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ORIGINAL RESEARCH

What do dividend changes reveal? Theory and evidence from a unique environment

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Abstract

We explore the reasons behind corporate dividend changes and factors driving those changes during 2001–2021 in Oman, as a unique environment. The implications of our paper contrast with the relevant existing literature which demonstrates a positive correlation between dividends and *stock prices* in Oman, in support of the signaling theory. Employing multiple methods and after controlling for the nonlinearity in the profitability process, we find virtually no evidence for the signaling theory of dividends for dividend reductions, in terms of future earnings. Furthermore, our analysis affirms the importance of current profitability in influencing the magnitude of and the propensity to change (increase or decrease) dividends in listed Omani firms. We also find that the catering theory of dividends does not have any explanatory power on dividend changes. Further, firms' life-cycle status and real investments have been found to significantly affect the decision to change dividends. Our results, which depart from the findings in the conventional literature, can be attributed to the distinct institutional features in Oman. Our game-theoretic model of dividend signaling/dividend catering provides some explanations.

Keywords Dividend · Profitability · Earnings · Tax-based signaling theory · Catering theory · Investments · Life cycle theory · Oman

JEL Classification D82 · G35

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1 Introduction

Dividend policy remains one of the most puzzling and controversial issues in corporate finance. According to Miller and Modigliani (1961), dividend policy (i.e., timing and magnitude of dividend payments) is irrelevant in a perfect market. Given the tax disadvantage of dividends, Black (1976) proposes that the optimal dividend policy in a world of taxes is ‘not to pay dividends’. However, despite tax disadvantage of dividends, firms continue to pay dividends. Theoretical and empirical research have attempted to resolve this puzzle with market frictions such as taxes, agency costs, free cash flows, information asymmetry, signaling, clientele effects, and regulatory constraints. One of the most cited explanations for paying dividends is information signaling. The signaling hypothesis argues that dividend increases contain positive informational content about future earnings, suggesting a positive link between dividends and earnings. Thus, dividends are seen by the market as a signal of quality (in terms of earnings), and so, following an announcement of a dividend increase, current share prices should immediately move upwards. Therefore, according to the signaling hypothesis, dividends, earnings, and share price movements should be positively correlated.

Thus, empirical tests of the dividend signaling model focus on two factors: a) the effect of dividends on stock prices (that is, market reaction to dividends), and b) the relationship between dividends and earnings. There is widespread and strong evidence that dividends and stock prices are positively correlated. However, in terms of the relationship between dividend changes and (current and future) earnings, the evidence is mixed.

The existing tests focus on signaling models in the standard (rational) finance tradition. However, a further complication arises when one delves into behavioural corporate finance, and particularly, Baker and Wurgler’s (2004) dividend catering model. In this approach, psychologically biased and emotional investors have an irrational desire for dividends, and are happy to pay a catering premium for firms with higher dividends, even if such firms do not possess any more earnings quality than non-paying dividend firms. Thus, the catering theory provides an explanation as to why the stock market may react positively (in the short-run) to dividend increases, but there is no positive relationship between dividends and earnings in the long-run.

In this paper, we develop a game-theoretic dividend signaling model and provide empirical analyses by considering the economic and behavioural factors that may affect the relationship between dividends and earnings in Oman.

Oman provides an interesting environment in which to analyse this issue.[1] There are no taxes, and the information environment is very weak and opaque. Further, the institutions in Oman are very strong, which may eliminate the role of dividends in reducing agency problems (of free-cash flows). Furthermore, the market is relatively young, consisting of many smaller and less sophisticated investors. Thus, dividend catering may have a powerful effect.

In order to consider why there may not be a consistent relationship between the three factors (dividend changes, stock prices, and earnings), we begin by developing a game-theoretic model that provides explanations. We demonstrate that there is no effect between

[1] The Omani government depends heavily on oil and gas revenues accounting for over 60% of total export earnings, 45% of government revenue and 50% of GDP government revenue. It has a very low inflation rate, no personal tax and flat corporate income tax rate of 15%. Dividends and gains from the sale of locally listed shares are exempt from tax. Its currency, Omani Riyal, has been pegged to the US dollar since 1986 (1 Omani Riyal = \$2.6).

dividends changes and future earnings, which is inconsistent with (long-term) dividend signaling, but is consistent with (short-term) dividend catering.

Our empirical research begins by focusing on the relationship between dividend changes and current/future earnings in Oman. The first empirical evidence, a positive link between dividend changes and stock market reaction in support of dividend signaling, and/or dividend catering, was already provided by Al-Yahyaee et al. (2011). We complement this by analysing the relationship between dividend changes and earnings in Oman.[2]

Our results are consistent with the earlier studies in the U.S. documenting that dividend changes are uncorrelated with future profitability changes. Using matched-sample approaches, we find that dividend changes are highly correlated with current profitability changes. In testing the signaling hypothesis, our results yield virtually no support for the signaling theory. Our findings are in line with Grullon et al. (2005) using US data and Choi et al. (2011) using Korean data that future profitability and dividend changes are uncorrelated, both papers using the non-linear approach. Similarly, Benartzi et al. (1997) -using US data- find no relation, or a very weak relation between dividend and future profitability using matching sample approach.

Following our results on the absence of convincing evidence on the signaling theory, we consider the relevance of the catering incentives, life-cycle theory and firms' real investment decisions to dividend changes. Our analyses reveal no evidence on the impact of the catering theory of dividends on dividend changes, which is inconsistent with Barker and Wurgler (2004) and Li and Lie (2006). The findings also demonstrate that the life-cycle theory (DeAngelo et al. 2006) and a firm's real investment are associated with dividend changes and decreases in Oman.

The investigation of other factors that affect dividend changes in the Omani market show that, not surprisingly, current profitability changes are positively associated with dividend changes, increases and decreases in listed Omani firms. The results also reveal that firm size and market-to-book ratio (proxy for growth opportunities) are negatively connected with the amount of dividend changes and increases. Besides, current change in retained earnings is positively associated with amount of dividend changes and increases. For dividend-decreasing firms, we observe that the size of the firm, market-to-book ratio and current change in retrained earnings are positively related to dividend reductions.

Our investigation of the factors that influence the likelihood of firms to change dividends in Oman reveals the following. We find that current profitability impacts the propensity of firms to change, increase and decrease dividends. The results also show size, growth, market-to-book ratio, dividend yield and current change in retrained earnings (leverage) have a positive (negative) influence on firms to change dividends. Market-to-book ratio, leverage and dividend yield, on the other hand, heighten the propensity of Omani firms to decrease dividends.

Lin and Lee (2021) show that the relationship between dividends' stickiness and future earnings is more apparent in firms with lower dividend premium (hence lower catering-related incentives). Lin et al. (2018) reports that in firms with lower dividend premium, the impact of information asymmetry on cash dividends is stronger compared to the impact of

[2] Our paper differs from Al-Yahyaee et al. (2011) in several aspects: i) we focus on dividend change and future profitability; ii) our study therefore contributes to the literature by demonstrating that there is unpersuasive link between dividend decreases and future profitability; iii) we examine the importance of current profitability in influencing the magnitude and the propensity to change (increase or decrease) dividends in Omani firms; iv) we tested several theories in Omani firms such as the catering theory, the relevance of the real investment decisions and the life-cycle theory, which could potentially explain the dividend changes; and v) our paper develops a game-theoretic dividend signaling model.

dividend premium. Thus, we conduct additional analyses to explore the impact of catering incentives on the relationship between dividend changes and future profitability. More specifically, we examine if the information content of dividend changes announcements is more pronounced in firms with lower catering incentives rather than higher incentives. This is because for the case of higher catering incentives firms are very likely to change dividend policy to cater for the shareholders' changing demand for cash dividends (as a dominant effect), not to provide signals for their expected future profitability. We employ dividend premium and market-to-book ratio as measures of market sentiments in constructing two groups (i.e., those with higher and lower catering incentives) and examine the link between all dividend change types in those groups with future profitability. Our results appear to reveal no support for the catering incentives in firms with lower market sentiments.

We also account for the effect of real investment on future profitability and find that real investment reduces future profitability in dividend deceasing firms. Moreover, our results suggest that real investments during Covid-19 pandemic adversely affected firms' future profitability, after considering some other factors.

In summary, our paper provides three major contributions. First, we delve into the empirical implications of the signaling theory, catering theory and life-cycle theory in a unique environment: Oman. Second, we develop a game-theoretic dividend signaling/dividend catering model that provides economic and behavioural insights into this inconsistent relationship.

In our third contribution, we combine our findings of no significant link between dividends and earnings with the existing findings from Al-Yahyaee et al. (2011) who find a strongly positive relationship between dividends and stock prices in Oman. Hence, we argue that dividend signaling (or dividend catering) seems to apply in terms of stock market reaction to dividend changes, but that it seems to break down in terms of the fundamentals: dividend changes are not related to future earnings. As far as we are aware, our paper is the first study to confront existing research on the link between dividends and stock prices, with an analysis, for a closely matched sample, of the relationship between dividends and future earnings, and to argue that there is an inconsistent relationship between dividends, stock prices, and future earnings.

The remainder of this paper is organised as follows. In Sect. 2, before proceeding with our theoretical and empirical analyses, we discuss the relevant dividend policy literature. In Sect. 3, we develop and analyse our game-theoretic dividend signaling/dividend catering model. This enables us to analyse the inconsistent relationship between dividends, stock prices, and (current and future) earnings. In Sect. 4, we discuss country background and develop our hypotheses. Section 5 describes the sample and provides descriptive statistics. Section 6 presents the empirical findings. Section 7 concludes the paper.

2 Literature review

2.1 Relationship between dividends, stock prices and earnings

The empirical analyses in the US and other developed markets suggest that dividend changes are positively associated with stock price adjustment in the same direction (e.g.,Pettit 1972; Aharony and Swary 1980; Kane et al. 1984; Nissim and Ziv 2001; Gunasekarage and Power 2002; Harada and Nguyen 2005; Lie 2005; Dasilas and Leventis

2011; Khanal and Mishra 2017; Ali 2022), supporting the signaling hypothesis. However, when considering the relationship between dividend changes and future *earnings,* the evidence is mixed. Previous studies demonstrate that firms change dividend policy to signal their earnings prospects (e.g., Nissim and Ziv 2001; Harada and Nguyen 2005; Cho et al. 2023). Deng et al. (2017) study the information content of dividends in China and report that dividends are informative about future earnings. Besides, Ham et al. (2020) find that dividend changes signal future earnings in the short-horizon in the US. Ham et al. (2021) reveal that dividend convey information about permanent earnings. However, other studies in this area reject the dividend signaling hypothesis. Benartzi et al. (1997) examine the association between dividends and earnings in the US and show that dividends are significantly (insignificantly) correlated with current (future) earnings. Fukuda (2000) finds weak results on the information content of dividends. Using nonlinear approach, Grullon et al. (2005), on the other hand, report no support for the relationship between dividend changes and future earnings. Michaely et al. (2021) uncover that dividend announcements provide information about cash flow volatility and not signaling future earnings.

Aggarwal et al. (2012) argue that the inconclusive results on the link between dividends and future earnings in the previous studies might occur due to the variation in asymmetric information among public firms, which insufficiently provides adequate testing power in the US. They use a sample of foreign firms that cross-list on the U.S. stock markets in the form of American Depository Receipts (ADRs), which represents firms with poor information environment. Their results reveal a strong association between dividend increases and future earnings, supporting the signaling hypothesis. Ellahie and Kaplan (2021) show that dividends contain information about future earnings in countries with weak institutions. Chen et al. (2022) find that high-growth firms can pay more dividends for signaling purposes and the market favours such signals. Similarly, Lin and Lee (2021) add that signaling of future earnings by dividends is also applicable to the case of sticky dividends. On the other hand, Kuo (2013) distinguishes between taxable and non-taxable stock dividends and finds that the market is responsive only to the former. Leary and Nukala (2023) suggest that one way to figure out whether expected future earnings can be revealed via the change in dividend policy can embed in the level of informed decision making of managers as well as their career concerns.

While most of these studies have been conducted in the U.S. (e.g.Aharony and Swary 1980; Nissim and Ziv 2001) and other developed markets (e.g., Harada and Nguyen 2005; Dasilas and Leventis 2011), much less consideration has been given to developing markets where financial and institutional characteristics differ significantly. However, recently, scholars have begun to examine dividend policy in emerging markets. For example, Al-Yahyaee and co-authors have examined dividend policy in Oman. Similarly, Dedman et al. (2017), Lin et al. (2023a) and Lin et al. (2023b) analyse dividend policy of Chinese firms. There are parallels between these two areas of research: both sets of studies emphasise that examining dividends in these countries is interesting, as both Oman and China can be classified as weak information environments, and both countries are low on investor protection from an agency viewpoint. Sawicki (2009) analyses the relationship between corporate governance and dividends in five East Asian countries, and Duqi et al. (2020) compare the payout policy of Islamic and conventional banks in 16 countries.

Some earlier studies examine the influence of financial crisis on corporate dividend policy and find inconclusive results (e.g., Hauser 2013; Floyd et al. 2015). Hoberg and Prabhala (2008) find that financial crisis lowers the propensity of firms to pay dividends. Likewise, Hauser (2013) shows that corporate dividend policy became tight during the global financial crisis. However, focusing on the financial sector, Floyd et al. (2015) find that US banks are less likely to cut dividends during the crisis.

The recent literature on the impact of Covid-19 on corporate payout policy reveals the adverse effect of the pandemic on dividends. Cejnek et al. (2021) show that Covid-19 has a negative influence on near-term dividend futures prices. Similarly, Pettenuzzo et al. (2021) find that during the pandemic US firms saved $86bn by reducing or suspending dividends. Further, Ali (2022) detects a significant increase in the number of firms that decrease or omit dividends compared to the pre- Covid-19 period in G-12 countries. For the case of G-7 countries Ntantamis and Zhou (2022) find evidence on the reduction in payout policy during Covid-19 in firms with less cash holdings. Liang et al. (2023) extend the previous studies and consider the impact of firms' financial constraints on the relationship between Covid-19 times and dividend policy. They find that Covid-19 adversely affects dividend policy in China and the effect is larger for firms with financial constraints. In contrast, Tinungki et al. (2022) examine the impact of Covid-19 on dividend policy in Indonesia and find that the pandemic does not have a significant effect on firms' dividend policy.

2.2 Relationship between dividends, catering theory and life-cycle theory

The catering theory of dividends proposed by Baker and Wurgler (2004) argue that firms pay dividends when investors place a high premium on dividend paying stocks. Their study provides evidence of a positive relationship between dividend premium and the propensity to initiate or continue dividends. Likewise, Li and Lie (2006) find that the likelihood to increase (decrease) dividends is positively (negatively) correlated with dividend premium. Considering the amount of dividends, they provide evidence for the catering theory in the case of dividend increases.[3] Ferris et al. (2006) find support for the catering theory in the UK. Lin et al. (2023a, b) show that firms in China respond to investors' complaints about dividends by increasing the level of dividends. Kuo et al. (2013) examine the catering theory in an international context and find that catering theory persists among common law economies but not in civil law countries. In contrast, Denis and Osobov (2008) detect no association between catering incentives and the propensity to reduce dividends in the UK. Ali and Urcan (2012) show that only in the period where dividend premium is high, managers increase dividends to cater investors' demand.[4] Recent studies have provided further support to the catering theory of dividends in Taiwan (Wang et al. 2016), in Turkey (Takmaz et al. 2021), and in emerging countries (ElBannan 2020).

The life-cycle theory of dividends postulates that a firm moves over different life-cycle stages which impact their payout policy. Fama and French (2001) report a decrease in the payout policy in firms with a small size, low profitability and high growth. Grullon et al. (2002) demonstrate that dividend changes contain information about a firm's life cycle. DeAngelo et al. (2006) find that the propensity to pay dividends is more pronounced in mature firms. Denis and Osobov (2008) report a high tendency to pay dividends in mature firms in six developed markets. Brockman and Unlu (2011) and Shao et al. (2013) provide evidence on the life-cycle of dividends in an international context. In addition, Bostan et al. (2023) examine the relationship between dividends and profitability using a large sample from 59 countries over the period between 2006 and 2021. They find support for the

[3] They find a negative and insignificant relationship between dividend decreases and catering incentives.

[4] However, they find evidence for the signaling theory of dividends in the period with low dividend premium.

life cycle theory and the catering theory of dividends. As a similar study, Cadenovic et al. (2023) detect evidence on the life-cycle theory of dividends.

Regarding the link between capital expenditures and payout policy, Desai and Jin (2011) find that capital expenditures are positively associated with payout policy. However, Iyer et al. (2017) examine the relationship between capital expenditures and payout channels in firms that engaged in share repurchase activity. They find insignificant (negative and significant) relationship between capital expenditures and dividends (repurchases). On the other hand, Rajput and Jhunjhunwala (2019) reveal no relationship between capital expenditures and payout policy in India. Hasan and Habib (2020) find that capital expenditures adversely affect the amount of and the propensity to pay dividends for the US firms.

Finally, AlGhazali et al. (2023) develop a theoretical analysis for dividend policy by focusing on the impact of the complex mix of managerial moral hazard, overconfidence, and far-sightedness and short-sightedness, considering also the presence of catering effects. They then show when the association between managerial overconfidence and dividends is negative or positive.

2.3 Our contribution to the "Dividends in Oman" research

Our research has been motivated by the emerging research on dividend policy in Oman, specifically by three key papers: Al-Yahyaee et al. (2011) and Al-Yahyaee (2014a; 2014b). Table 166 in the Appendix summarises this research and puts our research into context. This table emphasises the importance of our work: Al-Yahyaee (2014a) found a positive relationship between ***stock*** dividend changes and stock price in the Omani stock market. This appears to be a rational reaction by the market, as he also finds a positive relationship between ***stock*** dividends and future earnings in Oman in the same paper. Furthermore, he finds that infrequent payers of stock dividends have higher ex-post performance than frequent payers (Al-Yahyaee 2014b).

Moreover, in a separate paper Al-Yahyaee et al. (2011) find a positive relationship between ***cash*** dividends and stock price reaction. However, they do not look at the relationship between cash dividends and earnings. This motivates our analysis in order to fill this gap. In particular, we attempt to answer several questions as to whether there is any association between dividend changes and past, current, and future earnings and factors influencing the level of dividends and the propensity to pay dividends among Omani firms.

