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Corporate dividend policy, managerial overconfidence, myopia, and investor irrationality: a complex concoction

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ABSTRACT

Corporate dividend policy is a puzzle, especially when considering the effects of economic and behavioural factors. We develop a theoretical analysis of corporate dividend policy in order to analyse the effects of the complex mix of managerial moral hazard, overconfidence, and myopia on managerial incentives to increase or decrease dividends. Furthermore, we consider the effect of investor irrationality that drives corporate dividend catering behaviour. We investigate how this complex mix of economic and behavioural factors is likely to affect dividend policy. Our analysis provides a deep theoretical underpinning to understanding these effects and provides a basis for future empirical research.

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1. Introduction

Ever since Miller and Modigliani's seminal dividend irrelevance theorem (Miller and Modigliani 1961), researchers, practitioners and financial market analysts alike have attempted to understand the managerial motives behind corporate dividend policy, and why the market reacts the way that it does to dividend announcements. MM had demonstrated that, in a perfect world, with no market frictions, informational asymmetry, or agency conflicts, a firm's choice of dividend level would have no effect on firm value. MM's reasoning was that the market value of the firm should only be affected by a firm's projects, its operations, cash flows and managerial performance. For these scholars, dividend policy and financing decisions are secondary, with no effect on project investment, managerial behaviour, performance or cash flows.

In the case of dividend policy (our focus in this paper), an interesting aspect to arise from MM's analysis is their argument that money is 'fungible' ('money is money'). Thus, in a perfect world, investors are only concerned with their total wealth from an investment (both the capital gains and the dividend). They are indifferent between different mixes of these dividends and capital gains, as long as the total monetary return is unaffected. For example, consider a case where you invested £100 today in shares in firm X (with a view to selling them in exactly a year's time). Three future scenarios are indicated to you: (a) the shares will stay the same in value (no capital gain), but you will receive a £10 dividend before you sell, (b) the shares will have appreciated by £10 when you sell (capital gain), but you will receive no dividend, or (c) the shares will have appreciated by £5, and you will receive a capital gain of £5. MM asserted that you would be indifferent between these three scenarios. In all three cases, you would have received a gain of £10 in a year on your £100 investment: just the split between dividends and capital gains would be different in each of the three cases.

In spite of the MM dividend irrelevance argument, in the real-world, it is observed that a firm's dividend policy can have a huge effect on firm value and market reaction. Generally, it is observed that an announcement of a dividend increase (decrease) causes a positive (negative) market reaction. Dividends appear not irrelevant!

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Fisher Black described corporate dividend policy, thus: 'Dividend policy is a puzzle. The harder we look at it, the more we see that the pieces just don't fit together.' One reason why it is such a puzzle is that, when we break away from MM's perfect world, we note that there are many factors (e.g. economic, behavioural and psychological) that can affect the relationship between dividend policy and firm value, and (particularly relevant for our paper) the managerial motives and incentives affecting dividend policy. Furthermore, Bouwman (2009) suggests the association between dividends, overconfidence, and value may be ambiguous.

In this paper, we develop a theoretical analysis of dividend policy that incorporates agency/moral hazard issues, together with behavioural/psychological factors (particularly managerial overconfidence, managerial myopia, as well as investor irrationality), in order to consider these effects on corporate dividend policy. We are particularly interested in examining the relationship between managerial overconfidence, and managerial myopia on dividends: when these factors drive higher or lower dividends. Furthermore, we incorporate investors' irrational desire for dividends: thus, our model incorporates dividend catering as well.

1.1. Dividend policy: agency and information issues

In their dividend irrelevance theorem in 1961, MM assumed perfectly frictionless markets, with unselfish managers always acting to maximise firm value/shareholder wealth. Furthermore, they assumed that managers and investors had equal access to information (the 'symmetric information' assumption). Once it was observed that, in the real-world, dividend policy had huge effects on firm value and market reaction, the early theoretical research focused on agency/moral hazard issues (leading to a constraining role for dividends), and informational asymmetries between managers and investors (leading to a signalling role for dividends).

In our model, we do not consider the asymmetric information/signalling role. We focus on agency/moral hazard (in the form of managerial effort-shirking when working on a project: we demonstrate how a dividend increase can drive a higher effort level).

A key agency analysis of dividend policy that we take into our model is that of Jensen's free cash flow. Jensen (1986) provides a conceptual argument that self-interested managers may be tempted to waste 'free cash flows' (i.e. those cash flows available to the firm for project investment, after paying cash out to investors) on bad value-destroying projects, due to the private benefits that these managers may obtain from such projects. Jensen argues that dividends provide a means of constraining managers: by paying out the cash flows to investors, the manager will not then be able to invest in bad projects. This provides a rationale for dividend increases leading to positive market reaction, and an increase in firm value.

Easterbrook (1984) considers an agency analysis of dividends: the author argues that increasing dividends means that managers have less cash flows to invest in new projects, and need to keep coming back to the capital market to raise more investment funds: in doing so, they subject themselves to market scrutiny, and this then reduces managerial opportunistic behaviour.

In terms of asymmetric information, dividend signalling models (e.g. Miller and Rock 1985) suggest that dividend increases serve as a signal of 'firm quality': that is, the increases signal to the market that the firm is becoming better placed to pay the dividend: its future expected cash flows are higher than the market realised: hence, the market reacts positively.

The moral hazard problem that we consider in our model is that of managerial effort shirking. In our model, dividend increases mitigate this effort shirking. Our model incorporates elements of Jensen's free cash flows argument, in that we consider how dividends can affect the ability of the management to invest in a future project: however, in our model, the future project is unambiguously value-adding (i.e. the case of positive NPV projects).

1.2. Dividend policy: behavioural/psychological issues

As noted, the early response to MM dividend irrelevance considered purely economic agency and information issues. The later research has fallen firmly into the 'behavioural corporate finance' camp. Behavioural corporate finance examines the effects of managerial psychological biases on corporate finance decision-making (investment appraisal, capital structure, and *dividend policy*). A particular bias that has been analysed in the literature

is that of managerial overconfidence. Much of the work has focused on the effect of this managerial bias on investment appraisal (managerial overconfidence has been demonstrated to increase investment into higher-risk and value-reducing projects) and capital structure (it has been observed that managerial overconfidence may result in higher corporate debt levels). Breuer, Rieger, and Soypak (2014) also show empirically the relevance of behavioural patterns of investors in determining corporate dividend policy.

In behavioural corporate finance, there has been much work analysing the effects of managerial overconfidence on capital budgeting (investment appraisal) and capital structure (financing) decisions. In contrast, the research on managerial overconfidence and dividends is recently emerging, and little understood. Our model thus contributes to this area of research.

The existing research on overconfidence in behavioural corporate finance demonstrates ambiguous results. In capital budgeting, overconfidence may be bad, since it may result in excessive risk-taking, noting that Adam, Fernando, and Golubeva (2015) show how execute overconfidence can clearly influence risky corporate decisions. However, Gervais, Heaton, and Odean (2003) demonstrate that it may be beneficial in offsetting managerial risk aversion because risk-aversion leads to managers taking insufficient risk from the viewpoints of investors, yet overconfidence may counteract this. In terms of capital structure, Fairchild (2005) demonstrates that managerial overconfidence may lead to higher debt, but the effect on firm value is ambiguous (overconfidence may be seen as bad, since it causes too much debt, which increases expected financial distress). However, overconfidence also drives higher effort. Thus, the effect of overconfidence on firm value depends on the trade-off between high debt/higher expected financial distress and higher effort. Moreover, Fairchild (2009) demonstrates that high overconfidence may actually lead to lower debt as the overconfident manager may overestimate the value of the future project, and hence requires higher current cash flows. Further, Caliskan and Doukas (2015) find that higher CEO risk tolerance reduces the tendency to pay dividends.

Recently, there has been emerging research on the effects of managerial overconfidence on dividend policy. This area of enquiry has produced mixed theoretical and empirical results. Some scholars argue that managerial overconfidence and dividends should be negatively related (e.g. Ben-David, Graham, and Harvey 2007; Cordeiro 2009; Deshmukh, Goel, and Howe 2013). However, Nguyen et al. (2021) and Wu and Liu (2011) argue that overconfidence and dividends may be positively related.

Wu and Liu (2011) extend Miller and Rock's (1985) dividend policy model by incorporating some degree of overconfidence in the process of determining a firm's future earnings. Their theoretical model demonstrates that overconfident CEOs pay high dividends compared with rational CEOs. Rasheed, Sadaqat, and Chughtai (2012) empirically examine the association between managerial overconfidence and dividend policy and find that overconfident CEOs pay more dividends. Using US data, Banerjee, Humphery-Jenner, and Nanda (2015) show that overconfident managers pay more dividends following the Sarbanes-Oxley Act in 2002. Nguyen et al. (2021) examine the relationship between managerial overconfidence and dividend payout in Vietnam during 2014–2018. Their results reveal that firms managed by overconfident executives pay more dividends compared to those managed by non-overconfident peers. Charbti, Hervé, and Poincelot (2021) reveal a positive link between managerial overconfidence and dividend policy in French firms. Further, Jiraporn, Leelalai, and Tong (2016) investigate the impact of managerial ability on the propensity of firms to pay dividends during 1989–2011. They show that there is a positive relation between managerial ability and the likelihood of firms to pay dividends. Specifically, they report that a talented manager who is confident about sustaining profitability in the future pays larger dividends.

However, the other studies that examine the association between executives' overconfidence and dividend policy reveal contrasting results. Ben-David, Graham, and Harvey (2007) conduct a quarterly survey of Chief Financial Officers (CFOs) in the US, and find that overconfident managers are less likely to pay dividends and more likely to repurchase shares. Cordeiro (2009) argues that overconfident managers always believe their firms to be undervalued by the markets; such managers overestimate the returns from current projects, and/or believe that their firms have good investment opportunities. Therefore, overconfident managers prefer not to pay dividends to shareholders. Using data for the period 1980–1994, Cordeiro finds that US firms with overconfident CEOs are less likely to pay dividends compared with those run by rational peers. However, no conclusion is made with regard to the impact of overconfidence on the amount of dividends.

Deshmukh, Goel, and Howe (2013) develop a dynamic model of dividend policy and overconfident managers, and empirically test it in the US during 1980–1994. Their model builds on the assumptions that overconfident CEOs view internal funds as less costly than external financing, overestimate the value of future projects and work toward maximising shareholders' value. Their model demonstrates that because overconfident CEOs believe that future investments are value enhancing, they are more likely to lower dividends than rational peers in order to build financial slack to invest in future projects. The model further indicates that the effect of managerial overconfidence on dividends is weaker in high growth firms. Their empirical findings on the effect of managerial overconfidence on the amount of dividends are consistent with their theoretical predictions. More precisely, they affirm that overconfident CEOs pay less dividends than rational counterparts. Also, they show that in high growth firms, the impact of overconfidence on dividend policy is mitigated. However, firms' total payout and share repurchases are found to be unaffected by the types of managers.

Burg, Scheinert, and Streitz (2012) investigate the impact of managerial overconfidence on corporate payout policy (i.e. dividends, share repurchases and total payout) in the US between 1992 and 2010. Their predictions are based on the intuition that since overconfident managers believe their firms to be undervalued and view external finance to be very costly, they are more likely to repurchase firms' shares and pay less dividends compared to their rational peers. Their results expose that firms with new overconfident managers increase their share repurchases, whereas no effect on share repurchases ratio is found when the new CEOs are rational. Further, they detect an increase in cash dividends among firms with new overconfident managers but this increase is lower than firms with rational managers. For the total payout, they find insignificant differences between rational and overconfident managers.

Azouzi and Anis (2012) examine the influence of managerial emotional biases (i.e. loss aversion, optimism and overconfidence) on dividend policy in Tunisian firms. Their study involves 100 executives from both listed and non-listed companies. They find that emotional biases of CEOs negatively affect corporate dividend policy. In China, Chen, Zheng, and Wu (2011) investigate the influence of overconfident managers and managerial discretion on dividend policy among 745 listed firms. Their results detect a negative association between overconfidence and the amount of dividends. Furthermore, their results show that this relation is strengthened by CEO duality and cash flows, and weakened by the State ownership and political connections.

