Share Price Informativeness and Dividend Smoothing Behavior in GCC Markets

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Abstract

This paper examines the dividend smoothing behaviour in Gulf Cooperation Council (GCC) countries, in emerging markets where the response to news and the economic environment are different from those of developed countries. We examine the effect of share price informativeness on dividend smoothing in the (GCC) markets, using an unbalanced panel data for a sample of 628 GCC-listed firms during 1994-2016. For the regression analysis, the hypotheses are tested using panel regressions and GMM estimation. The empirical results can be summarised in the following manner: First, the Lintner model shows that the dividend smoothing degree in GCC firms is comparable to that of a developed market. Second, and importantly, the results reveal that the dividend smoothing in GCC firms is sensitive to private information of share prices. Finally, the findings indicate that information asymmetry and agency-based models affect the tendency to smooth dividends in the GCC markets.

Keywords: Dividend smoothing, share price informativeness, information asymmetry, GCC.

1. Introduction

1.1 Background

Dividends reduce investors' uncertainty, causing them to discount a firm's future earnings at a lower rate, thereby increasing the firm's value (Kustono et al., 2021). As shareholders are significantly concerned about dividend payments, corporate managers realized early the importance of dividend payments in satisfying shareholders expectations. They often smoothed dividends over time believing that dividend reductions might have unfavourable effects on share price and therefore, used dividends as a device to signal information to the market. According to Lintner (1956), managers believe that the shareholders deserve a fair share of the firm's earnings through dividends and that shareholders prefer to receive a stable dividend payment. While firms are reluctant to downturn their dividends even if they have earnings' decline, they do not increase dividends until they are confident that there is a permanent sustainable increase in earnings (Chemmanur et al., 2010). Consequently, managers tend to prevent making changes to their dividend rates that may have to be reversed in the future. As a result, they make partial adjustments towards a target payout ratio to smooth dividend payments[1]. Several justifications explain managers' tendency to smooth dividends. For instance, shareholders evaluate firms based on their dividend behaviour that is characterized by dividend stability.

According to Karpavičius (2014), the firm's wealth and share prices may be boosted through dividend smoothing (DS, hereafter). This is because steady dividend payments have a positive influence on share prices[2]. According to the information asymmetry (IA, hereafter) and agency costs models of dividends, DS may help reduce the costs of agency conflicts between managers and outside shareholders by exposing the firm to the discipline of monitoring investors. Managers utilise dividends to attract institutional investors who are highly valued because of their monitoring capabilities (Guttman et al., 2010). The attracted institutional investors can impose large penalties

[1] Lintner (1956) proposed a partial adjustment model where the firms may be unable to make instant returns on their targets due to the existence of adjustment costs, but smooth changes to their dividends by gradually adjusting their dividends commensurate with earnings toward their target ratios. As a result, the partial adjustment mechanism permits a given firm's observed dividend ratio to be not always equal to its target level.

[2] When firms reduce their dividend payments to accumulate internal funding for future projects, investors may not perceive such actions as a good sign for their investments. To obtain high share prices, companies should be able to maintain a proper balance between dividend and the retention of funds for future investments.

in response to cuts in dividends. Therefore, managers are forced to smooth dividends to avoid these implications (Leary and Michaely, 2011). The IA degree between an investor and the firm influences DS. Firms facing greater IA and less investor cognizance will need to smooth more to allow investors to assess the firm's earnings ability and value (Guttman et al., 2010).

1.2 Motivation

The extent of DS is affected by the uncertainty facing the firm. Previous studies report that higher degrees of IA intensify DS. Firms facing greater IA and less investor knowledge will need to smooth their dividends more to allow investors to assess the firm's earnings ability and value. Firm size, profitability, cash dividends and growth opportunities are examples of public information factors influencing dividend policy (Fama and French, 2001; Grullon and Michaely, 2002). De Cesari and Huang-Meier (2015) confirm that the private information conveyed by stock prices changes. Share price informativeness (SPI, hereafter) is considered as an important determinant of dividend policy. IA is inversely proportional to SPI, as shown in Withisuphakorn and Jiraporn (2017) and Hu et al. (2019), suggesting that more powerful CEOs are less likely to disclose information, resulting in high IA and therefore SPI. However, since an absence of corporate governance mechanisms characterizes emerging markets, a negative relationship between SPI and DS is stronger for GCC[3] markets.

We highlight plausible determinants (proxies of SPI) of DS that have not been examined and investigate their impact on DS: (1) firm-specific return variation, (2) bid-ask spread, and (3) private information trading measure. This study aims to fill this gap by analysing the influence of SPI on DS. Thus, this research seeks to answer the following question: "*Is SPI a determinant of DS?*".

Several studies have looked at the determinants of DS investigating factors at the firm level, such as firm size (DeAngelo et al., 2004), corporate governance (Javakhadze et al., 2014), growth opportunities (Chemmanur et al., 2010), cash flows (Al-Najjar and Belghitar, 2012) and business risk (Leary and Michaely, 2011). Others examined the

[3] GCC is a regional intergovernmental political and economic union consisting of all Arab states of the Persian Gulf. Its member states are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. These members share similar economic, geographical, demographic, social, and religious features (Jamaani & Roca, 2015). Also, GCC economies remain highly dependent on oil and are less diversified (Khoja et al., 2016).

effect of market-wide and country-specific factors, such as inflation (Basse and Reddemann, 2011), interest rate (Jeong, 2013), investor protection and national cultural identity (Javakhadze et al., 2014). The impact of these factors varies from one country to another because of different economic conditions, policies, regulations, efficiency of the financial markets and cultural background.

In the GCC countries, there are not personal taxes levied on either capital gains or dividends (Al-Malkawi et al., 2014; Rezvanian et al., 2015); hence, investors should be indifferent to capital gains or cash dividends are given the absence of personal taxes. However, the GCC stock markets are less mature, less liberal (Arouri et al., 2011; Al-Ajmi and Kim, 2011) and less efficient (Jamaani and Roca, 2015) than developed markets making them more volatile and entail a higher degree of IA (Sahut and Teulon, 2017). GCC firms also have weak corporate governance (Al-Malkawi et al., 2014), low transparency levels (Pillai and Al-Malkawi, 2018) and a high concentration of government ownership (Al-Kuwari, 2009). These features of the GCC markets in terms of IA, corporate governance guidelines, transparency and disclosure regulations, are expected to reduce the levels of SPI and increase the uncertainty surrounding the expected future cash flows.

