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THE WAR IN UKRAINE AND EARNINGS REPORTING QUALITY IN CENTRAL AND EASTERN EUROPE

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The War in Ukraine and Earnings Reporting Quality in Central and Eastern Europe

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Abstract

The Russian invasion of Ukraine, which affected not only the directly involved countries, has caused a worldwide turmoil. Higher losses may have motivated the distressed companies to change their behavior, in particular, in terms of their earnings reporting quality. Contributing to the literature on earnings management during wide-scale external shocks, this paper explores the impact of the war in Ukraine on the earnings reporting quality of Central and Eastern European companies. The study focuses on the timeframe spanning from Q1 of 2017 to Q3 of 2022 and examines 224 publicly listed companies across 11 countries, which adds up to a total of 5152 firm-quarter observations. Using two income smoothing and three accrual quality proxies utilized by Filip and Raffournier (2014), we find that for several industries - Consumer Cyclicals, Energy, and Non-Energy Materials - earnings management has decreased after the start of the war. Moreover, on a firm level, higher exposure to the Russian market is associated with an even larger decrease in the level of earnings management after the start of the war. The Covid-19 period also shows a similar and significant trend in the improvement of earnings reporting quality. These findings consistently imply that there is a link between financial distress and more prudent earnings reporting.

Keywords: earnings management, earnings reporting quality, Russian war in Ukraine, Central and Eastern European companies, Covid-19

1. Introduction

Over the past years, earnings reporting quality has been a frequently scrutinized subject of a number of academic research papers in various micro- and macroeconomic contexts. Since managers have some discretionary power in financial reporting, earnings can be manipulated in the desired way to achieve certain favorable outcomes. The degree of manipulations, however, can vary in different economic environments and, in particular, change when facing a wide-scale external shock.

In literature, several studies have scrutinized earnings reporting quality in the context of a crisis (e.g., the 2008 global financial crisis, or the Covid-19-induced crisis). Nevertheless, the empirical evidence is conflicting and there are incentives for both income-increasing and income-decreasing earnings management as well as an improvement in the earnings reporting quality during a distressed period. For instance, in the European study of the global financial crisis in 2008, Filip and Raffournier (2014) find improved earnings reporting quality while, in contrast, in the global investigation of the same crisis, Persakis and Iatridis (2015) bring evidence that the earnings management was intensified at the time of the recession. Likewise, Hsu and Yang (2022) also find a trend of upward earnings management during the Covid-19-induced crisis in the UK-based study.

In a similar way to the latter global exogenous shocks, the Russian invasion of Ukraine which started on February 24, 2022, can also be perceived as a significant economic shock that resulted in a global economic turmoil. The shock may have impacted earnings reporting practices, especially for companies most closely related to Russia, as the latter country was highly sanctioned worldwide, therefore, the connectedness to Russia created higher business-related risks and losses (Berninger, Kiesel, & Kolaric, 2022). The affected companies, similarly, were also expected to voluntarily impose their own actions to discontinue the relations with the aggressor country.

Although this is not a pure financial crisis like, for instance, the global financial crisis in 2008, the war in Ukraine still represents a major external event. The war has equivalently big adverse effects on many companies, which is, to some extent, similar to the consequences from

other external shocks that were analyzed in the previously mentioned studies as many companies faced unexpected losses. Nonetheless, the war in Ukraine has an even more unique and distinct setting as it involves geopolitical and economic uncertainty, and energy crisis simultaneously, making the circumstances of the study particularly intriguing and, hence, worthwhile to be scrutinized in more depth.

Up until now, there has been a significant number of studies examining the economic impact of the war in Ukraine on global markets. However, there seem to be no recent studies about the earnings reporting quality in the context of the Russian war in Ukraine. The impact of the war reached not only the directly involved nations but also transmitted through a spillover effect to other economies, in particular, the ones that were historically closely related to Russia (Irtyshcheva, Kramarenko, & Sirenko, 2022). Reacting to the invasion, many firms, in turn, have left the Russian market in support of Ukraine. The implementation of such voluntary sanctions by companies often resulted in sacrificing a portion of their profits (Berninger, Kiesel, & Kolaric, 2022). Additionally, some firms have been struggling with other war-imposed consequences such as inflation or supply chain problems affecting their operations. Since companies are expected to cater to shareholders and meet or beat last year's earnings, one of the likely scenarios is that the decreased profitability might be sought to be hidden. On the other hand, there are various incentives to improve the earnings quality as well, e.g., higher scrutiny from the auditors, or fear of litigation costs in case manipulations are exposed (Filip & Raffournier, 2014). Market participants' general acceptance of the losses during economic recessions is another likely motive to report the actual financial situation for the companies.

Knowing that earnings management was already observed in several previous crises (e.g., the 2008 financial crisis, Covid-19 pandemic, etc.) and the results are contradicting, we aim to research whether the Central and Eastern European [CEE] companies related to Russia manage earnings and/or smoothen out the sudden losses faced because of the war. The choice of the region allows us to analyze companies that have the closest interconnectedness with the Russian market due to historical and economic ties as well as geographical proximity. This leads us to two research questions:

(1) How did the war in Ukraine affect earnings reporting quality for Central and Eastern European companies?

(2) What are the differences in companies' earnings management practices depending on their exposure to the Russian market between the pre-and post-war periods?

The results indicate that before the start of the war, companies had high income smoothing practices; however, since the start of the war, income smoothing has decreased dramatically. Next, companies from several industries - Consumer Cyclicals, Energy, and Non-Energy Materials - have improved their earnings reporting quality after the start of the war. When performing a difference-in-differences analysis, the results show that companies with higher revenue exposure to Russia have decreased their level of earnings management after the start of the war, while in general, these companies tend to manipulate earnings more than companies with smaller exposure. Additionally, when investigating a firm's auditor's impact on the level of earnings management, we find no significance of the "Big 4" auditors' influence on the firm-level residuals.

The paper is constructed as follows. Section 2 introduces the literature review and talks about the potential directions of earnings management based on different incentives and looks at studies about earnings reporting quality in the context of several exogenous shocks. Section 3 describes the data and methodology utilized for answering the research questions. Section 4 provides the empirical results of the study and robustness tests to validate the findings. Section 5 explains the findings of the study and Section 6 concludes them.

2. Literature review

2.1. Review of company behavior when facing unexpected negative shocks

A crisis can be defined as a period of experiencing substantial difficulties, danger, or suffering (Cambridge Dictionary, n.d.). Kusa et al. (2022) suggest that a crisis as an economic shock possesses limited time for action and may threaten the existence of numerous business entities. Exploring the possible responses during a crisis, the management can adopt decisions that influence both the company's external and internal environment, and these decisions can even be destructive and limit the company's viability (Hermann, 1963). According to Kusa et al. (2022), who investigate the factors that foster a company's growth during a crisis, several important elements such as opportunity seeking, diversification, and proactiveness can help companies survive the shocks. However, the roles of these determinants often depend on the underlying factors in the market conditions and company specifications.

Additionally, Lins et al. (2017) point to the importance of corporate social responsibility when a firm faces an external shock such as a crisis during which the overall trust in the markets decreases. They provide evidence that firms with higher corporate social responsibility levels are more trusted by investors and stakeholders. Nevertheless, because of the financial distress, managers of companies typically have incentives to engage in various coping mechanisms. Some decisions made are concerned with innovation or the adoption of a new strategy, e.g., marketing (Wang et al., 2020), production, research (Sharma et al., 2022), or others. However, to help a company survive a crisis, there are high incentives to engage in various unauthorized activities too, one of which is manipulating earnings, either in income-increasing or income-decreasing directions (Habib et al., 2013). The latter strategic action to facilitate the crisis's effects is a primary focus of our research.

2.2. Earnings Management

Earnings management can be defined in multiple ways; however, for most of them, the fundamental idea remains unchanged: earnings are manipulated through financial reporting discretion for the purpose of attaining certain objectives (El Diri, 2017). Corporate managers exercise their judgment when creating financial reports and usually alter the latter for two

primary motives: to misrepresent the economic performance and mislead stakeholders or to influence several outcomes by reporting different numbers (Lo, 2008). Specifically, some of the targeted outcomes from managing earnings could be management's personal incentives for improving their compensation, meeting certain earnings expectations, satisfying the shareholders, and others (El Diri, 2017).

In a broader context, earnings management is usually classified into two parts: accrual accounting earnings management and real activities earnings management (Lo, 2008). In accrual management, the accounting policies and estimates are changed, and it does not affect the cash flow, e.g., when changing the depreciation method or estimating provision for doubtful accounts (Zang, 2012). Possible manipulations of accruals can be detected either by investigating discretionary or non-discretionary accruals (Darmawan et al., 2019). Meanwhile, real earnings management is defined as the discrepancy from the regular operations of a company through certain managerial decisions (Roychowdhury, 2006). This usually happens through the real operational activities of a firm and has an impact on the cash flow, e.g., by delaying asset write-offs, managing research and development expenditures, price discounts, etc.

One type of real earnings manipulation is income smoothing which is characterized as management's attempt to reduce the fluctuations in the company's net income by using discretion in financial reporting (Chen et al., 2019). In order to reduce fluctuations, earnings are smoothed out to hide income disparities between more and less successful time intervals (Copeland, 1968). Some of the reasons explaining the decision to smooth earnings are the management's belief that shareholders are ready to pay a higher price for a company with smoother earnings (Trueman & Titman, 1988). The reduction of volatility in reported income is associated with better appraisal of the company in terms of, for example, borrowing conditions, terms of trade, or relationships with stakeholders.

Although real earnings management methods are argued to be more effective than accrual earnings management, it is relatively more difficult for the market or auditors to uncover these actions. However, the latter type of earnings management may have a negative effect on the future cash flows of the company (Darmawan et al., 2019) and is usually more costly too (Lo, 2018). However, under economic uncertainty, managers prefer to use real earnings management

since there are no clear benchmarks for evaluating which firm reporting decisions would be appropriate for their specific circumstances (Lo, 2018). Nevertheless, Zang (2012) highlights the need to scrutinize the tradeoff between both earnings management methods - companies usually evaluate the methods based on their costliness and timing and often regard these methods as substitutes.

2.3. Previous research on earnings management

2.3.1. Upward earnings management

One of the directions of earnings manipulations is upward earnings management (i.e., reporting inflated earnings beyond their actual value). Several factors might lead companies to deliberately boost the numbers they report. Hsu and Yang (2022) link such a type of decreased earnings quality with the willingness of the companies to prevent or reduce the negative consequences of unexpected shocks. Meeting the expectations of the shareholders is crucial for businesses thus they may be motivated to intentionally increase reported earnings. In this way, companies can protect the value of their shares from a negative reaction in case investors are dissatisfied with a worse performance of the company during the crisis.

Looking at the management's motivation for meeting or beating forecasted earnings benchmarks, Graham et al. (2005) name a few possible reasons for such behavior. For example, building credibility within the market, maintaining the stock price, and improving management's reputation. Managers are likely to be focused on short-term earnings benchmarks, thus, would be willing to take risks and sacrifice long-term value. They may also have incentives to smooth earnings as investors view such companies as less risky. This can lead to a more positive outlook on a company's future performance and, in turn, would be reflected in the future stock prices because, without detecting the illegal practice, markets would assume the reported numbers to be reflecting the actual performance. Therefore, the stock prices would be impacted in a positive way. Nevertheless, if the market participants were to uncover such an upward earnings management, it would lead to a correction of the market's overly positive perception of the firm's real value (Darmawan et al., 2019).

Among other reasons to engage in positive earnings manipulation could be the risk of bankruptcy or getting delisted (Persakis & Iatridis, 2015). Low profitability, the need for capital and equity, meeting analysts' expectations as well as a risk of violating loan covenants are among other typical motives to manipulate reported earnings upward. Additionally, if the CEO's compensation is linked with the value of the company's stock or options, or the CEO is concerned about his/her reputation, he/she might also seek to encourage earnings management in the company (Iatridis & Kadorinis, 2009).

2.3.2. Downward earnings management

The direction of earnings manipulations can also be income-decreasing. In some cases, reporting higher losses than faced, which we later refer to as downward earnings management, might be beneficial when already breaching debt covenants or when unable to repay debt (Filip & Raffournier, 2014). Inflated reported losses signal the difficulties that a company faces and can help in negotiations for more concessions in loan conditions (e.g., lower interest rates, delayed payments of principal and/or interest, etc.). Such concessions might be possible as some banks may not call for the liquidation of the firm under distress but rather accept less favorable conditions for repayment of their loan if there is a long-term potential for recovery, which would benefit banks more than the short-term stricter conditions that can be detrimental for the existence of a firm (Shleifer & Vishny, 1992). This is because, during crises, the assets of liquidated companies are worth significantly less than when the economy is booming. As a result, banks anticipate gaining greater profits by accepting changes in the debt covenants and allowing a company to continue operations instead of calling the loan during a financial distress period. Companies can leverage this information when deciding whether to mislead creditors to potentially get convenient conditions. However, such a strategy is risky as creditors might not agree with concessions.

Additional incentives to manage earnings downward might occur because of different agency conflicts, such as with employees and shareholders. For instance, when a company is in tight contractual renegotiations with the labor union regarding wages, reporting bigger losses can help the management in convincing the doubting employees to agree with wage reductions since the company is officially facing financial difficulties (DeAngelo et al., 1994). Regardless of the

true scope of losses, the latter income-decreasing manipulations allow managers to have more bargaining power with employees as they perceive the company as financially distressed and, consequently, are concerned about keeping their jobs during an economic recession period even at the cost of forgoing some part of their wages.

Similarly to agency conflicts with employees, shareholders can also be disciplined by the bigger reported losses. When managers are convinced that the dividend cut is reasonable and needed, the shareholders' appetite for dividends can be justifiably restrained by showing worse financials (DeAngelo et al., 1994). Shareholders are likely to agree with the dividend cuts in the short run because, in the longer perspective, it is to the benefit of investors to help the company survive the ongoing crisis.

Moreover, Filip and Raffournier (2014) argue that government support for companies during economic crises can also serve as an incentive to use income-decreasing accounting tools. Typical forms of support that companies might seek to receive from the government by showing bigger losses include the protection of the domestic market through higher import tariffs on foreign competitors, antitrust clearance for a company, a pretext to protest unfavorable regulations, or, in more extreme cases, even to seek a government bailout (DeAngelo et al., 1994; Filip & Raffournier, 2014). Nevertheless, in an empirical analysis of DeAngelo et al. (1994), the opportunity to receive government aid was not found to be a primary driver for the downward earnings manipulations; however, bigger losses alongside other relevant evidence proving financial difficulties were often mentioned as the reasons for applying to receive governmental aid.