Yung, Li, and Sun (2015) study the impact of overconfident managers on corporate dividend policy in real estate investment trusts from 2000 to 2012. They find that firms with overconfident managers pay less dividends compared to those managed by non-overconfident peers. Chee, Ab Razak, and Wong (2019) examine the effect of overconfident managers on divided policy in Tiger Cub Economies from 2012 to 2016. Their results reveal a negative association between managerial overconfidence and corporate dividend policy. Hoang, Dang, and Tran (2020) find that dividend policy in firms managed by overconfident managers is not statistically different compared to those managed by rational peers. A study by Vinh (2020) in Ho Chi Minh Stock Exchange (HOSE) reveals similar results.

Shu et al. (2013) evaluate the effect of overconfident managers on share repurchase programmes in Taiwanese listed firms between 2000 and 2008. They find that firms run by overconfident managers tend to have a higher execution rate and invest more in share repurchases than those run by rational counterparts. Andriosopoulos, Andriosopoulos, and Hoque (2013) find that information disclosure and overconfidence are positively correlated with buyback completion rate. Banerjee, Humphery-Jenner, and Nanda (2018) show that overconfident CEOs are more likely to repurchase shares and spend more on shares repurchases. They further detect that overconfident CEOs are more (less) sensitive to stock price decline (cash position).

Hence, the existing research into the link between managerial overconfidence and dividends is ambiguous. Some researchers demonstrate that managerial overconfidence and dividends are positively related, while other scholars find a negative link. In this paper, we develop the first model that considers the factors that may lead to a *positive* or *negative* effect of managerial overconfidence on the dividend levels.

1.3. Optimism versus overconfidence

The economic and psychology literatures show that optimism and overconfidence are characteristic traits of human beings. These literatures view optimism as generalised positive expectations about future events (Puri

and Robinson 2007; Scheier and Carver 1985; Scheier, Carver, and Bridges 1994). It is more related to overestimation of exogenous outcomes such as economic growth (Malmendier and Tate 2005b). Atasoy et al. (2022) examine the investors' bias in risk perception and expected return by referring to various behavioural issues such as framing, heruistics (based on the tangibility of investments), and loss aversion: they show the role of perceived permanence in judging the level of financial risks. Sadler-Smith (2004) discusses various managerial styles, by referring to creative intuition and rational analysis, which influences executive decision making and firm performance.

The psychology literature distinguishes between three types of overconfidence: (i) the tendency to overestimate human ability (better than the average); (ii) to believe that they have more control over events than it is in reality (illusion of control); and (iii) to think that their knowledge is more accurate than it really is (miscalibration) (De Paola, Gioia, and Scoppa 2014). Relatedly, Goswami and Urminsky (2021) show how managers are exposed to sub-optimal or biased (i.e. overestimating the difficulty of tasks) decisions on their employees' compensation schemes.

Despite the relevant role of optimism and overconfidence in corporate financial policies, there is no uniform definition of these terms in the behavioural corporate finance literature. For example, Heaton (2002) states that optimistic managers overestimate (underestimate) the probability of good (bad) future performance of their firms. Heaton's theoretical model incorporates managerial optimism in the form of overestimating (underestimating) the probability of future project success (failure).

A study of Ben-David, Graham, and Harvey (2007) refers to an optimistic manager as one who overestimates their firm's future cash flows while Malmendier, Tate, and Yan (2011) use this definition to define overconfident managers. Ben-David, Graham, and Harvey (2007) employee miscalibration, i.e. underestimation of the volatility of future cash flow by managers, to define overconfidence. The works of Gervais, Heaton, and Odean (2011) and Deshmukh, Goel, and Howe (2013) theoretically attach overconfidence to a manager who overestimates the private signal relative to public information.

Apparently, discussions of optimism and overconfidence have tended to be context-dependent in behavioural corporate finance literature, and defined in the empirical studies using, in most cases, the exact proxies such as CEO unexercised option moneyness, survey and media press to define the psychological biases of managers: optimism or overconfidence. Malmendier and Tate (2005a) use unexercised in the money options by CEOs to measure overconfidence while Campbell et al. (2011) use the same definition to term optimism.

Brown (2012) states that the two terms- optimism and overconfidence- are the same in cases where future events depend on an individual's current actions. According to Malmendier and Tate (2005a, 2662): 'Upward bias in the assessment of future outcome is sometimes referred to as "overoptimism" rather than "overconfidence". We follow the literature on self-serving attribution and choose the label 'overconfidence' in order to distinguish the overestimation of one's own ability (such as IQ or managerial skills) and outcomes relating to one's own personal situation from the general overestimation of exogenous outcomes.

Pikulina, Renneboog, and Tobler (2014) use individual beliefs about their ability to measure overconfidence. Au, Qin, and Zhang (2017) as well show the relevance of individual beliefs of the executives in China within the context of entrepreneural orientation and company performance. Pikulina, Renneboog, and Tobler (2014) reveal that people who overestimate their ability to be higher than it actually is exert more effort. In this study, the term overconfidence stems from the 'better-than-the-average' effects, and is defined as an overestimation of individual ability relative to the average ability level in the economy (Fast et al. 2012; Van den Steen 2011). Specifically, an overconfident manager is defined as the one who overestimates their ability to influence the success of current/future projects. This will drive overconfident managers to exert higher effort than rational peers (similar to Gervais, Heaton, and Odean 2011). Grossman and Hart (1982) look at this commitment in terms of debt: high debt commits the manager to high effort due to bankruptcy threat. In our model, higher dividends commit managers to higher efforts in order to increase the probability of being able to take the new project.

1.4. Managerial myopia and corporate finance

The initial research focus in behavioural corporate finance for a long time has been on managerial overconfidence. However, recently, scholars have begun to analyse other behavioural, psychological and emotional biases

that may affect corporate managers. One particular emerging area of focus is that of managerial myopia. For example, Kang et al. (2018) develop a theoretical model in order to analyse the interactions among managerial myopia, managerial overconfidence, and corporate project investment decisions. Employing a hyperbolic discounting framework, they consider how overconfidence can lead to overinvestment, while myopia can lead to underinvestment. Hence, in combination, the two effects may offset each other.

Sheng, Guo, and Chang (2022) consider the effect of managerial myopia on firm productivity in China. They find that myopia results in lower innovative activity, and weaker factor productivity. Lundstrum (2002) considers two theories of corporate investment myopia, confronting the NPV rule with agency problems. Thakor (1990) discusses how the interaction of myopic managers and myopic investors can lead to distortions in corporate investment decisions, and suggests that this problem is particularly acute in corporate America.

Chemmanur and Ravid (1999) develop a model of corporate myopia in which asymmetric information and shareholder myopia interact to induce management to invest in short-run, rather than more valuable long-run projects.

Jensen (2005) discusses how the myopia of the investors/the stock market, which can lead to short-run share price overvaluation, can set into motion a set of organisational forces that can induce managerial myopia. Jensen likens the short-run over-valuation of shares to managerial heroin, whereby managers 'high' on the fame and adulation of the stock market take short-run actions to boost the share price and keep it high.

Trent (2020) develops a framework to consider how corporate myopia can increase financial risk. Chatjuthamard, Ongsakul, and Jiraporn (2022) study the interaction between managerial myopia, corporate complexity and hostile takeover activity. Klein and Wuebker (2020) consider the interaction between managerial myopia, corporate diversification, and innovation. Denis (2019) analyses the interaction between managerial myopia and corporate governance. Schuster, Nicolai, and Covin (2020) examine the underpinnings of managerial myopia, analysing whether such myopia is less prevalent in founder-led firms.

In the area of capital structure research, Nolan (2002) demonstrates that long-term debt can be employed to mitigate managerial myopia. Such managers, who would be focused on short-run decisions, would be motivated to consider increasing long-run earnings in order to mitigate the long-run bankruptcy threat.

Thus, there is an area of research into managerial myopia and the effect on corporate investment. Yet, there is no research to speak of on myopia and capital structure (Nolan 2002, being a notable exception), and the literature is silent on the relationship between managerial myopia and corporate dividend policy. We begin to address this lacuna in our model.

1.5. Dividend catering theory

An early behavioural corporate finance model of dividend policy that incorporates dividend catering pressure on managerial decisions has been provided by Fairchild (2010). The author develops a dividend signalling model of managerial quality in which investors are behaviourally conditioned to believe that high dividends signal a good firm, but in which a manager may wish to cut dividends in order to invest in a new positive-NPV project. Fairchild demonstrates that the manager can resolve this tension through communication, backed by corporate reputation. Baker, Ruback, and Wurgler (2007) outline two approaches within behavioural corporate finance: the irrational managers approach, taking the rationality of investors as given (effectively assuming efficient capital markets), and the irrational investors approach, taking the rationality of managers as given. The first part of our literature review here (on managerial overconfidence, and managerial myopia) falls firmly into the first camp: irrational managers. Baker, Ruback, and Wurgler (2007) then suggest that future research should attempt to combine both approaches. We do so towards the end of our analysis by introducing Baker and Wurgler's (2004) dividend catering theory, where corporate management cater to short-run irrational investors' demand for dividends.

In summary, we develop a theoretical model of corporate dividend policy that examines the interaction of moral hazard/agency problems, managerial overconfidence, managerial myopia and dividend catering to irrational investors. We demonstrate that the interactions among the combined effects of managerial overconfidence and myopia and the level of dividends (positive or negative) are complex and ambiguous. Indeed, the study of Brav et al. (2005) reports that a firm's dividend policy varies across firms. Our analysis goes some way towards providing factors behind this variation.

This paper is organised as follows. Section 2 presents our game theoretic model, exploring the complex interactions between managerial overconfidence, managerial myopia, moral hazard, dividend catering, and dividend policy. Section 3 clarifies with numerical and graphical analyses. Testable empirical implications of our model and the concluding remarks of the paper are presented in Section 4.

2. The model

Before turning to our benchmark model in Section 2.1, and our main model in Section 2.2, it is worth considering the ingredients of our models that lead to the complex concoction (managerial overconfidence, myopia, moral hazard, and dividend catering) and that lead to ambiguous dividend effects. The ingredients of our model are as follows (ingredient 1 relates to our benchmark model: ingredients 2–4 relate to our main model):

(1) Jensen's free cash flows effects/moral hazard: dividends can affect the ability of the firm to invest in a forthcoming project. As in Jensen, higher dividends can be used to commit not to take a forthcoming, negative-NPV &value-destroying projects. In our benchmark model, the forthcoming project (project 2) is genuinely a negative-NPV project: the fully rational manager chooses the high dividend to commit not to invest in it. The overconfident manager mistakenly believes that project 2 is positive NPV/value-adding and reduces the dividend to be able to invest in it. Hence, in our benchmark model, managerial overconfidence results in a dividend cut.
(2) Main model: moral hazard in the form of effort shirking. A higher dividend can be used to commit to higher effort. Now, managerial overconfidence may result in a dividend increase.
(3) Main model: managerial myopia versus far-sightedness. In our model, market uncertainty about managerial effort, performance, future cash flows and firm prospects is only resolved in the long-run. In the short-run, the use of high dividends to commit to high effort may only have a moderate effect on firm value and managerial payoff. In the long-run, the high dividend may have a stronger effect on firm value and managerial payoff. Hence, our model may lead to the counter-intuitive result that far-sightedness leads to higher dividends than in the myopic manager case.
(4) Main model: dividend catering: introducing investor irrationality in the short-term may drive short-run dividend increases.

We now turn to our theoretical analysis.

2.1. Benchmark model: managerial overconfidence results in reduced dividends

In our literature analysis, we have identified that the evidence on the relationship between managerial overconfidence and dividends is mixed, with some researchers finding a negative relationship (higher overconfidence leads to lower dividends), while other researchers find a positive relationship (higher overconfidence leads to higher dividends). The analyses in our models in this paper consider these conflicts, and attempt to develop theoretical explanations for the mixed evidence.[1]

In this (first) benchmark model, we provide a simple analysis which demonstrates when and why managerial overconfidence may result in *lower* dividends. In the following section, we then introduce our much more complex analysis, incorporating moral hazard (in the form of effort-shirking), overconfidence, and myopia, to demonstrate how overconfidence can lead to *higher* dividends.