High IA and low SPI in GCC firms would induce investors' preference towards receiving cash dividends. From the perspective of management, DS is adequate practice to ensure the perseverance of cash dividends to investors. According to the IA arguments, DS will be more common in those industries where there is greater uncertainty or opacity about the firm value (Javakhadze et al., 2014). This is because regular cash dividends can help resolve any potential conflicts that might arise from the IA. We expect to observe high DS in the GCC markets where IA is higher and SPI is lower than in developed markets. Further investigation of the level of DS as well as its determinants for GCC is required. This raises the following research question: *To what extent do GCC firms smooth their dividends?* If so, "*What are the determinants of DS behaviour in GCC firms?*" In this paper, we extend the work of previous studies by analysing a comprehensive data set of the GCC markets to examine if firms from GCC countries are smoothing and determine firms' propensity to smooth[4].

[4]According to Felimban et al. (2018, p.227) "*Further research should examine if firms from GCC countries are smoothing and determine firms' propensity to smooth*".

Our study contributes in several ways to the existing literature. First, we measure the degree of DS using data for all GCC countries. Second, we empirically investigate the importance of SPI as a new determinant of DS that has not been explored before. At a higher degree of IA (lower SPI), there is more need for dividends smoothing. Third, we identify other determinants of DS behaviour and test the agency and IA explanations for DS in GCC listed firms. The results reported in this study may help financial analysts to use the SPI as an indicator for the presence of the IA. If IA exists and is high, then firm tends to smooth its dividend to reduce the IA degree. The results help analysts in understanding the relationship between DS and SPI.

The remainder of the paper is organised as follows. Section 2 reviews the theoretical and empirical literature. Section 3 describes data sources and presents the research methodology. Section 4 presents the empirical results, while Section 5 summarises the findings and includes concluding remarks.

2. Theoretical framework and literature review

Most of the dividend smoothing papers (e.g. Chemmanur et al., 2010; Leary and Michaely, 2011; Jeong, 2013 and Javakhadze et al., 2014) measure the DS and identify its determinants following Lintner's model of DS through partial adjustments upon a target payout ratio. Some studies reformulated the Lintner model. Benartzi et al. (1997) recommend the use of the original Lintner model as the best DS process. Following Table 1, we notice few studies of emerging GCC markets.

"Insert Table 1-about here"

There are several studies on DS in developed markets (Javakhadze et al., 2014; Rhee and Park 2018; Fliers, 2019, Nguyen, 2020, and Asimakopoulos et al., 2021) and emerging markets (Adaoglu, 2000; Chemmanur et al., 2010; Benavides et al., 2016, and Al-Malkawi and Bhatti, 2020). However, very few studies examined the practice of DS across the GCC markets; see Al-Yahyaee et al. (2011) and Al-Malkawi et al. (2014). Also, no previous studies considered all GCC countries as a single market. To the best of our knowledge, this is the first empirical paper on DS using data from all GCC markets.

Although DS is a key element of the dividend policy, there is limited empirical evidence as to why firms do smoothing. Javakhadze et al. (2014) examine the determinants of the DS across countries. However, the effect of private information conveyed by share prices on DS has been largely ignored. De Cesari and Huang Meier (2015) confirm that SPI is an important determinant of dividend policy and find that the quarterly dividends changes are positively related to abnormal returns; also, they report that this relationship is stronger when stock returns are more likely to convey new private information to managers. Our study differs from their research in that their focus is on how the sensitivity of dividend changes to abnormal returns depends on the SPI. We, however, focus on the direct effect of SPI on dividend policy by studying its impact on dividend policy behaviour. Further, previous research has shown that financial and non-financial industries have different practical characteristics regarding capital structure, the concept of management, and leverage ratio. However, all existing GCC studies ignore this. Therefore, we compare GCC financial and non-financial firms to analyse how differently dividend policy work in the two types of industries.

3. Research Questions and Hypotheses

We consider the following objectives: first, we measure the degree of DS in the GCC markets. Then, we examine SPI as a new determinant of DS and verify if the determinants of DS from previous studies apply to our data set. To verify that DS is prominent in the GCC markets, as in developed markets, and validate our sample, we investigate the pattern of DS in GCC firms. We empirically test the following hypothesis:

H1: The Firms of GCC markets smooth their dividends

A high speed of dividend adjustment (SOA, hereafter) is expected to yield low IA. Hence, we conjecture that high firms-specific returns variation leads to less DS.

H2: The coefficients of the (ψ) is expected to correlate positively (negatively) to the SOA (DS).

We also use the bid-ask price spread (BAPS) as a measure of SPI. We compute BAPS as the annual average of the quoted bid-ask spread (the difference between the bid and ask prices divided the by midpoint). A larger BAPS can signal higher IA (Loureiro

and Taboada, 2012). Firms with high IA tend to smooth their dividend more, so we assume that there is a positive (negative) correlation between BAPS and DS (SOA).

H3: The BAPS is expected to be negatively (positively) correlated to the SOA (DS).

For firms with low IA, private information trading (PIT, hereafter) tends to be negative since more volume indicates liquidity-based trading, and the stock exhibits negative return autocorrelation. Since the PIT (γ) correlates positively with IA, it is expected to intensify DS.

H4: The (γ) *coefficient is expected to correlate negatively (positively) with SOA (DS).*

Summary of estimations results for the research hypotheses of the SPI, IA and DS is given in Table 2.

"Insert Table 2-about here"

4. Methodology and Data

3.1 Methodology

This paper employs two main regression models as shown below to analyse the smoothness of dividend in GCC listed firms. The first model measures the degree of DS in our context. The second model examines the relationship between SPI and DS policy and the determinants of dividend smoothing. The methodology part is divided into three parts: (1) Lintner model, (2) the models of SPI proxies, and (3) control variables.

3.1.1 Lintner model

We measure DS by using the partial adjustment model to estimate the SOA coefficient (Javakhadze et al., 2014). Lintner's model represents one of the first attempts to test the dividend stability of firms.

$$D_{it} = \alpha_{it} + \beta_1 E_{it} + \beta_2 D_{it-1} + \varepsilon_{it} \quad (1)$$

$\beta_1 = c_i r_i$ is the target payout ratio; $\beta_2 = 1 - c_i$ (speed of adjustment)

D_{it} is the dividend per share by firm i in the year t. E_{it} is the net earnings in that year t. D_{it-1} is the lagged dividend per share. The intercept term α_i for some firms is expected to be zero but, generally, it will be positive to reflect the management's reluctance to either reduce or cut dividends. c_i is the SOA coefficient with $0 \leq c_i \leq 1$ and ε_{it} is an error-term. A higher SOA c_i and lower r_i signify either instability or absence of smoothing. Conversely, a higher r_i and low SOA coefficient means that listed firms' corporate managers are motivated by smoothing of dividends. Higher value of c_i indicates less smoothing in dividends; namely, less stability in dividend policy. Consequently, the SOA relates inversely to DS. r_i is a target of cash dividends as a fraction of earnings in a given year. Briefly, this is a ratio that the management should maintain. In line with Leary and Michaely (2011), the firm's median payout ratio, measured over the sample period, is used to represent the r_i.

