

Between Models and Markets: Navigating Methodological Dilemmas in Estimating Earnings Management Across Industries

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Abstract— The credibility and transparency of financial reporting directly influence investors' decisions, market trust, and capital allocation efficiency. Earnings management, which occurs when managers manipulate profit or loss levels known internally but not disclosed under normal circumstances, poses a significant challenge to assessing the quality of financial performance. This phenomenon encompasses accounting discretion, often pursued through creative interpretations of accounting standards. Although interest in earnings management spans over 70 years, detection methods have primarily been developed for large, developed markets such as the U.S., with limited adaptation for smaller or emerging economies. This study addresses methodological challenges in estimating earnings management in smaller markets, using the Polish regulated market as an example. Key issues include sample selection, model choice for accrual-based earnings management, definition of endogenous variables, and methodological approaches to estimation, such as cross-sectional versus firm-specific time-series data. Empirical findings indicate that, although the choice of regression model has a limited effect, the methodology for calculating total accruals and the criteria for sample grouping substantially influence the outcomes, with sectoral differences further highlighting the sensitivity of earnings management measures to methodological assumptions.

Keywords— accrual-based earnings management, sectoral analysis, public companies

I. INTRODUCTION

The credibility and transparency of financial results reported by securities issuers have a direct and integral impact on investors' decisions, their ability to assess the true financial condition of companies, and the overall efficiency of capital allocation. Higher quality financial reporting can help reduce information asymmetry, limit investment risk, and enhance

trust in the capital market. One of the most critical analytical areas in assessing the quality of a company's financial performance is the issue of estimating the scale and direction of earnings management. This phenomenon can be described as the application of practices that result in not disclosing a level of financial performance that is known to management and that would otherwise be presented in the issuer's financial statements under normal circumstances—i.e., in the absence of predefined financial targets achievable through creative interpretation of accounting principles, flexible approaches to the processes of recording, classification, processing, and presentation of economic events, as well as the structuring of business operations (Ronen & Yaari, 2010, pp. 25–26; Dechow & Skinner, 2000, p. 239; Piosik, 2016, p. 19).

Research into the scale and direction of corporate earnings shaping has resulted in the development of a broad and sophisticated set of analytical tools. The vast majority of these instruments were originally designed for the U.S. market and later applied - often without adaptation - to other markets operating under different economic and regulatory conditions. In the context of smaller markets, particularly those in the emerging economies of Central and Eastern Europe, existing research on earnings manipulation has yet to produce a distinctive theoretical or practical contribution. Nor has it succeeded in identifying measurement tools for earnings management that are well-suited to the specific features and institutional environments of these markets. Additionally, the assessment of earnings shaping in publicly listed companies involves several methodological challenges that scholars and practitioners in accounting and corporate finance must address.

This study focuses on a deeper exploration of the methodological dilemmas that arise in the process of estimating



the magnitude of accrual-based earnings management in smaller markets. These challenges are particularly pronounced in the context of emerging economies, where institutional environments and market structures differ significantly from those in developed markets. The key issues addressed include the selection of observations for the sample; the choice of models and instruments used to estimate the extent of accrual-based earnings management; the definition of the endogenous variable within these regression frameworks; and the methodological approach to estimating the scale of profit (or loss) manipulation. The study also incorporates a sectoral analysis of accrual-based earnings management, illustrating how methodological choices influence results across industries. By examining these dilemmas, the study aims to highlight the limitations of applying generalized measurement models across diverse market settings and to emphasize the need for context-sensitive analytical approaches.

Although this paper adopts a predominantly theoretical perspective, it also incorporates empirical data to illustrate the methodological dilemmas under examination in a more concrete manner. The underlying calculations are based on publicly listed companies operating on the Main Market of the Warsaw Stock Exchange between 2014 and 2023, whose shares were continuously traded throughout the full 10-year research horizon. The inclusion of these calculations serves as a valuable complement to the theoretical discussion, offering practical insight into the challenges of estimating accrual-based earnings management in the context of a smaller, yet increasingly significant, capital market.