In our simple benchmark model, we consider the following. We consider a firm that has a current project in place, project 1 at the start of date 1. This project will produce a certain, guaranteed, risk-free income of $R_1 > 0$ at the end of date 1. At this point, it is known that that a new project, project 2, will become available at the start of date 2. Project 2 will require capital investment $I < R_1$ at the start of date 2. If the manager invests in project 2, it will produce date 2 (expected) income of V_2. A rational manager understands this expected income. An overconfident manager overestimates this expected income: he believes project 2's expected income to be $\hat{V}_2$with $\hat{V}_2 \geq V_2$. For a rational manager, $\hat{V}_2 = V_2$. For an overconfident manager, $\hat{V}_2 > V_2$. Increasing $\hat{\gamma}$ represents an increase in the manager's overconfidence in his ability to work on the current project, project 1,

while increasing $\hat{V}_2$ represents an increase in the manager's current overconfidence in the future value of project 2 (as the manager 'looks forward' in anticipation). We emphasise that we are focusing on the manager's current overconfidence, when he makes his dividend announcement decision at the start of the game (which we assume he is committed to). In our model, we focus on the effects of exogenously changing both overconfidence factors at the time of the dividend announcement. We do not consider how overconfidence may change over time, as future time-varying levels of overconfidence are irrelevant in the model: it is the current overconfidence at the start of the game that affects his dividend announcement at that time.

Investing in project 2 will provide private benefits $b > 0$ to the manager at the end of date 1.

In contrast to our 'complex' model in the next section, in our simple benchmark model, (a) there is no managerial effort, and hence no moral hazard in terms of effort shirking, and (b) the manager is completely myopic: he is only interested in his short-run (end of date 1) payoff, and (c) In this benchmark model, we focus on the case where project 2 has negative NPV: $V_2 - I < 0$.

The myopic manager's date 1 payoff is as follows:

$$\pi_M = \alpha V + B \tag{1}$$

where α represents the manager's equity stake, V represents the date 1 value that the market assigns to the firm, and $B \in \{0, b\}$ represents the manager's private benefits from project 2 if the manager does not (does) invest in project 2, respectively.

At the start of date 1, the manager has the following decision to make: he decides whether to announce a low or high dividend (he is committed to paying out the announced dividend at the end of date 1). The dividend announcement affects his ability to invest in project 2 as follows. The low dividend is $D_L \leq R_1 - I$. The high dividend is $D_H > R_1 - I$. In the case of the low dividend, the manager is able to pay it out of end of date 1 project 1 income R_1, and is still able to invest in project 2 if he wants to. In the case of the high dividend, once the manager has paid it out from project 1 income, he is unable to invest in project 2.

The market observes the beginning of date 1 dividend announcement and values the firm accordingly. Now, given the myopia of the manager (focusing on end of date 1 payoff), once the market has valued the firm at V, it is in the manager's interests to invest in project 2 if he can, due to the private benefits obtained (i.e. 'b'): Thus, due to myopia, the manager invests in project 2 for sure in the case of the low dividend. In the case of the high dividend, he cannot invest in the project 2. The rational market understands this and values the firm accordingly at the end of date 1.

In the case of the rational manager, his payoff from the low and high dividend is, respectively:

$$\pi_M = \alpha(R_1 + V_2 - I) + b \tag{2}$$

$$\pi_M = \alpha R_1 \tag{3}$$

The rational manager chooses the high dividend if Equation (3) > Equation (2): that is, he chooses the high dividend if.

$$\alpha(V_2 - I) + b < 0 \tag{4}$$

Similarly, the overconfident manager chooses between low and high dividend by comparing (for the low dividend)

$$\pi_M = \alpha(R_1 + \hat{V}_2 - I) + b \tag{5}$$

with Equation (3) (for the high dividend).

Thus, the overconfident manager will choose the low dividend if Equation (5) > Equation (3): that is, he chooses the low dividend if.

$$\alpha(\hat{V}_2 - I) + b > 0 \tag{6}$$

Recall that project 2's true NPV is negative: $V_2 - I < 0$. Therefore, if b is sufficiently low, Equation (4) holds, and the rational manager chooses the high dividend: in effect, the moral hazard problem here is that the manager

cannot commit not to invest in the new project, which harms his payoff, so the rational manager uses the high dividend as a commitment device to pay out funds as dividends so that he cannot invest in project 2 (Jensen's free cash flows argument).

The overconfident manager overestimates project 2's value, and NPV: that is $\hat{V}_2 - I > V_2 - I$. Thus, the overconfident manager perceives project 2's NPV as being either less negative than it actually is, or even mistakenly perceives it as positive NPV. In the case of perceiving it as positive NPV, Equation (6) definitely holds. In the case of $\hat{V}_2 - I$ being negative, but with $\hat{V}_2 - I > V_2 - I$, it is still possible that Equation (6) can hold, as long as b is large enough.

Thus, focusing on the case where:

$$\alpha(\hat{V}_2 - I) + b > 0 > \alpha(V_2 - I) + b \tag{7}$$

We state our first key result.

Proposition 2.1: *In our benchmark case, the rational manager chooses the high dividend, and the overconfident manager chooses the low dividend. Thus, overconfidence and dividends are negatively related.*

The argument here is that the rational manager is using the high dividend to commit not to invest in the negative NPV project 2 (Jensen's free cash flows assertion). The overconfident manager mistakenly believes that project 2 is desirable: mistakenly believes that project 2 has a positive NPV and is therefore a good investment. Therefore, he cuts the dividend in order to be able to invest in it.

2.2. Main model: complex mix of managerial factors: ambiguous dividend effects

In the previous section, we developed a simple benchmark model of managerial overconfidence and dividends. Employing Jensen's free cash flow framework, we demonstrated the situation where the rational manager chose a high dividend to commit not to invest in a future negative NPV project, while the overconfident manager mistakenly perceived project 2 to have a positive NPV, and therefore cut the dividend in order to be able to invest in it.

In this section, we now turn to our in-depth complex analysis of the interactions between managerial overconfidence (in his ability on a current project, and in his perception of future project value), myopia/far-sightedness, moral hazard (in the form of effort shirking), and dividend catering.

In contrast to the previous model, in this model, in the face of the moral hazard problem of effort-shirking, the manager may use the higher dividend to commit to a higher effort, in order to drive up current firm valuation. We develop a game-theoretic model that analyses the interactions between managerial overconfidence, managerial myopia, and dividend policy.

One interesting contrast with the previous analysis (where overconfidence drove lower dividends) is as follows. In the current model, since dividends can be used to commit to higher effort, overconfidence can drive higher dividends. This is even the case when considering overconfidence about the future project. As that too drives higher effort, overconfidence about the future project can drive higher dividends (note the contrast with the benchmark, where overconfidence about the future project drove *lower* dividends).

The details, and timeline of our model are as follows.

Date 1: Consider a firm which consists of an existing project, project 1, that the management and employees are working on. A new project, project 2, arises on the horizon. Project 2 will be available to invest in next period, date 2. At that time, it will require initial investment $I > 0$.

The management have two decisions to make at date 1: how much effort to exert into the current project 1, and what dividend to announce that they will pay at the start of date 2. We assume (not modelled here) that they are committed to the announced dividend: for example, the market does not like a change in dividend from the announcement: this 'lie' would be a bad signal, affecting managerial integrity, and the market would 'punish' the firm in terms of valuation.

In making their effort decision, management consider the following. Managerial effort e on project 1 affects the probability of success, and the project's outcome, as follows. With probability $p = \gamma e$, project 1 succeeds, in which case it produces high net cashflow R_H. With probability $1 - p$, the project fails, in which case it produces low net cashflow R_L, where $R_H > R_L > I > 0$. Note that γ represents managerial ability (to enhance project 1's success probability). An overconfident manager overestimates his ability, such that his perceived ability on project 1 is $\hat{\gamma} > \gamma$. When $\hat{\gamma} = \gamma$, we define the manager as being rational/well-calibrated. Note that the size of $\hat{\gamma} - \gamma$ represents the level of overconfidence in ability.

In making their dividend decision, management consider that this decision may affect the firm's ability to invest in the new project at the start of date 2, as follows:

Date 2: If $R_i - I \geq D$, management can invest in the new project, project 2. On the other hand, if $R_i - I < D$, management cannot invest in the new project (where subscript $i \in \{H, L\}$ represents the project 1 outcome).

Note that we assume that outside financing (such as debt or equity) is too costly for management to consider financing project 2. We assume that management must use internal cash flows for both dividends and for investing in project 2. The inequalities above capture the fact that, in the absence of the availability of external finance, if the dividend is too high, given the project outcome, the management will not be able to invest in the new project.

If the management can invest in the new project 2, it brings a value to the firm of V_2. We consider the possibility that the new project can have a positive or negative NPV: that is, we consider the case where $V_2 \geq I$, or $V_2 < I$. Just as we consider that management may be overconfident in ability on project 1, we consider that management may also be overconfident in the value of project 2. That is, management's perceived value of project 2 is $\hat{V}_2 \geq V_2$. An interesting case is where $\hat{V}_2 - I > 0 > V_2 - I$. In this case, project 2 has negative NPV, but the overconfident manager thinks it has positive NPV.

Date 3: The game ends and management receive their payoff.

2.3. Solving the model

First, we note that, at date 1, the expected value of project 1 is:

$$V_1 = pR_H + (1 - p)R_L + q(V_2 - I) \tag{8}$$

where q represents the probability of the firm being able to invest in the new project.

Note that q depends on the interaction of the chosen dividend level and the realisation (good or bad) of the income from project 1: we will analyse this during the solution of the model.

Furthermore, we assume the following:

$$A : 1. \quad \alpha(V_2 - I) + b \geq 0$$

where α is the manager's equity stake. Assumption A:1 means that the manager invests in project 2 at date 2 if he can. Here, we can consider the case where the true NPV of project 2 is negative. However, private benefits are large enough to outweigh the negative NPV of project 2, so that the manager invests in project 2 if he can for any level of overconfidence in project 2's NPV: $\hat{V}_2 \geq V_2$.

Substituting for $p = \gamma e$, and re-writing Equation (8), we obtain:

$$V_1 = \gamma e(R_H - R_L) + R_L + q(V_2 - I) \tag{9}$$

Note that the overconfident manager overestimates his ability, and mistakenly perceives project 1 value as:

$$\hat{V}_1 = \hat{\gamma} e(R_H - R_L) + R_L + \hat{q}(V_2 - I) \tag{10}$$

Furthermore, note that management's effort in project 1 is unobservable to the market. The only aspect that the market can observe is the outcome (success or failure), and therefore the income (R_H or R_L), going into date 2.

At date 1, the (overconfident) manager starts the game with the following perceived expected payoff function:

$$\hat{\pi}_M = \alpha[\varphi \hat{V}_1 + (1-\varphi)\hat{V}_2] - \beta e^2 + E(b) \tag{11}$$

where $\alpha \in (0,1)$ represents the manager's equity stake. Furthermore, $\varphi \in [0,1]$ are weightings that the manager puts on date 1 and date 2 payoffs. Thus, φrepresents the manager's myopia parameter. If $\varphi = 0$, the manager is completely far-sighted, putting all of the weighting on date 2 payoff. If $\varphi = 1$, the manager is completely myopic, putting all of his weighting on current, date 1, period payoff. Thus, in the [0–1] interval, a higher (lower) φ represents a more myopic (more far-sighted) managerial perspective.

The third term in the payoff represents the manager's cost of effort, which exhibits increasing marginal cost of effort. The final term is the manager's expected private benefit.

Recall that effort is unobservable in date 1. Furthermore, in our model, the manager announces the dividend level at date 1, the market observes this announcement and sets the date 1 market value V_1, given the market's expectation of the manager's effort level, and after that, the manager exerts unobservable effort. The market can only observe the outcome of this effort when we move into date 2. Thus, if the manager is completely myopic, then, in the absence of any other effort driver, there is a commitment problem. Given that the market has already rewarded the manager with market valuation, and effort is unobservable, and the manager is not thinking beyond date 1, it is optimal for the manager to exert zero effort.