3.1.2 Share price informativeness (SPI) measures

- Firm-specific stock return variation or "price non-synchronicity"

We use firm-specific stock return variation *(ψ)* as the first proxy for SPI (De Cesari and Huang-Meier, 2015). A higher ψ reflects a lower correlation between stock returns and the market as well as industry returns. This suggests that share prices are more likely to reflect firm-specific information. Hence, share prices are less synchronous with market return and industry return. For generic stock i, ψ can be defined as:

$$(\psi) = ln \left[\frac{1 - R^2_{i.t}}{R^2_{i.t}}\right] \quad (2)$$

Higher values of ψ indicate higher firm-specific stock return variation relative to market-wide and industry-wide variation, i.e., lower synchronicity (a monotonically increasing function of R^2) with the market and the industry. R^2 is estimated from the following regression for each firm and year (Haggard et al., 2008; Ferreira et al., 2011; and Tan et al., 2017):

$$r_{i.j.t} = a_i + b_{i.m} r_{m.t} + b_{i.j} r_{j.t} + \varepsilon_{i.t} \quad (3)$$

$r_{i.j.t}$ is the return for firm i that is part of industry j at time t. $r_{m.t}$ represents the market return at time t. $r_{j.t}$ is the return for industry j at time t. We regress the weekly stock return of each firm in our sample on the current and prior week*'s* value-weighted market return as well as the current and previous week*'s* value-weighted industry return as in Brockman and Yan (2009), Ben-Nasr and Cosset (2014), and De Cesari and Huang-Meier (2015).

- Bid-Ask Spread

We use the BAPS as the second measure of SPI. We compute the bid-ask spread as the yearly average of weekly quoted bid-ask (the difference between the bid and ask prices divided by the midpoint). More trading is shown to reduce the bid-ask spread as a result of more information awareness and low IA level among various market participants. $BAPS$ bid-ask percentage spreads (see, Loureiro and Taboada, 2012) were calculated as follows:

$$BAPS = \frac{1}{D} \sum_{d=1}^{D} \frac{Ask_{i.d} - Bid_{i.d}}{\frac{Ask_{i.d} + Bid_{i.d}}{2}} \quad (4)$$

where $Ask_{i.d}$ and $Bid_{i.d}$ are, respectively, the ask and bid prices of stock *i* at day *d,* and *D* is the number of trading days.

- The Private information trading (PIT)

The third proxy of SPI is the PIT measure; this is based on stock return autocorrelation conditional on trading volume. We estimate calendar-year regressions for each firm in our sample (Ben-Nasr and Cosset, 2014; De Cesari and Huang-Meier, 2015) as follows:

$$r_{i.t} = a_i + b_i r_{i.t-1} + c_i r_{m.t} + \gamma_i (r_{i.t-1} \times V_{i.t-1}) + \varepsilon_{i.t} \quad (5)$$

where $r_{i.t}$ is weekly returns, $r_{m.t}$ is the market return, and $V_{i.t-1}$ represents the logarithm of firm i's weekly turnover, detrended by subtracting its 26-week moving

average[5]. The amount of PIT is given by the regression coefficient γ_i on the interaction between trading volume and asset returns. Stocks with positive γ_i are associated with speculative trade[6] (high amount of PIT), while stocks with negative γ_i are associated with hedging trade[7] (low amount of PIT). For firms with considerable IA, the coefficient γ_i tends to be positive since more volume indicates more information-based trading and the stock exhibits positive return autocorrelation. For firms with low IA, the coefficient γ_i tends to be negative since more volume indicates liquidity-based trading and the stock exhibits negative return autocorrelation.

3.1.3 Control variables

In the regression model for investigating the determinants of DS, we include several control variables that potentially affect corporate dividend policy. Following Chintrakarn et al. (2021) and Hu (2021), we include a large number of control variables that likely influence DS. Following the literature, the control variables are: Age, firm size, leverage, financial slack, MTBV, Earnings volatility, Return volatility, Investors horizon and Dividend level. Furthermore, to examine the impact of abnormal returns on DS. We use the market adjusted model of abnormal returns; it is estimated as the individual stock return in excess of the index return. Table 3 shows the definitions of all the variables considered, including the dependent variable (SOA), the proxies of SPI and the control variables.

"Insert Table 3-about here"

In this paper, we follow Leary and Michaely (2011) and Javakhadze et al. (2014) to capture the determinants of DS. We use the following model:

$$SOA_{i,t} = \alpha_{i,t} + \beta_1 SPI_{i,t} + \beta_2 FS_{i,t} + \sum_{j=1}^{N} \beta_j \, MARKET_{j,i,t} + \sum_{k=1}^{N} \beta_k INDUSTRY_{k,i,t} \, \varepsilon_{i,t} \quad (6)$$

Where: SOA_{it} = speed of adjustment; SPI_{it} = share price informativeness; FS_{it} = firm-specific variables; $MARKET_{j,i,t}$ denotes market dummy; $INDUSTRY_{k,i,t}$ denotes industry dummy, and ε = error term.

[5] To avoid the problem of zero trading volume, we add a small constant (0.00000255) to the turnover before taking logs. The value of the constant is chosen to maximize the normality of the distribution of daily trading volume.
[6] Speculative trades are defined as trades initiated by investors to speculate on their private information.
[7] Hedging trades are defined as trades initiated by investors to rebalance their portfolios for risk sharing.

Following Andres et al. (2015), Bremberger et al. (2016), Al-Najjar and Kilincarslan (2017) and Al-Malkawi and Bhatti (2020), we employ three alternative empirical methods[8] to estimate the associations to provide more valid, consistent, and robust results: the pooled least squares (OLS) method; fixed effects (FE) or random effects (RE); and the Generalised Method of Moments (GMM). Furthermore, several events impacting global economies occurred during the study period, specifically the global financial crisis (2008–2009) and the Arab spring crisis (2011-2012). To examine the impact of the global financial crisis (GFC) and Arab Spring event (ASev) on dividend stability, we extended the models by adding dummy variables. The GFC dummy variable is 1 for 2008–2009 period and zero otherwise, in line with Malkawi et al. (2014), Forti and Schiozer (2015), Mehdi et al. (2017) and Caporale et al. (2018). Dummy variable for ASev takes the value 1 for 2011-2012 period and zero otherwise, following ElBannan (2020) and Budagaga (2020).

3.2 Data description

Our sample includes data for listed firms in six GCC markets during 1994-2016. The unbalanced panel dataset includes 628 listed GCC firms with 8,662 firm-year observations. We construct our initial sample from DataStream, Bloomberg and Gulf Base (www.gulfbase.com). The firms should have at least five years of non-zero dividends (both at the current and previous years) and earnings; otherwise, they are excluded. The reason for this exclusion is that the firms do not have a trend of cash dividend payments for testing dividend stability.

Table 4 reveals that the paper contains a total of 8,662 firm-year observations; 46% are financial, while 54% are non-financial firms.

