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# Big 4 Auditor Affiliation and Accruals Quality in Bangladesh

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# Big 4 auditor affiliation and accruals quality in Bangladesh

## ABSTRACT

**Purpose-** This study examines the association between Big 4 affiliated auditors and accruals quality in Bangladesh.

**Motivation-** Bangladesh is an emerging economy and international audit firms operate there through affiliated local audit firms. The Bangladesh audit market can be characterized as an intensely competitive small audit market with relatively poor demand for high audit quality. In addition, Bangladesh has a relatively small and under developed but growing capital market that is characterized by poor corporate regulation and weak investor protection.

**Design/methodology/approach-** Following prior literature (e.g., Becker et al., 1998; Francis et al., 1999; Krishnan, 2003), this paper uses both absolute discretionary accruals and signed discretionary accruals as proxies of accruals quality. The sample is 382 firm-year observations and covers fiscal years 2000 to 2003.

**Findings-** This study finds that the association between Big 4 affiliates and accruals quality in Bangladesh depends on measures of accruals quality and accruals models used. Overall, Big 4 affiliates do not have a positive impact on accruals quality of their clients in Bangladesh.

**Originality/value-** This paper contributes to the literature on audit quality and accruals quality. The results potentially suggest that Big 4 affiliates do not have any positive impact on accruals quality of clients in an intensely competitive audit market where the demand for quality audit is poor and monitoring is lax and raise potential implications for policy makers and market participants in Bangladesh.

**Keywords** Audit quality, Accruals quality, Big 4 affiliates; Investor protection.

**Paper type** Research paper

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## **1. Introduction**

This study examines the association between Big 4 affiliated auditors and accruals quality in Bangladesh. Prior research shows that earnings of Big 4 clients are of higher quality than non-Big 4 clients (e.g., Becker et al., 1998; Francis et al., 1999; Francis, 2004) with the gap in earnings quality widening with variations in investor protection (Francis and Wang, 2008). The Big 4 international audit firms tend to operate in smaller capital markets through a local audit firm and Bangladesh is one such setting where this unique alliance occurs.<sup>1</sup> Despite the emergence of audit services provided by a Big 4 through an affiliated audit firm, prior research does not examine how audit quality differs between clients of a Big 4 affiliate and local non-Big 4 affiliated auditors. Prior research on investor protection and audit quality excludes countries not represented in the La Porta et al. (1998, 2006) measures of investor protection. The countries typically represented in the La Porta et al. (1998, 2006) measures of investor protection tend to be mature and larger economies. Smaller and emerging economies that relatively recently adopted regulations towards better investor protection have not been widely studied. The authors study Bangladesh because it (i) is an emerging economy whose capital market has undergone significant regulatory reforms, (ii) is one of the unique regimes where the Big 4 operates through a local audit firm, (iii) is not represented in the La Porta et al. (1998, 2006) measures of investor protection, and (iv) has an institutional environment that differs from the U.S. and such differences have implications for audit quality.

Accruals quality may become increasingly important to capital market participants in Bangladesh. Francis et al. (2004) find that accruals quality has cost of capital consequences. Bangladeshi companies have normally relied heavily on bank financing. Companies are now increasingly turning to the stock market for financing. For example, the number of listed

companies in Dhaka Stock Exchange (DSE) increased from 192 in 1995-96 to 259 in 2003-04 (Bangladesh Bank, 2010). The stock market is also attracting more investors than ever before. For example, turnover in the DSE increased from BDT 8199.10 million in 1995-96 to BDT 24770.00 million in 2003-04 (Bangladesh Bank, 2010)<sup>2</sup>. The market capitalization of companies listed with DSE increased from BDT 79361.7 million at the end of 1995-96 to BDT 141851.00 million at the end of 2003-04 (Bangladesh Bank, 2010). Thus given the increasing importance of the stock market to both companies and investors, accruals quality may be increasing in importance to companies, investors and regulators in Bangladesh.

To enhance the reputation of its capital market, Bangladesh attracted the international Big 4 audit firms to operate through a local audit firm. Four local audit firms are affiliates of the Big 4 auditors; Rahman Rahman Huq, Hoda Vasi Chowdhury, A Qasem & Co. and S F Ahmed are associated with KPMG International, Deloitte Touche Tohmatsu, Price WaterhouseCoopers, and Ernst & Young, respectively<sup>3</sup>. This paper refers to these four audit firms as Big 4 affiliates and unaffiliated local audit firms as local or non-Big 4 firms. The Big 4 monitors the affiliated audit firm through periodic audits of a sample of engagements. The intent of these periodic audits is to ensure the affiliated Big 4 complies with the quality control parameters set by the Big 4. Non-compliance can result in termination of the Big 4 affiliation. Local audit firms not affiliated with a Big 4 are not subject to periodic reviews by any entity or regulator. Therefore, one expectation is that clients of a Big 4 affiliate would exhibit higher accruals quality than clients of local auditors.

However, there may be no difference in accruals quality between clients of affiliated Big 4 and other auditors in Bangladesh because her institutional environment appears to offer low investor protection for the following reasons. First, the World Bank (2003) reported that the

external audit provides poor quality audits in Bangladesh because of poor regulatory oversight. Second, the concentration of ownership in founders, families and closely related parties diminishes the demand for a high quality audit and increases the scope for expropriation of minority shareholders.<sup>4</sup> The appointment of an external auditor to opine on the annual financial statements may be a compliance exercise rather than an audit of substance. Third, the appointment of a Big 4 affiliate may be for impression management purposes; portraying an image to the market about the quality of the firm's earnings. Related is the plausibility that the local audit firm seeks out an affiliation to enhance its reputation and thereby impresses and gains potential new clients in the small and competitive audit market. Such impression management techniques usually are devoid of leading to higher accruals quality (e.g., Merkl-Davies and Brennan, 2007). Fourth, the heightened potential for agency problems has not been effectively addressed by the recently adopted Bangladesh Securities and Exchange Commission (SEC, 2006) corporate governance requirements. The Bangladesh SEC requires only one independent director on the board of a listed company which is in stark contrast to majority board independence requirements in other countries. As there is no prior Bangladesh evidence on the association between Big 4 affiliation and accruals quality, it is an open empirical question that this paper addresses.

Francis (2004) reviews the U.S. evidence on audit quality and notes that it is not clear whether the U.S. evidence on audit quality generalizes to audits in other countries. Audit quality is influenced by auditor incentives, which are, in turn, affected by the institutional environments (e.g., litigation risk exposure, monitoring and enforcement regimes) in which auditors work (Francis, 2004; Khurana and Raman, 2004; Venkataraman et al., 2008). Since variation in institutional environments exists, a strong case exists for investigating the association between

audit quality and accruals quality in different institutional environments. As noted earlier, the accounting and auditing environment in Bangladesh is distinctively different from that of the U.S. Thus, this study adds to the literature on audit quality and accruals quality by responding to calls for more international research on auditing practices by Francis (2004).