Interestingly, in our paper we find no relationship between cash dividends and future earnings. This motivates our research question: why do investors react rationally to stock dividends (the increase in stock price being justified by future increase in earnings: a justified 'good news' announcement)? However, combining Al-Yahyaee et al.'s (2011) work on cash dividends and stock prices with our research in this paper on cash dividends and future earnings, it appears that their reaction to cash dividends is irrational (there is no future increase in earnings). This latter question is an interesting one that also applies to much evidence around the world in developed and developing countries: e.g., some evidence of positive relationship between cash dividends and stock price, but no relationship between cash dividends and earnings, in USA. Indeed, Al-Yahyaee et al. (2011) state: "*Although Oman's stock market is young and investors there have limited knowledge and experience, the stock market appears to efficiently incorporate dividends information in share prices and returns… though it is beyond the scope of the current paper, it is possible that the reactions to cash dividend announcements observed in this paper might be due to behavioural characteristics of irrational investors*." Al-Yahyaee et al. (2011) only introduce Omani investor irrationality as a possibility, but do not directly analyse it, as they only look at the stock price reaction. We complete the picture by analysing the link between cash dividends and future earnings, and confirm Al-Yahyaee et al.'s (2011) suspicion: the positive market reaction to cash dividends is indeed irrational: it is not backed up by future earnings.

We also provide other explanations as to why firms change dividends in Oman where dividends are tax exempted. Our empirical findings show no evidence for the catering theory. Instead, we should that life-cycle theory is more applicable. Also, real investment decisions appear to impact dividend policy of Omani firms.

3 Game-theoretic dividend signaling model

In our subsequent empirical analysis, we examine the relationship between current dividend changes, and changes in current and future earnings in Oman. Overall, we demonstrate that dividend changes in Oman are significantly correlated with current earnings changes in the same direction: that is, dividend increases (decreases) are strongly correlated with current earnings increases (decreases). However, we further show that there is little relationship between dividend changes and future earnings. This is an interesting finding, as Al-Yahyaee et al. (2011) test the dividend signaling content of dividend increase/decrease announcements in Oman. They have demonstrated that dividend increases (decreases) in Oman result in positive (negative) stock market reaction, hence supporting the dividend signaling hypothesis. Thus, a natural question arises: why would dividend increases (decreases) provide a positive (negative) signal to investors in Oman, such that the stock market reacts positively, and yet have little predictive power for future earnings? Does this reveal a level of irrationality amongst investors, who are somewhat 'fooled' by dividend increases, that, in the end, do not materialise as increased future earnings.

In order to consider this apparent conflict/contradiction, we develop a simple game-theoretic dividend signaling model that contains both a 'rational' component (dividend changes provide a genuine signal of firm quality) and a behavioural (irrational investors) component whereby investors attach a 'catering' premium to firms that increase dividends.

Miller and Modigliani (MM) (1961) considered conditions under which dividend changes would have no effect on firm value (the dividend irrelevance theorem). In their irrelevance theorem, MM assumed a) perfect, frictionless capital markets, with no trading costs and no taxes, b) symmetric information between corporate managers and external investors about the company's current earnings and future prospects, and c) no agency problems (unselfish managers acting purely in the shareholders' interests, to maximise firm value). According to this theorem, any change in dividends would have no effect on firm value: there would be no stock market reaction to dividend changes: dividends are truly irrelevant.

Following empirical evidence that dividend changes and stock prices are positively linked (dividend increases result in increases in stock prices), subsequent researchers examined the effects of changing the MM perfect market assumptions in an attempt to understand the evidence. Particularly, scholars dropped the assumption of symmetric information between corporate management and investors (in order to develop asymmetric information, dividend signaling models), and also considered agency models, in which dividends constrained self-interested managers' value-destroying actions.

In our model, we focus on the asymmetric information/dividend signaling role of dividends. The idea is that, in a world of asymmetric information, where a firm's management know more than investors about the company's current and future prospects, dividends may provide a positive signal to investors of the firm's quality and prospects, such that the stock market reacts positively to dividend increases.

We note that the MM dividend irrelevance theorem, and the subsequent asymmetric information/dividend signaling models (and the agency models of dividends) were all rooted in the standard/traditional '*homo economicus'* models in corporate finance (with the assumptions of fully rational, unemotional, non-psychological, perfect calculators and maximisers of expected utility). Hence, in traditional dividend signaling models, rational investors fully understand the signals that management provides through their dividend policy, and rational managers therefore provide the correct signals: dividend increases genuinely signal high quality firms, and stock market prices respond accordingly, positively.

In our analysis of Oman, we demonstrate that, in contrast to Al-Yahyaee et al.'s (2011) support for the dividend signaling hypothesis (where he found a positive relationship between dividend changes and stock prices), there is little relationship between dividend increases and future earnings. It appears that the dividend signaling hypothesis 'breaks down': it does not signal future prospects, in contrast to investors' expectations. Does this suggest that investors' stock market reaction is irrational?

In order to provide a framework to consider this question, in our model, we consider both rational investor reaction to dividend signals, and irrational reaction (from the dividend models in behavioural corporate finance). In our model, a firm faces a trade-off between investing free cash flows into a new value-increasing project, or paying this cash out as dividends to investors who have been behaviourally conditioned into perceiving dividend increases as good news. Given this trade-off, we examine conditions under which the firm passes up the positive investment opportunity in order to pay the dividends. Our model is important in the context of our research (and Al-Yahyaee's analyses) in Oman: as we demonstrate the dangers of catering to irrational (behaviourally-conditioned) investors by paying high dividends, instead of investing for growth.

Our model shares features with Baker and Wurgler's (2004) dividend catering model, and Fairchild's (2010) behavioural signaling model of dividend policy. Baker and Wurgler (2004) introduced the idea of dividend catering, in which firms cater to investors' irrational demand for dividends, and investors irrationally believe that dividends signal a firm with high-ability management and good future prospects. Hence, such investors pay a 'catering premium' for dividend vs equivalent non-dividend paying firms: suggesting that the positive stock market reaction to dividend increases observed in reality (such as in Al-Yahyaee's analysis) may be partially due to an irrational catering premium paid by investors.

Fairchild (2010) considers firms that face a trade-off between investing for future growth or paying dividends to cater to dividend-demand from investors. He justifies this irrational demand in two ways: (a) Baker and Wurgler's dividend catering argument that investors simply have an irrational view that dividend-payers must be good (as Fairchild (2010) explains: "*We consider investors who have been conditioned to believe that high dividends signal high quality*" and (b) that investors (as argued by Shefrin 2007) have an irrational desire for dividends due to mental accounting (money is not fungible: they put capital gains and dividends into separate mental accounts in their mind) combined with self-control problems (investors spend capital gains frivolously on holidays, parties, general good-living, while they see dividend income as their stable savings for the future). Thus, they feel the need for dividend income to provide external control on their spending behaviour.

In Fairchild's model, firms are thus pressurised to pay dividends even if it means passing up on investing in good future projects.

We set up our asymmetric information/dividend signaling model, to combine both rational dividend-signaling, and irrational dividend catering, as follows. We consider a stock market consisting of two firms: "Good" and "Bad" (hence, respectively, the notation,$i \in \{G, B\}$). In the absence of any dividend signaling, investors assign an equal (50/50) probability to each firm being of each type.

Each firm operates over two periods. In period 1, firm $i \in \{G, B\}$ has a project in place that has generated earnings of $X_i > 0$ in date 1, and will generate further cash flows of Y_i in date 2.

At the end of date 1, each firm faces the following choices. It can invest.

in a new project.[5] We consider the case where $X_G > I > X_B$.Thus, in the absence of dividends (or even under a sufficiently low dividend), the good firm can afford to invest in the new project from first period current income. On the other hand, the bad firm's first period income is so low that it cannot afford to invest in the new project, even in a situation of zero dividends. In the absence of investing in the new project, each firm generates second period income of Y_i. We will consider the relationship between first period and second period income in later analysis.

If firm G invests in the new project (as noted, firm B is unable to do so), the new project generates a net income of $Z > I > 0$ during period 2. We focus on the case where $Z - I > 0$; that is, project 2 has a positive NPV (we assume, without loss of generality, zero discount rate, and universal risk-neutrality: this enhances the model's tractability), and thus the firm should invest in project 2, if it can, to increase firm value for the shareholders.

As noted previously, we consider two components in our dividend signaling model: rational, but myopic, signaling, and dividend catering. By rational but myopic signaling, we assume that the market is only valuing current period income: investors are not aware of future cash flows: furthermore, they do not know about the new project, so they do not consider the effect of dividends on the firm's ability to invest in the new project, project 2.

In terms of this rational signaling, we consider ex-ante and ex-post Bayesian updating, and we solve for the pure Bayesian equilibrium (PBE) of the model. Ex-ante, investors assign an equal (50/50) probability to each firm being good or bad. We consider three possible dividend payouts that each firm can pay: Low (zero) dividend, medium dividend $D_L = X_B$, or high dividend $D_H > X_B$. Recall that, since $X_G > I > X_B$, the bad firm is unable to invest in the new project, even under zero dividends.

In order to consider an interesting dividend dilemma for the good firm, we focus on the case where

$$X_G - I = X_B$$

Importantly, this means that, for the good firm, if it pays low (zero), or medium dividend $D_L = X_{B,}$, it can invest in the new project. However, if it pays the high dividend, $D_H > X_B$, the good firm is unable to invest in the good project.

The investors observe both firms' dividend payout and update their beliefs as follows. If both firms pay the same dividend, then the investors are unable to update their beliefs, and continue to assign equal probability to each firm being good or bad. If one firm pays a higher dividend than the other, the market assigns a probability 1 of the

[5] We assume here that if the firm wishes to invest in the new project, it must do so using internal finance. It is unable, or unwilling, to obtain external finance, due to, for example, Myers and Majluf (1984) type concerns.

high-paying (low-paying) firm being the good (bad) firm. Investors assume higher dividend signals higher quality (the better firm has higher current earnings and can afford a higher dividend).

In addition to the signaling role of dividends, we consider the behavioural factor of dividend catering (Baker and Wurgler 2004) to irrational investors. We focus on the case where the low and medium dividends provide no catering premium, whereas the high dividend provides a short-term (date 1) price premium of $\Delta > 0$.

We solve for the equilibrium date 1 dividend policy of both firms as follows. Recall that we consider the case where stock market investors are myopic, considering the current project in place only. Each firm's dividend policy will have an effect on the current date 1 market value of each firm, due to the investor's Bayesian updating, as a result of dividend signaling, and as a result of the irrational dividend premium. As is standard in corporate finance signaling models, we assume that, in the long-run (date 2), true firm type, together with the investment in the second project (if the firm is able to do so, and has made that project investment) is revealed to the market, and the firm is valued accurately at date 2.

The management of firm i chooses its date 1 dividend to maximise the manager's following payoff:

$$\pi = \overline{V}_1 + \alpha V_2 \tag{1}$$

where the first term $\overline{V}_1$ represents the myopic value of the firm at date 1 as a result of the dividend signaling and the catering premium. The second term represents the long-term, revealed, true value of the firm V_2 multiplied by the 'managerial far-sightedness' parameter $\alpha \in [0, 1]$. Note that $\alpha = 0$ represents totally myopic management, who focus on short-term (date 1) value, without any consideration of the long-term (date 2). Increasing α represents increasing far-sightedness, as the weight on date 2 true value of the firm increases in the manager's payoff. When $\alpha = 1$, management places equal weight on short term (myopic) and long term (far-sighted) project value.

In order to solve for the equilibrium of the dividend signaling/catering game, first consider the bad firm's optimal behaviour, in the form of its best responses to the good firm's dividend choice. The bad firm chooses between low (zero) dividend, and medium dividend, $D_L = X_B$. The bad firm cannot afford to pay high dividends.

Consider the case where the good firm has chosen the low (zero) dividend. If the bad firm chooses the low dividend too, the investors observe the same, zero, dividend for both firms, are unable to update their beliefs, and continue to assign equal probability to each firm being of each type. Recalling that the bad firm is unable to invest in the new project for any dividend level (even zero dividend), the bad manager's payoff from matching the good firm's zero dividend is:

$$\pi_B = \overline{V}_1 + \alpha V_2 = \frac{X_G + X_B}{2} + \alpha Y_B \tag{2}$$

On the other hand, given that firm G has chosen zero dividend, the payoff for the management of firm B if they choose the medium dividend is:

$$\pi_B = \overline{V}_1 + \alpha V_2 = X_G + \alpha Y_B. \tag{3}$$

We note that (3) > (2) unambiguously. If firm G pays the zero dividend, management B's best response is to pay the medium dividend. That is, by separating from firm G's zero dividend, firm B is effectively 'fooling' the market, who believes that the firm that pays the higher (lower) dividend is the good (bad) firm. We need to show that this 'fooling' case cannot exist in equilibrium.

Next, consider the case where firm G chooses to pay the medium dividend. Now, if firm B pays the low (zero) dividend, the market correctly updates its beliefs: it rightly believes that the firm paying the medium (low: zero) dividend is the good (bad) firm. Hence, the payoff for the bad manager is:

$$\pi_B = \overline{V}_1 + \alpha V_2 = X_B + \alpha Y_B \tag{4}$$

If, instead, firm B matches firm G by paying the medium dividend, management B's payoff is as in payoff 2. Therefore, given that firm G pays the medium dividend, management B's best response is to pay the medium dividend. Effectively, separating from firm G by paying the low dividend reveals to the market that this is, indeed, the bad firm, and the firm is valued accordingly. By matching firm G's medium dividend, firm B is mimicking firm G and gains the date 1 pooling value.

Finally, consider the case where firm G chooses the high dividend. Now, firm B gains payoff (4) for either the low (zero) dividend, or medium dividend payout: both are lower than the high dividend, and so both identify the firm as the bad firm. Therefore, if firm G pays the high dividend, firm B is indifferent between paying the low or medium dividend. We assume that, in the case that firm B is indifferent between the low or medium dividend, it will choose to pay the medium dividend.

Therefore, whatever dividend firm G chooses (low, medium or high), firm B's best response is to choose the medium dividend. In game theory terms, we say that firm B's dominant strategy is to pay the medium dividend. Therefore, in order to complete our analysis of the equilibrium of the game, all we need to do is to consider firm G's best response to firm B's medium dividend strategy.

Given that firm B has chosen its dominant strategy (medium dividend), if firm G chooses the low (zero) dividend payout (which implies that it will be able to invest in project 2: which the myopic investors are unaware of), management G's payoff is:

$$\pi_G = \overline{V}_1 + \alpha V_2 = X_B + \alpha(Y_G + Z - I) \tag{5}$$

If firm G matches firm B's medium payout:

$$\pi_G = \overline{V}_1 + \alpha V_2 = \frac{X_G + X_B}{2} + \alpha(Y_G + Z - I) \tag{6}$$

We observe that (6) > (5) unambiguously. Therefore, firm G never pays the low (zero) dividend: it is a dominated strategy. Finally, if firm G separates from firm B by paying the high dividend (such that firm G is now unable to invest in the new project):

$$\pi_G = \overline{V}_1 + \alpha V_2 = X_G + \Delta + \alpha Y_G. \tag{7}$$

Therefore, we obtain firm G's best response to firm B's medium dividend by comparing (7) and (6).

(7) > (6) iff:

$$\frac{X_G - X_B}{2} + \Delta > \alpha(Z - I). \tag{C1}$$

That is, given firm B's dominant strategy of paying the medium dividend, firm G pays the medium dividend if condition C1 is violated, and firm G pays the high dividend of condition C1 holds. Thus, we can bring this all together to state our main result:

Proposition ***(a) Pooling equilibrium***: *If* $\frac{X_G - X_B}{2} + \Delta < \alpha(Z - I)$, *the good firm matches with the bad firm by paying the medium dividend. Although firm G is valued at the lower pooling value in the short-term (date 1), the management of firm G are sufficiently far-sighted, and the short-run catering premium is low enough (i.e., high enough α, low enough Δ) to focus on long-term value creation. Therefore, they are happy to pay the pooling medium dividend in order to invest in project 2 (long-term growth). Firm G's earnings over time are* X_G *and* $Y_G + Z - I$.

(b) Separating equilibrium: *If* $\frac{X_G - X_B}{2} + \Delta > \alpha(Z - I)$, *the good firm separates from the bad firm by paying the high dividend. In the short-term, the market reacts positively, both due to the signaling gain, and the catering premium. Due to myopia of the market and of management (low α), firm G is unable to invest in project 2 (eschews long-term growth). Firm G's earnings over time are* X_G *and* Y_G.

From propositions (a) and (b), we note the following. When the signaling gain and the catering premium is particularly high, the good firm is driven to increase dividends. The short-run value of the firm increases, due to both the signaling and catering effects. This is consistent with the existing empirical research, including Al-Yahyaee's analysis of dividend signaling in Oman: dividend increases result in a short-run positive stock market reaction. In our model, this positive effect is due to signaling of current income: firm G, with higher current income, can afford to pay the higher dividend.

However, our model demonstrates that, due to stock market myopia and catering effects, the relationship between current dividends and future earnings is ambiguous. The dividend increase means that firm G is unable to invest in the new growth project. This, of course, 'dents' future (date 2) cash flows. Cohen and Yagil (2006) consider a 'new agency cost of dividends': positive NPV projects that a firm is unable to invest in, due to short-term pressure to pay dividends.

Therefore, in our model, paying the high dividend unambiguously reduces future current income, compared to the medium dividend (Y_G under the high dividend, compared with $Y_G + Z - I$ under the medium dividend). The question then is, under the high dividend (no growth project investment), what is the evolution of the cash flows over time, comparing X_G and Y_G?

This analysis suggests that we consider the effect of dividend increases on future income, both cross-sectionally (in our model, the good firm paying higher dividends has lower future earnings than the good firm paying medium dividend), and across time (in our model, the relationship between higher dividends and future earnings is ambiguous): unambiguously, it reduces earnings from investment in growth projects: the relationship between current and future earnings then depends on the growth rate (or contraction rate) of the current project in place.

In summary, our model demonstrates that an increase in dividends results in a positive current stock market reaction (due to both short-term signaling and catering effects), and a strong signal of current income. However, the long-run relationship between current dividend increases and long-run, future earnings, is ambiguous: it may be positive, negative, or uncorrelated.

A further point to note is the following. Researchers have identified that dividend signaling may be particularly prevalent and valuable as a signal of quality in opaque financial markets with a high level of information asymmetry (such as Oman). In our model, the first factor on the left hand side of condition C1 (as in the proposition) could be considered as representing the degree of informational asymmetric information problem: the larger is $\frac{X_G - X_B}{2}$, the more likely the high quality firm will be to pay a high dividend to separate from the low quality firm.

Our evidence for Oman in this paper (that is, little relationship between dividends and future earnings) combined with Al-Yahyaee's evidence that the stock market reacts positively to dividend increases in Oman suggests that firms in Oman[6] are engaged in dividend catering. This suggests a combination of high α (high myopia by corporate management): and high pressure from investors (high catering premium Δ). Furthermore, our model suggests that this is inefficient. At a practical level, as noted above, and in footnote 27, one of the authors is acquainted with a firm in Oman that has bowed to the external pressures to pay a large proportion of its income every year as dividends: it has been unable to invest in growth, and is now facing 'ruin'. Please also refer to Fig. 1, which is related to this discussion.

