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Earnings informativeness and trading frequency: Evidence from African markets

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Abstract

We investigate the informativeness of earnings announcements in African stock markets and examine whether, conditional on the level of synchronicity and liquidity of stocks, market reactions are influenced by earnings characteristics. Normalized volatility indicates that earnings announcements are informative across the sample. The results are driven by less frequently traded stocks and informativeness manifests more clearly at announcement and in the post-announcement window. There is little evidence of leakage. Informativeness is also present for highly traded stocks, notably after announcement. Cross-sectional tests provide evidence of an effect of both earnings fundamentals and investor behaviour on stock returns around earnings announcements.

KEYWORDS

Africa, earnings, informativeness, market efficiency, trading frequency

1 | INTRODUCTION

The relationship between earnings and stock prices is one of the cornerstones of finance and corporate governance. According to the efficient market hypothesis, stock prices should quickly and accurately incorporate new information about a company when such information becomes publicly available (Fama, 1970). If the value of a company is the discounted value of future earnings (Gordon, 1959) then new earnings information should be reflected in stock prices. In developed markets, stock prices are generally considered to exhibit semi-strong form efficiency (Morck, Yeung, & Yu, 2000). In developing markets, stock prices have been described as 'synchronous', that is, stock prices move at the same time as markets (Morck et al., 2000). The purpose of this study is to test the informativeness of earnings announcements, measured as the stock market reaction to earnings announcements in the context of a set of developing and emerging African markets. In particular, we examine the boundary between synchronicity and earnings informativeness as trading frequency of companies increases.

To investigate the informativeness of earnings announcements, we collect a large set of corporate annual earnings announcements from companies in three common law African countries.[1] We then examine whether market reactions are associated with synchronicity, trading frequency, firm fundamentals, or earnings characteristics that we consider to be behavioural in nature. Our results show that earnings announcements are informative in all three of our countries, but the impact of earnings characteristics varies by country. Informativeness of earnings is strongly influenced by the level of trading frequency. We find that the magnitude of earnings affects trading volume but not price in our Kenyan sample whilst both price and trading volume are affected by the size of earnings in Nigeria. Price and trading volume are associated with changes in earnings and

changes from negative to positive earnings, respectively, in the South African sample. We find little support for an impact of synchronicity in our cross-sectional analysis but some evidence of the impact of trading frequency. Notably, less frequently traded stocks are associated with greater earnings informativeness. More highly traded stocks are less associated with earnings informativeness which may indicate synchronicity, leakage or even a stabilising presence such as block holders.

Synchronous trading implies that prices will be less related to corporate fundamentals and more sensitive to market-wide factors (Morck et al., 2000). Due to low levels of trading frequency in developing markets, stock prices may not quickly or accurately reflect new firm-specific information. The liquidity of stocks plays an important role in the general determination of asset prices and stock returns (Bekaert, Harvey, & Lundblad, 2007). The importance of liquidity in influencing stock returns dates back to the work of Amihud and Mendelson (1986), who argue that, expected returns of stocks are an increasing concave function of liquidity. Amihud (2002) also finds that expected returns increase with illiquidity. The implications of liquidity for stock returns may therefore be extended to the informativeness of corporate information which measures how stock returns are affected by such corporate information (e.g., earnings announcements). We examine how liquidity and earnings information interact to affect the pattern of returns around corporate earnings announcements.

When markets are efficient, investors, safe in the knowledge that they have the protection of market liquidity, will be willing to commit their funds to listed companies. Consequently, outside investors will receive weak protection from expropriation by insiders and new investment will be discouraged if earnings information does not inform stock prices. Despite the important implications for investor protection and attraction of investment funds, the impact of synchronicity on market reactions to corporate announcements remains relatively unexplored. Yet arguably the most important channel of communication of company performance between managers and shareholders and, by implication, investor protection is the annual earnings announcement. Following the categorisation suggested in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) we choose common law (rather than civil law) countries in Africa. These countries have market-based systems of governance in which stock prices and information efficiency form a key component of investor protection. Bank-based, civil law or other non-market-based systems of corporate governance would have different implications for stock prices and liquidity. Using our sample of African markets, we conduct a detailed examination of the role of earnings fundamentals whilst controlling for synchronicity and trading frequency.

Although there have been a number of studies of market efficiency in African companies, attention has been primarily on weak rather than semi-strong form market efficiency (Appiah-Kusi & Menyah, 2003; Jefferis & Smith, 2005; Lagoarde-Segot & Lucey, 2008). As African markets develop, it is important to extend analysis to the informativeness of new publicly available information. The information efficiency of stock markets is crucial if African markets are to attract new investment. The African continent is increasingly becoming a viable destination for multinational companies. According to World investment report 2019, issued by United Nations Conference on Trade and Development, UNCTAD (2019), Africa attracted $46 billion foreign direct investment (FDI) in 2018, an increase of 11% compared to 2017. The three countries in our study—South African, Nigeria and Kenya—are major destinations for foreign investors in Africa. In addition, Nigeria and Kenya are the largest economies in Africa and Eastern Africa, respectively, whilst South Africa has the most developed market on Africa continent. The continued attractiveness of African markets as a destination for both foreign direct and portfolio investors can be confirmed by empirical work which emphasize incremental improvements in market efficiency. For markets to play their disciplinary role effectively, corporate information such as earnings should not only be credible but released on a timely basis.

The lack of evidence has largely been due to data limitations and general illiquidity of most African stock markets (Assefa & Mollick, 2014). Another important factor has been the poor quality of data provided by corporate news providers in Africa. Griffin, Hirschey, and Kelly (2011) show that earnings and other corporate news announcements are more informative in countries with greater media sophistication and technology. A third factor is the unavailability of earnings forecasts data due to the poor coverage of African companies by financial analysts. The few studies that have examined the stock price reaction to corporate announcements by African companies such as earnings find little evidence to support the view that news regarding African firms carries information content (Afego, 2013; Osei, 2002). Consistent with data constraints, samples used in these studies have been small. However, in recent years, some African stock markets have taken steps to improve the provision of value-relevant corporate information. For example, some stock markets in Africa now have electronic trading systems that enable investors and other market participants to obtain information on a real-time basis. The websites of African stock exchanges now contain sections for company announcements, many of which qualify as price sensitive under the current regulation. Such recent

development of African markets enables closer investigation of information efficiency and the desirability of African markets as an investment prospect.

Overall, this article provides new evidence on how African markets respond to new value-relevant information. Whilst we do not find significance of the proxy for synchronicity around corporate earnings releases, we do find that more highly traded stocks are less responsive to new earnings information, which provides circumstantial support for the argument that company earnings are less important than market movements in pricing more liquid African stocks. The important role of illiquidity in asset-pricing in developing markets is recognized in studies such as Hearn, Piesse, and Strange (2010) who examine illiquidity and the cost of capital in African markets, and Murg, Pachler, and Zeitlberger (2016), who investigate stock price implications of analyst recommendations in Austrian firms. Further, Ibbotson, Chen, Kim, and Hu (2013) argue that trading strategies can be constructed based on liquidity in a similar manner to size, value/growth or momentum strategies. We extend the understanding of liquidity and informativeness of earnings by providing evidence in the context of developing African markets. Finally, we contribute to the broader literature on market efficiency and investor protection in developing countries. Financial development will follow from strong investor protection and market efficiency is of paramount importance as a mechanism for investor protection in developing markets. Markets, developing or otherwise, will only attract investment funds if investors believe that market values reflect the value of companies and if the market is sufficiently liquid to ensure shareholders can sell their stocks cheaply and quickly. The responsiveness of markets to earnings information provides evidence of an efficient market and investor protection. Our results suggest that, whilst earnings are informative across the sample, work is needed to improve investor protection in the African markets.

The rest of this article is organized as follows. Section 2 provides a review of the related literature. The hypotheses are presented in Section 3. Section 4 describes the data and our empirical design. The results are presented in Section 5. Section 6 contains a short discussion of robustness and the conclusion is in Section 7.

2 | LITERATURE REVIEW

2.1 | Price reactions to earnings announcements

Whilst earnings are an important mechanism for ensuring accountability, they also give an indication of the future earnings of companies. If the value of a company is the sum of discounted future earnings, then information on the value of future earnings is required for markets to accurately price firms. To be more precise, the value of a company is the discounted value of future cash flows and earnings are simply the operating cash flows after accounting adjustments. Historic earnings may even be a more accurate predictor of future operating cash flows than historic cash flows (Dechow, Kothari, & Watts, 1998).

New information about future earnings will affect the demand for stocks and hence the market value of the firm. Berkman, Dimitrov, Jain, Koch, and Tice (2009) argue that earnings announcements help to reduce variation in opinions among investors which ultimately increases the accuracy of valuations. In an extensive study of how markets react to different categories of press releases by U.S. firms, Neuhierl, Scherbina, and Schlusche (2013) find that reporting of weak financial results are accompanied by negative market reactions on average whilst stronger financial reports trigger positive cumulative abnormal returns (*CAR*s). These findings are not only intuitive but also consistent with the literature on positive earnings surprises (Kothari, 2001; Vega, 2006).

