Do the burst of financial crisis and European Union membership impact Earnings Management.[*]
Evidence from emerging Eastern European countries.

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Abstract

The paper studies earnings management in developing European countries. We investigated if membership in the European Union and the recent global financial crisis affected the decisions of managers in Eastern European countries to engage in earnings management.

By analyzing a sample of 4,627 firms from four developing Eastern European countries (the Czech Republic, Poland, Hungary, and Slovakia) over the period of 2002–2009, our findings suggest there was a decrease in earnings management over the period leading up to the accession of these countries to the European Union. Additionally, we found that there was an increase in earnings management after the burst of the financial crisis.

The results contribute to the debate in the accounting literature regarding the variations in earnings management related to the changes in environmental factors influencing companies. These results have several implications for standard setters and regulators; in particular, companies' incentives are strongly influenced by the general conditions and circumstance of their home countries. Additionally, the study explores the still unexplored developing markets of Eastern European countries.

1. Introduction

Earnings management has been analyzed from different perspectives in recent decades. Past empirical studies have considered different aspects of earnings management such as its definition, the methodology to detect and measure earnings management, and managerial incentives or environmental circumstances that may stimulate or limit earnings management. No single definition of the concept of earnings management exists, and multiple measures have been used to estimate the degree of earnings management in previous empirical studies.

This article addresses how environmental factors may affect managers' decisions to manage earnings. In particular, the motivation for this study is to determine how companies from emerging Eastern European countries respond to their external environment, and we consider two important events (the entry of these countries into the European Union and the global financial crisis) and their effects on managers' decisions regarding earnings management.

The 2008 global financial crisis is considered by many economists to have been the worst financial crisis since the Great Depression of the 1930 s. This research tries to answer the following questions: did the propensity of firms from emerging countries to engage in earnings management change after the financial crisis? How did the global financial crisis impact the extent of these developing firms' earnings management strategies? At the same time, the entry of these countries into the global and European market also affected local companies by exposing them to new turbulent and risky environments and competition with well-established Western European companies with more financial resources. Furthermore, these companies were forced to make the adjustments to how they present themselves. They, for example, can try to appear more competitive than they actually are. Other possibility is to manage earnings and to appear as weaker company and perceive certain benefits from the European accession.

The study contributes to the literature in three ways. First, it examines the impact of the global financial crisis on how firms' in the chosen countries manipulated financial results. In late 2007, the world financial crisis began, and the first impacts of the crisis on the economic environments of the countries were perceived in early 2008. Advanced economies struggled to maintain economic activity and were shaken by the instability caused by the recession. Emerging economies were also impacted as the deterioration in the economic environment caused considerable concern around the globe. Different authors have focused on similar questions; nevertheless, most of the previous papers published on the topic focus on the US, Asia or Western European countries.

Second, this research tries to explain how accession to the European Union affected the extent of earnings management in companies from developing countries. The accession of emerging Eastern European countries to the European Union resulted in new institutional, technological, and economic challenges for firms operating in these countries. This raises the question of how managers have responded to the complex and altered market environment. Important and fundamental changes have taken place in the economic and social structures in these countries. Additionally, from the point of view of researchers, it is important to explore the scope of earnings management by taking into account the whole European Community and not only the western part of the European Union.

Finally, earnings management based on companies from emerging European countries is still barely explored. It is our purpose to fill the research gap in earnings management studies. Most European studies are based on the Western European countries. Incorporating Eastern European countries into the investigation of earnings management may allow for analyses on the broad impacts of earnings management on all of Europe (see for example, Balcerowicz, 1994; Jaruga and Ho, 2002). Developing Eastern European countries are still not at the same economic level as Western European countries. We can confirm that there is still a large gap between both regions[1]. Eastern Europe continues to adapt to the EU model through constant transformation and development. Given these economic circumstances, it could be expected that there are also possible differences in earnings management between Eastern and Western European countries. Consequently, an investigation into earnings management in these growing markets is needed.

Our study investigates earnings management in the companies from four developing Eastern European countries (Poland, Hungary, Slovakia, and the Czech Republic) during the period from 2003 to 2009. We test our research hypothesis with a methodology based on discretionary accruals. We compare the discretionary part of accruals before and after two events (i.e., accession to the European Union and the financial crisis).

Our findings suggest that earnings management has changed over the years. Managers of Eastern European companies manage their earnings by responding to the changes in their companies' environments. We detect two tendencies. From 2003 to 2007, we observed a moderate but continuous decrease in earnings management in companies from the emerging Eastern European countries, which can be explained by the accession of these countries to the European Union. We confirm that over different phases of the accession process earnings management decreased. In other words, companies from developing Eastern European countries gradually reduced earnings management in this period.

Additionally, we detect an increase in earnings management between 2008 and 2009. We find that earnings management significantly increased in the crisis years.

These results contribute to the debate in the literature about the effect of general economic conditions on earnings management in developing European countries. More specifically, they demonstrate that earnings management is more common during crises than growth periods. This finding should be of interest to academics, practitioners, and investors.

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1 See evolution of the Gross Domestic Product, inflation, interest rate, unemployment rate, minimum wages, among other statistics. Consult the following databases: Eurostat (2015), World Bank database (2015), World Economic Outlook Database (2015).

The remainder of this paper is organized in the following manner. First, we present a brief review of the literature and focus on studies on earnings management related to the effects of environmental circumstances, especially the global financial crisis and European Union membership. Next, we present the sample of countries and explain the methodology we employed. We then discuss the results. The next section discusses other studies based on emerging countries from other regions of the world. We compare their results with our study. Finally, we present the conclusions of the findings and their implications for further studies.

2. Literature review

Revelations of misrepresentations of financial statements have drawn attention to the reasons for such behavior. Some authors believe that managers always have an incentive to control information (see for example, Dechow and Sloan, 1991; Holthausen, Larcker and Sloan, 1995; Shackleford and Shevlin, 2001). However, in some circumstances, incentives may change depending on companies' external environments. Lim, Ding, and Thong (2008) argue that a dynamic environment is one of the factors that can influence managers' decisions. Thompson (1967) and Terreberry (1968) add that the complexity of the environment is important for managers' decisions. Kothari, Leone, and Wasley (2005) also argue that environmental uncertainty is likely to affect firm performance.

The general circumstances facing a firm are constantly changing. Managers must respond to these changes. They must try to cope with the fluctuations of the market, and they must also respond to these fluctuations through variations in earnings management. Richardson (2000) shows that earnings management changes due to the level of risk taken by firms. Therefore, some sets of relationships and circumstances may lead managers to engage in earnings management; however, other sets of macroeconomic factors may significantly limit the behavior of the managers.

There is an ongoing debate about whether and how economic cycles (especially the effects of crises) influence managers to misrepresent financial information by carrying out earnings management. Johnson (1999) and Chen (2010) state that firms' earnings volatility is correlated with economic cycles[2]. In the abundant studies on earnings management, the authors underline the influence of economic cycles on the existence of earnings management. Two main tendencies are observed.

The first group of papers demonstrates that when the economy, as a whole, is performing well, managers will be under pressure to report increased earnings.

2 The economic cycle is understood as a natural fluctuation of the economy between periods of expansion (growth) and recession (crisis). It may easily affect executives' decisions; see for example, Ohn, Taylor, and Pagan (2004); Lee, Lee, and Mason (2006); Dustmann, Glitz, and Vogel (2009), among others.

Therefore, managers of firms that perform more poorly than their peers in good times will be penalized by markets if their reported earnings fail to meet expectations. Alternatively, when the economy as a whole is not performing well, the penalty for not reporting positive results might not be as severe as that during good times (Cohen and Zarowin, 2007). This simple logic predicts that managers' concerns and performance evaluations will provide incentives to inflate earnings in good times (Cohen and Zarowin, 2007). Similarly, Conrad, Cornell, and Landsman (2002) state that the tendency of firms to inflate earnings is greater during good times than during the bad times. Thus, firms face greater incentives to avoid poor earnings when the economy is strong, so they are more prone to boost earnings during such periods. Other authors (such as Khurana *et al.,* 2006, and Rajgopal, Shivakumar, and Simpson, 2007), confirm the above hypothesis that earnings management increases during good times, and the market's response to bad news is most severe during good times.

At the same time, in a period of economic stress, managers are less likely to manipulate their earnings. Cimini (2015), for example, demonstrates that after a financial crisis, there is a reduction in earnings management. He analyzed a sample of non-financial entities listed in the 15 EU countries. He is reasonably confident about the reduction in earnings management during the crisis because, on the one hand, the increase in conditional conservatism during the financial crisis should raise earnings quality and impair earnings management; on the other hand, the close monitoring by auditors during the crisis contributed to an increase in the quality of financial reporting, which reduces earnings management. Filip and Raffournier (2011) also confirm that managers are less likely to manage earnings in crisis years. They analyzed the impact of the 2008–2009 financial crisis on earnings management based on a sample of 16 European countries.