The model in this section complements our subsequent empirical research as follows. It suggests that firms, such as those in Oman, may feel pressured to cater to investors' irrational desire for dividends (due to the positive relationship between dividends and stock price: as found by Al-Yahyaee et al. 2011), at the expense of future earnings (our research confirms no significant relationship between dividends and future earnings in Oman). This 'dividend catering' policy may be detrimental to firms' long-term growth and survival.

4 Hypothesis development

4.1 Country background

The unique institutional background in Oman provides us with an opportunity to investigate the information content of dividend changes and the factors that drive the change in dividends. First, there is no tax on dividends and capital gains in Oman which allows us to re-test the tax-based signaling hypothesis (Black 1976).[7] A signal has to be costly to be of any value. According to this hypothesis, in the absence of taxes,[8] dividends are not credible signals with respect to firms' prospects in the Omani market.

Moreover, dividend policy can be influenced by tax clientele effects (Miller and Modigliani 1961; Elton and Gruber 1970; Petitt 1977; Graham and Kumar 2006). In many countries like the U.S. and Canada, large institutional investors receive favorable tax treatment on dividend income. Hence, institutional investors as a clientele may prefer dividends to retention as documented by many studies including Grinstein and Michaely (2005). However, the absence of taxes suggests that there are no tax clientele effects in Oman.

[6] According to the evidence (for example, Baker and Wurgler 2004), Oman is not unique in this aspect: there is considerable evidence from around the world of myopic dividend catering.

[7] See Footnote 1.

[8] It is interesting to compare Al-Yahyaee et al.'s (2011) analysis with that of Geiler and Renneboog (2015), who analyse the effect of recent dividend-taxation changes in the UK, with the objective of considering the clientele hypothesis. They find that such changes have had little effect on UK firms' dividend policy, and thus conclude that there is little support for a tax effect, or for the clientele hypothesis, in the UK.

In other words, the institutional investors in Oman may have no preference for dividends relative to capital gains that are due to taxes. This goes in line with the irrelevance theory (Miller and Modigliani 1961), where it is shown that investors could adjust their shareholdings according to their cash needs and hence the firm's value is unaffected by its dividends policy: namely, low-tax investors could prefer dividend-paying firms while high-tax investors prefer capital gains.

Oman regulations do not require firms to pay a dividend. The regulations that can directly influence dividend payments is that they cannot be paid out of firms' capital. Moreover, in contrast to the corporate laws in developed countries designed to protect minority shareholders (La Porta et al. 2000), Oman securities regulations do not provide strong protections for minority shareholders. In addition, there are no regulatory constraints that hinder firms from repurchasing their stocks.[9] As taxation is one of the most common explanations for the use of stock buybacks (Vermaelen 2005), and as there are no taxes in Oman, we can ex-ante rule out taxation as an explanation for the use of stock repurchases.

Omani firms rely heavily on bank financing where banks dominate the financial system and control the financing channels of closely-held firms in Oman. In the last five years, the bank credit to GDP ratio has been higher than the market capitalisation to GDP ratio in Oman, which suggests that Oman is a bank-based country.[10]

In contrast to the U.S. and UK markets, the Omani market may be considered to be a very poor information environment, characterised by low corporate disclosure requirements, low transparency, unpublished earnings forecasts and very few professional analysts: The Hawkamah Survey by the Institute of International Finance Inc in 2006 reveals the inability of corporate governance frameworks in GCC countries to meet the threshold sought by international investors.[11] It also reveals the need to strengthen the rules on disclosure and transparency and implementing higher financial reporting standards in listed firms in Oman. Furthermore, the corruption perception index by Transparency International shows that Oman lags significantly behind US and UK (see Fig. 2). In 2020, the Capital Market Authority (CMA) cooperated with Muscat Securities Market (MSM) for implementing the XBRL disclosure platform for the reporting of financial and non-financial information by all listed firms in MSM aiming to improve corporate transparency.[12] These features suggest a poor information environment in Oman which might drive firms to use dividends to convey information about their earnings quality (Skinner and Soltes 2011; Aggarwal et al. 2012).

Among the explanations for the existence of dividends in an otherwise perfect capital market are information asymmetry and agency costs. The agency cost argument conjectures that managers may not act in the best interest of shareholders, and therefore, investors demand dividend payments to limit the waste of free cash flow and reduce managerial opportunism (Jensen and Meckling 1976). The information asymmetry argument advocates that managers use dividends to signal capital markets about future profitability and to distinguish good firms from poor-quality firms (Miller and Modigliani 1961). Both of these

[9] See the Institute of International Finance (IIF) Corporate Governance publications for detailed information about stock repurchase regulations in the GCC including Oman.

[10] According to the Central Bank of Oman's annual report in 2019, the bank credit to GDP ratio was 76.4% in 2015; 87.9% in 2016; 86.7% in 2017; 81.7% in 2018; and 88% in 2019. On the other hand, the market capitalisation to GDP ratio was 60% in 2015; 68% in 2016; 66% in 2017; 59% in 2018; and 64% in 2019.

[11] https://www.hawkamah.org/

[12] See Extensible Business Reporting Language (XBRL) (https://www.xbrl.org/news/oman-announces-xbrl-disclosures-platform/).

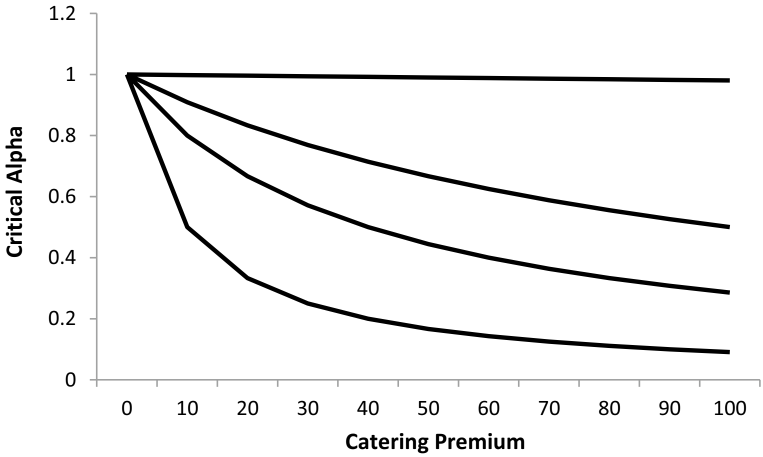

Fig. 1 The critical values based on the dividend catering premium

arguments assume that ownership and control are separate and there is easy access to capital to externally finance good investments. These settings may not apply to Oman where firms are characterised by a highly concentrated ownership structure that differs from the highly diffused ownership settings in the U.S. and U.K. For example, according to Muscat Clearing and Depository the largest three shareholders in listed firms in Omani market own- on average- 61% of the outstanding shares in 2019. Furthermore, the largest and top two shareholders hold 37% and 51% of the outstanding shares, respectively.[13] This concentrated ownership structure should reduce the need to use dividends as a signaling mechanism (Dasilas and Leventis 2011). Shareholders and managers are likely to communicate more frequently, and important information is likely to be circulated to large shareholders without fear of disclosure to competitors. Similarly, this concentration of ownership should reduce the agency cost between managers and shareholders.

In this context, direct communication with creditors and shareholders along with regular visits enable these investors to have access to confidential information, which limits the signaling power of dividends (Aivazian et al. 2003). Furthermore, if bank monitoring is effective, then dividend payments may not be necessary to reduce managers' tendency to overinvest free cash flow. All of these arguments suggest that information asymmetry, agency costs and free cash flow theories can be ruled out as an explanation for the use of dividends in Oman.

4.2 Hypotheses

In Oman, neither dividends nor capital gains are taxed. Therefore, we are able to eliminate the tax-based signaling hypothesis (Bhattacharya 1979; John and Williams 1985), as an

[13] Muscat Clearing and Depository Co. SAOC was established in 1998 by Royal Decree No. 82/98. It is responsible for registering and transferring the ownership of securities on the Muscat Securities Market (MSM).

explanation for Oman firms' payout policy, and the positive stock market reaction to dividend increases.[14]

Moreover, the majority of Omani firms are characterised by having a high stock ownership concentration and operating in a bank-based environment as discussed above, and are relatively highly leveraged compared to the firms in developed countries (see e.g., Antoniou et al. 2008). These features suggest a diminished role for dividends in eliminating the agency conflicts between the principal and the agent. Namely, the cash flow problems regarding overinvestment, and the conflict of interest between managers and shareholders would be mitigated (see e.g., De Cesari 2012). Thus, there should be little role for the free cash flow hypothesis, and dividend changes should have weak correlation with future earnings.

In terms of traditional (rational) finance, Aggarwal et al. (2012) state that firms in a poor information environment have more incentive to use dividend increases to signal their future prospect. Therefore, this leaves the signaling hypothesis as potentially the main explanation for the positive stock market reaction to dividend increases in Oman as an opaque informational environment. Yet, as Oman firms change their dividends frequently (see Table 1), any dividend change potentially loses its reliability as a signal for the level of future earnings (Chen et al. 2002).

In terms of behavioural finance, dividend catering theory also provides an explanation for the positive relationship between dividends and stock prices (i.e., the irrational catering premium by Baker and Wurgler 2004). In Baker and Wurgler's (2004) setting, investors may have irrational preferences for cash dividends irrespective of whether their firms' earnings quality is better than the earnings quality of the firms paying no dividends. This is how the catering theory is feasible in explaining the phenomenon in which the investors react favourably to dividend increases although there is no association between future earnings and dividends in the long-term. Our preceding model in Sect. 3 covered both elements: signaling and catering.

Our model suggests that, although there may be a (short-run) positive relationship between dividends and stock prices (due to signaling and catering effects),[15] this may not translate to a positive link between dividends and future earnings (although there may be a strong relationship between dividends and current earnings). Thus, the discussion in this sub-section leads to the following hypotheses:

Hypothesis 1: Dividend changes are positively related to current earnings in Oman (dividend signaling/dividend catering).

Hypothesis 2: Dividend changes do not provide information about firms' future profitability in Oman (no long-term signaling).

Hypotheses 1 and 2 come directly from our preceding game-theoretic analysis. The conflicting predictions in hypotheses 1 and 2 make the Omani market an interesting environment for studying the association between dividends and earnings.

[14] See Hodgkinson and Partington (2013) who show the relevance of tax policies regarding the value of dividends.

[15] Al Yahyaee et al. (2011) empirically examine the association between dividends and stock price in Oman and find evidence for the signaling theory.

5 Data

Our sample consists of Omani non-financial firms announcing cash dividends between the years 2001 and 2021. Cash dividends, stock dividends and stock splits are gathered from the Muscat Securities Market (MSM) website. The data for all other factors (e.g., earnings, market value and book value of equity, total assets and retained earnings) are collected from firms annual reports, "Shareholding Guide of MSM Listed Companies", "Key Indicators of Public Joint Stock Companies Report" and Refinitiv Eikon.[16] To mitigate the influence of outliers, dividend increases greater than 200% are capped at 200%,[17] and the other variables are winsorized at the 1% and 99% levels. Our sample consists of all regular cash dividends (thus excluding stock dividends, stock repurchases, stock splits and extra dividends). Our original sample contained 1680 dividend changes and non-dividend changes. After imposing the above constraints on the dividend and the fiscal year, the resulting sample consists of 582 dividend changes (dividend increases and decreases) and 228 non-dividend changes. Table 1 provides the variables that we consider in this study, together with the acronyms used throughout the paper.[18]

Table 2 summarises the distribution of firms with dividend increases, dividend decreases, dividend initiations, dividend omissions, and no-change in dividends by year. An important stylised fact is the high propensity for Omani firms to change dividends very frequently (that is, every year). As reported in Table 2, approximately 77% of Omani companies change their dividend level every year. This tendency is similar to that reported by Choi et al. (2011) using Korean data. However, it conflicts with the pattern observed in the U.S. and other developed markets, where firms are less likely to change their dividend levels (e.gBenartzi et al. 1997; Nissim and Ziv 2001; Grullon et al. 2005; Andres et al. 2009). Comparing the frequency of dividend increases and decreases by the Omani firms in our sample, dividend increases (decreases) account for about 33% (25%), whereas in the U.S. market they account for nearly 94% (6%) of the dividend changes (Nissim and Ziv 2001). Another marked difference is that the number of Omani firms that initiate their dividends is less than those that omit their dividends. This stands in line with the evidence on the U.S. firms where firms that omit are more than those initiate dividends (e.g. Michaely et al. 1995; Ho and Wu 2001).

Table 3 presents the descriptive statistics for each dividend group; increases (Panel A), decreases (Panel B), no change (Panel C), initiations (Panel D) and omissions (Panel E). The average (median) increase in dividends is about 52% (33%) compared with an average (median) decrease in dividends of approximately 33% (33%). These findings are in

[16] This report can be obtained from the Muscat Security Market (MSM) website (http://www.msm.gov.om). It was first published in 2009, and it covered a 10-year period for all listed firms in MSM from 2000–2009. The second report was released in 2011: it covers the period from 2002 to 2011. The latest report was released in 2017, covering 2001 to 2016. The data from 2017 to 2021 is collected from firms' annual reports.

[17] We do not winsorize dividend decreases as they are bounded at − 100% (Ham et al. 2020).

[18] There is a growing literature using the Omani data. For instance, i) Al Lawati et al. (2021) investigate the relationship between audit committee characteristics on forward-looking disclosure quality and quantity; ii) Al-Malkawi et al. (2014) examine whether the firms adopt any policy of smoothing dividends; iii) Al Yahyaee (2014a) examines the impact of stock dividends on stock price; iv) Al-Yahyaee et al. (2011) examine the relationship between cash dividends announcements and stock prices; and v) Al-Yahyaee (2014b) studies the frequency and motives for stock dividends. Therefore, our results using data from Oman could have implications for emerging markets, Gulf Cooperation Council (GCC) countries and some of the developed countries.

Table 1 The list of the variables and their definitions

Name	Definition
DIVCHG	The percentage change in annual dividend payments
DIVINC	The percentage change in dividend increases for firms that increase dividend payments
DIVDEC	The percentage change in dividend decreases (without taking absolute values) for firms that decrease dividend payments
DIVCHGD	Dummy variable: 1 if a firm has changed dividends, 0 otherwise
DIVINCD	Dummy variable: 1 if the dividend change is positive, and 0 otherwise
DIVDECD	Dummy variable: 1 if the dividend change is negative, and 0 otherwise
DIVPREM	The logarithmic difference in the value-weighted average market-to-book value of dividend-payer firms and non-payer firms
YLD	Dividends in previous year divided by market value of equity at the beginning of previous year
SIZE	Natural logarithm of total assets in thousand OMRs
M/B	Book value of assets minus book value of equity plus market value of equity scaled by book value of assets
GROWTH	Percentage change in total assets
LEV	Total debt scaled by book value of total assets
AGE	Firm maturity: measured as the logarithm of firm age since inception
ERN	Earnings (net income) scaled by total assets
RETA	The ratio of retained earnings to total assets
ROE	Return on equity: calculated as net income scaled by book value of equity
ROA	Return on assets: measured as operating income divided by total assets
ECHG	Change in ERN
ROECHG	Change in ROE
ROACHG	Change in ROA
RETACH	Change in RETA
EDMV	Change in earnings scaled by market value of equity
EDBV	Change in earnings scaled by book value of equity
CAPEX	Capital expenditures scaled by total assets
RE/TE	Retained earnings over total equity

line with Choi et al. (2011) who show that dividend increases in Korea are more extreme in magnitude than dividend decreases. However, this finding contrasts with the previous studies in the U.S. (e.g. Nissim and Ziv 2001; Grullon et al. 2005), which show that dividend increases are less extreme in magnitude. In our analysis, compared to dividend decreasing firms, firms that increase dividends have higher levels of profitability, market-to-book ratio and dividend premium (DIVPREM). Dividend decreasing firms are larger, more mature and have higher dividend yield. Firms that do not change their dividends have higher retained earnings and earned/contributed capital mix (RE/TE). Firms that initiate dividends experience higher growth. Moreover, dividend omitting firms have high leverage, negative profitability and higher real investment (CAPEX).

Further, we test the variables used in this study for non-stationarity in their levels (i.e., I(0)) by applying the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Im-Pesaran and Shin (IPS) tests. The results are reported in Table 3 Panel F. The null hypothesis is that the series contains a unit root. The findings suggest that we reject the null hypothesis

Table 2 Frequency of firm-year observations for dividend policy

Year	Dividend increases	Dividend decreases	No change	Dividend initiation	Dividend omission	Total for year	Dividend premium
2001	12	7	6	6	1	32	0.018
2002	10	6	11	8	4	39	0.214
2003	13	11	10	3	1	38	– 0.060
2004	18	6	9	1	5	39	– 0.092
2005	12	10	12	4	1	39	0.338
2006	21	8	9	2	2	42	– 0.006
2007	25	6	8	10	2	51	0.631
2008	17	10	12	4	10	53	0.223
2009	18	9	11	8	6	52	0.146
2010	27	8	10	7	1	53	0.538
2011	18	20	11	2	4	55	0.527
2012	22	12	9	5	4	52	0.600
2013	18	9	17	7	4	55	0.578
2014	21	13	14	2	4	54	0.610
2015	14	20	17	5	3	59	0.452
2016	16	20	10	2	10	58	0.391
2017	9	22	12	4	4	51	0.224
2018	11	17	14	3	6	51	0.059
2019	10	18	11	3	7	49	– 0.077
2020	10	10	10	1	12	43	– 0.109
2021	12	6	5	7	8	38	0.003
Total for category	334	248	228	94	99	1003	

This table shows the number of firm-year observation for each year of the sample for Dividend Increases, Dividend Decreases, No Change (in dividends), Dividend Initiation and Dividend Omission. The sample consists of 582 dividend changes and 228 no dividend changes. Dividend increases (decreases) is defined as the event that firms pay more (less) cash dividend than the previous year. Dividend Initiation is defined as the event that firms pay cash dividend a hiatus of one year. Dividend Omission is defined as the event that firms cut cash dividend for the first time after paying them for at least one year and the firms that chose not to change dividends is defined as No Change. Dividend premium (labelled as DIVPREM for the regression analyses) is the log difference in the value-weighted average market-to-book value of dividend-payer firms and non-payer firms, following Baker and Wurgler (2004)

for all variables at the 1% significance level, except for the variable Size, where we fail to reject the null hypothesis. Therefore, our variables satisfactorily pass the stationarity tests.