2.4. The manager is completely myopic

To see this, let us first consider the case where $\varphi = 1$, (complete myopia) such that the manager's perceived payoff in Equation (11) becomes:

$$\hat{\pi}_M = \alpha \hat{V}_1 - \beta e^2 + E(b) \tag{12}$$

where α represents the manager's equity stake in the firm, and $\hat{V}_1$ represents the market's expectation of managerial effort as $\bar{e}$. Then, from Equation (10),

$$\hat{V}_1 = \hat{\gamma}\bar{e}(R_H - R_L) + R_{L.} + \hat{q}(V_2 - I) \tag{13}$$

Now, we will observe how a completely myopic (and overconfident) manager's dividend policy can impact the market's expectation of his effort level, and therefore the market's date 1 valuation (both the true valuation V_1, and the overconfident manager's perceived valuation $\hat{V}_1$).

We note that, in the case of complete myopia, the manager may use the dividend announcement as a commitment device to exert higher effort: in the case of complete myopia, the only factor driving this is that the manager might be driven to exert higher effort to be able to pay the (higher) dividend, and invest in the new project 2, as that provides him private benefits.

We consider three levels of dividend:

(a) Low dividend: $D_L \leq R_L - I$. In this case, the dividend is so low that the manager can take the new project 2, regardless of whether project 1 is successful or not.
(b) Medium dividend, $D_M \in (R_L - I, R_H - I]$. The dividend is low enough such that the manager can only take the new project 2, if project 1 is successful. In the case of failure, the dividend is too high: so he will be unable to take the new project.
(c) High dividend, $D_H > R_H - I$. In this case, the dividend is so high, that the manager is unable to take the new project 2, regardless of whether project 1 is successful or not.

In the case of the low dividend, a myopic manager can invest in project 2 to gain his private benefits, regardless of whether project 1 achieves success or failure. Therefore, as the myopic manager receives his date 1 monetary payoff, and then exerts unobservable effort, he cannot commit to exerting any effort. Due to the commitment problem, it is optimal for him to exert zero effort.

The rational financial market investors correctly anticipate that he will exert zero effort: thus, in Equation (13), $\bar{e} = 0$. Thus, the market correctly values the project at date 1 as $\hat{V}_1 = R_L$ Therefore, from Equation (12), the myopic manager's payoff from choosing the low dividend is:

$$\hat{\pi}_M(D_L) = \alpha(R_L + \hat{V}_2 - I) + b \tag{14}$$

Note that the final term b represents the fact that, in the case of the low dividend, he will be able to invest in project 2 to obtain his private benefits for sure, regardless of project 1 outcome.

In the case of the medium dividend, the manager is only able to invest in project 2 if project 1 succeeds. Thus, there is now an incentive for even the completely myopic manager to exert effort, in order to be able to invest in project 2, to be able to obtain his private benefits. The medium dividend can be employed by the manager as a commitment to exerting effort.

Thus, using Equations (12) and (13), the completely myopic manager chooses his optimal effort level to maximise:

$$\hat{\pi}_M = \alpha[\hat{\gamma}\bar{e}(R_H - R_L + \hat{V}_2 - I) + R_L] - \beta e^2 + \hat{p}b \tag{15}$$

Note the comparison with Equation (14) regarding the expected private benefits in the final term of Equations (14) and (15). In Equation (14), in the case of low dividends, the manager can take private benefits for sure. In Equation (15), in the case of medium dividends, the manager can only invest in project 2 and achieve private benefits, if project 1 succeeds, which occurs with probability p : hence, the true expected private benefits in Equation (15) are $pb = \gamma eb$. However, the overconfident manager, who overestimates his ability in project 1, perceives his expected private benefits as $\hat{p}b = \hat{\gamma}eb$.

Substituting for $\hat{p}b = \hat{\gamma}eb$ in Equation (15), we obtain the myopic manager's optimal effort level in the case of the medium dividend by solving $\frac{\partial \hat{\pi}_M}{\sigma e} = 0$, and setting to zero.

Since the market provides date 1 value based on its expectation of managerial effort $\bar{e}$, essentially, the manager is choosing effort to maximise $-\beta e^2 + \hat{p}b = -\beta e^2 + \hat{\gamma}eb$. Differentiating and solving, we obtain the myopic manager's following optimal effort level in the case of medium dividends:

$$e^* = \frac{\hat{\gamma}b}{2\beta}. \tag{16}$$

That is, in the case of medium dividends (where the manager can only invest in project 2) if project 1 succeeds, the completely myopic manager's optimal effort level is increasing in his private benefits b from project 2, and in his overconfidence $\hat{\gamma}$: the higher his overconfidence, the higher his effort level.

Noting that the rational financial market correctly anticipates the optimal effort level Equation (16): that is $\bar{e} = e^* = \frac{\hat{\gamma}b}{2\beta}$, we substitute$\bar{e}$ and e^* into Equation (15) to obtain the manager's payoff from choosing the medium dividend:

$$\hat{\pi}_M = \alpha\left[\frac{\hat{\gamma}^2 b}{2\beta}(R_H - R_L + \hat{V}_2 - I) + R_L\right] + \frac{\hat{\gamma}^2 b^2}{4\beta} \tag{17}$$

Finally, in the case of the completely myopic manager, we consider the case of the high dividend. This case has similarities with the case of the low dividend. In the case of the low dividend, the manager could invest in project 2, regardless of project 1 outcome. Therefore, he had no incentive to exert any effort. In the case of the high dividend, the manager now *cannot* invest in project 2, regardless of project 1 outcome. Therefore, again, he has no incentive to exert any effort. Thus, low and high dividends provide no commitment from the manager to exert any effort. The key difference though is that in the case of the low dividend, the manager can invest in project 2, regardless of outcome, achieving private benefits for sure. Thus, in the case of low dividends, his payoff was as in Equation (14) (reproduced here for ease of comparison): $\hat{\pi}_M(D_L) = \alpha(R_L + \hat{V}_2 - I) + b$.

In the case of the high dividend, the market again correctly anticipates zero effort, and, as the manager cannot invest in project 2, regardless of project 1 outcome, his payoff is now missing the value of project 2 and the private benefits: $\hat{\pi}_M(D_H) = \alpha R_L$.

Thus, $\hat{\pi}_M(D_L) > \hat{\pi}_M(D_H)$: the manager never chooses the high dividend. It is dominated by the low dividend. Thus, the completely myopic manager chooses between low dividend and medium dividend by comparing Equations (14) and (17).

The completely myopic manager chooses the medium dividend compared to the low dividend if Equation (17) > Equation (14): that is, if:

$$\alpha(\frac{\hat{\gamma}^2 b}{2\beta}(R_H - R_L + \hat{V}_2 - I) - (\hat{V}_2 - I)) + \frac{\hat{\gamma}^2 b^2}{4\beta} - b \geq 0 \tag{18}$$

The first term represents the increase in the manager's monetary equity value on project 1 due to committing to higher effort from choosing the medium dividend compared to the low dividend. The second term, $-(\hat{V}_2 - I)$, represents the lost equity value of being able to invest for sure in the new project if the manager switches from the low to the medium dividend. The final two terms represent the manager's loss in expected private benefits due to choosing the medium dividend (where he can only invest in project 2 if project 1 is successful) compared with the low dividend (where he can take project 1 for sure).

We observe the following from Equation (18). If the manager had no ability, and he correctly perceived this to be the case ($\gamma = \hat{\gamma} = 0$), then Equation (18) $= -\alpha(\hat{V}_2 - I) - b$, and he would not choose the medium dividend: he would choose the low dividend. That is, in the case of zero ability, he would not wish to set the medium dividend to commit to higher effort, as he has no ability: he would not be able to create any value.

Using Equation (18), we define a critical level of overconfidence $\hat{\gamma}_C$ at which the LHS of Equation (18) $= 0$.

Therefore, this critical level of overconfidence is:

$$\hat{\gamma}_C = \sqrt{\frac{4\alpha\beta(\hat{V}_2 - I + b)}{2\alpha b(R_H - R_L + \hat{V}_2 - I) + b^2}} \tag{19}$$

To provide some interest in this model, consider the case where the true level of ability γ is such that $\gamma \in [0, \hat{\gamma}_C)$. This means that a rational, well-calibrated (non-overconfident) myopic manager, who understands his true γ, will choose the low dividend. His true ability is too low for him to want to use the medium dividend to commit to a higher effort level. We are thus able to state our first main result.

Proposition 2.2: *The effect of the completely myopic manager's overconfidence on his dividend decision is as follows:*

(a) *Low overconfidence: when $\hat{\gamma} \in [\gamma, \hat{\gamma}_C)$, the completely myopic manager chooses the low dividend.*
(b) *High overconfidence: when $\hat{\gamma} \geq \hat{\gamma}_C$, the completely myopic manager switches to the medium dividend. He never chooses the high dividend.*

2.5. Combining managerial overconfidence and levels of myopia/farsightedness

In the previous section, we considered the case of the completely myopic manager, focusing on the effect of his dividend choice on the market's date 1 valuation, and hence on his myopic payoff. Since the myopic manager was paid before any outcome of his unobservable effort was observed by the market, he used the medium dividend as a commitment device to exert high effort, in order to be able to invest in project 2 to obtain his private benefit. We demonstrated that the rational, well-calibrated manager chose the low dividend: the market correctly anticipated that his optimal effort level would be zero.

At a critical level of overconfidence in his ability, the manager increased the payout to the medium dividend.

In this section, we combine overconfidence and myopia/farsightedness, as follows. Recall Equation (11), ($\hat{\pi}_M = \varphi\alpha\hat{V}_1 + (1-\varphi)\alpha\hat{V}_2 - \beta e^2 + E(b)$), which represented a weighted combination of managerial myopic and long-run perspectives. From Equation (11), we compare the three dividend policy choices (low, medium or high), as we did previously, but now in the case where the manager puts some weighting on both the short run (date 1) and long run (date 2) firm value.

First, consider the case of the low dividend: $D_L \leq R_L - I$. The manager can invest in project 2, regardless of the realisation of project 1 income. Therefore, his payoff in Equation (3) becomes:

$$\hat{\pi}_M = \varphi\alpha(\hat{\gamma}\bar{e}(R_H - R_L) + R_L + \hat{V}_2 - I) + (1-\varphi)\alpha(\hat{\gamma}e(R_H - R_L) + R_L + \hat{V}_2 - I) - \beta e^2 + b$$

Note that the term in the first bracket (representing short-run date 1 value $\hat{V}_1$) is as previously. The market pays the date 1 payoff to the manager before the project 1 outcome of his unobservable effort is realised. The market thus assesses his effort as $\bar{e}$, which is purely driven in the short term by his desire to invest in project 2 to obtain the private benefits. Thus, in the previous section, we observed that in the purely myopic case ($\varphi = 1$), the manager may use the medium dividend to commit to a higher effort: under the zero dividend, he had no incentive to exert any effort at all, as he could take project 2 regardless of project 1 outcome. The rational market knew this, and, in the low dividend case, valued the firm according to $\bar{e} = 0$. The medium dividend committed the manager to the optimal positive effort level (in order to increase the chances of taking project 2), and this pushed market value upwards, due to $\bar{e} = e^*$.

Now, in the current case of mixed myopia/far-sightedness, the second term in the above equation emphasises the long-term valuation effect. At date 2, project 1 realisation (high or low income) is observable, and the market values the company accordingly. Hence, the term in the second bracket is the manager's (perceived due to over-confidence) expected value at date 2: and he knows his effort level. Thus, in the second term, e is his genuinely privately observed effort level. Therefore, in contrast to the date 1 effort level (in the first bracket) being driven only by the desire to take project 2 for the private benefits it brings, the effort level when considering the long run date 2 value is genuinely driven by project 1's high and low realisation of valuation.

We differentiate the previous equation with respect to effort, and solve to gain the manager's optimal effort level:

$$e^* = \frac{(1-\varphi)\alpha\hat{\gamma}(R_H - R_L)}{2\beta} \tag{20}$$

Note that the manager's effort level is increasing in his far-sightedness $(1-\varphi)$ and hence decreasing in his myopia φ. When he is completely myopic, $\varphi = 1$. We gain the optimal effort level in the purely myopic case: $e^* = 0$. In this case of the low dividend, the manager can take project 2 regardless of project 1 realisation, so he has no incentive to exert any effort. As his myopia parameter reduces in the [1,0] interval, his effort level increases as he places more weight on the realised value at date 2.