The authors use both absolute discretionary accruals and signed discretionary accruals as measures of accruals quality. They use absolute and signed residuals from the Dechow and Dichev (DD) (2002) model modified by McNichols (2002) (hereinafter “modified DD model”) to measure absolute discretionary accruals and signed discretionary accruals, respectively. Using 382 firm-year observations for fiscal years 2000 to 2003 from the Dhaka Stock Exchange (DSE), the authors find the coefficient on Big 4 affiliates is positive and statistically significant when both absolute discretionary accruals and signed discretionary accruals are used as dependent variables. However, additional analyses show that the results on the association between Big 4 affiliates and accruals quality depend on measures of accruals quality and accruals models used.

Findings of this study potentially suggest that the Big 4 affiliates do not have a positive impact on the accruals quality of their clients in Bangladesh. Clients may be hiring a Big 4 affiliate, and local audit firms may be seeking out an affiliation with a Big 4 firm, for impression management purposes. This paper adds to the literature by demonstrating that Big 4 affiliates may have no positive impact on accruals quality in a small and emerging market with poor regulations and low investor protection.

Results of this study have potential implications for regulators such as the Bangladesh SEC and multinational donor agencies such as the World Bank and the IMF. The findings suggest that the nature of the institutional environment in Bangladesh potentially limits the benefits to be derived from audits conducted by a Big 4 affiliate. The authors argue that

affiliation with a Big 4 international accounting firm may not improve the quality of the audit provided by the local affiliate vis-à-vis other local audit firms unless there is market demand for quality differentiated audits and a strong monitoring and enforcement regime is in place. The hiring of a Big 4 affiliate as a means to improve audit and accruals quality and thus enhance the reputation of the Bangladesh capital market does not appear to be a substitute for stringent regulations. A preliminary investigation of the audit fees paid to a Big 4 affiliated audit firm suggests there are no benefits in terms of higher accruals quality. The findings raise further research questions pertaining to motives for hiring a Big 4 affiliated audit firm.

A caveat is in order now. This study covers only a single country with a small capital market and the sample, especially the sample of firms audited by Big 4 affiliates, is small. While this reflects the situation in Bangladesh, the results may not be generalizable to countries having similar institutional environments. This offers opportunities for further research.

The remainder of this paper is organized as follows. The next section briefly reviews the Bangladesh audit environment and the Section 3 discusses measures of accruals quality. The authors then explain the research method followed by the results in Sections 4 and 5. Section 6 concludes the paper.

## **2. Bangladesh audit environment and accruals quality**

The Bangladesh SEC was established in 1993 to protect capital market participants, oversee issuance of securities and develop and regulate the Bangladesh securities market. The SEC has the authority to impose penalties on companies issuing misleading information and not complying with the legal corporate accounting and disclosure requirements.<sup>5</sup>

According to a World Bank review, the Bangladesh institutional environment suffers from several significant defects. For example, while the Registrar of Joint Stock Companies

(RJSC) has the legal authority to enforce the provisions of the Companies Act, the RJSC lacks the technical competence to monitor compliance with accounting and auditing matters (World Bank, 2003, para 23). The World Bank reported that the RJSC did not monitor or take action against companies that failed to file annual audited financial statements (World Bank, 2003, para 23). The World Bank (2003, para 24) also noted that the SEC did not have sufficiently qualified staff to effectively monitor the accounting practices of listed firms.

The Institute of Chartered Accountants of Bangladesh (ICAB), like its peers in developed nations such as the U.S., the U.K., and Australia, regulates its members. Similar to mechanisms overseas, the ICAB established an Investigation and Disciplinary Committee (IDC) that is empowered by the bye-laws of the ICAB to investigate complaints against its members. However, the World Bank found that the ICAB failed to enforce its regulations when its members breached auditing and ethical standards (World Bank, 2003, para 27 & 34). The World Bank (2003, para 12) also reported that the IDC is not proactive in disciplining errant practitioners.

The size of the market for audit services in Bangladesh constrains the bargaining power of the audit firms and thus affects the quality of audits in Bangladesh. The total number of companies listed on the Dhaka Stock Exchange was 256 in 2004.<sup>6</sup> These listed firms were shared between 50 to 60 audit firms suggesting that the competition for clients is intense. The ratio of listed companies per auditor is significantly less than that in developed and high investor protection countries like the U.S. and the U.K. Thus, audit firms in Bangladesh are likely to face greater economic incentives to acquiesce with client reporting practices. Since the enforcement of regulations is weak and the market for audit services is spread thinly, the cost of breaching



independence and not protecting their reputation may be lower than the economic benefits extracted from client fee revenues.

Overall, the nature of the institutional environment and the lack of effective audit regulation, together with the small and intensely competitive audit market raise interesting implications for the association between Big 4 affiliates and accruals quality in Bangladesh. Prior research predominantly in the U.S. reports that the accruals quality of non-Big 4 clients is lower than that of Big 4 clients (e.g., Becker et al., 1998; Francis et al., 1999; Krishnan, 2003). In addition, in a high investor protection market like the U.S., Big 4 audit firms have incentives to provide high quality audits (Francis and Wang, 2008). Discovery of an audit failure leads to litigation, loss of reputation and future client revenues (DeAngelo, 1981; Krishnan, 2003).

In Bangladesh and based on U.S. evidence, it may be expected that Big 4 affiliated audit firms will provide high quality audits which manifests in observable differences in accruals quality between Big 4 affiliates and local audit firms. This is so because there is some monitoring by the international Big 4 of the affiliated audit firms. The Big 4 affiliates must comply with the quality control standards set by the international Big 4 audit firm. Failure to comply with these quality control standards can result in loss of the Big 4 affiliation, loss of reputation, and thus loss of client and fee revenues. The audit fee charged by a Big 4 affiliate is not trivial. For example, the Big 4 affiliates earned average audit fees of BDT 230,560 and BDT 226,021 while local firms earned average audit fees of BDT 57,068 and BDT 53,191 in 2005 and 2006, respectively.<sup>7</sup> These fee differences of about 400% are statistically significant ( $p < 0.01$ ) and economically important.

However, given the nature of the weak regulatory and investor protection regime in Bangladesh, it is plausible that Big 4 affiliates and local firms face the same set of incentives and

thus they may not provide quality differentiated audits. To attract investors, obtain less costly finance and comply with the Bangladesh public company requirements, clients may hire Big 4 affiliated auditors for impression management purposes. Merkl-Davies and Brennan (2007) document that firms engage in impression management to achieve some ulterior objective such as attempting to conceal or divert attention away from the quality of their reports and earnings. Moreover, local auditors may also seek to form an alliance with a Big 4 firm for impression management purposes. If this is the case, then a Big 4 affiliate can market itself as a higher quality auditor and charge fee premiums but in fact provide audits that parallel the quality of local audit firms. Given the alternative arguments, this paper does not predict a directional association between Big 4 affiliates and accruals quality in Bangladesh.