"Insert Table 4-about here"

Table 5 presents the descriptive statistics of the variables used. Accordingly, the GCC firms' average γ is equal to 0.0023. The firms' mean age is 8 years, with a maximum age of 23 years. In terms of log (total assets), the firms' average size is equal to 2.57. We find that the mean return volatility of our sample firms is about 0.04, the mean

[8] We use the pooled OLS method to capture the effect of time-varying factors on response variables. FE and RE effect estimation deals with the heterogeneity issue. These methods assume unobserved heterogeneity between individuals. FE method assumes that the unobserved heterogeneity is correlated with the independent variables. Although the panel data regression (FE and RE) models solve the problem of heterogeneity, GMM controls the issue of endogeneity.

investment horizon is 3, while the *payrat* reveals that firms had an average of 54.8%. Moreover, the means of *DEBT* show that firms included about 18.6% of debt financing in their capital structures. On average, GCC firms had a good prospect of growth, as *MTBV* shows a mean market-to-book ratio of 1.9; also, the mean of Abnormal returns is 10.3%.

"Insert Table 5-about here"

Table 6 reports the Pearson correlation coefficients between the main variables used in the study, as well as their degrees of significance. The pairwise correlation coefficients between the key regression variables are low, indicating that multicollinearity is not likely to affect our multivariate regression results.

"Insert Table 6-about here"

5. Empirical Results

This part of the paper exhibits the main empirical findings which are divided into the following two parts: (1) the degree of DS of GCC listed firms; and (2) the main determinants of DS of GCC listed firms.

4.1 The partial adjustment model (Lintner model)

Table 7 presents the regression results of the baseline the partial adjustment model. For this, we use pooled OLS, FE and GMM as the three alternative estimation methods. We further use the Linter model to examine whether GCC firms follow stable dividend policies. Consequently, we are interested in the SOA, which reflects how quickly the firms adjust dividends towards the target ratio, the higher the SOA, the less the smoothness and the less stability in dividends. Table 7 shows that the Lintner model estimation for all GCC sectors indicates that their firms have followed a stable dividend policy, and their firms are reluctant to cut dividends. The coefficients of models for both *EPS* and DPS_{t-1} are positive and highly significant. Hence, current earnings and past dividends are important factors for dividend decision of companies listed on GCC. The results are consistent with Lintner's original model, implying that GCC firms are reluctant to reduce than to raise dividends. Therefore, we support H1.

"Insert Table 7 about here"

In comparison to prior studies shown in Table 8, the SOA figure of GCC is 0.3445, which indicates that GCC firms do smooth their dividends. This is close to 0.30 for the US firms reported by Lintner (1956). The SOA figure based on the FE model is equal to 0.3445 which is comparable to the 0.33 for Germany and 0.34 for South Africa reported by Javakhadze et al. (2014). However, our results for SOA are slightly lower than those of the emerging markets reported by Benavides et al. (2016).

We also report DS behaviour at country level to verify that our GCC findings are not the result of some countries dominating the whole sample. The SOAs across the GCC countries do not vary substantially as shown in Table 8 and are positive for all six markets. Hence, we conclude that firms across all GCC markets implement DS in their dividend policy. This is consistent with previous studies including Leary and Michaely (2011), Jeong (2013), Al-Malkawi et al. (2014), Javakhadze et al. (2014), and Benavides et al. (2016). Similarly, we find that GCC firms have a target payout ratio of 0.38-037. This value is much lower than 0.50, which is reported by Lintner (1956) and Fama and Babiak (1968) for US firms.

"Insert Table 8 about here"

- The impact of Global Financial Crisis (GFC) and Arab spring event (ASev) on dividend stability

The sample period includes 2 considerable financial challenges: the GFC and the changes in the political regimes of many Arab countries (the Arab Spring). The findings in Table 7 show that the yearly dummy for the GFC (2008–2009) has no significant effect on the dividend payment decision of firms listed in the GCC region; in line with Al-Malkawi et al. (2014). Hence, GFC had no significant effect on dividend policy of GCC firms. GCC firms are more concerned about their reputation and do not change their dividend payout policy. Also, despite the GFC, GCC firms continue to follow stable dividend policy in order to send signal to the market about their future earnings.

While the yearly dummy for the Arabic spring crisis (2011–20112) has a significant positive effect, this suggests that the dividend per share has increased during the ASev period. This result is consistent with ElBannan (2020).

4.1.1 Further analysis (financial and non-financial firms)

Table 9 compares the SOA values of GCC firms based on the industry. As can be seen, in the financial sector, the coefficient on lagged dividends β_2, namely DS, varies from 0.6335 (FE) to 0.7822 (OLS) and thus, the SOA c_i ranges between 0.217 and 0.366. These results are lower than the SOA figures for the non-financial sectors, which range between 0.421 (OLS) and 0.573 (FE). This is due to the differences in the firms' policies. In addition, the coefficient of EPS for non-financial firms ranges between 0.2631 (OLS) and 0.3178 (GMM); further, target payout ratios range between 0.482 (FE) and 0.652 (GMM). These are higher than the ones from the financial sector, which are 0.293 (FE) and 0.368 (OLS). All estimated coefficients are significant at 1% level. The autocorrelation tests for second-order correlation in the residuals as well as the two-step Sargan-Hansen statistic (testing the joint of the instrument's validity) suggest that our estimates are valid. The findings support previous research (Yahyaee, 2006; Osman and Mohammed, 2010).

"Insert Table 9 about here"

4.2 Determinants of dividend smoothing

To analyse the statistical impact of SPI, we use multiple regression analysis and GMM-based estimations. The dependent variable (i.e. SOA) is the same in all cases (models), while the numbers of independent variables change. Table 10 presents in each column the results of AR(1), AR(2) and the Sargen and Hansen test. The results show that AR(1) is significant, while AR(2) is insignificant for all cases. This indicates that errors are not autocorrelated at the 2nd differential level. Moreover, the results of Sargen and Hansen tests of over-identifying restrictions. In all cases, the Sargan test rejects the hypothesis that instruments are valid. When considering the Sargan and Hansen test results, it is found that applied instruments are valid. Herewith, we use the Hansen test as the main measure of testing the validity identification of restrictions. All variables are winsorized at the 1st and 99th percentile. Table 10 evaluates a total of 4 models which apply the panel regression models and GMM estimation, respectively. The individual tests (each SPI proxy with control variables) are performed in models (1), (2) and (3). Model (4) evaluates the relationship between firm characteristics and SOA (DS).

The result from Model (1) shows that ψ has a positive and significant impact on SOA while BAPS and γ has a negative and significant impact on SOA in Model (2) and (3). These results indicate that an increase in the firm's annual specific return variation is associated with a reduction in DS; also, increases in BAPS means that γ raises the DS. Looking at other control variables, it is found that size, the investment horizon and earning volatility have both negative (positive) and significant impact on DS (SOA). On the other hand, age, return volatility, leverage, growth, financial slack, and abnormal return have both positive (negative) and significant impact on DS (SOA). The findings from the comprehensive models 1, 2, 3, and 4 support both explanations of IA and agency theory for DS. Further, Table 10 presents the results of the model using the two-step GMM system method.