A second group of studies shows a different tendency, documenting that in periods of prosperity, less earnings management is expected, and during periods of distress, more earnings management is likely. Ahmad-Zaluki, Campbell, and Goodacre (2009), for example, provide evidence for earnings management during a period of economic distress. They provide two main explanations for the results. First, during a crisis, companies cannot use subsidiaries as financial buffers. Second, more attention is paid to financial stability than financial reporting transparency. Conrad, Cornell, and Landsman (2002) also state that during periods of crisis, managers are more likely to manage their earnings to cover their financial gaps and fulfill the companies' objectives. Managers may try to smooth the effect of fluctuations in the markets because, as explained by Baulkaran and Asem (2012), the market reacts more adversely to negative earnings news. Strings of news are important determinants of investors' reactions when markets are stable, and the effect of market transitions on investor overconfidence drives reactions during market transitions (Bhattacharya, 2001;

Baulkaran and Asem, 2012). Hence, managers may mitigate the negative impacts of economic situations by inflating earnings.

Callao and Jarne (2011) also show that earnings-increasing discretionary accruals increased during the crisis, confirming that crisis periods affect financial reporting quality. The crisis strengthened some incentives to manage earnings, such as indebtedness. Finally, Ball and Shivakumar (2005) suggest that the lower levels of earnings management in recession periods may also result in conservative reporting.

European Union membership allows for free trade between the countries of Eastern and Western Europe. Managers of the companies from Eastern European countries may try to manage their earnings to seem stronger/weaker depending on the situation; they may do this to be able to compete in the European market. According to Moravcsik (1998), increased membership in the European Union helps increase opportunities for cross-border trade and capital movements, but at the same time, it creates opportunities for earnings management. Dijmarescu (2001) points out that membership is not a matter of the timing of the initiated negotiations. It is rather a matter of the readiness, determination, and changes made by the candidate countries to adhere to the free market and the rule of law, irrespective of political decisions reached by the EU toward its eastward extension (Dijmarescu, 2001). Therefore, this determination may lead to the existence of earnings management. In practice, managers are able to choose methods and make estimations that do not reflect the true economic position of their companies in order to provide more positive images of their companies (Healy and Wahlen, 1999).

However, it is perceived as shrinking the possibilities for managing results, as candidate states implement numerous legislative measures as a result of political pressure from the European Commission. During the transition period, new EU member countries are active in reviewing and amending key legislation to adapt new European requirements. The EU Commission proposes principles to improve regulations, such as the development and implementation of national anti-corruption strategies or programs covering both preventive and repressive measures; the creation of competent and visible control bodies; the development of targeted investigative techniques, statistics, and indicators; and the implementation of clear and transparent rules on party financing, and external financial control of political parties (Dionisie and Checchi, 2010).

3. Methodology

3.1. Sample and analysis period

We examine four developing Eastern European countries (Poland, Hungry, Slovakia, and the Czech Republic), as the issue of earnings management in devel-

oping Eastern European countries has been barely explored. We found only a few studies based on Eastern European countries, and most of them are descriptive and based on Polish companies (see Table 1).

The analysis covers the period of 2002 to 2009 because we are interested in evaluating the managers' engagement in earnings management just before accession to the European Union (i.e., 2002–2004). Eastern European companies were developing, growing, and making transformations over more than 10 years after the collapse of communism. It may be interesting to observe the effect of these transformations on existence of earnings management by companies from these countries.

In May 2004, these four Eastern European countries acceded to the European Union. The accession and its initial impact from 2005 to 2007 may be very important in terms of the engagement and scope of earnings management by managers in these countries. Furthermore, we are interested in evaluating the managers' activity in the period affected by world financial crisis, and whether during that period, managers are more/less likely to engage in earnings management. The initial impact of the global financial crisis occurred during the period of 2008–2009.

Our study contains both listed and unlisted companies. Nevertheless, our sample focuses mainly on unlisted private companies, as the financial sectors of listed companies in our sample countries are still in progress, growing, and flourishing very slowly.

For several decades, earnings management among public firms has been studied extensively in accounting literature while earnings management in private companies has not been investigated. However, private firms make up the foundation of the global economy and play an important role in economic growth, since they are major contributors to employment, entrepreneurship, and innovation worldwide (Sundvik, 2017).

Table 1:   Country of earnings management investigation.

Country of investigation	Nº of studies
US	99
China	17
Spain	11
Malaysia	5
Japan	4
Taiwan	4
Finland	4
UK	4
Poland	4

Country of investigation	Nº of studies
Germany	3
Korea	3
Brazil	3
Belgium	3
Hong Kong	2
Australia	2
Netherlands	2
France	2
Pakistan	1
Indonesia	1
Iran	1
Bangladesh	1
Greece	1
Canada	1
Italy	1
Rumania	1
	180*

* Table presents research on earnings management based on a sample from a single country. It is a common practice of researchers to use a one-country selection sample. In total, we may observe 180 studies within the period of 1981–2012. Additionally, we confirm 11 descriptive studies, and 16 additional studies with a multi-country sample. Callao, Jarne and Wroblewski (2014) called these last studies: panel studies or comparative studies.

The Czech Republic, Hungary, Slovakia, and Poland are among the eight Central and Eastern European countries that became new member states of the European Union on May 1st, 2004. These countries are transition economies. The transition process involved a set of reforms including privatization, labor market reform, the development of capital markets, price liberalization, currency convertibility, macroeconomic stabilization, and welfare reform (Kosmala, MacLullich and Gurau, 2004). Complex and dynamic changes brought about a need for thorough reform of the accounting systems in these countries, which was intended to reinforce the foundations of the new market economy (i.e., accountability, profitability, and transparency) (Kosmala, MacLullich and Gurau, 2004).

The key factors that determined the direction of the reforms were the specific geographic locations of the countries (i.e., the proximity to the European Union) and the need to attract foreign investments. As the countries strived to integrate with the European Union and attract foreign capital, the harmonization of their national financial reporting systems with the European directives and later with the International Accounting Standards framework became a crucial issue. Con-

sequently, new regulations have successively incorporated the provisions laid out in the EU directives. Much attention was paid to achieving greater transparency and enhancing the quality of financial statements through the extension of the reporting requirements (Kosmala, MacLullich and Gurau, 2004). Therefore, we use non-consolidated financial statements prepared under local GAAP. Nevertheless, the financial statements are prepared under EU directives, which ensure the reliability of the reports[3].

The directives leave some room for discretion due to explicit and implicit options. Furthermore, in some systems, some accruals may be considered as discretionary, while in others, the same accruals might be considered as non-discretionary. However, the literature still considers Eastern European countries as unique economic structures facing the common EU legal framework (see, for example, Prochazka, 2017).

Additionally, during the analysis period, the IFRS was not required, and different studies examining developing countries confirm that the introduction of the IFRS does not necessarily influence earnings management by private companies. In particular, it does not reduce earnings management, as may be expected (Kersten, 2011). Hasan and Rahman (2017) also confirm that the outcome of IFRS adoption is not conclusive to determine its influence on earnings management for a sample of developing countries. Results presented by Doukakis (2014), as well as, suggest that mandatory IFRS adoption had no significant impact on either real or accrual-based earnings management practices. Finally, Aussenegg, Inwinkl and Schneider (2008) verified that for companies from developing countries, the transition from local GAAPs to IAS/IFRS does not change earnings management behavior.

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3 New accounting system in Slovakia became reality in 1991, Act no. 563/1991; and it became effective on January 1, 1993. In 2003 **the Slovak Republic** prepared a new act: Act No. 431/2003 on Accounting, which harmonized Slovak accounting with the directives of the EU.
In Hungary, accounting requirements have been regulated by law since 1991. Then, another act, the Act on Accounting (Act C of 2000) came into effect on January 1, 2001. This act brought Hungarian financial reporting practices closer to the International Financial Reporting Standard (IFRS), especially in line with the EU 4th and 7th Directives.
First accounting framework **in the Czech Republic** was based on the Act. No. 563/1992 Coll. After that, there was an important number of normative implemented to the Accounting Act in terms of the adjustment to the EU directives, such as: recognition of the items of a financial statement, for example: Entrepreneurs (No. 500/2002 Coll.); Financial institutions (No. 501/2002 Coll.); Commercial insurance companies (No. 502/2002 Coll.); Health insurance companies (No. 503/2002 Coll.); Non-profit organizations (No. 504/2002 Coll.); Governmental: public units (No. 410/2009 Coll.), among others.
Finally, **in Poland**, first, accounting was regulated by the Accounting Act of 29 September 1994. Then, in 2002 major amendments entered into force to adjust to EU directives. It was a preparation of the adaptation of legal regulations to directives and IFRS between 2011 and 2014.