Next, consider the medium dividend $D_M \in (R_L - I, R_H - I]$. In this case, the manager can only take project 2 when project 1 achieves the high realisation. Thus, his payoff becomes:

$$\hat{\pi}_M = \varphi\alpha(\hat{\gamma}\bar{e}(R_H - R_L + \hat{V}_2 - I) + R_L) + (1-\varphi)\alpha(\hat{\gamma}e(R_H - R_L + \hat{V}_2 - I) + R_L) - \beta e^2 + \hat{\gamma}\bar{e}b$$

We observe the difference between the payoff for the low and medium dividend. In this case (medium dividend), the manager can only invest in project 2 under the high realisation of project 2. Now, solving for the manager's optimal effort, we obtain:

$$e^* = \frac{(1-\varphi)\alpha\hat{\gamma}(R_H - R_L + \hat{V}_2 - I) + \hat{\gamma}b}{2\beta} \tag{21}$$

We note two interesting aspects here. The mixed myopic/far-sighted manager's optimal effort level in the medium dividend case exceeds his optimal effort level in the low dividend case due to using the medium dividend to commit to higher effort: whereas in the completely myopic case, this is due both to the private benefits, and the NPV of project 2.

Secondly, the effort level in the medium dividend case is higher in the far-sighted case than in the completely myopic case, and is increasing in the far-sighted parameter $(1-\varphi)$. When we consider $1-\varphi=0$, we recover the completely myopic optimal effort level in the case of the medium dividend: $e^*=\frac{\hat{\gamma}b}{2\beta}$.

Finally, as previously, the manager will never choose the high dividend, as he is then unable to take the new project. His expected payoff is as in the case of the low dividend, but without the private benefits: therefore, D_L dominates D_H.

2.6. Mixed myopic/far-sighted manager's optimal dividend choice

In this section, it is useful to consider both the market's date 1 valuation of the firm, and the manager's perceived expected payoff, for the two dividend levels (low and medium).

We note that, in a rational financial market, the market's perception of the manager's effort equals the actual optimal effort level, $\bar{e}=e^*$.

Therefore, in the case of $D_L \leq R_L - I$, the market's (true) valuation of the firm is:

$$V_1 = \gamma \bar{e}(R_H - R_L) + R_L + V_2 - I$$

Substituting in for the optimal effort level, $\bar{e}=e^*$, we obtain:

$$V_1 = \frac{\gamma\hat{\gamma}(1-\varphi)\alpha(R_H-R_L)^2}{2\beta} + R_L + V_2 - I \tag{22}$$

The overconfident manager perceives that $\gamma=\hat{\gamma}$ (and, in deciding his dividend policy, he thinks that the market perceives this too).

Thus, the manager's perceived market value is.

$$\hat{V}_1 = \frac{\hat{\gamma}^2(1-\varphi)\alpha(R_H-R_L)^2}{2\beta} + R_L + V_2 - I \tag{23}$$

The manager's perceived payoff, given the low dividend is:

$$\hat{\pi}_M = \frac{\hat{\gamma}^2\alpha^2[\varphi(1-\varphi)+(1-\varphi)^2](R_H-R_L)^2}{2\beta} + \alpha(R_L + \hat{V}_2 - I) \tag{24}$$

Next, consider the case where the manager chooses the medium dividend. $D_M \in (R_L - I, R_H - I]$.

We note the following. When the manager is completely myopic ($\varphi=1$), we recover Equation (9) in the previous section in the case of the medium dividend. Recall that for zero overconfidence, in the case of the completely myopic manager, Equation (6) > Equation (9) for sure: in the case of zero overconfidence and complete myopia, the manager unambiguously chooses the low dividend. The only reason for issuing the medium dividend in the case of complete myopia is to commit to a higher effort level, and if the manager has zero ability, he will not wish to do so: he will retain the low dividends.

Proposition 2.2 then demonstrates that, in the completely myopic case, then as overconfidence increases, there becomes a level of overconfidence at which the completely myopic manager increases the dividend from low to medium dividend to commit to higher effort.

When the manager is completely far-sighted ($\varphi=0$), the manager's payoff in the case of the medium dividend becomes:

$$\hat{\pi}_M = \frac{\hat{\gamma}^2[\alpha(R_H - R_L + \hat{V}_2 - I + b)^2}{2\beta} + \alpha R_L \tag{25}$$

The completely far-sighted manager's payoff in the case of the low dividend is:

$$\hat{\pi}_M = \frac{\hat{\gamma}^2\alpha^2(R_H-R_L)^2}{4\beta} + \alpha R_L + b + \alpha(\hat{V}_2 - I) \tag{26}$$

As in the case of complete myopia, we again define a critical level of overconfidence in this completely far-sighted case, where Equation (25) = Equation (26). We label this critical level as γ_{CFS} (where CFS stands for 'critical level in the case of complete far-sightedness'). We are able to state the following:

Proposition 2.3: *When the manager is completely far-sighted, he switches from low to high dividends at a critical level of overconfidence $\hat{\gamma}_{CFS}$. It is ambiguous whether this critical switching level is lower or higher than the critical value $\widehat{\gamma}_C$ for the myopic case in proposition* 2.2.

Effectively, combining Proposition 2.2 (which describes the effect of increasing overconfidence in the completely myopic case, driving an increase in dividends from the low to the medium level at a critical level of overconfidence), and Proposition 2.3, which consider the completely far-sighted case, we can intuitively consider a two-dimensional space where:

Proposition 2.4: (a) *We fix the myopia/far-sighted level at any given level in the interval $\varphi\epsilon(0,1)$, and increase the overconfidence level. There will exist a critical level of overconfidence $\hat{\gamma}_c(\varphi)$ at which the manager will switch from the low to the high dividend to commit to the high effort. If $\hat{\gamma}_{CFS} > \widehat{\gamma}_C$, then, as the level of myopia increases through the interval $\varphi\epsilon(0,1)$, the critical level of overconfidence at which the manager switches from the low to the medium dividend decreases. If $\hat{\gamma}_{CFS} < \widehat{\gamma}_C$, then, as the level of myopia increases through the interval $\varphi\epsilon(0,1)$, the critical level at which the manager switches from the low to the medium dividend increases.*

(b) *Let $\hat{\gamma}_{CFS} > \widehat{\gamma}_C$. Consider a level of overconfidence in the interval $\hat{\gamma} \in (\widehat{\gamma}_C, \hat{\gamma}_{CFS})$. When the manager is fully far-sighted, he chooses the low dividend. As his level of myopia increases through the interval $\varphi\epsilon(0,1)$, there exists a critical level of myopia φ_C at which he switches from the low to the medium dividend.*

(c) *Let $\hat{\gamma}_{CFS} < \widehat{\gamma}_C$. Consider a level of overconfidence in the interval $\hat{\gamma} \in (\hat{\gamma}_{CFS,}\widehat{\gamma}_C,)$. When the manager is fully far-sighted, he chooses the medium dividend. As his level of myopia increases through the interval $\varphi\epsilon(0,1)$, there exists a critical level of myopia φ_C at which he switches from the medium to the low dividend.*

Thus, the overall relationship between managerial overconfidence, myopia/far-sightedness, and dividends is ambiguous.

Proposition 2.4 suggests an interesting two-dimensional interaction between managerial myopia/far-sightedness, managerial overconfidence and dividend level. In proposition (4b), increasing myopia interacts with increasing overconfidence to increase dividends. In proposition (4c), increasing myopia counteracts increasing overconfidence to reduce dividends.

Proposition 2.4 will be analysed and clarified numerically and graphically in the forthcoming numerical/graphical section. Propositions (4b) and (4c) lead to the following:

Proposition 2.5: *Consider levels of overconfidence outside of the critical interval $\hat{\gamma} \in (\widehat{\gamma}_C, \hat{\gamma}_{CFS})$ or $\hat{\gamma} \in (\hat{\gamma}_{CFS,}\widehat{\gamma}_C,)$ (depending on whether $\hat{\gamma}_{CFS} > \widehat{\gamma}_C$ or $\hat{\gamma}_{CFS} < \widehat{\gamma}_C$):*

(a) *If $\hat{\gamma}$ is less than the lower end of the interval, the manager chooses the low dividend for all levels of myopia.*

(b) *If $\hat{\gamma}$ is more than the upper end of the interval, the manager chooses the medium dividend for all levels of myopia.*

(c) *The interactive effects of overconfidence and myopia only occur in the critical interval, as described in propositions* (4b) *and* (4c).

Propositions 2.2–2.5 are clarified in our numerical/graphical analyses in section 3, where we also present a useful two-dimensional table demonstrating the combined effects of overconfidence and myopia on dividend levels.

2.7. Managerial overconfidence in the value of future project 2

Thus far, we have focused on the interaction between myopia and the manager's overconfidence in his ability to create value on the current project, project 1. We found that this type of overconfidence drove a more myopic manager to announce higher dividends in order to commit to higher short-term effort.

Our model allows us to now consider the effect of managerial overconfidence in the value of the future project, project 2. We have modelled this through the manager's perceived value of project 2, $\hat{V}$, compared with the true value V. For the overconfident manager, $\hat{V} > V$: and the higher is $\hat{V}$, the more overconfident he is. We focus on proposition (4b) and state the following.

Proposition 2.6: *Consider proposition* (4)*: as the manager's overconfidence in the future project's (project* 2*'s) value* $\hat{V}$ *increases, the critical level of far-sightedness* $\varphi_c(\hat{\gamma})$ *at which the manager will switch from the high to the low dividend decreases (moves to the left). That is, for a given level of managerial overconfidence in his ability on the current project, project* 1*, as his overconfidence in the future project* 2 *value increases, the critical level of far-sightedness at which he switches from the high to the low dividend decreases. Namely, he switches to the low dividend 'earlier' as his overconfidence in the value of the future project increases.*

Proposition 2.6 captures on an interesting interaction/tension between the three factors: (a) managerial myopia/far-sightedness, (b) managerial overconfidence in his ability on the current project, and (c) managerial overconfidence in the value of the future project. Myopia and overconfidence in his ability on the current project 1 drive him to push the dividend up to commit to higher effort to drive market value up in the short term. Far-sightedness and overconfidence in the value of project 2 drive him to reduce dividends to be able to invest in project 2. We capture proposition 2.6 in the numerical/graphical section 3.

2.8. The effect of dividend catering to irrational investors

Baker, Ruback, and Wurgler (2007) suggest two approaches in behavioural corporate finance: (a) the irrational managers approach, taking investor irrationality as given, and (b) the irrational investors approach, taking managerial rationality as given. The existing research into the effects of managerial overconfidence (managerial irrationality) on dividend policy fits into the first camp. The research that looks at rational managers catering to irrational investors' desires falls into the second camp. Some scholars have called for research that combines these two approaches, thus considering irrational managers *and* irrational investors.

Thus far, our analysis falls firmly in the first camp. That is, we have considered managerial irrationality (overconfidence and myopia) under the assumption that the market is rational (implicitly assuming that the financial market is efficient, pricing the firm rationally).

In this section, we now introduce investor irrationality, effectively adding dividend catering to the mix. In doing so, we take the first tentative steps towards creating a dividend model that combines both managerial and investor irrationality. Furthermore, it is often noted that company management do not have 'free-reign' over dividend decisions. They often have their hands forced by investors: dividend catering captures this external shareholder pressure on the management.

We add dividend catering to our model as follows. We assume that investors like high dividends, but not low dividends. Following Baker and Wurgler's (2004) dividend catering theory, we assume that the market places an irrational catering premium μ in the short-term (at date 1) onto the value of the firm in the case of the high dividend: no such catering premium exists in the case of low dividends. As this premium only exists in the short term, our existing model will be modified as follows.

We amend Equation (5), the manager's perceived project 1 value as follows:

$$\hat{V}_1 = \hat{\gamma}\bar{e}(R_H - R_L) + R_L + \hat{q}(V_2 - I) + \delta \tag{27}$$

where $\delta \in \{\mu, 0\}$ is the catering premium for the high/low dividend, respectively. Taking this through the model, and the optimisation as before, we are able to analyse proposition (4b) to state the following.

