Accuracy of earnings forecasts: Evidence from Ghana

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ABSTRACT

This study examines the accuracy of the earnings forecasts contained in the prospectuses for initial public offerings (IPO) and rights offerings (RO) of public companies listed on the Ghana Stock Exchange during the period from 2004 to 2011. The study also examines the bias in those earnings forecasts and the association between the accuracy of the earnings forecasts and the following firm characteristics: age of the firm, firm size, auditor quality, forecast horizon and business risk.

The results indicate that, overall, the earnings forecasts included in the prospectuses are not accurate and tend to be optimistic. However, comparing IPO with RO, the earnings forecasts for RO are more accurate and pessimistic while those for IPO are less accurate and optimistic. Also, whereas there is no significant difference in forecast accuracy between RO and IPO, the same is not true for auditor quality; the Big-4 auditing firms are associated with significant higher forecast accuracy than the Non-Big-4 auditing firms.

Regarding relationships, significant inverse correlations exist between forecast accuracy and two of the firm characteristics: age and size of the firm. However, in explaining the variance in forecast accuracy, the firm characteristics that have significant effect are auditor quality, forecast horizon, and size of the firm. From these results, it is recommended that future investors pay more attention to the age of the firm, size of the firm and auditor quality in evaluating the accuracy of earnings forecasts contained in prospectuses issued for the Ghana Stock Exchange.

Keywords: Earnings forecasts, forecast error, Ghana Stock Exchange.

INTRODUCTION

Located in West Africa, Ghana has an estimated population of 25 million (Central Intelligence Agency) [CIA], 2013). Ghana gained independence from England in 1957 and has been striving to develop a market economy ever since. Over the past 25 years, Ghana's economy dominated by the production of gold, cocoa, and recently oil has been strengthened by sound management and a competitive business environment (CIA, 2013). Ghana's brisk economic growth, averaging more than 8 percent the past five years, political stability, and oil discovery in 2007 have raised its profile among investors (Reuters, 10/31/13). But can investors (both local and foreign) seeking to invest in Ghana through the Ghana Stock Exchange rely on earnings forecasts contained in the prospectuses of companies listed on the exchange? Are these earnings forecasts biased or not, and what are the factors that determine the accuracy of these forecasts?

The Ghana Stock Exchange is relatively small by international standards; it was established in July 1989 and trading commenced in November 1990. As of December 2012, there were 35 companies and 25 collective investment schemes (mutual funds or unit trusts) listed on the exchange. Listings on the exchange are regulated by the Listing Rules of the Ghana Stock Exchange, The Companies Code, Act 179, and L. I. 1728 of the Securities and Exchange Commission Regulations of Ghana, 2003. Company prospectuses provide important source of information for the investors, in that they contain information about the past performance, the present financial situation and expected future direction (Hartnett and Romcke, 2000). In the British Commonwealth Countries (of which Ghana is one) such as New Zealand, Australia, Canada, Malaysia, Singapore and the United Kingdom, disclosure of future earnings forecasts in the prospectuses of initial public offerings is common (Cheng and Firth, 2000).

The accuracy of earnings forecasts in prospectuses for initial public offerings has been studied in several countries (Hartnett and Romcke, 2000; Gounopoulos, 2003; Henry et al, 2002). These studies go back a number of years. However, no such studies have been done to date for Ghana, an emerging economy that has seen a lot of local and foreign investor interest within the past five years owing to its rapid economic growth and discovery of oil. Therefore, this study seeks to examine the accuracy of earnings forecasts contained in prospectuses using evidence from the Ghana Stock Exchange. Also, whereas earlier studies focus primarily on prospectuses issued in connection with initial public offering, this study covers both the earnings forecasts included in prospectuses of initial public offerings and those included in prospectuses of rights offerings as well.