### **3. Accruals quality**

The most direct manifestation of audit quality is the auditor opinion on financial statements (Francis, 2004). This paper does not use auditor opinion as the outcome variable because qualified audit opinions are infrequent and adverse opinions are rare in Bangladesh. So following prior research (Becker et al., 1998; Francis et al., 1999; Francis, 2004), this study uses accruals quality as the outcome variable because accruals incorporate the effects of accounting estimates and judgments made by management. The Bangladesh Standard on Auditing (BSA) 540 requires the auditor to assess the accounting estimates made by management and obtain sufficient appropriate evidence regarding those estimates (ICAB, 2006). Further, BSA 700 requires the auditor to state in the audit report that an audit includes assessing the accounting principles and significant estimates made by management and evaluating overall financial statement presentation (ICAB, 2006).

Different models have been used in the literature to measure accruals quality. For example, Healy (1985) and DeAngelo (1986) treat total accruals and first difference in total accruals, respectively, as discretionary. Jones (1991) runs firm-specific regressions of accruals on changes in revenue and property, plant and equipment (PPE) and treats the residual from the model as discretionary. Various modifications to Jones' (1991) model have been used in the literature. In one modification known as Modified Jones Model, changes in receivables are deducted from changes in revenue to determine the non-discretionary accruals and discretionary accruals in the event period (Dechow et al. 1995). Kothari et al. (2005) propose a performance- matched accruals models. DeFond and Jiambalvo (1994) and Subramanyam (1996) apply the Jones (1991) model to cross-sectional samples. Dechow and Sloan (1991) develop an industry-based model to determine non-discretionary accruals. Dechow and Dichev (2002) regress working capital accruals on lagged, current and future cash flows from operations and treat the standard deviation in residuals from the model as an indication of accruals quality. McNichols (2002) extends Dechow and Dichev's (2002) model by including changes in sales and PPE as additional independent variables. Ball and Shivakumar (2006) extend Jones' (1991) and Dechow and Dichev's (2002) models by incorporating the impact of asymmetrical timeliness of earnings in those models.

There is no conclusive evidence on which accruals model best measures accruals quality (Gul et al., 2009). This paper uses the DD (2002) model modified by McNichols (2002)<sup>8</sup>. Francis et al. (2004) report that accruals quality measured using parameters in the DD (2002) model has the largest cost of capital consequences. However, McNichols (2002) documents that the explanatory power of the modified DD model is higher than that of the DD (2002) model and the Jones (1991) model, and concludes that both the DD (2002) model and the Jones (1991) model

are probably misspecified. Hence, this study uses the DD (2002) model extended by McNichols (2002). Since Bangladesh listed companies increasingly rely on the stock market for external financing, the accruals quality measure used in this paper is more appropriate in Bangladesh context. Finally, the authors cannot use models (e.g., Kothari et al., 2005) that impose minimum data requirements (number of firms per industry) because of the small country setting of this study. The authors estimate the following accruals model:

$$TACC_t = a_1 + a_2CFO_{t-1} + a_3CFO_t + a_4CFO_{t+1} + a_5\Delta SALES_t + a_6PPE_t + \varepsilon_t \quad (1)$$

where:

TACC = total accruals (change in [current assets-cash] less change in current liabilities less depreciation);  
 CFO = net income less total accruals;  
 $\Delta SALES$  = change in sales revenue; and  
 PPE = property, plant and equipment.

All variables are deflated by average total assets. Since CFO is not publicly available in Bangladesh (see method section), the authors calculate CFO using the indirect method.<sup>9</sup>

The authors estimate model (1) for each of the four years 2000 to 2003 to estimate accruals quality.<sup>10</sup> Following prior literature (e.g., Becker et al., 1998; Francis et al., 1999; Krishnan, 2003), this study uses both absolute discretionary accruals ( $|DACC|$ ) and signed discretionary accruals (DACC) as measures of accruals quality. Absolute discretionary accruals and signed discretionary accruals are measured as absolute and signed residuals, respectively, from model (1). Absolute discretionary accruals treat both income-decreasing and income-increasing accruals symmetrically, and higher absolute discretionary accruals indicate poor earnings quality (Gul et al., 2009). On the other hand, when signed discretionary accruals are used as a proxy for accruals quality, positive discretionary accruals indicate management uses

accruals to increase reported profit and hence, poor accruals quality. The interpretation of negative discretionary accruals is not straightforward, however. Since negative discretionary accruals indicate income-decreasing accruals, it is consistent with conservatism and higher accruals quality. At the same time, it is consistent with big bath behavior also (Gul et al., 2009).

#### **4. Methodology**

##### *4.1 Data and sample*

The authors hand-collect audited financial statement data from the Balance Sheet Analysis of Joint Stock Companies Listed on the Dhaka Stock Exchange (hereinafter BASA), published by the Bangladesh Bank, the central bank of Bangladesh. The BASA provides selected financial statement data for listed non-financial companies for a maximum of five years. This is the most comprehensive public source of accounting information in Bangladesh. They hand-collect data from the 2003, 2004, and 2005 publications of BASA to minimize loss of data and thus maximize the sample size. The 2005 publication of BASA was the latest at the time of collecting data. The earliest reported data year is 1998 and the most recent is 2004.<sup>11</sup> Not all companies are consecutively represented in the BASA publications. The authors begin with 1,205 firm-year observations and eliminate 606 observations because of missing data and 164 observations because they cannot identify the auditor. This leaves them with 435 firm-year observations. After excluding outliers at the 1% and 99% levels, the authors have a final sample of 382 firm-years.

To address the representativeness of the sample, it is compared to the BASA population. Table I shows that the industry distribution of the sample is consistent with the industry distribution of the BASA population. About 78% of the sample comprises the textile, food, engineering and pharmaceuticals and chemical industries. Table I also shows that the Big 4

affiliates are concentrated in three industries: food, engineering and pharmaceuticals and chemical industries. Given that Big 4 affiliates appear to be industry-specific, this paper controls for industry fixed effects in empirical analyses.