Proposition 2.7: *Consider proposition* (4b). *As the irrational investors' short-term catering premium μ for the high dividend increases, the critical level of far-sightedness $\varphi_c(\hat{\gamma})$ at which the manager will switch from the high to the low dividend increases (moves to the right). That is, for a given level of managerial overconfidence in his ability on the current project, project* 1, *as the short-term catering premium increases, the critical level of far-sightedness at which he switches from the high to the low dividend also increases. Namely, he switches to the low dividend 'later' as the short-term catering premium increases.*

We consider the effects described in proposition 2.5 in the numerical examples & figures in section 3.

3. Numerical simulations

Our theoretical analysis has demonstrated that the interaction between managerial overconfidence, the manager's level of myopia/farsightedness, and the level of dividends is complex and ambiguous. We now consider numerical simulations to analyse these interesting effects numerically and diagrammatically.

We focus on the following parameter values:

Manager's true ability on project 1: $\gamma = 0$.
Manager's overconfidence: $\hat{\gamma} \geq \gamma$.
Three levels of myopia $\in \{0, 0.5, 1\}$ (completely far-sighted, mixed myopic/far-sighted, completely myopic).
$R_H = 100,000$; $R_L = 50,000$.
$V_2 = 10,000$ (true value of project 2).
$\hat{V}_2 \in \{10,000; 200,000\}$ (that is, we consider two cases for the manager's overconfidence in the value of future project 2: no overconfidence, or extreme overconfidence).
$I = 5,000$ (Investment funds required to start project 2).
$\beta = 2,000,000$
$b = 10,000$ (Private benefits from project 2).

In addition, we consider two cases of catering to investors: no dividend catering, vs. a short-run catering premium of 10,000 in the case that the manager chooses the medium dividend.

Note that, in all of the following cases, given our parameter values, the low dividend and the medium dividend are in the following intervals:

$$D_L \leq R_L - I => D_L \leq 45,000$$
$$D_M \in (R_L - I, R_H - I) => D_M \in (45,000, 95,000)$$

Namely, in the case of the low dividend D_L, the manager can invest in project 2, regardless of the outcome of project 1. For the medium dividend D_M, the manager can only invest in project 2 if project 1 achieves the high outcome: in the case of the low outcome, he cannot invest in project 2.

3.1. No overconfidence in project 2 value: $\hat{V}_2 = V_2$

Given these parameters, we derive the following results (which reflect propositions 2.2, 2.3 and 2.4). First, we consider the case of a completely myopic manager.

When the manager is completely myopic (near-sighted) ($\varphi = 1$), as displayed in Figure 1, he chooses the low dividend for levels of overconfidence from the true level (($\hat{\gamma} = \gamma = 0$) all the way up to $\hat{\gamma} = 12.5$. It is only when he reaches extreme overconfidence ($\hat{\gamma} > 12.5$) that the completely myopic manager increases dividends from the low to the medium level to commit to a higher effort level, in order to push short run value up. Hence, our numerical analysis ties in with proposition 2.1. In the case of a completely myopic manager, there is a *positive* association between overconfidence and dividends. It is interesting to note that overconfidence harms the manager in reality. His perceived payoff for the medium dividend is increasing in overconfidence, but his true

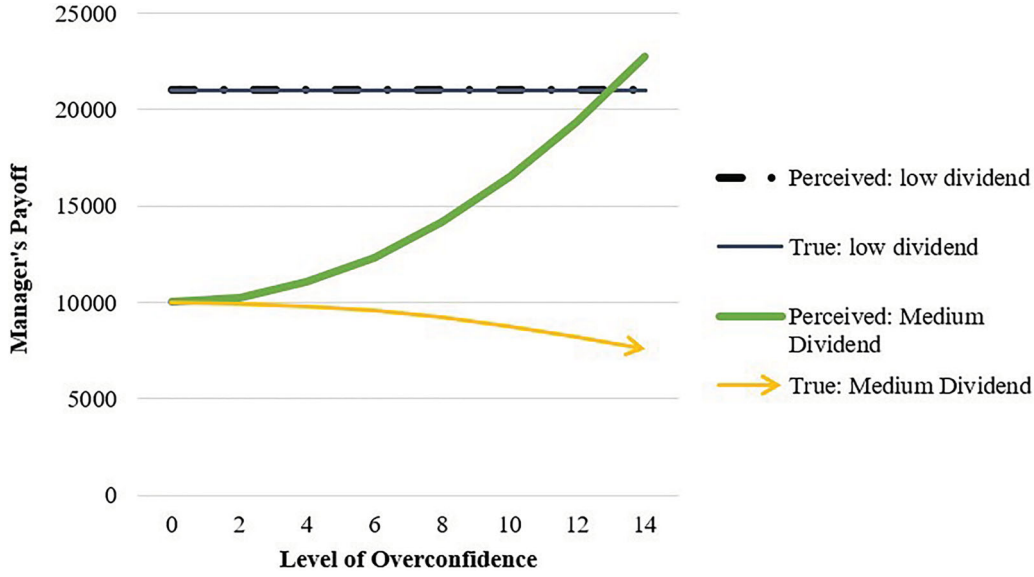

Figure 1. Manager's perceived payoff: low vs. medium dividend, and complete myopia ($\varphi = 1$).

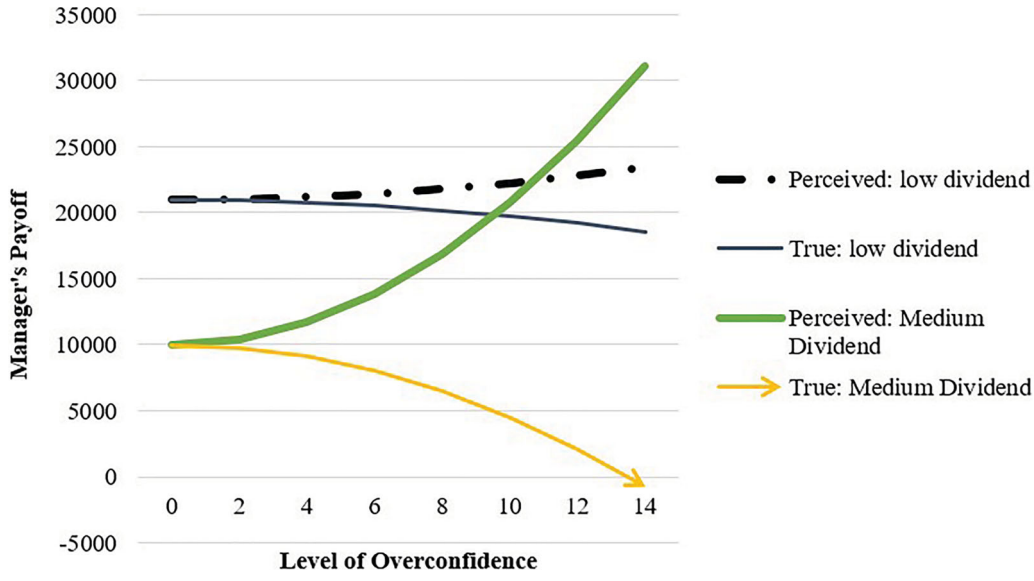

Figure 2. Manager's perceived payoff: low vs. medium dividend, and complete far-sightedness ($\varphi = 0$).

payoff is decreasing in overconfidence (as the medium dividend is driving him to higher effort, but in reality his ability is zero in our analysis). Next, we consider the case of a completely far-sighted manager.

The case of the completely far-sighted manager ($\varphi = 0$), as shown in Figure 2, is similar to that of the myopic manager: he chooses the low dividend for low levels of overconfidence, and then switches to the medium dividend for high levels of overconfidence. The difference, though, is striking: the complexly far-sighted manager switches to the medium dividend at a lower critical level of overconfidence ($\hat{\gamma} = 10.5$) than the completely myopic manager ($\hat{\gamma} > 12.5$).

The intuition for this is that in the completely myopic case, the manager is only able to commit to high effort through the driver of the private benefit value. In the case of the far-sighted manager, he

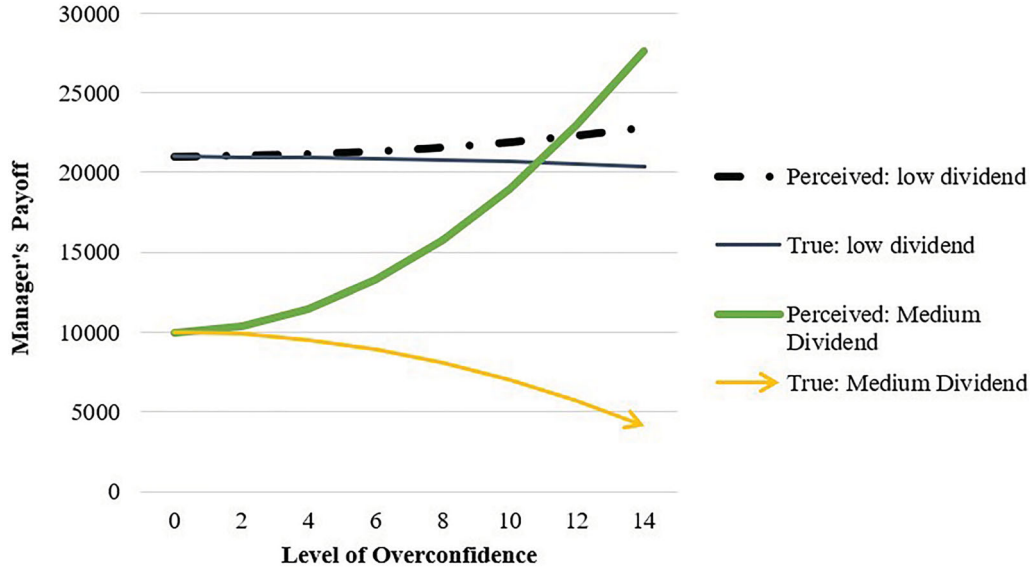

Figure 3. Manager's perceived payoff: low vs. medium dividend, and mixed myopia/far-sightedness ($\varphi = 0.5$).

anticipates that he will be rewarded on the financial value of project 1 success, plus project 2's economic value. This amplifies the effect of overconfidence, driving him to the medium dividend 'earlier' than in the myopic case.

We now consider our third case. This is the 'mid-way' case between complete myopia and complete far-sightedness. That is, the manager puts equal weighting on myopia and far-sightedness: ($\varphi = 0.5$). In this case, the corresponding illustration (i.e. Figure 3) is as follows.

We note that, in the case of mixed myopia/far-sightedness($\varphi = 0.5$) the manager switches from the low to the medium dividend at a 'middle' level of overconfidence, half-way between $\hat{\gamma} = 10.5$ (for the completely far-sighted manager) and $\hat{\gamma} = 12.5$ (for the completely myopic manager). Note, again, that the manager's true payoff is decreasing in overconfidence. Interestingly, at the point where he switches from the medium dividend (as he perceives his payoff to cross-over and become higher and increasing at that point), his true payoff 'takes a huge dive', and then carries on deceasing as his overconfidence increases.

Therefore, our analysis thus far has demonstrated that (a) dividends are increasing in overconfidence (as the manager uses them as a commitment device to higher effort), and (b) the critical level of overconfidence at which the manager switches from the low to the medium dividend is *decreasing* in far-sightedness. The far-sighted manager perceives a greater reward from using the dividend to commit to a higher effort level. Thus, in summary, our analysis thus far predicts a positive relationship between overconfidence and dividends, and a positive (negative) relationship between managerial far-sightedness (myopia) and dividends: the latter being a somewhat surprising and unexpected result.

However, hitherto, we have focused on the effect of managerial overconfidence in his ability on the current project, project 1: hence, he is interested in using the dividend as a commitment device to higher effort on project 1. This is the reason that we obtain the positive relationship between managerial overconfidence and dividends.

Up to this point, in our numerical/graphical analyses, we have considered the effect of managerial overconfidence on dividends for given and fixed myopia levels (considering three different cases: completely myopic, completely far-sighted, and mixed myopic/far-sighted): hence, we have focused on propositions 2.2–2.4.

Considering the figures above (Figure 1–3), we can observe that, as we increase myopia through the three levels, the critical overconfidence value at which the manager switches from the low to the medium dividend decreases from approximately 12.5 (for fully myopic) to 10.5 (for fully far-sighted).