LITERATURE REVIEW

Studies of earnings forecast accuracy have been conducted for British Commonwealth countries (United Kingdom, Canada, Australia, New Zealand, Singapore, Malaysia etc.) going back to several decades (Hartnett and Romcke, 2000; Jog and McConomy (2003); Henry et al, 2002). In these countries, the disclosure of earnings forecast in initial public offering prospectuses is either mandatory (Malaysia and Singapore) or voluntary (Canada, United Kingdom). On the other hand, there have been no such studies for the United States; because of the litigious environment, disclosures of earnings forecasts in prospectuses of American initial public offerings is non-existent (Cheng and Firth, 2000).

In the United Kingdom, Jelic (2007) investigated management earnings forecasts contained in prospectuses prepared for 1660 listings on the London Stock Exchange from 1981

to 2004. He examined the association between the accuracy of management earnings forecasts and the performance (short term and long term) of the related initial public offerings. His results suggested that, in the long run, initial public offers with overly optimistic forecasts underperformed their counterparts with more cautious, pessimistic forecasts. In his view, firms with optimistic forecasts seem to be penalized once the actual earnings were announced.

In Canada where disclosure of earnings forecasts in prospectuses is voluntary, Jog and McConomy (2003) examined the accuracy of earnings forecasts of the prospectuses of 258 firms with initial public offerings on the Toronto Stock Exchange between 1983 and 1994. Their findings indicated that firms which included optimistic forecasts in their prospectuses were penalized significantly in the market place.

Clarkson (2000) studied the link between auditor quality and earnings forecast accuracy for a sample of 96 initial public offerings from 1984-1987 and 81 initial public offerings from 1992-1995 on the Toronto Stock Exchange. His findings revealed that forecast accuracy was negatively related to auditor quality, indicating that Big-6 audit firms were associated with smaller absolute forecast errors than non-Big-6 firms. He also found that the difference between the two regimes was statistically significant.

El-Rajabi and Gunasekaran (2006) examined the prospectuses of 41 newly formed public companies in Amman (Jordan) Stock Exchange during the period from 1992-1996 and tested the accuracy of earnings forecasts and the association between the earnings forecasts and certain firm characteristics. Their results indicated that earnings forecast were overly optimistic (85.4 percent of the sample were optimistic while 14.6 percent were pessimistic) and they postulated that Jordanian companies included optimistic forecasts in their prospectuses in order to attract subscribers to buy stocks.

Hartnett and Romcke (2000) examined the accuracy of both revenue and profit forecasts in a sample of 203 Australian prospectuses from 1991 to 1996. Their findings revealed that 60% of the revenue forecasts and 40 percent of the profit of forecasts were within 10 percent of the actual result. They also investigated 11 variables as potential determinants of revenue and profit forecast error, namely, age, size, forecast interval, equity retained by pre-offer owners, industry conditions, macroeconomic conditions, audit quality, float motive, subscription price, range of activities and international exposure. They found significant association between float motive, auditor quality, industry conditions and forecast errors.

Gounopoulus (2003) also studied the prospectuses of 208 initial public offering on the Athens Stock Exchange (Greece) from 1994-2001 to determine the accuracy of earnings forecast contained in them. They found a mean forecast error of 8.04% and mean absolute forecast error of 42.82%. They also found statistically significant association between the accuracy of the earnings forecast and firm size, retained ownership and cost of going public.

Chen et al, (2001), studied earnings forecasts errors in IPO prospectus and their associations with initial stock returns on the Stock Exchange of Hong Kong. Their sample data consisted of all Hong Kong and Chinese company initial public offer listings during the period 1993 to 1996. They found mean forecast errors of 9.94% and mean absolute forecast errors of 21.96%. Their results showed that the earnings forecasts were relatively accurate, when compared with previous studies, but explaining their variability was difficult and no systematic patterns were observable.

Cheng and Firth (2000), examined the accuracy of profit forecasts made in initial public offers prospectus in Hong Kong. They used 154 initial public offer data on the Hong Kong Stock Exchange from 1992 to 1995. They also examined the bias and rationality in the profit forecasts.