6 Empirical results

6.1 Unadjusted/adjusted profitability changes around dividend changes

We begin our analysis by examining the profitability performance surrounding dividend changes, following the earlier studies (e.g. Benartzi et al. 1997; Fukuda 2000; Fairchild et al. 2014). We accomplish this by calculating the mean of unadjusted profitability changes

Table 3 Descriptive statistics and stationarity tests

	Mean	Median	Min	Max	Std. Dev
Panel A: Dividend increases					
DIVCHG	0.605	0.333	0.017	12.077	0.972
SIZE	10.302	10.401	6.697	13.472	1.347
M/B	1.383	1.232	0.399	3.382	0.574
GROWTH	0.087	0.062	−0.344	0.962	0.156
LEV	0.424	0.418	0.066	0.932	0.213
YLD	0.066	0.053	0.001	0.462	0.063
AGE	2.793	2.833	0.693	3.761	0.587
ERN	0.095	0.088	−0.018	0.246	0.054
RETA	0.268	0.237	0.017	0.65	0.158
ROE	0.172	0.163	−0.064	0.784	0.095
ROA	0.095	0.088	−0.018	0.246	0.054
DIVPREM	0.285	0.374	−0.203	0.691	0.323
CAPEX	0.057	0.036	0.00	0.638	0.073
RE/TE	0.463	0.44	0.06	1.123	0.205
Panel B: Dividend decreases					
DIVCHG	−0.334	−0.333	−0.85	−0.016	0.189
SIZE	10.52	10.555	7.74	13.472	1.42
M/B	1.273	1.174	0.399	3.382	0.517
GROWTH	0.048	−0.007	−0.278	0.962	0.198
LEV	0.44	0.44	0.066	0.938	0.239
YLD	0.087	0.065	0.001	0.462	0.085
AGE	2.914	2.996	0.693	3.761	0.6
ERN	0.064	0.055	−0.262	0.246	0.052
RETA	0.24	0.194	0.009	0.65	0.166
ROE	0.128	0.11	−0.298	0.692	0.105
ROA	0.064	0.055	−0.262	0.246	0.052
DIVPREM	0.241	0.265	−0.203	0.691	0.299
CAPEX	0.050	0.023	0.00	0.381	0.068
RE/TE	0.427	0.394	0.057	0.888	0.216
Panel C: No change in dividends					
DIVCHG	0	0	0	0	0
SIZE	10.443	10.404	6.742	13.472	1.440
M/B	1.343	1.227	0.404	3.382	0.548
GROWTH	0.071	0.049	−0.226	0.744	0.141
LEV	0.421	0.418	0.086	0.931	0.199
YLD	0.065	0.052	0.002	0.462	0.063
AGE	2.853	2.944	1.099	3.761	0.583
ERN	0.087	0.075	0.007	0.246	0.055
RETA	0.294	0.263	0.000	0.65	0.170
ROE	0.150	0.142	0.018	0.47	0.079
ROA	0.087	0.075	0.007	0.246	0.055
DIVPREM	0.258	0.295	−0.203	0.691	0.311
CAPEX	0.074	0.045	0.00	1.512	0.13

Table 3 (continued)

	Mean	Median	Min	Max	Std. Dev
RE/TE	0.497	0.511	−0.001	0.962	0.221
Panel D: Dividend initiations					
DIVCHG	N/A$^{\delta}$	N/A$^{\delta}$	N/A$^{\delta}$	N/A$^{\delta}$	N/A$^{\delta}$
SIZE	9.733	9.578	6.621	13.472	1.407
M/B	1.113	1.025	0.399	3.382	0.444
GROWTH	0.124	0.087	−0.344	0.962	0.224
LEV	0.466	0.487	0.066	1.024	0.235
YLD	0	0	0	0	0
AGE	2.719	2.833	1.099	3.761	0.588
ERN	0.066	0.048	−0.241	0.246	0.076
RETA	0.172	0.127	−0.096	0.65	0.142
ROE	0.161	0.097	−0.16	1.587	0.208
ROA	0.066	0.048	−0.241	0.246	0.076
DIVPREM	0.279	0.295	−0.203	0.691	0.328
CAPEX	0.064	0.029	0.00	0.393	0.087
RE/TE	0.380	0.274	0.045	4.004	0.438
Panel E: Dividend omissions					
DIVCHG	−1	−1	−1	−1	0
SIZE	9.865	9.659	6.621	13.472	1.497
M/B	1.103	0.999	0.399	3.382	0.527
GROWTH	0.016	−0.026	−0.344	0.962	0.221
LEV	0.468	0.431	0.066	1.725	0.276
YLD	0.072	0.054	0.007	0.462	0.085
AGE	2.978	3.091	0.693	3.738	0.518
ERN	−0.001	0.006	−0.314	0.202	0.08
RETA	0.178	0.155	−0.831	0.65	0.186
ROE	0.021	0.013	−0.91	0.94	0.205
ROA	−0.001	0.006	−0.314	0.202	0.08
DIVPREM	0.151	0.126	−0.203	0.691	0.308
CAPEX	0.101	0.029	0.00	2.068	0.269
RE/TE	0.374	0.335	−0.619	1.147	0.260

	ADF	PP	IPS
Panel F: Stationarity tests			
DIVCHG	470.24***	646.82***	−14.98***
SIZE	188.25	175.33	2.10
M/B	282.05***	288.33***	−2.91***
GROWTH	651.62***	729.02***	−15.93***
LEV	278.49***	248.62***	−2.89***
YLD	407.31***	447.71***	−10.00***
AGE	1138.70***	526.06***	−67.26***
ROE	840.65***	718.63***	−17.85***
ROA	429.79***	487.31***	−7.94***
ECHG	1045.09***	1413.46***	−38.51***
ROECHG	1484.44***	3676.92***	−37.12***

Table 3 (continued)

	ADF	PP	IPS
ROACHG	1137.34***	1964.98***	− 29.58***
RETACH	1007.93***	1099.49***	− 27.34***
EDMV	1309.74***	1955.15***	− 29.28***
EDBV	1080.36***	1929.21***	− 27.68***
DIVPREM	495.37***	485.90***	− 13.03***
CAPEX	471.82***	555.60***	− 196.57***
RE/TE	971.50***	468.23***	− 11.55***

The table presents several characteristics of the sample of Omani firms. It reports the summary statistics of variables for each dividend's category. All variables are defined in Table 1. Panels A, B, C, D and E present the groups of firms that chose to increase, decrease, not change, initiate or omit dividends, respectively. In Panel D, "δ" means the change is effectively positive infinity. Except DIVCHG, all continuous variables are winsorized at the 1% and 99% levels. Stationarity tests are reported in Panel F: we employ the ADF (Augmented Dickey-Fuller), PP (Phillips-Perron) and IPS (Im-Pesaran and Shin) panel unit root tests. In this panel, *** indicates that the null hypothesis of 'no-stationarity/presence of unit roots' for the I(0) process is rejected at the 1% level significance level

for year −2, −1, 0, 1 and 2 (year 0 is the announcement year) for each dividend category. Then we replicate the same analysis using the mean of adjusted profitability changes, defined as the difference between the mean of profitability changes for dividend changes and non-dividend changes in the same industry. If the profitability follows a random walk, then the mean of profitability changes should be equal to zero. Table 4 reports the findings under two different panels. Panel A displays the mean of unadjusted profitability changes. Panel B shows the mean of adjusted profitability performance of dividend changing firms compared with firms that did not change their dividends in the same industry.

The reason why we examined the relationship between current dividends and current earnings is related to the study of Benartzi et al. (1997) who examine the future profitability and dividend changes: they find no evidence for dividend signaling. They find that dividend changes reflect current and past earnings changes. Another reason why we examine the above-mentioned relationship is due to Al-Malkawi et al. (2014) who study dividend smoothing and find that Omani firms adopt a policy of smoothing dividends. It is well documented that dividend smoothing is related to dividends signaling. The dividend signaling theory is based on the belief that investors prefer stable dividend over the years and firms are reluctant to cut dividends (Aharony and Swary 1980). John and Williams (1985) demonstrate that the optimal dividend policy is to pay smoothed dividends relative to stock prices which implies that when dividends are used as a signaling mechanism firms are expected to smooth their dividends. Moreover, Guttman et al. (2007) document that dividend smoothing can arise from a coarse signaling equilibrium in a setting where managers have private information about firm value. Dividends are smoothed with respect to earnings to be a credible signal (Jeong 2013). This may suggest that Omani firms use dividends as a signal to convey their private information to outsiders (Al-Malkawi et al. 2014). Hence, Omani firms are more likely to smooth their dividends to strengthen the credibility of dividends as a signal of their future prospects.

In brief, signaling is normally about the association between future profitability and dividend changes. Yet, in some cases "future" earnings are not related to dividend changes. This may warrant further investigation regarding the association between "current"

Table 4 Profitability changes around dividend changes

	Panel A. Unadjusted profitability changes					Panel B. Adjusted profitability changes				
	Year − 2	Year − 1	Year 0	Year 1	Year 2	Year − 2	Year − 1	Year 0	Year 1	Year 2
Dividend increases										
ECHG	0.577	0.013	0.358***	−0.048	0.779	0.577	−0.088	0.256***	−0.020	0.341
	(1.01)	(0.07)	(6.35)	(−1.17)	(1.31)	(1.01)	(−0.41)	(2.81)	(−0.46)	(1.03)
ROECHG	−0.001	0.007	0.022***	−0.021***	−0.025**	−0.002	0.013	0.029***	−0.009	−0.015
	(−0.02)	(0.87)	(5.46)	(−3.48)	(−2.03)	(−0.09)	(1.60)	(5.68)	(−1.46)	(−1.11)
EDMV	0.043**	0.048**	0.059***	0.004	−0.002	0.011	0.025	0.047***	−0.002	−0.006
	(2.11)	(2.43)	(3.54)	(0.78)	(−0.28)	(0.63)	(1.49)	(2.66)	(−0.32)	(−0.90)
EDBV	−0.005	0.012	0.052***	0.005	0.005	−0.011	0.014	0.042***	−0.003	−0.001
	(−0.28)	(0.60)	(9.83)	(0.79)	(0.69)	(−1.13)	(1.61)	(6.82)	(−0.45)	(−0.12)
Dividend decreases										
ECHG	0.104	0.405*	−0.245***	0.036	−1.131	0.104	0.262	−0.284***	−0.116	−1.498**
	(1.12)	(1.94)	(−4.93)	(0.35)	(−1.48)	(1.12)	(1.22)	(−3.70)	(−1.02)	(−1.91)
ROECHG	0.017*	−0.009	−0.038***	−0.006	0.023	0.024**	0.002	−0.028***	0.002	0.034
	(1.69)	(−1.53)	(−7.59)	(−0.95)	(0.51)	(2.20)	(0.22)	(−5.08)	(0.30)	(0.74)
EDMV	0.047*	0.044*	−0.018***	0.005	−0.005	0.036	0.041*	−0.020***	0.000	−0.008
	(1.68)	(1.90)	(−4.65)	(0.96)	(−0.78)	(1.27)	(1.74)	(−4.56)	(0.01)	(−1.35)
EDBV	0.035***	0.024***	−0.025***	0.007	−0.007	0.026**	0.019***	−0.026***	0.003	−0.009
	(3.63)	(3.44)	(−4.58)	(1.18)	(−1.14)	(2.46)	(2.77)	(−4.62)	(0.43)	(−1.56)
Dividend initiations										
ECHG	1.459	−0.525	4.023	−0.200**	0.157	1.459	−0.491	2.176	−0.154	0.269
	(1.11)	(−1.12)	(1.63)	(−2.12)	(0.27)	(1.11)	(−1.02)	(1.07)	(−1.53)	(0.44)
ROECHG	−0.011	−0.004	0.195*	−0.155	−0.069	0.015	−0.018	0.197*	−0.136	−0.059
	(−0.54)	(−0.07)	(1.77)	(−1.48)	(−1.45)	(0.83)	(−0.31)	(1.65)	(−1.26)	(−1.22)
EDMV	0.014	0.020	0.199**	−0.069**	−0.007	0.018	−0.012	0.136*	−0.066*	−0.014
	(0.72)	(0.93)	(2.41)	(−2.00)	(−0.42)	(1.00)	(−0.45)	(1.72)	(−1.81)	(−0.73)

Table 4 (continued)

	Panel A. Unadjusted profitability changes					Panel B. Adjusted profitability changes				
	Year − 2	Year − 1	Year 0	Year 1	Year 2	Year − 2	Year − 1	Year 0	Year 1	Year 2
EDBV	−0.018	−0.006	0.077	0.088	0.003	−0.042	−0.037	0.103***	0.098	−0.008
	(−0.43)	(−0.21)	(1.18)	(0.82)	(0.12)	(−0.90)	(−1.16)	(3.78)	(0.87)	(−0.41)
Dividend omissions										
ECHG	−0.279	0.568	−0.863***	−0.095	−0.916	−0.279	0.380	−0.855***	−2.147	−0.931
	(−0.78)	(0.41)	(−6.68)	(−0.03)	(−1.10)	(−0.78)	(0.26)	(−6.26)	(−0.86)	(−1.05)
ROECHG	−0.013	0.130	−0.195**	0.036	−0.195	−0.002	0.138	−0.190*	0.048	−0.180
	(−0.90)	(1.27)	(−2.10)	(0.28)	(−0.74)	(−0.14)	(1.28)	(−1.96)	(0.35)	(−0.65)
EDMV	0.007	0.080**	−0.128***	−0.010	−0.046	0.01	0.07	−0.13***	−0.01	−0.03
	(0.62)	(1.98)	(−4.14)	(−0.40)	(−1.58)	(0.40)	(1.55)	(−4.14)	(−0.51)	(−1.14)
EDBV	0.011	0.047***	0.002	0.011	0.071	0.009	0.032*	−0.002	0.008	0.090
	(0.80)	(2.66)	(0.02)	(0.45)	(0.55)	(0.65)	(1.91)	(−0.02)	(0.31)	(0.67)

This table shows profitability changes (i.e., ECHG, ROECHG, EDMV, EDBV) surrounding dividend changes. Panel A displays unadjusted profitability changes for dividend-changing firms. Panel B shows the adjusted profitability performance of dividend-changing firms calculated as profitability changes for dividend-changing firms less profitability changes for those firms that did not change their dividends in year 0 in the same industry. *, **, *** indicates significance levels at the 10%, 5% and 1%, respectively using a two-tailed t-test for the means. All variables are defined in Table 1 earnings and dividend changes (see e.g., Benartzi et al. 1997), which also has been part of our empirical analyses in this paper.

6.1.1 Unadjusted profitability

Table 4, panel A, shows that dividend increasing firms have significant and positive profitability changes in year 0. We find also dividend increases are correlated with past profitability changes for the *EDMV* measure. For years 1 and 2, there are significant negative growth in profitability of firms that increases their dividends for the *ROECHG* measure. These findings suggest that there is a strong association between dividend increases and current profitability changes for all profitability measures.

Profitability changes of dividend-decreasing firms experience negative growth in year 0, significant at the 1% level, for all measures of profitability. In prior years to dividend decreases (years -1 and -2), dividend-decreasing firms experience significant profitability improvement. These results suggest that dividend-decreasing firms are correlated with current profitability reduction.

The mean profitability changes for dividend-initiation firms are positive and significant in year 0 for the *ROECHG* and *EDMV* measures. However, we find no significant increases in profitability before or after the dividend initiation. In fact, we observe a negative profitability growth in the year following dividend initiation. This result is inconsistent with Lintner (1956) and Healy and Palepu (1988) who find that firms that initiate dividends experience permanent earnings growth. Also, these results do not support Ho and Wu (2001) and Fukuda (2000) who find that dividend-initiating firms experienced earnings growth in year −1. Dividend omitting firms experience significant and negative profitability changes in year 0. However, they have significant positive profitability growth in year −1.

6.1.2 Adjusted profitability

Next, we consider the relation between dividend changes and adjusted profitability changes. The results in Panel B of Table 4 show that in year 0, dividend increasing firms perform significantly better than no-dividend change firms in the same industry. However, this relationship does not hold before or after the dividend changes for all of our measures. Firms that chose to decrease dividends perform significantly worse than no-dividend change firms in year 0. This relationship continues to hold for *ECHG* measure in year 2. However, those firms experience significant profitability improvement compared to no-dividend change firms in prior years to dividend reduction.

Dividend-initiating firms experience significant positive profitability increases in year 0 for all measures, and negatively significant *EDMV* growth in the following year, compared to firms that chose not to change their dividends. Dividend-omitting firms perform significantly worse than no-dividend change firms in the announcement year (year 0). Our findings reveal a strong relationship between dividend changes and current adjusted profitability changes. The signaling hypothesis suggests that changes in dividend should be informative about future profitability. On this basis, we find little support for the information content of dividend changes in the case of dividend decreases.

6.2 Regression analysis

In this section, we examine the relationship between dividends and profitability in more depth, using regression analysis. We begin by using a linear model. Following the method of Nissim and Ziv (2001), we gradually make the analysis more sophisticated by adding in variables, finally splitting the analysis into positive and negative dividend changes. Then we follow Grullon et al. (2005) by considering a superior non-linear model.

6.2.1 Linear mean reversion in earnings

In this section we investigate the link between dividend changes and profitability changes using a linear model of profitability expectations. We begin our analysis by examining the relation between dividend changes and current and future profitability changes using the following basic model:

$$PROFCHG_{i,t+j} = \beta_0 + \beta_1 DIVCHG_{i,t} + \varepsilon_{i,t+j} \tag{8}$$

where $PROFCHG$ denote the profitability measures ($EDBV$, $EDMV$, $ECHG$and$ROECHG$) in year $t+j$, and $DIVCHG$ is the percentage change in dividend payments between two consecutive years; where year t is the dividend or profitability change year and j is 0, 1 or 2. All variables are defined in Table 1. The basic assumption of this model is that earnings follow a random walk.

Table 5 reports the pooled OLS regressions with heteroskedasticity-robust White's (1980) t-statistics for years 0, 1 and 2. The results in Panel A show a positive relation between dividend changes and all current profitability measures in year 0, where the mean coefficients of dividend changes are positive and significant. Also, dividend changes have a power in predicting future profitability changes ($ROECHG$) in year 2 ($t+j=2$), indicating that dividend changes are informative about future profitability changes consistent with the earlier studies of Nissim and Ziv (2001) in the U.S. In Panel B, the coefficients of dividend increases are significantly positive with current profitability changes amongst all of profitability measures. For year 1, we find significant positive coefficients in $ECHG$. In the case of dividend decreases, we find a positive and significant profitability changes in the current year indicating that higher reduction in dividend decreases (without taking their absolute values) imply a higher reduction in current profitability. as shown in Panel C.[19]

However, Nissim and Ziv (2001) argue that the dependent variable $EDMV$ in Eq. (8) suffers from two specification issues. First, dividend changes might be correlated with the dependent variable. Second, there may be the omission of important control variables. In addressing these issues, they divide the change in earnings by the book value of the equity at the beginning of the year instead of the market value of equity, and they include the lagged return of equity ($ROE_{i,t+j-1}$) as a control variable. Hence, following Nissim and Ziv (2001), our next step is to add a control variable $ROE_{i,t+j-1}$ in Eq. (8) to produce the following model:

$$EDBV_{i,t+j} = \beta_0 + \beta_1 DIVCHG_{i,t} + \beta_2 ROE_{i,t+j-1} + \varepsilon_{i,t+j} \tag{9}$$

[19] The results are qualitatively similar to those in Table 5 when we use the change in ROACHG as a profitability measure.