"Insert Table 10 about here"

From Table 10, the result obtained from model (1) of Panel regression and GMM estimation shows that the firm-specific return variation ψ has a statistically significant impact on SOA while controlling firm characteristics. The impact of annual ψ is statistically significant. The direction of the relationship between ψ and SOA is positive. Firms' greater stock return synchronicity (R^2) is due to the lack of firm-specific information incorporated in the share prices, and hence, a negative correlation is expected between ψ and IA. Accordingly, firms with high value of ψ smooth less. These results suggest that hypothesis H2 is accepted, i.e. there is an impact of the firm-specific return variation ψ the SOA.

The result of model (2) shows that (BAPS) has a statistically significant negative impact on SOA. Previous literature has confirmed a significant association between BAPS (liquidity) and a positive impact on dividend payout (Amidu and Abor, 2006); this justifies BAPS' negative impact on SOA. Our result indicates that a larger BAPS can signal more IA (Loureiro and Taboada, 2012). Research shows that a higher percentage of BAPS is directly associated with IA (Luo, 2017). Firms, experiencing less investor knowledge and greater informational asymmetry, require greater DS to allow investors to evaluate the firm's value and earnings ability (Guttman et al., 2010). Therefore, we support the H3, i.e. that $BAPS$ has a significant impact on SOA. When $BAPS$ increases, higher IA is expected. Therefore, there is a positive correlation between $BAPS$ and DS.

According to model (3), γ has a statistically significant negative impact on (SOA). This supports our hypothesis H4 and is consistent with the work of Javakhadze et al. (2014), who report that firms smooth more as the information environment becomes opaquer. This is because γ has a significant impact on SOA since the increase in γ's value is related to more share prices' private information (De Cesari and Huang-Meier, 2015). It is observed that DS can arise when managers have private information related to the firm's value (Leary and Michaely, 2009). In other words, private information is one of the determinants of DS, it suggests that γ has a positive influence on DS.

The current findings provide clear support for the relevance of SPI. By using the measures of SPI, we determine that GCC firms with a low ψ, but high levels of BAPS and γ are more inclined to smooth dividends. This confirms that SPI impacts on the practice of DS.

Moreover, by using the measures of IA as control variables, we determine that the small GCC firms that have a high level of return volatility and high growth opportunities are more inclined to smooth dividends. Our results are most consistent with the high abnormal returns simultaneous presence of the effects of IA in the decisions to smooth dividends. These findings are consistent with the study of Jeong (2013) on IA theory, i.e. firms with higher degrees of IA are more likely to smooth dividends. Furthermore, our results indicate that firms subject to agency conflicts smooth the most. Older firms, those with greater financial slack and high dividend payout, smooth more. We suggest the presence of agency effects in the firms' decisions to smooth their dividends. These findings are consistent with the work of Jensen (1986) on agency cost theory; hence, managers pay dividends from free cash flow to reduce agency conflicts. According to Table 10, there are observed significant and negative coefficients for the past abnormal returns, this indicates that, as the abnormal returns rise, dividend smooth rises too. Thus, from an IA point of view, there should be a positive correlation between abnormal returns and DS. Firm's managers may consider the past abnormal stock returns when deciding on the revision of cash dividend payments (De Cesari and Huang-Meier, 2015). This is because unexpected changes in asset values should reflect and, thus, convey news about cash flows.

- The impact of GFC and ASev on dividend smoothing

Table 10 shows that the GFC coefficient is negative (positive) and significant, whereas the ASev coefficient is positive (negative) and significant with the DS (SOA). The GFC dummy variable is positive and statistically significant at the 1% level; GFC period (2008–2009) had a negative impact on DS in GCC firms. This indicates that GCC firms during the GFC were less likely to smooth their cash dividends. In other words, GCC firms used conservative policies and focussed on retaining cash rather than on the distribution of cash as dividends.

Further, the Arab Spring crisis (2011-2012) had a positive impact on DS in GCC firms. This indicates that during the Arab spring period, GCC firms prefer to pay dividends to shareholders rather than capitalize on themselves. In general, from our results (Tables 7 and 10), we understand that during Arab Spring, the GCC firms maintain steady dividend or increase it. This result is consistent with the agency theory; managers care about the shareholders' satisfaction.

Final, the paper's results are compared to the theoretical expectations as well as the results from relevant studies in Table 11. We report: relevant firm characteristics, empirical proxy used for each characteristic described, predicted relationship between our smoothing measures and the proxy, the sign and significance of the empirical relationship reported.

"Insert Table 11 -about here"

6. Conclusions

We contribute to the literature by analysing the DS behaviour of firms in six GCC countries. To the best of our knowledge, none of the past studies has collectively examined all GCC stock market. The study employs data from 628 listed firms covering the period from 1994 to 2016. The empirical analysis using both panel regression and GMM estimations shows that IA can explain the DS behaviour of firms. First, we examined the DS of listed firms in the GCC using Lintner's (1956) partial adjustment model. The estimation of the Lintner model for all GCC sectors indicates that their firms have smoothed their dividends and are reluctant to cut them. Our results show that financial firms smooth their dividends to a greater extent than

non-financial firms. Inversely, the non-financial sector's payout ratio is higher than for the financial sector.

Moreover, we investigate the determinants of the DS behaviour of GCC firms. Our findings regarding control variables show that smoothing is more prevalent when agency costs are high: older firms, higher financial slack firms, and firms with high dividend levels exhibit more smoothing than their counterparts. We also find that firms that are more likely to suffer from IA (small firms with high growth and abnormal returns) smooth more. More importantly, we show that all SPI factors proposed in this study are influencing factors of dividend policy. Specifically, our findings suggest that the private information learned from share price movements can play a critical role in understanding the DS behaviour in the GCC. Finally, we report a significant effect of the GFC and ASev crisis on the link between SPI and DS.

The findings of our study have important policy implications. First, dividend policymakers in the emerging GCC stock market tend to make more stable dividend payments and adjust their target payout ratios at a lower speed. Adopting more stable dividend policies supports the view that policymakers regard such corporate decisions as signalling mechanisms. This also implies that dividend policymakers only increase dividend payments when they believe that earnings can permanently sustain higher dividend levels. They are also reluctant to drastically decrease or cut dividends, since these are bad signals regarding the firm's future prospects that the market receives, especially in emerging economies where financial markets are much less stable compared to developed economies. Second, we shed some light on the importance of SPI in determining dividends smoothing. We show that SPI is amongst the important determinants of the smoothness of dividends. Moreover, these results should be beneficial to researchers in understanding dividend differences between firms, even in the same industry. That is, the level of SPI may propose an additional explanation for these differences. In addition, SPI has significant effects on DS, which could help firms make better decisions concerning their dividend policies. Specifically, to the extent that stock prices incorporate more information about the firm fundamentals, the need for dividends as a signalling mechanism reduces. Firms with higher SPI are more subject to the scrutiny and monitoring of the capital markets. Hence, they have a lesser need to use dividends as a disciplining mechanism.