They found a mean forecast error of 9.89%, indicating that actual profits were greater than forecasts, and that the level of accuracy of profit forecasts in Hong Kong was comparable to that for many other countries. They also found a pessimistic bias in the earnings forecasts.

Sun and Xu (2012) investigated whether management earnings forecasts fully incorporate information in historical accounting conservatism. They found that management earnings forecasts are more optimistic for firms with greater accounting conservatism in the previous year.

Finally, Chen and Firth (1999) examined all initial public offerings made on the Shanghai Securities Exchange and Shenzhen Stock Exchange, China, from 1991 to 1996 and which contained profit forecasts in their prospectuses, to assess their accuracy and hence the credibility that could be attached to them. Their results showed that the profits forecasts were moderately accurate. They also found that, on average, the actual profits exceeded the forecasts, however, identifying the reasons for differences in forecast accuracy proved to be difficult.

VARIABLES AND THEIR DETERMINATION

Hartnett and Romcke (2000) have documented the potential determinants of forecast errors investigated in previous studies. There were in all 13 determinants (age, size, forecast interval, industry, macro economic conditions, float year, leverage, auditor quality, underwriter, growth prospects, profit volatility, equity retained and the type of issue). Nine of the previous studies investigated the association of these determinants and forecast errors, with the number of potential determinants used ranging from 2 to 9.

This study uses five of the determinants (type of issue, age, auditor quality, forecast horizon, and size) and an additional variable, the number of risk factors indicated in the prospectuses, to study the accuracy of earnings forecasts contained in prospectuses issued for listings on the Ghana Stock Exchange. These six variables and two additional variables (measuring forecast error and forecast accuracy) are defined below.

Type of Offerings (TYPE)

Earlier studies of forecast errors have mostly focused on initial public offerings. Because rights offerings were common on the Ghana Stock Exchange during the period covered by the study, earnings forecasts in prospectuses of both initial public offerings and rights offerings are used. This approach enriches the earnings forecast literature since studies involving rights offerings are rare (Hartnett and Romcke, 2000). Rights offerings are defined as an offering of common stock to existing shareholders to buy new shares from the company. In Ghana, the prospectus for rights offerings typically ask shareholders not wishing to take up all or part of the offering to renounce their rights so that the shares could be offered to other inventors. It is hypothesized that companies issuing rights offerings are likely to be more mature, have established histories and stable growth patterns, and thus their earnings forecasts are likely to be more precise. Type of offering is a dichotomous variable that takes a value of 0 (if the earnings forecast are included in prospectuses for rights offerings) and a value of 1 (if the earnings forecast are included in prospectuses for initial public offerings).

Auditor Quality (AUD)

Auditor quality is also captured by a dichotomous variable that assumes a value of 1 (if the firm's auditor who examined the earnings forecast is one of the Big-4 firms, namely Price Waterhouse Coppers, Ernest and Young, Deloitte & Touché, and KPMG) and a value of 0 (if the auditor is a Non-Big 4 audit firm). Clarkson (2000) hypothesized that earnings forecasts examined by Big-4 audit firms are more accurate because those firms will endeavor to maintain their reputations by being associated with accurate disclosures.

Forecast Horizon (FH)

Forecast horizon is calculated as the number of years covered by the earnings forecast. Some companies provided 3 years of earnings forecasts while others provided 4 or 5 years. The longer the forecast horizon, the more uncertainty there is. Therefore it is hypothesized that forecasts with longer horizons are more inaccurate (Cheng and Firth, 2000).

Size (SIZE)

Size is defined as the actual total assets of the company as of the forecast date. Since large firms can employ more sophisticated forecast techniques and are able to absorb unexpected financial events and can devote more resources to making forecasts, it is hypothesized that large companies will have more accurate earnings forecasts (Clarkson, 2000; Jog and McConomy, 2003).