II. MATERIALS AND METHODS

A. *Historical and Conceptual Foundations of Earnings Management Research*

The phenomenon of corporate earnings management has been the subject of academic inquiry for over seventy years. One of the earliest broader observations of managerial practices related to accrual manipulation was made by Hepworth in 1953, who documented several accounting techniques used to smooth earnings and shift revenue and cost streams over time. In the following two decades, hypotheses concerning income smoothing in U.S. companies were tested by scholars such as Gordon (1964), White (1970), and Beidelman (1975). The dominant research approaches at that time included graphical analyses illustrating the volatility of financial reporting data arranged in time series, as well as basic mathematical modelling focused on individual accrual items (increases in asset or liability values), which were assumed to explain the presence of income smoothing within the examined samples.

In the 1980s, Healy (1985) and DeAngelo (1986) introduced analytical formulas based on total accruals as a foundation for estimating the degree of earnings management. In both cases, it was assumed that the value of operational accruals in a given year - resulting from generated sales and investment in fixed assets - should be equal to the total profit adjustments reported in the preceding year. Consequently, an increase in accrual

adjustments relative to the prior year was interpreted as evidence of financial statement manipulation and the use of creative accounting techniques. A noteworthy aspect of both models was the assertion that the accrual value calculated for a given firm should not be directly compared to similar adjustments reported by other firms - even within the same industry. This view was justified by the recognition that companies operating at a larger scale naturally report higher accruals. Therefore, to ensure data comparability, both models expressed total accruals as a ratio to the firm's total assets from the previous year.

A methodological breakthrough in estimating the scale and direction of earnings management occurred in 1991, when Jones introduced the first regression-based model allowing for the extraction of discretionary and non-discretionary (operational) accruals. This regression-based approach has remained the dominant analytical framework in global earnings management research to this day.

B. *Sample Selection*

Concerns related to sample selection in empirical research often stem from a common approach in the literature, whereby all available data for a given period are used in the analysis. In other words, the research sample includes all companies (i.e., the full set of available observations) for which the necessary financial reporting data could be retrieved. This approach may lead to the implicit assumption that earnings are managed across the entire population of analyzed firms. However, according to certain methodological frameworks - such as the Jones model - the implementation of earnings management detection methods should be preceded by the identification of specific incentives or circumstances that plausibly motivate management to engage in such practices.

Another critical issue concerns the determination of the minimum number of observations required to correctly model the magnitude of earnings management. Although it is commonly accepted that at least ten firm-year observations are needed for a reliable estimation (Dechow et al., 1995), many researchers choose to raise this threshold. For instance, some cross-sectional studies adopt stricter criteria to ensure robustness, particularly when analyzing accrual-based earnings management across industries.

Furthermore, the composition of the sample - particularly in terms of industry affiliation, company size, and corporate governance characteristics - can substantially influence the explanatory power and generalizability of the results. Including heterogeneous entities within the same sample may obscure underlying patterns or exaggerate effects, especially in markets with varying levels of regulatory enforcement and financial reporting quality. For this reason, some studies advocate for more granular sample construction, based on pre-defined selection criteria such as industry group, firm size, or likelihood of managerial discretion.

Lastly, an often-overlooked but equally important consideration is the temporal consistency of data. Firms with incomplete reporting histories or erratic financial disclosures can introduce distortions in the estimation of accruals.

Consequently, ensuring that only firms with continuous, high-quality data over the full estimation window are included may significantly improve the robustness of the model's outputs (Kothari et al., 2005).

C. Choice of Regression Model

Formulas designed to estimate accrual-based earnings management illustrate the diversity of available tools for measuring this phenomenon. A key dimension of research on earnings management involves the search for the "best" model for estimating discretionary accruals. However, findings to date do not point to a clear consensus regarding the superiority of any particular model. Scholars and practitioners of accounting often highlight the limitations of existing methodological approaches. Yet evaluating the usefulness of specific models becomes problematic when attempting to answer the question: how should such an assessment be conducted?

For instance, Metzker and Siekelova (2021) examined the degree of model fit to empirical data and concluded that a higher "goodness of fit" implies a model's superiority. This conclusion appears questionable, as regression models designed to extract accrual components should not focus solely on predictive performance with respect to the endogenous variable (i.e., the degree of fit between explanatory variables and the dependent variable). Rather, attention should be directed toward the correct identification of discretionary accruals in cases where actual earnings manipulation occurred. Christensen et al. (2023) introduce distorted variables into their models - variables that imply the occurrence of earnings management - and use these to estimate the proportion of observations in which the null hypothesis of no manipulation should be rejected.