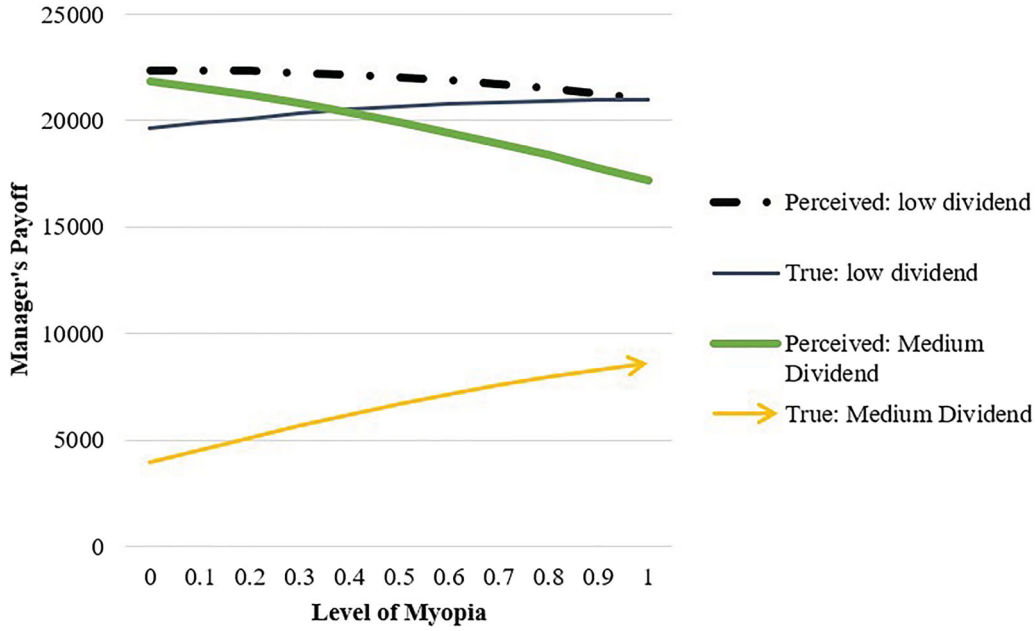

Figure 4. Manager's perceived payoff: low vs. medium dividend, and increasing myopia with fixed overconfidence ($\hat{\gamma} = 10.5$).

3.2. The effect of increasing myopia on dividends for fixed levels of overconfidence

Now we turn to a numerical/graphical analysis of proposition 2.5. This turns the analysis around, and fixes the overconfidence level, and considers the effect of increasing levels of myopia. Given our parameter values, the lower end of the critical overconfidence interval is $\hat{\gamma} = 10.5$, and the upper end is $\hat{\gamma} = 13$. Our graphs (Figures 4–8) thus demonstrate that, when overconfidence is lower than 10.5, the manager chooses the low level of dividends for any level of myopia. When the manager's overconfidence is greater than 12.5, he chooses the medium dividend for any level of myopia.

In the critical overconfidence interval between 10.5 and 13, overconfidence interacts with the myopia level to affect the manager's dividend choice. In our numerical example, in the critical overconfidence interval, increasing myopia beyond a critical level induces the manager to switch from the medium to the low dividend. However, increasing overconfidence in that interval pushes the critical myopia level to the right: the manager increases the dividend 'later': thus, in our example, overconfidence and myopia act in opposite directions (proposition (4c)). In the Appendix (Table A1), we consider this analysis in a tabular form.

We have not yet considered the effect of including overconfidence in the value of forthcoming project 2. We now turn to this case as below.

3.3. Overconfidence in project 2 value: $\hat{V}_2 = 200,000 > V_2 = 10,000$.

In this sub-section, we consider a huge level of managerial overconfidence in the value of *future* project 2. All of the other parameter values are the same. That is, we again take the previous three cases (completely far-sighted, completely near-sighted (myopic), and mixed far-sighted/near-sighted, together with the same range of managerial overconfidence in his ability on the *current* project 1), and we consider the effect of incorporating managerial overconfidence in project 2's value.

Compared with the previous example (project 1), Figure 9 depicts that overconfidence in project 2's value has the effect of shifting the critical value to the left: the manager switches to the medium dividend even earlier when he is overconfident in the value of the future project.

Interestingly, in the case of the completely myopic manager, Figure 10 illustrates that extreme overconfidence in the value of future project 2 drives him away from the medium dividend unambiguously to the low dividend,

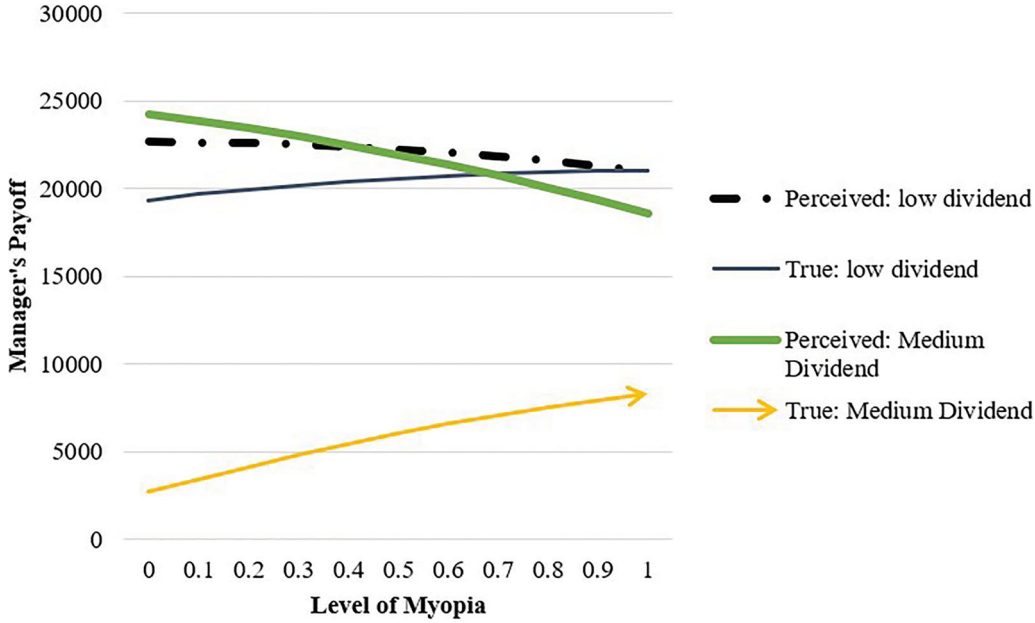

Figure 5. Manager's perceived payoff: low vs. medium dividend, and increasing myopia with fixed overconfidence ($\hat{\gamma} = 11.5$).

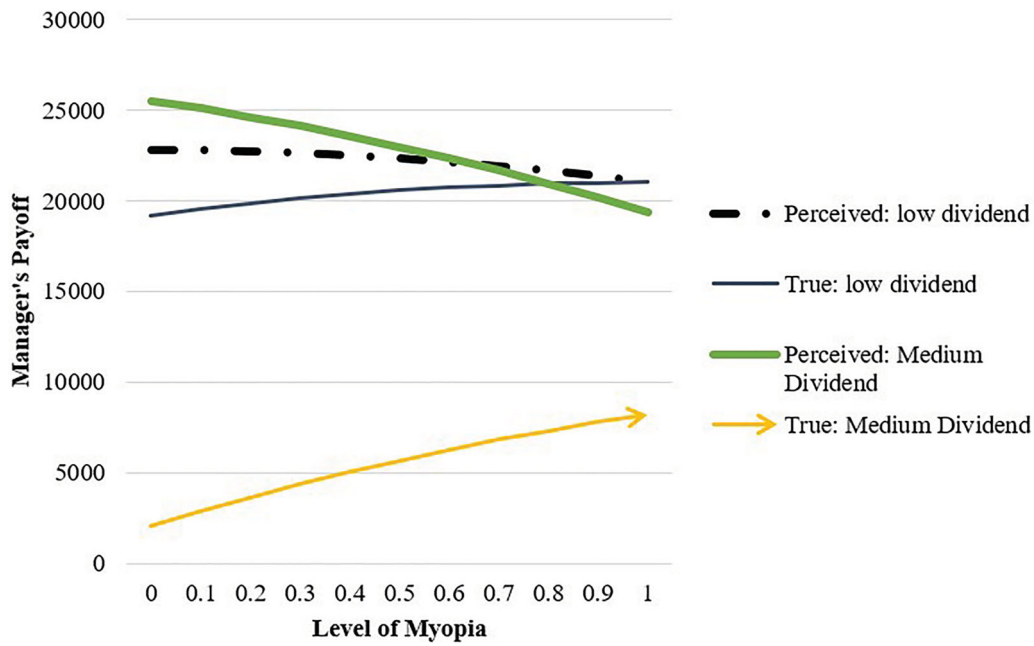

Figure 6. Manager's perceived payoff: low vs. medium dividend, and increasing myopia with fixed overconfidence ($\hat{\gamma} = 12$).

for any level of overconfidence in his ability on project 1. Now, the myopic manager's overconfidence in project 2 drives him to the low dividend.

Finally, we consider the mixed case in Figure 11.

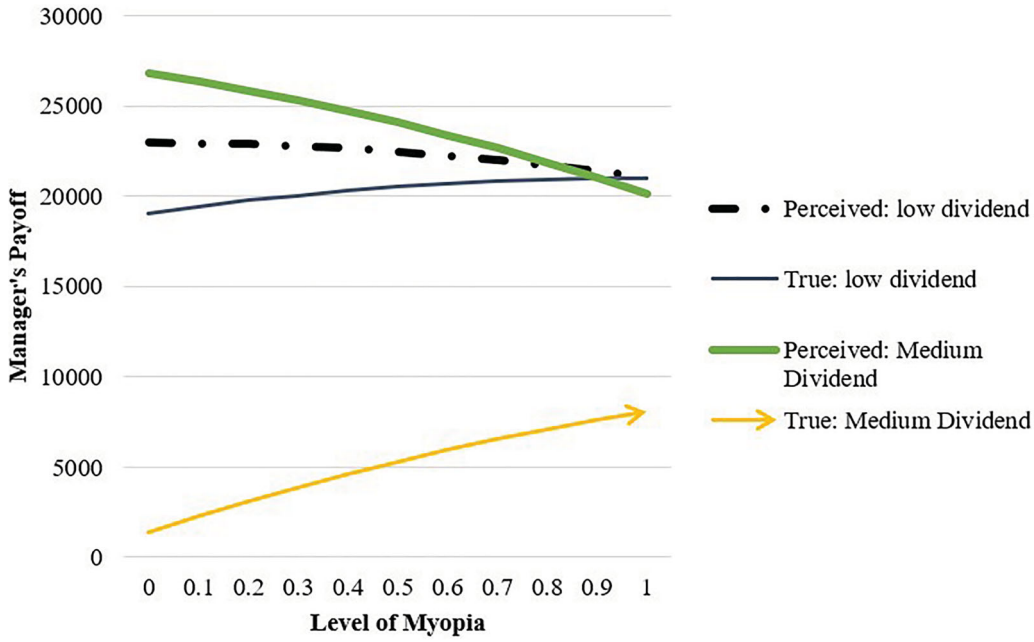

Figure 7. Manager's perceived payoff: low vs. medium dividend, and increasing myopia with fixed overconfidence ($\hat{\gamma} = 12.5$).