Age (AGE)

Age is measured as the time that has elapsed since the company was incorporated. It is hypothesized that the longer the company's operating history, the more accurate is the earnings forecast (Cheng and Firth, 2000; Clarkson, 2000).

Number of Risk Factors (NRF)

The number of risk factors identified and discussed in the offering prospectuses is used as a proxy for business risk. Risk implies uncertainty and this may reduce the accuracy of earnings forecasts. It is hypothesized that a large number of risk factors is associated with a large forecast error (Cheng and Firth, 2000).

Forecast Error (FE)

Some prior studies (Clarkson, 2000; El-Rajabi and Gunasegaram, 2006) defined forecast error (FE) as the difference between the earnings forecast and the actual realized earnings for the forecast period scaled by earnings forecast. Other studies (Cheng and Firth, 2000) scaled the FE by dividing it by the actual realized earnings. Still, in other studies (Hartnett and Romcke, 2000), the scaled FE is converted to percentage. It is the latter approach that is used in this study. Thus, forecast error (FE) and absolute forecast error (AFE) are defined as follows:

$$\text{FE} = \frac{(\text{Actual} - \text{Forecast})100}{\text{Forecast}}$$

$$\text{AFE} = \frac{|\text{Actual} - \text{Forecast}|100}{|\text{Forecast}|}$$

Consistent with previous studies (Cheng and Firth, 2000), FE is used to define the bias in the earnings forecast and AFE is used to define the accuracy of earnings forecast. The bias in the forecast can be pessimistic (indicated by a positive FE) or optimistic (indicated by a negative FE).

HYPOTHESES AND METHODOLOGY

As alluded to earlier, this study seeks to examine (1) the accuracy of the earnings forecasts, (2) the existence of any bias (optimistic or pessimistic), and (3) the relationship between forecast accuracy and the firm characteristics (or variables) defined earlier. Specifically, the following hypotheses are investigated.

H1: The earnings forecasts are accurate.
H2: The earnings forecasts are biased. They are either optimistic or pessimistic.
H3: Rights offerings have higher forecast accuracy than initial public offerings.
H4: Big-4 audit firms are associated with higher forecast accuracy than Non–Big-4 firms.
H5: The older the firm, the more accurate are the earnings forecasts.
H6: The bigger the firm, the more accurate are the earnings forecasts.
H7: Firms with longer forecast horizons have less accurate earnings forecasts.
H8: Firms with large number of business risk factors have less accurate forecasts.
H9: At least one of the six firm characteristics considered in the study has significant effect on forecast accuracy.

The first two hypotheses, H1 and H2, are investigated by examining the descriptive statistics for FE and AFE. Consistent with the literature, earnings forecasts are considered accurate if over 50% of the forecasts are within 10% of the actual earnings. In other words, the earnings forecasts are considered accurate if more than 50% of the AFE values are less than 10%. Whereas AFE measures forecast accuracy, the mean of FE measures the magnitude of the forecast bias and the sign of FE determines the nature of the bias (pessimistic if sign is positive, optimistic if sign is negative).

The third and fourth hypotheses, H3 and H4, are tested using the Two Independent Samples T-test if AFE, the testing variable, is approximately normal or the Mann Whitney U Nonparametric Test if AFE is not normal. The next four hypotheses, H5 to H8, are tested using Pearson correlation (if normality and linearity can be assumed) or Spearman's correlation (if normality and linearity cannot be assumed). The last hypothesis, H9, is tested using multiple linear regression analysis. Since the variables AFE and SIZE tend to be severely skewed (Clarkson, 2000), they are log-transformed for use in the multiple linear regression model as shown below.

$$\ln(AFE) = \beta_0 + \beta_1 TYPE + \beta_2 AGE + \beta_3 AUD + \beta_4 FH + \beta_5 \ln(SIZE) + \beta_6 NRF + e$$

Where:

ln(AFE) = Natural log of the absolute forecast error.
TYPE = Type of offering coded as: 1 (initial public offering) or 0 (rights offering).
AGE = Age of the firm as measured by the number of years since incorporation.
AUD = Auditor quality coded as: 1 (Big-4: KPMG, PriceWaterhouseCoopers, Ernest & Young, Deloite & Touché) or 0 (Non-Big-4 firm).
FH = Forecast horizon as measured by the number of months covered by the earnings forecast.
lnSIZE = Natural log of the size of the firm as measured by total assets of the firm as of the forecast date.
NRF = Number of risk factors identified and discussed in the offering prospectus.

