlation between earnings management towards small positive incomes and being publicly listed. Since the value of significance is higher than 0.05, we do not find a reason to reject  $H_0$ , so this difference is not significant. Publicly listed companies report small positive incomes less frequently than private companies. The accounting quality of listed companies is higher, but the difference is not significant.

There is no significant difference between private and public companies according to the examination of the relationship between cash flow and accruals. Since the significance values of both the private and public companies are higher than 0.05, we do not find a reason to reject  $H_0$ .

### 5.3. The result of the evaluation model

The following equation shows the result of the evaluation model:

$$H_1 = 0.2417 \times 1 + 0.2417 \times 0 + 0.0889 \times 1 + 0.2139 \times 0 + 0.2139 \times 0 = \boxed{0.3306} \quad (21)$$

The analysis of the discretionary accruals and the timely loss recognition shows significant differences between the accounting quality of private and public companies. These differences supported our hypothesis, so the output of the single method resulted in 1. The results of the volatility of earnings, earnings management towards small positive incomes and the correlation between cash flow and total accruals were not significant, so the output of the single method resulted in 0. Since the output of the evaluation model is positive, we conclude that publicly listed companies have higher accounting quality compared to private companies in Hungary during the examined period.

## Conclusion

Meeting the objective of financial reporting is very expensive, so monitoring the final outcome is essential. The aim of this paper is to study the differences in accounting quality of publicly listed and private companies in Hungary. Our secondary goal was to develop an evaluation process that takes due account of the complexity of the topic. Since accounting quality is a complex issue, such an approach is proposed in the future. Based on previous research, we assumed that public companies have higher accounting quality than private companies. To test our assumption, we examined the financial data of 63 companies between 1997 and 2016. The analyzed statements were non-consolidated financial statements prepared in accordance with HLA. The examined areas were accruals, timely loss recognition, volatility of earnings, cash flow and earnings management towards target. We found a significant negative correlation between discretionary accruals and being publicly listed, a significant positive correlation between timely loss recognition and we did not receive any significant results when analyzing earnings management towards small positive incomes, cash flow or the volatility of earnings. We also evaluated these results with the help of our own developed evaluation model and found that publicly listed companies have higher accounting quality compared to private companies.

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