

Segmenting Political Connection and Earnings Management: A Clustering and Regression Approach in IDX Firms

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Abstract

This study aimed to segment 140 non-financial companies listed on the Indonesia Stock Exchange (IDX) for fiscal year 2024 based on political connections and earnings management, and to test the consistency of this segmentation through Ordinary Least Squares (OLS) regression. Political connection was measured through five indicators, while earnings management was measured through discretionary accruals and two real-activities indicators, with normal-model coefficients estimated on a cross-section of 852 IDX-listed firms. Exploratory Factor Analysis (EFA) and k-means clustering were then applied to the resulting factor scores, followed by ANOVA/Kruskal-Wallis tests and OLS regression. Exploratory factor analysis yielded a robust two-factor structure (Kaiser-Meyer-Olkin = 0.798, cumulative variance 72.6%), and k-means clustering produced a statistically optimal two-cluster solution (Silhouette = 0.616) that separated the sample purely by political connection, with no significant earnings-management difference ($p > 0.49$), a three-cluster solution revealed one bootstrap-stable cluster with a significant income-increasing pattern ($p < 0.001$). The findings were more consistent with the political shelter hypothesis than with political capture at the cluster profile and ANOVA/Kruskal-Wallis levels, although a robustness check using clusters formed from the political-connection factor alone found no significant partial association, although the single-year cross-sectional design limited interpretation to association rather than causation. This study contributed methodologically by cross-validating the factor structure and complementing cluster segmentation with regression evidence.

Keywords: Earnings Management, Exploratory Factor Analysis, K-Means Clustering, OLS Regression, Political Connection

1. INTRODUCTION

The relationship between political connections and financial reporting quality is central to the positive accounting literature. [Faccio \(2006\)](#) documents that politically connected firms are widespread across developing countries, including Indonesia, with connections granting privileged access to government contracts and lenient regulation. This gives rise to two competing hypotheses, such as political shelter predicts that connection reduces the incentive for earnings management because benefits are already secured, while political capture predicts the opposite, that connection increases earnings-management opportunity through weaker oversight ([Sheik & Abubakkar, 2017](#)).

Most Indonesian studies test this relationship using linear regression, implicitly assuming that firms are neatly divided into two binary groups, thereby overlooking the heterogeneous patterns that a simple dichotomy misses. This study applies Exploratory Factor Analysis (EFA) followed by k-means clustering to identify firms' natural grouping based on the combination of both constructs without pre-specifying the cluster number or boundaries. This descriptive-exploratory segmentation maps combination patterns but does not establish the influence between constructs ([Agung, Wandebori, & Sirait, 2026](#)). The direction of influence remains theoretically relevant because the political shelter versus political capture literature is fundamentally a causal claim rarely tested alongside cluster segmentation ([Bustamin, Wardhani, & Yanto, 2026](#)). This study therefore adds an OLS regression stage to examine whether the grouping pattern identified is also reflected in a regression-based test of partial association.

Earnings management is measured through discretionary accruals using the performance-adjusted model of [Kothari, Leone, and Wasley \(2005\)](#), a measure that remains widely used in recent earnings-management research [Jamadar, Ong, Abdullah, and Kamarudin \(2022\)](#), and two real-activities indicators following [Roychowdhury \(2006\)](#), such as abnormal cash flow from operations and abnormal discretionary expenses, which continue to serve as established proxies for real earnings

manipulation in recent studies ([Bansal, 2022](#)). This study offers three methodological contributions. First, the normal accrual and real-activities model coefficients are estimated on a large cross-section of 852 IDX-listed firms rather than on the small segmentation sample, consistent with cross-sectional earnings-management practices. Second, the factor structure is cross-validated through Principal Component Analysis (PCA), with the two- and three-cluster solutions reported side by side alongside ANOVA/Kruskal-Wallis results, so that the choice of cluster count is transparent rather than unilateral. Third, the segmentation is complemented by OLS regression that explicitly distinguishes association from causal claims. Based on this background, this study formulated two research questions:

- RQ1.** Does the combination of political connection and earnings management form statistically distinct segments (clusters) among IDX-listed non-financial companies, and what is the optimal number of clusters?
- RQ2.** Is the segmentation pattern consistent with the partial association between political connection and earnings management in an OLS regression test, after controlling for firm size and profitability?

2. LITERATURE REVIEW

Political connections are a widespread corporate characteristic across many economies. [Faccio \(2006\)](#) shows that politically connected firms can be identified through direct ties between corporate officers or major shareholders and members of parliament, ministers, or heads of state, and that such firms concentrate in countries with weaker governance and higher perceived corruption, including several Southeast Asian countries. In Indonesia, politically connected firms rely more on domestic bank financing and disclose less to capital markets, consistent with political ties substituting for disclosure-based discipline. [Murti, Utama, Hermawan, and Abbas \(2022\)](#) add that the formation of politically connected boards is itself shaped by country-level governance quality, regulated-industry status, firm size, and institutional ownership, evidence that political connections are embedded in a broader governance context.

Consistent with this, [Taqi, Kalbuana, Abbas, and Mayyizah \(2024\)](#), studying IDX-listed consumer-goods firms, find that political connections send a positive signal with respect to litigation risk alongside audit quality and firm size, indicating that political connections shape outcomes beyond financial reporting alone in the Indonesian setting. The type of connection also matters in Malaysia, [Hoang, Tran, Tran, and Le \(2022\)](#) find that only firms connected through government-linked investments or politically connected directors show lower financial reporting quality, while firms connected through personal or family ties show no such effect. This resource-allocation channel is documented elsewhere: firms with bureaucratic ties in Ecuador are more likely to win government procurement contracts ([Brugués, Brugués, & Giambra, 2024](#)), and U.S. federal bureaucrats award larger and less risky contracts to politically connected firms when they have greater discretion ([Boland & Godsell, 2021](#)), both illustrating the privileged access to government contracts to which [Faccio \(2006\)](#) alludes.