*INSERT TABLE 1 ABOUT HERE*

#### 4.2 Models

To investigate the association between Big 4 affiliates and accruals quality, the authors estimate the following OLS regressions:

$$|DACC| = a_1 + a_2BFA + a_3AUDSIZE + a_4NEGNI + a_5|TACC\_ATA| + a_6LOGTA + a_7TL\_TA + a_8OC + a_9AUDCHANGE + \text{industry and year fixed effects} + \varepsilon(2)$$

$$DACC = a_1 + a_2BFA + a_3AUDSIZE + a_4NEGNI + a_5|TACC\_ATA| + a_6LOGTA + a_7TL\_TA + a_8OC + a_9AUDCHANGE + \text{industry and year fixed effects} + \varepsilon(3)$$

where:

DACC	= the absolute magnitude of residuals from model (1);
DACC	= the signed residuals from model (1);
BFA	= 1 if the auditor of the firm is a Big 4 affiliate, and 0 otherwise;
AUDSIZE	= size of the auditor, measured as the number of sample companies audited by the auditor;
NEGNI	= 1 if net income is negative (i.e., net loss), and 0 otherwise;
TACC_ATA	= the absolute value of total accruals scaled by average total assets;
LOGTA	= the natural logarithm of total assets;
TL_TA	= total liabilities divided by total assets;
OC	= the length of operating cycle measured as (average days in inventories + average days in receivables)/365 <sup>12</sup> ;
AUDCHANGE	= 1 if there is a change in the auditor in the fiscal year, and 0 otherwise <sup>13</sup> ; and

Industry and year fixed effects represent eight industry groups and three year fixed effects.

In models (2) & (3), in addition to the variable of interest, BFA, this paper controls for auditor size (AUDSIZE) because DeAngelo (1981) argues audit firm size is synchronous with audit quality and in Bangladesh, the Big 4 affiliated auditors are not the largest firms. The study includes negative income (NEGNI), size (LOGTA) and length of the operating cycle (OC) because DD (2002) find that their measure of accruals quality is associated with these variables.<sup>14</sup> The study controls for absolute value of total accruals scaled by average total assets (|TACC\_ATA|) because prior research (e.g., Becker et al., 1998) reports this variable affects accruals quality. This paper controls for leverage (TL\_TA) and auditor change (AUDCHANGE) because prior research finds these associated with accruals quality (e.g., Becker et al., 1998; Press and Weintrop, 1990; DeFond and Jiambalvo, 1994). Models (2) and (3) include industry fixed effects (INDUSTRY) because (a) in the sample, clients of Big 4 affiliates and local auditors do not appear to be randomly distributed across industries and (b) accruals quality is not computed on an industry basis. Finally, this paper controls for year fixed effects because it uses a pooled cross-sectional sample and accruals quality may vary over time.

## **5. Results**

### *5.1 Descriptive statistics*

Table II presents the descriptive statistics for groups of firms audited by Big 4 affiliates and local auditors. According to Table II, clients of Big 4 affiliates have higher average |DACC| and DACC than their local counterparts and the difference is significant ( $p < 0.01$ ). Clients of Big 4 affiliates are significantly ( $p < 0.01$ ) larger (LOGTA) and more profitable (NI\_ATA) than clients of local auditors. Similarly, clients of Big 4 affiliates report significantly ( $p < 0.01$ ) greater cash flow and net losses (NEGNI) less frequently than local audit firm clients. A significantly

( $p < 0.01$ ) lower proportion of clients of Big 4 affiliates change their auditor compared to clients of local auditors.<sup>15</sup> The results reported above are similar if the Mann-Whitney non-parametric test of differences is used.

*INSERT TABLE II ABOUT HERE*

### *5.2 Modified DD model estimation*

Table III reports the correlation matrix and the results of estimating model (1). The maximum Pearson correlation of 0.247, which is between current cash flow and changes in sales,<sup>16</sup> is well below the 0.80 threshold beyond which multicollinearity problems may arise (Gujarati, 2003).

*INSERT TABLE III ABOUT HERE*

DD (2002) predict a negative sign for the coefficient on current cash flow and positive signs for the coefficients on past and future cash flow. The coefficients on all the CFO variables-lagged, current and one-period ahead-have the predicted signs and each coefficient is significant in each of the four years. Further, changes in sales and PPE have the expected positive and negative signs, respectively, each year and the coefficients are significant in all four years. The adjusted- $R^2$  ranges from 0.607 to 0.807 and the overall model is significant ( $p < 0.01$ ). These results suggest the estimation of accruals quality in this paper is comparable to DD (2002) and McNichols (2002).

### *5.3 Big 4 affiliates and accrual estimation error*

Table IV reports the correlation matrix (Panel A) and the results of regressing  $|DACC|$  and DACC on BFA and the control variables (Panel B). The maximum Pearson correlation in Panel



A is 0.368, which is between TL\_TA and NEGNI.<sup>17</sup> This is less than the 0.80 threshold beyond which multicollinearity concerns may arise (Gujarati, 2003).

Panel B of Table IV shows that the coefficients on NEGNI, |TACC\_ATA|, TL\_TA and AUDCHANGE are statistically significant in both models (2) and (3). These observations are consistent with the prior accruals literature. More importantly, the coefficient on BFA is positive and significant ( $p < 0.01$ ) when |DACC| is the dependent variable, thus suggesting that clients of Big 4 affiliates have higher absolute accruals estimation errors relative to local audit firm clients. The overall model is significant ( $p < 0.01$ ) with comparatively good explanatory power (adjusted- $R^2 = 0.37$ ). When DACC is the dependent variable, BFA is positive and significant ( $p < 0.05$ ), suggesting that clients of Big 4 affiliates have higher income-increasing accruals than clients of local auditors.

*INSERT TABLE IV ABOUT HERE*

#### *5.4 Additional analyses*

Accruals quality is subject to measurement error. To enhance the robustness of the results, the authors estimated accruals quality using alternative accruals models and re-estimated models (2) and (3). The results are reported in Table V. First, following McNichols (2002), working capital accruals is used as the dependent variable in model (1) and model (2) and (3) are re-estimated using absolute and signed residuals from that model as proxies for accruals quality. The results are reported in second and third columns of Table V. As the second column shows, BFA is positive and significant ( $p < 0.05$ ). However, BFA is not significant when model (3) is re-estimated (third column). Second, the authors use DD (2002) model and absolute and signed

residuals from that model as dependent variables in models (2) and (3). The results are reported in fourth and fifth columns of Table V. In the fourth column where the dependent variable is absolute residual from the DD (2002) model, the adjusted  $R^2$  is 0.45 and the overall model is significant ( $p < 0.01$ ). BFA is positive and significant ( $p < 0.05$ ). In the last column where the dependent variable is signed residual from the DD (2002) model, the adjusted  $R^2$  is 0.30 and the overall model is significant ( $p < 0.01$ ). However, BFA is not significant at conventional levels. Thus, while the results on the association between Big 4 affiliates and absolute discretionary accruals are robust to alternative accruals models, the results on the association between Big 4 affiliates and signed discretionary accruals depend on accruals models used. Collectively, these findings potentially suggest that the Big 4 affiliates do not have a positive impact on the accruals quality of their clients in Bangladesh.