New information conveyed by earnings to the market causes investors to actively seek information during the pre-event window (Park & Lee, 2014). This results in information asymmetry as investors vary in their ability to acquire and process information. Park and Lee (2014) also report that different types of investors, particularly institutional investors, trade profitably around earnings announcements. This trading takes place around both negative and positive earnings surprises. Ball and Shivakumar (2008) however find that on average, earnings announcements contain approximately 1–2% of total information available in the stock market, indicating that the amount of incremental information revealed by earnings announcements is modest at best. They suggest three reasons for this phenomenon. First, whilst the revision in share prices occurs at a relatively higher frequency, accounting earnings by their nature are low frequency. Second, earnings releases, unlike other firm information, are not discretionary and are released regardless of whether or not there is new information to report. Finally, unlike other corporate information, earnings information is backward rather than forward-looking. These views are discussed further by Ball (2013) who argues that as opposed to providing substantial new information, earnings provide 'confirmation' of the firm's financial reporting framework in order to discipline insider activities by managers, that is, earnings provide little new information but are primarily a mechanism for ensuring accountability.

Zhang, Cai, and Keasey (2013) attribute the market reaction to earnings news to the impact of information

risk and transaction costs. They argue that information risk increases the relative significance of public news announcements which makes traders react more strongly. Thus, the initial market reaction to earnings announcements is greater for higher information risk firms. On the other hand, transaction costs, which are partly induced by information risk, mitigate the initial market reaction to earnings leading to higher subsequent post-earnings announcement drift.

The market reaction to earnings announcements is however not restricted to price changes around the earnings announcement, especially when price changes do not reflect the reactions of investors to the earnings announcements (Barron, Schneible Jr, & Stevens, 2016). Trading volume around announcement dates provides an alternative approach to determining if earnings announcements or other financial disclosures affect trading behaviour (Bamber, Barron, & Stevens, 2011). Moreover, since investors may have individual expectations prior to earnings news releases, the arrival of new information elicits a revision of these expectations. Increased trading would be expected as investors rebalance portfolios (Kim & Verrecchia, 1991). Harris and Raviv (1993) and Kandel and Pearson (1995) further argue that investors use different techniques to analyse the same information, which is likely to generate trading activity, especially when the information is material.

The importance of the annual earnings announcement as a major form of corporate news is further demonstrated in a study by Boulland and Dessaint (2017) who find that investors react not only to earnings announcements but even to press releases by firms which give notice of their upcoming earnings announcement dates.

2.2 | Cross-country variations in reactions to earnings announcements

Although there is a large empirical literature that shows earnings announcements have information content (Beaver, 1968; Kothari, 2001; Neuhierl et al., 2013), cross-country studies of market reactions to corporate information in general and, more particularly, earnings announcements reveal substantial variation between countries. Indeed, some countries, particularly emerging countries, exhibiting little or no reaction at all (DeFond, Hung, & Trezevant, 2007; Griffin et al., 2011). Griffin et al. (2011) find that differences in market reactions to earnings announcements across countries are driven by differences in public news dissemination prior to the event including levels of insider trading, quality of news transmission mechanisms and accounting quality.

Bhattacharya, Daouk, Jorgenson, and Kehr (2000) argue that since insiders trade on private information, prices are likely to incorporate value-relevant information before such information is made public which ultimately leads to fewer or no public announcements of firm information. Given the lack of new information in such cases, market reactions would be expected to be small. Consistent with this view, DeFond et al. (2007) find that in countries with stronger enforcement of insider trading laws and general investor protection mechanisms, earnings announcements have greater information value.

Another influence of the information content of earnings is the quality of the financial reporting system. Eiler, Miranda-Lopez, and Tama-Sweet (2015) and Olibe (2016) find that financial reporting standards and changes in regulations also affect the market reactions to earnings announcements. Landsman, Maydew, and Thornock (2012) find that the information content of earnings increased after the mandatory adoption of International Financial Reporting Standards (IFRS). Similarly, firms in IFRS adopting countries exhibit greater information content of earnings when compared to non-IFRS adopting countries. The effect becomes more pronounced when IFRS adoption is combined with strong enforcement of regulations. Landsman et al. (2012) suggest that the informativeness of earnings after the adoption of IFRS is driven by the reduction in the reporting lag, increased analyst following and increased FDI.

Pevzner, Xie, and Xin (2015) examine international differences in the information content of earnings and find investors' perception of the trustworthiness of earnings to be an important determinant of how investors react to corporate earnings announcements. Although there are different dimensions of national culture that explain market reactions to firm disclosures, Pevzner et al. (2015) identify trust as the most significant because it fundamentally underpins many economic transactions. They argue that trust is positively associated with investors' reactions to corporate earnings announcements. For countries with weaker investor protection mechanisms and disclosure requirements, the relationship between trust and market prices is more pronounced as trust could substitute for more formal mechanisms.

2.3 | Market efficiency in African markets

Studies on market efficiency in African markets have been limited to tests of the weak form hypothesis. The evidence does not support a clear conclusion. For example, Magnusson and Wydick (2002) find evidence of weak form efficiency in Botswana, South Africa, Kenya,

Nigeria and Mauritus whilst Appiah-Kusi and Menyah (2003) find weak form efficiency in Morocco and Zimbabwe. On the contrary, Lagoarde-Segot and Lucey (2008) find markets to be weak form inefficient in Tunisia, Egypt and Morocco whiles Nwosu, Orji, and Anagwu (2013) make similar findings in Egypt, South Africa, Kenya and Nigeria.

Few studies examine market efficiency in terms of how stock markets react to corporate information such as earnings announcements (Afego, 2013; Osei, 2002). The lack of evidence can be attributed to problems of data availability. Another problem may be the low levels of liquidity. Nonetheless, Hearn et al. (2010) have shown that illiquidity can play an important role in pricing of African stocks. Osei (2002) examines the market reaction to company annual earnings announcements in Ghana and find limited evidence of slow market reactions to both favourable and unfavourable earnings releases. Similar findings are presented by Afego (2013) who finds a generally negative reaction of the Nigerian market irrespective of whether earnings are favourable or unfavourable.

3 | HYPOTHESIS DEVELOPMENT

3.1 | Are earnings informative in African markets?

Although there is a large literature on market responses to earnings announcements, evidence on earnings informativeness in an international context is in its infancy (Landsman et al., 2012). Due to structural changes such as financial development and changes to accounting rules and enforcement, research on the role of earnings in emerging markets remains topical. Effective structures in developed countries facilitate the price discovery process, enhancing market efficiency in these markets through frequent trading. However, according to Griffin, Kelly, and Nardari (2010), when the information environment is saturated, investors may not be able to process all information efficiently leading to under-reaction to earnings and related announcements. On the other hand, there may be little or no reaction at all to earnings announcements in developing countries which have considerably weaker information environments. Again, Griffin et al. (2010) recognize that this might be, at least partly, attributed to higher transaction costs. Such structural factors also include synchronicity and illiquidity, as identified by Bhattacharya et al. (2000), who argue that stock prices in less developed countries may not react to corporate news because: (a) the stock market in question is generally informationally inefficient; (b) firms in the market do not make value-relevant announcements; (c) the news announced may have been completely anticipated; or (d) insider trading prohibitions may be non-existent or not enforced. On this, Morck et al. (2000) argue poorer protection of investors and property rights makes firm level information less useful to traders which in turn reduces the incorporation of firm level information into stock prices. However, given that most African stock markets have made improvements their stock market operations including the introduction of electronic trading platforms, we hypothesize that earnings announcements in African markets carry information content relevant to market valuation.

H1 Earnings announcements are informative.

3.2 | Is earnings informativeness associated with trading frequency?

Our second hypothesis tests the association between earnings' informativeness with trading frequency. Trading frequency proxies for liquidity and market vigilance which would be expected to be associated with synchronicity on the one hand and earnings informativeness on the other. Specifically, we establish two competing hypotheses: the new information hypothesis and the synchronous trading hypothesis. The new information hypothesis indicates that the increasing level of trading frequency leads to a higher level of earnings' informativeness. Brogaard, Hendershott, and Riordan (2014) examine the role of high frequency trading on price discovery. They find that high frequency trading facilitates informativeness of public announcements. They argue that high frequency trading dealers compete with each other to drive new information into assets prices. Following such a point of view, we expect that the trading frequency is positively related to earnings' informativeness. On the other hand, synchronous trading hypothesis suggests that the increasing level of trading frequency actually lowers the level of earnings' informativeness. Weller (2018) argues that the popularity of high frequency trading (e.g., algorithmic trading) discourages the acquisition of new information. He documents a negative relation between algorithmic trading activities and informativeness of earnings disclosure. The possible explanation is that high frequency trading lowers the profitability of trading on new information, hence lowering the desire to acquire as well as the quantity of new information incorporated. Following these arguments, we expect that the trading frequency is negatively related to earnings' informativeness, that is, the stock return will be more synchronous with market returns if trading frequency increases. Since

these hypotheses are competing, we do not predict the direction of the relationship between earnings informativeness and trading frequency in our second hypothesis.

H2 Earnings informativeness is associated with trading frequency.