Our initial sample of companies was composed of a total of 4,627 non-financial firms, yielding 32,389 firm-year observations over the period of 2002–2009. We have only retained those firms for which data were available for the variables considered for all the years included in the study (2003–2009) and for the prior period (2002) used to calculate changes in certain variables. For each variable, we eliminated outliers, which are observations falling outside the range set by the mean value plus/minus three times the standard deviation. The data were collected using the AMADEUS database. Our final sample is presented in Table 2.

Table 2: Sample selection procedure.

	Czech R.	*Poland*	*Hungary*	*Slovakia*	**Total**
Total number of firms available in Amadeus database	3,006	2,609	183	398	6,196
Incomplete data (missing data)	(779)	(208)	(62)	(163)	(1,212)
Extreme values	(178)	(150)	(7)	(22)	(357)
Total sample firms	**2,049**	**2,251**	**114**	**213**	**4,627**
Number of observations	14,343	15,757	798	1,491	32,389

3.2. Methodology

3.2.1. Measurement of earnings management

We use a methodology based on accruals to detect and estimate the discretionary part of accruals. Accruals are defined as the part of revenues and expenses that do not imply collections and payments, and are indirectly calculated as the difference between profit and operating cash flows[4]. Total accruals are composed of non-discretionary accruals *(NDA),* which are the part of accruals that are difficult to manipulate, and discretionary accruals *(DA),* which are easier to manipulate; therefore, *TA = NDA + DA.*

Since the discretionary and non-discretionary components of accruals are not directly observable, we use a cross-sectional version of the model employed by Yoon and Miller (2002)[5]:

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4 The equation is: $TA_{it} = \Delta Receivables_{it} + \Delta Inventories_{it} - \Delta Payables_{it} - DEP_{it}$. It is used to calculate total accruals (TA). ΔReceivables is the change in receivable accounts; ΔInventories is the change in inventories; ΔPayables is the change in payable accounts; and DEP is the depreciation and amortization expenses. The subscripts *i* and *t* refer to the firm and the year respectively. Variations are calculated with respect to the prior year.

5 Based on the previous research (working paper from 2016), we have evaluated the robustness and effectiveness of thirteen models for measuring earnings management, both for time-series and cross-sectional analysis: the Healy Model (1985), the DeAngelo Model (1986), the Jones Model (1991), Dechow, Sloan and Sweeney Model (Modified Jones Model) (1995), the Kang and Sivaramakrishnan Model (1995), the Shivakumar Model

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0 \frac{1}{A_{it-1}} + \alpha_1 \frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} + \alpha_2 \frac{\Delta EXP_{it} - \Delta PAY_{it}}{A_{it-1}} (1)$$
$$+ \alpha_3 \frac{NCASH_{it-1} \times GPPEGRW_{it}}{A_{it-1}} + \varepsilon_{it}$$

where TA_{it} is total accruals in year t booked by firm i in period t; ΔREV_{it} is the change in net sales revenue; ΔREC_{it} is the change in receivable accounts; ΔEXP_{it} is the change in operating expenses, excluding non-cash expenses; ΔPAY_{it} is the change in payables; $NCASH_{it-1}$ is previous period non-cash expenses, such as depreciation; $GPPEGRW_{it}$ is a rate of growth in gross property, plant, and equipment; A_{it-1} is total assets from the previous period and is used as a deflator to avoid problems of heteroscedasticity; and ε_{it} is the error term.

After estimating the parameters of equation (1), we applied the values obtained to predict discretionary accruals for the 2003–2009 period. The prediction error is interpreted as the discretionary part of accruals, defined in equation (2):

$$\frac{DA_{it}}{A_{it-1}} = \frac{TA_{it}}{A_{it-1}} - \left(a_0 \frac{1}{A_{it-1}} + a_1 \frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} + a_2 \frac{\Delta EXP_{it} - \Delta PAY_{it}}{A_{it-1}} (2) \right.$$
$$\left. + a_3 \frac{NCASH_{it-1} \times GPPEGRW_{it}}{A_{it-1}} \right)$$

where DA_{it} are discretionary accruals for firm i in period t, and a_0, a_1, a_2 and a_3 are the estimated values of αi.

After obtaining the discretionary accruals for each company, we investigated whether companies from emerging Eastern Europe perform earnings management. Then taking into consideration the absolute value of the discretionary accruals, we ran Friedman's test[6] to see if earnings management varies over the period in the different countries. We also confirmed that the variables do not follow a normal distribution (see Annex 1).

(1996), the Key Model (1997), the Teoh, *et al.* Model (1998), the Kasznik Model (1999), the Yoon and Miller Model (2002), the Dechow, Richardson, and Tuna Model (2003), the Larcker and Richardson Model (2004), the Kothari et al. Model (2005). Based on the adjusted R square, standard error of the estimated variables, and the p-value, which represents the statistical significance of the variables, the results indicated that the cross-sectional Yoon and Miller model (2002) is an effective model for the Eastern European countries in detecting earnings management. We have observed higher level of adjusted R square, lower level of standard error, and more significant values of the parameters in comparison to other models.

6 Friedman's Test is a non-parametric test used to test for differences between groups (see, for example Stevens, 1986; Hinkle, Wiersma and Jurs, 1988; Hayes *et al.*, 1992).

3.2.2. Model specification: environmental factors influencing earnings management

Based on the large earnings management literature,[7] we first identified variables that may explain changes in earnings management over time. We then created a linear regression model to examine how each variable affects firms' decisions to manage earnings. In the linear regression model *the dependent variable* is the absolute value of discretionary accruals ($|DA|$) because we want to measure the magnitude of earnings management without regard to its sign. We estimate the coefficients of the variables by maximum likelihood using an ordinary least squares regression.

Between 2004 and 2007 Eastern European countries took steps towards European Union membership. Therefore, our first variable ***ADAPTEU*** accounts for accession period of these countries. The accession of Poland, the Czech Republic, Hungary, and Slovakia began in May 2004. Therefore, we differentiate possible periods that may have different influences on managers' decisions regarding earnings management. The first period of 2003–2004 included the process of preparation for EU membership. Then in 2005 and 2006, these countries began adapting to European standards. Finally, the countries became full members between 2007 and 2009. Two dummy variables are introduced to the model; the first dummy represents the preparation period of 2003–2004, and the second dummy variable designates the period of 2005–2006.

According to previous studies, European Union membership may significantly limit earnings management because of the new requirements of the European Union. Eastern European countries were not obliged to adopt IFRS in our sample period, as mentioned in previous section, but they made adjustments to investors' requirements and to international regulation that required additional relevant information. Ewert and Wagenhofer (2005) explain that tighter accounting standards and clearer rules increase earnings quality; they also decrease the likelihood of earnings management in companies. Additionally, detailed accounting standards may add value to accounting information (Bartov and Mohanram, 2004; Hung and Subramanyam, 2007; Barth, Landsman and Lang, 2008; Rudra and Bhattacharjee, 2012).

Furthermore, managers of the companies from Eastern European countries may have incentives to increase earnings management to be able to compete in the European market. Managers of firms from Eastern European countries may try to improve their earnings to seem stronger and because accounting regulation permits the manager to make judgments; for example, there are accounting gaps and the possibility of making accounting choices. Managers can make certain choices in financial reporting. In theory, companies should select accounting

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7   We made a revision of 207 papers on earnings management.

methods and make estimations that best reflect the economic position of the company (Kempen, 2010). In practice, managers are able to choose methods and make estimations that do not reflect the true economic position of their companies but create more positive images to outsiders (Healy and Wahlen, 1999); these actions are possible even within the permitted regulatory framework. Therefore, we do not expect positive or negative coefficients.

The global financial crisis began in 2008–2009. The initial effects were seen during this period. The literature confirms that fluctuations in the economy affect companies' activities. Firm's earnings fluctuations are correlated with economic cycles in general; see, for example, Johnson (1999), Conrad, Cornell and Landsman (2002), Jin (2005), Cohen and Zarowin (2007), Khurana *et al.* (2006), and Chen (2010), among others.

Jin (2005), for example, shows that the aggregate extent of earnings management is larger during recessions than during expansion. The author explains this situation with the fact that, in very weak economic periods, managers tend to engage more in earnings management. In very strong economic periods, managers may manage their earnings less (Jin 2005).