2.3.3. Decrease in earnings management

On the other hand, there are several arguments supporting that earnings reporting quality might improve (i.e., meaning that there is a decrease in earnings management) during an economic downturn. One of the reasons Filip and Raffournier (2014) mention is closer monitoring from the auditors during the recession periods, especially if the companies choose the most reputable auditing firms to increase the credibility of their earnings reports. Tighter supervision during an economic crisis, in turn, reduces the discretionary power of making certain

accounting decisions that can lead to performing earnings manipulations (Chia, Lapsley, & Lee, 2007). Closer surveillance also increases the risk of litigation in case the illegal practices would be exposed by the auditors or other stakeholders (Filip & Raffournier, 2014). That, as a consequence, would result in a costly and lengthy litigation process that disincentivizes engaging in earnings management activities and, therefore, drives more conservative reporting behavior of the companies.

Another reason to improve the quality of earnings (i.e., report prudent numbers) during an economic downturn is the market participants' general acceptance of losses. Analysts expect companies to make exceptional losses but these losses are more tolerated by investors since the decrease in earnings is normal during an unanticipated crisis (Strobl, 2013). Moreover, at troubled times, the earnings of companies fluctuate inconsistently and thus are not fully trusted by analysts when making future forecasts (Filip & Raffournier, 2014). Analysts typically suspect more frequent deceitful earnings announcements and, consequently, call for more conservative reporting. This, in turn, mitigates the need for companies to manage earnings.

2.3.4. Earnings management in different industries

There is empirical evidence that earnings management practices can differ for different industries. According to the study by Sun and Rath (2008) conducted for Australian firms, several industries including Energy and Industrials tend to engage in downward earnings management while Healthcare and Telecommunication & Utilities - in upward earnings management. To better understand the different characteristics of industries and how they might affect earnings reporting practices, the audit report lag [ARL], which refers to the time required by auditors to complete an audit after the conclusion of a company's fiscal year, can be utilized. Previous studies show that unexpectedly longer ARLs could be linked to inferior earnings reporting quality (Knechel & Payne, 2001).

Bamber, Bamber, and Schoderbek (1993) state that the complexity of an audit (proxied by different industries) is among the factors that influence the ARL. Industries that are characterized by higher risk profiles, lower regulatory stringency, and a higher likelihood of litigation typically tend to have longer ARLs (Abernathy et al., 2017). However, the

identification of industries that demonstrate longer audit report lags seems to be underrepresented in the previous literature, with only a limited number of industries such as Banking or Finance being examined in terms of the audit report lags (e.g., Wiyantoro & Usman, 2018, Loew & Mollenhauer, 2019). This hinders the interpretation of audit discrepancies across various other industries and their resulting impact on the quality of earnings reporting.

2.3.5. Results from previous crises

Previous research has been done about several external shocks such as the 2008 economic recession or the Covid-19-induced crisis. In a UK-based study of the Covid-19 crisis, income-increasing earnings management was observed during the period of the pandemic (Hsu & Yang, 2022). Likewise, Persakis and Iatridis (2015) state that during the financial crisis in 2008, globally, companies were incentivized to show higher reported numbers because many were at risk of bankruptcy or getting delisted. On the other hand, there is significant empirical evidence that earnings reporting quality might improve as a result of a crisis. For instance, Filip and Raffournier (2014), who analyzed the financial crisis of 2008, found contrasting results - a decrease in earnings management among European companies, i.e., improved earnings reporting quality. Similarly, the Dot-com-induced crisis in 2001 as well as the Asian financial crisis in 1997-1998 both show the pattern of less earnings management mainly because the losses were simply too big to be hidden by earnings management (Chintrakarn, Jiraporn, & Kim, 2017).

2.3.6. Hypotheses formulation

Because of these conflicting views, an empirical analysis is needed for determining the actual direction of earnings management in the context of the Russian war in Ukraine. Consistent with the findings of Filip and Raffournier (2014) and Chintrakarn, Jiraporn, and Kim (2017), stating that it is riskier to manipulate earnings during significant exogenous shocks (e.g., litigation and reputational costs) and losses are generally more accepted by the stakeholders, we hypothesize that the earnings reporting quality has improved in the period after the start of the war in Ukraine:

(H1) Earnings management for the listed companies in the CEE region has decreased after the start of the war.

Based on the anticipation of higher losses faced because of the war in Ukraine, companies related to the Russian market are hypothesized to manage earnings even less than the ones with lower exposure. These companies might be perceived as the most affected and are likely to be under tighter public scrutiny, thus, assuming that companies that were historically highly tied with the Russian market faced higher losses (Irtyshcheva, Kramarenko, & Sirenko, 2022), we hypothesize that:

(H2) Companies with higher exposure to the Russian market engaged in less earnings management activities after the start of the war compared to companies with lower exposure.

3. Research Design

3.1. Data and sample

The sample consists of quarterly firm-level data of publicly listed CEE companies. We define 11 countries belonging to this region: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia (OECD, 2001). We exclude Albania from the sample and leave only European Union member countries to account for the specific regulations within the EU and sanctions against Russia since the war started (European Council, 2022).

The data used is longitudinal - the same companies across a prolonged time frame to see the changes incurred after the start of the war. The time period chosen is from Q1 2017 to Q3 2022, which includes several years before the war started, and all available quarters after the Russian invasion of Ukraine on February 24, 2022. Additionally, with the chosen time frame, we are able to account for the Covid-19 pandemic, which expectedly has also influenced the earnings reporting quality of companies (Hsu & Yang, 2022). The list of public companies is retrieved from FactSet for firms with a market value above 2 million euros. The latter threshold allows us to include businesses categorized as either small, medium, or large, which effectively excludes micro-sized enterprises (European Commission, n.d.).

The companies within the list have available price data and the GeoRev Country Pct - Russian Federation variable (later referred to as GeoRev Russia) which shows a firm's exposure (in %) to the Russian market. Following Filip and Raffournier (2014) methodology, we exclude financial institutions and banks due to different financial reporting practices. As all of the EU public companies follow the IFRS reporting standards (IFRS, 2022), we do not exclude any companies due to different reporting standards that would arguably influence the behavior of earnings management. We extract the financial data of companies from Bloomberg and exclude firms that have missing financial data. For the depreciation and amortization variable as well as the current portion of long-term debt, we extract the data from Refinitiv Eikon Datastream since there is a substantial number of missing observations for these variables in Bloomberg. This

leaves us with the final sample of 224 companies and 5152 firm-quarter observations (see Table 1).

Table 1. The sample

Public firms from 11 countries (market value > 2M)	1114
Firms with "GeoRev Russia" variable available in FactSet	402
Firms available in Bloomberg	289
- Banks and financial institutions	19
- Firms with missing data	46
= Firms included in sample	224
= The final number of firm-quarter observations Q1 2017- Q3 2022	5152

3.2. Methodology

To answer our first research question and examine the potential earnings management practices in Central and Eastern Europe during our analyzed period, which includes the economic turmoil caused by the war in Ukraine, we follow the methodology of Filip and Raffournier (2014). The techniques used include widely-accepted two measures of income smoothing and three metrics of accrual quality (see all the variables defined in Appendix A). Next, we control for additional variables such as the impact of Covid-19 as well as a firm's earnings and its size. Lastly, we perform robustness tests to validate our results.

3.2.1. Income smoothing measures

For income smoothing proxies, we use two measures utilized by Filip and Raffournier (2014), who borrowed them from Leuz et al. (2003). The calculations of the first income smoothing proxy are as follows:

$$IS_i = \frac{\sigma_{CFO,i}}{\sigma_{NI,i}} \quad (1)$$

where $\sigma_{CFO,i}$ is the standard deviation of cash flow from operations for a firm *i*, and $\sigma_{NI,i}$ is the standard deviation of net income for a firm *i*, where both standard deviations are computed on a firm-level using quarterly observations. If the variability of cash flow from operations is larger than the variability of earnings, i.e., the IS_i value is high, the managers may engage in income smoothing through accounting adjustments. We report the results in two ways: grouping observations by quarters and by industries to derive the IS1 proxy.

The other income smoothing proxy, IS2, is the Spearman correlation between the change in accruals (where the latter are calculated by subtracting CFO from net income) divided by the first lag of assets and the change in cash flow from operations (Filip & Raffournier, 2014). The equation is as follows:

$$IS_2 = \rho(\frac{\Delta Acc_{it}}{A_{it-1}}, \Delta CFO_{it}) \quad (2)$$

where ΔAcc_{it} denotes the change in accruals (defined as net income minus CFO) in quarter *t* for a firm *i*, A_{it-1} represents lagged total assets in quarter *t-1* for a firm *i*, and ΔCFO_{it} shows the change in cash flow from operations in quarter *t* for a firm *i*.

The observations are grouped by quarters as well as industries before finding Spearman correlations, which proxy our second income smoothing measure. Due to an inverse relationship between accruals and cash flow from operations (an increase in accruals decreases the CFO), there must be a negative correlation, thus, for the consistency of interpretations of the proxy, we multiply it by minus 1. In the case of higher earnings smoothing, there should be an unusually high Spearman's correlation because of the manipulations performed by the management - a company might utilize accruals to "buffer" unexpected events (e.g., recognize unforeseen expenses over a longer timeframe). This approach allows managers to smooth out the cash flow fluctuations that companies can encounter during financially unstable periods.

3.2.2. Accrual quality measures

The first accrual quality proxy comes from the Jones model (1991) modified by Dechow, Sloan, and Sweeney (1995), and adopted by Filip and Raffournier (2014). In addition to the

original modified Jones model, return on assets is included as a performance measure (Filip & Raffournier, 2014). The calculations of the model are as follows:

$$ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it} \quad (3)$$

where ACC_{it} stands for accruals which can be defined as non-cash current assets after deduction of the change in current liabilities, adding back a short-term portion of the long-term debt, and deducting depreciation and amortization expenses; then these accruals are divided by lagged total assets of a firm *i* in quarter *t*. A_{it-1} depicts lagged total assets in quarter *t*-1 for a firm *i*; ΔREV_{it} shows the change in revenues divided by lagged total assets in quarter *t* for a firm *i*; ΔREC_{it} stands for the change in accounts receivables divided by lagged total assets in quarter *t* for a firm *i*; $PPEN_{it}$represents the net property, plant, and equipment divided by lagged total assets in quarter *t* for a firm *i*; ROA_{it} is computed as a net income divided by lagged total assets in quarter *t* for a firm *i*.

The inclusion of scaled lagged total assets is made to address the issue of heteroskedasticity (i.e., when the variation in residuals is uneven) (Kothari, Leone, & Wasley, 2005). The constant is included as a complementary control for the latter issue as well as helps to address the problem of omitted variables (Kothari, Leone, & Wasley, 2005). The difference between the change in revenues (i.e., sale on cash) and change in accounts receivables (i.e., sale on credit) serves as another independent variable for the estimation of accruals since revenues are directly linked with accruals, but the part of revenues that comes from credit can be easily manipulated through the discretion in revenue recognition. Therefore, accounts receivables are deducted from revenues to keep only the non-discretionary revenues not subject to earnings manipulation as an explanatory variable. Next, the net property, plant, and equipment helps to explain a part of accruals associated with real business activities (i.e., investment in long-term assets, which might not be immediately apparent in a firm's cash flows). Depreciation expenses are perceived as subject to potential earnings management (e.g., through restating the salvage value or useful life of the PPE) thus the net PPE (excluding accumulated depreciation) is used instead of the gross PPE to reflect a more accurate stance of a firm's non-current assets. Lastly, ROA is utilized to account for the effect that a firm-specific performance has on accruals

(Kothari, Leone, & Wasley, 2005). Higher ROA is typically associated with higher operational efficiency (e.g., in collecting cash) so there should be less non-cash transactions (i.e., accruals).

From the above equation (3), we obtain unstandardized residuals whose standard deviation, a proxy represented as JONES1, can be used as a tool to observe earnings management for different quarters. Since the model incorporates an unintentional variation of accruals coming from real business activities (i.e., activities that are reflected by the independent variables), the variation in residuals incorporates the intentional (i.e., discretionary) part of fluctuations caused by earnings management. A low value of the standard deviation of the residuals thus can be treated as an indicator of high quality of accruals while high variation indicates low accrual quality.

The second discretionary accruals proxy used by Filip and Raffournier (2014) comes from Larcker and Richardson (2004) who build upon the modified Jones model by adding two other relevant independent variables instead of the previously used return on assets. Book-to-market ratio serves as a variable that incorporates future expectations of the company's performance in terms of its potential growth. Higher growth of companies is typically associated with higher accruals. Similarly, based on empirical evidence from Dechow, Sloan, and Sweeney (1995), controlling for the operating cash flow allows to avoid inaccuracies in the measurement of discretionary accruals caused by high-performing firms (Larcker & Richardson, 2004). The equation of the abovementioned adjusted Jones model is as follows:

$$ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it} \quad (4)$$

where BM_{it} stands for a book-to-market ratio in quarter *t* for a firm *i*; CFO_{it} reflects the operating cash flow divided by the first lag of total assets in quarter *t* for a firm *i*; all the other variables are described in equation (3).

The unstandardized residuals from equation (4) serve as the second proxy of accrual quality, and their size of standard deviation, depicted as JONES2, can be interpreted as an indication of the quality of accruals. As before, a high standard deviation can be perceived as a sign of low accrual quality, and vice versa.

The third metric of accrual quality adopted by Filip and Raffournier (2014) is the Dechow and Dichev [DD] (2002) model. In their study, Francis et al. (2005) argue that the DD model is more effective than the Jones model because, alongside other independent variables, it takes into account not only current cash flow from operations but also the ones from past and future periods thus the information risk is included in the DD model. The later model has the following equation:

$$ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it} \quad (5)$$

where all the variables are known from the previous equations (3) and (4).

Similarly, a high standard deviation (depicted as DD, reported by quarters and industries) in unstandardized residuals obtained from equation (5) can indicate the intentional part of earnings fluctuations, therefore, is a sign of earnings management. Low standard deviation, in turn, can be interpreted as high quality of accruals.

3.2.3. Time-specific results

To compare the time-specific standard deviations of firms from the above-calculated measures, we group them by quarters, therefore obtaining values for each measure for a total of 23 quarters. Additionally, we pool the results in two groups representing the periods before and after the start of the war (i.e., 2017-2021 and 2022). We calculate the absolute difference in the standard deviations of these pre- and post-war periods and test for significance.

Additionally, we obtain the unstandardized residuals from JONES1, JONES2, and DD models, and group them by positive and negative directions (denoted with plus or minus signs in the output). We obtain standard deviations for each of the subsamples (positive and negative), and group by the same periods as previously (i.e., 2017-2021 and 2022). Then, we test for their difference and significance separately to find the distinction between income-increasing and income-decreasing earnings management before and after the start of the war.

3.2.4. Industry-specific results

To assess potential industry-specific effects, we group the firm-level observations by industries to calculate industry-specific metrics. Our analysis includes a total of 11 distinct industries. We obtain both the income smoothing and accrual quality proxies explained above grouped by industry, divided into periods before and after the start of the war (i.e., 2017-2021 and 2022). We calculate the difference in values for each industry and test their significance, therefore, discovering industry effects on the earnings reporting quality of different companies and determining whether the event of the war has a significant influence on changes in earnings reporting quality.