7. References

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Table 1: Summary of Empirical Studies and Main Findings

Authors	Area of Study	Studied period	Country	Sample	Main Findings
Brav et al. (2005).	Dividend policy	2005	US	384 CFOs and Treasurer	Managers prefer repurchases due to their flexibility. There is weak support for the agency, information asymmetry, and clientele motivation in deciding dividend policy.
Andres et al. (2009).	Dividend smoothing and Lintner model	1984-2005	Germany	220 industrial and commercial firms	Dividends in Germany are more volatile than in the US and UK. Also, cuts in dividends occur more frequently and, in Germany, at a higher SOA.
Al-Najjar (2009).	Dividend smoothing behaviour	1999-2003	Jordan	86 Jordanian non-financial firms	Jordanian firms have target payout ratios, which they adjust to their target ratios. Thus, the Lintner model is fully applicable.
Chemmanur et al. (2010).	Differences in dividend smoothing	1984-2002	Hong Kong and the US	153 HK firms and 603 US firms	US firms smooth their dividends more than HK counterparts. Support for signalling and the implications of the differences between the two countries' tax regimes are discussed.
Al-Yahyaee et al. (2011a).	Dividend smoothing in a unique environment	1989-2004	Oman	545 Fin + non-Fin firms	There is no support for tax-motivated dividend smoothing. The smoothing is characterised by a supporting agency and information asymmetry-based motives. So, omani financial firms adjust their dividend policies very quickly, they do have a target dividend payout ratio, and they are willing to cut their dividends.
Al-Ajmi and Abo Hussain (2011).	Dividend smoothing in an Islamic country	1990-2206	Saudi Arabia	54 firms	Saudi firms are found to act quickly in increasing dividend payments. This confirms the traditional view that firms have a higher propensity to increase rather than decrease dividends.
Leary and Michaely (2011).	Determinants of dividend smoothing.	1985-2005	US	1,335 firms and 21,400 firm-year observations	There is an increasing trend in dividend smoothing. Additionally, Dividend smoothing is associated with agency costs.
Al-Najjar and Belghitar	Dividend smoothing	1991-2007	UK	432 non-financial firm-	The original version of the Lintner model does

(2012).	behaviour			year observations	not work effectively for UK firms. The modified dividend partial adjustment model, which includes cash flows, is more suitable.
Jeong (2013).	Determinants of dividend smoothing.	1981-2012	Korea	279 firms	When compared to US firms, Korean firms have a lower degree of dividend smoothing. Firm characteristics and macroeconomic factors influence dividend smoothing. This support neither agency- nor information asymmetry-based explanations.
Javakhadze et al. (2014).	Determinants of dividend smoothing.	1999-2011	24 countries	2219 non-Fin firms	Dividend smoothing occurs internationally.
Rhee and Park (2018).	changes in dividend smoothing	2000-2015	Korea	-	After the crisis, the speed of adjustment increased above pre-crisis levels. Moreover, Dividends are adjusted more flexibly for small firms with high investment levels after the financial crisis.
Fliers (2019).	The relation between financial flexibility and dividend smoothing	1986- 2013	US	517 firms	There is an adverse effect on firms with low levels of unused debt capacity. Additionally, there is a positive relationship between capital structure adjustment speeds and dividend smoothing.
Nguyen (2020)	The impact of stock market liquidity on firms' dividend payout policy	2000-2018	Australia	non-financial and non-utility	There is an increase in stock liquidity around this shock, leading to an increase in firm dividend, suggesting a causal effect of stock liquidity on firm dividend.
simakopoulos, Asimakopoulos and Zhang (2021).	the impact of credit rating changes on firms' dividend smoothing behavior	1951-2017	US	409 firms	Firms engaged in less smoothing behavior following a downgrade on their credit scores, whereas we observed only a marginal positive impact on firms' smoothing behavior after a credit rating upgrade.

Table 2: Summary of estimations results for the research hypotheses

Share Price Informativeness (SPI) proxies	The relationship with the information asymmetry (IA)	Action
firm-specific return variation (ψ)	$\uparrow \psi$ ($\uparrow$ SPI) ➔ ($\downarrow$ IA)	A larger (ψ) could signal less IA; firms need not to smooth dividends more.
bid-ask price spread (BAPS)	$\uparrow$ BAPS ($\downarrow$ SPI) ➔ ($\uparrow$ IA)	A larger BAPS could signal higher IA; firms need to smooth dividends more.
the private information trading (γ)	$\uparrow \gamma$ ($\downarrow$ SPI) ➔ ($\uparrow$ IA)	A larger (γ) could signal higher IA; firms need to smooth dividends more.

Table 3: Description of variables used

Category	Variables	Empirical proxy	Definition
Dependent variable	Dividend smoothing	SOA (speed of adjustment)	$DPS_{it} = \alpha_{it} + \beta_1 EPS_{it} + \beta_2 DPS_{it-1} + \varepsilon_{it}$ $\beta_1 = c_i \eta_i$ $\beta_2 = 1 - c_i$
Independent variables	Share price informativeness (SPI)	ψ	Annual firm-specific return variation computed as $\psi = \ln(1-R^2_{i,t}/R^2_{i,t})$ where $R^2_{i,t}$ represents the coefficient of determination of the regression of firm *i* weekly returns on the value-weighted market and value-weighted industry indices in year t.
		BAPS	bid-ask percentage spread BAPS is the weekly average spread divided by the median of the bid and ask prices over weekly *t-1*
		(γ) *Gamma*	The measure of trading based on private information developed by (Llorente et al., 2002) obtained by regressing coefficient on the interaction between firm *i*'s lagged weekly returns and the logarithm of its weekly share turnover. (de-trended by subtracting its 26-weeks moving average).
Control variables	Firm age	*age*	(The number of years since the firm first appeared in the DataStream database)
	Firm Size	*size*	The logarithm of the firm's total assets
	Earnings Volatility	*EAR_VOL*	(The standard deviation of the ratio of EBITDA to assets over the sample period)
	Dividend Level	*(payrat)*	payout ratio = DPS/EPS
	Return volatility	*RET_VOL*	SD (Return) (the annual standard deviation of weekly stock returns, including distributions
	Investment horizon	*inves_horiz*	Stock Turnover (the annual average of the ratio of monthly traded volume of shares to total shares outstanding)
	Leverage	*deb_a*	The ratio of long-term debt to total assets.
	Growth opportunity	*MTBV*	Market to book value
	Financial Slack	*(CashT)*	cash scaled by total assets
	Abnormal return[66]	*Abr*	$AR_{it} = R_{it} - R_{mt}$ Abnormal Return = Stock return – Market return, Where, R_{it} is the rate of stock return *i* on day t, $R_{it} = lnP_{it} - lnP_{it-1}$ R_{mt} is rate of index return on day *t*, $R_{mt} = lnPI_{it} - lnPI_{it-1}$ is value weighted market return of the index.