Conrad, Cornell, and Landsman (2002) and Cohen and Zarowin (2007) demonstrate that during periods of crisis, managers manage earnings more to fulfill their companies' objectives. Managers may try to mitigate the effects of economic fluctuation because, as explained by Baulkaran and Asem (2012), the market reacts adversely to fluctuations in earnings.

However, Chia *et al.* (2007) and Cimini (2015) give reasons to believe that earnings management is less common in crises than expansions. It can be argued that during crises, firms are subjected to increases in monitoring by auditors, creditors, and other stakeholders, which should result in less discretion to manage earnings.

Based on these findings, our second variable is a ***CRISIS* dummy variable,** which is 1 if the company's observation is from the period of 2008–2009 (the global financial crisis) and 0 otherwise. Based on the literature, we predict a positive relationship between the level of earnings management and this dummy variable. In periods of crisis, companies from developing countries are expected to increase earnings management as a response to the economic adversity.

Third, the influence of taxes on companies has largely been considered a strong stimulus for discretion by managers in financial statements. The literature demonstrates the importance of the effect of tax incentives on earnings management. Many studies have found evidence of earnings management for tax purposes. In Eastern European countries, the tax and financial reporting systems are closely connected, as a consequence of the strong influence of taxation on accounting. This connection comes from the development of the relationship be-

tween taxation and accounting in recent decades; there was a long absence of specific accounting legislation until the 1990 s. Companies in the former centrally planned economies were largely unaware of the scale of the taxes they paid through the turnover and payroll systems (Tanzi, 1999). Therefore, we include the *TAX* **variable**, as the tax environment may be still a strong stimulus for earnings management.

Finally, we include two variables to describe the macroeconomic conditions of Eastern European countries. The macroeconomic performance of countries is an institutional factor, and its relation to earnings management has been analyzed by, for example, Robson (1996), Clayton and Giesbrecht (1997), Leuz, Nanda and Wysocki (2002), Higson, Holly, and Kattuman (2002), Jin (2005), Tylsch 2009, and Broadstock, Shu, and Xu (2011), among others.

Broadstock, Shu, and Xu (2011) explain that the purpose of including macroeconomic information is to consider factors which may reduce the subjectivity of managers' decisions because companies' performances are also reflected by economic activity. Leuz, Nanda and Wysocki (2002) demonstrate that the macroeconomic environment can potentially affect firms. Differences in macroeconomic stability across countries may systematically impact the variability of accounting earnings. Higson, Holly, and Kattuman (2002) find evidence for the impact of changes in the macroeconomic environment on different segments of companies (Higson, Holly, and Kattuman, 2002) and on firms' earnings management behavior (Jiang, Fan and Fan, 2010; Bratten, Payne and Thomas, 2013). Robson (1996) demonstrates that movements in the aggregate failure of a firm's activity may coincide with changes in macroeconomic performance; for example, uncertainty can induce growing firms to delay their decisions to invest in capital (Dixit, 1989; Lambrecht and Myers, 2007).

The first macroeconomic variable included is **Gross Domestic Product (*GDP*).** We use the natural logarithm GDP per capita for each country. Previous studies used this measure for macroeconomic conditions (see Fama, 1981; Veronesi, 1999, Chordia and Shivakumar, 2002; Johnson, 1999; Kothari*,* 2001, and Klein and Marquardt, 2006). We expect to find a negative relationship indicating that better local country markets constrain earnings management (i.e., low levels of earnings management are expected). Shen and Chih (2005) confirm that higher GDP per capita decreases the degree of earnings management. Chih, Shen, and Kang (2007) find that companies in richer countries are generally less likely to manage earnings.

Our second macroeconomic variable is **unemployment (*UNEMPLOYM)*** that is the rate of unemployment in each country. Broadstock, Shu, and Xu (2011) used this variable to measure macroeconomic conditions. We expect positive association between earnings management and unemployment; a high rate of unemployment indicates poor economic conditions and may lead to higher earnings

management over time (increasing or decreasing earnings). Prior studies demonstrate that in poor economic conditions, firms will be motivated to make accounting choices that give them advantages, mitigate the fluctuations caused by financial distress, or appear to strengthen their financial positions (see, for example, Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997; Lambrecht and Myers, 2007).

Table 3 shows the variables, their definitions and the expected signs.

Table 3: **Variables definition and predicted sign of the coefficients of the independent variables.**

Variable	Definition	Expected sign
Dependent variable:		
$|DA|$	Absolute value of discretionary accruals	
Independent variables:		
ADAPTEU	The variable designates periods leading to European Union membership. Three periods can be observed: 2003–2004 preparation for EU membership; 2005 and 2006 process of adaptation to the European rules and standards; 2007- 2009 the period of stabilization. Therefore, two dummy variables are introduced.	?
CRISIS	Crisis is a dummy variable, which takes a value of 1 if a company's observation is from the period of 2008 and 2009 (the global financial crisis) and 0 otherwise.	+
TAX	TAX is defined as the tax on the revenues of each company of each country. $$\frac{\text{TaxCosts}_t}{\text{Revenues}_t}$$	+
GDP	Gross Domestic Product is defined as the natural logarithm of the GDP per capita of each country. $$\ln\text{GDP}_t$$	–
UNEMPLOYM	UNEMPLOYM is the rate of unemployment in each country by year. $$\%\text{Unemploym}_t$$	+

* where *t* is a period from 2003 to 2009.

We also consider three control variables used in other studies (see Table 4). To control for size effects, we include **firm size (*SIZE*)** measured by the relation of the total assets in each company in each sample, by year and scaled by total assets from *t-1*. Studies on earnings management confirm that the size of com-

panies has an impact on the existence of earnings management; see Dhaliwal (1988), Watts and Zimmerman (1990), Chaney and Jeter (1992), Burgstahler and Dichev (1997), Young (1999), Barton and Simko (2002), Dechow and Dichev (2002), Othman and Zhegal (2006), Acito (2011), and Paiva and Costa (2013), among others.

Table 4: Control variables.

Variable	Definition
SIZE	SIZE is total assets scaled by assets from *t-1* $$\frac{\text{Assets}_t}{\text{Assets}_{t-1}}$$
LISTED	LISTED is a dummy variable that equals 1 if firm is a listed company and 0 otherwise
INDUSTRY	INDUSTRY is a variable that includes nine dummy variables according to the one digit SIC codes; it takes values 1 if the firm belongs to the corresponding industry (No =1, ..., 9) and otherwise 0. Industry classification is presented in Table 8.3

* where *t* is a period from 2003 to 2009,

The second control variable, ***LISTED,*** accounts for whether firms are listed on the Czech, Polish, Hungarian, or Slovakian stock exchanges. It is a dummy variable taking the value 1 if a company is listed and 0 if not. The coefficient on *LISTED* captures the difference in the degree of earnings management between listed and non-listed firms in Eastern European countries. Previous studies suggest that listed and non-listed companies differ in managing earnings; see Rangan (1998), Beatty and Harris (1998), Vander Bauwhede and Willekens (2003), Jensen (2004), Ball and Shivakumar (2005), Burgstahler, Hail and Leuz (2006), Sundgren (2007), and Skarda (2010).

We also include the ***INDUSTRY* variable**. Following the literature, we measure the **firms' industry** with multiple dummy variables (nine dummies); each variable takes the value of 1 if a company belongs to the industry corresponding to that variable (N^o=1, …,9) and 0 otherwise. Industry classification and the distribution of the companies in each industry in our four countries are described in Annex 2. According to the literature, a firm's industry is seen as an important variable in determining its accounting choices; see for example, Verrecchia (1983), Watts and Zimmerman (1986), Foster (1986), Porter and McGahan (1997), Beneish (2001), Palepu *et al.* (2004), Lin (2006), Lee (2007), Callao and Jarne (2011), and Datta, Iskandar-Datta, and Singh (2013).