*INSERT TABLE V ABOUT HERE*

It is possible that self-selection bias affects the findings. Prior research documents that clients self-select auditors (Chaney et al., 2004). Descriptive statistics in Table II suggest self-selection bias. Clients of Big4 affiliates report losses less frequently, are larger and more profitable than clients of local auditors. To control for possible endogeneity, this paper employs two-stage least squares regressions (2SLS) approach. In the first stage, the predicted value of BFA is obtained, which is then used in the second stage regression. Specifically, following Chaney et al. (2004), the authors run the following auditor choice model and replace BFA in models (2) and (3) with the fitted value from this model.

$$\begin{aligned}
\text{BFA} = & a_1 + a_2\text{AUDSIZE} + a_3\text{NEGNI} + a_4|\text{TACC\_ATA}| + a_5\text{LOGTA} \\
& + a_6\text{TL\_TA} + a_7\text{OC} + a_8\text{AUDCHANGE} + a_9\text{ATURN} + a_{10}\text{CURRENT} + \\
& a_{11}\text{QUICK} + a_{12}\text{ROA} + a_{13}\text{ROA*NEGNI} + a_{14}\text{CFO} + \text{industry and year} \\
& \text{fixed effects} + \varepsilon
\end{aligned} \tag{4}$$

where:

BFA	= 1 if the auditor of the firm is a Big 4 affiliate, and 0 otherwise;
AUDSIZE	= size of the auditor, measured as the number of sample companies audited by the auditor;
NEGNI	= 1 if net income is negative (i.e., net loss), and 0 otherwise;
TACC_ATA	= the absolute value of total accruals scaled by average total assets;
LOGTA	= the natural logarithm of total assets;
TL_TA	= total liabilities divided by total assets;
OC	= the length of operating cycle measured as (average days in inventories + average days in receivables)/365;
AUDCHANGE	= 1 if there is a change in the auditor in the fiscal year, and 0 otherwise;
ATURN	= Asset turnover, measured as sales divided by average total assets;
CURRENT	= Current ratio, measured as current assets divided by current liabilities;
QUICK	= Quick ratio, measured as quick assets divided by current liabilities;
ROA	= Return on assets, measured as net income divided by average total assets;
CFO	= cash flow from operations; and

Industry and year fixed effects represent eight industry groups and three year fixed effects.

The results of 2SLS regressions are reported in Table VI. When model (2) is re-estimated using 2SLS approach, the overall model is significant ( $p < 0.01$ ) and BFA is positive and significant ( $p < 0.01$ ). BFA is positive and significant ( $p < 0.01$ ) when model (3) is re-estimated using 2SLS approach. Thus, the results hold good when self-selection bias is controlled for.

*INSERT TABLE VI ABOUT HERE*

## **6. Conclusion**

This study investigates the association between Big 4 affiliates and accruals quality in Bangladesh. Absolute and signed residuals from the modified DD (2002) model are used as proxies for accruals quality. Using 382 firm-year observations from the Dhaka Stock Exchange (DSE) for fiscal years 2000 to 2003, the study finds that a Big 4 affiliate is positively associated with the absolute value of residuals from the modified DD (2002) model, thus indicating that clients of Big 4 affiliates have higher absolute accrual estimation errors than clients of local auditors. Further, a Big 4 affiliate is positively associated with signed residuals from the modified DD (2002) model, indicating that clients of Big 4 affiliates have higher income-increasing accruals than clients of local auditors. The results on the association between Big 4 affiliates and absolute discretionary accruals hold good across alternative accruals models and when self-selection bias is controlled for. However, the results on the association between Big 4 affiliates and signed discretionary accruals depend on accruals models used. Thus, the association between Big 4 affiliates and accruals quality in Bangladesh depends on measures of accruals quality and accruals models used. Collectively, these findings potentially suggest that the Big 4 affiliates do not have a positive impact on the accruals quality of their clients compared to local audit firms not affiliated with a Big 4 auditor in Bangladesh.

The findings differ from those in the U.S. (e.g., Becker et al., 1998; Francis et al., 1999) but are broadly consistent with Francis and Wang (2008). Becker et al. (1998) and Francis et al. (1999) find that Big 4 clients have lower discretionary accruals (higher accruals quality) than their non-Big 4 counterparts. Francis and Wang (2008) find that the Big 4 are positively associated with accruals quality in strong investor protection regimes but negatively associated in

weaker regimes. The Bangladesh audit environment is characterized by an intensely competitive market for audit services, poor demand for quality audit services, and poor monitoring and enforcement regime. Thus, although Big 4 affiliates may be monitored by their respective international Big 4, the results suggest such monitoring may not manifest in the measures of accruals quality the paper examines.

A potential explanation of the findings of this study is that clients hire a Big 4 affiliated auditor to convey the impression that their earnings is of high quality than clients audited by local auditors, when in fact that may not be the case. Because larger firms are more visible to the market, and firms with greater resources including better profits and cash flow can afford to pay audit fee premiums to a Big 4 affiliate, such firms may be hiring a Big 4 affiliate for impression management purposes (e.g., Merkl-Davies and Brennan, 2007). The univariate audit fee tests and multivariate accruals quality tests are consistent with this explanation. The authors observed that Big 4 affiliates charged significantly higher audit fees than non-Big 4 local firms. The audit fee difference was more than 400%. Also, local audit firms may seek out an affiliation with an international Big 4 firm to give the impression they are of higher quality than local auditors unaffiliated with a Big 4. Thus, Big 4 affiliates could justify charging audit fee premiums. Such conjecture is consistent with the concept of impression management (e.g., Merkl-Davies and Brennan, 2007). To provide further insight to the proposition, this study calls for further research examining why firms appoint a Big 4 affiliate, and whether firms switch from a local audit firm to a Big 4 affiliate. The descriptive data in Table II suggest clients of a Big 4 affiliate have a lower incidence of auditor change compared to clients of a non-Big 4 affiliate. This is important for an under-developed and poorly regulated audit market because the audit fees paid to Big 4 affiliates are not trivial and are significantly greater than those paid to local audit firms

not affiliated with a Big 4. Further research is encouraged to explore the benefits a Big 4 affiliation brings to the local audit firm and the capital market generally. The initial results in this study suggest a Big 4 affiliation does not bring benefits to the capital market in terms of higher reported accruals quality. The Bangladesh regulators may be interested in such issues as they gradually improve the regulation of capital market and audit firms.

This study is subject to the following caveats. First, it is widely recognized that any proxy for accruals quality is not error free. Although the study employs primary and additional measures to enhance the reliability of the results, the authors acknowledge the noise in the proxies for accruals quality may affect the results. Although the authors considered using audit opinions as a proxy for audit quality, it was discovered that the variation in audit opinions was negligible thus limiting its use as a dependent variable. Most audit opinions were clean opinions.