Note: the table presents the definitions for the dependent variable, all the independent variables and all control variables.

Table 4: Total number of firms based on each sample of the GCC member states (1994 - 2016)

		Financial	Non-Financial	Total
UAE	Obs	829	580	1409
	FIRMS	62	44	106
SA	Obs	611	1492	2103
	FIRMS	55	113	168
QA	Obs	291	267	558
	FIRMS	22	21	43
OM	Obs	475	1155	1630
	FIRMS	28	82	110
KU	Obs	1408	861	2269
	FIRMS	99	60	159
BA	Obs	400	293	693
	FIRMS	25	17	42
GCC	Obs	4014	4648	8662
	FIRMS	291	337	628

Table 5: Descriptive statistics for all variables (1994 - 2016)

	Mean	Std. Dev.	Min	Max	Obs
SOA	.3265	.3495571	0	1	8662
ψ	2.2528	.9528494	-.4587	4.1734	8662
BAPS	.03298	.0398469	.0019058	.2119	8662
(γ)	.00232	.0212279	-.07117	.1221	8662
age	8.2676	5.150362	1	23	8662
size	2.5778	.9729111	.77215	5.6131	8662
EAR_VOL	43.7131	86.85344	0	269.4571	8662
payrat	.54763	.8182537	0	6.49359	8662
RET_VOL	.0381	.0325865	0	.1473	8662
inves_horiz	2.9811	9.130274	0	69.1457	8662
deb_a	18.56498	19.32623	0	75.617	8662
MTBV	1.896749	1.740145	.1819	11.3094	8662
CashT	416.4379	1236.967	.0208	7950.185	8662
Abr	.1028337	.1567062	0	.8751415	8662

Note: the table reports the summary statistics of variables used in our study for the speed of adjustment (*SOA*), firm-specific return variation (ψ), bid-ask percentage spread (*BAPS*), the PIT (γ), firm age (*age*), Firm size (*size*), Earning volatility (*EAR_VOL*), payout ratio (payrat), Return volatility (*RET_VOL*), Investment horizon (*inves_horiz*), Debt (*deb_a*), market-to-book-value (*MTBV*), cash to the asset (*CashT*) and abnormal return (*Abr*). The variables are summarised across all firm-years.

Table 6: The correlation matrix for all explanatory variables used in the analysis

	SOA	*ABR*	ψ	*BAPS*	γ	*age*	*size*	*EAR_VOL*	*payrat*	*RET_VOL*	*inves_horiz*	*Debt/TA*	*MTBV*	*Cash/TA*
SOA	1.000													
ABR	-0.1084	1.000												
ψ	0.0948	-0.4450	1.000											
BAPS	-0.033	0.031	-0.028	1.000										
γ	-0.0362	0.0772	-0.1511	-0.023	1.000									
age	0.012	-0.022	-0.0531	0.027	0.017	1.000								
size	0.1351	-0.0636	0.0649	-0.1922	0.022	0.2596	1.000							
EAR_VOL	0.019	-0.027	0.028	-0.0411	-0.019	0.0421	0.1195	1.000						
payrat	0.1614	-0.0548	0.011	-0.015	-0.019	0.0329	0.024	-0.008	1.000					
RET_VOL	-0.0519	0.2095	0.1853	-0.0607	0.016	0.1796	0.1210	0.0564	-0.0862	1.000				
inves_horiz	-0.0607	-0.0627	0.1903	-0.0907	-0.024	-0.0799	-0.1232	-0.032	-0.0393	0.3524	1.000			
Debt/TA	-0.0487	0.0526	-0.0497	0.028	0.007	-0.011	0.1443	0.0892	-0.0763	0.0341	-0.1136	1.000		
MTBV	0.005	-0.2259	0.3685	0.0965	-0.0711	-0.1359	-0.013	0.001	-0.0462	0.0798	0.2875	-0.0864	1.000	
Cash/TA	0.0867	-0.1033	0.1289	-0.0907	-0.014	0.2065	0.6340	0.0451	-0.004	0.005	-0.0874	0.004	0.0129	1.000

Note: The table presents the correlation matrix for the speed of adjustment (*SOA*), firm-specific return variation (ψ), bid-ask percentage spread (*BAPS*), the private information trading (γ), firm age (*age*), Firm size (*size*), Earning volatility (*EAR_VOL*), payout ratio (*payrat*), Return volatility (*RET_VOL*), Investment horizon (*inves_horiz*), Debt ratio (*deb_a*), market-to-book-value (*MTBV*), cash to the asset (*CashT*) and abnormal return (*Abr*).

Table 7: Lintner model regression estimates for GCC firms during the GFC and ASev

Dependent variable=DPS	*Pooled OLS*	*Panel regression*	*GMM*
EPS	.1313 ***	.1314***	.1273 ***
	42.24	3.98	4.06
DPS_{t-1}	.6554***	.6555***	.6554225
	84.30	9.86	12.12
GFC	.0010129	.0010129	.0019973
	0.18	0.20	0.36
ASev	.0086*	.0086**	.0065*
	1.66	2.15	1.67
Constant	.0184***	.0184***	-.0279***
	8.16	4.48	-0.62
SOA (c)	0.3445	0.3445	0.3445
(r)	0.38	0.38	0.37
Adj R^2	0.8160	0.8161	
f-stat p	0.0000	0.0000	
Hausman p		0.0000	
AR(1) p	-		0.017
AR(2) p	-		0.096
Sargan p	-		0.000
Hansen p	-		0.136
Mark EFF	Yes	Yes	Yes
No. of Obs	8033	8033	7207

Notes: ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Table 8: Estimates of speed of adjustment (SOA)

Author	Country	Period	No of Firms	SOA
Leary and Michaely (2011)	USA	1985-2005	1335	0.14
Jeong (2013)	Korea	1981-2012	279	0.68
Al-Malkawi et al. (2014)	Oman	2001-2010	104	0.26
Javakhadze et al. (2014)	Australia	1999-2011	76	0.46
	Austria		6	0.36
	Bermuda		63	0.67
	Cayman Island		9	0.64
	China		11	0.6
	Denmark		6	0.57
	Finland		21	0.55
	Germany		25	0.33
	Hong Kong		44	0.48
	India		96	0.43
	Ireland		7	0.36
	Japan		1194	0.15
	Malaysia		125	0.44
	Netherlands		24	0.54
	New Zealand		5	0.4
	Nigeria		5	0.53
	Norway		14	0.47
	Pakistan		17	0.63
	Singapore		43	0.48
	South Africa		16	0.67
	South Korea		120	0.34
	Sweden		31	0.5
	Switzerland		21	0.39
	United Kingdom		240	0.28
Benavides et al. (2016)	Argentina	1995-2013	60	0.48
	Brazil		319	0.47
	Chile		141	0.78
	Colombia		19	0.45
	Mexico		60	0.4
	Peru		67	0.55
Current Study	GCC	1994-2016	628	0.34
	Bahrain		42	0.33
	Kuwait		159	0.33
	Oman		110	0.32
	Qatar		43	0.38
	Saudi Arabia		168	0.28
	UAE		106	0.38