With these variables, we created the following model:

$$|DA| = \beta_0 + \beta_1 ADAPTEU_{34} + \beta_2 ADAPTEU_{56} + \beta_3 CRISIS + \beta_4 TAX_{it}\,(3)$$
$$+ \beta_5 GDP_{it} + \beta_6 UNEMPLOY_{it} + + \beta_7 SIZE_{it} + \beta_8 LISTED$$
$$+ \beta_9 INDUSTRY_1 + \ldots + \beta_{17} INDUSTRY_9$$

The dependent variable, $|DA|$, is the absolute value of discretionary accruals of the firms, as mentioned. The explanatory variables are as follows:

- The ADAPTEU variable includes two dummy variables that designate periods leading to European Union membership. We differentiate three main periods: 1) 2003–2004, the preparation for EU membership; 2) 2005 and 2006, the process of adaptation to the European rules and standards; and 3) 2007–2009, the period of stabilization and entry into the membership structures, which we call the full membership period. For $ADAPTEU_{34}$, the variable takes the value of 1 if a company's observation is from the period of 2003 and 2004 and 0 otherwise; for $ADAPTEU_{56}$, the variable takes the value of 1 if a company's observation is from the period of 2005 and 2006 and 0 otherwise.
- *CRISIS* is a dummy variable, which takes a value of 1 if a company's observation is from the period of 2008 and 2009 (the global financial crisis) and 0 otherwise;
- *TAX* is defined as the tax on the revenues of each company of each country[8];
- *GDP* is defined as the natural logarithm of the GDP per capita of each country;
- *UNEMPLOYM* is the rate of unemployment in each country by year;
- *SIZE* is total assets scaled by assets from *t-1;*
- *LISTED* is a dummy variable that equals 1 if firm is a listed company and, 0 otherwise;
- *INDUSTRY* is a variable that includes nine dummy variables according to the one digit SIC codes; it takes values 1 if the firm belongs to the corresponding industry (Nº =1, …, 9) and, otherwise 0.

4. Results

4.1. Analysis of earnings management

We confirm that companies from emerging Eastern European countries manage their earnings. Annex 3 reports the descriptive statistics and detailed results of the regression parameters for discretionary accruals using the model from Yoon and Miller (2002).

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8 Similar measure of tax variable was used in Lin, Lin, and Tsai (2004); Callao, Jarne, and Wroblewski (2017) for a sample of developing countries.

Additionally, the results of the non-parametric Friedman's test verify that there are differences in earnings management over the period (see Table 5). The test also yields significant results (chi-squared statistic significant at the 1 % level).

Table 5: Non-parametric Friedman's test results.

		Czech Republic	Poland	Hungary	Slovakia
Chi-Square		77.251***	87.184***	15.534**	61.087***
	2003	4.07	3.85	4.35	3.73
	2004	4.13	4.34	4.38	3.57
	2005	4.12	4.02	3.99	3.57
Mean	2006	3.89	3.91	3.8	3.66
Rank	2007	3.66	4.06	3.54	4.48
	2008	4.00	3.83	3.74	4.33
	2009	4.13	3.98	4.21	4.66

* significance at the 10 % level.
** significance at the 5 % level.
*** significance at the 1 % level.

Figure 1 : Tendencies of the earnings management in Eastern European countries over the years.

	Czech Republic	Poland	Hungary	Slovakia
2003				
2004				
2005				
2006				
2007				
2008				
2009				

Source: The author, based on Friedman test.

Moreover, we detected two main tendencies in our results: a gradual decrease in earnings management (mean ranks) in firms from our sample countries between 2003 and 2007 and a rise in earnings management between 2008 and 2009 (see Figure 1).

Both tendencies might be explained by the effect of joining the European Union by the four countries, and the impact of the global financial crisis which have started in late 2007 and in early 2008 affected economic environment worldwide. In the following section, we present the regression results.

4.2. Regression results

Table 6 presents the results of the regression[9]. The coefficient on the unemployment variable is insignificant. This indicates that the rate of unemployment is not significantly related to the scope of earnings management in companies from Eastern European countries and it cannot explain observed changes in earnings management over time. The other variables have coefficients that are significant the 1 % (most of the variables) and 5 % levels. We now present the influence of each independent variable on the scope of earnings management in firms from Eastern European countries over time.

Table 6: Results of ordinary least squares regression.

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Significance
	B	Std. Error	Beta		
(Constant)	.033	.046		.786	.427
ADAPTEU34	.008	.003	.032	3.295	.001
ADAPTEU56	.001	.002	.003	.370	.712
CRISIS	.017	.002	.064	8.382	.000
TAX	-.003	.012	-.036	2.823	.776
GDP	-.009	.005	-.026	-1.905	.057
UNEMPLOYM	.000	.000	-.006	-.559	.576
LISTED	.012	.005	.012	2.199	.028
SIZE	.103	.002	.347	64.823	.000
INDUSTRY1	.014	.004	.034	3.744	.000
INDUSTRY2	.017	.003	.059	5.161	.000

9   We confirm that the model is well-specified. The adjusted R^2 of the model is at the 13 % level. This is a good result in terms of discretionary accruals models. Additionally, F-test confirms that the model is significant (F=302.788). Other authors obtained similar results of adjusted R^2, see for example, Liu and Ziebart (1999) R^2=8.4 %; Koh (2003) R^2=12.86 %; Louis (2004) R^2=10.71 %; Guan, Wright and Leikam (2005) R^2=11.06 %; Bergstressera and Philippon (2006) R^2=8.2 %; Liu and Lu (2007) R^2=7.48 %.

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Significance
	B	Std. Error	Beta		
INDUSTRY3	.006	.004	.014	1.665	.096
INDUSTRY4	.030	.003	.129	9.341	.000
INDUSTRY5	.015	.005	.019	2.959	.003
INDUSTRY6	-.003	.004	-.006	-.754	.454
INDUSTRY7	.028	.004	.043	6.179	.000
INDUSTRY8	.003	.004	.006	.667	.505
INDUSTRY9	.051	.008	.038	6.668	.000
Adjusted R²	0.130				
F-value	302.788*				

$$|DA| = \beta_0 + \beta_1 ADAPTEU_{34} + \beta_2 ADAPTEU_{56} + \beta_3 CRISIS + \beta_4 TAX_{it}$$
$$+ \beta_5 GDP_{it} + \beta_6 UNEMPLOY_{it} + \beta_7 SIZE_{it} + \beta_8 LISTED$$
$$+ \beta_9 INDUSTRY_1 + \ldots + \beta_{17} INDUSTRY_9$$

ADAPTEU variable includes two dummy variables that designates periods leading to European Union membership. *CRISIS* is a dummy variable, which takes a value of 1 if a company's observation is from the period of 2008 and 2009, 0 otherwise. *TAX* is defined as the tax on the revenues. *GDP* is defined as the natural logarithm of the Gross Domestic Product per capita. *UNEMPLOYM* is the rate of unemployment. *SIZE* is total assets scaled by assets from *t-1*. *LISTED* is a dummy variable that equals 1 if the firm is a listed company and 0 otherwise. *INDUSTRY* is a variable that includes nine dummy variables according to the one digit SIC codes; it takes values 1 if the firm belongs to the corresponding industry (Nº =1, ..., 9) and otherwise 0.

*Significant at 1%

Phases in the adaptation process to European Union (ADAPTEU)

The results demonstrate that there is a significant difference in terms of the scope of earnings management between the two periods preceding European Union membership of the four countries. The dummy variables provide a clear comparison of the three EU membership periods. We can see that the first period of preparation for EU accession (2003–2004) has a significant impact on the scope of earnings management over that period of time. The coefficient is positive and significant at the 5% level. It indicates that the circumstances of the first period incentivized managers to intensify earnings management (i.e., to increase or decrease earnings).

In the **first period**, companies from the four Eastern European countries found it necessary to improve their strategic positions. They were weaker, smaller, and, as a result, less competitive than their Western European counterparts. Indeed, they are still not at the same level as companies from Western European coun-

tries. Gorynia (2005) explains that strategic position consists of the attractiveness of the markets in which firms operate and the competence of those firms in their respective fields. We confirm that the "unexpected" increment of the scope of the revenues was between 5 % and 10 % in more than 85 % companies from all four developing countries. At the same time, we observed also an approximately 5–7 % decrease in total costs, which may indicate that firms were attempting to improve their strategic positions through earnings management.

Kempen (2010) explains that managers make certain choices to better reflect the economic positions of their companies. This is due to accounting regulations which permit managers to make judgments and, in practice choose methods and estimations that do not reflect the true economic positions of the company but provide more positive images (Healy and Wahlen, 1999).

We did not identify a significant influence of the *second period* on the extent of earnings management (the variable is not significant). This finding can be explained by the fact that during the period of adaptation, managers of firms from the four Eastern European countries focused on the fulfilment of European requirements, standards, and rules. European structures demand adjustments to accounting practices. As mentioned previously, the accounting framework in all countries has been updated to the EU directives. The accounting systems in Eastern European countries were outdated and needed important changes. Prior to accession, the accounting frameworks in Slovakia, Hungary, the Czech Republic, and Poland were based on laws from 1991, 1991, 1992, and 1994, respectively

Furthermore, detailed accounting standards add value to accounting information (Bartov and Mohanram, 2004; Hung and Subramanyam, 2007; Rudra and Bhattacharjee, 2012). However, the period before the EU membership may be characterized as transitional and, the adoption of IFRS was not complete.