3.2.5. Difference-in-differences analysis

To answer the second research question and find the difference in earnings management practices between firms with different exposures to the Russian market, we perform a difference-in-differences analysis. Before utilizing the difference-in-differences model, we determine whether the assumptions of the model are met: 1) treatment is not determined by the outcome, 2) parallel trends hold for the treatment and control groups, and 3) there is a stable unit treatment value and no spillover (i.e., anticipatory) effects from treated group to untreated (Roth et al. 2023).

When conducting the analysis, we explain the residuals of the accrual quality proxies by the level of GeoRev Russia variable collected from FactSet, the impact of the war, and controlling for other possible influences. We run the regression as follows:

$$EM_{it} = \alpha_0 + \alpha_1 Time_t + \alpha_2 Treated_i + \alpha_3 Time_t * Treated_i + \alpha_4 factor(Industry)_i + \alpha_5 Poland_i + \alpha_6 ln(Revenues)_{it} + \alpha_7 ROA_{it} + \alpha_8 Covid_t + \alpha_9 BIG4_i + \xi_{it} \quad (6)$$

where EM_{it} represents the residuals from previously calculated earnings management measures proxied by JONES1, JONES2, and DD for a firm *i* in quarter *t*; $Time_t$ is a dummy variable that depicts the period split before and after the start of the war in Ukraine, i.e., pre-treatment and post-treatment periods, where period during 2022 equals 1 and all other periods equal 0; $Treated_i$ is a dummy variable representing treatment and control groups, treatment being firms

with high exposure to the Russian market (equals 1), thresholded by the 4th quartile of GeoRev Russia firm exposure level for the total firm pool, 0 otherwise; $Time_t * Treated_i$ represents the interaction term of the *Time* and *Treated* variables (equals 1 when both conditions are met); $factor(Industry)_i$ controls for industry effects, creating 11 industry-specific dummy variables; $Poland_i$ represents a dummy variable for Poland (equals 1) to control for the fact that the majority of our sample comes from the latter country; $ln(Revenues)_{it}$ depicts revenues as of at the end of the quarter of a firm *i* for quarter *t* expressed in natural logarithm to control for the effect of a firm size; ROA_{it} is a firm's *i* return on assets calculated as net income divided by the total assets at the beginning of a quarter *t* to control for profitability; $Covid_t$ is a dummy variable controlling for Covid-19-affected time periods, where the quarters between 2020 Q1 - 2021 Q4 equal 1 and all the other periods equal 0. $BIG4_i$ is a dummy variable controlling for firms audited by "Big 4" companies (KPMG, Deloitte, EY, and PwC), equaling 1, to capture auditor effects on earnings reporting quality. The coefficient α_1 can be interpreted as the size by which the outcome of the control group has changed in the post-treatment period. α_2 shows the difference between the treatment group (firms with high exposure) and the control group (firms with low exposure) before the treatment. α_3 shows whether there exists a difference in the treatment group's results in the post-treatment (after the start of the war) period compared to a no-intervention scenario. The other coefficients of the control variables show how they affect the changes in earnings management when significant.

3.2.6. Fixed effects regressions

To address endogeneity concerns, we control for the unobserved firm-specific effects that affect both the dependent variable and the independent variables. These effects are removed using the fixed effects regressions. We split our data sample into treated and non-treated groups based on companies' revenue exposure to Russia and utilize the following fixed effects model:

$$EM_{it} = \alpha_0 + \alpha_1 War_t + \alpha_2 Covid_t + \alpha_3 ln(Revenues)_{it} + \alpha_4 ROA_{it} + \alpha_5 factor(Industry)_i + \xi_{it} \quad (7)$$

where EM_{it} represents the firm- and quarter-specific residuals from JONES1, JONES2, and DD regressions; War_t variable identifies the quarters affected by the war in Ukraine, equaling 1 for

quarters in 2022 and 0 otherwise; $Covid_t$ variable controls for the periods of the Covid-19 outbreak, equaling 1 for the period from 2020 Q1 to 2021 Q4 and 0 otherwise; $ln(Revenues)_{it}$ represents the natural logarithm of revenues for a firm i at quarter t; ROA_{it} depicts the return on assets calculated as net income divided by the total assets as of the beginning of the period for a firm i at quarter t; and $factor(Industry)_i$ controls for 11 industries in our sample.

3.2.7. Tests

To verify the obtained results in all previous models, we use several testing methods. To test for differences between industries and quarters using parametric tests, we conduct t-tests on each of the proxies. Additionally, we employ a non-parametric test to validate the results, specifically, the Wilcoxon signed rank test is utilized, which determines whether the medians of the residuals from the 2 samples before and after the start of the war are significantly different. Lastly, the Variance Inflation Factor [VIF] test is performed to assess if there is no extreme multicollinearity in the regressions.

4. Results

4.1. Descriptive statistics

Our sample consists of 224 publicly listed companies from Central and Eastern European countries with available quarterly data and revenue exposure to Russia (extracted from FactSet). The majority of the firms come from Poland (59.4%) and Croatia (15.2%), there are also 4.9% of firms from Lithuania, 4.5% from Bulgaria and Romania, 4.0% from Slovenia, 2.6% from Estonia, 2.2% from Hungary, 1.8% from Latvia, and 0.9% from The Czech Republic. In terms of industries, they are classified by the FactSet Revere Business Industry Classification System (RBICS), which identifies each firm's main business operations (FactSet, 2021). The biggest part of the firms belong to Industrials (21.9%), Non-Energy Materials (17.0%), Consumer Non-Cyclicals (14.7%), and Technology (11.6%) industries (see Table 2).

Table 2. Firm distribution by industries using FactSet RBICS industry classification.

Industry	Frequency	Percent
1 - Business Services	9	4.0
2 - Consumer Cyclicals	22	9.8
3 - Consumer Non-Cyclicals	33	14.7
4 - Consumer Services	17	7.6
5 – Energy	9	4.0
6 – Healthcare	14	6.3
7 – Industrials	49	21.9
8 - Non-energy materials	38	17.0
9 – Technology	26	11.6
10 - Utilities	3	1.3
11 - Telecommunications	4	1.8
Total	**224**	**100.0**

The descriptive statistics of each variable used for accruals quality proxies can be found in Table 3. All the variables are winsorized at the 1st percentile and the 99th percentile to reduce the impact of extreme outliers on the proxies. After filtering out the quarters with missing data for relevant variables, the JONES1 proxy has 2529 firm-quarters before the start of the war and 360 firm-quarters after the start of the war, the JONES2 proxy has 2482 and 352, the DD proxy has 2509 and 221, respectively. This indicates that our sample division is not as evenly distributed across the two periods. From the accruals quality variables alone, no strong tendencies regarding potential earnings manipulations can be observed.

Table 3. Descriptive statistics for the variables used for the accruals quality proxies.

Variable	N	Min	Mean	Max	St. Dev.
JONES1					
Accruals	2529	0.039	0.438	0.968	0.213
	360	0.069	0.463	0.973	0.218
Inverse_lag_Assets	2529	0.000	0.018	0.128	0.025
	360	0.000	0.015	0.122	0.022
Change_REV_REC	2529	-0.211	0.006	0.236	0.066
	360	-0.226	0.005	0.253	0.070
Scaled_PPEN	2529	0.014	0.386	0.904	0.219
	360	0.015	0.363	0.874	0.208
ROA	2529	-10.04	1.144	12.19	2.979
	360	-8.516	1.646	18.63	3.634
JONES2					
Accruals	2482	0.038	0.437	0.969	0.213
	352	0.068	0.463	0.974	0.220
Inverse_lag_Assets	2482	0.000	0.018	0.158	0.025
	352	0.000	0.014	0.123	0.021
Change_REV_REC	2482	-0.209	0.006	0.236	0.065
	352	-0.232	0.004	0.257	0.070
Scaled_PPEN	2482	0.013	0.388	0.904	0.219
	352	0.021	0.362	0.874	0.207

BM.ratio	2482	0.052	1.163	6.498	1.071
	352	0.051	1.206	6.348	1.112
Scaled_CFO	2482	-0.102	0.024	0.185	0.045
	352	-0.133	0.012	0.148	0.044
DD					
Accruals	2509	0.038	0.438	0.966	0.212
	221	0.078	0.457	0.969	0.221
Scaled_lag1_CFO	2509	-0.127	0.022	0.181	0.046
	221	-0.093	0.016	0.142	0.042
Change_REV_REC	2509	-0.211	0.006	0.236	0.066
	221	-0.252	0.000	0.287	0.073
Scaled_PPEN	2509	0.014	0.386	0.904	0.219
	221	0.031	0.376	0.879	0.211
Scaled_lead1_CFO	2509	-0.120	0.022	0.182	0.046
	221	-0.123	0.019	0.176	0.046
Scaled_CFO	2509	-0.108	0.024	0.188	0.045
	221	-0.143	0.009	0.136	0.046

All the observations below the 1st percentile and above the 99th percentile are winsorized for each variable to control for the occurrence of extreme outliers. The first line shows the descriptive statistics for the period before the start of the war, the second line shows the statistics for the period after the start of the war. *Accruals* are defined as non-cash CA minus Δ in CL plus the current portion of the long-term debt minus D&A; the number is then divided by lagged total assets. *Inverse_lag_Assets* stands for 1 divided by the lagged total assets. *Change_REV_REC* depicts the difference between Δ in revenues and Δ in accounts receivables, both scaled by the lagged total assets. *Scaled_PPEN* represents the net PPE divided by the lagged total assets. *ROA* is equal to net income divided by the lagged total assets. *BM.ratio* shows the book-to-market ratio. *Scaled_CFO* represents operating cash flow divided by the lagged total assets. *Scaled_lag1_CFO* depicts lagged operating cash flow divided by the lagged total assets. *Scaled_lead1_CFO* represents the first lead of operating cash flow divided by the lagged total assets. All values except *BM.ratio* and *ROA* are expressed in millions of euros. The latter two ratios are expressed as ratios. The correlations of the variables can be seen in Appendix H.1.

Similarly to accruals quality proxies, the descriptive statistics relevant to income smoothing proxies are shown in Table 4. The sample for the IS1 proxy has 4330 firm-quarters before the start of the war and 588 firm-quarters after the start of the war while the sample for the IS2 proxy consists of 4241 and 582 firm-quarter observations, respectively. The statistics

provided in the table are derived after winsorizing the relevant dependent and independent variables at the 1st percentile and the 99th percentile.

Table 4. Descriptive statistics for the variables used for the income smoothing proxies.

Variable		N	Min	Mean	Max	St. Dev.
IS1						
	CFO	4330	-31.91	12.53	316.83	43.06
		588	-49.53	13.06	338.74	48.07
	Net.Income	4330	-27.45	5.177	150.0	20.12
		588	-24.48	15.74	495.37	63.05
IS2						
	dCFO	4241	-164.1	0.414	167.08	32.42
		582	-420.0	-4.062	197.46	60.12
	Scaled_dAccruals	4241	-0.270	-0.001	0.280	0.076
		582	-0.204	-0.007	0.340	0.079
	Lag_Total.Assets	4241	2.616	526	13414	1692
		582	3.747	749	20229	2529

All the observations below the 1st percentile and above the 99th percentile are winsorized for each variable to control for the occurrence of extreme outliers. The first line shows the descriptive statistics for the period before the start of the war, the second line shows the statistics for the period after the start of the war. *CFO* displays operating cash flow. *Net.Income* shows net income. *dCFO* stands for the change in CFO. *Scaled_dAccruals* represents the change in accruals scaled by *Lag_Total.Assets* (which are lagged total assets). All values are expressed in millions of euros. The correlations of the variables can be seen in Appendix H.2.

4.2. Empirical results

4.2.1. Analysis by quarters

As mentioned in the methodology, the basis of our research framework is the models used by Filip and Raffournier (2014), who perform three accrual quality and two income smoothing proxies. Table 5 reports all the proxies used to measure earnings management of the sample companies in three ways: as pooled results for each proxy, results by quarters, as well as the difference between the period before and after the start of the war and its significance. From the performed tests, it can be seen that the difference between the two periods is statistically

Table 5. Accrual quality and income smoothing proxies by quarter.

Year	Income smoothing		Accrual quality		
	IS1	IS2	JONES1	JONES2	DD
Pool	1.897	0.700	0.186	0.181	0.178
2017 Q1	1.613	0.543	-	-	-
2017 Q2	2.022	0.757	0.196	0.195	0.175
2017 Q3	2.071	0.742	0.198	0.182	0.179
2017 Q4	2.334	0.564	0.184	0.185	0.168
2018 Q1	1.766	0.619	0.205	0.174	0.176
2018 Q2	2.035	0.794	0.196	0.188	0.167
2018 Q3	2.188	0.698	0.205	0.196	0.200
2018 Q4	2.363	0.652	0.186	0.184	0.180
2019 Q1	1.924	0.665	0.189	0.179	0.183
2019 Q2	2.418	0.715	0.177	0.173	0.173
2019 Q3	2.594	0.658	0.177	0.172	0.172
2019 Q4	3.201	0.643	0.155	0.150	0.147
2020 Q1	1.838	0.655	0.170	0.166	0.162
2020 Q2	2.991	0.719	0.160	0.159	0.155
2020 Q3	3.058	0.728	0.169	0.164	0.165
2020 Q4	2.654	0.716	0.157	0.157	0.155
2021 Q1	1.558	0.717	0.182	0.177	0.178
2021 Q2	2.222	0.701	0.178	0.175	0.166
2021 Q3	1.457	0.661	0.187	0.170	0.172
2021 Q4	2.167	0.664	0.181	0.173	0.166
2022 Q1	0.849	0.725	0.201	0.177	0.176
2022 Q2	0.785	0.733	0.196	0.191	0.156

2022 Q3	0.676	0.584	0.182	0.176	-
2017-2021 (1)	2.140	0.699	0.184	0.180	0.178
2022 (2)	0.762	0.703	0.196	0.184	0.173
Δ (2) - (1)	-1.378	0.012	0.011	0.005	-0.005
P-value					
t-test	0.000	0.563	0.167	0.306	0.730
Wilcoxon	0.001	0.000	0.226	0.308	0.771

The table shows earnings reporting quality measures for each quarter from 2017 Q1 till 2022 Q2. *IS1* is calculated by dividing the standard deviation of the CFO by the standard deviation of NI. *IS2* is calculated by finding the Spearman correlation between the change in accruals (NI minus CFO) divided by the lagged total assets and the change in CFO, the result is multiplied by -1 for the interpretation consistency. JONES1 (1), JONES2 (2), and DD (3) are found by obtaining the standard deviations of residuals from the respective equations: (*1*) $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$
(*2*) $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it}$
(*3*) $ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$
The significance of the findings is tested using t-tests and Wilcoxon signed rank tests and reported as p-values.

significant only for the IS1 proxy. Here the IS1 measure for the period before the start of the war is 2.14, meaning that before the start of the war, earnings varied more than twice as much as the cash flow from operations, indicating high income smoothing. In the quarters after the start of the war, in contrast, the IS1 measure decreased to 0.76, indicating that earnings fluctuated less than the cash flow from operations, thus, income smoothing decreased significantly during the period after the start of the war.