Two competing theoretical predictions follow from this privileged access. The political shelter hypothesis holds that politically connected firms have less incentive to manage earnings upward because access to contracts, financing, and regulatory leniency is already secured through non-market channels ([Fanani & Zahidi, 2026](#)). In contrast, the political capture hypothesis holds that political connections weaken external monitoring and corporate governance, widening managers' opportunity to engage in aggressive earnings management ([Rumapea, 2026](#)). Recent evidence supports the capture-side argument. [Hamdi \(2024\)](#) finds that French firms with politically connected independent directors exhibit higher discretionary accruals and greater real-activities manipulation, while [Ahmed, Duellman, and Grady \(2022\)](#) show that politically connected U.S. firms shift toward greater accrual-based and lower real-activities manipulation. [Xiao, Chan, and Chen \(2023\)](#) further find that board political connections reduce firms' propensity to disclose non-Generally Accepted Accounting Principles (GAAP) earnings, suggesting that political ties may also affect corporate reporting transparency.

More recent evidence also suggests that the relationship between political connections and earnings management is contingent on the nature and intensity of political ties. [Proença, Augusto, and Murteira \(2025\)](#) find an inverted U-shaped relationship between political connections and earnings management among European Central Bank (ECB)-supervised banks, with low to moderate political connections encouraging discretionary practices but stronger connections discouraging them because of greater scrutiny and oversight. [Kallias, Kallias, Liu, Malikov, and Zhang \(2025\)](#) show that firms' political tactics can influence their choice of earnings management methods, further highlighting the dynamic nature of political connections and managerial reporting behavior.

Conversely, evidence supporting the shelter perspective suggests that political connections may reduce managers' incentives to manipulate earnings when they provide firms with alternative resources and protection. [Khalil, Harianto, and Guney \(2022\)](#) find that political connections are negatively associated with both accrual-based and real earnings management among Indonesian firms, with the relationship becoming stronger in firms with better corporate governance and higher audit quality. A similar contrast between connection types appears in Jordan, where [Alhadab, Abdullatif, Ahmed, Tahat, and Mansour \(2020\)](#) find that politically connected firms exhibit higher real earnings management, while government-connected firms exhibit lower accrual-based and real earnings management, illustrating that political connections and government ownership can pull earnings management in opposite directions within the same institutional setting. Evidence for the shelter side also extends beyond narrowly defined political ties, [Abbas, Feng, Malik, and Dawood \(2025\)](#) find that directors with military backgrounds on Pakistani boards significantly constrain both accrual-based and real earnings management, an effect reinforced when paired with high audit quality. Taken together, these findings suggest that the relationship between political connections and earnings management remains theoretically ambiguous and depends on the nature and intensity of political ties, the institutional environment, the choice of earnings management strategy, and the effectiveness of corporate governance and external monitoring mechanisms.

In terms of measurement, the earnings management literature has developed two complementary proxy families. Accrual-based measures, refined by [Kothari, Leone, and Wasley \(2005\)](#), isolate discretionary accruals by controlling for firm performance and reducing the misspecification. Real-activity measures, developed by [Roychowdhury \(2006\)](#), capture manipulation through deviations in operating cash flow and discretionary expenses from sales-predicted levels, reflecting that managers can also manage earnings through the timing of real business activities. Using both indicator families, as this study does, provides a more complete picture than either alone. The international review by [\(Habib, Ranasinghe, Wu, Biswas, & Ahmad, 2022\)](#) confirms that real-activities manipulation is now widely studied alongside accrual-based measures, reinforcing the case for considering both jointly.

Firm-specific determinants of accrual-based earnings management continue to be documented in the IDX consumer goods sector, a 2020-2024 panel study of listed consumer goods firms finds that deferred tax liabilities are positively associated with discretionary accruals and profitability is negatively associated, while tax management itself shows no significant effect (the effects of tax management, deferred tax liabilities, and profitability on earnings management, 2026). Earnings management is also shaped by external monitoring and disclosure pressures beyond political ties. [Ali, Arslan, Mubeen, Azeem, Zhen-Yu, Yushi, and Miao \(2025\)](#) systematically reviewed 145 studies and documented a consistent association between sustainability disclosure and lower earnings management, while [Wang, Dai, Chen, and Sun \(2025\)](#) showed that China's environmental protection tax reduced corporate earnings management mainly by strengthening public surveillance and internal governance rather than through direct government enforcement, which is consistent with the broader premise that stronger external monitoring constrains manipulation.

On the methodological side, EFA requires the sampling-adequacy criteria of [Kaiser \(1974\)](#), the adequacy for a given sample size depends heavily on indicator communality ([Goretzko, Pham, & Bühner, 2021](#)). Cluster stability can be evaluated using resampling-based approaches, particularly bootstrap resampling, by repeatedly generating perturbed datasets and assessing the consistency of the

resulting clustering solutions using partition similarity measures such as the Adjusted Rand Index (ARI) ([Liu, Yu, & Blair, 2022](#); [Warrens, & van der Hoef, 2022](#)). In the Indonesian accounting literature, governance and ownership constructs, including related-party transactions and dividend policy, have more commonly been tested through single-equation regression ([Sari, Utama, & Rossieta, 2017](#)) than through unsupervised segmentation with follow-up regression validation, as done here. [Cisse and Priantinah \(2025\)](#), for instance, use simple linear regression to test firm size, leverage, and governance mechanisms against earnings management for IDX-listed consumer-goods firms and find leverage the only significant predictor, underscoring how single-equation designs dominate this strand of the Indonesian literature and reinforcing the case for the segmentation-based alternative pursued here.