Table 5 Dividend changes and current and future profitability changes

Dependent Variables	*EDBV*			*EDMV*			*ECHG*			*ROECHG*		
	$t+j=t$	$t+j=1$	$t+j=2$	$t+j=t$	$t+j=1$	$t+j=2$	$t+j=t$	$t+j=1$	$t+j=2$	$t+j=t$	$t+j=1$	$t+j=2$
Panel A. Dividend changes												
Intercept	0.00877***	0.00472	0.00453	−0.0100***	−0.0123***	−0.00827	0.00884***	0.00220	0.00152	0.0131	−0.00622	−0.0643
	(2.78)	(1.36)	(1.14)	(−3.42)	(−3.57)	(−0.90)	(2.90)	(0.70)	(0.40)	(0.42)	(−0.13)	(−0.77)
DIVCHG	0.0724***	0.00330	0.00995	0.0492***	−0.0129	−0.0199	0.0643***	0.0102	0.00480	0.615***	−0.0189	0.389*
	(7.42)	(0.33)	(1.29)	(5.86)	(−1.61)	(−1.12)	(5.27)	(1.24)	(0.70)	(5.76)	(−0.19)	(1.85)
Adj.R^2	0.132	−0.00101	0.000534	0.0795	0.00314	0.000550	0.0951	0.00220	−0.000818	0.0914	−0.00121	0.00560
Panel B. Dividend increases												
Intercept	0.0257***	−0.00179	−0.00159	0.0104*	−0.0195**	−0.0258	0.0193**	−0.00981	−0.00939	0.108	−0.107*	−0.0507
	(3.38)	(−0.21)	(−0.17)	(1.65)	(−2.44)	(−1.62)	(2.29)	(−1.49)	(−1.11)	(1.40)	(−1.89)	(−0.43)
DIVINC	0.0514***	0.0125	0.0136	0.0228*	−0.00337	0.00147	0.0524**	0.0261**	0.0147	0.479***	0.114	0.322
	(3.15)	(0.75)	(1.40)	(1.67)	(−0.30)	(0.12)	(2.52)	(2.12)	(1.64)	(2.63)	(1.51)	(1.24)
Adj.R^2	0.0664	0.000188	−0.000946	0.0203	−0.00290	−0.00326	0.0477	0.0197	0.000506	0.0510	0.00289	0.00118
Panel C. Dividend decreases												
Intercept	−0.00220	0.00356	−0.0112	−0.0202**	−0.0185	−0.0301*	−0.00731	0.00623	−0.00798	0.0597	−0.0605	0.282
	(−0.25)	(0.38)	(−1.14)	(−2.41)	(−1.58)	(−1.83)	(−0.99)	(0.78)	(−0.99)	(0.54)	(−0.30)	(0.75)
DIVDEC	0.0666**	−0.0115	−0.0136	0.0541**	−0.0380	−0.0849	0.0342	0.00171	−0.0104	0.912***	−0.288	1.416
	(2.44)	(−0.39)	(−0.45)	(2.14)	(−0.94)	(−0.85)	(1.33)	(0.06)	(−0.36)	(3.54)	(−0.35)	(1.54)
Adj.R^2	0.0183	−0.00372	−0.00359	0.0125	0.00154	−0.00173	0.00632	−0.00421	−0.00393	0.0445	−0.00310	0.00440

This table reports the regressions regarding the effects of current and future profitability on dividend changes. Panel A shows the results for all dividend changes. The results for dividend increases and decreases are presented in Panels B and C, respectively. The first row represents the coefficient and the second row represents White's (1980) t-statistics for each regression. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively. All variables are defined in Table 1

For $j = 1$ and 2, where $EDBV_{i,t}$ is defined as the annual change in earnings divided by the book value of equity at the beginning of the announcement year.

Similar to earlier work of Nissim and Ziv (2001) and Grullon et al. (2005), we extend Eq. (9) further and estimate the following model, which includes dummy variables to allow for different coefficients for dividend increases and decreases:

$$\begin{aligned} EDBV_{i,t+j} = {} & \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} \\ & + \beta_2 ROE_{i,t+j-1} + \beta_3 EDBV_{i,t+j-1} + \beta_4 DPC_{i,t} \\ & + \beta_5 DIVCHG_{i,t} + \beta_6 DNC_{i,t} + \varepsilon_{i,t+j} \end{aligned} \tag{10}$$

where $DPC_{i,t}$ ($DNC_{i,t}$) is a dummy variable that takes the value of 1 for dividend increases (decreases) and 0 otherwise. All other variables are defined as the same as in Eq. (9). Following Nissim and Ziv (2001) and Grullon et al. (2005), we use the Fama and MacBeth (1973) method to account for the problem associated with residual cross-correlations.

The results in Table 6 report the regression outputs from Eqs. (9) and (10) in panels A and B, respectively. Each panel report two different regression outputs; OLS, which is pooled regression with robust standard errors, and CS, which is a cross-sectional regression, following Fama and MacBeth's (1973) methodology. Panel A, Table 6 shows that the coefficients of dividend changes ($DIVCHG_{i,t}$) are insignificant for years 1 and 2 in both the OLS and CS models. Also, ROE_t is negative and significant in year 1 and 2 for both models. Thus, the results demonstrate the importance of the specification issues, but do not support the information content of the dividend hypothesis (in contrast to Nissim and Ziv 2001). The results in Panel B of Table 6 reveal similar results to those of Panel A showing no association between dividend changes and future profitability in the subsequent years.[20]

We extend our analysis further by including more control variables, similar to the earlier studies (e.g., Kato et al. 2002). The dependent variable is the change in profitability (EDBV) in years 1 and 2, and the dividend change is the main explanatory variable. We include size, asset growth, market-to-book ratio, leverage, dividend yield, firm maturity, and change in retained earnings in the prior year to the announcement of dividend changes as additional control variables:

$$\begin{aligned} PROFCHG_{i,t+j} = {} & \beta_0 + \beta_1 DIVCHG_{i,t} + \beta_2 SIZE_{i,t-1} + \beta_3 GROWTH_{i,t-1} \\ & + \beta_4 log(M/B)_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 YLD_{i,t-1} + \beta_7 AGE_{i,t-1} \\ & + \beta_8 RETACHG_{i,t-1} + \beta_9 RETACHG_{i,t-2} + \varepsilon_{i,t+j} \end{aligned} \tag{11}$$

where $PROFCHG_{i,t+j}$ denotes the profitability measures ($EDBV$) in years 1 ($j = 1$) and 2 ($j = 2$), and year t is the dividend change year. All other variables are defined in Table 1.

The estimated output of Eq. (11) is reported in Table 7. The results reveal no association between dividend changes and future profitability as shown in models 1and 2. The coefficients of dividend increases are insignificant in years 1 and 2 as stated in models 3 and 4, respectively. Similarly, the coefficients of dividend deceases remain insignificant in years 1 and 2 as stated in both models 5 and 4. These findings stand in sharp contrast to the recent study of Aggarwal et al. (2012), where they find that dividend increases

[20] We repeat the same analyses using Eq. (8) and (9), using panel data fixed effects with clustering at firm level. The coefficients of dividend changes from Eq. (8) are statistically insignificant in each of the subsequent two years. The regressions for from Eq. (9) also provides no evidence of the signaling theory of dividends in the following two years.

Table 6 Dividend changes and future profitability changes (OLS and FM methods)

Dependent variable = EDBV	Panel A				Panel B			
	OLS		CS		OLS		CS	
	$t+j=1$	$t+j=2$	$t+j=1$	$t+j=2$	$t+j=1$	$t+j=2$	$t+j=1$	$t+j=2$
Intercept	0.0474*	0.0449	0.0270***	0.0294**	0.0462*	0.0565**	0.0306***	0.0457***
	(1.94)	(1.59)	(3.02)	(2.50)	(1.86)	(2.22)	(3.10)	(3.84)
$DIVCHG_t$	0.00289	0.00507	0.00485	−0.0009	0.0120	0.000456	0.0337	−0.0424
	(0.30)	(0.66)	(0.45)	(−0.11)	(0.38)	(0.01)	(0.85)	(−1.12)
DPC_t x $DIVCHG_t$					0.00237	0.000206	−0.0262	0.0127
					(0.07)	(0.01)	(−0.70)	(0.29)
DNC_t x $DIVCHG_t$					0.0123	0.000486	−0.00579	0.0225
					(0.39)	(0.01)	(−0.17)	(0.73)
$ROE_{i, t+j-1}$ (t = 0)	−0.139*		−0.147**		−0.133*		−0.172**	
	(−1.72)		(−2.36)		(−1.95)		(−2.82)	
$ROE_{i, t+j-1}$ (t = 1)		−0.271**		−0.165**		−0.280**		−0.176**
		(−2.14)		(−2.17)		(−2.13)		(−2.59)
$EDBV_{i, t+j-1}$ (t = 0)					−0.00893	0.0672	0.0171	0.0200
					(−0.10)	(0.65)	(0.19)	(0.22)
DPC_t					−0.00781	−0.0200*	−0.00515	−0.0175
					(−0.77)	(−1.85)	(−0.59)	(−1.28)
DNC_t					0.00943	−0.0240*	0.0111	−0.0324*
					(0.83)	(−1.76)	(0.70)	(−2.17)
Year & Industry FE?	Yes	Yes	No	No	Yes	Yes	No	No
R^2	0.107	0.149	0.133	0.143	0.109	0.160	0.251	0.250
Adj/Average R^2	0.0788	0.122	0.0839	0.0951	0.0763	0.128	0.0776	0.0779
p-value	0.00	0.00	0.0555	0.113	0.00	0.00	0.012	0.0297

This table presents the regression output related to the link between profitability changes and dividend changes. DPC is a dummy variable that takes the value of 1 when firm increase dividends, and 0 otherwise. DNC is a dummy variable that takes the value of 1 when firm decrease dividends, and 0 otherwise. All other variables are defined in Table 1. OLS reports the regressions using robust standard errors. CS reports the regressions based on the Fama and MacBeth (FM) (1973) procedure. The t-statistics are reported in parentheses. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively

Table 7 Dividend changes, future profitability and additional control variables

Dependent variable = $EDBV_t$	Model 1 $t = 1$	Model 2 $t = 2$	Model 3 $t = 1$	Model 4 $t = 2$	Model 5 $t = 1$	Model 6 $t = 2$
Intercept	−0.00126	0.0557	−0.0279	−0.00421	0.0743	−0.0752
	(−0.03)	(1.02)	(−0.33)	(−0.04)	(0.86)	(−0.96)
DIVCHG	−0.00226	−0.00349				
	(−0.21)	(−0.39)				
DIVINC			0.0149	−0.00746		
			(0.80)	(−0.50)		
DIVDEC					−0.00599	−0.0231
					(−0.19)	(−0.79)
SIZE	−0.00141	−0.00140	−0.000696	0.00253	−0.00288	0.00608
	(−0.52)	(−0.45)	(−0.15)	(0.45)	(−0.51)	(0.96)
GROWTH	0.0187	0.00314	0.0253	0.0210	−0.0203	−0.0426
	(0.50)	(0.07)	(0.33)	(0.19)	(−0.38)	(−1.10)
M/B	−0.00816	−0.00226	−0.00197	−0.00323	−0.00651	0.00787
	(−1.20)	(−0.31)	(−0.16)	(−0.26)	(−0.43)	(0.54)
LEV	0.0390	0.00599	0.0246	0.0319	0.0662	−0.0343
	(1.56)	(0.20)	(0.55)	(0.50)	(1.42)	(−1.11)
YLD	−0.00698	−0.0771	0.194	−0.238*	−0.123	0.123*
	(−0.08)	(−1.24)	(0.95)	(−1.80)	(−1.30)	(1.73)
AGE	−0.00393	−0.00961	−0.0126	−0.00895	−0.000539	0.00109
	(−0.55)	(−1.15)	(−1.04)	(−0.56)	(−0.04)	(0.09)
RETACH	−0.0129	0.0157	−0.0118	0.00381	−0.0460	0.0259
	(−0.90)	(0.93)	(−0.63)	(0.19)	(−1.27)	(1.64)
$RETACH_{-1}$	0.00219	−0.0144*	0.0175	−0.0306	−0.00285	−0.00169
	(0.33)	(−1.66)	(1.34)	(−1.62)	(−0.24)	(−0.14)
Year & Industry FE?	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.113	0.0974	0.170	0.132	0.190	0.151
Adj. R^2	0.0754	0.0587	0.0765	0.0329	0.0685	0.0216
p-value	0.00	0.00	0.00	0.05	0.02	0.00

This table reports the estimated outputs regarding the link between future profitability (at year 1 and 2) and all dividends changes (DIVCHG), dividend increases (DIVINC) and dividend decreases (DIVDEC), by also considering some control variables. All variables are defined in Table 1. The figures in parentheses are the t-statistics. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively

convey information about future profitability in the case of dividend increases but dividend decreases have no association with future profitability.[21]

Our results in this section show a strong association between dividend changes and changes in current profitability. Furthermore, the results provide a trivial support to the information content of dividends in year 2 following dividend changes in year *t* and in year 1 following dividend increases for one measure of profitability as displayed in Table 5.

[21] We obtain similar results when we adopt other measure of profitability (EMV).

6.2.2 The non-linear model

Grullon et al. (2005) argue that the linear analysis in the previous section is likely to produce biased results because it assumes uniformity of the mean reversion and the level of autocorrelation across all observations. To overcome misspecifications and to control for the non-linearity, they suggested the use of the modified partial adjustment model developed by Fama and French (2000) as follows:

$$\begin{aligned} EDBV_{i,t+j} = {} & \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} \\ & + (\gamma_1 + \gamma_2 NDFED_{i,t} + \gamma_3 NDFED_{i,t} \times DFE_{i,t} + \gamma_4 PDFED_{i,t} \times DFE_{i,t}) \\ & \times DFE_{i,t} + (\lambda_1 + \lambda_2 NCED_{i,t} + \lambda_3 NCED_{i,t} \times CE_{i,t} + \lambda_4 PCED_{i,t} \times CE_{i,t}) \times CE_{i,t} + \varepsilon_{i,t+j} \end{aligned} \tag{12}$$

where $DFE_{i,t}$ is $ROE_{i,t} - E[ROE_{i,t}]$; $E\left[ROE_{i,t}\right]$ is the fitted value from the cross-sectional regression of $ROE_{i,t}$ on the logarithm of total assets, the logarithm of the market-to-book ratio, and $ROE_{i,t}$ in year $-$ 1; $CE_{i,t}$ is $EDBV_{i,t}$; $NDFED_{i,t}$ ($PDFED_{i,t}$) is a dummy variable that takes the value of 1 if $DFE_{i,t}$ is negative (positive) and 0 otherwise; and $NCED_{i,t}$ ($PCED_{i,t}$) is a dummy variable that takes the value of 1 if $CE_{i,t}$ is negative (positive) and 0 otherwise. All other variables are as defined as in Eq. (10). The mean reversion in $EDBV_{i,t+j}$ is captured by the coefficient γ_1. The coefficients γ_2, γ_3 and γ_4 measure nonlinear mean revision in $EDBV_{i,t+j}$ which indicates that the reversals are stronger for larger rather than smaller changes in either sign. The coefficient λ_1 measures the autocorrelation of $EDBV_{i,t+j}$. The coefficients λ_2, λ_3 and λ_4 measure nonlinearity in the autocorrelation of $EDBV_{i,t+j}$.

Table 8 reveals the results for the estimation of nonlinear model in Eq. (12). Similar to our findings in Table 6, we find no evidence for a link between dividend changes and future profitability changes for dividend increasing and decreasing firms in year 1. The coefficient for positive (β_{1p}) dividend changes in year 2 is negative and significant at 10% level, implying that dividend increases signal negative future profitability. These results provide no support to the signaling hypothesis of dividends in Oman; this is consistent with the findings of Grullon et al. (2005) in the US. Further, Table 8 shows the importance of the nonlinear model in explaining a large fraction of the cross-sectional variation in profitability changes compared to the linear model in Table 6. That is, R^2 increases from 25 to 43% and from 25 to 34% in year 1 and 2, respectively. These results are consistent with the US findings by Grullon et al. (2005).

6.3 Additional analyses

In this section, following Grullon et al. (2005), we perform a number of additional analyses to verify the robustness of our results by replicating all of the analysis in the previous section, using alterative dependent variables that measure profitability; a) change in profitability and b) future profitability.