Second, the relatively small sample may affect the results, which is a function of the size of the Bangladesh capital market and data availability. Future research may investigate the association between Big 4 affiliates and accruals quality in similar accounting and audit environments. Finally, the association between a Big 4 affiliate and accruals quality may improve overtime particularly as international monitoring agencies such as the World Bank pressure the Bangladesh government to strengthen its oversight of financial reporting and the capital market. One recent development in Bangladesh is the SEC's requirement for boards of directors to comprise at least one independent director. The extent to which Bangladesh companies comply with this requirement, and how such developments affect the capital market and the demand for higher audit quality in a small and emerging economy presents opportunities for future research.

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## Endnotes

<sup>1</sup> Some other countries where the Big 4 operates through an affiliate are Egypt, Fiji, Indonesia, Philippines and Turkey. These also are smaller capital markets with low investor protection.

<sup>2</sup> BDT stands for Bangladesh Taka, the currency of Bangladesh. The average exchange rate was US \$1 = BDT 40.84 during 1995-96 and US \$1 = BDT 58.94 during 2003-04 (Bangladesh Bank, 2010).

<sup>3</sup> Another audit firm, ACNABIN, was associated with Arthur Andersen during the study period. Since its clients are not included in the sample, this paper uses Big 4 instead of Big 5.

<sup>4</sup> For example, the mean (median) percentages of ownership of sponsors in listed firms were 44.26% (48.73%) and 43.87% (49.55%) in 2003 and 2004, respectively.

<sup>5</sup> The Companies Act 1994 is the main regulation that deals with all companies. The Act details, inter alia, accounting and disclosure requirements for all companies-listed and non-listed, public and private. The Securities and Exchange Rules of 1987 details the accounting and disclosure requirements for listed companies only. The 1987 Rules required the publication of annual financial statements (balance sheet, and profit and loss account) and the audit thereof by a chartered accountant. As a result of amendments to the Rules in 1997, the Rules now require the publication of the cash flow statement together with the balance sheet, and the profit and loss account, preparation of financial statements in accordance with International Accounting Standards (IAS) as adopted in Bangladesh, the audit of annual financial statements in accordance with the International Standards of Auditing (ISA) as adopted in Bangladesh, and publication of half-yearly statements (Hasan et al., 2007).

<sup>6</sup> This information was accessed on November 16, 2009 from the following site: <http://www.dsebd.org/mglc.php>

<sup>7</sup> The authors were able to obtain audit fees for 53 firms for 2005 and 2006. Of these 53 firms, the Big 4 affiliate audited 12 firms and the non-Big 4 audited 41. BDT stands for Bangladesh Taka, the currency of Bangladesh. The average exchange rate was: U.S. \$ 1 = BDT 61.4 in 2005 and U.S. \$1 = BDT 67.1 in 2006. Exchange rate information available at <http://www.bangladesh-bank.org/>

<sup>8</sup> In DD (2002) model, working capital accruals are regressed on past, current and one-year-ahead cash flow from operations (CFO). McNichols (2002) extends this model by incorporating two additional independent variables, changes in sales and property, plant and equipment (PPE). The authors estimate a variation of this modified model to estimate accruals quality. Unlike McNichols (2002) who uses working capital accruals as the dependent variable in the accruals model, this study uses total accruals as the dependent variable because depreciation, which is included in total accruals but not in working capital accruals, is associated with PPE, one explanatory variable in McNichols (2002). Estimation statistics in Table III show the accruals model has a very good fit.

<sup>9</sup> See Drtina and Largay III (1985) for limitations of the indirect method of calculating cash from operations.

<sup>10</sup> The results are qualitatively similar to those reported in this paper when model (1) is run for the pooled cross-sectional sample.

<sup>11</sup> There were two noticeable changes in the accounting and audit environment in Bangladesh after the study period. First, Rahman Rahman Huq (RRH), which was an affiliate of KPMG during the study period, became a member firm of KPMG International in 2006. It would be interesting to see whether the accruals quality of client firms improves after RRH becomes a member firm of KPMG though it would be difficult to investigate this issue empirically as RRH is the only member firm of a Big 4 auditor now and the number of listed firms audited by RRH is very few. Second, the turnover and market capitalization of firms listed on the Dhaka Stock Exchange increased greatly after 2003. The turnover increased from BDT 24770.00 million in 2003-04 to BDT 893789.40 million in 2008-09 and the market capitalization increased from BDT 141851.00 million in 2003-04 to BDT 1001433.00 million in 2008-09. BDT stands for Bangladesh Taka, the Bangladesh currency. The average exchange rate was US \$1 = BDT 58.94 during 2003-04 and US \$1 = BDT 68.80 during 2008-09 (Bangladesh Bank, 2010). This development in Bangladesh stock market will likely increase the importance of accruals quality of listed firms in

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Bangladesh. Barring these changes, the authors are not aware of any other major change in the Bangladesh accounting and audit environment. Thus, while the data are somewhat dated, the data and findings of this study are very relevant even today.

<sup>12</sup> An alternative specification used by Dechow et al. (1998) is operating cash cycle calculated as the average days accounts receivable and inventories minus average accounts payable. The study does not use this specification because BASA does not report accounts payable.

<sup>13</sup> Becker et al. (1998) use two dummy variables- OldAud and NewAud- to capture auditor change. OldAud is equal to 1 if the last sample year is followed by an auditor change and NewAud is equal to 1 if the first sample year is the first year with a new auditor. The authors do not have data to measure OldAud and hence, cannot implement their definitions of auditor change.

<sup>14</sup> DD (2002, Table 4, Panel C) report that standard deviation of sales and average absolute working capital accruals are associated with their measure of accruals quality. This paper does not use standard deviation of sales as a control variable in models (2) and (3) because it, unlike DD (2002, Table 4, Panel C) who use a time series sample, uses a pooled cross-sectional research design and hence cannot compute standard deviation of sales. The study does not use absolute working capital accruals as a control variable because it, unlike DD (2002) who use working capital accruals as the dependent variable in their accruals model, uses total accruals as the dependent variable in model (1) and absolute total accruals, [TACC\_ATA], instead of absolute working capital accruals as a control variable in models (2) and (3).

<sup>15</sup> The non-parametric Mann-Whitney tests yield similar results.

<sup>16</sup> The maximum Spearman's correlation is 0.377, which is between current cash flow and one-year-ahead cash flow.

<sup>17</sup> The maximum Spearman correlation is 0.261, which is again between TL\_TA and NEGNI.