3.3 | The role of company fundamentals

Our next set of hypotheses specifically tests the informativeness of earnings characteristics. Since the value of common stock can be interpreted as being the discounted value of all future cash flows, earnings are central to the valuation of common stock (Beaver, 1968). Earnings are the cash flows of firms after the application of accounting conventions and are the primary figure reported to shareholders as a measure of profitability. Hence, we focus on earnings for informativeness in our markets. But as Beaver (1968) observes, earnings are only valuable if they have information content. For this set of hypotheses, we focus on earnings variables which directly indicate the level or future growth of profitability. We include four hypotheses relating to earnings informativeness. There are a number of reasons why earnings responses may not be associated with market response in a consistent manner (Bhattacharya et al. (2000). Markets may be inefficient at processing such information and maybe rely on heuristics when judging the value of information. Market efficiency may also be compromised by leakage or anticipation of information which may be exacerbated by weak investor protection in the form of regulation and enforcement of insider trading rules (La Porta et al., 2000). The last of Bhattacharya et al.'s (2000) observations, in our case, that earnings announcements carry no new price-relevant information, is the least likely. Hypothesis H3 examines the effect of earnings on market reactions whilst Hypothesis H4 tests the association between market reactions to earnings announcements and the growth in earnings. The final two 'informativeness' hypotheses are to test whether investors respond to changes in earnings from negative to positive and vice versa. Investors may be more concerned about loss aversion than specific detail of earnings announcements which may not be simple to decipher. Informativeness may be higher for announcements which indicate a change in earnings from formerly positive earnings to negative earnings Pinello (2008). However, studies such as Bartov, Givoly, and Hayn (2002) and Kasznik and McNichols (2002) find asymmetric reactions to earnings surprises with greater market reactions to positive news.[2] Our second set of hypotheses is as follows:

H3 Market reactions to earnings announcements are positively associated with the magnitude of announced earnings.

H4 Market reactions to earnings announcements are positively associated with positive changes in earnings relative to the previous year.

H5 Market reactions to earnings announcements are positively related to changes in earnings from negative to positive.

H6 Market reactions to earnings announcements are negatively associated with changes in earnings from positive to negative.

4 | DATA AND METHODOLOGY

To assess the impact of earnings announcements on stock prices, an initial sample of 4,088 earnings announcements by 640 firms across five countries (Botswana, Ghana, Kenya, Nigeria and South Africa) was collected from Datastream for the period 2005–2015. However, 17 companies (81 announcements) were excluded due to missing return data.[3] A further 16 announcements were dropped due to contamination (major confounding events) relating to other corporate events that were identified when cross-checking announcements from stock websites of stock markets, resulting in a sample of 3,991 annual earnings announcements.[4] A potential concern with this sample may lie in the inclusion of South Africa, which some might consider to bear some semblance to developed countries. However, there is evidence that the South African market is equally characterized by weaker implementation and enforcement of regulation, as well as being smaller and relatively less liquid compared to developed markets (Institute of International Finance, 2007).

In order to capture the impact of information on stock prices, stocks must be actively traded. In particular, thin-trading and illiquidity confound estimation of value implications of earnings information. We select our sample of earnings announcements based on a measure of liquidity proposed by Bekaert et al. (2007)—the percentage of non-zero returns. Lesmond (2005) argues that this measure provides a comprehensive estimate of liquidity as it implicitly incorporates spreads, commission costs, expected price impact and opportunity costs of informed trading. Moreover, in a study of African markets, which include those in our sample, Hearn and Piesse (2013) find that non-zero return days is a better approach to capturing equity market liquidity, compared to alternative

measures such volume-based turnover ratios. Following Griffin et al. (2011), we require stocks to have experienced price changes (non-zero returns) in at least 50% of the trading days in the prior year. By applying this filter, we arrive at a total of 1,762 announcements from three countries (Kenya, Nigeria and South Africa).[5] Although this approach has resulted in a significant reduction in sample size in terms of both announcements and countries, our final sample provides us with a more appropriate basis to examine how stock prices react to corporate information. Bartholdy, Olson, and Peare (2007), who investigate event study methodology in smaller markets, recommend that results should be presented separately for highly traded stocks and less traded stocks. Following this approach and in an attempt to further examine whether information content is associated with liquidity and frequency of trading, we split our selected announcements into two categories by using threshold percentages of non-zero returns. Our categories are *High Trading Frequency* (*HTF*) which represents announcements by companies whose stocks experienced price changes on at least 75% of trading days in the previous year. The second category is the *Medium Trading Frequency* set (*MTF*) which comprises companies whose stocks traded less than 75% of days in the previous year but more than 50%. It is important to note that the classification is conducted in relation to earnings announcements rather than companies. Hence, a company may be considered as *HTF* in one period but *MTF* or excluded in another period. Table 1 presents the number of earnings announcements by country and year and by categories. One notable observation is the dominance of earnings announcements by South African firms in the sample. For this reason, we conduct our analysis on a country by country basis to ensure that our conclusions are not necessarily driven by the influence of South Africa in the sample.

Firm level data and return indices are obtained from Datastream. These include stock returns and firm financial data (accounting variables). We use daily stock returns (excluding weekends and holidays). Return indices are adjusted for dividends and other changes in capitalisation. For each country, the S&P Broad Market Index (BMI) is used. These indices are computed based on domestic publicly listed companies to reflect at least 80% of the domestic market subject to size and liquidity criteria.

As our main aim is to examine the information content or lack thereof of earnings announcements, we use the absolute value of the market-adjusted abnormal returns as a measure of volatility around the earnings announcement. Following the approach adopted by Griffin et al. (2011), we compute normalized volatility (*NormalisedVol*) which measures whether volatility

TABLE 1 Distribution of earnings announcements

Panel A Year	Country			
	Kenya	Nigeria	South Africa	Total
2005	3	1	77	81
2006	8	5	120	133
2007	16	15	130	161
2008	24	14	149	187
2009	29	9	158	196
2010	29	12	130	171
2011	32	45	128	205
2012	33	28	123	184
2013	22	29	119	170
2014	28	32	140	200
2015	17	28	29	74
Total	241	218	1,303	1,762
Panel B				
	Country			
Year	Kenya	Nigeria	South Africa	Total
HTF	19	36	133	188
MTF	222	182	1,170	1,574
Total	241	218	1,303	1,762

Note: This table presents number of earnings announcements between 2005 and 2015 for our sample countries. Panel A presents the number of earnings announcements by country and by year. Panel B presents the number of earnings announcements categorized according to price changes in the previous years (percentage of non-zero returns in the previous year). HTF (high trading frequency) represents announcements by firms which had a price change on at least 75% of trading days in the previous year. MTF (medium trading frequency) represents announcements where firms had a price change of between 50% and 74.99% of trading days in the previous year.

within the event window is greater than volatility during normal periods (a period outside the event window). Intuitively, if volatility is found to be greater in the event window than during normal periods, earnings are deemed to have information content. The period outside of the event window includes a period prior to the beginning of the event window and a period after the end of the event window. Given that trading and news transmission mechanisms are still not sophisticated in many developing markets, we use a slightly bigger event window (−10,+10) than those used in more developed markets as our main event window. However, we also present normalized volatility for other event windows. Our pre- and post-event windows are each is made up of 60 days.

Normalized volatility is therefore computed as:

$$NormalisedVol = \left(\frac{EventVol}{NormalVol} \right) - 1 \qquad (1)$$

where

$$EventVol = \frac{1}{N} \sum_{i=1}^{N} \frac{1}{21} \sum_{t=-10}^{10} |AR_{it}| \qquad (2)$$

and

$$NormalVol = \frac{1}{N} \sum_{i-1}^{N} \frac{1}{120} \left(\sum_{t=-11}^{-70} |AR_{it}| + \sum_{t=11}^{70} |AR_{it}| \right) \qquad (3)$$

In our multivariate analyses, we determine the impact of earnings characteristics on abnormal returns by estimating the following model for firms in each country.

$$\begin{aligned} CAR_{it} = {} & Earning\ Characteristics_{it} + Trading\ Frequency_{it} \\ & + Synchronicity_{it} + Firm\ Size + Log(Age)_{it} + Leverage_{it} \\ & + Reporting\ Lag_{it} + Industry + Year + \varepsilon_{it} \end{aligned}$$
$$(4)$$

where for a sample firm i: *CAR* is the cumulative abnormal returns to earnings at year t.

Earnings Characteristics include the magnitude of earnings (*Earnings*), *Earnings Growth*, *Positive to Negative* and *Negative to Positive*. *Earnings* is computed as earnings in year t scaled by total assets. In any framework for determining the informativeness of earnings, the relative size of earnings is relevant because earnings form an important component of the valuation of common stock (Beaver, 1968). *Earnings Growth* is the change in earnings scaled by total assets. In the absence of analyst forecasts of earnings, we use the preceding year's earnings as an indication of expected earnings. *Negative to Positive* is an indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise. *Positive to Negative* is an indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise. These two dummy variables are constructed to help capture asymmetric reactions to changes in earnings. Bartov et al. (2002) and Kasznik and McNichols (2002) argue that there are differences in reactions between negative and positive surprises to earnings news.

Trading Frequency is an indicator variable that takes the value of 1 if the firm is in the *HTF* (>75%) category

and 0 if in the *MTF* (50–74%) category. We construct this variable in the spirit of Bartholdy et al. (2007) to capture the different levels of trading frequency and liquidity.

Synchronicity is the R^2 obtained from a regression of the daily returns of individual stock returns in each year against the returns on the market for the corresponding period. R^2 is a popular measure of synchronicity as it measures the amount of variation of a stock price that is associated with the market (Morck et al., 2000; Roll 1988). The R^2 coefficient indicates the proportion of stock return variation that is explained by the market return. Higher values of R^2 imply that movements in stock prices are driven by market-wide factors rather than idiosyncratic factors, implying less informativeness of stock prices.