6.3.1 Dividend changes and changes in future profitability level

Instead of the change in earnings scaled by the book value of equity $EDBV$, here we use the change in ROA (ΔROA) as the dependent variable; and ROA, instead of $EDBV$, as the independent variable, and we re-estimate all of the regressions in the previous subsection, using the linear and nonlinear model as follows:

Table 8 Dividend changes and future earnings changes

Year: $EDBV_{i,t+j} = \beta_0 + \beta_{1p}DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N}DNC_{i,t} \times DIVCHG_{i,t} + (\gamma_1 + \gamma_2 NDFED_{i,t} + \gamma_3 NDFED_{i,t} \times DFE_{i,t} + \gamma_4 PDFED_{i,t} \times DFE_{i,t}) \times DFE_{i,t}$ $+(\lambda_1 + \lambda_2 NCED_{i,t} + \lambda_3 NCED_{i,t} \times CE_{i,t} + \lambda_4 PCED_{i,t} \times CE_{i,t}) \times CE_{i,t} + \varepsilon_{i,t+j}$

Year	β_0	β_{1p}	β_{1N}	γ_1	γ_2	γ_3	γ_4	λ_1	λ_2	λ_3	λ_4	R^2
t+j=1	0.009	0. 0047	0.031	0.183	−0.172	−0.004	−0.77	0.358	−0.881	4.616	−5.587	0.430
	(0.59)	(0.45)	(1.12)	(0.40)	(−0.37)	(−0.06)	(−0.62)	(0.97)	(−1.48)	(0.97)	(−1.09)	
t+j=2	0.0373*	−0.0418*	0.0228	−0.0434	0.116	0.0437	0.001	−0.310	0.458	−5.996	6.308	0.341
	(1.91)	(−1.82)	(0.74)	(−0.17)	(0.43)	(0.80)	(0.00)	(−0.60)	(0.47)	(−1.06)	(1.06)	

This table reports regressions regarding the link between profitability changes ($EDBV_{t+j}$) in year $t+j$ and dividend changes ($DIVCHG_t$) in year t. $DPC_t(DNC_t)$ is a dummy variable that takes the value of 1 for dividend increases (decreases) and 0 otherwise. DFE_t is $ROE_t - E[ROE_t]$; $E\left[ROE_t\right]$ is the fitted value from the cross-sectional regression of ROE_t on the logarithm of total assets, the logarithm of the market-to-book ratio, and ROE_t in year − 1; CE_t is $EDBV_t$; $NDFED_t$ ($PDFED_t$) is a dummy variable that takes the value of 1 if DFE_t is negative (positive) and 0 otherwise; and $NCED_t$ ($PCED_t$) is a dummy variable that takes the value of 1 if CE_t is negative (positive) and 0 otherwise. All other variables are defined in Table 1. The numbers in parentheses are t-statistics computed using White's (1980) heteroskedasticity consistent standard errors. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively

$$\Delta ROA_{i,t+j} = \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} + \beta_2 ROA_{i,t+j-1} + \beta_3 \Delta ROA_{i,t} + \varepsilon_{i,t+j} \tag{13}$$

$$\begin{aligned}\Delta ROA_{i,t+j} = {} & \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} \\ & + (\gamma_1 + \gamma_2 NDFED_{i,t} + \gamma_3 NDFED_{i,t} \times DFE_{i,t} + \gamma_4 PDFED_{i,t} \times DFE_{i,t}) \\ & \times DFE_{i,t} + (\lambda_1 + \lambda_2 NCED_{i,t} + \lambda_3 NCED_{i,t} \times CE_{i,t} + \lambda_4 PCED_{i,t} \times CE_{i,t}) \times CE_{i,t} + \varepsilon_{i,t+j}\end{aligned} \tag{14}$$

where $ROA_{i,t+j}$ is operating income before depreciation in year $t+j$ divided by total assets at the end of year $t+j$. $DFE_{i,t}$ is $ROA_{i,t} - E[ROA_{i,t}]$; $E[ROA_{i,t}]$ is the fitted value from the cross-sectional regression of $ROA_{i,t}$ on the logarithm of total assets, the logarithm of the market-to-book ratio, and ROA in year -1. $CE_{i,t}$ is $ROA_{i,t} - ROA_{i,t-1}$. All other variables are defined as in the Eq. (12) above.

Panels A and B in Table 9 summarise the regression results from the linear and non-linear model of profitability, respectively. Panel A shows that in year 1 and 2, the relation between positive dividend changes and future profitability is insignificant. Similar results are revealed for negative dividend changes in year 1. The coefficient of dividend decreases is positive and significant in year 2 suggesting that firms that cut dividends exhibit negative future profitability in year 2, which is in line with Grullon et al. (2005) who state that this has a wrong sign as per the implications of the signaling theory. The nonlinear earnings model in panel B provides no evidence for the dividend signaling in both years. Further, the adjusted R^2 is much higher in the nonlinear model (Panel B) compared with the linear model in Panel A, suggesting the nonlinear behaviour of profitability.

6.3.2 Dividend changes and future profitability levels

In this section, we analyse the relationship between dividend changes and future profitability levels to verify our results in the previous sections and to make our findings comparable with Grullon et al. (2005). Using future profitability levels, we re-examine the correlation between future profitability levels and changes in dividend, using the following two models:

$$\begin{aligned}ROE_{i,t+j} = {} & \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} \\ & + \beta_2 ROE_{i,t+j-1} + \beta_3 \Delta ROE_{i,t} + \beta_4 \log(M/B)_{i,t-1} + \beta_5 SIZE_{i,t-1} + \varepsilon_{i,t+j}\end{aligned} \tag{15}$$

$$\begin{aligned}ROE_{i,t+j} = {} & \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} \\ & + \left(\gamma_1 + \gamma_2 NDFED_{i,t} + \gamma_3 NDFED_{i,t} \times ROE_{i,t} + \gamma_4 PDFED_{i,t} \times ROE_{i,t}\right) \\ & \times ROE_{i,t} + \left(\lambda_1 + \lambda_2 NCED_{i,t} + \lambda_3 NCED_{i,t} \times CE_{i,t} + \lambda_4 PCED_{i,t} \times CE_{i,t}\right) \\ & \times CE_{i,t} + \varphi_1 \log(M/B)_{i,t-1} + \varphi_2 SIZE_{i,t-1} + \varepsilon_{i,t+j}\end{aligned} \tag{16}$$

All variables are defined in Table 1 and in Eq. (12). The results are summarised in Table 10 showing that there is no association between dividend changes and the future level of ROE in year 1 in the linear and nonlinear models. However, the models reveal that the coefficients of positive dividend changes are negative and significant in year 2, which is inconsistent with the signaling theory of dividends.

We repeat the previous analyses in Eqs. (15) and (16) using *ROA* and Δ*ROA* instead of *ROE* and Δ*ROE*.

$$\begin{aligned} ROA_{i,t+j} = {} & \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} \\ & + \beta_2 ROA_{i,t+j-1} + \beta_3 \Delta ROA_{i,t} + \beta_4 \log(M/B)_{i,t-1} + \beta_5 SIZE_{i,t-1} + \varepsilon_{i,t+j} \end{aligned} \tag{17}$$

$$\begin{aligned} ROA_{i,t+j} = {} & \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} \\ & + \left(\gamma_1 + \gamma_2 NDFED_{i,t} + \gamma_3 NDFED_{i,t} \times ROA_{i,t} + \gamma_4 PDFED_{i,t} \times ROA_{i,t}\right) \\ & \times ROA_{i,t} + \left(\lambda_1 + \lambda_2 NCED_{i,t} + \lambda_3 NCED_{i,t} CE_{i,t} + \lambda_4 PCED_{i,t} \times CE_{i,t}\right) \\ & \times CE_{i,t} + \varphi_1 \log(M/B)_{i,t-1} + \varphi_2 SIZE_{i,t-1} + \varepsilon_{i,t+j} \end{aligned} \tag{18}$$

The estimated outputs of Eqs. (17) and (18) are reported in Tables 11 Panels A and B, respectively. The results indicate that the coefficients of positive and negative dividend changes are statistically insignificant for both years in the linear model: Panel A. The non-linear earnings model reveals that the relationship between negative dividend changes and the level of ROA is positive and statistically significant at the 5% level in year 2 only. This suggests that negative dividend changes (i.e., dividend decreases) signal a reduction in profitability level (ROA) in year 2.

Overall, our analyses provide quite weak support for the signaling theory. Specifically, the results indicate that negative dividend changes are only informative about future profitability level (change in ROA and ROA) in year 2. Hence, our results stand in contrast to the earlier studies of Nissim and Ziv (2001) in the US, where they find evidence of the signaling theory, and Aggarwal et al. (2012), where they detect that positive dividend changes are informative about future profitability in a poor information environment. It should be noted that in Omani setting the poor information environment cannot fully explain the signaling power of dividend changes. Our linear results are partly consistent with Grullon et al. (2005), who find strong evidence against the signaling hypothesis; yet our non-linear results provide a weak support for the signaling explanations. Furthermore, the findings are consistent with the tax-based signaling hypothesis, noting that again in Oman dividends are not taxed.

6.4 Determinants of dividend changes with specific reference to catering and life-cycle theories

We turn our analysis to investigate the relevance of the catering theory and life-cycle theory of dividends in Omani context, considering also the factors influencing dividend policy, similar to the previous studies (e.gFama and French 2001; Denis and Osobov 2008). The dependent variables are: (i) all dividend changes, (ii) dividend increases and (iii) dividend decreases. The explanatory variables are current and past change in profitability (EDBV and ECHG), dividend premium (DIVPREM, i.e., the logarithmic difference in the value-weighted average market-to-book value of dividend-payer firms and non-payer firms), capital expenditure (CAPEX), firm maturity (RE/TE), size, age, growth, market-to-book ratio, leverage, dividend yield and current and past change in retained earnings. We control for industry and year fixed effects in all regressions.

Table 9 Dividend changes and future changes in return on assets (ROA)

Panel A. Time-series means of the cross-sectional regression coefficients from the linear model

$\Delta ROA_{i,t+j} = \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} + \beta_2 ROA_{i,t+j-1} + \beta_3 \Delta ROA_{i,t} + \varepsilon_{i,t+j}$

Year	β_0	β_{1p}	β_{1N}	β_2	β_3	R^2
t+j=1	0.0131***	0.0117	0.0115	−0.247***	−0.152*	0.290
	(3.20)	(1.66)	(1.24)	(−4.18)	(−2.01)	
t+j=2	0.0181***	−0.0257	0.0189*	−0.268***	−0.00645	0.230
	(5.25)	(−1.46)	(1.85)	(−6.47)	(−0.11)	

Panel B. Time-series means of the cross-sectional regression coefficients from the nonlinear model

$\Delta ROA_{i,t+j} = \beta_0 + \beta_{1p} DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N} DNC_{i,t} \times DIVCHG_{i,t} + (\gamma_1 + \gamma_2 NDFED_{i,t} + \gamma_3 NDFED_{i,t} \times DFE_{i,t} + \gamma_4 PDFED_{i,t} \times DFE_{i,t}) \times DFE_{i,t} + (\lambda_1 + \lambda_2 NCED_{i,t} + \lambda_3 NCED_{i,t} \times CE_{i,t} + \lambda_4 PCED_{i,t} \times CE_{i,t}) \times CE_{i,t} + \varepsilon_{i,t+j}$

Year	β_0	β_{1p}	β_{1N}	γ_1	γ_2	γ_3	γ_4	λ_1	λ_2	λ_3	λ_4	R^2
t+j=1	−0.00524	0.00859	0.0135	0.232	−0.0144	47.15	−15.55	0.0749	−0.120	−9.391	12.38	0.492
	(−1.08)	(1.13)	(1.30)	(0.44)	(−0.01)	(1.04)	(−1.34)	(0.16)	(−0.14)	(−0.92)	(0.83)	
t+j=2	0.00531	−0.0165	0.0149	−0.764*	0.466	−10.81	−2.093	0.474	−0.303	3.989	−4.253	0.402
	(1.25)	(−0.93)	(1.09)	(−1.96)	(0.38)	(−0.40)	(−0.21)	(0.95)	(−0.31)	(0.24)	(−0.33)	

This table reports regression results relating changes in $ROA(\Delta ROA_{t+j})$ in year $t + j$ to dividend changes ($DIVCHG_t$) in year t. $DPC_t(DNC_t)$ is a dummy variable that takes the value of 1 for dividend increases (decreases) and 0 otherwise. DFE_t is $ROA_t - E[ROA_t]$; $E[ROA_t]$ is the fitted value from the cross-sectional regression of ROA_t on the logarithm of total assets, the logarithm of the market-to-book ratio, and ROA_t in year − 1; CE_t is ΔROA_t; $NDFED_t$ ($PDFED_t$) is a dummy variable that takes the value of 1 if DFE_t is negative (positive) and 0 otherwise; and $NCED_t$ ($PCED_t$) is a dummy variable that takes the value of 1 if CE_t is negative (positive) and 0 otherwise. All other variables are defined in Table 1. The numbers in parentheses are t-statistics computed using White's (1980) heteroskedasticity consistent standard errors. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively

Table 10 Dividend changes and future changes in return on equity (ROE)

Panel A. Time-series means of the cross-sectional regression coefficients from the linear model

$$ROE_{i,t+j} = \beta_0 + \beta_{1p}DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N}DNC_{i,t} \times DIVCHG_{i,t} + \beta_2 ROE_{i,t+j-1} + \beta_3 \Delta ROE_{i,t} + \beta_4 \log(M/B)_{i,t-1} + \beta_5 SIZE_{i,t-1} + \varepsilon_{i,t+j}$$

Year	β_0	β_{1p}	β_{1N}	β_2	β_3	β_4	β_5	R^2
t+j=1	−0.0148	0.000926	0.00705	0.712***	0.00389	0.00800	0.00470	0.540
	(−0.43)	(0.08)	(0.22)	(10.81)	(0.05)	(1.01)	(1.59)	
t+j=2	0.00313	−0.0454*	0.0109	0.722***	0.00527	0.0416***	0.00225	0.517
	(0.08)	(−1.79)	(0.28)	(5.57)	(0.10)	(3.10)	(0.55)	

Panel B. Time-series means of the cross-sectional regression coefficients from the nonlinear model

$$ROE_{i,t+j} = \beta_0 + \beta_{1p}DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N}DNC_{i,t} \times DIVCHG_{i,t} + \left(\gamma_1 + \gamma_2 NDFED_{i,t} + \gamma_3 NDFED_{i,t} \times ROE_{i,t} + \gamma_4 PDFED_{i,t} \times ROE_{i,t}\right) \times ROE_{i,t} + \left(\lambda_1 + \lambda_2 NCED_{i,t} + \lambda_3 NCED_{i,t} \times CE_{i,t} + \lambda_4 PCED_{i,t} \times CE_{i,t}\right) \times CE_{i,t} + \varphi_1 \log(M/B)_{i,t-1} + \varphi_2 SIZE_{i,t-1} + \varepsilon_{i,t+j}$$

Year	β_0	β_{1p}	β_{1N}	γ_1	γ_2	γ_3	γ_4	λ_1	λ_2	λ_3	λ_4	ϑ_1	ϑ_2	R^2
t+j=1	0.0125	−0.00419	0.0300	0.518**	0.330	40.89	0.775	0.712	−0.765	0.937	−7.233	−0.0046	0.00268	0.680
	(0.36)	(−0.30)	(1.03)	(2.75)	(0.61)	(1.17)	(1.69)	(1.71)	(−1.59)	(0.30)	(−1.18)	(−0.50)	(0.87)	
t+j=2	−0.00829	−0.0471*	0.0273	0.329	−0.486	−31.97	0.771	0.540	−0.568	−0.294	−6.084	0.0143	0.00627	0.469
	(−0.16)	(−2.02)	(0.69)	(1.03)	(−0.58)	(−1.00)	(0.81)	(0.95)	(−0.61)	(−0.13)	(−0.84)	(0.86)	(1.38)	

This table reports regression results relating $ROE_{i,t+j}$ level in year $t+j$ to dividend changes ($DIVCHG_t$) in year t. $DPC_t(DNC_t)$ is a dummy variable that takes the value of 1 for dividend increases (decreases) and 0 otherwise. CE_t is ΔROE_t; $NDFED_t$ ($PDFED_t$) is a dummy variable that takes the value of 1 if ROE_t is negative (positive) and 0 otherwise; and $NCED_t$ ($PCED_t$) is a dummy variable that takes the value of 1 if CE_t is negative (positive) and 0 otherwise. $\log(M/B_{i,t-1})$ is the logarithm of the market-to-book ratio of equity. All other variables are defined in Table 1. The numbers in parentheses are t-statistics computed using White's (1980) heteroskedasticity consistent standard errors. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively

Table 11 Dividend changes and future return on assets (ROA)

Panel A. Time-series means of the cross-sectional regression coefficients from the linear model

$ROA_{i,t+j} = \beta_0 + \beta_{1p}DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N}DNC_{i,t} \times DIVCHG_{i,t} + \beta_2 ROA_{i,t+j-1} + \beta_3 \Delta ROA_{i,t} + \beta_4 \log(M/B)_{i,t-1} + \beta_5 SIZE_{i,t-1} + \varepsilon_{i,t+j}$

Year	β_0	β_{1p}	β_{1N}	β_2	β_3	β_4	β_5	R^2
t+j=1	0.0240	0.00885	0.0154	0.780***	−0.178	−0.00010	−0.00112	0.612
	(1.13)	(1.19)	(1.35)	(10.17)	(−1.55)	(−0.02)	(−0.55)	
t+j=2	0.0188	−0.0226	0.0102	0.685***	0.0321	0.0183**	−0.0001	0.579
	(0.71)	(−1.25)	(0.95)	(12.87)	(0.44)	(2.22)	(−0.04)	

Panel B. Time-series means of the cross-sectional regression coefficients from the nonlinear model

$ROA_{i,t+j} = \beta_0 + \beta_{1p}DPC_{i,t} \times DIVCHG_{i,t} + \beta_{1N}DNC_{i,t} \times DIVCHG_{i,t} + \left(\gamma_1 + \gamma_2 NDFED_{i,t} + \gamma_3 NDFED_{i,t} \times ROA_{i,t} + \gamma_4 PDFED_{i,t} \times ROA_{i,t}\right) \times ROA_{i,t} + \left(\lambda_1 + \lambda_2 NCED_{i,t} + \lambda_3 NCED_{i,t} \times CE_{i,t} + \lambda_4 PCED_{i,t} \times CE_{i,t}\right) \times CE_{i,t} + \varphi_1 \log(M/B)_{i,t-1} + \varphi_2 SIZE_{i,t-1} + \varepsilon_{i,t+j}$

Year	β_0	β_{1p}	β_{1N}	γ_1	γ_2	γ_3	γ_4	λ_1	λ_2	λ_3	λ_4	ϑ_1	ϑ_2	R^2
t+j=1	0.00580	0.00644	0.0163	0.944***	0.196	0.96	−0.826	0.454	−0.720	−3.483	−9.661	−0.00428	−0.0002	0.693
	(0.32)	(0.96)	(1.54)	(6.30)	(0.34)	(1.27)	(−0.86)	(1.29)	(−1.25)	(−0.49)	(−1.36)	(−0.99)	(−0.10)	
t+j=2	0.0120	−0.0159	0.0218*	0.977***	−1.633	−3.849	−2.557*	0.0650	0.0168	5.801	−4.044	0.00798	−0.0001	0.527
	(0.37)	(−1.06)	(1.82)	(5.19)	(−0.91)	(−1.00)	(−1.90)	(0.17)	(0.03)	(0.57)	(−0.63)	(1.21)	(−0.02)	

This table reports regression results relating $ROA_{i,t+j}$ level in year $t+j$ to dividend changes ($DIVCHG_t$) in year t. $DPC_t(DNC_t)$ is a dummy variable that takes the value of 1 for dividend increases (decreases) and 0 otherwise. CE_t is ΔROA_t; $NDFED_t$ ($PDFED_t$) is a dummy variable that takes the value of 1 if ROA_t is negative (positive) and 0 otherwise; and $NCED_t$ ($PCED_t$) is a dummy variable that takes the value of 1 if CE_t is negative (positive) and 0 otherwise. $\log(M/B_{i,t-1})$ is the logarithm of the market-to-book ratio of equity. All other variables are defined in Table 1. The numbers in parentheses are t-statistics computed using White's (1980) heteroskedasticity consistent standard errors. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively

Table 12 Factors affecting dividend changes and the propensity to pay dividends

	DIVCHG		DIVINC		DIVDEC		DIVCHGD		DIVINCD		DIVDECD	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Intercept	0.542**	0.703***	0.832**	1.052**	−0.646***	−0.604***	−7.968***	−7.740***	1.488**	1.724**	−1.641**	−1.926**
	(2.27)	(2.87)	(2.11)	(2.50)	(−3.57)	(−3.34)	(−8.81)	(−8.75)	(1.97)	(2.35)	(−2.05)	(−2.40)
$EDBV_0$	1.972***		1.221***		0.275*		0.801**		5.709***		−4.829***	
	(4.79)		(2.84)		(1.68)		(2.40)		(3.49)		(−2.90)	
$EDBV_{-1}$	0.545**		0.942***		0.0818		1.628***		0.115		0.309	
	(2.33)		(4.17)		(0.46)		(4.22)		(0.19)		(0.51)	
$ECHG_0$		0.115***		0.0748**		0.0307		0.0375		0.261**		−0.366**
		(3.11)		(2.15)		(1.55)		(1.43)		(2.23)		(−2.29)
$ECHG_{-1}$		−0.0297**		−0.0422*		−0.00600		0.00882**		−0.0410		0.0556
		(−2.16)		(−1.91)		(−1.01)		(2.52)		(−0.87)		(1.13)
DIVPREM	−0.0801	0.115	0.137	0.162	0.114	0.197	0.489	0.372	−0.565	0.158	0.487	−0.132
	(−0.24)	(0.43)	(0.47)	(0.56)	(0.46)	(0.97)	(0.46)	(0.38)	(−0.61)	(0.21)	(0.50)	(−0.15)
CAPEX	0.125	0.0320	−0.110	−0.219	−0.396	−0.471*	−2.151**	−2.480***	0.681	0.514	−2.054*	−1.721*
	(0.55)	(0.12)	(−0.46)	(−0.84)	(−1.40)	(−1.72)	(−2.45)	(−2.69)	(1.07)	(0.78)	(−1.87)	(−1.74)
RE/TE	0.0459	0.147	−0.00104	0.0924	0.0423	0.0331	0.364***	0.321***	−0.248	−0.0318	−0.787**	−0.870***
	(0.45)	(1.44)	(−0.01)	(0.58)	(0.52)	(0.41)	(4.40)	(4.22)	(−0.84)	(−0.11)	(−2.54)	(−2.85)
SIZE	−0.0250	−0.0372**	−0.0489*	−0.0692**	0.0250*	0.0236*	0.677***	0.649***	−0.0542	−0.0729	0.0319	0.0458
	(−1.65)	(−2.34)	(−1.80)	(−2.41)	(1.89)	(1.78)	(11.29)	(11.05)	(−1.05)	(−1.41)	(0.58)	(0.80)
GROWTH	0.00982	0.137	0.0722	0.311	−0.0535	−0.0280	1.727***	2.027***	0.0726	0.215	0.354	0.286
	(0.07)	(0.85)	(0.39)	(1.47)	(−0.49)	(−0.27)	(3.34)	(3.93)	(0.19)	(0.58)	(0.87)	(0.71)
M/B	−0.0942***	−0.100***	−0.168***	−0.133**	0.0509*	0.0438	1.334***	1.327***	−0.145	−0.162	0.227**	0.262**
	(−2.64)	(−2.79)	(−2.70)	(−2.14)	(1.77)	(1.49)	(6.21)	(6.52)	(−1.32)	(−1.44)	(2.02)	(2.31)
LEV	−0.189	−0.157	−0.0493	−0.0300	−0.107	−0.0952	−2.519***	−2.230***	−0.322	−0.236	0.732**	0.661*
	(−1.56)	(−1.31)	(−0.25)	(−0.14)	(−1.48)	(−1.35)	(−8.63)	(−8.60)	(−0.97)	(−0.75)	(2.10)	(1.91)
YLD	−0.815**	−1.073***	−0.275	−0.443	−0.458**	−0.482**	10.37***	9.701***	−1.379	−1.740*	2.814***	3.209***

Table 12 (continued)

	DIVCHG		DIVINC		DIVDEC		DIVCHGD		DIVINCD		DIVDECD	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	(−2.27)	(−2.94)	(−0.53)	(−0.85)	(−2.12)	(−2.26)	(3.68)	(3.47)	(−1.33)	(−1.70)	(3.09)	(3.63)
AGE	0.00652	0.00290	0.119**	0.118*	−0.0124	−0.0118	0.0277	−0.00362	−0.173	−0.161	0.175	0.178
	(0.17)	(0.07)	(2.02)	(1.89)	(−0.43)	(−0.41)	(0.21)	(−0.03)	(−1.33)	(−1.32)	(1.33)	(1.43)
RETACHG	0.184**	0.380***	0.116	0.249**	0.125*	0.111*	0.207***	0.180**	0.435	0.806***	−0.827**	−0.994***
	(2.05)	(3.87)	(1.43)	(2.30)	(1.87)	(1.82)	(2.61)	(2.07)	(1.61)	(3.75)	(−2.34)	(−3.54)
$RETACHG_{-1}$	0.0271	0.0189	0.0870*	0.0404	−0.0508	−0.0346	0.168**	0.158**	0.112	0.119	0.201	0.224*
	(0.51)	(0.35)	(1.67)	(0.62)	(−0.84)	(−0.70)	(2.13)	(2.00)	(0.85)	(0.93)	(1.42)	(1.67)
Year & Industry FE?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2 or Pseudo R^2	0.207	0.179	0.186	0.143	0.107	0.111	0.533	0.519	0.156	0.126	0.176	0.169
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Models 1 to 6 reports the estimated outputs regarding the determinants of all dividends changes (DIVCHG), dividend increases (DIVINC) and dividend decreases (DIVDEC) as dependent variables, considering current and past profitability and other explanatory variables. Models 7 to 12 report the outputs of probit regressions: the dependent variables are DIVCHGD (=1 if firms change dividends; 0 otherwise); DIVINCD (=1 if dividends are increased; 0 otherwise); and DIVDECD (=1 if dividends are decreased; 0 otherwise). All other variables are defined in Table 1. The figures in parentheses are the t-statistics in models 1–6 and z-statistics in models 7–12. All models include time and industry fixed effects. *,**,*** indicates significance levels at 10%, 5% and 1%, respectively

$$\begin{aligned} DIVCHG_{i,t} = \beta_0 &+ \beta_1 PROFCHG_{i,t} + \beta_2 PROFCHG_{i,t-1} + \beta_3 DIVPREM_{i,t-1} \\ &+ \beta_4 CAPEX_{i,t-1} + \beta_5 (RE/TE)_{i,t-1} + \beta_6 SIZE_{i,t-1} \\ &+ \beta_7 GROWTH_{i,t-1} + \beta_8 \log(M/B)_{i,t-1} + \beta_9 LEV_{i,t-1} + \beta_{10} YLD_{i,t-1} \\ &+ \beta_{11} AGE_{i,t-1} + \beta_{12} RETACHG_{i,t-1} + \beta_{13} RETACHG_{i,t-2} + \varepsilon_{i,t} \end{aligned} \tag{19}$$

The results of the regressions of dividend changes (DIVCHG) on past and current profitability changes are presented in models 1 and 2 of Table 12.

Our results in models 1 and 2 show that the coefficients of current profitability measure are positive and highly significant, indicating a strong association between the magnitude of dividend changes and current profitability changes in Omani firms. Similarly, models 3 and 4 suggest that any increase in past and current profitability are associated with higher dividend increases for firms that increase dividends.

Moreover, models 5 reveals positive relationship between dividend decreases and current profitability changes, suggesting that higher profitability also impacts the magnitude of dividend decreases in the same direction. This finding seems to be parallel to Michaely and Moin (2022) results which indicate that the link between disappearing dividends (decreasing dividends) and some firm characteristics can change over time.[22]

The findings in models 1 to 6 in Table 12 show that dividend premium is insignificantly correlated with the amount of dividend changes, increases and decreases. These findings contrast with the earlier study of Li and Lie (2006) who detect a positive relationship between dividend premium and the amount of dividend increases in the USA. Our results also reveal that the coefficients of CAPEX are statistically insignificant in models 1 to 4, indicating that firms' capital expenditures decision is not correlated with the amount of dividend changes and increases. However, dividend decreases is negatively and significantly related to CAPEX as reported in model 6, suggesting that Omani firms reduce the amount of dividend decreases when they invest more on capital expenditure. A possible explanation is that firms use external financing for capital expenditure and use the access cash to distribute dividend.[23]

Firms' maturity (RE/TE) is found to be uncorrelated with the amount of dividend changes, increases and decreases as shown in models 1 to 6. Firm size is found to be negative (positive) and significantly correlated with the amount of dividend changes and increases (decreases), suggesting that larger firms reduce the amount of dividend changes, increases and decreases in Oman. These findings are not in line with the findings of Fairchild et al. (2014) for Thailand, where they show that firm size has no explanatory power in determining the level of dividend changes. We find that current growth (GROWTH) has no significant relation with dividend changes, increases and decreases in the same models. The results further indicate that market-to-book ratio bear negative and significant coefficients for dividend changes and

[22] The results in models 5 and 6 are not held when we use alternative profitability measures (ROECHG, EDMV). We find that the coefficients of profitability measures are insignificant while the results for the remaining variables are qualitatively similar. We re-estimated these models by considering the impact of financial crisis (2008–2009) and Covid-19 periods (2020). The findings suggest that profitability measures are uncorrelated with the amount of dividend decreases. Furthermore, we split the sample into high/low growth firms. Firms are classified as high (low) growth if the growth rate is greater (less) than the sample median. The results show that earnings changes are not correlated with dividend decreases in high growth firms, yet, the relationship is positive and significant in low growth firms between profitability measures and dividend decreases.

[23] Omani firms rely heavily on bank financing, which may suggest that firms that invest for their real investment activities obtain financing from the banks and continue to distribute the internal cash as dividends.

increases, implying that firms with more investment potentials pay less dividends. Leverage is found to be insignificantly associated with all types of dividend changes. Dividend yield coefficients are negative and statistically significant for dividend changes and decreases. The coefficients of Age are positive and statistically significant with dividend increases indicating that older firms in Oman pay more dividends. Moreover, we find positive and significant associations between dividend changes, increases and decreases, and current RETA changes. These findings are in line with the free cash flow hypothesis whereby firms tend to pay high dividends when the change in accumulated profits improve.

6.5 The propensity to change dividends with specific reference to catering and life-cycle theories

To get a further insight, this section examines how current and past profitability, and other control variables used in Eq. (19), influence the likelihood of dividend changes, dividend increases and dividend decreases. We run probit regressions using Eq. (19) where the explanatory variables are (i) a dichotomous variable that is 1 if the firm changes its dividend and 0 otherwise (DIVCHGD); (ii) a dichotomous variable that is 1 for dividend-increasing firms and 0 otherwise (DIVINCD); and (iii) a dichotomous variable that is 1 for dividend-decreasing firms and 0 otherwise (DIVDECD). We control for industry and year fixed effects in all regressions.

The estimations for the probit regressions are presented in Table 12 models 7 to 12. The coefficients of current profitability in models 7–12 is positive (negative) and highly significant for dividend changes and increases (decreases), indicating that change in profitability increases the likelihood of firms to change their dividends in the same direction (in line with Fairchild et al. 2014). Inconsistent with the catering theory, models 7 to 12 reveal that dividend premium (DIVPREM) is uncorrelated with the likelihood of firms to change, increase and decrease their dividends.[24] These findings are in line with the study of Lin et al. (2018) in Taiwan. The capital expenditure is found to be negatively and significantly related to the propensity of firms to change and decrease dividends as shown in models 7–8 and 11–12, respectively. The results in models 7 to 12 show that firms maturity is positively (negatively) related to the likelihood of firms to change (decrease) their dividends.

Models 9–12 reveal that firm size has insignificant influence on firms' decision to increase and decrease dividends, which is not in line with the results obtained by Aggarwal et al. (2012) for cross-listed firms in the US but consistent with those obtained by Fairchild et al. (2014) for Thailand. Market-to-book ratio has significant coefficients in models 7–8 and 11–12, indicating that future investments do have an impact on the propensity of firms to change and decrease dividends, which is in line with Aggarwal et al. (2012) and Grullon

[24] In untabulated results, we replicate the analyses in models 7 to 12 in Table 12 without dividend premium and split the sample into higher and lower dividend premium following Lin and Lee (2021) (see Sect. 6.6 for details). The findings reveal that there is no evidence that firms with higher dividend premium are more likely to change, increase and decrease dividends, compared to those with lower dividend premium. Moreover, we replicate the analyses in models 7 to 12 and include dividend premium, CAPEX and RE/TE separately in each model. The results reveal that dividend premium is positively and significantly correlated with the propensity of dividend changes only (models 7 and 8). CAPEX and RE/TE, on the other hand, hold their signs and significance levels in all models, similar to those reported in Table 12. The results for other variables remain quantitatively the same.

Table 13 Dividend changes, future profitability and additional control variables (impact of catering incentives)

	Dependent variable = $EDBV_t$											
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	High-DIVPREM	Low-DIVPREM	High-DIVPREM	Low-DIVPREM	High-DIVPREM	Low-DIVPREM	High-MB	Low-MB	High-MB	Low-MB	High-MB	Low-MB
	$t=1$	$t=1$	$t=1$	$t=1$	$t=1$	$t=1$	$t=1$	$t=1$	$t=1$	$t=1$	$t=1$	$t=1$
Intercept	−0.00408	0.0443	−0.00753	0.0194	0.0676	−0.0370	−0.0532	−0.0177	−0.123	0.0369	0.0605	0.293
	(−0.08)	(0.51)	(−0.08)	(0.13)	(0.73)	(−0.22)	(−0.88)	(−0.22)	(−1.06)	(0.26)	(0.45)	(1.57)
DIVCHG	−0.02	0.0380					0.00712	−0.00864				
	(−1.14)	(1.48)					(0.37)	(−0.77)				
DIVINC			−0.00730	0.0657					0.0111	0.0202		
			(−0.52)	(1.55)					(0.37)	(1.06)		
DIVDEC					0.0132	−0.0862					−0.0140	−0.0124
					(0.40)	(−1.07)					(−0.34)	(−0.20)
SIZE	−0.00341	0.00584	−0.00165	0.00674	−0.00431	0.00547	0.00328	−0.00402	0.0000563	−0.000396	−0.00118	−0.0117
	(−1.19)	(1.04)	(−0.31)	(0.51)	(−0.68)	(0.41)	(0.90)	(−0.89)	(0.01)	(−0.05)	(−0.13)	(−1.01)
GROWTH	−0.0237	0.180***	0.00169	0.137	−0.125**	0.247***	0.00506	0.00269	−0.0709	0.00927	0.0251	0.0135
	(−0.57)	(2.79)	(0.02)	(0.72)	(−2.14)	(3.17)	(0.06)	(0.07)	(−0.38)	(0.16)	(0.32)	(0.14)
M/B	−0.00816	−0.0350*	−0.00912	−0.0415	−0.00650	−0.0426	−0.00515	0.0227	0.0134	0.0595	0.0184	−0.103
	(−1.25)	(−1.77)	(−0.78)	(−0.98)	(−0.49)	(−1.07)	(−0.53)	(0.66)	(0.67)	(0.90)	(0.93)	(−1.58)
LEV	0.0369	0.0264	0.00556	0.0239	0.0706	0.0634	0.0476	0.0244	0.0713	−0.0576	−0.00984	0.166
	(1.27)	(0.72)	(0.12)	(0.26)	(1.24)	(1.31)	(1.28)	(0.53)	(1.00)	(−0.93)	(−0.22)	(1.54)
YLD	−0.0518	0.0355	0.0268	0.509	−0.0924	−0.434***	0.114	−0.0216	0.561	−0.0251	−0.0793	−0.188
	(−0.94)	(0.13)	(0.28)	(1.00)	(−1.09)	(−3.41)	(0.61)	(−0.27)	(1.11)	(−0.19)	(−0.84)	(−0.91)
AGE	−0.000837	−0.0134	−0.00955	−0.0224	−0.00239	0.00430	−0.00500	0.00288	−0.00638	−0.0292	−0.0125	−0.0166
	(−0.10)	(−1.00)	(−0.62)	(−0.80)	(−0.17)	(0.22)	(−0.53)	(0.21)	(−0.39)	(−1.20)	(−0.86)	(−0.52)
RETACH	−0.0282	0.00804	−0.0279	−0.00206	−0.0902**	0.0213	−0.0317	−0.00777	−0.0293	−0.00805	0.00166	−0.0750

Table 13 (continued)

	Dependent variable = $EDBV_t$											
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	High-DIVPREM	Low-DIVPREM	High-DIVPREM	Low-DIVPREM	High-DIVPREM	Low-DIVPREM	High-MB	Low-MB	High-MB	Low-MB	High-MB	Low-MB
	$t = 1$	$t = 1$	$t = 1$	$t = 1$	$t = 1$	$t = 1$	$t = 1$	$t = 1$	$t = 1$	$t = 1$	$t = 1$	$t = 1$
	(−1.54)	(0.26)	(−1.07)	(−0.06)	(−2.04)	(0.41)	(−1.44)	(−0.42)	(−1.04)	(−0.30)	(0.04)	(−0.91)
$RETACH_{-1}$	0.00805	−0.00496	0.0157	0.0246	−0.00446	0.0348	−0.0158*	0.0310**	0.00213	0.0326	−0.0126	0.0149
	(1.23)	(−0.38)	(1.52)	(0.56)	(−0.36)	(1.69)	(−1.92)	(2.47)	(0.16)	(1.12)	(−0.78)	(0.49)
Year & Industry FE?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.0884	0.349	0.112	0.304	0.215	0.660	0.137	0.181	0.248	0.335	0.304	0.353
Adj. R^2	0.0467	0.281	0.00362	0.0855	0.0860	0.509	0.0702	0.0906	0.0867	0.108	0.0814	0.0673
p-value	0.0000537	0.0000768	0.00982	0.0264	0.00659	0.0035	0.0000328	0.0101	0.0104	0.00682	0.00791	0.0024

This table reports the estimated outputs regarding the link between future profitability (at year 1) and all dividends changes (DIVCHG), dividend increases (DIVINC) and dividend decreases (DIVDEC), by also considering some control variables. High DIVPREM (Low DIVPREM) is a dummy variable taking the value of 1 when the natural logarithm value-weighted M/B ratio for the dividend-payer group is greater (less) than the non-dividend-payer group in the given industry-year. High-MB (Low-MB) takes the value of 1 (0) if the firm's market-to-book ratio is greater than the industry median in a given year. All variables are defined in Table 1. The figures in parentheses are the t-statistics. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively

Table 14 Capital expenditure, dividend changes, future profitability and additional control variables