We can observe the general trends of the quality of earnings management in different periods. For accrual quality measures (see the reported regressions in Appendix B), the standard deviations of the JONES1 residuals reach as high as 0.205 in 2018 and as low as 0.147 in 2019 Q4 for the DD model. Additionally, the different sizes of standard deviations can be linked to significant changes in the business environment or external shocks. During the period spanning from the fourth quarter of 2019 to the fourth quarter of 2020, which coincided with the Covid-19 pandemic, the smallest standard deviations relative to other time periods within our sample can

be seen. Such findings indicate an improvement in the earnings reporting quality throughout this particular time period and thus allow us to accept the first hypothesis.

4.2.2. Positive and negative discretionary accruals

Next, we group the discretionary accruals (measured by the residuals) of JONES1, JONES2, and DD models by positive and negative directions to determine the significance of income-increasing or income-decreasing behavior of the firms before and after the start of the war (reported in Table 6). The results are displayed as standard deviations of the respective subsamples corresponding to positive and negative residuals. We can observe that for positive discretionary accruals, JONES1 and JONES2 results are significant, and the difference between the two periods is negative. This indicates that for firms that engage in earnings-increasing activities, after the start of the war, earnings reporting quality increased (allowing us to accept the first hypothesis). For negative discretionary accruals, no such significant relationship is found, therefore, for firms that engage in income-decreasing activities, the difference between pre-and post-war periods cannot be established. These firms also have lower earnings reporting quality both before and after the start of the war, indicated by the higher standard deviations.

Table 6. Earnings reporting quality by positive and negative discretionary accruals

Direction	**Period**	**Accrual quality**		
		JONES1	**JONES2**	**DD**
Positive	2017-2021 (1)	0.106	0.103	0.104
	2022 (2)	0.105	0.095	0.097
	Δ (2) - (1)	-0.001	-0.008	-0.007
	T-test (Wilcoxon)	(*)	. (*)	
Negative	2017-2021 (1)	0.128	0.126	0.122
	2022 (2)	0.132	0.128	0.119
	Δ (2) - (1)	0.004	0.002	-0.003
	T-test (Wilcoxon)			

The table above shows the results from positive and negative discretionary accruals analysis by obtaining the standard deviations of residuals from JONES1, JONES2, and DD models. The residuals are found from the following respective equations and grouped based on their value (negative or positive) : $(1) ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$ $(2)\ ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} +$

ξ_{it} $(3) ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$. The significance of findings is tested using t-tests and Wilcoxon signed rank tests and the signs marked by ***, **, *, and . stand for 0.1%, 1%, 5%, and 10% significance levels, respectively.

4.2.3. Analysis by industry

To observe how industry-level characteristics influence potential earnings management, the proxies are also reported by different industries. Table 7 reports the results of all the proxies before the start of the war and after the start of the war for nine industries excluding Utilities and Telecommunications due to an insufficient number of firms in our sample. The within-industry two-period differences are then tested with t-tests and Wilcoxon signed rank tests.

The changes in income smoothing and accrual quality between the periods are notable between the industries. For example, for the IS1 measure, the income smoothing proxy is in a huge range from 0.66 to 4.45, having large industry-specific two-period absolute differences ranging from -1.37 to 2.54. For the IS2, the results of the proxy vary from 0.30 (i.e., low income smoothing) to 0.82 (i.e., high income smoothing). The largest absolute change between the periods is observed for the Energy industry (-0.10), which points towards an improved accrual quality. However, most of the differences in industry-level income smoothing proxies (except Energy, Industrials, and Technology industries) do not show significance. As for the accrual quality proxies, the Technology industry shows the highest but insignificant results both before and after the start of the war and for JONES1 and DD models. Although insignificantly, the Healthcare industry has the biggest accrual quality improvements between the two periods.

Nevertheless, we can observe that industries generally show similar directions of earnings quality changes. The Consumer Cyclicals industry sees a slight improvement in the accrual quality (all three proxies show a decrease in earnings management at a 5% significance level), where the JONES1 proxy decreased by 0.009, JONES2 by 0.027, and DD by 0.040. The Energy industry, similarly, shows an improved accrual quality since for these firms, the JONES1 variable dropped by 0.020 (at a 0.1% significance level), JONES2 by 0.023 (0.1%), and DD by 0.024 (5%). The Industrials industry demonstrates reduced income smoothing as the proxy IS1 decreased by -0.012 (1%). The Non-Energy Materials also signify an improved accrual quality since JONES1 decreased by -0.003 (5%).

Table 7. Accrual quality and income smoothing proxies by industry.

Year	Period	Income smoothing		Accrual quality		
		IS1	IS2	JONES1	JONES2	DD
Business Services	2017-2021	1.908	0.782	0.105	0.096	0.115
	2022	4.449	0.820	0.114	0.102	0.073
	Δ	2.541	0.038	0.008	0.005	-0.042
	T-test (Wilcoxon)					
Consumer Cyclicals	2017-2021	2.131	0.749	0.128	0.122	0.124
	2022	1.503	0.802	0.119	0.095	0.084
	Δ	-0.628	0.053	-0.009	-0.027	-0.040
	T-test (Wilcoxon)			*(*)	*(*)	*(*)
Consumer Non-Cyclicals	2017-2021	1.990	0.734	0.169	0.166	0.170
	2022	0.668	0.741	0.174	0.160	0.158
	Δ	-1.322	0.007	0.004	-0.006	-0.012
	T-test (Wilcoxon)					
Consumer Services	2017-2021	1.544	0.348	0.083	0.080	0.086
	2022	1.604	0.304	0.078	0.073	0.069
	Δ	0.061	-0.044	-0.005	-0.007	-0.017
	T-test (Wilcoxon)					
Energy	2017-2021	2.032	0.761	0.074	0.073	0.073
	2022	0.660	0.660	0.054	0.050	0.048
	Δ	-1.373	-0.101	-0.020	-0.023	-0.024
	T-test (Wilcoxon)		(.)	***(***)	***(***)	*(*)
Healthcare	2017-2021	1.283	0.751	0.166	0.164	0.174
	2022	0.826	0.818	0.106	0.091	0.088
	Δ	-0.457	0.066	-0.060	-0.072	-0.086
	T-test (Wilcoxon)					

Industrials	2017-2021	1.944	0.599	0.107	0.105	0.110
	2022	1.933	0.600	0.110	0.107	0.112
	Δ	-0.012	0.001	0.003	0.002	0.002
	T-test (Wilcoxon)	** (*)		**. (*)**		
Non-Energy Materials	2017-2021	2.174	0.740	0.108	0.105	0.105
	2022	0.835	0.736	0.105	0.101	0.088
	Δ	-1.338	-0.004	-0.003	-0.004	-0.017
	T-test (Wilcoxon)			* (.)		
Technology	2017-2021	2.495	0.722	0.223	0.166	0.216
	2022	2.285	0.703	0.246	0.167	0.171
	Δ	-0.210	-0.019	0.0225	0.001	-0.045
	T-test (Wilcoxon)	.				

The first line shows the measure of earnings reporting quality before the start of the war, the second line shows the earnings reporting quality after the start of the war, and the third line shows the difference between the periods with added significance level where such is found using t-tests and Wilcoxon signed rank tests. The significance signs marked by ***, **, *, and . stand for 0.1%, 1%, 5%, and 10% significance levels, respectively. *IS1* is found by dividing the standard deviation of the CFO by the standard deviation of NI. *IS2* is calculated by finding the Spearman correlation between the change in accruals (NI minus CFO) divided by the lagged total assets and the change in CFO, the result is multiplied by -1 for the interpretation consistency. JONES1 (1), JONES2 (2), and DD (3) are found by obtaining the standard deviations of residuals from the following respective equations: $(1)\ ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$

$(2)\ ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it}$

$(3) ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$

Looking at the levels of earnings management, the Technology industry exhibits the lowest accrual quality as the standard deviations of the residuals from all three accrual models are the highest among the analyzed industries, often exceeding them nearly twice. Nevertheless, the results of this industry are not statistically significant. In contrast, the industry with the lowest standard deviations of residuals and, consequently, with the highest accrual quality is the Energy industry. The results are significant and consistent across all three accrual quality models. Income smoothing proxies, conversely, have less clear trends as the industries with the highest income smoothing levels are Business Services (after the start of the war, the IS1 is at an all-time high of 4.45, although

insignificant) and Technology, whose CFO fluctuated 2.5 times more than net income during the period before the start of the war, significant at 10%. Lastly, based on the IS2, Business Services had the biggest earnings smoothing and Consumer Services the lowest (both insignificant).

Overall, we can observe that the magnitudes of the differences between industries are substantial. In the period after the start of the war in Ukraine, the Energy industry has improved its accrual quality by approximately 0.022 million euros, Consumer Cyclicals by on average of 0.025 million euros while, for example, a few less significant industries such as the Healthcare industry reached an even bigger improvement of on average 0.073 million euros. Most other industries did not have significant and meaningful changes. The consistent improvement in the earnings reporting quality for the significant industries allows us to accept the first hypothesis.

4.2.4. Difference-in-differences analysis

After the comparison by quarters and industries, we perform a difference-in-differences analysis where we test the impact of revenue exposure to the Russian market on the levels of unexplained accruals measured by the residuals from the accrual quality models JONES1, JONES2, and DD. These residuals are used as the dependent variables. Prior to starting the analysis, we evaluate if the assumptions of the difference-in-differences model are satisfied. The first assumption that the treatment is not determined by the outcome holds because the treatment (i.e., high exposure to the Russian market) is allocated based on the percentage of revenue exposed to Russia. Next, the parallel trends assumption mostly holds as evident from the graphs in Appendix C.1., C.2. and C.3. Lastly, the stable unit treatment value assumption is believed to be met as firms having high exposure to the Russian market (i.e., treatment group) do not directly affect other firm exposure to Russia, therefore, there is minimal or no spillover effect.

From the variable *Treated* visible in Table 8, it can be seen that the treatment group (i.e., when exposure to the Russian market is in the 4th quartile of all the companies from our sample) has higher residuals for all three models, which can be interpreted as a higher unexplained part of the accruals. This variable is significant for all three models at a 5% significance level, pointing to a notable difference between the treatment (i.e., high exposure) and non-treatment groups (i.e., low exposure). The interpretation of these results is that for a firm with high exposure to the

Russian market (*Treated=1*), the unexplained part of accruals is higher by 0.059 million euros in the JONES1 model, 0.067 million in the JONES2 model, and 0.056 million in the DD model.

The *Time* variable is not significant for any of the models, meaning that we cannot draw any conclusions about the levels of residuals after the start of the war compared to the pre-war period. Additionally, we can observe that the *Time*Treated* variable is negatively related to residuals for all three models, which can be explained as a decrease in the level of unexplained part of the accruals for firms within the treatment group (i.e., with higher exposure to the Russian market) in the period after the start of the war. This relationship is significant at a 10% significance level for the JONES2 model, however, no significance for the JONES1 and DD models is found. The interpretation is that in the period after the start of the war, within the treatment group, a firm's unexplained part of accruals are by 0.039 million lower compared to what the outcome would be if no intervention (i.e., the event of the war) had occurred. Therefore, based on the JONES2 model, the treated group has 0.067 million euros higher unexplained part of the accruals than the untreated group, whereas, after the start of the war, the difference becomes only 0.028 million euros.

This leads us to the conclusion that while on average the companies with higher exposure to the Russian market had significantly higher residuals (potentially indicating more income-increasing activities), during the period after the start of the war, the residuals decreased, therefore, income-increasing activities may have decreased. An alternative explanation is that for companies with higher exposure to the Russian market in the pre-war period, income-increasing earnings management was more prevalent, however, after the start of the war, they may have engaged in more earnings-decreasing activities. Therefore, we can only partially accept our hypothesis that companies with higher exposure to the Russian market engaged in less earnings management activities after the start of the war compared to companies with lower exposure as there are two potential directions of earnings management. Specifically, assuming that both income-increasing and income-decreasing activities changed the pattern after the start of the war, we cannot conclude which source had a higher impact on the decreased average level of residuals.

Looking at the models' explanatory power, we can observe that the R2, which is on average 0.35, represents a notable portion of the variance in residuals that can be explained by the variables used in each of the regressions. When we apply the Variance Inflation Factor test to check for the possible multicollinearity that would skew the results of difference-in-differences analysis (see Appendix D), we do not find any variables that would exceed the widely accepted threshold of VIF being over 10. Therefore, the regressions provided in Table 8 do not contain variables with extreme multicollinearity.

Table 8. Difference-in-differences analysis

variable	Statistic	JONES1	JONES2	DD
(Intercept)	Estimate	-0.059	-0.040	-0.076
Treated	Estimate	0.059*	0.067*	0.056*
Time	Estimate	0.012	0.001	-0.005
Time*Treated	Estimate	-0.033	-0.039 .	-0.028
COVID	Estimate	-0.029***	-0.028***	-0.021*
Poland	Estimate	0.012	0.018	0.013
ln(Revenues)	Estimate	0.005	0.005	-0.010
ROA	Estimate	0.002	0.004	0.005*
BIG4	Estimate	-0.020	-0.005	-0.013
	N	2889	2834	2730
	R2	0.367	0.347	0.350
	adj R2	0.363	0.343	0.346

The table above shows the results from the difference-in-differences analysis, explaining the residuals of the JONES1 (1), JONES2 (2), and DD (3) models. The residuals are found from the following respective equations: $(1)\ ACC_{it} =$

$a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$ (2) $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it}$ (3)$ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$ The variable *treated* equals 1 for a firm whose GeoRev Russia exposure is in the 4th quartile of all firm exposure levels, otherwise 0. The *Time* is an event represented by the start of the war in Ukraine, where quarters during 2022 equal 1 and other periods equal 0. The *Time*Treated* is a dummy variable showing 1 if the observation has revenue exposure to Russia above the third quartile and if the observation occurs after the start of the war; otherwise the dummy is equal to 0. Other control variables added to the regression control for a firm's size (ln(*Revenues)* expressed as a natural logarithm), profitability (measured by *ROA*), *Poland* (to account for the majority of our sample companies), Covid effects, where the dummy *Covid* equals 1 during all the quarters of years 2022 and 2021, and, *BIG4* variable controls for auditors from the "Big 4" companies. Additionally, we control for 11 industries (the results are not reported). The equation is constructed as follows: $EM_{it} = \alpha_0 + \alpha_1 Time_t + \alpha_2 Treated_i + \alpha_3 Time_t * Treated_i + \alpha_4 factor(Industry)_i + \alpha_5 Poland_i + \alpha_6 ln(Revenues)_{it} + \alpha_7 ROA_{it} + \alpha_8 Covid_t + \alpha_9 BIG4_i + \xi_{it}$. The significance signs ***, **, *, and . stand for 0.1%, 1%, 5%, and 10% significance levels, respectively.