According to Piosik (2011, pp. 489–490), the minimal approach to estimating non-discretionary accruals involves the Jones model, where non-discretionary accruals (NDACC) are explained using two variables: the absolute chain increase in sales revenues and the average value of fixed tangible assets. The original Jones model relied on time-series analysis for individual firms, which required long estimation windows and potentially distorted outcomes. From a methodological standpoint, it should be emphasized that the Jones regression model (and its subsequent modifications) can be reduced to a generalized form in which the value of discretionary accruals is determined based on the residual term of the regression. This residual represents the portion of total accruals that cannot be explained by operational variables such as revenue changes or levels of tangible fixed assets. In practice, discretionary accruals are estimated as the difference between actual and predicted (non-discretionary) accruals, which serves as a core diagnostic for identifying potential earnings manipulation. Key modifications of the Jones model include those proposed by Dechow et al. (1995), who suggested adding the change in short-term receivables as an explanatory variable. However, this approach assumes that all increases in receivables are discretionary, which contradicts business reality. Only in a later model by Dechow et al. (2003) was this limitation addressed by incorporating a coefficient that captured changes in non-

discretionary receivables. Meanwhile, Kothari et al. (2005) introduced an intercept (to reduce heteroskedasticity) and a return-on-assets variable (to limit the size of estimated discretionary accruals).

A considerable number of regression models employed to estimate accrual components incorporate cash flow from operations as an explanatory variable. Since cash flows are relatively unaffected by accounting assumptions, estimates, or policies, they are often regarded as the least subject to manipulation and particularly valuable in identifying intentional earnings management. For instance, the model proposed by Dechow and Dichev (2002) includes only operating cash flows as explanatory variables, with the dependent variable being changes in working capital accruals. However, as noted by Piosik (2011, p. 488), this model is conceptually inconsistent, as it juxtaposes static quantities (i.e., net accruals) on the left-hand side with flow variables (i.e., cash flows) on the right-hand side of the equation.

Some accrual detection models also include leading or lagging variables, which is a desirable feature - since current total accruals may reasonably be modeled as a function of future changes in revenues. Others, such as the Chambers (1999) model, include recursive terms (i.e., prior-period accruals as predictors), while still others incorporate capital market-based indicators, like the book-to-market ratio used in the Larcker and Richardson (2004) model. The selection of a regression model should also be aligned with the specific goal of the analysis whether to detect individual cases of earnings management or to assess the overall tendency across a population. In this regard, some models, despite lower statistical power, may better capture manipulation under special circumstances, such as small-cap firms, emerging markets, or during crisis periods (Roychowdhury, 2006).

Another methodological issue is the heteroskedasticity of residuals, which may inflate significance levels and lead to false positives. Modern research recommends using robust standard errors or heteroskedasticity-consistent estimators like White's estimator (Petersen, 2009). Recent studies also explore nonlinear estimation techniques, such as quantile regression or Bayesian models, which better capture extreme values in the distribution of discretionary accruals (Chen et al., 2018). Moreover, there's a growing trend toward applying machine learning algorithms - including decision trees, random forests, and support vector machines - for detecting reporting anomalies and estimating the likelihood of earnings management (Bao et al., 2020).

In this paper, we estimated the magnitude of accrual-based earnings management using the Jones model (1991) (Equation 1) as well as the modified Jones model (Dechow et al., 2003) (Equation 2). These are the two most widely used models for detecting earnings-altering operations. The main difference between them is that the modified Jones model adjusts for changes in receivables, which improves the identification of discretionary accruals by accounting for revenue-related accruals that are beyond management's control. Moreover, the second model includes the slope parameter k , which represents the expected responsiveness of accounts receivable to changes

in sales (where a value of $k = 1$ signifies nondiscretionary movements, while $k = 0$ indicates discretionary manipulation) (Equation 3). In both models, the magnitude of earnings management is indicated by the values of the residual term (ε), which represents the portion of total accruals unexplained by normal operational factors.

$$\frac{TACC_t}{TA_{t-1}} = \alpha_1 \left(\frac{1}{TA_{t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_t}{TA_{t-1}} \right) + \alpha_3 \left(\frac{PPE_t}{TA_{t-1}} \right) + \varepsilon_t \quad (1)$$

$$\frac{TACC_t}{TA_{t-1}} = \alpha_1 \left(\frac{1}{TA_{t-1}} \right) + \alpha_2 \left(\frac{(1+k) * \Delta REV_t - \Delta REC_t}{TA_{t-1}} \right) + \alpha_3 \left(\frac{PPE_t}{TA_{t-1}} \right) + \alpha_4 \frac{TACC_{t-1}}{TA_{t-2}} + \varepsilon_t \quad (2)$$

$$\Delta REC_t = \alpha_1 + k * \Delta REV_t + \varepsilon_t \quad (3)$$

Where:

- TACC_t – total accruals in year t;
- TA_t – total assets in year t;
- REV_t – revenues from sales in year t;
- REC_t – net receivables in year t;
- PPE_t – gross property, plant and equipment in year t;
- k – slope coefficient indicating the expected change in receivables per unit change in sales.