Table 7: Audit regulations in various countries.

Country	Adoption of Directive 2006/43/EC	Audit partner rotation	Disclosure of audit fees
Czech Republic	2009	until 2008: no; since 2009: yes (7 years)	until 2008: no; since 2009: yes
Hungary	2008	until 2007: no; since 2008: yes (5 years)	until 2007: no; since 2008: yes
Poland	2009	until 2008: no; since 2009: yes (5 years)	until 2008: no; since 2009: yes

*Slovakia has not been included in this study.
Source: Hess (2014).

Finally, ***the last period*** represented by the dummy variable not included in the model[10], had a lower level of earnings management than the other two periods. In this period, the companies were fully-integrated into the EU structure. Additionally, the control procedures in the EU were well-developed and sophisticated. Therefore, earnings management may have been significantly reduced by direct influence of the Western European investors or by audit control. Hess (2014) analyzes the audit regulation in 28 European countries and, its effect on the quality of financial statements. Different steps have been taken to improve the reliability of the financial statements; for example, external rotation is a measure to increase auditor independence and to improve audit quality. Another measure was the implementation of the Audit Directive 2006/437EC. Furthermore, Directive 2006/43/EC (European Parliament and European Council 2006), amended by Directive 2008/30/EC (European Parliament and European Council 2008), contains rules regarding statutory audits of annual accounts[11]. The main goal of the Audit Directive was to harmonize the audit processes across the EU member states and to establish a single market for audit services within the EU. As shown in Table 7, all four countries improved audit regulations by introducing the Audit Directive 2006/43/EC, audit partner rotation of disclosure of audit fees, among other measures; these actions confirm our results.

Economic crisis variable (CRISIS)

The CRISIS variable has a significant positive coefficient (0.017), which is consistent with our prediction. Changes in the scope of the earnings management of Eastern European firms were influenced by the economic crisis. The positive sign of the coefficient of the variable indicates that during crises, it is expected that managers will increase earnings management (i.e., to increase or decrease earnings). On the other hand, when economic conditions improve a lower level of earnings management is predicted.

The global crisis impacted on the economic environment worldwide. Advanced economies were battling to maintain economic activities and were shaken by the instability of the markets caused by the recession. Emerging economies were also impacted as the deterioration in the economic environment caused considerable concern around the globe. Figure 2 shows some economic variables of the firms and the abrupt and unexpected decreases in the values of these variables between 2008 and 2009.

The financial crisis dramatically reduced the economic activity of companies from Eastern European countries; the economic crisis hit the emerging region of Eastern Europe in late 2008.

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10 Regression model includes one less dummy variable than there are categories, to avoid multi-colinearity.

11 European Parliament and European Council, 2006.

Figure 2: Economic variables: Total scaled assets (mean) by country

ROA mean
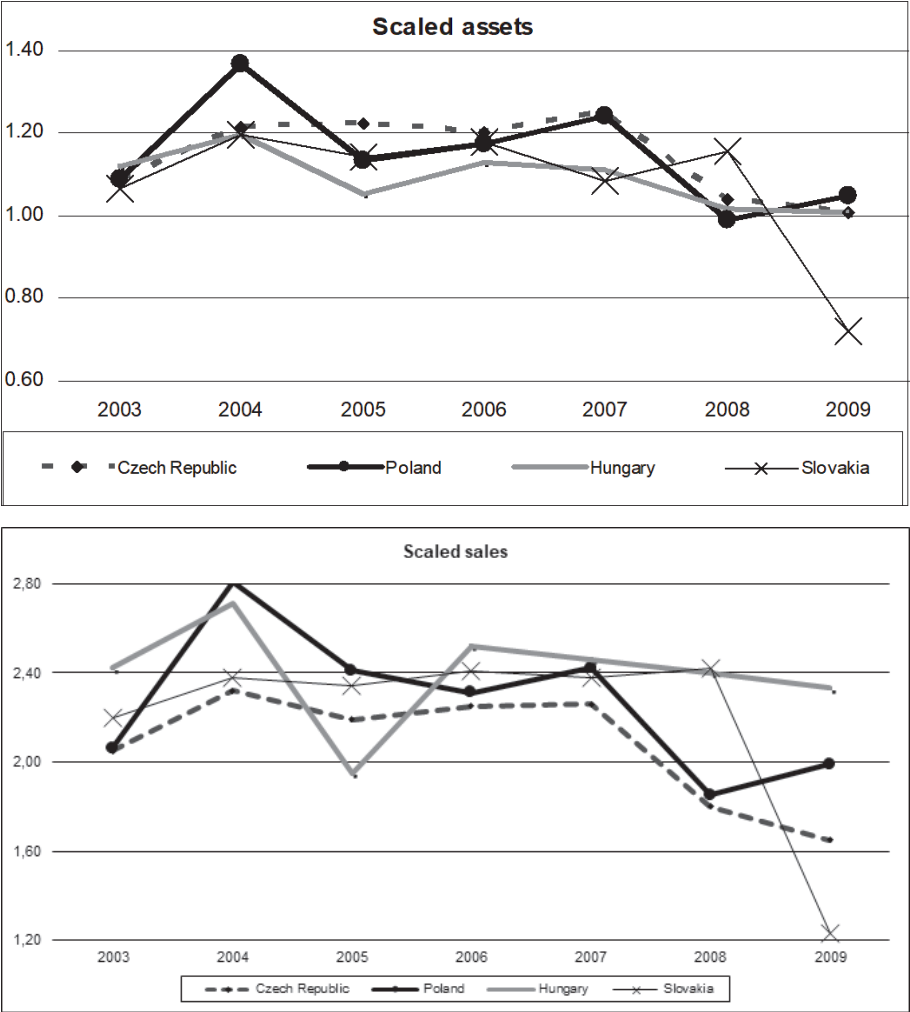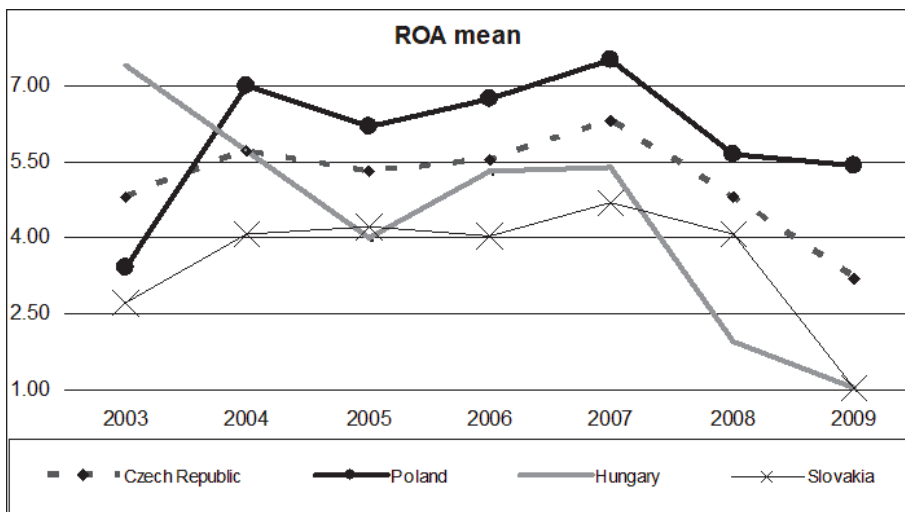
Source: The author

Gross Domestic Product variable (GDP)

The coefficient of the Gross Domestic Product variable is significant (at the 10 % level) and negative (-0.009), representing the fact that the Eastern European countries' economic development affects managers' decisions to change their use of earnings management over time. The sign is in line with our prediction; strong local markets constrain earnings management.

Figure 3: Gross Domestic Product per capita.
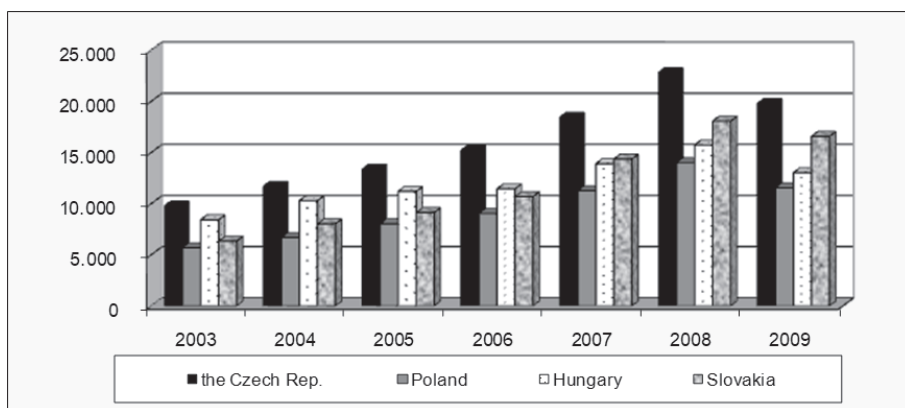
Source: The author.