Taken together, the political shelter and political capture hypotheses represent competing causal claims rarely examined jointly with an unsupervised segmentation of firms based on the actual combination of political connections and earnings management observed in the data ([Hutahayan, Mollet, & Urip, 2025](#); [Pamungkas, & Purnomo, 2025](#)). This study addresses this gap by mapping the natural grouping of IDX-listed companies through EFA-based factor scores and k-means clustering, and then testing whether the implied association is also detectable in a conventional OLS regression after controlling for firm size and profitability. Given the descriptive-exploratory nature of the segmentation stage, no formal directional hypotheses are proposed, instead, the two research questions in Section 1 guide the study, with political shelter and political capture serving as competing benchmarks for interpretation.

3. RESEARCH METHODOLOGY

3.1 Population, Sample, and Data Source

The study population comprised all non-financial companies listed on the Indonesia Stock Exchange (IDX) with fiscal year 2024 and 2023 financial data available in the Refinitiv database (n=852 firms). The financial sector was excluded from the population because the structure of its financial statements is not comparable in terms of the working-capital accrual items that form the basis for calculating discretionary accruals. The final sample consists of 140 companies, selected via purposive sampling requiring complete data for the three Earnings Management (EM) indicators, such as Discretionary Accruals (DA), Abnormal Cash Flow from Operations (ACFO), Abnormal Discretionary Expenses (ADISX): total assets, operating cash flow, net income, revenue, Selling, General, and Administrative (SG&A) expenses, and gross fixed assets for two consecutive years. EFA, PCA, k-means, and OLS regression (Section 3.6) were run on this full set of 140. Political connection status was identified through three sources documented per firm, such as manual review of annual reports and board profiles for large-capitalization firms, structural verification of state ownership for state-owned enterprises, where the state, as the controlling shareholder, represents political affiliation; and verification of business group membership with a widely documented political-affiliation history. Firms outside these categories were coded as unconnected, reflecting an absence of evidence rather than an absolute guarantee of no connection.

3.2 Operational Definition of Variables

Political connections are measured through five indicators following [Faccio \(2006\)](#), adapted to the Indonesian governance context: KD_dummy (=1 if a director has a political background), KK_dummy (same, for commissioners), KS_dummy (=1 if the controlling shareholder, including the state for State-Owned Enterprises (SOEs), has direct political affiliation), JP (count of politically affiliated directors/commissioners), and PDPC (that count as a percentage of total directors and commissioners). DA is calculated as the residual from the [Kothari et al. \(2005\)](#) model, regressing total accruals scaled by prior-period assets on the inverse of assets, the change in revenue net of the change in receivables, gross fixed assets, and prior-period return on assets. Discretionary accruals are obtained as the residual value from this equation. ACFO and ADISX are residuals normal model, which regresses operating cash flow and discretionary expenses on revenue, revenue changes, and prior-period total assets. A negative ACFO indicates below-normal operating cash flows, which is consistent with sales manipulation via price discounts. A negative ADISX indicates a below-normal cut in discretionary expenses to increase current-period earnings.

3.3 Normal Model Estimation and Outlier Treatment

The normal accrual and real-activities model coefficients are estimated via OLS on a cross-section of all IDX-listed non-financial companies with complete data (up to 852 firms), avoiding the overfitting risk of estimating the normal model on the same small tested sample size. Variables at this estimation stage are winsorized at the 1st and 99th percentiles, as are the three earnings management indicators before EFA, clustering, and regression. Thus, extreme values do not dominate the cluster formation or coefficient estimation.

3.4 Exploratory Factor Analysis (EFA) and PCA Robustness Check

Eight indicators, three EM and five Political Connection (PC), were tested for suitability via the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity, alongside their Pearson correlation matrix, before being extracted into two factors using maximum likelihood. The indicator-construct structure was set a priori on theoretical grounds, therefore, the EFA here functions as empirical validation and data reduction, weighting each indicator by its association with the latent factor, rather than open-ended exploration. As a robustness check, PCA was run in parallel, the high congruence between EFA factor scores and PCA component scores confirms that the structure is not an artifact of the extraction method.

3.5 K-Means Clustering and Statistical Validation

The PC and EM factor scores served as the two input dimensions for k-means clustering. The optimal cluster count was determined via the Silhouette coefficient over $k=2-6$, given the study's four-quadrant conceptual framework, $k=3$ is reported alongside the statistically optimal solution. K-means remains a widely used and validated method for uncovering structure in financial market data, [Steinbacher, Steinbacher, and Steinbacher \(2026\)](#), for instance, apply k-means clustering to large-scale stock-price datasets and recover robust, stylized clusters, supporting the method's suitability for financial applications such as the present study. Combining EFA with k-means clustering, as this study does, is likewise an established sequence outside finance, [Sheik and Abubakkar \(2017\)](#) first extract customer relationship management practice dimensions through EFA and then use the resulting factor scores to segment bank customers via cluster analysis, while [Guo, Wang, and Jin \(2026\)](#) apply the same two-stage EFA-then-k-means sequence to extract latent mental-health dimensions and segment parents into psychological profiles across pandemic phases, both supporting factor-score-based clustering as a suitable strategy for uncovering latent group structure regardless of substantive domain. After clustering, one-way ANOVA and Kruskal-Wallis tests were run on seven variables, such as the PC and EM factor scores, the three EM indicators, and two PC indicators (JP, PDPC). ANOVA assumes normality, Kruskal-Wallis its non-parametric alternative, is more suitable for unbalanced cluster sizes. Cluster stability was further tested via 1,000 bootstrap iterations, using the Adjusted Rand Index (ARI) to measure agreement with the original clustering.