D. Measurement of Total Accruals

A key methodological concern in empirical research on the extent of earnings management in reporting entities lies not only in the choice of the regression model used to estimate accrual subcategories, but also in the method adopted to calculate the endogenous variable representing total accruals (TACC).

In some studies, the applied formulas allow total accruals to be equated with adjustments to net income, defining them as the difference between net profit and cash flows from operating activities (Equation 4). This approach is consistent with the structure of financial statements prepared under the Accounting Act or IFRS and is found, for example, in Yoon et al. (2006) and Piech (2018). While this method offers compatibility with standardized financial reporting, it does not take into account the fact that net income may be influenced by financing activities, which are not reflected in operating cash flows.

An alternative is the balance sheet approach, originally used in the Jones (1991) model, in which total accruals are understood as the change in net working capital, adjusted for depreciation of tangible and intangible assets (Equation 5). In this case, the TACC variable reflects changes in non-cash components of net current assets, as shown in Garcia Lara et al. (2005), and Wróblewski et al. (2017). The main advantage of this approach is its focus on the aggregated valuation effects of working capital components. However, it does not include non-operating activities such as the creation of long-term provisions, impairment losses on fixed assets, foreign exchange differences, or the acquisition and disposal of subsidiaries. These elements may significantly influence the total level of net

income adjustments.

Although the selection of a particular method for identifying total accruals depends on the knowledge, assumptions, and preferences of the researcher, it is important to recognize that this choice will directly affect the final values of discretionary accrual indicators (DACC). This observation is particularly relevant when comparing the scale and direction of earnings management in an international context.

$$TACC_t = EAT_t - CFO_t \quad (4)$$

$$TACC_t = (\Delta CA_t - \Delta CASH_t) - (\Delta CL_t - \Delta STD_t) - DEP_t \quad (5)$$

Where:

- EAT_t – earnings after taxes in year t;
- ΔCA_t – change in current assets in year t;
- ΔCASH_t – change in cash and other short-term investments in year t;
- ΔCL_t – change in current liabilities in year t;
- ΔSTD_t – change in short-term loans and borrowings in year t;
- DEP_t – depreciation in year t.

E. Sample Grouping Strategy

The final methodological issue relevant to the estimation of the scale and direction of earnings management in firms that warrants broader commentary concerns the approach to grouping the research sample. Various methodological frameworks permit empirical analyses either from the perspective of individual firms observed over time (i.e., the time-series data approach) or from the perspective of groups of firms at a specific point in time (i.e., the cross-sectional data approach).

A common rationale for adopting the time-series approach lies in the assumption that earnings management patterns are firm-specific rather than industry-driven - a view supported by the premises of the upper echelons theory (Hambrick & Mason, 1984). However, as previously noted, this approach requires a sufficiently long observation window and assumes the constancy of regression parameters over the entire period of analysis.

Conversely, when opting for a cross-sectional regression model based on a group of comparable firms, researchers must determine which attribute should serve as the basis for grouping entities into subpopulations — be it the industry in which the firms operate, firm size, or financial performance in a given year (t). Grabiński (2016, p. 171) observed that in the original studies conducted on the U.S. market, researchers first selected target firms, then constructed a peer group of similar companies, and only thereafter conducted the regression analysis. On smaller markets - where the total number of listed entities is significantly lower - researchers typically include all firms for which the necessary data are available, grouped according to a predefined characteristic. This pragmatic solution ensures the viability of statistical inference in environments where sample size is inherently limited.

F. Stated Hypotheses

Based on the arguments presented above, we formulate three hypotheses for this study:

- H1. In the examined sample, accrual-based earnings management proxies estimated using the Jones model and the Dechow et al. model are highly and positively correlated, indicating consistency in the relative assessment of earnings management across models.
- H2. In the examined sample, accrual-based earnings management proxies estimated at the firm-year level and those obtained using a cross-sectional sector-year approach are highly and positively correlated, suggesting that the choice of estimation approach does not materially affect the overall evaluation of earnings management.
- H3. In the examined sample, total accruals estimated using the Balance Sheet approach and the Cash Flow-based approach are highly and positively correlated, implying robustness of accrual-based earnings management measures to alternative accrual estimation methods.