Firm Size is the size of the firm at year t measured by the natural log of the firm's market value at the beginning of the year (Chan & Hameed, 2006; Pevzner et al., 2015). *Log (Age)* is the log of the number of years since the base date of the firm in Datastream.[6] *Leverage* is firm leverage computed as total debt divided by total assets at the beginning of the year (Guest, 2009; Kohl & Schaefers, 2012; Leary & Roberts, 2005). *Reporting Lag* is the number of days between the fiscal year end of the firm and the earnings announcement date (Landsman et al., 2012; Pevzner et al., 2015).

As indicated earlier, revisions of investors' expectations resulting from the arrival of new corporate information would be expected to lead to increased trading volume. So in addition to normalized volatility, we also examine the informativeness of earnings as measured by abnormal trading volume (*ATV*) around the earnings announcement (DeFond et al., 2007; Landsman et al., 2012; Pevzner et al., 2015). ATV is computed as:

$$ATV = \left(\frac{Trading\ Volume_{(-10,10)}}{Trading\ Volume_{(-70,-11)}} \right) \qquad (5)$$

where Trading volume is scaled by number of shares outstanding.

Again, in our multivariate analysis, we examine the impact of earnings characteristics on ATV by estimating the following equation:

$$\begin{aligned} ATV_{it} = {} & Earning\ Characteristics_{it} + Trading\ Frequency_{it} \\ & + Synchronicity_{it} + Firm\ Size + Log(Age)_{it} + Leverage_{it} \\ & + Reporting\ Lag_{it} + Industry + Year + \varepsilon_{it} \end{aligned}$$
$$(6)$$

where *ATV* is the abnormal trading volume which is estimated as the average trading volume of the stock during

TABLE 2 Summary statistics

Panel A: Kenya

	Count	Mean	SD	Min	Median	Max
NormalisedVol	241	0.120	0.339	−0.581	0.078	0.939
CAR	241	−0.008	0.119	−0.383	−0.024	0.363
ATV	235	1.373	0.989	0.166	1.144	5.381
Earnings	236	0.057	0.063	−0.294	0.046	0.235
Earnings Growth	221	−0.005	0.056	−0.290	0.000	0.321
Positive to Negative	222	0.068	0.252	0.000	0.000	1.000
Negative to Positive	222	0.041	0.198	0.000	0.000	1.000
Firm Size	241	292.108	463.553	1.550	118.350	3,318.080
Age	241	15.456	6.274	2.000	17.000	24.000
Leverage	210	0.170	0.153	0.001	0.130	0.628
Trading Frequency	241	0.079	0.270	0.000	0.000	1.000
Synchronicity	241	0.054	0.088	0.000	0.015	0.470
Reporting Lag	232	89.759	38.157	37.000	80.500	246.000

Panel B: Nigeria

	Count	Mean	SD	Min	Median	Max
NormalisedVol	218	0.095	0.316	−0.581	0.070	0.939
CAR	218	−0.022	0.128	−0.383	−0.033	0.363
ATV	210	1.240	0.936	0.166	0.970	5.381
Earnings	215	0.059	0.071	−0.130	0.040	0.314
Earnings Growth	198	0.013	0.091	−0.210	0.000	0.838
Positive to Negative	199	0.055	0.229	0.000	0.000	1.000
Negative to Positive	199	0.116	0.321	0.000	0.000	1.000
Firm Size	161	838.750	1,415.487	4.790	267.620	8,364.220
Age	185	3.541	1.925	0.000	3.000	11.000
Leverage	176	0.154	0.136	0.001	0.112	0.691
Trading Frequency	218	0.165	0.372	0.000	0.000	1.000
Synchronicity	218	0.120	0.138	0.000	0.068	0.750
Reporting Lag	211	116.711	56.413	28.000	101.000	246.000

Panel C: South Africa

	Count	Mean	SD	Min	Median	Max
NormalisedVol	1,303	0.015	0.283	−0.581	−0.013	0.939
CAR	1,303	−0.008	0.122	−0.383	−0.009	0.363
ATV	1,247	1.258	0.824	0.166	1.069	5.381
Earnings	1,296	0.076	0.250	−5.380	0.074	4.731
Earnings Growth	1,280	−0.002	0.147	−1.013	−0.001	0.917
Positive to Negative	1,281	0.066	0.248	0.000	0.000	1.000
Negative to Positive	1,281	0.056	0.230	0.000	0.000	1.000
Firm Size	1,303	1,426.835	2,216.046	3.190	420.760	8,364.220
Age	1,303	14.467	8.650	1.000	14.000	42.000
Leverage	1,206	0.191	0.175	0.001	0.152	1.172
Trading Frequency	1,303	0.102	0.303	0.000	0.000	1.000

(Continues)

TABLE 2 (Continued)

Panel C: South Africa						
	Count	Mean	SD	Min	Median	Max
Synchronicity	1,303	0.105	0.134	0.000	0.044	0.610
Reporting Lag	1,289	66.247	20.761	28.000	64.000	236.000

Note: This table presents summary statistics of variables used. It reports the number of observations, mean, *SD*, minimum value, median value and maximum values. In order to minimize the effects of outliers, continuous variables are winsorized at the 1st and 99th percentile. For variables that are log transformed, the non-log transformed version are reported in this table.

the event window scaled by the average trading volume over a 2-month (60 days) period prior to the event window. We consider this to be a sufficient period to reflect normal trading activity prior to the event window. All other variables are as in Equation (4).

5 | RESULTS

5.1 | Descriptive statistics and correlations

Table 2 shows the descriptive statistics for variables in the sample by country. The mean *NormalisedVol* is 0.12, 0.10 and 0.02 for Kenya, Nigeria and South Africa, respectively. These figures are lower than the mean figure reported in Griffin et al. (2011) for emerging countries (0.15). However, this is understandable as their study included countries that are relatively more developed than the countries in our sample. The only African country included in their study was South Africa. The mean (median) cumulative abnormal return (*CAR*) is −0.008 (−0.024) for Kenya, −0.02 (−0.03) for Nigeria and −0.008 (−0.009) for South Africa. The mean (median) ATV is 1.373 (1.144), 1.240 (0.970) and 1.258 (1.069) for Kenya, Nigeria and South Africa, respectively. Firms in Kenya and Nigeria appear on average to have the same level of earnings with South Africa having a slightly higher level. Earnings changes from positive in the previous year to negative in the current year are 6.8% for Kenya, 5.5% for Nigeria and 6.6% for South Africa whilst earnings change from negative to positive are 4.1%, 11.6% and 5.6%, respectively. Firms in all three countries are relatively smaller in size (less than half the size) compared to those in Pevzner et al. (2015) who include both developed and emerging market firms (including U.S. and UK firms). Mean leverage is less than 20% in all countries indicating that sample firms use relatively low levels of debt in the capital structure. Contrary to the general notion that prices in less developed markets are synchronous, the mean synchronicity values are 5.4%, 12% and 10.5%, respectively, for Kenya, Nigeria and South Africa.[7] However, in unreported *t*-tests, we observe that firms in the HTF category are more synchronous than those in the MTF category. Additionally, on average firms take 90, 117 and 66 days re after their fiscal year end to report their earnings in Kenya, Nigeria and South Africa, respectively.

5.2 | Informativeness of earnings announcements

Table 3 shows normalized volatility (*NormalisedVol*) calculated for our main event window and a set of other event windows. Panel A presents *NormalisedVol* for all earnings announcements by country. Panels B and C show *NormalisedVol* for positive and negative *CARs*, respectively. Positive *CARs* signify good news and negative *CARs* indicate bad news. In panel A, for the main event window, normalized volatility is 0.12 for the full sample of Kenyan earnings announcements, implying that volatility during the event window is 12% greater than volatility during normal periods. Normalized volatility is 9.5% and 2% for Nigeria and South Africa, respectively, for their full samples. The implication is that earnings announcements carry information content since volatility during the event window is significantly greater during normal periods. Using a smaller event window, (−1,+1), normalized volatility remains positive and significant for both Kenya and Nigeria but is not significant for South African companies. Similar observations are made on the event day itself. These findings therefore provide support for our first hypothesis that earnings in African markets are informative.

We check for an asymmetric reaction to good and bad earnings information in panels B and C of Table 3. We consider positive *CARs* to indicate good news and negative *CARs* to indicate bad news. For the full event window, results are largely consistent, if a little lower in magnitude for negative news, with those in Panel A for Kenya and Nigeria. Notably, for the South African sample, good news appears to result in higher returns throughout our event window but normalized volatility is

TABLE 3 Normalized volatility for different earnings event windows

Panel A: All earnings

Event window	Full			HTF			MTF		
	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
(−10,+10)	0.122***	0.095***	0.022**	0.111**	0.03	0.01	0.123***	0.108***	0.023**
(−10,−3)	−0.016	−0.013	0.029*	−0.117	−0.058	0.005	−0.007	−0.004	0.032*
(−2,+2)	0.375***	0.139***	−0.001	0.433**	0.08	−0.017	0.370***	0.151***	0.001
(−1,+1)	0.507***	0.187***	0.016	0.667**	0.107	−0.039	0.494***	0.203***	0.022
(−1,0)	0.336***	0.164***	−0.011	0.281	0.136	−0.038	0.341***	0.169***	−0.007
0	0.496***	0.324***	0.024	0.777*	0.069	0.034	0.472***	0.374***	0.023
(0,+1)	0.665***	0.279***	0.046**	1.111**	0.06	−0.004	0.626***	0.323***	0.052**
(0,+3)	0.438***	0.202***	0.015	0.599**	0.024	0.007	0.424***	0.237***	0.016
(+3,+10)	0.111***	0.185***	0.055***	0.163**	0.161**	0.073**	0.107***	0.189***	0.053***