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**Table I**  
**Sample description**

**Panel A: Sample by industry**

<u>Industry</u>	<u>Total</u>	<u>Sample%</u>	<u>Big 4 affiliate %</u>	<u>BASA<sup>a</sup>%</u>
Food	66	17.28	15.38	20.21
Fuel & power	8	2.09	9.62	2.66
Textile	115	30.11	1.92	22.87
Pharmaceuticals & chemicals	58	15.18	30.77	14.36
Engineering	59	15.45	23.08	11.17
Jute	11	2.88	0.00	2.66
Paper & printing	8	2.09	1.92	4.79
Cement	12	3.14	3.85	4.26
Misc.	<u>45</u>	<u>11.78</u>	<u>13.46</u>	<u>17.02</u>
Total	382	100.00	100.00	100.00

**Panel B: Sample by year**

	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>Pooled</u>
Full sample	107	99	90	86	382
Big 4 Affiliates	13	16	12	11	52

sample

<sup>a</sup>BASA represents the Balance Sheet Analysis of Joint Stock Companies Listed on the Dhaka and Chittagong Stock Exchanges, published by the Bangladesh Bank- the central bank of Bangladesh.

**Table II**  
**Descriptive statistics**

Variables	Big 4 Affiliate (n = 52)		Local audit firm (n = 330)		t-value <sup>#</sup>
	Mean	SD	Mean	SD	
DACC	0.048	0.046	0.031	0.032	3.355***
DACC	0.019	0.064	-0.003	0.044	3.355***
AUDSIZE	4.404	1.636	5.291	5.106	1.242
NEGNI	0.060	0.235	0.230	0.420	2.842***
TACC_ATA	0.070	0.073	0.063	0.071	0.569
LOGTA	8.777	1.131	8.155	1.246	3.384***
TL_TA	0.600	0.399	0.638	0.326	0.748
OC	0.722	1.181	0.948	1.236	1.233
AUDCHANGE	0.270	0.448	0.480	0.500	2.886***
GROWTH	0.135	0.177	0.072	0.335	1.338
NI_ATA	0.095	0.094	0.017	0.061	7.784***
CFO_ATA	0.130	0.120	0.053	0.097	5.174***

Variable definitions:

|DACC| = the absolute magnitude of the residual from model (1)

DACC = the signed residual from model (1)

AUDSIZE = the number of sample companies audited by the auditor in a given year;

NEGNI = 1 if the sample firm has net loss in the fiscal year, 0 otherwise;

|TACC\_ATA| = the absolute magnitude of total accruals scaled by average total assets;

LOGTA = the natural logarithm of total assets; TL\_TA = total liabilities divided by

total assets; OC = the length of operating cycle measured as (average days in

inventories + average days in receivables)/365; AUDCHANGE = 1 if there is an

auditor change, 0 otherwise; GROWTH = the percentage change in sales; NI\_ATA =

net income deflated by average of total assets; and CFO\_ATA = cash flow scaled by

average total assets.

\*, \*\*, and \*\*\* indicate significance at 10%, 5%, and 1% levels, respectively.

# The Mann-Whitney test yields similar results.

**Table III**  
**Results of the modified DD (2002) model**

**Panel A: Correlation matrix: Pearson (Spearman) correlations below (above) the diagonal<sup>a</sup>**

	<u>CFO<sub>t-1</sub></u>	<u>CFO<sub>t</sub></u>	<u>CFO<sub>t+1</sub></u>	<u>ΔSALES</u>	<u>PPE</u>
CFO <sub>t-1</sub>	1.000	<b>0.344</b>	<b>0.255</b>	<b>0.113</b>	<b>0.150</b>
CFO <sub>t</sub>	<b>0.187</b>	1.000	<b>0.377</b>	<b>0.247</b>	<b>0.167</b>
CFO <sub>t+1</sub>	0.058	<b>0.232</b>	1.000	<b>0.268</b>	<b>0.155</b>
ΔSALES	0.071	<b>0.247</b>	<b>0.201</b>	1.000	-0.091
PPE	0.063	0.072	0.073	-0.084	1.000

**Panel B: Regression results:  $TACC_t = a_1 + a_2CFO_{t-1} + a_3CFO_t + a_4CFO_{t+1} + a_5\Delta SALES_t + a_6PPE_t + \varepsilon_t$**

<u>Variables (predicted sign)</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>
	<u>Estimate</u> <u>(t-value)<sup>b</sup></u>	<u>Estimate</u> <u>(t-value)<sup>b</sup></u>	<u>Estimate</u> <u>(t-value)<sup>b</sup></u>	<u>Estimate</u> <u>(t-value)<sup>b</sup></u>
Intercept (?)	0.022 (1.617)	0.008 (0.696)	0.001 (0.093)	0.001 (0.091)
CFO <sub>t-1</sub> (+)	0.208 (3.045***)	0.270 (5.999***)	0.370 (3.359***)	0.169 (1.924**)
CFO <sub>t</sub> (-)	-0.591 (-11.807***)	-0.738 (-12.590***)	-0.901 (-13.087***)	-0.709 (-7.839***)
CFO <sub>t+1</sub> (+)	0.166 (2.407***)	0.194 (4.428***)	0.117 (1.682**)	0.218 (3.326***)
ΔSALES (+)	0.0374 (1.326*)	0.065 (1.937**)	0.125 (4.715***)	0.062 (2.188**)
PPE (-)	-0.072 (-3.908***)	-0.039 (-2.638***)	-0.020 (-1.195)	-0.025 (-1.954**)
N	107	99	90	86
Adjusted R <sup>2</sup>	0.607	0.650	0.807	0.618
F-statistic	33.725***	37.362***	75.610***	28.475***

All variables are defined in Table II.

<sup>a</sup> Correlation coefficients in bold are significant at the 5% level.

<sup>b</sup> The reported t-values are based on White's (1980) corrected standard errors.

\*, \*\*, and \*\*\* indicate significance at 10%, 5%, and 1% levels, respectively.

**Table IV**  
**Results of accruals quality analysis**

<b>Panel A: Correlation matrix: Pearson (Spearman) correlations below (above) the diagonal<sup>a</sup></b>										
	BFA	AUDSIZE	NEGNI	TACC_ATA	LOGTA	TL_TA	OC	AUDCHANGE		
BFA	1.000	0.093	<b>-0.144</b>	0.016	<b>0.210</b>	-0.066	<b>-0.130</b>	<b>-0.160</b>		
AUDSIZE	-0.064	1.000	<b>-0.111</b>	-0.044	<b>0.150</b>	0.001	0.039	<b>-0.140</b>		
NEGNI	<b>-0.144</b>	-0.067	1.000	<b>0.241</b>	<b>-0.225</b>	<b>0.261</b>	<b>0.226</b>	0.048		
TACC_ATA	0.029	-0.062	<b>0.274</b>	1.000	<b>-0.118</b>	0.097	<b>-0.140</b>	<b>0.102</b>		
LOGTA	<b>0.171</b>	<b>0.214</b>	<b>-0.199</b>	<b>-0.115</b>	1.000	0.016	0.091	<b>-0.158</b>		
TL_TA	-0.038	-0.044	<b>0.368</b>	<b>0.242</b>	<b>-0.172</b>	1.000	<b>0.143</b>	0.001		
OC	-0.063	-0.046	<b>0.207</b>	<b>0.153</b>	-0.007	<b>0.126</b>	1.000	-0.051		
AUDCHANGE	-0.146	<b>-0.208</b>	0.048	0.058	<b>-0.170</b>	0.017	0.053	1.000		