3.6 Partial Effect Testing (OLS Regression)

The cluster segmentation in Section 3.5 is observational-descriptive, it shows the grouping pattern but does not itself test whether political connections are systematically associated with earnings management after controlling for other firm characteristics. This study therefore adds OLS regression with two specifications. The continuous specification regresses the EM factor score (EM_score) and each individual EM indicator (DA, ACFO, ADISX, winsorized) on the PC factor score (PC_score), with SIZE (log total assets) and Return on Asset (ROA) as controls, following the standard accrual-literature practice.

The cluster-dummy specification regresses DA, ACFO, and ADISX on two cluster-membership dummies from the $k=3$ solution (Cluster 1 = high connection/neutral EM, Cluster 2 = strongly income-increasing), with Cluster 0 as the reference, controlling for SIZE and ROA. This validates the ANOVA/Kruskal-Wallis differences in Section 3.5 while controlling for additional variables. EM_score is not regressed on the cluster dummies because it is one of the two dimensions k-means uses to form the clusters, regressing it on cluster labels derived from itself would be circular. The same partial-endogeneity concern applies, to a lesser degree, to the three individual EM indicators (DA, ACFO, ADISX) reported in Table 11, because EM_score is itself a weighted linear combination

of DA, ACFO, and ADISX (Table 3), cluster membership in the $k=3$ solution is not fully independent of these dependent variables. Table 11 is therefore reported as a descriptive validation of the cluster profile already identified in Sections 4.3–4.4 (Tables 6 and 9), not as an independent hypothesis test, that role is served only by the continuous specification in Table 10, where PC_score is exogenous to the dependent variables by construction.

Both regression specifications test partial association, not causality. The data are a single-year cross-section without an identification strategy, therefore, a significant coefficient is equally consistent with three explanations, such as political connections influence earnings management, reverse causality, where firms with less-manipulated earnings are more attractive for political affiliation or an unobserved variable such as internal governance quality driving both constructs. Section 4.5 therefore interprets the results only as statements of association, consistent or inconsistent with the two hypotheses.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 1. Descriptive statistics (N=140)

Variables	Mean	Std. Dev.	Min	Max
DA	0.0159	0.1050	-0.2478	0.6250
ACFO	0.0110	0.0843	-0.3318	0.2561
ADISX	0.0045	0.0998	-0.1871	0.4539
KD_dummy	0.1143	0.3193	0	1
KK_dummy	0.2143	0.4118	0	1
KS_dummy	0.1857	0.3903	0	1
JP	0.3571	0.7872	0	4
PDPC (%)	3.6907	8.1398	0	40

Table 1 presents descriptive statistics for all 140 companies. The three earnings-management indicators show means close to zero, as expected for residuals from a normal model estimated on a large cross-section. The standard deviation of DA of 0.1050 indicates substantial variation across firms, consistent with the findings in the Indonesian accrual literature ([Sari et al., 2017](#)). The results also indicate that earnings management varied considerably among the sampled companies, suggesting differences in the extent of discretionary reporting practices across firms.

Thirty-two of the 140 companies (22.9%) were identified as having at least one form of political connection. This proportion is comparable to the findings of [Faccio \(2006\)](#) for Southeast Asian countries, which reported that 20% to 40% of listed companies have political connections. This 32-firm count reflects a binary definition, at least one of the five indicators (KD, KK, KS, JP, PDPC) is non-zero, whereas cluster membership in Section 4.3 is based on the continuous, composite PC factor score, in which JP and PDPC carry the dominant loadings (0.994 and 0.998; Table 3). A firm with only a marginal connection under the binary definition (one politically affiliated director but a low JP/PDPC value) can therefore fall below the composite threshold separating the high-connection cluster and be grouped instead with the low-connection cluster. The cross-tabulation confirms this of the 32 binarily connected firms, 18 fall into the high-connection cluster and 14 fall into the low-connection cluster in the $k=2$ solution, while in the $k=3$ solution, 15 fall into Cluster 1 (high connection/neutral EM), 16 fall into Cluster 0 (low connection/neutral EM), and one firm PT Bakrie & Brothers Tbk (BNBR) falls into Cluster 2 (the strongly income-increasing cluster) despite having a recorded connection, an exception consistent with the sectoral heterogeneity already noted for Cluster 2 in Section 4.3.2. No firm outside the 32 binarily connected firms is placed in either the high-connection cluster ($k=2$ or $k=1$ of $k=3$), confirming that the composite PC factor score never assigns an unconnected firm to a high-connection cluster; it only redistributes some marginally connected firms into the low-connection group.

4.2 Exploratory Factor Analysis (EFA) Results

The suitability tests indicate that the data meet the requirements for EFA a KMO of 0.798, categorized as good under [Kaiser \(1974\)](#) criteria, and a significant Bartlett's test ($\chi^2=1,116.36$, $p<0.001$). The KMO value indicates that the correlations among the variables are sufficiently adequate for factor analysis. The significant Bartlett test further confirms that the correlation matrix is not an identity matrix, supporting the appropriateness of conducting EFA.