	Dependent variable = $EDBV_t$ DIVCHG DIVINC DIVDEC					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	$t = 1$	$t = 2$	$t = 1$	$t = 2$	$t = 1$	$t = 2$
Intercept	0.156**	0.242***	0.225**	0.167	0.0847	−0.000366
	(2.03)	(3.12)	(2.06)	(1.19)	(0.93)	(−0.00)
DIVCHG	−0.00756	−0.00728				
	(−0.91)	(−0.71)				
DIVINC			0.00270	−0.00961		
			(0.18)	(−0.51)		
DIVDEC					−0.00179	−0.0275
					(−0.05)	(−0.91)
CAPEX	−0.0611	−0.120	0.171	−0.339	−0.308***	−0.0800
	(−1.13)	(−1.33)	(1.03)	(−1.39)	(−2.61)	(−0.38)
SIZE	−0.00367	−0.000726	−0.00574	0.000778	0.00106	0.00754
	(−1.20)	(−0.20)	(−0.98)	(0.12)	(0.17)	(1.03)
GROWTH	−0.00208	0.00627	−0.0621	0.0423	−0.000867	−0.0458
	(−0.04)	(0.10)	(−0.61)	(0.28)	(−0.01)	(−1.16)
M/B	−0.00957	−0.00325	−0.0147	0.00636	−0.00656	0.00941
	(−1.32)	(−0.41)	(−1.19)	(0.45)	(−0.40)	(0.55)
LEV	0.0462	−0.00818	0.0188	0.0288	0.0525	−0.0430
	(1.52)	(−0.23)	(0.38)	(0.37)	(0.92)	(−1.30)
YLD	−0.0784	−0.130*	0.00450	−0.296*	−0.160	0.0679
	(−1.26)	(−1.78)	(0.04)	(−1.76)	(−1.61)	(0.94)
AGE	−0.00377	−0.0139	−0.0155	−0.0154	−0.00149	−0.00373
	(−0.41)	(−1.27)	(−1.02)	(−0.74)	(−0.11)	(−0.33)
RETACH	−0.0428**	0.0288	−0.0355	0.00599	−0.0558	0.0281*
	(−2.05)	(1.26)	(−1.20)	(0.21)	(−1.44)	(1.67)
$RETACH_{-1}$	0.00324	−0.0240**	0.0184	−0.0363	−0.0156	−0.00699
	(0.42)	(−2.07)	(1.20)	(−1.61)	(−1.40)	(−0.50)
Year & Industry FE?	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.154	0.120	0.221	0.152	0.223	0.197
Adj. R^2	0.113	0.0769	0.118	0.0383	0.0957	0.0628
p-value	0.000	0.002	0.001	0.003	0.009	0.001

This table reports the estimated outputs regarding the link between future profitability, CAPEX and all dividends changes (DIVCHG), dividend increases (DIVINC) and dividend decreases (DIVDEC), by also considering some control variables. The dependent variable is future profitability at either year 1 or year 2. All variables are defined in Table 1. The figures in parentheses are the t-statistics. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively

Table 15 Capital expenditure, dividend changes, future profitability and additional control variables during financial crisis and Covid-19 pandemic

Dependent variable = $EDBV_t$	DIVCHG Model 1 $t=1$	DIVINC Model 2 $t=1$	DIVDEC Model 3 $t=1$	DIVCHG Model 4 $t=1$	DIVINC Model 5 $t=1$	DIVDEC Model 6 $t=1$
Intercept	0.240***	0.161	0.00926	0.155**	0.212*	0.0845
	(3.09)	(1.14)	(0.12)	(2.00)	(1.89)	(0.92)
DIVCHG	−0.00724			−0.00774		
	(−0.70)			(−0.94)		
DIVINC		−0.00762			0.000652	
		(−0.40)			(0.04)	
DIVDEC			−0.0282			−0.00186
			(−0.92)			(−0.05)
CAPEX	−0.135	−0.376	−0.123	−0.0596	0.174	−0.308**
	(−1.35)	(−1.49)	(−0.53)	(−1.11)	(1.05)	(−2.57)
CRISIS	−0.191***	−0.138*	−0.126***			
	(−3.26)	(−1.69)	(−3.18)			
CAPEX * CRISIS	0.176	0.242	0.391			
	(1.51)	(1.08)	(1.21)			
COVID				−0.094***	−0.058*	−0.0875**
				(−2.96)	(−1.92)	(−2.00)
CAPEX * COVID				−0.437*	−1.877*	−0.0278
				(−1.84)	(−1.68)	(−0.16)
SIZE	−0.000703	0.00120	0.00672	−0.00350	−0.00494	0.00108
	(−0.19)	(0.18)	(0.94)	(−1.14)	(−0.83)	(0.17)
GROWTH	0.00534	0.0413	−0.0391	−0.00220	−0.0637	−0.000895
	(0.08)	(0.27)	(−0.95)	(−0.04)	(−0.62)	(−0.01)
M/B	−0.00287	0.00727	0.00976	−0.00970	−0.0152	−0.00655
	(−0.36)	(0.51)	(0.57)	(−1.34)	(−1.23)	(−0.40)
LEV	−0.00672	0.0313	−0.0448	0.0459	0.0217	0.0525
	(−0.19)	(0.41)	(−1.33)	(1.51)	(0.44)	(0.91)
YLD	−0.124*	−0.288*	0.0678	−0.0782	0.00878	−0.160
	(−1.71)	(−1.72)	(0.93)	(−1.25)	(0.08)	(−1.61)
AGE	−0.0131	−0.0149	−0.00350	−0.00367	−0.0143	−0.00150
	(−1.19)	(−0.72)	(−0.31)	(−0.40)	(−0.92)	(−0.11)
RETACH	0.0295	0.00657	0.0259	−0.0430**	−0.0353	−0.0558
	(1.30)	(0.23)	(1.48)	(−2.06)	(−1.20)	(−1.44)
$RETACH_{-1}$	−0.0245**	−0.0367	−0.00548	0.00266	0.0185	−0.0156
	(−2.10)	(−1.62)	(−0.38)	(0.34)	(1.20)	(−1.40)
Year & Industry FE?	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.122	0.154	0.203	0.155	0.225	0.223
Adj. R^2	0.0769	0.0354	0.0640	0.112	0.118	0.0904
p-value	0.00252	0.0164	0.000843	0.00000277	0.000598	0.0000033

This table reports the estimated outputs regarding the link between future profitability as dependent variable (at year 1 and 2), CAPEX and all dividends changes (DIVCHG), dividend increases (DIVINC) and dividend decreases (DIVDEC), by also considering some control variables. All variables are defined in Table 1. The figures in parentheses are the t-statistics. *,**,*** indicates significance levels at the 10%, 5% and 1%, respectively et al. (2011).[25] That is, the higher (lower) the investment opportunities, the higher (lower) the probability that firms change and cut (raise) dividends.

The results also show that the coefficients of leverage are negatively and positively related to the propensity of firms to change and decrease dividends. The dividend yield for dividend-changing and decreasing firms is positive and significant, suggesting that the dividend stability is important for these firms. The coefficient on current RETACHG is positive (negative) and highly significant for dividend changes and increases (decreases). The evidence further indicates that past RETACHG positively increases the likelihood of firms to cut dividends. Overall, these findings suggest that there is no evidence for catering theory of dividends but they provide a strong support to the life-cycle theory proposed by Fama and French (2001), Grullon and Michaely (2002) and DeAngelo et al. (2006). The other variables appear insignificantly associated with the propensity of Omani firms to increase or decrease dividends.

6.6 The relevance of catering incentives and real investments on dividend changes

We further investigate the impact of market sentiments on the relationship between dividend changes and future profitability. Lin and Lee (2021) find that the dividend signaling is more pronounced in firms with less catering pressure. Lin et al. (2018) shows that the impact of asymmetric information on dividend increases is stronger in firms with low dividend premium. We argue that dividend changes may signal future profitability changes in firms with low dividend premium. We split our sample into two groups (high and low) market sentiments. Our first proxy to measure the catering incentives is dividend premium. We construct a dummy variable for higher (lower) dividend premium that is 1 (0) if the natural logarithm value-weighted M/B ratio for the dividend-payer group is greater (less) than the non-dividend-payer group in the given industry-year. We construct our second measure of market sentiments based on market-to-book ratio. High-MB (Low-MB) takes the value of 1 (zero) if a firm's market-to-book ratio is greater than the industry median in a given year (Lin and Lee 2021).

We re-estimate Eq. (11) for year 1 and report our results in Table 13. The findings reveal that the coefficients of all dividend change types as shown in models 1 to 12 are insignificantly correlated with future profitability, indicating that market sentiments (for both proxies) have no tangible effects to support the signaling hypothesis.[26]

We next examine the impact of a firm's real investment (CAPEX) on future profitability (year 1 and 2). Firms that increase dividends at the expense of missing the value-enhancing investments would be expected to have a reduction in their future profitability.

The analysis of the impact of CAPEX on future profitability is reported in Table 14. The estimated results reveal that the coefficients of CAPEX in models 1–4 are statistically insignificant implying that firms that reduce capital investments do not exhibit a reduction in future profitability. However, in the case of dividend-decreasing firms we find CAPEX bears a negative and significant coefficient in model 5, suggesting that the reduction of CAPEX in those firms reduce their future profitability in year 1. One possible explanation for this finding is that firms may want to smooth dividends and want to have steady dividend policy (irrespective of future profitability, and without considering the signaling and

[25] This result contradicts with the findings of Fairchild et al. (2014) in Thailand.

[26] We replicate the same analyses for year 2: the untabulated findings reveal similar results.

catering motives). Thus, they increase CAPEX by relying on costly external financing and the payoff from the real investment would appear not immediately as it takes several years to generate cash flows from the projects.

We extend the analyses above in Table 14 and consider the impact of financial crisis and Covid-19 period on the relationship between CAPEX and future profitability. During these unstable periods, firms experience financing issues and may be left with internal financing to finance new investments.

To investigate the effect of capital expenditure (real investment) decisions on future profitability (year 1) during these periods we created a dummy variable for the global financial crisis (CRISIS) and for the Covid-19 pandemic (COVID). CRISIS is 1 for financial crisis years (2008 and 2009), and 0 otherwise. COVID is 1 for the pandemic year (2020, noting that we did not consider 2021 because we need profitability data one-year ahead) and 0 otherwise. We include these variables and their interactions with CAPEX in Eq. (11). The results are reported in Table 15. During the financial crisis (models 1–3) we find that the coefficients of CRISIS are negative and significant indicating that firms experience negative future profitability owing to the financial crisis no matter if they change, increase or decrease dividends. However, the interaction term CAPEX * CRISIS is insignificant for all cases. Hence, we find that the impact of real investment on future profitability does not change due to the financial crisis.

For the Covid-19 period, in models 4–6, we find that the coefficients on COVID are negative and significant, reflecting the damaging effect of the pandemic on future profitability. Our results of the interactions are negative and statistically significant in models 4 and 5. These findings suggest that in firms that have changed or increased dividends during the pandemic, the increase in real investments reduced future profitability whereas for the case of dividend decreasing firms we report no significant results.

7 Conclusion

Our study explored the reasons behind corporate dividend changes in Oman, a country with unique institutional setting and cultural aspects, by examining, first, the relationship between different types of dividend changes and past, current and future profitability; second, the relevance of catering theory, real investment decisions and life-cycle theory. Prior research suggests that dividend changes convey information about firms' prospects, and that a signal has to be costly to be of any value (Black 1976; Bhattacharya 1979). However, the empirical results on the association between dividend changes and future profitability are inconclusive. Further, the earlier study of Aggarwal et al. (2012) argued that, in a poor information environment, firms have more incentive to use dividend changes to convey information about future profitability. We re-examine these arguments using data from an emerging market with unique market idiosyncrasies.

We investigate the relation between dividend changes and future earnings changes in Oman, using multiple methods from earlier studies. Thus, our work complements Al-Yahyaee et al.'s (2011) study on dividend announcements and *stock market reaction* in Oman, where they find strong support for the signaling theory of dividends. Our results find virtually no support for the information content of dividend in relation to *future profitability*.

Our analyses suggest that in Oman where there is no tax on dividends, dividend changes are not informative about future profitability, which is consistent with the tax signaling hypothesis (Black 1976). Another explanation of why dividend changes do not signal future profitability might be attributed to investors sentiments toward dividends in Oman (see

Barker and Wurgler 2004). Yet, a firm's life-cycle status and real investments are found to influence the dividend changes (Grullon and Michaely 2002; DeAngelo et al. 2006). Further analyses provide no support to the signaling theory in firms with lower catering incentives.

We further study the factors that affect the magnitude of dividend changes in Oman. Our results show that current profitability changes, firm size, market-to-book ratio and current change in retained earnings are the most important factors that drive the amount of dividend changes, increases and decreases. The results also demonstrate that dividend changes and decreases (increases) are affected by dividend yield (firm age).

The association between firms' characteristics and the propensity to change, increase and decrease dividends are also examined: we affirm that current profitability affects the likelihood to do so. The propensity of Omani firms to change dividends is positively (negatively) associated with size, growth, market-to-book ratio, dividend yield and current change in retrained earnings (leverage). Dividend yield reduces the likelihood of firms to increase dividends. The propensity of firms to decrease dividends significantly and positively (negatively) correlated with market-to-book ratio, leverage and dividend yield (current change in retrained earnings).

Our study contributes to the extant knowledge in the literature. Our findings reveal no evidence for the use of dividend changes to convey information about future profitability even in firms with lower catering incentives. However, we find support for the influence of real investments and the life-cycle theory on all dividend change types. Furthermore, our conclusion on the strong relationship between dividend changes and current profitability changes enabled us to understand the reason behind the highly frequent changes of dividend policy in Oman.

Thus, our study provides practical implications for managers, investors as well as practitioners with regard to the announcement of dividend changes in Oman. Our study can have important implications for countries with similar dividend tax legislation (i.e., most Gulf countries), and in countries where tax on dividends are exempted for some specific listed firms (i.e., Switzerland from 2011) or some specific temporary time periods (i.e., in the USA the Bush Administration's reduction of dividend tax rate to zero). A growing body of academic literature has found that there is a remarkable increase in dividends payments following the exemption of dividend tax, in some firms, in the Switzerland (Isakov et al. 2021), after significant reduction on dividend tax in the US (Chetty and Saez 2010; Yagan 2015).

Future research may extend the analysis to explore the contrast between the relationship between dividends and stock price reactions, and dividends and profitability, as an interesting, and under-researched area. Particularly, it is interesting to ask why stock prices react so strongly to dividend announcements in Oman when dividends provide little information about future profitability in the same corporations (i.e., our evidence). Could this be evidence of investor irrationality (that is, investors have been conditioned to believe that dividend increases are good news, and hence, the stock market reacts accordingly)? This would be consistent with the dividend catering theory in which firms cater to investors' (irrational) demands for dividends by paying out when investors place a premium on dividend paying stocks.[27]

A major contribution of our paper is that we have developed a game-theoretic model of dividend signaling/dividend catering that provides economic and behavioural insights

[27] Indeed, one of the authors is personally acquainted with an Omani company where the institutional investors have consistently been demanding 100% dividend payout ratios in recent years, despite the firm having good, value-adding investment opportunities available. The CEO has opined that the firm will be in trouble if it does not cut the dividend in order to invest in growth. This can be considered in the dividend catering framework, and demonstrates the dangers of catering to the short-run market reaction (dividend signaling).

into why there may be a positive relationship between dividend increases and stock prices, and yet little relationship between dividends and future earnings. Our model demonstrates that such dividend catering may be perilous for firms, as such firms may pass up on growth opportunities.

We further suggest that scholars extend this comparison between dividends, earnings and stock price reaction to other countries around the world. For example, there is considerable evidence in favour of the signaling hypothesis in relation to stock market reaction in the U.S. (that is, evidence of a positive relationship between dividend changes and stock prices) but the evidence on the relationship between dividend changes and earnings is vague and mixed. It would be interesting to consider why.

Appendix

See Table 16 and Fig. 2.

Table 16 Existing research by Al-Yahyaee and co-authors on dividends in Oman and placing our contribution in context

	Effect on Stock Price	Effect on Earnings
Cash Dividends	Positive relationship or positive market reaction: cash dividend increases (decreases) result in stock price increase (decrease). *Source*: Al-Yahyaee et al. (2011)	**Our Contribution:** NO relationship between CASH dividends and future earnings
Stock Dividends	As above: Positive relationship or positive market reaction: stock dividend increases (decreases) result in stock price increase (decrease). *Source*: Al-Yahyaee (2014a)	Positive and significant effect/ significant predictor of positive future earnings *Source*: Al-Yahyaee (2014a) Infrequent payers of stock dividends have higher ex post operating performance than frequent payers (thus, infrequent stock dividends are used to convey positive information about ex post earnings) *Source*: Al-Yahyaee (2014b)

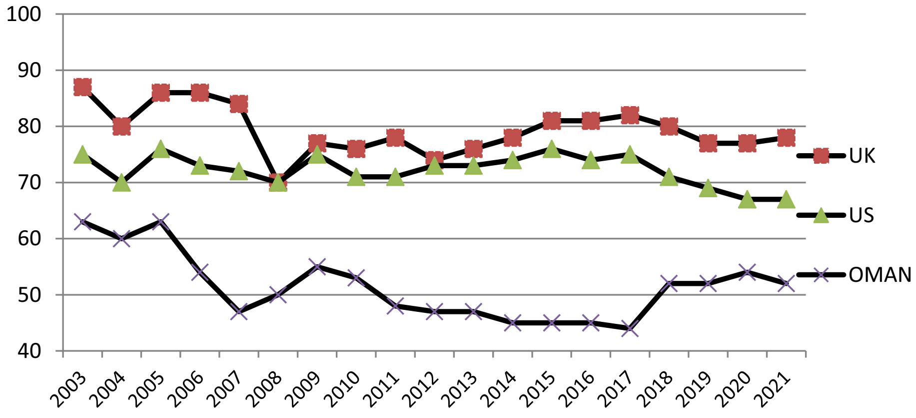

Fig. 2 Corruption index in Oman, UK and US. *Source*: Transparency International (http://www.transparency.org/cpi). A higher score indicates lower level of corruption

Data availability The data set that supports the findings of this study are collected from three different reports issued by Muscat Securities Market: (i) Key Indicators of Public Joint Stock Companies 2000–2009; (ii) Key Indicators of Public Joint Stock Companies 2002 – 2011; (iii) MSM Guide 2017 (covering the period from 2012 to 2016); (iv) annual reports 2017–2021; and (v) Refinitiv (known as LSEG) Eikon. Other missing data are gathered directly from Muscat Securities Market. Our data set can be made available from the authors upon request.

Declarations

Conflict of interest All authors confirm that they do not have any financial or non-financial conflicts of interest.

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