4.2.5. Fixed effects regressions

We use firm fixed effects regression to isolate the effects of any unobservable firm-specific characteristics in treated and control samples (Appendix E). The *War* variable (i.e., the three quarters of 2022) is significant in JONES 2 model (at 0.1%) for firms with high exposure to the Russian market (treated group) and negatively impacts residuals, which indicates that during the war, these companies had lower unexplained residuals. The *COVID* variable is significant for all subsamples at 1% or 0.1% significance levels and affects the residuals negatively, similar to the *War* variable, and for the treated company samples, the effect of Covid-19 on the unexplained accruals is more negative. The natural logarithm of *Revenues* consistently points to higher residuals of all subsamples (except for JONES1), but the results from the *ROA* variable are less consistent thus we cannot draw conclusions. From this analysis, it is evident that the main results from our previous findings largely hold in the fixed effects specification.

4.2.6. Plotting the results

Finally, as a supplementary analysis for our results, we plot quarter-specific JONES1, JONES2, and DD model proxies (refer to Table 5 for detailed numbers and descriptions) to see the changes in the above-obtained results over time. In Graph 1 representing the JONES1 model, we observe the changes in accrual quality for all firms from the sample split by 22 quarters (without the first quarter of 2017 due to the usage of the first lag in the calculations of the proxy). Here, each number of the quarter corresponds to the quarter's position in the sequence relative to our sample (e.g., 2017 Q2 represents quarter 2, 2017 Q3 represents quarter 3, and 2022 Q3 represents quarter 23). A common trend is that in the last quarter of each year, the quality of

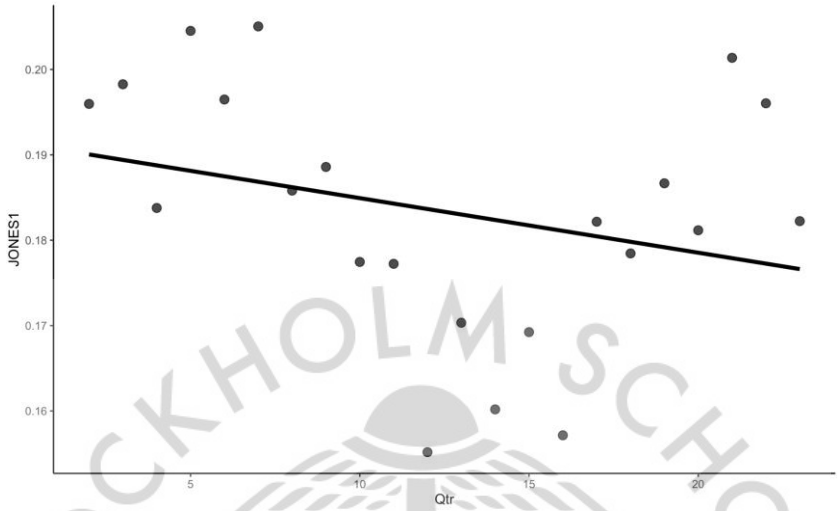
accruals increases as the standard deviations drop compared to other quarters. Similarly, the quality of accruals improved when reporting half-year results. The interim results (i.e., Q1 and Q3), on the other hand, consistently show a relative increase in the standard deviations of residuals, which can be interpreted as a worse accrual quality.

Additionally, we observe a big improvement in accrual quality (i.e., a decrease in standard deviations) starting from quarter 12 (2019 Q4). After that, during the months of the Covid-19 outbreak, the standard deviations fluctuated, thus, the accrual quality worsened for some quarters, but then improved for others. As for the impact of the war on the accrual quality, the standard deviation jumped in quarter 21 (2022 Q1) representing a worsening of the accrual quality; however, in the next quarters, the quality seems to have gradually improved. Nevertheless, comparing the period after the start of the war with the pre-Covid period, the overall quality of accruals seems to be slightly improved. The Covid-19 period, however, still might be perceived as a more pronounced shock than the war in Ukraine.

For JONES2 and DD models, the overall trends of sizes of standard deviations and their relationships over time are similar (see Appendix F.1 and F.2). Quarter 12 (2019 Q4) as well shows the lowest standard deviations in the whole sample period, and quarter 21 (2022 Q1) shows an increased standard deviation. Nevertheless, for JONES2 the increase is not that notable and rather transferred to the second quarter of 2022. However, when comparing the post-war period to the pre-Covid period, it appears that the quality of accruals has somewhat improved for both JONES2 and DD as well as the slope is negative, consistent with previously observed trends.

To compare the directions of the earnings management (i.e., upward or downward), we plot the residuals of the JONES1, JONES2, and DD models, which represent firm- and time-specific earnings management levels. Appendix G.1 shows JONES1 residuals plotted by quarters and split by high and low exposure to Russia (i.e., treated group, which was previously defined as firms having exposure to the Russian market above the 75th percentile of the total firm sample, and non-treated otherwise). The lines on the graph show the slopes of the residuals for high- and low-exposure groups. Generally, the low-exposure companies seem to have an almost

Graph 1. The plot of the standard deviations of residuals of the JONES1 model by quarter.



The graph above shows the results from the JONES1 calculations, plotting the standard deviations of the residuals by quarter (see the detailed numbers in Table 5). Residuals (ξ_{it}) from the JONES1 are obtained from the following equation: $(1)\ ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$. In this model, the residuals of all firms are pooled together and split by quarters. Each number of the quarter corresponds to the quarter's position in the sequence relative to our sample (e.g., 2017 Q2 represents quarter 2, 2017 Q3 represents quarter 3, and 2022 Q3 represents quarter 23).

flat and negligibly negative slope of the line, while the high-exposure companies have on average more positive residuals, which over time tend to decrease, as visible from the negative slope. For the JONES2 and DD (see Appendix G.2 and G.3), the overall results are similar to JONES1; however, in the DD model, the slope of the high-exposure firms is flatter. Overall, we see that high-exposure firms are more likely to engage in income-increasing earnings management, whereas low-exposure companies manage earnings in both upward and downward directions to a similar extent.

5. Discussion

From Appendix H.3. and H.4. we can observe that the real (i.e., income smoothing) and accrual earnings management methods are negatively correlated. This might indicate that increasing the use of one method decreases the management's use of the other, and vice versa. It can also be observed that all of the accrual metrics are highly correlated and this is due to the fact that the variables used in the models have an overlap and the models are to some extent similar. Such a trend is visible within the IS measures, however, to a much smaller extent. This leads us to believe that all of these five proxies are good predictors of earnings management as they complement each other and allow us to uncover different behaviors in earnings management.

The analysis of firms pooled by periods yielded significant differences for the full sample of the Central and Eastern European countries for the IS1 proxy. The results signify that there exists a difference in one of the real earnings management types - income smoothing - between the periods before and after the start of the war, and the income smoothing has decreased, allowing us to accept our first hypothesis. In terms of accrual quality, there is no statistically significant difference observed between periods in the pooled-firm samples.

Through the grouping of proxies by industries, we have identified several statistically significant findings. Consumer Cyclicals, Energy, Non-Energy Materials, and Industrials industries have the most significant changes in the pre-and post-start of the war periods for the accrual quality measures (see Table 6). The earnings reporting quality of firms within all these industries, except for Industrials (however, only at a 10% level of significance), has improved since the start of the war, consistent with our first hypothesis. Similarly, the Industrials, Energy, and Technology industries significantly showed a reduction in income smoothing. The first research question of how the war in Ukraine affected earnings reporting quality for Central and Eastern European companies is therefore answered with the conclusion that the earnings reporting quality improved.

When explaining the reasons behind the differences in industries, it is important to consider the distinct industry-specific business characteristics. To exemplify, with regard to the significance of the Energy industry, potential explanations may be associated with the Energy

sector outperforming other industries that had relatively higher volatility and lower returns during the year 2022. With the rising commodity prices, oil and gas prices have particularly largely increased compared to 2021, and the returns of the Energy sector were positive (Franzen, 2022). This is especially relevant for the Eurozone in the context of Russia's war in Ukraine, as the Eurozone has been largely dependent on Russian energy, hence, an energy crisis has emerged. Because of this crisis and the high demand, companies conducting oil and gas businesses have been enjoying "record-breaking profits" during 2022 (Levitan, 2023). This seems to be a feasible explanation for the improved accrual quality within this sector, as the companies are doing well, do not have as high cash flow variability, and, in turn, do not need to manage earnings or hide unusual losses.

Another example - the Consumer Cyclicals industry's performance - is largely correlated with the economy's state, thus when the economy is generally performing worse, consumers can afford less of the luxury goods like cars, housing, entertainment, etc. (Corporate Finance Institute, 2022). Since this industry is known to depend on the economic power of consumers, one way to interpret why the war in Ukraine has evoked an improvement in the industry's accrual quality is that investors expect such companies to perform worse in times of distress, thus losses, or lower profitability is generally accepted as it is an unavoidable outcome having a strong dependency on the economic cycle and, consequently, a higher volatility in cash flow because of the disruptions.

Overall, a nearly unanimous trend of improving earnings reporting quality for firms in the significant industries can be attributed to several reasons. One reason is that during times of distress, it is normal for companies to face bigger losses, therefore, market participants tend to accept losses as a common consequence of an external shock, in this case, the war in Ukraine.. Additionally, it is normal for earnings to fluctuate during distress, thus financial analysts do not fully trust the quality of earnings reporting when making forecasts and, in turn, there are fewer incentives for companies affected by the war in Ukraine to engage in earnings management activities. Lastly, auditors are typically supervising companies tighter during times of an economic downturn, thus there is a higher risk for companies to get caught by managing earnings and, consequently, pay high litigation costs. However, our analysis allows us to disregard the

latter auditor-related reasons when explaining the improved quality of accruals because the *Big4* auditor variable is insignificant in our sample.

With regards to the findings that the revenue exposure to the Russian market significantly increases the levels of unexplained accruals in general for all the periods, this could point to a constant geopolitical or economic risk, even before the start of the war in Ukraine. This could also be due to the fact that our sample firms are from the European Union countries, while Russia is not, which could create potential challenges or increased complexity in business operations for those exposed to the Russian market. Nevertheless, this is an area worth exploring for further research as the exact reasons for the generally higher residuals for the companies having higher revenue exposure to Russia are unknown and not yet researched.

In terms of the finding that higher exposure to the Russian market during the period after the start of the war shows a lower unexplained part of accruals, we found two possible explanations for such a relationship. If we consider that initially, companies with higher exposure to the Russian market engaged in more income-increasing activities, we can accept our second hypothesis that companies decreased income-increasing activities. However, if we assume that these companies opted to undertake more income-decreasing activities (which would further decrease the negative residuals and lower the overall level of residuals), it is probable that the companies engaged in more earnings management than before. In such a case, we would have to reject our second hypothesis. Likely, it is a combination of both, hence, we leave the second hypothesis partially accepted.

With the latter analysis and the additional observations from the plotted results, we can answer our second research question of what the differences are in companies' earnings management practices depending on their exposure to the Russian market between the pre-and post-war periods. We conclude that companies with higher exposure to the Russian market are more likely to engage in income-increasing earnings management activities. Moreover, their overall levels of unexplained residuals are higher both before and after the start of the war; however, the residuals have decreased since then, thus narrowing the gap between low- and high-exposure companies in terms of the average levels of the unexplained part of the accruals.

The interpretations of the reduced overall level of residuals could lie in the fact that these companies had a particularly big exposure to the epicenter of our analyzed event, i.e., companies were directly related to the aggressor of the war in Ukraine. Society has quickly become aware of the ties between companies and the Russian market, so the losses could have been largely anticipated. Through sanctions and/or moral pressure imposed by society (e.g., social media campaigns, boycotts, etc.), many companies were forced to change their business operations and leave Russia, they also lost suppliers, clients, or business opportunities, thus, exceptional losses were expected. The expected worse-than-usual performance could have been the reason to manage earnings less as the market participants anticipated potentially higher losses.

Throughout our analysis, we observe several trends of income-increasing and income-decreasing behavior. The upward earnings management (represented by positive residuals) for companies significantly decreases, explaining higher earnings reporting quality, while the downward earnings management (represented by negative residuals) increases, although insignificantly. Both types of residuals, positive and negative, have mostly negative relationships with the external shocks - the war in Ukraine and Covid-19 among other control variables - and overall, lead us to conclude that external shocks motivate companies to change their earnings reporting practices. Nevertheless, there is significant evidence from our industry- and quarter-specific analyses to believe that many companies have opted to become more transparent and, in turn, improved their earnings reporting quality.

5.1. Limitations

One of the potential limitations of our research is data availability. Since the analysis mainly focuses on the impact of the war in Ukraine on earnings reporting practices, and the war is still a relatively recent event, there are only a few quarters of data available for analysis. This leads to an unevenly balanced panel data. Moreover, our sample includes only companies with GeoRev Russia available from the FactSet, thus the sample size is limited.

Another limitation is the fact that data extracted from Bloomberg had relatively many observations with missing depreciation and amortization costs as well as the current portion of the long-term debt, thus, to assure that a sufficient enough sample size is used for the analysis,

we had to extract a part of missing data from Refinitiv Eikon Datastream where the latter two variables were more widely available. The merging of the two different databases might have skewed the results as there might have been slight differences in some of the numbers extracted.

Additionally, we acknowledge that the models utilized in this paper were originally established for different economic settings and, therefore, might be susceptible to the business cycles, in particular, when there is a prolonged external shock that can cause abnormal variability in financial metrics such as cash flow from operations and others. However, the measures are widely accepted and applied by many researchers, including Filip and Raffournier (2014), in the context of a crisis and control for the main real business activities even though they may be more volatile than usual. This leads us to rely on these established earnings management proxies as we believe the variability in the variables does not affect our analysis tangibly.

Next, there are external factors that can have a residual impact on our findings, for example, Covid-19 was present during several quarters from our analyzed period (which we try to account for), also high inflation might have affected the behavior of the managers, etc. Additionally, the war in Ukraine has a different setting from the studies of previous crises that we mention in the literature review and that we base our methodology on. This is not a financial crisis like, for instance, the 2008 financial crisis, thus the events are difficult to compare. The studied event - the war in Ukraine - largely influences business decisions from different new perspectives: geopolitical risk, energy crisis, sanctions, etc. Nevertheless, the war in Ukraine is still a notable external shock, and, in this way, similar to the Covid-19 crisis or the 2008 financial crisis. Therefore, we regard its impact on the company's financial performance as substantial.

6. Conclusions

In this paper, we examine the impact of the war in Ukraine on the quality of earnings reporting in CEE countries, and, based on the sample spanning from 2017 to 2022, we conclude that in terms of both real and accrual earnings management, the earnings reporting quality has increased. Specifically, the accrual earnings management has decreased significantly for the Consumer Cyclicals, Energy, and Non-Energy Materials industries, comparing the periods before and after the start of the war. Similarly, the Industrials, Energy, and Technology industries reduced their real earnings management as captured by the first income smoothing proxy.