Panel B: Positive CARs

Event window	Full			HTF			MTF		
	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
(−10,10)	0.216***	0.114***	0.052***	0.199*	−0.034	0.008	0.216***	0.145***	0.056***
(−10,−3)	0.013***	−0.044	0.078***	−0.314	−0.271	0.003	0.038	0.005	0.086***
(−2,2)	0.389***	0.124**	0.048**	0.293	0.027	0.023	0.394***	0.144**	0.051**
(−1,1)	0.537***	0.085	0.076***	0.132	0.063	0.039	0.573***	0.09	0.079***
(−1,0)	0.390***	0.12	0.029	−0.057	0.145	−0.073	0.437***	0.114	0.041
0	0.505***	0.217**	0.111**	0.301	0.186	0.014	0.529***	0.225*	0.122***
(0,1)	0.652***	0.171**	0.103***	0.622	0.062	0.088	0.655***	0.192**	0.104***
(0−3)	0.455***	0.151**	0.050**	0.396	−0.009	0.032	0.460***	0.178**	0.052**
(3,10)	0.158***	0.128***	0.064***	0.238	0.052	0.078	0.152***	0.145***	0.063***

Panel C: Negative CARs

Event window	Full			HTF			MTF		
	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa	Kenya	Nigeria	South Africa
(−10,10)	0.059**	0.082***	−0.004	0.088	0.076	0.012	0.055*	0.083***	−0.006
(−10,−3)	−0.041	0.007	−0.016	0.026	0.095	0.007	−0.047	−0.01	−0.019
(−2,2)	0.362***	0.152***	−0.045	0.497**	0.128	−0.047	0.346***	0.157***	−0.045
(−1,1)	0.482***	0.295***	−0.041	1.149**	0.17	−0.091	0.426***	0.316***	−0.034
(−1,0)	0.288***	0.212***	−0.049	0.746*	0.121	0.001	0.256***	0.226**	−0.055
0	0.490***	0.438***	−0.053	1.307	−0.094	0.052	0.436***	0.527***	−0.064
(0,1)	0.674***	0.384***	−0.009	1.656**	0.058	0.088	0.605***	0.447***	0.000
(0−3)	0.424***	0.249***	−0.014	0.747**	0.048	−0.01	0.396***	0.294***	−0.015
(3,10)	0.076**	0.236***	0.048***	0.107	0.283***	0.068	0.073**	0.228***	0.046***

Note: This table presents earnings event reaction results in the form of normalized volatility. Normalized volatility measures volatility of stock returns with the event window in relation to volatility outside the event window and is computed as ([event volatility/normal volatility] − 1). Event volatility is computed as the mean absolute market-adjusted abnormal return within the event window. For an −10,+10 event window, event volatility is computed as $EventVol = \frac{1}{N}\sum_{i=1}^{N}\frac{1}{21}\sum_{t=-10}^{10}|AR_{i,t}|$. Normal volatility is computed as mean absolute market-adjusted abnormal return for 60 days before the start of the event window and 60 days after the end of the event window. For a −10, 10 event window, normal volatility is computed as $NormalVol = \frac{1}{N}\sum_{i=1}^{n}\frac{1}{120}\left(\sum_{t=-70}^{-11}|AR_{i,t}| + \sum_{t=11}^{70}|AR_{i,t}|\right)$. Panel A presents results for all earnings, Panel B for positive earnings and Panel C for negative earnings. ***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively. Significance only reported for $EventVol > NormalVol$.

TABLE 4 Regression analysis of cumulative abnormal returns

	Kenya			Nigeria			South Africa		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Earnings	0.1219			0.5988**			0.0120		
	(0.70)			(2.52)			(0.28)		
Earnings Growth		0.1592			0.2623			0.0609	
		(0.63)			(1.43)			(1.64)	
Positive to Negative			−0.0651**			0.0139			0.0011
			(−2.49)			(0.25)			(0.06)
Negative to Positive			0.0421			0.0071			0.0348*
			(1.18)			(0.13)			(1.90)
Trading Frequency	−0.0880***	−0.0871***	−0.0954***	−0.0226	−0.0237	−0.0193	−0.0218	−0.0211	−0.0225
	(−3.41)	(−3.39)	(−3.87)	(−0.53)	(−0.55)	(−0.49)	(−1.59)	(−1.56)	(−1.64)
Synchronicity	0.1133	0.1107	0.1149	0.0035	−0.0079	−0.0200	0.0572	0.0572	0.0538
	(1.43)	(1.38)	(1.44)	(0.04)	(−0.08)	(−0.21)	(1.37)	(1.39)	(1.30)
Firm Size	−0.0166	−0.0151	−0.0171	−0.0048	−0.0010	0.0009	−0.0038	−0.0034	−0.0022
	(−1.58)	(−1.43)	(−1.63)	(−0.40)	(−0.08)	(0.08)	(−0.93)	(−0.88)	(−0.55)
Log (Age)	0.0062	0.0055	0.0058	0.0187	0.0100	0.0064	0.0023	0.0017	0.0013
	(0.31)	(0.28)	(0.30)	(0.53)	(0.28)	(0.18)	(0.44)	(0.32)	(0.26)
Leverage	−0.1686**	−0.1824**	−0.1438**	0.2094*	0.1379	0.1462	0.0115	0.0133	0.0100
	(−2.21)	(−2.70)	(−2.10)	(1.93)	(1.47)	(1.64)	(0.64)	(0.74)	(0.54)
Reporting Lag	−0.0006	−0.0006	−0.0006	−0.0000	−0.0000	−0.0001	−0.0001	−0.0002	−0.0001
	(−1.31)	(−1.43)	(−1.48)	(−0.18)	(−0.10)	(−0.32)	(−0.63)	(−0.63)	(−0.48)
Constant	0.1206	0.1302	0.1416	0.0317	0.0695	0.0705	0.0361	0.0335	0.0275
	(0.98)	(0.99)	(1.08)	(0.37)	(0.84)	(0.93)	(1.05)	(0.98)	(0.78)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	188	188	188	122	122	122	1,141	1,141	1,141
R^2	0.234	0.235	0.258	0.176	0.158	0.146	0.036	0.041	0.040

Note: This table presents results of regression analysis of abnormal trading volume (ATV) around the earnings event window (−10,+10) on a country by country basis, estimated from the following equation: CAR_{it} = Earnings Characteristics$_{it}$ + Trading Frequency$_{it}$ + Synchronicity$_{it}$ + + Firm Size$_{it}$ + Log(Age)$_{it}$Leverage$_{it}$ + Reporting Lag$_{it}$ + Industry + Year + ε_{it}.
Earnings characteristics refer to (1) *Earnings*, *which* is the earnings of the firm scaled by total assets; (2) *Earnings Growth*, *which* is change in earnings scaled by total assets; (3) *Positive to Negative*, *which* is an indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise; and (4) *Negative to Positive which* is an indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise. *Trading Frequency* is an indicator variable that takes the value of 1 if the firm is in the HTF category and 0 if in the MTF category. *Synchronicity is the R-squared from a market model regression of stock returns on the corresponding market index. Firm Size* is the natural logarithm of the firm's market value at the beginning of the year. *Log (Age)* is the number of years since the base date of the firm in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Reporting Lag* is the number of days between the fiscal year end of the firm and the earnings announcement date. *T*-statistics based on standard errors adjusted for heteroscedasticity and firm level clustering are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively.

only positive and significant in the post-event window (+3,+10) for bad news. In the period prior to the event (−10,−3), we only observe positive and significant normalized volatility in Panel B and not in Panel C. This might suggest that firms are more likely to leak information when earnings news is good.

We also find support for our second hypothesis that earnings informativeness is influenced by trading frequency. We observe that announcements in the *MTF* category display higher and more significant *NormalisedVol* than announcements in the *HTF* category in all panels of Table 4. The results from the *MTF* sample indicate

TABLE 5 Regression Analysis of Abnormal Trading Volume

Dependent variable: ATV									
	Kenya			Nigeria			South Africa		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
|Earnings|	2.8913**			6.4260***			−0.3981*		
	(2.16)			(2.93)			(−1.93)		
|Earnings Growth|		3.7939			4.5491***			0.1013	
		(1.24)			(2.95)			(0.56)	
Positive to Negative			−0.0365			0.2590			−0.0173
			(−0.12)			(0.46)			(−0.20)
Negative to Positive			0.4063			0.1142			0.2391
			(0.84)			(0.65)			(1.42)
Trading Frequency	−0.0632	−0.1345	−0.1425	−0.0381	−0.1313	−0.0320	−0.0329	−0.0419	−0.0402
	(−0.32)	(−0.76)	(−0.72)	(−0.13)	(−0.36)	(−0.09)	(−0.39)	(−0.49)	(−0.48)
Synchronicity	−0.0145	−0.1174	−0.0425	0.4945	0.5594	0.2924	−0.0070	−0.0264	−0.0403
	(−0.02)	(−0.17)	(−0.06)	(0.83)	(0.93)	(0.49)	(−0.03)	(−0.11)	(−0.17)
Firm Size	−0.0803	−0.0434	−0.0590	−0.0350	−0.0227	0.0131	−0.0544**	−0.0493*	−0.0438*
	(−1.15)	(−0.59)	(−0.88)	(−0.55)	(−0.25)	(0.16)	(−2.04)	(−1.92)	(−1.79)
Log (Age)	0.1210	0.1269	0.1111	−3.7971***	−3.8471***	−3.8855***	−0.0126	−0.0093	−0.0141
	(1.00)	(1.10)	(0.93)	(−17.53)	(−16.70)	(−16.03)	(−0.31)	(−0.23)	(−0.35)
Leverage	0.8094	0.2752	0.5554	0.1897	−0.6494	−0.3893	−0.2266	−0.2284	−0.2225
	(1.04)	(0.33)	(0.62)	(0.33)	(−0.83)	(−0.54)	(−1.56)	(−1.58)	(−1.52)
Reporting Lag	0.0001	−0.0008	−0.0007	−0.0017	−0.0020	−0.0014	−0.0014	−0.0014	−0.0011
	(0.07)	(−0.53)	(−0.42)	(−1.13)	(−1.25)	(−0.87)	(−0.97)	(−0.99)	(−0.80)
Constant	0.9724	1.0468	1.2442*	6.1433***	6.6282***	6.3806***	1.9435***	1.8569***	1.8183***
	(1.42)	(1.56)	(1.97)	(13.64)	(9.75)	(10.32)	(6.74)	(6.73)	(6.65)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	188	188	188	122	122	122	1,141	1,141	1,141
R^2	0.153	0.156	0.141	0.344	0.340	0.300	0.034	0.032	0.036