DATA

Prospectuses covering 8 initial public offerings and 6 rights issues on the Ghana Stock Exchange for the period from 2004 to 2011 were examined. The period covered by the earnings forecast for companies ranged from 3 years to 5 years, so in total 55 earnings forecasts were examined. The source of the data was the World Wide Web, the Ghana Stock Exchange website, individual company websites and the website www.annualreportsghana.com. Though the sample size is smaller than that of previous studies, due to limited size of the Ghana Stock Exchange, it is enough to perform statistical analysis. Prior studies have either defined earnings as "net profit after tax" (El-Rajabi and Gunasegaram, 2006) or "net profit before tax" (Clarkson, 2000). In this study earnings are defined as "net profit after tax."

ANALYSIS OF RESULTS

Hypothesis 1:

The frequency distribution of AFE, the variable that measures forecast accuracy, is shown in Table 3. The table shows that only 18.2 % of the AFE values are less than 10%, indicating a lack of forecast accuracy. This contrasts with the results of Hartnett and Romcke (2000) who found that 40% of the earnings forecasts in Australian prospectuses were within 10 percent of the actual earnings but similar to the results of Gounopoulos (2003) who found that 13% of the earnings forecasts for Greek initial public offerings were within 10 percent of the actual earnings. It can also be seen from Table 1 that the mean of AFE is 65.1%, implying that actual earnings were either 65% greater than forecast or 65% lower than forecast. This result is less than the 163.4% reported by El-Rajabi and Gunasekaran (2006) but considerably greater than the 9.89%, 23.1%, and 26.57% reported, respectively, by Cheng and Firth (2000), Clarkson (2000), and Chen et.al. (2001).

Hypothesis 2:

From Table 1, the mean of FE is -22.0% indicating a negative bias or optimistic earnings forecasts. Also from Table 2, 58.2 % of the FE values are negative indicating optimistic forecasts while 41.8% of them are positive indicating pessimistic forecasts. Thus overall, the earnings forecasts are optimistic. These results compare with those reported for Jordan by El-Rajabi and Gunasekeran (2006) who obtained mean FE of -147.2% with 14.6% of the forecasts pessimistic and 85.4% optimistic. This result is also similar to those reported in other international studies, suggesting management tendency to be optimistic in their earnings forecasts.

Hypothesis 3:

From Table 4, the mean FE for rights offerings is 27.2% and that for initial public offerings is -45.98%. This means the earnings forecasts for rights offerings are cautious or pessimistic while earnings forecasts for initial public offerings are optimistic. Considering forecast accuracy, the mean of AFE is 57.5% for rights offerings and 68.8% for initial public offerings. Thus, the forecasts for rights offerings are slightly more accurate than those for initial public offerings. However, the difference is not statistically significant (p-value = .542) from the Mann-Whitney U test results.

Hypothesis 4:

From Table 5, the mean FE for forecasts examined by the Big-4 audit firms and the Non-Big-4 firms are -8.8% and -40.4%, respectively. This shows both forecasts are optimistic but the magnitude of the bias is greater for the Non-Big-4 audit firms. With respect to forecast accuracy, the mean of AFE is 38.7% for the Big-4 audit firms and 101.8.8% for the Non-Big-4 audit firms. The Mann-Whitney U test results show that the difference in the forecast accuracy is statistically significant (p-value = .004). Thus, the forecasts examined by the Big-4 audit firms are more accurate than those examined by the Non-Big-4 audit firms. These results are similar to those reported by Clarkson (2000).