These findings could be interpreted in several ways. First, the market participants are less sensitive to the reported losses during times of wide-scale prolonged economic shocks since most of the market players face financial difficulties. Hence, companies are not generally expected to perform well, and, based on our findings, might be even encouraged to acknowledge the losses as many companies already do, as observed from their improved earnings reporting quality. It could also be that during distress times, it is beneficial for companies to state their real financial results as their visible reported losses can help in negotiations with contractors or when applying for various types of government aid. Lastly, based on other literature, auditors might be more motivated to tighten their control over the reporting quality at times of recession in suspicion of the attempts by firms to reduce the scale of losses, and our findings may point towards the same direction, although insignificantly.

We also find that the connectedness to the Russian market has an influence on the earnings reporting quality - companies with higher revenue exposure decreased unexplained accruals representing the intentional earnings management activities in response to the war in Ukraine. This finding, consistent with the other finding of improved earnings reporting quality during the big-scale external shock, may indicate that the higher the losses, the more prudent the companies are. Therefore, instead of managing earnings to beat the benchmarks and expectations, distressed companies can leverage this information to focus on their competitive advantage. Since most other companies face similar financial challenges, and that is a generally accepted norm, they can rather focus on outperforming competitors and use the time of the

economic downturn for implementing changes in their strategies or making restructuring plans that lead to long-term growth.

To expand on the topic of earnings reporting quality during distressed periods, future research could explore the types of crises (e.g., war, financial crisis, pandemic, etc.) by their underlying characteristics and drivers, and link them with channels through which companies seek to manipulate earnings reporting. Additionally, since the results may differ depending on the industries, a closer investigation of the complexities of industries could be conducted. Lastly, there might be tangible differences in the results among companies related to Russia based on their different responses to the aggressor, for instance, exiting the Russian market, temporarily suspending operations in Russia, or continuing with business-as-usual (Sonnenfeld et al., n.d.). Therefore, as companies may face varying levels of losses and corresponding market responses based on their voluntary actions towards the aggressor, a potential area for future research could be to explore the further implications of these actions on the earnings reporting quality.

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Appendices

Appendix A. Variables utilized for the income smoothing and accrual quality proxies

Variable name	Application in other papers	Description
Dependent and independent variables		
Accruals	Jones (1991), Filip and Raffournier (2014)	A dependent variable for the JONES1, JONES2, and DD models. The variable is defined as non-cash current assets minus the change in current liabilities plus the current portion of long-term debt minus depreciation & amortization; the number is then divided by the lagged total assets.
Inverse_lag_Assets	Jones (1991), Filip and Raffournier (2014)	An independent variable for the JONES1 and JONES2 models. The variable stands for 1 divided by the lagged total assets. The use of scaled lagged total assets is meant to address the issue of heteroskedasticity (i.e., a condition where the variation in residuals is not uniform). The issue is particularly topical in our analysis since residuals are used for calculating the accrual quality proxies.
Change_REV_REC	Dechow, Sloan, and Sweeney (1995), Filip and Raffournier (2014)	An independent variable for the JONES1, JONES2, and DD models. The variable shows the difference between the change in revenues and the change in accounts receivables, both scaled by the lagged total assets. The original Jones model (1991) included the change in revenues (i.e., sales on cash) as an independent variable implying that there is no discretionary power over reporting choices of revenues. However, Dechow, Sloan, and Sweeney (1995) additionally exclude the change in receivables (i.e., sales on credit) from the change in revenues assuming this part of revenues can be easily manipulated through the discretion in revenue recognition.
ROA	Kothari, Leone, and Wasley (2005), Filip and Raffournier (2014)	An independent variable for the JONES1 model. The variable is equal to net income divided by the lagged total assets. The inclusion of the variable allows accounting for the performance of the company.
Scaled_PPEN	Kothari, Leone, and Wasley (2005), Filip and Raffournier (2014)	An independent variable for the JONES1, JONES2, and DD models. The variable represents the net property, plant, and equipment divided by the lagged total assets. The variable helps to explain a part of accruals associated with an investment in long-term assets, which might not be immediately apparent in a firm's cash flows. Depreciation expenses can be subject to

		earnings management through restating the salvage value or useful life of the PPE. Therefore, to provide a better representation of a company's non-current assets, the net PPE value is used, which excludes the accumulated depreciation, instead of the gross PPE as in the original Jones model (1991).
BM.ratio	Larcker and Richardson (2004), Filip and Raffournier (2014)	An independent variable for the JONES2 model. The variable shows the book-to-market ratio. It serves as an approximation of the company's projected growth in the future.
Scaled_CFO	Dechow and Dichev (2002), Filip and Raffournier (2014)	An independent variable for the JONES2 and DD models. The variable represents operating cash flow divided by the lagged total assets. CFO is useful for explaining the inevitable part of the accruals (i.e., accruals caused by real business operations) as it shows the actual cash inflows and outflows which are not prone to earnings management.
Scaled_lag1_CFO	Dechow and Dichev (2002), Filip and Raffournier (2014)	An independent variable for the DD model. The variable depicts lagged operating cash flow divided by the lagged total assets. The lagged value is included to account for the cash flow recognition from the previous period.
Scaled_lead1_CFO	Dechow and Dichev (2002), Filip and Raffournier (2014)	An independent variable for the DD model. The variable represents the first lead of operating cash flow divided by the lagged total assets. The lead value is incorporated into the model to account for the cash flow recognition from the following period.
CFO	Leuz et al. (2003), Filip and Raffournier (2014)	An independent variable for the IS1 proxy. The variable shows operating cash flow, and its standard deviation is later used as the numerator in the ratio defined by the IS1 proxy (i.e., the standard deviation of CFO divided by the standard deviation of net income). Income smoothing may be inferred if the variability of the CFO is bigger than that of net income.
Net.Income	Leuz et al. (2003), Filip and Raffournier (2014)	An independent variable for the IS1 proxy. The variable displays the net income, and its standard deviation is later utilized as the denominator in the ratio defined by the IS1 proxy (i.e., the standard deviation of CFO divided by the standard deviation of net income). Income smoothing may be inferred if the variability of the CFO is bigger than that of net income.
dCFO	Leuz et al. (2003), Filip and Raffournier (2014)	An independent variable for the IS2 proxy. The variable expresses the change in cash flow from operations. A high Spearman's correlation between the change in accruals and the change in CFO may imply income smoothing - a company might use accruals to "buffer" unexpected events (e.g., recognize some sudden expenses over a longer period of time) and in this way

		smooth out the cash flow fluctuations.
Scaled_dAccruals	Leuz et al. (2003), Filip and Raffournier (2014)	An independent variable for the IS2 proxy. The variable displays the change in accruals (net income less CFO) scaled by the lagged total assets. If there is a strong Spearman's correlation between changes in accruals and changes in CFO, it could suggest that the company is engaging in income smoothing through using accruals to absorb unexpected shocks and smooth out earnings.
Lag_Total.Assets	Leuz et al. (2003), Filip and Raffournier (2014)	An independent variable for the IS2 proxy. The variable represents lagged total assets and is used to scale the level of accruals.
EM	Filip and Raffournier (2014)	A dependent variable for the Diff-in-Diff analysis corresponding to the residuals of each of the three accruals quality proxies (i.e., JONES1, JONES2, and DD). These residuals show the unexplained part of the accruals and may be interpreted as the levels of earnings management where positive residuals correspond to upward earnings management and negative residuals show downward earnings management.
Control variables		
COVID	Hsu and Yang (2022)	A dummy variable representing the period split between the Covid-19-affected time periods and the rest of the quarters, with a value of 1 assigned to the time periods ranging from Q1 of 2020 to Q4 of 2021, and a value of 0 assigned otherwise.
ln(Revenues)	Lo et al. (2017)	A variable defined as the natural logarithm of a firm's revenues that controls for a firm's size. By applying the natural logarithm, the revenue variable is converted into a more suitable format, which helps to decrease the impact of extreme values and gives a more tangible coefficient.
ROA	Lo et al. (2017)	An variable representing the return on assets. The inclusion of the variable allows accounting for the performance of the company.
Treated	-	A dummy variable indicating a treatment event, represented by the level of GeoRev Russia variable from the FactSet. The variable equals 1 if a firm's GeoRev Russia variable exceeds the third quartile of all firm exposure levels, and 0 otherwise.
Time	-	A dummy variable displaying the period after the start of the war in Ukraine, where quarters during the year 2022 equal 1, and 0 otherwise.

Time*Treated	-	A dummy variable showing 1 if the observation has revenue exposure to Russia above the 75th percentile of the sample and if the observation occurs after the start of the war; if at least one of the two conditions is not met, the dummy is equal to 0.
factor(Industry)	Conceptually inspired from Larcker and Richardson (2004)	A categorical variable controlling for industry-specific effects on the earnings management levels. The inclusion of the industry dummies allows to increase the goodness of fit of the regression model and controls for the heterogeneity of each of the different industries.
Poland	-	A dummy variable controlling for the Polish companies which account for the majority of our sample companies.
BIG 4	Chia, Lapsley, and Lee (2007)	A dummy variable equaling 1 when a firm is audited by a company from the "Big 4": KPMG, EY, Deloitte, or PwC; otherwise 0.

The table shows all the variables used in our analysis, the sources which they come from, and the descriptions. All the dependent and independent variables except for *EM* are winsorized at the 1st percentile and the 99th percentile to reduce the impact of extreme outliers on the proxies.

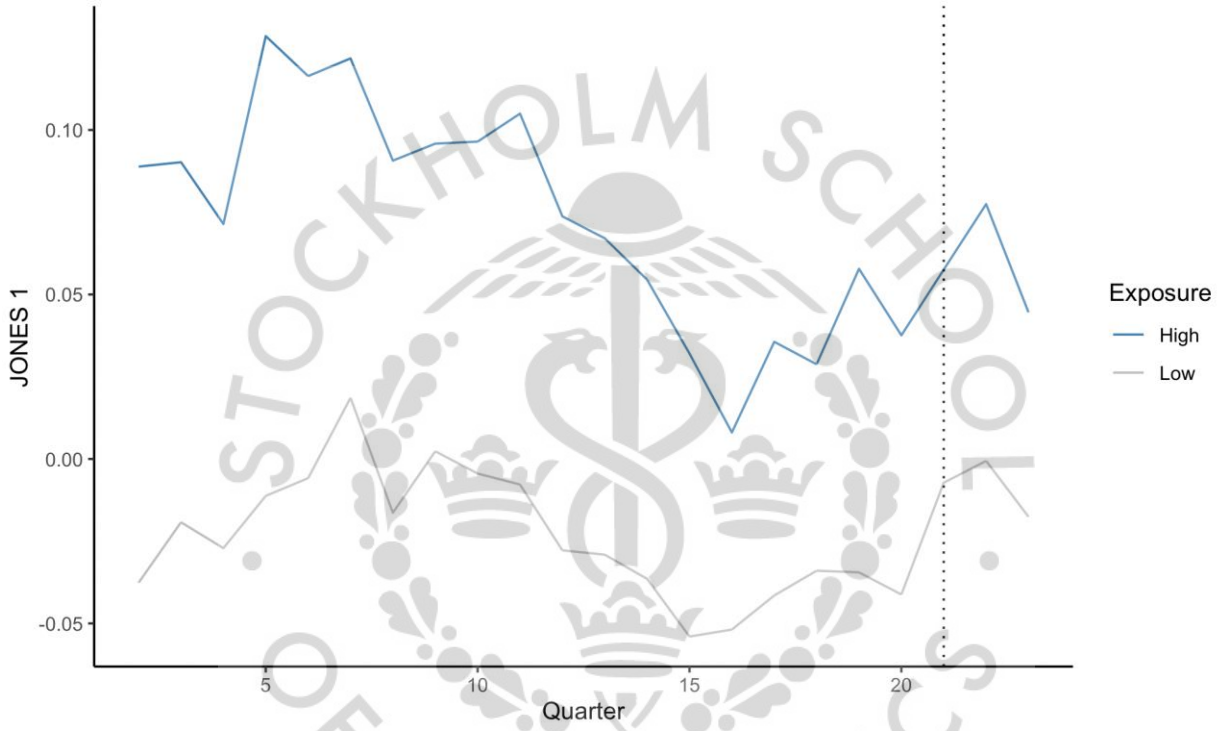
Appendix B. The results from the regression analysis, grouped by periods before and after the start of the war

Variable	Statistics	JONES1 before	JONES1 after	JONES2 before	JONES2 after	DD before	DD after
(Intercept)	Estimate	0.641***	0.652***	0.635***	0.668***	0.658***	0.683***
inverse_lag_Assets	Estimate	-0.446***	-0.791*	-0.397***	-1.227**		
change_REV_REC	Estimate	0.039	0.256*	0.153***	0.331**	0.047	0.279*
scaled_PPEN	Estimate	-0.495***	-0.482***	-0.496***	-0.505***	-0.465***	-0.487***
ROA	Estimate	-0.003**	-0.002				
BM.ratio	Estimate			0.017***	0.012		
scaled_CFO	Estimate			-0.787***	-1.608***	-0.757***	-1.698***
scaled_lag1_CFO	Estimate					-0.679***	-1.087***
scaled_lead1_CFO	Estimate					-0.341***	-0.564**
	Residual st.e.	0.185	0.197	0.180	0.186	0.178	0.175
	N	2519	360	2472	352	2499	221
	R2	0.246	0.200	0.287	0.305	0.294	0.399
	adj R2	0.245	0.191	0.285	0.295	0.293	0.385
	AIC	-1344	-143	-1455	-182	-1514	-140

The table shows the coefficients from the following accrual quality regressions: $(1) ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$ $(2)\ ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it}$ $(3) ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$ where regression (1) is for the JONES1 model, regression (2) is for the JONES2, and regression (3) is for the DD. The variable *inverse_lag_Assets* is equal to 1 divided by the first lag of total assets. *change_REV_REC* shows the difference between the change in revenues and the change in accounts receivables, both scaled by lagged total assets. The variable *scaled_PPEN* represents the net PPE divided by the first lag of total assets. *ROA* depicts the ratio of net income divided by the first lag of total assets. *BM.ratio* shows the book-to-market ratio. *scaled_CFO* represents operating cash flow divided by the lagged total assets. *scaled_lag1_CFO* shows the first lag of operating cash flow divided by lagged total assets. *scaled_lead1_CFO* shows the first lead of operating cash flow divided by the lagged total assets. All values except the two ratios - *BM.ratio* and *ROA* - are expressed in millions of euros. The significance signs ***, **, *, and . stand for 0.1%, 1%, 5%, and 10% significance levels, respectively.