Figure 3 shows that when the economy of each country is growing (contracting), the scope of earnings management decreases (increases). In the last two years of the period, the GDP of the four countries decreased and, at the same time, earnings management increased.

The literature confirms our results; higher GDP per capita decreases the degree of earnings management (Shen and Chih, 2005). Jin (2005) demonstrates that the magnitude of earnings management fluctuates quarterly, and its variation can be predicted by real economic activity.

Listed variable (LISTED)

The listed variable is significant at the 5 % level and has a positive coefficient (0.012). However, even though the security exchanges and financial sectors in the four countries are still relatively underdeveloped (Köke and Schröder, 2006), we confirm that fluctuations in earnings management depend on whether companies are listed. Table 8 shows the distribution of listed companies in each country over time. The positive sign indicates that earnings management is more common in listed firms than unlisted firms.

Such behavior may be connected to the visibility of firms. The threat of negative media publicity for listed companies may affect managerial practices (Bansal, 2005). Publicity generates pressure for firms to maintain stable development, strong earnings results, and positive images.

Table 8:   Total of listed companies in Eastern European countries.

Country	2003	2004	2005	2006	2007	2008	2009
Czech Republic	63	54	36	29	32	18	16
Poland	203	225	248	267	328	349	354
Hungary	49	47	44	41	41	41	43
Slovakia	306	258	209	173	153	125	107

Source: Doing Business database, 2012.

Size variable (SIZE)

Firm size is correlated with managerial decisions, and it indeed influences earnings management over time. The coefficient is positive (0.103) and significant. Our results confirm that firm size should also be considered when explaining the changes in the earnings management of Eastern European firms. We find that large firms have a higher level of earnings management, and small Eastern European firms have a lower level of earnings management over time. Large firms draw attention from the media, investors, and regulators, and regulation may be designed for specific industries or corporations (Paiva and Costa, 2013). There-

fore, large firms are more likely engaged in earnings management for the purpose of their public visibility and political costs (Watts and Zimmerman, 1990). However, smaller companies can face the contrary situation, such as a lower pressure, no media expectations, lower information asymmetry, and no agency conflicts.

Industry variable (INDUSTRY)

Firm industry is an important variable influencing the use of earnings management by Eastern European managers; Annex 2 shows the industry distribution in our sample countries. Table 6 shows that in almost all sectors, the coefficients of the variables are significant. This means that fluctuations in earnings management can be explained to some extent by the industries firms operate in. A firm operating in one industry may have a different tendency to engage in earnings management than companies operating in other industries.

There is a large body of literature that confirms that a firm's industry is an important variable affecting accounting choices, as explained above. This is because industry earnings performance is often used as a benchmark for evaluating firm performance (Antle and Smith, 1986; Gibbons and Murphy; 1990); firms' earnings information affects other firms' earnings decisions via intra-industry earnings information transfers (Pyo and Lustgarten, 1990; Freeman and Tse, 1992). Firms are likely to delay their earnings announcements to observe other firms' earnings and assess industry conditions (Park and Ro, 2004).

Tax variable (TAX)

Our results have confirmed that in our sample, the earnings management of companies from the four emerging Eastern European countries is not affected by taxes. The coefficient on tax variable (*TAX*) was not significant.

5. Context and implication for other emerging countries

Emerging European countries can be compared to other emerging countries from other regions. The literature defines an emerging market as a country that has some characteristics of a developed market but does not meet standards of a developed market (MSCI, 2012). The largest developing economies – Brazil, China, India, and Russia – and countries such as Indonesia, Mexico, South Korea, Malaysia, and Bangladesh are mentioned as examples of emerging economies. In Europe, the Czech Republic, Estonia, Greece, Hungary, Poland, Romania, Slovakia, and Slovenia are the main emerging countries. However, as mentioned in Section 3, there are almost no studies on European emerging markets.

The prior literature also reports the existence of earnings management in emerging economies; for example, Razzaque, Rahman and Salat (2006) found earnings management in companies from Bangladesh; Lee and Xue (2004), Yu, Du, and Sun (2006), Liu and Lu (2007) found evidence for China; Yoon and Miller (2002), Kim and Yi (2005) found evidence for South Korea; Saleh, Iskandar, and Rahmat (2005) and Bukit and Iskandar (2009) found evidence for Malaysia; Caramanis and Lennox (2008) found evidence for Greece; Swiderski (2010) found evidence for the Czech Republic, Hungary, and Poland; and Matis (2010) found evidence for Romania.

There are few studies discussing earnings management in emerging economies during periods of crisis; however, these studies have also found evidence that financial crises influence managers' decisions to use earnings management. Eng *et al.* (2019), for example, found that in the Chinese economy, firms' earnings management activities differ in crisis and non-crisis periods. They compare the pre-financial crisis period and the post-financial crisis period and find important differences; they also show that earnings management is lower in Chinese family firms relative to non-family firms in the post-financial crisis period, but both engage in earnings management.

Mittal and Ajay (2019) demonstrate the strong impact of earnings management in the financial reporting of Indian companies during crisis years. Fernandes da Silva *et al.* (2014), based on a Brazilian sample, find that earnings management practices may aim both to reduce and increase the earnings during periods of crisis. Such a practice might be used, for example, to transfer poor results from prior periods or even to avoid government sanctions (e.g., withdrawal of some subsidies), covering a higher than expected performance. Such a practice may also be adopted to bring "good news" which could help firms retain or attract cautious investors.

Pozzoli and Parthenope (2018) investigated the Brazilian economy and found contrary results – that is, that a crisis might not produce an increase in earnings management practices. They found a possible explanation, as the Brazilian economy, despite the global crisis grew significantly during this period.

As for the tax variables, other studies on emerging countries do not confirm our results and instead show that tax incentives influence earnings management. Lin (2006), for example, confirms that Chinese firms' earnings management behavior is correlated with the tax incentives. Swiderski (2010), based on samples from the Czech Republic, Hungary, and Poland, also demonstrate that public and private firms' engagement in earnings management is also affected by taxes. Flores *et al.* (2016) observe that Brazilian companies with greater income tax

burdens tend to improve their discretionary accruals and earnings management[12].

All these studies provide results that contradict those in our study, which was expected because tax incentives are widely considered to be determinants of earnings management. One possible explanation for our results is the changing tax practices of emerging Eastern European countries as they adopted more investor-oriented perspectives, as explained in Vellam (2004) and Sucher and Jindrichovska (2004). The market orientation approach clearly prioritizes investor perspectives rather than incentives regarding taxes (for example, reducing or increasing tax burdens).

We did not find studies on the influence of European membership and earnings management in other emerging countries. However, Yu, Du, and Sun (2006), for example, found empirical results indicating that Chinese firms changed their earnings management behavior in response to changes in regulatory requirements. Therefore, regulatory changes indeed impact firms' earnings management practices.

Finally, the macroeconomic conditions of emerging countries were analyzed by Chen *et al.* (2019). They found that Chinese firms in provinces with GDP growth lower than the national level were more likely to engage in earnings management than firms in other provinces. These results confirm our results finding that a strong local country markets may constrain earnings management.

6. Conclusion

The purpose of this paper was to investigate the influence of macroeconomic conditions on the earnings management of the companies from emerging Eastern European countries during the period of 2002–2009. In particular, we focused on whether and how the financial crisis affected the tendency of managers to manage earnings and the effect of European membership on the existence and scope of earnings management. We focused on four developing Eastern European countries (the Czech Republic, Poland, Hungary, and Slovakia) as these countries have been barely explored.

The main finding of this paper is that there was significant decrease in earnings management and an improvement of accruals quality in the period of European Union accession. During the period of adaptation to the EU requirements, managers of Eastern European companies may have focused on the fulfilment of European requirements, standards, and rules and complying with strict and de-

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12 Other explanation may come from the way of measuring tax variable, other authors used tax-rate increase, marginal tax-rate, pretax accounting income minus fiscal profit scaled by total assets, income tax expenses divided by pre-tax income, etc.

manding regulation. In the following years, new audit control procedures significantly reduced opportunities for earnings management.