Hypotheses 5, 6, 7, and 8:

The Spearman's correlation coefficients between forecast accuracy (AFE) and AGE, SIZE, FH, and NRF are shown in Table 6. The signs of all the correlations are negative as hypothesized. Furthermore, significant inverse relationships (at the 5% level) exist between (1) AFE and AGE (p-value = .016) and (2) AFE and SIZE (p-value = .000). Thus, Hypotheses 5 and 6 are confirmed but not Hypotheses 7 and 8.

Hypothesis 9:

An initial regression analysis showed TYPE having a high Variance Inflation Factor (VIF) of 3.104 (the largest VIF in the group). Therefore, to avoid collinearity, TYPE was excluded from the regression model. The resulting ANOVA Regression results (Table 7) show that a significant relationship (p-value = .000) exists between lnAFE and at least one of the following variables: AGE, AUD, FH, lnSIZE and NRF. This confirms Hypothesis 9.

Furthermore, the R^2 of .357 and adjusted R^2 of .291 are comparable to those in prior studies: El – Rajabi and Gunasekaran reported R^2 of 0.357 and adjusted R^2 of 0.221; Hartnett and Romcke reported R^2 of 0.2118 and adjusted R^2 of 0.1268. In general, low explanatory power is not uncommon in studies of the accuracy of earnings forecasts (Gounopoulos, 2003).

Finally, from Table 8, the variables FH (p-value = .043), AUD (p-value = .018), and lnSIZE (p-value = .024) have significant effect on lnAFE, with lnSIZE being the most important followed by AUD. They also have the expected negative sign. Thus, forecasts based on shorter forecast horizon, forecasts examined by the Big 4 audit firms, and forecasts by larger companies are all associated with lower forecast errors. This confirms the hypotheses outlined in this study, and is consistent with the results of previous studies, for example, (Hartnett and Romcke, 2000).

CONCLUSION

This study examines the accuracy of the earnings forecasts contained in the prospectuses of 14 public companies, 8 with Initial Public Offerings (IPO) and 6 with Rights Offerings (RO), listed on the Ghana Stock Exchange during the period from 2004 to 2011. The study also examines the bias in those earnings forecasts and the association between the accuracy of the earnings forecasts and the following firm characteristics: age of the firm, firm size, auditor quality, forecast horizon and business risk.

From the results, it is concluded that the earnings forecasts are not accurate because only 18.2 % of the absolute forecast errors are less than 10%. In fact, actual earnings were either 65% greater than forecasts or 65% lower than forecasts. This result is better than the Greek study (Gounopoulos, 2003) but worse than the results obtained by Hartnett and Romcke (2000), Cheng and Firth (2000), Clarkson (2000), and Chen et.al. (2001).

The mean forecast error of -22.0% (with 58.2% of the forecasts optimistic and 41.8% pessimistic) shows an overall optimistic bias in the earnings forecasts. This result compares with that reported for Jordan by El-Rajabi and Gunasekeran (2006) who obtained a mean forecast error of -147.2% (with 14.6% of the forecasts pessimistic and 85.4% optimistic). This result is also similar to those reported in other international studies, suggesting management tendency to be optimistic in their earnings forecasts.

Comparing rights offerings with initial public offerings, the earnings forecasts for rights offerings are more accurate and pessimistic while those for initial public offerings are less accurate and optimistic. However, the difference in forecast accuracy between the two is not significant. This part of the study is new and an enhancement to the literature on earnings forecasts because only initial public offerings were used in the literature reviewed.

On auditor quality, it is concluded that the Big-4 auditing firms are associated with significant higher forecast accuracy than the Non-Big-4 auditing firms.

Regarding relationships, significant inverse correlations exist between forecast accuracy and two of the firm characteristics: age and size of the firm. However, in explaining the variance in forecast accuracy, the firm characteristics that have significant effect are auditor quality, forecast horizon, and size of the firm. From these results, it is recommended that future investors pay more attention to the age of the firm, size of the firm and auditor quality in evaluating the accuracy of earnings forecasts contained in prospectuses issued for the Ghana Stock Exchange.