Table 2. Pearson correlation matrix among indicators (N=140)

Variables	DA	ACFO	ADISX	KD	KK	KS	JP	PDPC
DA	1	-0.454***	-0.190**	-0.172**	-0.107	-0.094	-0.070	-0.078
ACFO		1	0.174**	-0.036	-0.017	-0.101	0.021	0.024
ADISX			1	-0.009	-0.079	-0.073	-0.117	-0.108
KD				1	0.688***	0.694***	0.724***	0.752***
KK					1	0.825***	0.872***	0.871***
KS						1	0.789***	0.796***
JP							1	0.992***
PDPC								1

*** significant at $\alpha=0.01$, ** significant at $\alpha=0.05$

Table 2 shows the five political-connection indicators were strongly and consistently positively correlated ($r=0.688$ to 0.992 , $p<0.01$), supporting the assumption that all five measure a single latent construct, consistent with their high communalities (Table 3). The three earnings-management indicators correlated more weakly, such as DA and ACFO showed a moderate negative correlation ($r=-0.454$, $p<0.01$), in the expected direction, but ADISX correlated only weakly with both ($r=-0.190$, $r=0.174$), matching its low communality (0.074). Cross-construct correlations (DA/ACFO/ADISX with the five PC indicators) were all weak and mostly non-significant ($r\leq 0.19$), an initial sign that political connection and earnings management are not two sides of the same dimension, consistent with the separate two-factor EFA result.

Table 3. Factor loading matrix (maximum likelihood, N = 140)

Variables	Factor 1 (PC)	Factor 2 (EM)	Communality
DA	-0.078	0.862	0.746
ACFO	0.023	-0.512	0.263
ADISX	-0.110	-0.249	0.074
KD_dummy	0.749	-0.119	0.574
KK_dummy	0.875	-0.037	0.767
KS_dummy	0.799	-0.023	0.638
JP	0.994	0.011	0.988
PDPC	0.998	-0.001	0.996

Eigenvalue: 4.237 (Factor 1), 1.575 (Factor 2). The cumulative variance of both factors was 72.6%

Table 3 shows factor 1 is dominated by the five political connection indicators (loadings above 0.746). Factor 2 is dominated by DA (0.862) and ACFO (-0.512) in opposite directions, which is theoretically consistent, since a high Factor 2 score pairs income-increasing accruals with below-normal operating cash flow (e.g., price discounts or looser credit). ADISX loads weakly on both factors (communality 0.074), contributing little to the factor structure. The correlation between the EFA factor scores and PCA component scores was 0.966 for the political-connection dimension and 0.897 for the earnings-management dimension. Both values exceeded the 0.85 threshold, indicating strong structural congruence across extraction methods ([Tabachnick, Fidell, & Ullman, 2019](#)), providing evidence that the factor structure found is robust to the choice of extraction method.

4.3 K-Means Clustering Results

Table 4. Silhouette coefficient by number of clusters

k	2	3	4	5	6
Silhouette	0.616	0.550	0.442	0.488	0.543

Table 4 shows the highest Silhouette value occurs at k=2 (0.616), declining through k=4 before a slight rise at k=5-6 that stays below the k=2 value, indicating k=2 as the most geometrically separated solution, driven by the political-connection dimension. Because the study's conceptual framework assumes four quadrants of political connection and earnings management, k=3 is still reported for comparison despite its lower Silhouette coefficient. This comparison allows the study to assess whether the theoretically motivated three-cluster solution provides substantively meaningful patterns beyond the purely geometric clustering criterion.

4.3.1 Two-Cluster Solution (k = 2)

Table 5. Cluster profile – k=2 solution (N=140)

Cluster	N	PC Score	EM Score	DA	ACFO	ADISX	JP	PDPC (%)
0 – Low Connection	122	-0.339	0.020	0.021	0.011	0.006	0.098	0.92
1 – High Connection	18	2.296	-0.134	-0.018	0.009	-0.006	2.111	22.44

Table 5 shows the k=2 solution separates the sample purely by political connection, Cluster 1 (n=18) averages 2.1 politically backed board members and 22.4% PDPC, while Cluster 0 (n=122) has almost none (0.9% PDPC), covering all 140 firms. The EM Score difference between clusters (0.020 vs. -0.134) was much smaller than the PC Score difference. This result suggests that the two-cluster structure is mainly characterized by differences in political connection rather than earnings management.

4.3.2 Three-Cluster Solution (k = 3)

In line with the study's initial conceptual framework, which was designed to capture the four quadrants of the combination of political connection and earnings management, the k=3 solution is reported as a comparison.

Table 6. Cluster profile – k=3 solution (N=140)

Cluster	N	PC Score	EM Score	DA	ACFO	ADISX	JP	PDPC (%)
0 – Low Connection, Neutral EM	108	-0.291	-0.266	-0.012	0.027	0.014	0.130	1.32
1 – High Connection, Neutral EM	15	2.541	0.075	0.003	0.018	-0.040	2.333	24.40
2 – Low Connection, Strongly Income-Increasing	17	-0.396	1.621	0.204	-0.095	-0.017	0.059	0.47

Table 6 shows Cluster 1 (n=15, Table 7) is dominated by state-owned enterprises in energy, infrastructure, and construction, with an EM Score close to neutral (0.075). Cluster 2 (n=17) shows the highest EM Score (1.621), with an average DA of 0.204 (income-increasing accruals) and ACFO of -0.095 (below-normal cash flow), an earnings-management pattern spanning both accrual and real-activities dimensions. No company in Cluster 2 has a substantial political connection (average PDPC 0.47%), yet its composition spans media, energy, chemicals, and technology; thus, the pattern is spread across industries rather than one sector.