Furthermore, we confirm that during the period of crisis, there was an increase in earnings management. This finding can be explained by the fact that in a period of crisis, when investors are pessimistic about earnings news, managers rely more on earnings management. Furthermore, despite the poor economic situation, they try report earnings similar to those in previous periods. Moreover, it is confirmed that during periods of crisis, managers may try to smooth the effect of fluctuations and opt for earnings management to fulfill their companies' objectives.

Although we have filled some gaps in earnings management literature, there are further issues to investigate. A potential extension to this research could be a comparative study of earnings management in Eastern and Western Europe to understand both markets. The issue of earnings management in Europe as a whole has so far remained unanswered.

It would be also useful to conduct the analysis in this paper using the sample of other developing countries in order to know whether the European evidence is unique.

Another possible extension could be to analyze the data for the four Eastern European countries using a different methodology to see if such approach can confirm our results.

Lastly, future research could compare our results with a sample of Eastern European companies that prepare financial statements under the IFRS to evaluate if the introduction of the IFRS has an effect on earnings management. This has not yet been done with a sample of developing Eastern European countries.

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Annex 1: Results on Normality test of our four samples (absolute values of discretionary accruals)

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Country	Statistic	df	Sig.	Statistic	df	Sig.
DA	Czech R.	.210	14,343	.000	–	–	–
	Hungary	.224	15,757	.000	–	–	–
	Poland	.244	798	.000	.488	798	.000
	Slovakia	.142	1,491	.000	.788	1,491	.000
a. Lilliefors Significance Correction							

Tests of Normality

Annex 2: Industries classification based on the first digit of the Standard Industry Code (SIC-code), and the percentage of the distribution of the companies in each industry

	INDUSTRY										TOTAL
	0	1	2	3	4	5	6	7	8	9	
Czech R.	6.5 %	9.7 %	29.1 %	7.5 %	30.8 %	2.4 %	5.3 %	4.5 %	3.3 %	0.7 %	100 %
Poland	2.2 %	10.3 %	16.9 %	9.4 %	35.4 %	2.4 %	8.0 %	3.1 %	11.5 %	0.8 %	100 %
Hungary	0.9 %	9.6 %	27.2 %	4.4 %	43.9 %	4.4 %	2.6 %	1.8 %	4.4 %	0.9 %	100 %
Slovakia	5.2 %	20.2 %	24.9 %	8.0 %	32.9 %	3.3 %	0.9 %	1.4 %	2.3 %	0.9 %	100 %
TOTAL	4.2 %	10.5 %	22.9 %	8.4 %	33.5 %	2.5 %	6.3 %	3.6 %	7.2 %	0.8 %	**100 %**

According to SIC-code:

1 – agriculture, forestry and fishing industries, 2 – manufacturing, mining and quarrying and other industry, 3 – construction, 4 – wholesale and retail trade, transportation and storage, accommodation and food service activities,5 – information and communication industry,6 – financial and insurance activities, 7 – real estate activities,8 – professional, scientific, technical, administration and support service activities, 9 – public administration, defence, education, human health and social work activities, 0 – other services (group "other" comprises establishments engaged in providing services not specifically in previous category of public services, for example, Hunting, trapping and related service activities; Marine services).

Annex 3: Panel A: Statistics on discretionary accruals over the years

	2003	2004	2005	2006	2007	2008	2009
Panel A: the Czech Republic sample							
Mean	-0.0318	-0.0210	-0.0279	-0.0043	-0.0059	-0.0388	-0.0580
Standard deviation	0.1478	0.1599	0.1409	0.1389	0.1663	0.1348	0.1220
Median	-0.0422	-0.0310	-0.0401	-0.0206	-0.0200	-0.0464	-0.0587
Panel B: Polish sample							
Mean	-0.0323	-0.0059	-0.0325	-0.0248	-0.0190	-0.0470	-0.0544
Standard deviation	0.1799	0.1625	0.1531	0.1760	0.1427	0.1404	0.1143
Median	-0.0380	-0.0221	-0.0399	-0.0362	-0.0316	-0.0461	-0.0529
Panel C: Hungarian sample							
Mean	0.0470	-0.0242	-0.0259	0.0201	-0.0315	-0.0567	-0.0564
Standard deviation	0.3247	0.1783	0.1158	0.1905	0.1054	0.1143	0.1020
Median	-0.0244	-0.0495	-0.0444	-0.0159	-0.0348	-0.0486	-0.0558
Panel D: Slovakian sample							
Mean	-0.0478	-0.0069	-0.0494	-0.0294	-0.0618	-0.0551	-0.0972
Standard deviation	0.1098	0.1113	0.0841	0.1233	0.1643	0.1477	0.1058
Median	-0.0508	-0.0286	-0.0480	-0.0424	-0.0708	-0.0608	-0.0969

Panel B: Parameters of the estimation of regression (2)

Measurement model: Yoon and Miller (2002) Model

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0 \frac{1}{A_{it-1}} + \alpha_1 \frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} + \alpha_2 \frac{\Delta EXP_{it} - \Delta PAY_{it}}{A_{it-1}} + \alpha_3 \frac{NCASH_{it-1} \times GPPEGRW_{it}}{A_{it-1}} + \varepsilon_{it}$$

	Intercept	ΔREV-ΔREC	ΔEXP-ΔPAY	NCASH-1xGPPEGRW	Adjusted R²
2003					
Czech Republic Sample	-0.0318	-0.3742***	0.4279***	0.2374***	28.59 %
Poland Sample	-0.0323	-0.7323***	0.7842***	0.2216***	56.05 %
Hungary Sample	0.0470	-0.4969***	0.4995***	-0.8691	13.99 %
Slovakia Sample	-0.0478	-0.5429***	0.5828***	-0.0184	42.43 %
2004					
Czech Republic Sample	-0.0210	-0.3074***	0.3648***	0.5451***	23.62 %
Poland Sample	-0.0059	-0.4313***	0.4891***	-0.5023***	25.51 %
Hungary Sample	-0.0242	-0.1388***	0.1683***	0.1884	10.01 %
Slovakia Sample	-0.0069	-0.3651***	0.4044***	-1.1767***	29.54 %
2005					
Czech Republic Sample	-0.0279	-0.4382***	0.4755***	-0.0350	32.59 %
Poland Sample	-0.0325	-0.2957***	0.3342***	-0.1812***	13.25 %
Hungary Sample	-0.0259	-0.4737***	0.4810***	-0.6858	24.58 %
Slovakia Sample	-0.0494	-0.4790***	0.5229***	-0.2642	38.67 %
2006					
Czech Republic Sample	-0.0043	-0.4720***	0.5084***	-0.8119***	35.98 %
Poland Sample	-0.0248	-0.2802***	0.3315***	-0.0920	15.52 %
Hungary Sample	0.0201	-0.3080**	0.3170**	-0.8287	2.97 %
Slovakia Sample	-0.0294	-0.4716***	0.5129***	-0.5811	25.18 %

Measurement model: Yoon and Miller (2002) Model

2007					
Czech Republic Sample	-0.0059	-0.4599***	0.4798***	0.2435**	33.72 %
Poland Sample	-0.0190	-0.4379***	0.5055***	-0.1710*	29.67 %
Hungary Sample	-0.0315	-0.4723***	0.5106***	-0.6981	24.78 %
Slovakia Sample	-0.0618	-0.0290	0.2173***	-0.5867	39.05 %
2008					
Czech Republic Sample	-0.0388	-0.2026***	0.2369***	0.0220	8.81%
Poland Sample	-0.0470	-0.5176***	0.5940***	0.0061	32.71 %
Hungary Sample	-0.0567	-0.3012***	0.3350***	0.4139	9.19 %
Slovakia Sample	-0.0551	-0.2823***	0.2823***	1.2831**	24.13 %
2009					
Czech Republic Sample	-0.0580	-0.3586***	0.3868***	-0.3894***	18.41 %
Poland Sample	-0.0544	-0.5182***	0.5708***	-0.0037	42.31 %
Hungary Sample	-0.0564	-0.4916***	0.5066***	0.6417	47.10 %
Slovakia Sample	-0.0972	-0.5427***	0.5483***	0.4064	41.67 %

* significance at 10 %** significance at 5 %*** significance at 1 %
NDA_{it} – Non-discretionary accruals in year t; A_{it-1} – Total Assets in year t-1; ΔREV_{it} – Annual change in revenues in year t; ΔREC_{it} – Annual change in receivables accounts in year t; ΔEXP_{it} – Change in operating expenses excluding non-cash expenses in year t; ΔPAY_{it} – Change in payables accounts in year t; $NCASH_{it-1}$ – Non-cash expenses such as depreciation in year t-1; $GPPEGRW_{it}$ – A rate of growth in gross property, plant and equipment in year t.
Source: The author, working paper (2016).