Table 9: Robustness Check for the Lintner model (1994-2016)

Dependent variable =DPS	Financial			Non-Financial		
	(OLS)	(FE)	(GMM)	(OLS)	(FE)	(GMM)
EPS	.0803*** 23.22	.1075*** 20.78	.1134*** 37.43	.2631*** 39.19	.2769*** 32.98	.3178*** 22.16
DPS_{t-1}	.7822*** 72.10	.6335*** 50.21	.6403*** 45.12	.5782*** 54.69	.4267*** 35.81	.5133*** 12.95
Constant	.0072*** 3.21	.0159*** 6.15	-	.0075*** 3.38	.0294*** 10.51	-
SOA (c)	0.217	0.366	0.359	0.421	0.573	0.486
(r)	0.368	0.293	0.315	0.624	0.482	0.652
Adj R^2	0.8960	0.893	-	0.8439	0.841	-
f-stat p	0.0000	0.000	-	0.0000	0.000	-
Hausman p		0.0000			0.0000	
AR(1) p	-	-	0.029	-	-	0.046
AR(2) p	-	-	0.279	-	-	0.123
Sargan p	-	-	0.000	-	-	0.000
Hansen p	-	-	0.125	-	-	0.699
Mark EFF	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs	3724	3724	3363	4309	4309	3844

Notes: ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Table 10: Panel regressions and GMM estimations for dividend smoothing during GFC and ASev

DEP=SOA	PANEL REGRESSIONS				GMM			
	1	2	3	4	1	2	3	4
ψ	.0184***				.06806***			
	2.90				10.71			
BAPS		-.1405**				-.1355**		
		-1.97				-2.45		
γ			-.6278***				-.5159***	
			-2.81				-4.13	
AGE	.0009461	.0013565	.001234	.0011683	-.0065***	-.0051***	-.0079***	-.0077***
	0.88	1.18	1.15	1.09	-6.01	-4.78	-8.06	-7.18
SIZE	.0943***	.0749***	.0945***	.0939***	.1432***	.1417***	.1412***	.1398***
	11.57	7.93	11.59	11.51	11.30	13.03	11.83	10.16
EAR_VOL	4.04e-07	-1.33e-06	1.05e-06	9.13e-07	3.07e-06**	8.66e-07	4.71e-06***	3.35e-06**
	0.12	-0.38	0.31	0.27	2.42	0.68	3.79	2.38
PAYRAT	.0513***	.0417***	.0509***	.0514***	-.0067**	-.0159***	-.0097***	-.0093***
	9.31	6.81	9.23	9.31	-2.05	-5.66	-2.94	-2.60
RET_VOL	-.4687**	-.6376***	-.2638836	-.2975231	-.7937***	-.2375**	.0134669	.0321368
	-2.28	-2.85	-1.33	-1.51	-5.35	-2.16	0.11	0.24
INVES_HORIZ	.000553	.0002173	.0003155	.0004609	.0021***	.0011***	.0012***	.0013***
	0.87	0.33	0.49	0.72	5.59	3.44	3.51	3.50
DEB_A	-.0017***	-.0014***	-.0017***	-.0017***	-.0009**	-.0015***	-.0016***	-.0015***
	-6.62	-4.82	-6.64	-6.62	-2.51	-3.55	-4.37	-3.52
MTBV	.0051632	.0088***	.0069**	.0072**	-.0150***	.0102***	.0015922	.0028181
	1.63	2.61	2.24	2.33	-6.01	4.95	0.70	1.09
CASHT	-.00001***	-8.82e-06 *	-.00001***	-.00001***	-.00003***	-1.69e-06	-1.25e-06	2.90e-06
	-3.41	-1.85	-3.24	-3.15	-4.80	-0.31	-0.23	0.45
ABR	-.1196***	-.1884***	-.1562***	-.1606***	-.0839***	-.1063***	-.0981***	-.0958***
	-3.28	-5.31	-4.65	-4.78	-3.67	-5.07	-4.63	-4.21
GFC	.0582***	.0716***	.0599***	.0608***	.0181***	.0368***	.0297***	.0288***
	4.40	5.06	4.54	4.61	2.57	5.61	4.47	3.86
ASEV	-.0126993	-.0211*	-.0147157	-.0144419	-.0168***	-.0184***	-.0215***	-.0182***
	-1.07	-1.70	-1.25	-1.22	-2.89	-3.31	-3.98	-3.12
C	.0834***	.1887***	.1162***	.1192***	-.0629309	-.0000124	.1886***	.2286***
	2.64	5.57	4.00	4.10	-1.52	-0.00	4.38	5.31
HAUSMAN TEST	0.0000	0.0000	0.0000	0.0000				
ADJ R-SQUARED	0.0808	0.0758	0.0807	0.0796				
PROB > F	0.0000	0.0000	0.0000	0.0000				
AR (1) P					0.0000	0.0000	0.0000	0.0000
AR (2) P					0.210	0.242	0.176	0.175
HANSENP					0.103	0.205	0.268	0.263
MARK, IND EFF	YES	YES	YES	YES	YES	YES	YES	YES
OBS	8662	8662	8662	8662	8662	8662	8662	8662

Notes: ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Table 11: Comparison of reported results

Firm Char	Empirical proxy	Hypothesised Sign	The results	Leary and Michaely (2011)	Jeong (2013)	Javakhadz et al. (2014)	Muller and Svensson (2014)
SPI	(The firm-specific return variation (ψ)	+	+	0	0	0	0
	(Bid Ask spread (BAPS)	-	-	0	0	0	0
	(the private information trading (γ)	-	-	0	0	0	0
Firm age	Age	+	-	-	0	-	-
Firm size	Size	+	+	-	-	-	-
Dividend level	The payout ratio	+	+	-		+	
		-	-	-			-
Investors horizon	Stock turnover	-	+	+		-	-
Growth opportunities	MTBV	-	-	+		+	+
		+	+	+			+
Cash to asset	CASH	-	-		+	+	+
Leverage	LEVER	+	-	-			+
Earning volatility	SD (EBIT)	-	+	+		-	+
Return volatility	SD (Return)	-	-	+		+ , -	+
Abnormal return	Abr	-	-				