III. RESULTS

In the first step, we examine the descriptive statistics of discretionary accruals (DACC) estimated using the Dechow et al. firm-level year approach and two variants of the Jones model. We observe that mean DACC values are generally close to zero across sectors, indicating low average levels of earnings management, although sectoral differences are evident. The Finance sector exhibits consistently negative mean accruals, suggesting income-decreasing behavior, while Industrial and Construction Production shows positive mean values across all models. Fuel and Energy reports small positive means and medians, whereas Chemicals and Raw Materials displays higher accruals only under the cross-sectional Jones approach. We also observe negative mean accruals in Trade and Services and especially in Technology under the cross-sectional specification. Median values are typically closer to zero than means, implying that extreme observations partly drive average effects.

TABLE 1 SECTORAL DESCRIPTIVE STATISTICS OF DISCRETIONARY ACCRUALS BASED ON ALTERNATIVE MODELS

Sector	Statistical Measure	DACC (Dechow et al., Firm-Year Model)	DACC (Jones, Firm-Year Model)	DACC (Jones, Cross-Sectional Sector-Year Model)
Finance	Mean	-0.016	-0.012	-0.002
	Median	0.001	0.000	-0.006
Fuel and Energy	Mean	0.004	0.003	0.001
	Median	0.004	0.003	0.002
Chemicals and Raw Materials	Mean	0.000	0.000	0.008
	Median	0.000	-0.005	0.002
Industrial and Construction Production	Mean	0.006	0.007	0.006
	Median	0.002	0.001	0.001

Sector	Statistical Measure	DACC (Dechow et al., Firm-Year Model)	DACC (Jones, Firm-Year Model)	DACC (Jones, Cross-Sectional Sector-Year Model)
Consumer Goods	Mean	0.000	-0.002	0.003
	Median	0.002	0.000	0.003
Trade and Services	Mean	0.001	0.001	-0.001
	Median	0.003	-0.001	-0.003
Healthcare	Mean	-0.001	-0.002	0.002
	Median	0.000	0.001	0.003
Technology	Mean	0.001	0.001	-0.008
	Median	0.000	0.002	0.000

Source: own elaboration.

Next, with reference to the previously discussed methodological challenges related to measuring the magnitude of earnings management behaviour, we present Spearman's rank correlation coefficients between alternative proxies of discretionary accruals (DACC), calculated at the individual firm level over a ten-year observation window (2014–2023) (Table 2). Despite conceptual and technical differences between the applied estimation approaches, the results reveal a high degree of consistency between the estimates. For the full sample of publicly listed firms, the correlation coefficient reached $\rho = 0.831$, statistically significant at the 0.01 level (denoted by an asterisk), indicating a strong and positive association between the two earnings management proxies. Sector-level analyses further confirm this pattern. The Spearman coefficients range from $\rho = 0.746$ in the chemicals and raw materials sector to $\rho = 0.915$ in the consumer goods sector. In all sectors, the correlations are positive, statistically significant, and moderately to very strong, suggesting a robust alignment between the two accrual-based earnings management metrics.

TABLE 2 SPEARMAN'S RANK CORRELATION COEFFICIENTS BETWEEN DISCRETIONARY ACCRUALS ESTIMATED USING THE JONES MODEL AND THE DECHOW ET AL. MODEL

Sector	Earnings management proxies	DACC Jones	DACC Dechow et al.	N
All companies	DACC Jones	1.000	0.831**	2180
	DACC Dechow et al.	0.831**	1.000	
Finance	DACC Jones	1.000	0.767**	300
	DACC Dechow et al.	0.767**	1.000	
Fuel and Energy	DACC Jones	1.000	0.834**	110
	DACC Dechow et al.	0.834**	1.000	
Chemicals and Raw Materials	DACC Jones	1.000	0.746**	250
	DACC Dechow et al.	0.746**	1.000	
Industrial and Construction Production	DACC Jones	1.000	0.831**	720
	DACC Dechow et al.	0.831**	1.000	

Sector	Earnings management proxies	DACC Jones	DACC Dechow et al.	N
Consumer Goods	DACC Jones	1.000	0.915**	330
	DACC Dechow et al.	0.915**	1.000	
Trade and Services	DACC Jones	1.000	0.823**	190
	DACC Dechow et al.	0.823**	1.000	
Healthcare	DACC Jones	1.000	0.822**	100
	DACC Dechow et al.	0.822**	1.000	
Technology	DACC Jones	1.000	0.902**	180
	DACC Dechow et al.	0.902**	1.000	
Correlations statistically significant at the 0.01 level are marked with two asterisks (**), and those significant at the 0.05 level are marked with one asterisk (*)				

Source: own elaboration.