Table 7. List of companies in cluster 1 and cluster 2 (k=3 Solution)

Cluster	N	Ticker Codes
1 – High Connection, Neutral EM	15	ADMR, ANTM, BRPT, MEDC, PGAS, PTBA, SMGR, TLKM, ADRO, ADHI, WTON, PTPP, WIKA, TINS, GIAA
2 – Low Connection, Strongly Income-Increasing	17	VIVA, BNBR, DEWA, AMMN, TPIA, MBMA, EMTK, CUAN, TBLA, CDIA, BUKA, BELI, ARCI, WIFI, MTDL, EMAS, LPCK

Table 7 shows the three-cluster solution identified two distinct groups of firms based on political connection and earnings management characteristics. Cluster 1 consisted of 15 firms with

high political connections and neutral earnings management, while Cluster 2 included 17 firms with low political connections and strongly income-increasing earnings management. The ticker codes listed in each cluster represent the firms classified according to these respective characteristics.

4.4 Statistical Validation of Clusters: ANOVA and Kruskal-Wallis

Table 8. ANOVA and Kruskal-Wallis – k=2 solution

Variables	F (ANOVA)	p (ANOVA)	H (KW)	p (KW)
PC Score	488.57	<0.001***	46.72	<0.001***
EM Score	0.48	0.491	0.00	0.995
DA	2.20	0.140	1.06	0.304
ACFO	0.01	0.903	0.16	0.690
ADISX	0.23	0.634	1.08	0.299
JP	388.06	<0.001***	87.11	<0.001***
PDPC	515.44	<0.001***	90.75	<0.001***

*** significant at $\alpha=0.01$

Table 8 shows in the k=2 solution, the difference between clusters is significant only for the three variables directly related to political connections, all at $p<0.001$ for both tests. The EM Score and the three individual earnings-management indicators are not significant in this solution ($p>0.13$ for all indicators). This finding further confirms that the k=2 clustering primarily reflects differences in political connections rather than earnings-management characteristics.

Table 9. ANOVA and Kruskal-Wallis – k=3 solution

Variables	F (ANOVA)	p (ANOVA)	H (KW)	p (KW)
PC Score	240.66	<0.001***	66.45	<0.001***
EM Score	64.24	<0.001***	46.32	<0.001***
DA	55.77	<0.001***	43.86	<0.001***
ACFO	19.49	<0.001***	23.95	<0.001***
ADISX	2.40	0.094*	6.35	0.042**
JP	219.91	<0.001***	76.84	<0.001***
PDPC	247.89	<0.001***	77.88	<0.001***

*** significant at $\alpha=0.01$, ** significant at $\alpha=0.05$, * significant at $\alpha=0.10$

Table 9 shows in the k=3 solution, six of the seven variables were significant at $p<0.001$ in both tests, including EM Score, DA, and ACFO. ADISX was significant on the Kruskal-Wallis test ($p=0.042$) but only marginal on ANOVA ($p=0.094$), consistent with its low communality at the EFA stage (0.074). Comparing Tables 8 and 9 shows that the number of clusters chosen determines the study's substantive conclusion, the optimal k=2 solution finds no significant EM difference between political-connection clusters, while k=3 finds a significant difference for DA and ACFO. A 1,000-iteration bootstrap on the k=3 solution yields a mean Adjusted Rand Index of 0.656 (median 0.675, SD 0.221), above the 0.50 threshold for reasonable stability. Both solutions are reported side by side with their stability levels stated explicitly.

4.5 Partial Effect Test Results (OLS Regression)

Table 10 reports the continuous specification (PC_score on EM_score and individual indicators), while Table 11 reports the cluster-dummy specification (k=3) of the individual earnings-management indicators. Because cluster membership in the k=3 solution is partly derived from the same EM indicators used as dependent variables here (Table 3), Table 11 is interpreted as a descriptive validation of the cluster-level pattern already identified through ANOVA/Kruskal-Wallis (Table 9), not as an independent significance test. The coefficients and R^2 in Table 11 are mechanically inflated relative to a fully exogenous specification and should be read with partial endogeneity in mind.

Table 10. OLS regression – continuous specification: PC_score on EM_score and individual indicators (N=140)

Dependent Variables	β PC_score	p PC_score	β SIZE	β ROA	R ²
EM_score	-0.003	0.958	0.100	0.157	0.007
DA (winsorized)	-0.001	0.734	-0.002	0.368***	0.185
ACFO (winsorized)	0.004	0.244	0.001	0.314***	0.181
ADISX (winsorized)	-0.004	0.296	-0.026***	-0.042	0.094

*** significant at $\alpha=0.01$. All models include a constant (not shown). The VIF for all models is ≤ 1.11 , indicating no multicollinearity problem among PC_score, SIZE, and ROA

Table 10 shows in the continuous specification, PC_score was not significantly associated with the EM Score ($p=0.958$) or any individual EM indicator ($p>0.24$ for all). ROA is consistently positively significant for DA and ACFO ($p<0.001$), consistent with more profitable firms mechanically showing higher accruals and real-activity levels. This null linear PC_score-EM relationship matches the ANOVA/Kruskal-Wallis result for $k=2$ (Table 8).

Table 11. OLS regression – cluster-dummy specification ($k=3$) on individual earnings-management indicators (N=140, reference: Cluster 0)

Dependent Variables	β Cluster 1	p Cluster 1	β Cluster 2	p Cluster 2	R ²
DA (winsorized)	0.061***	0.001	0.124***	<0.001	0.513
ACFO (winsorized)	-0.040***	0.004	-0.110***	<0.001	0.552
ADISX (winsorized)	-0.039*	0.077	-0.059***	0.001	0.164

*** significant at $\alpha=0.01$, * significant at $\alpha=0.10$. Cluster 1 = high political connection/neutral EM ($n=5$), Cluster 2=low connection/strongly income-increasing ($n=17$), reference group Cluster 0=low connection/neutral EM ($n=108$). All models control for SIZE and ROA (not shown)

Table 11 shows the OLS results show that Cluster 1 and Cluster 2 have significant effects on DA and ACFO, with positive coefficients for DA and negative coefficients for ACFO. For ADISX, Cluster 2 has a significant negative effect ($\beta=-0.059$, $p=0.001$), while Cluster 1 is not significant at the 5% level ($\beta=-0.039$, $p=0.077$). The models explain 51.3% of the variance in DA, 55.2% in ACFO, and 16.4% in ADISX, indicating varying explanatory power across the earnings-management indicators.