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APPENDIX

TABLE 1: Descriptive Statistics: FE and AFE

Variables	Mean	Minimum	Maximum	Standard Deviation
FE	-22.0	-532.7	409.8	114.8
AFE	65.1	0.68	532.7	96.7

TABLE 2: Frequency Distribution: FE

Class Limits	Frequency	Percent
FE > 100	2	3.6
25 – 100	10	18.2
10 – 25	5	9.1
0 – 10	6	10.9
-10 – 0	4	7.3
-25 - -10	7	12.7
-100 - -25	15	27.3
FE ≤ -100	6	10.9

TABLE 3: Frequency Distribution: AFE

Class Limits	Frequency	Percent
AFE > 100	8	14.6
50 – 100	11	20.0
25 – 50	14	25.4
10 – 25	12	21.8
0 –10	10	18.2

TABLE 4: Rights Offerings vs. Initial Public Offerings

TYPE	Item	FE	AFE	Mann-Whitney U Test p-value
0	N	18	18	.542
	Mean	27.236494	57.532646	
	Standard Deviation	109.2872853	96.0440657	
1	N	37	37	
	Mean	-45.980836	68.759847	
	Standard Deviation	110.9925504	98.1481777	

0 – Rights Offerings
1 – Initial Public Offerings

TABLE 6: **Correlations**

Spearman's Rho		AGE	NRF	FH	SIZE	AFE
AGE	Correlation Coefficient	1.000	-.031	.147	.249*	-.288*
	p-value (1-tailed)	.	.412	.142	.033	.016
	N	55	55	55	55	55
NRF	Correlation Coefficient	-.031	1.000	.285*	.153	-.104
	p-value (1-tailed)	.412	.	.017	.133	.226
	N	55	55	55	55	55
FH	Correlation Coefficient	.147	.285*	1.000	-.210	-.209
	p-value (1-tailed)	.142	.017	.	.062	.063
	N	55	55	55	55	55
SIZE	Correlation Coefficient	.249*	.153	-.210	1.000	-.435*
	p-value (1-tailed)	.033	.133	.062	.	.000
	N	55	55	55	55	55
AFE	Correlation Coefficient	-.288*	-.104	-.209	-.435**	1.000*
	p-value (1-tailed)	.016	.226	.063	.000	.
	N	55	55	55	55	55

TABLE 5: Big-4 vs. Non-Big-4 Audit Firms

AUD	Item	FE	AFE	Mann-Whitney U Test p-value
0	N	23	23	.004
	Mean	-40.376467	101.805002	
	Standard Deviation	162.7108465	131.6959383	
1	N	32	32	
	Mean	-8.824228	38.693341	
	Standard Deviation	61.0883737	47.6098481	

0 – Non-Big-4 audit firms
1 – Big-4 audit firms

*. Correlation is significant at the 0.05 level (1-tailed).
**. Correlation is significant at the 0.01 level (1-tailed).

TABLE 7: ANOVA Regression

Model	Sum of Squares	df	Mean Square	F	p-value
Regression	34.919	5	6.984	5.431	.000
Residual	63.003	49	1.286		
Total	97.922	54			

a. Dependent Variable: lnAFE
b. Predictors: AGE, NRF, AUD, FH, lnSIZE
c. R^2 = .357
e. Adjusted R^2 = .291

TABLE 8: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	8.576	1.459		5.877	.000		
AGE	-.013	.011	-.144	-1.149	.256	.832	1.201
NRF	.044	.058	.094	.761	.450	.862	1.160
AUD	-.813	.333	-.301	-2.439	.018	.865	1.156
FH	-.368	.177	-.259	-2.077	.043	.843	1.187
lnSIZE	-.175	.075	-.315	-2.330	.024	.717	1.394