Based on Table 3, we observe strong and statistically significant positive Spearman correlations between discretionary accruals estimated using the firm-year Jones model and the cross-sectional sector-year approach across the full sample and all sectors. For all companies, the correlation equals 0.647, indicating a high degree of consistency between the two earnings management proxies. Similar results are observed at the sector level, with correlation coefficients ranging from 0.537 in Fuel and Energy to 0.707 in Consumer Goods. Overall, these findings suggest that the choice between the firm-year and cross-sectional Jones specifications does not materially affect the relative assessment of accrual-based earnings management.

TABLE 3 SPEARMAN'S RANK CORRELATION COEFFICIENTS BETWEEN DISCRETIONARY ACCRUALS ESTIMATED USING THE JONES FIRM-YEAR MODEL AND THE JONES CROSS-SECTIONAL SECTOR-YEAR MODEL

Sector	Earnings management proxies	DACC Jones	DACC Dechow et al.	N
All companies	DACC Jones	1.000	0.647**	2180
	DACC Dechow et al.	0.647**	1.000	
Finance	DACC Jones	1.000	0.618**	300
	DACC Dechow et al.	0.618**	1.000	
Fuel and Energy	DACC Jones	1.000	0.537**	110
	DACC Dechow et al.	0.537**	1.000	
Chemicals and Raw Materials	DACC Jones	1.000	0.579**	250
	DACC Dechow et al.	0.579**	1.000	
Industrial and Construction Production	DACC Jones	1.000	0.671**	720
	DACC Dechow et al.	0.671**	1.000	
Consumer Goods	DACC Jones	1.000	0.707**	330
	DACC Dechow et al.	0.707**	1.000	
Trade and Services	DACC Jones	1.000	0.614**	190
	DACC Dechow et al.	0.614**	1.000	
Healthcare	DACC Jones	1.000	0.607**	100

Sector	Earnings management proxies	DACC Jones	DACC Dechow et al.	N
	DACC Dechow et al.	0.607**	1.000	
Technology	DACC Jones	1.000	0.686**	180
	DACC Dechow et al.	0.686**	1.000	
Correlations statistically significant at the 0.01 level are marked with two asterisks (**), and those significant at the 0.05 level are marked with one asterisk (*).				

Source: own elaboration.

The importance of the investigated issue is further supported by the evidence provided in Table 4, which presents Spearman's rank correlation coefficients between total accruals (TACC) estimated using two alternative approaches: the balance sheet method (TACC BS) and the cash flow-based method (TACC CF). The analysis encompasses the full sample of companies as well as sector-specific subsets. The results indicate statistically significant positive correlations between the two proxies across all sectors at the 1% significance level. However, the magnitude of these correlations varies substantially. The strongest correlation is observed in the Industrial and Construction Production sector (0.682), suggesting a relatively high degree of consistency between the two estimation methods in this domain. In contrast, the Fuel and Energy and Chemicals and Raw Materials sectors exhibit the weakest correlations (both 0.357), pointing to notable discrepancies depending on the chosen calculation approach. Overall, the correlation for the entire sample is moderate (0.555), indicating that although the two methods are related, they capture somewhat different dimensions of total accruals. These findings highlight the critical impact of the choice of calculation method on the measurement of earnings management proxies, particularly when sectoral analyses are conducted.