Table 12. Robustness check – cluster-dummy specification using clusters formed from PC_score Alone ($k=3$, fully exogenous to EM, N=140, reference: Cluster 0)

Dependent Variables	β Cluster 1 (PC-only)	p Cluster 1	β Cluster 2 (PC-only)	p Cluster 2	R ²
DA (winsorized)	0.010	0.679	-0.009	0.723	0.186
ACFO (winsorized)	0.019	0.356	0.017	0.445	0.181
ADISX (winsorized)	-0.013	0.631	-0.020	0.463	0.092

Here, the cluster labels are re-estimated by k-means on PC_score alone (silhouette=0.928, $n=110$, 16, 14 for Clusters 0–2), so cluster membership is fully independent of DA, ACFO, and ADISX. All models control for SIZE and ROA (not shown). None of the six coefficients was significant at conventional levels ($p=0.36-0.72$)

Table 12 shows the robustness results using the political-connection factor alone show that Cluster 1 and Cluster 2 do not significantly affect DA, ACFO, or ADISX, with all p-values exceeding 0.05. The coefficients are small, ranging from -0.020 to 0.019, indicating weak partial associations between political connection and the earnings-management indicators. The R² values of 0.186 for DA, 0.181 for ACFO, and 0.092 for ADISX indicate limited explanatory power of the political-connection factor alone.

This robustness check directly addresses the endogeneity concern raised for Table 11, once cluster membership no longer uses any information from the EM indicators, the significant DA and ACFO differences reported in Table 11 disappear. This indicates that the significant pattern in Table 11 is substantially attributable to the partial circularity in how the $k=3$ clusters were formed, rather than to an association that is robust to the choice of the clustering variables. Combined with the null result in Table 10, the most defensible reading of this study's regression evidence is that no significant partial association between political connection and earnings management survives once the endogeneity in cluster formation is removed. The significant Table 11 pattern should be treated as a descriptive feature of the $k=3$ segmentation itself, not as confirmatory evidence for either the political shelter or political capture hypotheses.

As an additional note, PC_score correlates negatively with ROA ($r=-0.253$, $p=0.003$), driven mainly by KS_dummy ($r=-0.284$, $p<0.001$); politically connected firms, particularly SOEs, tend toward lower profitability, consistent with SOEs' concentration in thin-margin sectors like energy, construction, and infrastructure. SIZE also correlates negatively with ADISX ($r=-0.294$, $p<0.001$), indicating that larger firms cut discretionary expenses below normal. Both patterns are associative-descriptive, consistent with including ROA and SIZE as controls.

In the cluster-dummy specification, both Cluster 1 and Cluster 2 were significantly associated with DA and ACFO relative to Cluster 0, with sharply different magnitudes: Cluster 2 showed the largest DA coefficient ($\beta=0.124$, $p<0.001$) and most negative ACFO ($\beta=-0.110$, $p<0.001$), while Cluster 1 showed a smaller but still significant DA coefficient ($\beta=0.061$). ADISX showed a weaker but directionally consistent pattern, matching its low EFA communality (Table 3).

The contrast between Tables 10 and 11, continuous PC_score insignificant, yet cluster membership significant, echoes the comparison in Tables 8 and 9, how political connection is operationalized (continuous score vs. categorical combination with earnings management) affects the conclusion. The most cautious reading is that Cluster 2 (unconnected, strongly income-increasing) is consistently linked to more extreme DA and ACFO values than Clusters 0 and 1, across all four testing methods used here. It should be emphasized that the results in Tables 11 and 9 are not fully independent pieces of evidence, since both are derived from cluster labels formed in part from EM_score; only the continuous specification (Table 10) and the $k=2$ solution (Table 8), whose cluster labels are dominated by the political-connection dimension alone, are free of this circularity. The least circular evidence in this study is therefore the null PC_score-EM association in Table 10 together with the null EM difference in the $k=2$ solution (Table 8), the $k=3$ cluster-dummy evidence in Table 11 should be read as descriptive elaboration of an already-observed pattern rather than confirmatory hypothesis-test evidence.

4.6 Discussion

The political-connection dimension is more sharply defined than earnings management in this sample, reflected in the high EFA communalities of the five PC indicators (0.57–0.996) versus the three EM indicators (0.07–0.75), and in PC's significance in both cluster solutions while EM is significant only at $k=3$. This matches [Goretzko et al. \(2021\)](#) and MacCallum et al. (1999), who show that EFA sample-size adequacy depends on communality: high-communality indicators yield stable estimates even at moderate N , while low-communality indicators like ADISX need more precision.

The high-connection cluster in the $k=3$ solution (Cluster 1, dominated by SOEs in energy, infrastructure, and construction) shows a near-neutral EM Score (0.075), unlike Cluster 2's much higher score (1.621). This near-neutral position differs from both poles of the sample's EM distribution and matches Cluster 1's smaller regression coefficients compared with Cluster 2 in Table 11. The cluster with the strongest income-increasing pattern (Cluster 2 in the $k=3$ solution) consists almost entirely of companies without recorded political connections, with a composition spanning the media, energy, chemicals, and technology sectors. The sectoral heterogeneity of this cluster indicates that the income-increasing pattern found is spread across various types of businesses rather than being concentrated in a single industry profile.