Note: This table presents results of regression analysis of abnormal trading volume (ATV) around the earnings event window (−10,+10) on a country by country basis, estimated from the following equation: ATV_{it} = Earnings Characteristics$_{it}$ + Trading Frequency$_{it}$ + Synchronicity$_{it}$ + + Firm Size$_{it}$ + Log(Age)$_{it}$Leverage$_{it}$ + Reporting Lag$_{it}$ + Industry + Year + ε_{it}.
Earnings characteristics refer to (1) *Earnings which* is the earnings of the firm scaled by total assets; (2) *Earnings Growth which* is change in earnings scaled by total assets; (3) *Positive to Negative, which* is an indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise; and (4) *Negative to Positive which* is an indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise. *Trading Frequency* is an indicator variable that takes the value of 1 if the firm is in the HTF category and 0 if in the MTF category. *Synchronicity is the R-squared from a market model regression of stock returns on the corresponding market index. Firm Size* is the natural logarithm of the firm's market value at the beginning of the year. *Log (Age)* is the number of years since the base date of the firm in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Reporting Lag* is the number of days between the fiscal year end of the firm and the earnings announcement date. *T*-statistics based on standard errors adjusted for heteroscedasticity and firm level clustering are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively.

significant informativeness of earnings for less frequently traded stocks in Kenya and Nigeria whilst informativeness seems confined to good news in South Africa. The latter result is consistent with a behavioural explanation. Significance in the *HTF* sample is associated the post-announcement window (+3,+10) in all three countries and with Kenyan firms in other windows. One explanation for this general phenomenon would be that firms in the *HTF* category are more synchronously traded and contain little new information whilst firms in the *MTF*

category may be less synchronous. Earnings announcements for these stocks contain new information. Overall, consistent with our expectations in our first two hypotheses, the results in Table 3 show significant information content from earnings announcements. Which is largely associated with less frequently traded stocks in our sample. The results for Kenya and Nigeria indicate quick responses to new earnings information within the event windows consistent with the semi-strong form efficiency. The accuracy of market responses is not observable but in the next section (and in our subsequent hypotheses) we examine whether the informativeness identified in our normalized volatility tests is associated with specific earnings characteristics.

5.3 | Analysis of earnings and firm characteristics

Results of the regression analysis of *CAR*s are presented in Table 4. For each country, we test the impact of earnings and earnings growth in a separate model. Also, for all countries, we include industry and year dummies, consistent with previous studies.[8] The findings in general indicate idiosyncratic price effects across our sample countries. Earnings have a positive and significant impact on *CAR*s but only in the case of Nigerian firms. Thus, the hypothesis that market reactions to earnings are influenced by the size of earnings (H3) is supported only for the Nigeria sample, but rejected for both the Kenyan and South African sample. Of the three countries, Nigeria has the shortest time frame for firms to report their earnings (3 months) whilst Kenya report earnings after 4 months and South Africa after 6 months. Sengupta (2004) suggests that the reporting lag of earnings represents the level of information demand and litigation risk from investors. Firms face greater demand for information from investors who release earnings early. Our interpretation is that earnings are considered to be relatively more important by regulators and market participants when the time frame is shorter.

In our tests, due to the lack of analyst forecasts, earnings in the previous year proxies for expected earnings. A higher value for earnings indicates better than expected earnings from the previous year, which is reasonable since developing markets are expected to be more synchronous and prices less fundamentals based. Coefficient estimates of *Earnings Growth* are statistically insignificant across all three countries, providing no support for Hypothesis H4 that *Earnings Growth* positively and significantly affects market reactions to earnings. A potential explanation for this is that market participants in these markets have no expectations relative to earnings

and therefore, would not react to changes in earnings sufficiently enough to lead to a change in stock price. This could be attributed to the level of information flow and the absence of analysts. This might also further be explained by Wei and Zhang (2018) who argue that investors underact to earnings surprises in low trust regions. After all, trust by investors and other market participants is a function of rigorous accounting, investor protection, legal enforcement and corruption, which are still developmental challenges in African markets.

The third and fourth explanatory variables in our regressions are what we describe as 'behavioural'. The *Positive to Negative* earnings variable is negative and significant for Kenyan companies implying potential asymmetric price effects. The significance of the coefficient for *Negative to Positive* provides some weak support for our hypothesis for South African firms. Overall, the limited evidence on the Positive to Negative coefficient suggests that the market reacts more strongly to bad news than good news. This result is consistent with the view that behavioural biases might affect how accounting information is incorporated into stock prices (Mian & Sankaraguruswamy, 2012). Our finding here is consistent with loss aversion, that is, higher reactions to earnings when there are losses rather than gains (Pinello, 2008).

Consistent with our arguments in Table 4 that stocks in the HTF category may be more synchronously traded, we find a negative coefficient for the *Trading Frequency* dummy which is significant in the Kenyan sample. Thus, liquidity has some impact on market reactions to earnings in terms of abnormal returns. Further, we observe that cumulative abnormal returns are not significantly different for more synchronous companies or markets. The results in Table 4 indicate only limited evidence that markets respond to the specific information contained within earnings announcements. From a market efficiency perspective these results suggest that price movements around earnings announcements are only partially consistent with efficient pricing. Whilst our normalized volatility test in Table 4 are supportive of informativeness of announcements, earnings characteristics carry inconsistent signals to markets. First, only Nigerian firms exhibit a strong association with earnings themselves. This may be due to leakage of such information either formally or informally. Kenyan and South African firms exhibit, what we describe as, a more behavioural response. Both are also consistent with semi-form of efficiency in terms of speed of adjustment but the accuracy of such responses suggest relatively inefficient pricing in general. This result is consistent with Bhattacharya et al. (2000), who suggests that less developed markets countries are generally less informationally efficient and that announcements may have been anticipated.

TABLE 6 Regression analysis of differenced abnormal returns (DARs)

Dependent variable: DARS									
	Kenya			Nigeria			South Africa		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Earnings	0.0034			0.0282**			0.0016		
	(0.39)			(2.58)			(0.87)		
Earnings Growth		0.0097			0.0187**			0.0024*	
		(1.00)			(2.12)			(1.83)	
Positive to Negative			−0.0021			−0.0004			−0.0003
			(−1.40)			(−0.15)			(−0.39)
Negative to Positive			0.0023			0.0012			0.0010
			(1.48)			(0.52)			(1.29)
Trading Frequency	−0.0037***	−0.0036***	−0.0040***	−0.0006	−0.0008	−0.0004	−0.0007	−0.0007	−0.0007
	(−2.80)	(−2.73)	(−3.22)	(−0.31)	(−0.43)	(−0.23)	(−1.20)	(−1.19)	(−1.23)
Synchronicity	0.0048	0.0047	0.0049	−0.0010	−0.0012	−0.0018	−0.0008	−0.0009	−0.0010
	(1.23)	(1.20)	(1.25)	(−0.23)	(−0.28)	(−0.40)	(−0.43)	(−0.48)	(−0.53)
Firm Size	−0.0004	−0.0004	−0.0004	−0.0000	0.0001	0.0002	0.0001	0.0001	0.0001
	(−0.89)	(−0.80)	(−1.00)	(−0.10)	(0.18)	(0.42)	(0.46)	(0.69)	(0.78)
Log (Age)	0.0003	0.0002	0.0002	−0.0012	−0.0015	−0.0018	0.0000	0.0000	0.0000
	(0.31)	(0.20)	(0.25)	(−0.74)	(−0.97)	(−1.12)	(0.20)	(0.03)	(0.04)
Leverage	−0.0056	−0.0057*	−0.0049	0.0119**	0.0083*	0.0092**	0.0007	0.0006	0.0006
	(−1.47)	(−1.73)	(−1.37)	(2.45)	(1.93)	(2.15)	(0.85)	(0.76)	(0.65)
Reporting Lag	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000
	(−1.14)	(−1.25)	(−1.33)	(−0.73)	(−0.58)	(−0.72)	(−0.41)	(−0.45)	(−0.33)
Constant	0.0028	0.0036	0.0040	0.0049	0.0067*	0.0062*	0.0002	0.0001	0.0001
	(0.54)	(0.63)	(0.73)	(1.31)	(1.91)	(1.83)	(0.14)	(0.09)	(0.04)
Industry Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	188	188	188	122	122	122	1,141	1,141	1,141
R^2	0.216	0.223	0.234	0.148	0.145	0.118	0.022	0.025	0.023

Note: This table presents results from results of regression analysis on DARs around the earnings event window (−10,+10) on a country by country basis. DARs is computed as $\left(\frac{1}{N}\sum_{i=1}^{N} \frac{1}{21} \sum_{t=-10}^{10} AR_{i,t} \right) - \left(\frac{1}{N}\sum_{i=1}^{N} \frac{1}{120} \left(\sum_{t=-11}^{-70} AR_{i,t} + \sum_{t=11}^{70} AR_{i,t} \right) \right)$.