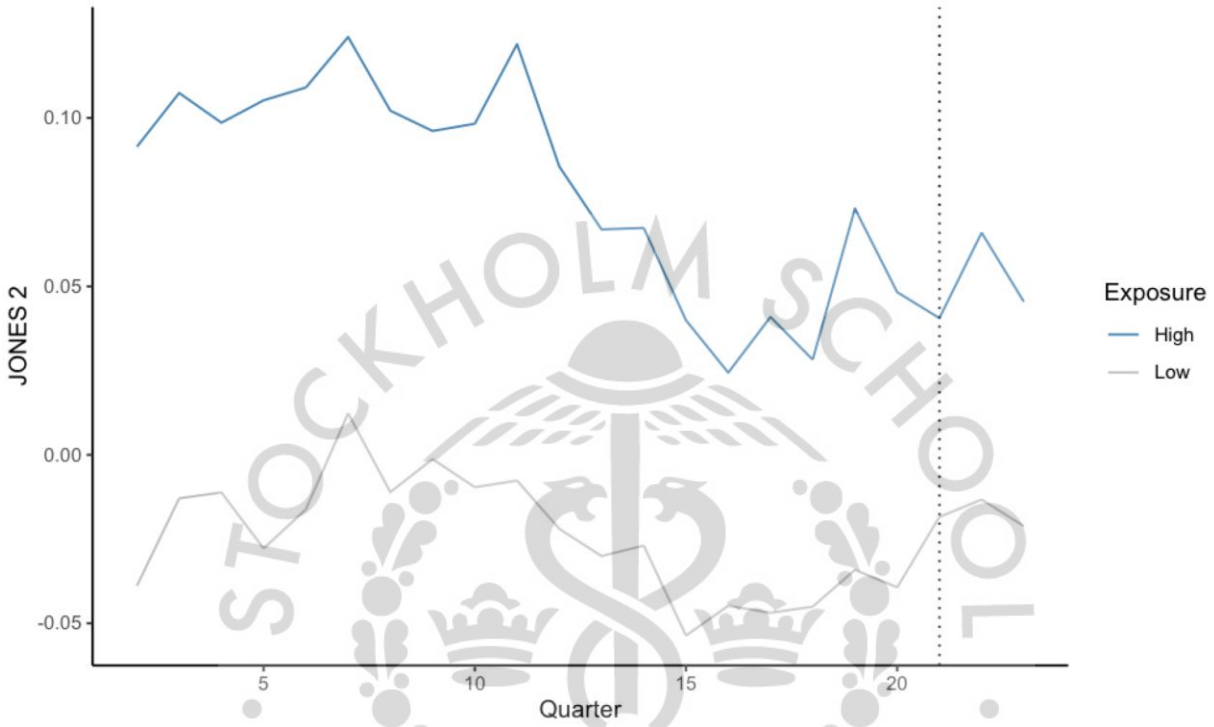
Appendix C. Plotted Parallel Trends of accrual proxies

Appendix C.1. The JONES1 proxy plotted by quarter, controlling for high and low exposures to the Russian market



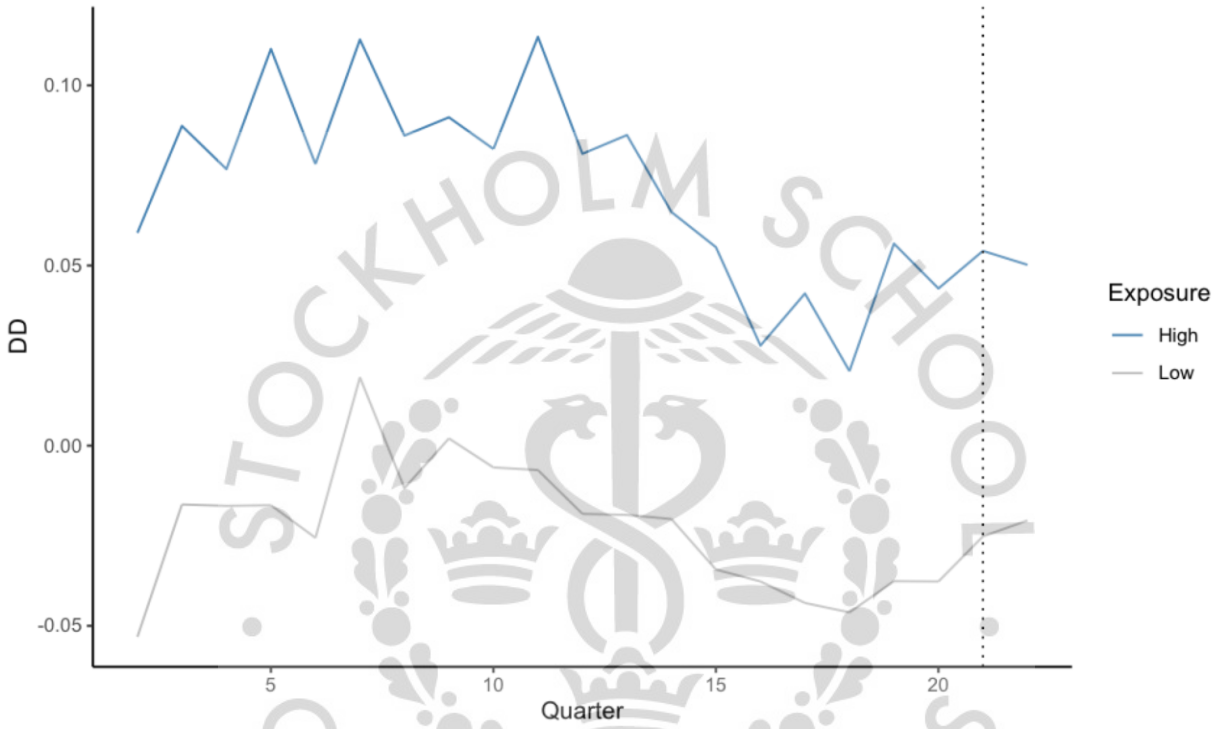
The graph shows the combined firm-specific residuals (ξ_{it}) plotted over the sample period (from 2017 Q2 corresponding to quarter "2" to 2022 Q3 corresponding to quarter "23"). The residuals are obtained from the JONES1 model calculations following the regression of $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$. The firms are split by the level of exposure to the Russian market using the *Treated* variable from the difference-in-differences analysis, where high exposure corresponds to firms with exposure to Russian market in the 4th quartile of all firm exposure levels, and low otherwise.

Appendix C.2. The JONES2 proxy plotted by quarter, controlling for high and low exposures to the Russian market



The graph shows the combined firm-specific residuals (ξ_{it}) plotted over the sample period (from 2017 Q2 corresponding to quarter "2" to 2022 Q3 corresponding to quarter "23"). The residuals are obtained from the JONES2 model calculations following the regression of $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it}$. The firms are split by the level of exposure to the Russian market using the *Treated* variable from the difference-in-differences analysis, where high exposure corresponds to firms with exposure to Russian market in the 4th quartile of all firm exposure levels, and low otherwise.

Appendix C.3. The DD proxy plotted by quarter, controlling for high and low exposures to the Russian market



The graph shows the combined firm-specific residuals (ξ_{it}) plotted over the sample period (from 2017 Q2 corresponding to quarter "2" to 2022 Q3 corresponding to quarter "23"). The residuals are obtained from the DD model calculations following the regression $ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$. The firms are split by the level of exposure to the Russian market using the *Treated* variable from the difference-in-differences analysis, where high exposure corresponds to firms with exposure to Russian market in the 4th quartile of all firm exposure levels, and low otherwise.

Appendix D. Variance Inflation Factor (VIF) test results

	Difference in difference		
	JONES1	**JONES 2**	**DD**
Treated	1.24	1.25	1.18
Time	1.48	1.49	1.46
Time*Treated	1.53	1.54	1.49
Consumer Cyclicals	2.77	3.03	2.81
Consumer Non-Cyclicals	3.28	3.57	3.32
Consumer Services	2.15	2.31	2.16
Energy	2.29	2.43	2.29
Healthcare	2.03	2.18	2.03
Industrials	4.18	4.63	4.23
Non-Energy Materials	3.63	4.04	3.68
Technology	2.9	3.19	2.91
COVID	1.12	1.12	1.08
Poland	1.45	1.45	1.45
ln(Revenues)	1.63	1.64	1.63
ROA	1.07	1.07	1.07
BIG 4	1.45	1.47	1.46

Most commonly accepted threshold for multicollinearity is when VIF is higher than 10. Based on the threshold, in our difference-in-difference regressions as well as regressions of residuals from the three accrual quality models, there is no severe multicollinearity. *Treated* is a dummy variable with 1 meaning that the company's revenue exposure to Russia is in the 4th quartile of all firm exposure levels, and 0 meaning that the exposure is below the third quartile. *Time* is a dummy variable with 1 meaning that the observation is after the start of the war, and 0 meaning that the observation is before the start of the war. *Time*Treated* is a dummy variable showing 1 if the observation has revenue exposure to Russia above the third quartile and if the observation occurs after the start of the war; otherwise the dummy is equal to 0. Variables from *Consumer Cyclicals* to *Technology* are the dummy variables for each industry of our sample. *COVID* is a dummy variable equal to 1 if the observation is during the period of Covid-19 (2020 Q1 - 2021 Q4), 0 otherwise. *ln(Revenues)* controls for the revenues of the firm (in millions of euros). *ROA* control for the profitability of a firm. *BIG 4* dummy variable controls for firms audited by the "Big 4" auditor companies- KPMG, PwC, Deloitte, EY.

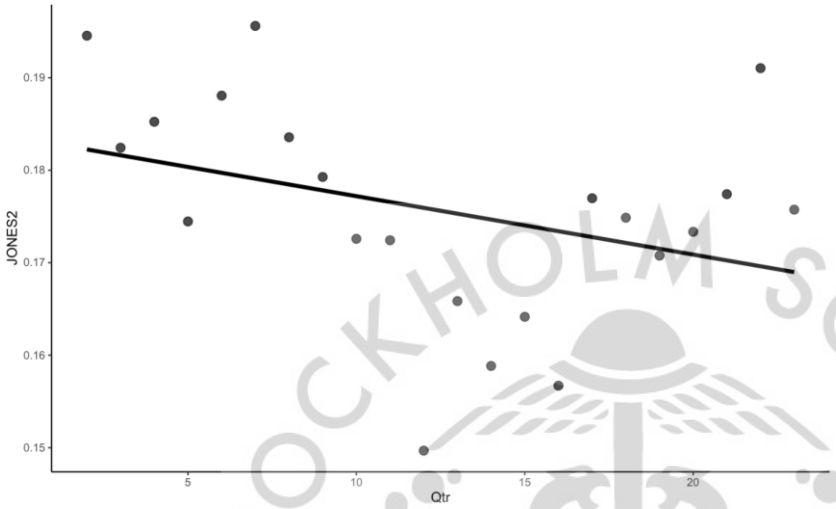
Appendix E. The results from the Fixed Effects regression analysis, grouped by treated and non-treated firms depending on their exposure to the Russian market

Variable	Statistics	JONES1 (treated=1)	JONES1 (untreated=2)	JONES2 (1)	JONES2 (2)	DD (1)	DD (2)
War	Estimate	-0.005	0.008	-0.049***	-0.002	-0.014	-0.005
Covid	Estimate	-0.038***	-0.024***	-0.045***	-0.019***	-0.030***	-0.014**
ln(Revenues)	Estimate	-0.003	0.019***	0.013***	0.016***	0.006 .	0.029***
ROA	Estimate	0.000	0.002*	-0.003*	0.003***	0.004**	0.003***
	N	714	2175	695	2139	679	2051
	R2	0.299	0.414	0.254	0.322	0.261	0.363
	adj R2	0.243	0.372	0.194	0.273	0.200	0.314

The table shows the coefficients of the following regression: $EM_{it} = \alpha_0 + \alpha_1 War_t + \alpha_2 Covid_t + \alpha_3 factor(Industry)_i + \alpha_4 ln(Revenues)_{it} + \alpha_5 ROA_{it} + \xi_{it}$, where EM is the residuals from JONES1 (1), JONES2 (2), and DD (3) regressions: (*1*) $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$ (*2*) $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it}$ (*3*)$ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$. The *War* variable equals 1 for the periods of the Russian war in Ukraine, the *COVID* variable equals 1 for the periods of Covid-19 outbreak. Additionally, *ln(Revenues)* are expressed in millions of euros and ROA variables control for firm size and profitability. The BIG 4 variable equals 1 when a firm's auditor is a company from the "Big 4". The samples are split by firm-specific exposure to the Russian market measured by the GeoRev Russia variable, where the *Treated* sample contains firms with market exposure in the 4th quartile of all firm exposure levels. The significance signs ***, **, *, and . stand for 0.1%, 1%, 5%, and 10% significance levels, respectively.

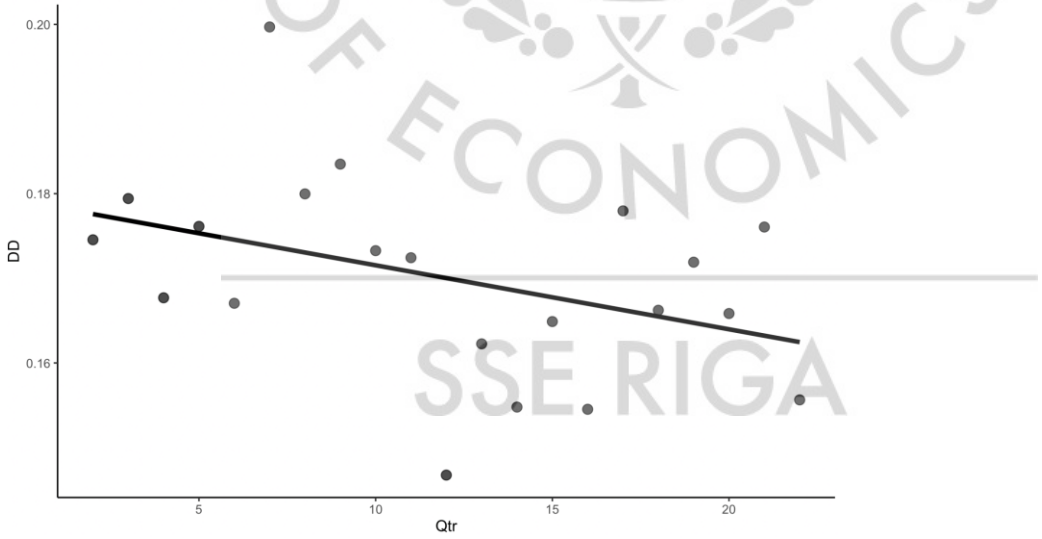
Appendix F. Plotted standard deviations of residuals by period

Appendix F.1. Standard deviations of JONES2 model residuals by quarter 2017 Q2 - 2022 Q3



The graph above shows the results from the JONES2 calculations, plotting the standard deviations of the residuals by quarter (see the detailed numbers in Table 5). Residuals (ξ_{it}) from JONES2 are obtained from the equation: $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it}$, and correspond to the unexplained part of a firm's accruals. In this model, the residuals of all firms are pooled together and split by quarter.