**Panel B: Regression results**

Variables	DACC  <sup>b</sup>	DACC <sup>c</sup>
Intercept	0.037 (2.544**)	0.054 (3.062***)
BFA	0.018 (3.111***)	0.017 (2.142**)
AUDSIZE	0.000 (0.596)	0.000 (0.714)
NEGNI	0.011 (2.487**)	-0.037 (-5.802***)
TACC_ATA	0.124 (4.541***)	-0.173 (-4.084***)
LOGTA	-0.002 (-1.633)	-0.002 (-1.147)

Model:  $|DACC| = a_1 + a_2BFA + a_3AUDSIZE + a_4NEGNI + a_5|TACC\_ATA| + a_6LOGTA + a_7TL\_TA + a_8OC + a_9AUDCHANGE +$  industry and year fixed effects +  $\varepsilon$

Model:  $DACC = a_1 + a_2BFA + a_3AUDSIZE + a_4NEGNI + a_5|TACC\_ATA| + a_6LOGTA + a_7TL\_TA + a_8OC + a_9AUDCHANGE +$  industry and year fixed effects +  $\varepsilon$

TL_TA	0.033 <b>(3.862***)</b>	-0.038 <b>(-3.805***)</b>
OC	-0.000 <b>(-0.141)</b>	0.001 <b>(0.848)</b>
AUDCHANGE	-0.010 <b>(-3.369***)</b>	-0.008 <b>(-2.043**)</b>
Industry fixed effects	Included	Included
Year fixed effects	Included	Included
N	382	382
Adjusted R <sup>2</sup>	0.368	0.401
F-statistic	12.699***	14.447***

<sup>a</sup> Correlation coefficients in bold are significant at the 5% level.

<sup>b</sup> |DACC| is the absolute residual from model (1).

<sup>c</sup> DACC is the signed residual from model (1).

All variables are defined in Table II.

The reported t-values are based on White's (1980) corrected standard errors.

\* \*\*, and \*\*\* indicate significance at 10%, 5%, and 1% levels, respectively.



**Table V**  
**Regressions using alternative measures of accruals quality**

	<u> DWCACC <sup>a</sup></u>	<u>DWCACC<sup>b</sup></u>	<u> DWCACC <sup>c</sup></u>	<u>DWCACC<sup>d</sup></u>
Intercept	0.038 (2.585**)	0.024 (1.225)	0.031 (2.311**)	0.017 (0.851)
BFA	0.013 (2.173**)	0.001 (0.113)	0.011 (1.984**)	0.002 (0.221)
AUDSIZE	0.000 (0.701)	0.001 (1.100)	0.000 (0.971)	0.000 (0.669)
NEGNI	0.010 (1.889*)	-0.048 (-6.197***)	0.010 (2.055**)	-0.055 (-7.096***)
WCACC_ATA	0.254 (5.301***)	-0.068 (-1.096)	0.309 (7.161***)	-0.062 (-0.934)
LOGTA	-0.003 (-2.001**)	0.000 (0.178)	-0.003 (-2.189**)	0.002 (0.777)
TL_TA	0.024 (2.366**)	-0.039 (-3.051***)	0.023 (2.296***)	-0.034 (-2.484**)
OC	0.002 (0.981)	-0.001 (-0.191)	0.001 (0.596)	-0.001 (-0.437)
AUDCHANGE	-0.001 (-0.361)	-0.013 (-2.627***)	-0.000 (-0.140)	-0.010 (-1.994**)
Industry and year fixed effects	Included	Included	Included	Included
N	382	382	382	382
Adjusted R <sup>2</sup>	0.378	0.295	0.452	0.302
F- statistic	13.188***	9.372***	17.510***	9.680***

<sup>a</sup>|DWCACC| is the absolute residual from the following model:

$$WCACC = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta SALES_t + \beta_5 PPE_t + \varepsilon_t$$

<sup>b</sup>WCACC is the signed residual from the following model:

$$WCACC = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta SALES_t + \beta_5 PPE_t + \varepsilon_t$$

<sup>c</sup>|DWCACC| is the absolute residual from the following model:

$$WCACC = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon_t$$

<sup>d</sup>WCACC is the signed residual from the following model:

$$WCACC = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon_t$$

WCACC= Working capital accruals, deflated by total assets.

|WCACC\_ATA| = Absolute working capital accruals, deflated by total assets.

All other variables are defined in Table II.

The reported t-values in parentheses are based on White's (1980) corrected standard errors.

\*, \*\*, and \*\*\* indicate significance at 10%, 5%, and 1% levels, respectively.

**Table VI**  
**Results of two-stage least squares regressions**

Variables	DACC  <sup>a</sup>	DACC <sup>b</sup>
Intercept	0.057 (3.266***)	0.078 (3.418***)
BFA	0.078 (6.047***)	0.091 (5.363**)
AUDSIZE	0.001 (1.852*)	0.001 (1.903)
NEGNI	0.016 (3.142**)	-0.031 (-4.605***)
TACC_ATA	0.101 (3.748***)	-0.201 (-5.652***)
LOGTA	-0.006 (-3.370***)	-0.006 (-2.840)
TL_TA	0.030 (5.183***)	-0.042 (-5.577***)
OC	0.002 (1.285)	0.005 (2.218)
AUDCHANGE	-0.005 (-1.189)	-0.002 (-0.410)
Industry fixed effects	Included	Included
Year fixed effects	Included	Included
N	382	382
Adjusted R <sup>2</sup>	0.309	0.345
F-statistic	9.955***	11.570***

Model:  $|DACC| = a_1 + a_2BFA + a_3AUDSIZE + a_4NEGNI + a_5|TACC\_ATA| + a_6LOGTA + a_7TL\_TA + a_8OC + a_9AUDCHANGE + Industry$   
 Industry and year fixed effects +  $\varepsilon$

<sup>a</sup>|DACC| is the absolute residual from model (1).

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<sup>b</sup>DACC is the signed residual from model (1).

Endogenous variable: BFA

Instrumental variables: AUDSIZE, NEGNI, |TACC\_ATA|, LOGTA, TL\_TA, OC, AUDCHANGE, ATURN, CURRENT, QUICK, ROA, ROA\*NEGNI, CFO, Industry and Year fixed effects

ATURN= Asset turnover, measured as sales divided by average total assets; CURRENT= Current ratio, measured as current assets divided by current liabilities; QUICK= Quick ratio, measured by quick assets divided by current liabilities; ROA = Return on assets, measured as net income divided by average total assets; and CFO = cash flow from operations. All other variables are defined in Table II.

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\*, \*\*, and \*\*\* indicate significance at 10%, 5%, and 1% levels, respectively.

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