Earnings is the earnings of the firm scaled by total assets; *Earning Growth* is change in earnings scaled by total assets; *Positive to Negative* is an indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise; and *Negative to Positive* is an indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise. *Firm Size* is measured as the natural logarithm of the firm's market value at the beginning of the year. *Log (Age)* is the number of years since the base date of the firm in Datastream. *Leverage* is computed as total debt divided by total assets at the beginning of the year. *Trading Frequency* is an indicator variable that takes the value of 1 if the firm is in the HTF category and 0 if in the MTF category. *Synchronicity is the R-squared from a market model regression. Reporting Lag* is the number of days between the fiscal year end of the firm and the earnings announcement date. *T*-statistics based on standard errors adjusted for heteroscedasticity and firm level clustering are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10%, respectively.

For the remaining variables, we find that *Firm Size* appears to have no significant impact on the reactions to earnings around the event date. The impact of *Leverage* is mixed. Whilst we observe a negative relationship between leverage and *CAR*s in Kenya, we find a weakly significant and positive coefficient for leverage in Nigeria in Column 4 of the table. The weakly positive coefficient observed in Nigeria is in line with the findings of Landsman et al. (2012) and Pevzner et al. (2015) who also find a positive relationship between leverage and the market reactions to earnings. The significant impact of leverage on *CAR*s in Nigeria can be explained by the notion that debt monitoring improves governance. Debt monitoring substitutes for improved governance in a country when

national institutions are weak, and corruption is prevalent.

Regression results of *ATV* are presented in Table 5. Similar to Table 4, we control for year and industry effects. We use the absolute value of *Earnings* and *Earnings Growth* as we are interested in how the magnitude of corporate earnings and growth in earnings, irrespective of the sign, impacts on *ATV*. We find positive and significant coefficient for the magnitude of earnings in both Kenya and Nigeria. This implies that, whilst the absolute value of earnings may be sufficient to induce trading in Kenya, it may not be enough to cause a change in the share price as we observe in Table 4. In the case of Nigeria, we observe a significant impact of the value of earnings on *ATV*, consistent with the results in Table 4, implying that the value of earnings induces a change in both price and volume. In South Africa, we find no significant impact on the magnitude of earnings and changes in earnings on *ATV*. Instead and consistent with our behavioural hypothesis, we find a significant impact of changes in earnings from negative to positive on *ATV*.

In addition, firm size loads negatively on *ATV* in South Africa, and is consistent with the findings of Landsman et al. (2012) and Pevzner et al. (2015) who both include South Africa in their cross-country study. Overall, our coefficient estimates of earnings and changes in earnings in both Tables 5 and 6 are consistent with the views of Beaver (1968), that the usefulness of earnings data in triggering market reactions to earnings may be observed in either a test of price, volume or both, but should not be non-existent in both. And as observed in Table 4, the level of synchronicity has no significance.

6 | ROBUSTNESS CHECK

In order to test the robustness of our results, we use an alternative dependent variable which captures price, *Differenced Abnormal Returns* (*DARs*), and provide results for comparison to those in Tables 4 and 5. *DARs* are computed as the average abnormal return during the event window minus the average abnormal return in a ±60 period prior the event window. This is similar in spirit to the differenced volatility variable used in Griffin et al. (2011) except that we do not use absolute values of abnormal returns. Results of these are presented in Table 6. One difference is notable—the significance of *Positive to Negative* dummy for Kenyan companies is no longer present in Table 6. But *Earnings* and *Earnings Growth* continue to be significant for Nigerian companies as observed in Table 5. Overall, our conclusions regarding the impact of earnings information, synchronicity and trading frequency on both

prices and volume remain unaltered. Table 7 provides a summary of our hypotheses and main findings.

7 | DISCUSSION AND CONCLUSION

Whilst the literature on the informativeness of earnings in an international context continues to develop, there remains relatively little evidence on African markets, which differ considerably in terms of institutional and regulatory factors when compared with more developed markets (Asongu, 2014; Hearn & Piesse, 2013).[9] We add to this literature by examining market responses to earnings announcements for a set of common law (i.e., market-based) African countries and investigate whether, considering that these markets are developing, reactions to earnings announcements are influenced by firm fundamentals, synchronicity and/or trading frequency.

Earnings announcements were collected and categorized according to the percentage of non-zero returns in the prior year of trading of the stock concerned. To ensure sufficient liquidity to capture earnings information, firms below a 50% threshold were dropped. The sample used was further categorized into two groups according to their trading frequency. Stocks which traded on 75% or more trading days over the previous years were categorized as high trading frequency and sample stocks that traded less frequently than 75% (but more than 50%) of days in the previous year were categorized as medium trading frequency. To identify the effect of earnings information on stock prices we estimated normalized volatility, ATV and market-adjusted *CAR*s for a 10-day window before and after the event. Cross-sectional analysis was then conducted to determine how earnings characteristics affect the market reactions to earnings announcements. Initially we considered all common law African markets but then narrowed the analysis to five African markets which displayed sufficient trading frequency to reasonably test for the semi-strong form of efficiency—Botswana, Ghana, Kenya, Nigeria and South Africa. Only the final three of these had sufficient liquidity to extend the analysis to include firms which experienced both high and medium trading frequency.

The findings reveal that, in terms of our preferred measure of normalized volatility, earnings are informative in all our countries. Contrary to Bhattacharya et al. (2000) there is relatively little evidence of leakage, but significant information content is identified in other event windows. The results are strongly driven by the less regularly traded sample (*MTF*). Of the highly traded samples, only Kenyan stocks display significant informativeness. Nonetheless, for all three countries, informativeness

TABLE 7 Summary of hypotheses and findings

Hypothesis	Finding
H1: Earnings announcements are informative	We find evidence of earnings informativeness
H2: Earnings informativeness is associated with trading frequency	Our results show that earnings associated with trading frequency
H3: Market reactions to earnings announcements are positively associated with the magnitude of announced earnings	There is a positive relationship between the magnitude of earnings and earnings informativeness in both Kenya (trading volume) and Nigeria (trading volume and abnormal returns)
H4: Market reactions to earnings announcements are positively associated with positive changes in earnings relative to the previous year	There is a positive relationship between changes in earnings and earnings informativeness in Nigeria
H5: Market reactions to earnings announcements are positively related to changes in earnings from negative to positive	There is no evidence of a significant impact of changes in earnings (from negative to positive) on market reactions to earnings
H6: Market reactions to earnings announcements are negatively associated with changes in earnings from positive to negative	Changes in earnings from positive to negative have a negative effect on price reactions in Kenya

is present for the more highly traded stocks in the post-event window.

To check for an asymmetric reaction to good and bad news, we examined the informativeness of positive and negative *CAR*s separately. The results for less frequently traded stocks mirror those of the full sample, that is, positive normalized volatility across the sample but some leakage in South Africa. For negative news, the *HTF* sample indicates no leakage but significant positive normalized volatility around the event (−2 to +3) for Kenyan stocks and in the post-event window (+3 to +10) for Nigeria. Whilst the results indicate idiosyncrasies in the pattern of earnings informativeness, trading frequency has an important role in determining when earnings information is impounded into stock prices.

We also examine the effect of specific characteristics of earnings on market reactions using a cross-sectional regression analysis. Our primary dependent variable is cumulative abnormal return which unlike normalized volatility captures both the magnitude and direction of earnings variables. We find only limited evidence of an effect of earnings characteristics on market reactions. Earnings are only found to be significant for Nigeria (but strongly so). Earnings growth is only weakly significant in South Africa and not in other countries in the sample. To test the effect of (what we describe as) behavioural variables, as opposed to fundamental earnings data, we include changes in earnings from positive to negative and vice versa in the analysis. Changes from positive to negative was strongly significant and negative for Kenyan companies but not for companies in other countries. Using ATV as an alternative dependent variable, we find that earnings are informative for both Kenya and Nigeria. The *Earnings Growth* variable is significant for Nigerian companies. Notably, a dummy variable indicating changes in earnings from negative to positive was found to be significant for South African companies. Tests using differenced volatility confirm the limited informativeness of earnings information in our sample.