TABLE 4 SPEARMAN'S RANK CORRELATION COEFFICIENTS BETWEEN TOTAL ACCRUALS ESTIMATED USING THE BALANCE SHEET APPROACH AND THE CASH FLOW-BASED APPROACH

Sector	Earnings management proxies	TACC BS	TACC CF	N
All companies	TACC BS	1.000	0.555**	2180
	TACC CF	0.555**	1.000	
Finance	TACC BS	1.000	0.471**	300
	TACC CF	0.471**	1.000	
Fuel and Energy	TACC BS	1.000	0.357**	110
	TACC CF	0.357**	1.000	
Chemicals and Raw Materials	TACC BS	1.000	0.357**	250
	TACC CF	0.357**	1.000	
Industrial and Construction Production	TACC BS	1.000	0.682**	720
	TACC CF	0.682**	1.000	
Consumer Goods	TACC BS	1.000	0.577**	330
	TACC CF	0.577**	1.000	
Trade and Services	TACC BS	1.000	0.426**	190
	TACC CF	0.426**	1.000	

Sector	Earnings management proxies	TACC BS	TACC CF	N
Healthcare	TACC BS	1.000	0.527**	100
	TACC CF.	0.527**	1.000	
Technology	TACC BS	1.000	0.507**	180
	TACC CF	0.507**	1.000	
Correlations statistically significant at the 0.01 level are marked with two asterisks (**), and those significant at the 0.05 level are marked with one asterisk (*).				

Source: own elaboration.

IV. DISCUSSION

We find that the empirical results generally support all three stated hypotheses. We confirm H1, as discretionary accruals estimated using the Jones model and the Dechow et al. model are strongly and positively correlated, indicating high consistency between the applied measures. We also confirm H2, since the firm-year and cross-sectional sector-year approaches produce highly correlated results, suggesting that the choice of estimation approach does not materially affect the relative evaluation of earnings management proxies. Finally, we confirm H3, as total accruals estimated using the balance sheet and cash flow-based approaches are positively and statistically significantly correlated, although the moderate strength of this relationship indicates some methodological sensitivity. Thus, based on our results, we pay particular attention to the method used to estimate total accruals, as this choice appears to have the greatest impact on the obtained proxies of accrual-based earnings management. We further suggest that future studies conduct similar methodological comparisons with respect to real earnings management, in order to assess the robustness and consistency of alternative operational earnings management measurement approaches.

V. CONCLUSIONS

Due to its accrual-based nature, net income is an economic category highly susceptible to managerial influence. The processes involved in both accounting discretion are understood as the implementation of practices that result in not reporting the level of profit (or loss) that is actually known to the management and that would otherwise be disclosed in the financial statements under normal circumstances - i.e., in the absence of predefined financial targets pursued through creative interpretations of accounting standards, flexible approaches to the recording, classification, processing, and presentation of economic events, as well as the deliberate structuring of business operations.

Academic and practical interest in this subject has been ongoing for more than 70 years, beginning with early work in the field of accounting theory and income smoothing. Over time, the topic has gained increasing importance, reflected in the continuous development of methods for detecting earnings management and the expanding volume of empirical research.

This paper highlights that any attempt to assess the scale and direction of earnings management behavior may be subject to considerable methodological challenges. These challenges may include issues related to sample size, selection criteria, and the treatment of specific observations within the research sample; the choice of appropriate tools for estimating accrual-based earnings management; and the mechanisms applied in the estimation process. These issues are especially important in the context of smaller and emerging markets, where specialized tools for detecting earnings management tailored to the specific characteristics of these markets have yet to be fully developed.

Based on empirical analyses of the regulated Polish market, this study demonstrated that the choice of regression model in detecting earnings management is not a critical issue. We present Spearman's rank correlation coefficients between two alternative proxies of discretionary accruals - those derived from the traditional Jones model and from the model developed by Dechow, Richardson, and Tuna. Despite conceptual and technical differences between the two models, the results reveal a high degree of consistency between their estimates. Additionally, the results indicate strong consistency between discretionary accruals estimated using firm-year specifications and those obtained from cross-sectional sector-year approaches, suggesting that the choice of estimation framework does not substantially alter the relative assessment of earnings management behaviour.

However, in the context of accrual-based earnings management, the method of calculating the endogenous variable (total accruals) proves to be more consequential. The correlations between total accruals proxies estimated using the balance sheet approach and those based on cash flows vary considerably across sectors, ranging from moderate to relatively low values. This variation suggests that applying these two distinct approaches to calculating total accruals may lead to divergent results in estimating discretionary accruals, depending on the sector under consideration.

The results of this research may be valuable for academic scholars seeking to refine measurement models and for regulators aiming to enhance the detection of earnings manipulation. Additionally, practitioners such as auditors and financial analysts can benefit from a better understanding of these methodological nuances when assessing the quality of financial reporting.

VI. REFERENCES

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