Overall, the four testing methods used in this study point in a consistent direction: the companies most aggressive in manipulating earnings are those without political connections, while state-owned enterprises and highly connected companies show a relatively neutral to conservative pattern. This is more consistent with the political shelter argument than with political capture: privileged access to government contracts and state-bank financing likely dampens managerial incentives to distort earnings, since state-owned enterprises' legitimacy depends less on capital-market perceptions of quarterly performance. This also resonates with (Khalil et al., 2022), who find that politically connected Indonesian firms exhibit lower accrual-based and real earnings management, particularly among better-governed, Big-4-audited firms, lending country-specific support to the shelter interpretation. Khalil et al. (2022) reaches a similar conclusion using an original Indonesian dataset, showing that politically connected firms are associated with fewer principal-principal and principal-agent conflicts and with lower real and discretionary accrual earnings management, and further finds a complementary rather than substitutionary relationship between political connection and corporate governance quality, adding further Indonesian evidence for accountable rather than opportunistic behaviour among politically connected firms.

These patterns are descriptively consistent with two more specific theoretical propositions that a future confirmatory design could test directly. First, if political shelter operates through reduced scrutiny incentives, the near-neutral EM Score of the SOE-dominated, high-connection cluster (Cluster 1) is consistent with a sheltered subgroup facing less pressure to manage earnings upward because political affiliation already secures favorable treatment, a mechanism that would predict lower earnings-management intensity specifically among connected SOEs, not among connected firms in general. Second, the sectoral heterogeneity and absence of recorded political connection in Cluster 2 (the strongly income-increasing cluster) is more consistent with a capital-market-pressure mechanism among unconnected firms, which rely more heavily on accounting discretion to meet market expectations in the absence of political access, than with either the shelter or capture hypotheses as conventionally framed around connected firms. These two propositions, an SOE-specific shelter effect and a capital-market-pressure effect concentrated among unconnected firms, are offered here as candidate mechanisms for confirmatory testing, not as claims established by the present exploratory design. It should be noted that regression-based support for either proposition is limited: the robustness check in Table 11b shows that the DA/ACFO/ADISX differences do not hold once cluster membership is estimated independently of the EM indicators; thus, at present, these propositions rest primarily on the cluster profile and ANOVA/Kruskal-Wallis description (Sections 4.3–4.4) rather than on an endogeneity-free regression test.

5. CONCLUSIONS

5.1 Conclusion

This study segments 140 non-financial IDX-listed companies by political connection and earnings management using EFA and k-means clustering, with normal model coefficients estimated on a cross-section of 852 firms to avoid small-sample instability. The EFA yielded a reliable two-factor structure (KMO = 0.798, cumulative variance 72.6%), confirmed by high congruence with the PCA. The optimal clustering solution (k=2, Silhouette = 0.616) separates the sample along the political-connection dimension, with earnings management not significantly differing between clusters (ANOVA or Kruskal-Wallis). The alternative k=3 solution, matching the conceptual framework, reveals significant DA/ACFO heterogeneity, with one cluster showing a stronger income-increasing pattern spread across sectors rather than being concentrated among connected firms.

This study adds an OLS regression test for the partial association between the two constructs. The continuous specification (PC_score on EM Score and the individual indicators) found no significant association ($p > 0.24$ for all models), confirming the absence of a simple linear relationship. The cluster dummy specification shows a consistent, significant pattern ($p < 0.01$ for most models), the unconnected, strongly income-increasing cluster has the most extreme DA and ACFO coefficients, while the highly connected cluster is more conservative. Together, the cluster profile, ANOVA/Kruskal-Wallis, and controlled OLS regression lend more support to the idea of political

shelter than to that of political capture. However, this reading is sensitive to how the $k=3$ clusters are formed, a robustness check using clusters based on PC_score alone (Table 12), fully independent of the EM indicators, finds none of the DA/ACFO/ADISX coefficients to be significant. Therefore, the overall evidence is better summarized as no robust partial association between political connection and earnings management once cluster endogeneity is removed, with the original Table 11 pattern reflecting the specific $k=3$ segmentation rather than a finding that generalizes across clustering choices.

5.2 Research Limitations

Several methodological limitations should be acknowledged. First, the cross-sectional design does not establish causal relationships, as alternative explanations such as reverse causality and unobserved factors cannot be fully excluded. Therefore, the findings provide strong associative evidence rather than definitive causal conclusions. Second, the relatively small cluster sizes in the $k=3$ solution may affect the precision and sensitivity of cluster-based estimates. Third, the purposive sampling approach limits the generalizability of findings to all IDX-listed companies. Fourth, the cluster-dummy regression may contain endogeneity because cluster formation partially relies on the same earnings management indicators used as dependent variables. Consequently, the cluster-dummy results should be interpreted descriptively, while the continuous specification and exogenous-cluster robustness test provide a more reliable basis for evaluating the observed associations.

5.3 Suggestions and Directions for Future Research

Future research could expand individual verification of political connections to a larger sample, add other real-activities indicators, such as abnormal production cost, using richer data, and, most importantly for the causality question raised by these associative findings, use a multi-year panel with firm fixed effects or an instrumental-variable strategy (e.g., changes in cabinet/parliamentary composition) to test temporal stability and disentangle direction from reverse causality and unobserved-variable bias.

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AUTHOR CONTRIBUTIONS

IRJ contributed to the conceptualization, data collection, formal analysis, and writing of the original draft. SR contributed to supervision, methodology, validation, and writing–review and editing. Both authors have read and approved the final manuscript for publication.

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