Whilst the role of trading frequency is clear in our results, we find no direct association between synchronicity and earnings informativeness. If African stocks are more synchronous with market movements and less associated with earnings news then we would expect stock price effects (positive or negative) around earnings announcements to be lower for stocks which are more synchronous and higher for those which are less associated with market movements. Our cross-sectional analysis provides no evidence of such an effect. However, one of our most notable results, that earnings announcements by medium traded stocks are more informative than highly traded stocks, indicating that pricing of more liquid stocks are less driven by earnings announcements. Miao and Yeo (2009) document that more liquid stocks are associated with larger market reactions to earnings announcements in the U.S. market. They argue that illiquidity will result in a larger trading costs, making investors reluctant to respond to earnings. Such a view is also supported by Chordia, Goyal, Sadka, Sadka, and Shivakumar (2009), who document that post-earnings announcement drift is more prevalent for highly illiquid stocks, since investors delay the response to earnings due to the high trading costs. Contrary to these views, our findings in Africa record that less frequently traded stocks receive larger market reactions to earnings announcements. A possible explanation is that information disclosure and transparency in African markets are weaker than those in more developed markets. The quality of information environment may determine the value available to be extracted from new information and hence the informativeness of earnings. Despite high trading costs, there may be more value to be extracted from new information concerning future earnings in a low

quality information environment. In addition, whilst our findings that illiquidity will result in larger market responses in African markets is counterintuitive, it may result from synchronicity of the more highly traded stocks. This in turn may arise from index tracking type investment strategies. Alternatively, earnings information may be communicated via less formal mechanisms, such as media coverage or informal briefings to major shareholders, rather than the formal earnings announcement. However, the results of our tests of behavioural variables suggest that other less sophisticated influences on pricing persist in African markets.

Another explanation for the relationship between earnings and trading frequency may be provided by examination of ownership structure. Gompers, Ishii, and Metrick (2003) argues that ownership structure affects the frequency with which stocks trade. Different types of ownership have an impact on stock price informativeness including ownership concentration (Fan, Guan, Li, & Yang, 2014); government ownership (Ben-Nasr & Cosset, 2014); block holdings (Brockman & Yan, 2009) and institutional investors (Boehmer & Kelley, 2009). Thus, the impact of trading frequency (liquidity) measures on earnings informativeness in our sample may be explained by differences in ownership structure. In Appendix B, we explore this conjecture by examining yearly ownership data for HTF and MTF companies. The subsample for which we are able to collect data is limited and hence we only provide univariate tests. The results indicate no significant differences in ownership structure between HTF and MTF stocks. Whilst more research may be able to uncover such a relationship, our results appear to imply a synchronous trading explanation.

Information efficiency is crucial if African stock markets are to attract new investment. For markets to play their disciplinary role effectively, corporate information such as earnings should not only be credible but released on a timely basis. The evidence from this article points to some information efficiency in our markets with respect to earnings. Yet institutional mechanisms for improving governance and information disclosure, such as laws and stock exchange regulations, need further strengthening in order that outside investors are protected, and markets become more efficient. Hearn and Piesse (2013), who study governance and liquidity in sub-Saharan Africa, find that liquidity is positively associated with institutional factors such as the effectiveness of the regulatory systems. The quality of regulatory regimes should be reflected in corporate reporting and insider trading. Further, the quality of news transmission could be enhanced with an emphasis on the use of information systems and technology. Improvement in the quality

and quantity of corporate news provision should be considered with particular attention to the role of the regulatory news providers and the quality of financial journalism. Studies in the UK have highlighted the value of corporate news provision (Sheridan, Jones, & Marston, 2006).

Bhattacharya et al. (2000) identifies four reasons why stock prices in less developed countries may not react to corporate news. First, the stock market in question is generally informationally inefficient. Second, firms in the market do not make value-relevant announcements. A third reason for inefficiency is that the news announced may have been completely anticipated. Finally, insider trading prohibitions may be non-existent or not enforced. Whilst our results indicate some earnings informativeness, the presence of price-relevant information and an absence of leakage, Bhattacharya et al.'s (2000) earlier results provide an explanation for why our results are not more convincing and for why market participants may prefer to rely on synchronicity to fundamentals when pricing stock in less efficient markets. The extent to which price movements reflect the true underlying and unobservable value of the firm is questionable.

Overall, the findings in this article suggest that African markets may not fit the stereotypical view of synchronous pricing (Morck et al., 2000). Earnings announcements in our sample carry important stock price implications although the association between the underlying earnings characteristics and stock price adjustments is not consistent. For our markets, which may be considered developing (Kenya and Nigeria) or emerging (South Africa), stock prices do respond to earnings news, implying interaction between synchronicity and earnings news. Pricing in African markets relies, at least in part, on earnings news especially for less frequently traded stocks. Our results also suggest several avenues for future research. We recommend that further work be conducted to establish how earnings informativeness changes as developing and emerging markets evolve. Another important step to understanding market efficiency in developing and emerging markets is to examine the role of other forms of corporate news in the pricing of stocks. Whilst historically such studies were frustrated by lack of data, new developments in information technology and enhancement of regulation may soon make such studies possible. Despite the idiosyncrasies of our results, it is clear in our results that regulators in African markets should continue their efforts to strengthen the information and trading environment which will ultimately benefit information and allocative efficiency and encourage investment in African markets.

ENDNOTES

[1] Our objective was to example all common law African markets. However, only a small group of countries exhibit sufficient trading and liquidity to make our tests practicable. After screening, we collected data for a set of five African countries but later excluded two of these (Ghana and Botswana) due to lack of useable data.

[2] The lack of forecast data limits our ability to predict earnings surprises. Hence, for this test we use changes in the sign of earnings to indicate unexpected information.

[3] Earnings announcement data were confirmed by checking against websites where possible.

[4] These announcements mostly related to capital investment decisions.

[5] In a comparable study, Griffin et al. (2011) report only 415 US earnings announcements are qualified for the criterial of frequent trading we employ, in the period of 2004–2008. Considering the big difference in listed company number between United States and our sample countries, our 1,762 observations clearly show that the market liquidity in African market is much better than we expected.

[6] Dasgupta, Gan, and Gao (2010) find that firm age is associated with the level of stock return synchronicity. Hence, if older firms are more (less) synchronous, then we can expect less (more) reaction to corporate information such as earnings.

[7] Our measure of synchronicity is robust to two other specifications of estimating synchronicity.

[8] Year dummies capture the effect of changes in accounting standards. A variable indicating the strength of accounting standards can be substituted for years dummies with no material changes to results. We also ran earnings informativeness tests for South African firms before and after the adoption of IFRS in 2012. There were no differences in results.

[9] Institutional and regulatory factors include timing of earnings announcements, channels by which earnings are reported (newsprint, websites, social media, etc.) and insider trading enforcement.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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APPENDIX A: VARIABLE DEFINITIONS

Variable	Description	Supporting literature
NormalisedVol	Event volatility/normal volatility minus 1. Event volatility is computed as the mean absolute market-adjusted abnormal return within the event window. Normal volatility is computed as mean absolute market-adjusted abnormal return for the 60 days before the start of the event window and 60 days after the end of the event window	Griffin et al., 2011
CAR	Cumulative abnormal return. It is the sum of abnormal returns realized by a firm during the event window	Brown and Warner (1985); Jones et al. (2004)
ATV	Abnormal trading volume. This is computed as the average trading volume of a stock during the event window divided by average trading volume during a period prior to the event window	DeFond et al. (2007); Landsman et al. (2012); Pevzner et al. (2015)
Trading Frequency	An indicator variable that takes the value of 1 if the firm experienced price changes in its stock at least 75% of trading days in the previous year and 0 if it experienced price changes in its stock at of 50% but less than 75% of trading days in the previous year	Bartholdy et al. (2007)
Synchronicity	R^2 from a market model regression of daily stock returns for stocks in each year against the market returns for the corresponding year	Morck et al. (2000); Chan and Hameed (2006)
Earnings	Earnings of the company scaled by total assets	Beaver (1968); Neuhierl et al. (2013)
Earnings Growth	Change in earnings is computed as the earnings in current year minus earnings in previous year divided by total assets	Authors construction
Positive to Negative	An indicator variable that equals 1 if the change in earnings was from a positive earnings figure to a negative earnings figure, and 0 otherwise	Bartov et al. (2002); Kasznik and McNichols (2002)
Negative to Positive	An indicator variable that equals 1 if the change in earnings was from a negative earnings figure to a positive earnings figure, and 0 otherwise	Bartov et al. (2002); Kasznik and McNichols (2002)
Firm Size	The natural logarithm of the firm's market value at the beginning of the year	Chan and Hameed (2006); Pevzner et al. (2015)
Leverage	Total debt divided by total assets at the beginning of the year	Leary and Roberts (2005)
Age	Number of years since the firm's base date in Datastream	Guest (2009); Kohl and Schaefers (2012)

Variable	Description	Supporting literature
Reporting Lag	The number of days between the fiscal year end of the firm and the earnings announcement date	Landsman et al. (2012); Pevzner et al. (2015)
DARs	Computed as the average abnormal return during the event window minus the average abnormal return in a ± 60 period prior the event window	Griffin et al. (2011)

APPENDIX B: DIFFERENCES IN OWNERSHIP STRUCTURE BETWEEN HTF AND MTF STOCKS

	Total		HTF			MTF		Diff
	N	*N*	Mean	Std	*N*	Mean	Std	(*p*-Value)
Largest Shareholder	656	77	0.328	0.22	579	0.309	0.19	(.402)
Top Five Shareholders	656	77	0.577	0.25	579	0.547	0.251	(.352)
Shares held by Government	39	8	0.133	0.088	31	0.24	0.193	(.134)
Shares held by Institutional Investors	656	77	0.321	0.221	579	0.329	0.234	(.796)
Shares held by Individuals and Families	300	36	0.042	0.086	264	0.075	0.099	(.053)

Note: This table presents summary statistics of five different types of ownership structures and test of mean differences between HTF and MTF stocks. *N* denotes the number of observations in each case.