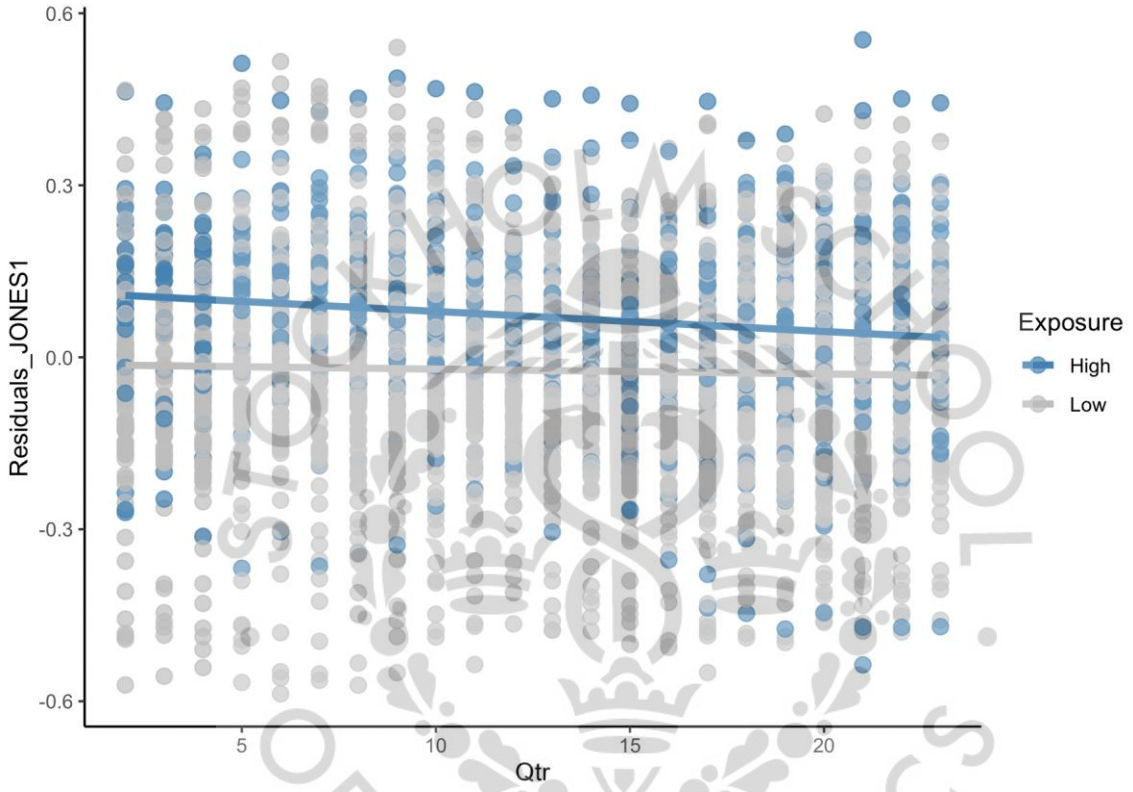
Appendix F.2. Standard deviations of DD model residuals by quarter 2017 Q2 - 2022 Q2



The graph above shows the results from the DD calculations, plotting the standard deviations of the residuals by quarter (see the detailed numbers in Table 5). Residuals (ξ_{it}) from DD are obtained from the equation: $ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$, and correspond to the unexplained part of a firm's accruals. In this model, the residuals of all firms are pooled together and split by quarter.

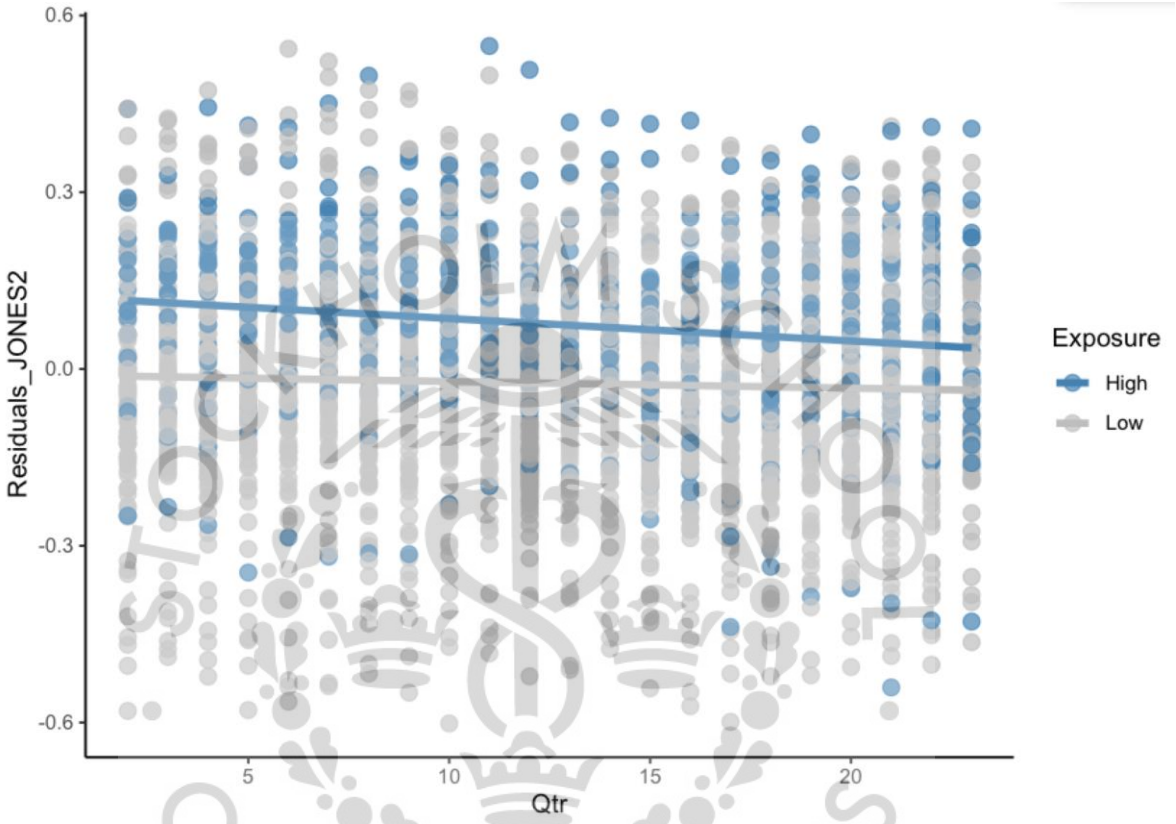
Appendix G. Plotted residuals by period

Appendix G.1. JONES1 residuals plotted by quarter, controlling for high and low exposures to the Russian market



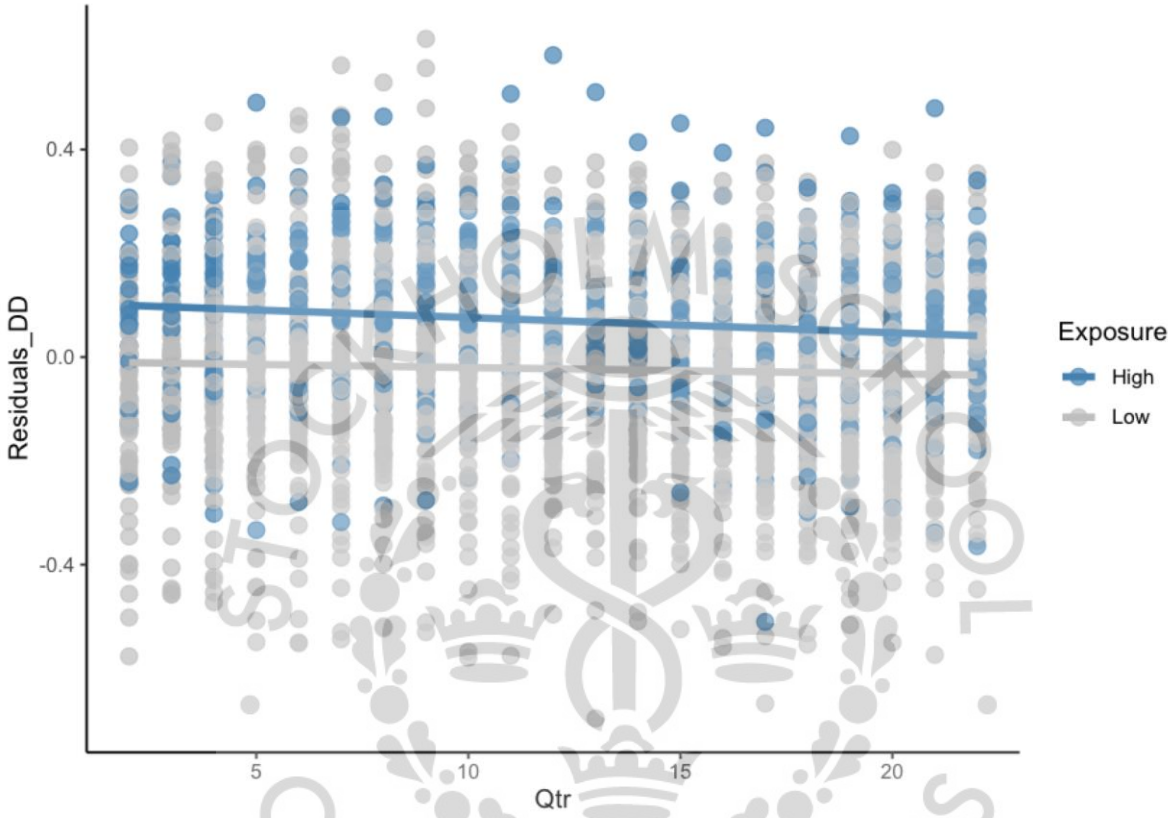
This graph shows the firm- and time-specific residuals (ξ_{it}) plotted over the sample period (2017 Q2 corresponding to quarter "2" to 2022 Q3 corresponding to quarter "23"). The residuals are obtained from the JONES1 model calculations following the regression of $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 ROA_{it} + \xi_{it}$. High levels of residuals correspond to higher unexplained part of the accruals which can be interpreted as an intentionally managed part of accruals. The firms are split by level of exposure to the Russian market using the *Treated* variable from the difference in differences analysis.

Appendix G.2. JONES2 residuals plotted by quarter, controlling for high and low exposures to the Russian market



This graph shows the firm- and time-specific residuals (ξ_{it}) plotted over the sample period (2017 Q2 corresponding to quarter "2" to 2022 Q3 corresponding to quarter "23"). The residuals are obtained from the JONES2 model calculations following the regression of $ACC_{it} = a_0 + a_1 1/A_{it-1} + a_2(\Delta REV_{it} - \Delta REC_{it}) + a_3 PPEN_{it} + a_4 BM_{it} + a_5 CFO_{it} + \xi_{it}$. High levels of residuals correspond to higher unexplained part of the accruals which can be interpreted as an intentionally managed part of accruals. The firms are split by level of exposure to the Russian market using the *Treated* variable from the difference in differences analysis.

Appendix G.3. DD residuals plotted by quarter, controlling for high and low exposures to the Russian market



This graph shows the firm- and time-specific residuals (ξ_{it}) plotted over the sample period (2017 Q2 corresponding to quarter "2" to 2022 Q3 corresponding to quarter "23"). The residuals are obtained from the JONES2 model calculations following the regression of $ACC_{it} = a_0 + a_1 CFO_{it-1} + a_2 CFO_{it} + a_3 CFO_{it+1} + a_4(\Delta REV_{it} - \Delta REC_{it}) + a_5 PPEN_{it} + \xi_{it}$. High levels of residuals correspond to higher unexplained part of the accruals which can be interpreted as an intentionally managed part of accruals. The firms are split by level of exposure to the Russian market using the *Treated* variable from the difference in differences analysis.

Appendix H. Correlation matrices of main variables of accrual and income smoothing proxies

Appendix H.1. Correlation matrix for accrual proxies

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Accruals	1							
(2) inverse_lag_Assets	0.047	1						
(3) change_REV_REC	0.006	-0.000	1					
(4) scaled_PPEN	**-0.228**	**-0.254**	0.003	1				
(5) ROA	-0.005	-0.065	-0.003	-0.059	1			
(6) scaled_CFO	-0.086	-0.038	0.002	-0.003	**0.297**	1		
(7) scaled_lead1_CFO	-0.049	-0.066	0.021	0.064	**0.308**	0.041	1	
(8) BM.ratio	0.042	-0.036	-0.001	0.005	-0.082	-0.081	-0.072	1

The table shows correlations between the variables used to obtain accruals of JONES1, JONES2 and DD models. The highest correlations (above 0.1) between the variables are highlighted.

Appendix H.2. Correlation matrix for income smoothing proxies

Variable	(1)	(2)	(3)	(4)	(5)
(1) CFO	1				
(2) Net Income	**0.626**	1			
(3) dCFO	**0.401**	0.005	1		
(4) Scaled dAccruals	**-0.129**	0.077	**-0.342**	1	
(5) lag(Total Assets)	**0.682**	**0.617**	0.004	0.001	1

The table shows correlations between the variables used to calculate IS1 and IS2 proxies. The highest correlations (above 0.1) between the variables are highlighted.

Appendix H.3. Correlation matrix for Earnings Management measures grouped by firms

Variable	(1)	(2)	(3)	(4)	(5)
(1) JONES1	1				
(2) JONES2	**0.822**	1			
(3) DD	**0.825**	**0.857**	1		
(4) IS1	-0.030	-0.077	-0.082	1	
(5) IS2	-0.062	0.023	-0.079	**0.270**	1

The table shows correlations between the earnings management proxies - JONES1, JONES2, DD, IS1, and IS2. The highest correlations (above 0.1) between the variables are highlighted.

Appendix H.4. Correlation matrix for Earnings Management measures grouped by quarters

Variable	(1)	(2)	(3)	(4)	(5)
(1) JONES1	1				
(2) JONES2	**0.861**	1			
(3) DD	**0.726**	**0.663**	1		
(4) IS1	**-0.697**	**-0.567**	**-0.386**	1	
(5) IS2	**0.119**	**0.180**	-0.042	-0.093	1

The table shows correlations between the earnings management proxies - JONES1, JONES2, DD, IS1, and IS2. The highest correlations (above 0.1) between the variables are highlighted.

Acknowledgment on the use of AI-based tools

In this work, two AI-based tools were utilized. Specifically, Grammarly was consistently used throughout the whole work for editing the text (e.g., grammar, spelling, punctuation, etc.) as the authors of this thesis are non-native English speakers. Additionally, ChatGPT was occasionally used to improve the flow and clarity of several sentences and for correcting other minor grammar mistakes. The latter tool has also assisted in understanding several theoretical concepts; however, was not relied upon and served only as an inspiration for conceptual ideas that were further clarified based on the existing literature. The R code was made entirely by the authors using theoretical information sources and our own knowledge without the help of any AI-based tools.