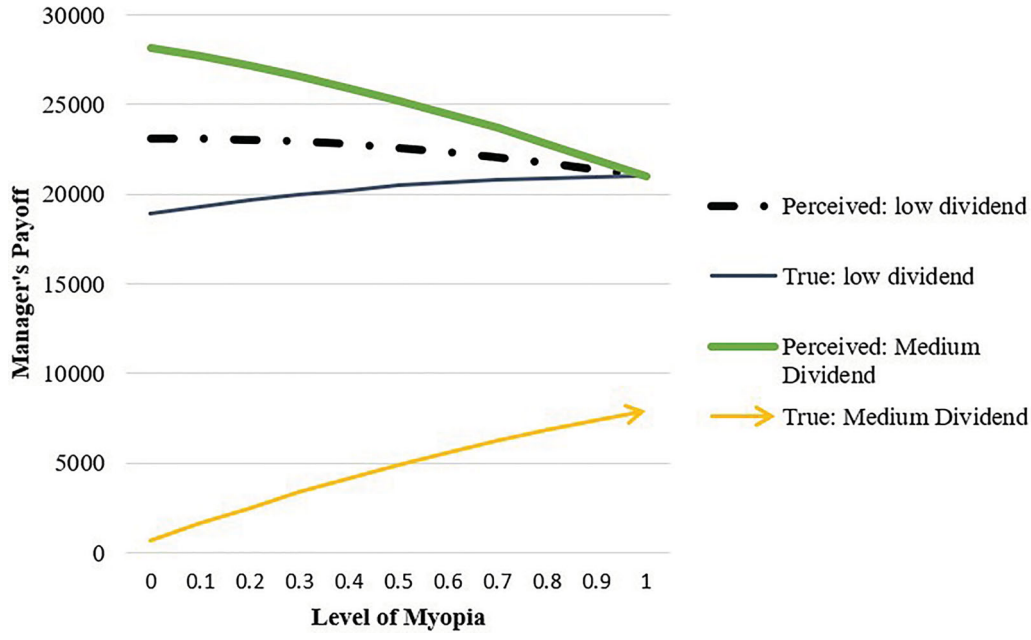

Figure 8. Manager's perceived payoff: low vs. medium dividend, and increasing myopia with fixed overconfidence ($\hat{\gamma} = 13$).

In the mixed case, overconfidence in the value of project 2 brings the critical value down slightly. Thus, overconfidence in the value of this project means that the manager switches to the medium dividend at a slightly lower level of overconfidence than when the manager has no overconfidence in project 2's value.

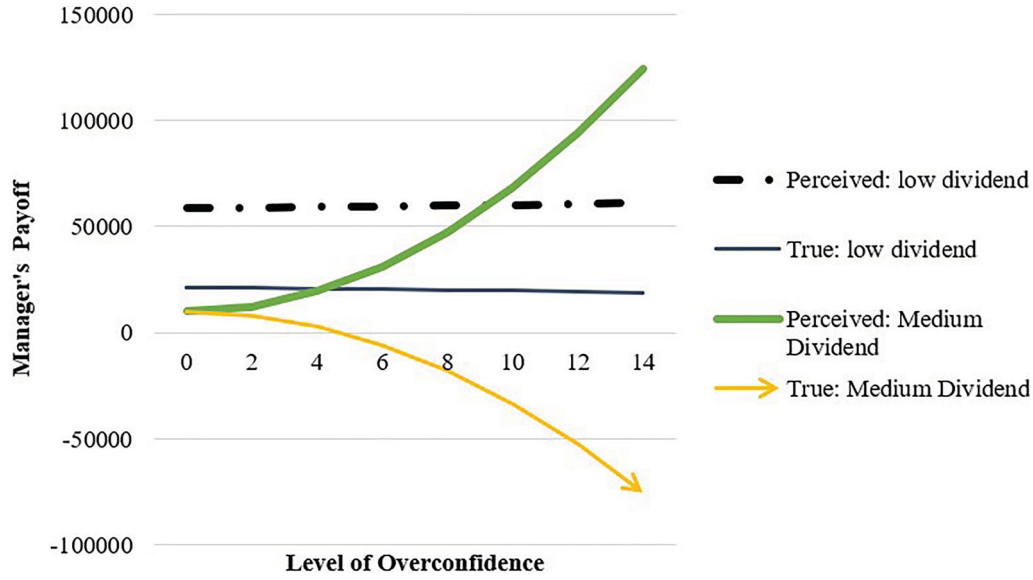

Figure 9. Manager's perceived payoff: low vs. medium dividend, and completely far-sighted ($\varphi = 0$) with manager's overconfidence on project 2's expected value.

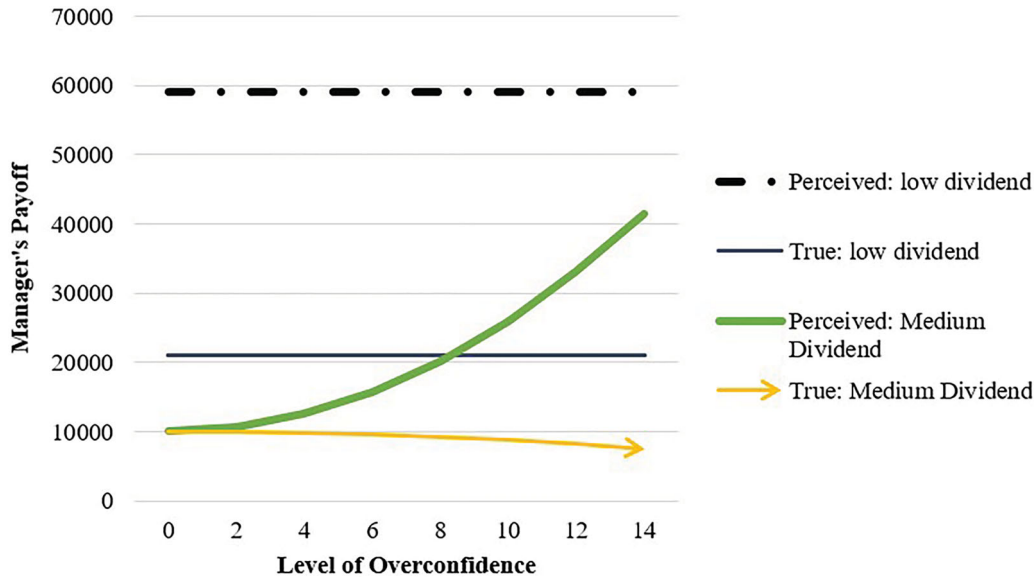

Figure 10. Manager's perceived payoff: low vs. medium dividend, and complete myopia ($\varphi = 1$) with manager's overconfidence on project 2's expected value.

This provides an interesting (and perhaps counterintuitive) contrast with our benchmark model at the beginning of the paper, where overconfidence in the value of project 2 meant that the manager reduced dividends in order to be able to invest in the new project (i.e. the standard Jensen (1986) free cash flow argument). In our main model, where increasing dividends can be used to commit to higher effort, overconfidence in project 2's value now drives the manager to increase dividends to commit to higher effort, thus driving higher (perceived) value and higher (perceived) managerial payoff. This emphasises the complexities surrounding dividend policy

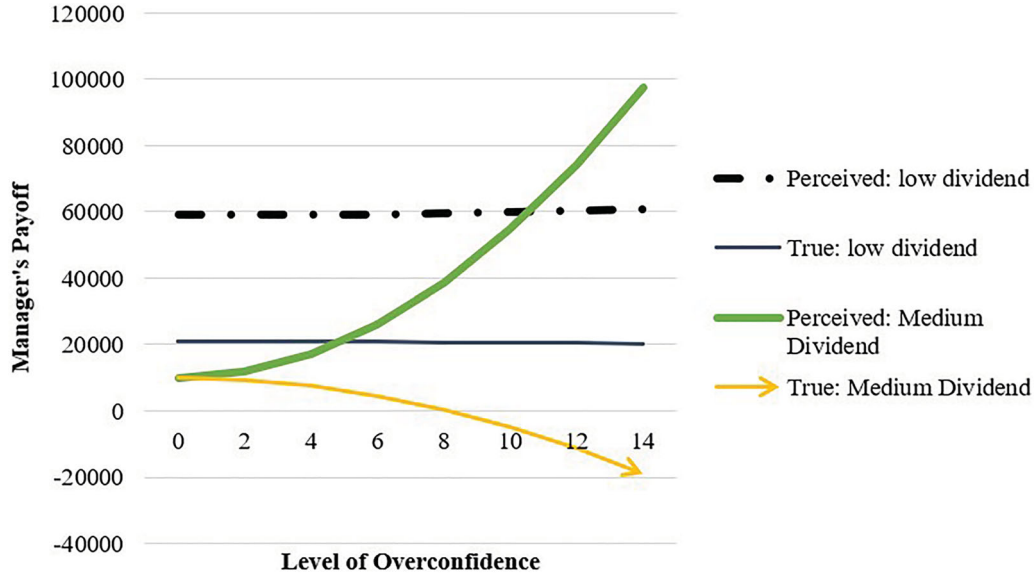

Figure 11. Manager's perceived payoff: low vs. medium dividend, and mixed myopia/far-sightedness ($\varphi = 0.5$) with manager's overconfidence on project 2's expected value.

when we combine agency problems, overconfidence in ability on current projects, and overconfidence in the value of future projects, as well as the differing levels of near-sightedness &far-sightedness.

3.4. Dividend catering/no overconfidence in project 2

Next, we introduce the effect of pressure from irrational investors/dividend catering. We return to our first case of no overconfidence in project 2 per its expected value. We assume the following. The market adds a dividend premium only in the case of the medium dividend (not in the case of the low dividend). The manager incorporates this into his payoff according to the weight φ that he places on his date 1 payoff. Thus, in the case that he is completely far-sighted ($\varphi = 0$), he places no weight on the catering premium form paying the medium dividend. As he becomes increasingly myopic, he places an increasing weight on the catering premium.

We operationalise this by considering a catering premium of 10,000, multiplied by the manager's myopia weight φ, which we add to his payoff in the case of the medium dividend. We obtain the following.

Comparing the final three figures (i.e. Figures 12–14) which represent the cases of fully far-sighted, fully myopic and mixed myopic/far-sighted managers, respectively, & all including the short-run catering premium with Figures 1–3 (representing fully myopic, fully far-sighted and the mixed myopic/far-sighted cases, but excluding the catering premium), we observe the following:

In the case of complete far-sightedness, the short-run catering premium has no effect on the critical level of overconfidence at which the manager switches from low to medium dividend. The completely far-sighted manager is therefore not interested in the short-run catering premium. In the fully myopic and mixed cases, the short-run catering premium has the effect of reducing the critical level of overconfidence at which he switches to the medium dividend. The comparison of the mixed vs. fully myopic cases reveals that this catering pressure is increasing in the manager's level of myopia. Overall, increasing overconfidence, increasing myopia (both of which represent managerial irrational traits) and catering pressure (investor irrationality) combine to drive the dividend increase.

4. Conclusion

In this paper, we developed a theoretical analysis of corporate dividend policy, in order to analyse the effects of the complex mix of managerial moral hazard, overconfidence, and myopia. Furthermore, we considered

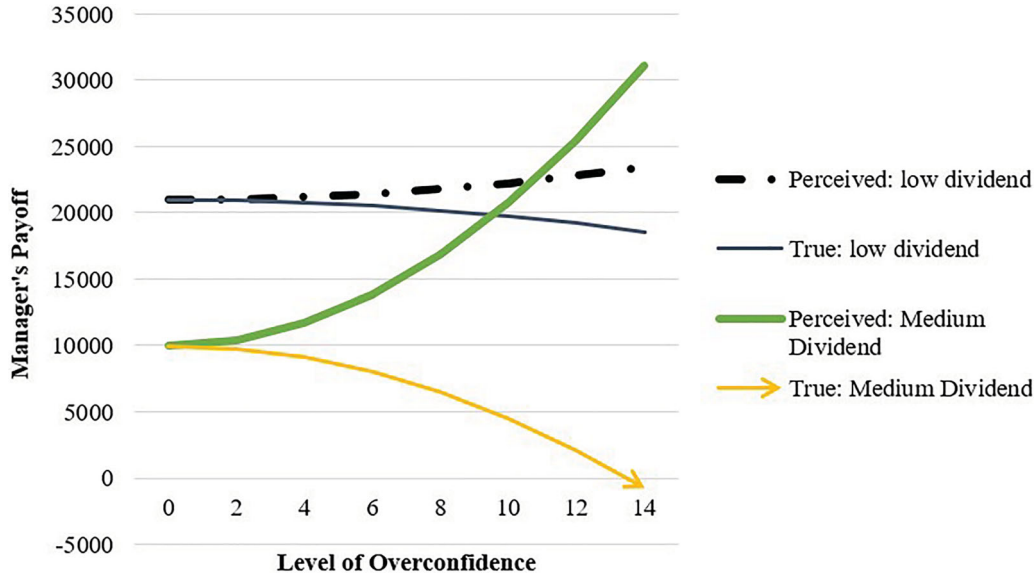

Figure 12. Manager's perceived payoff: low vs. medium dividend, and far-sightedness ($\varphi = 0$) with short-run catering.

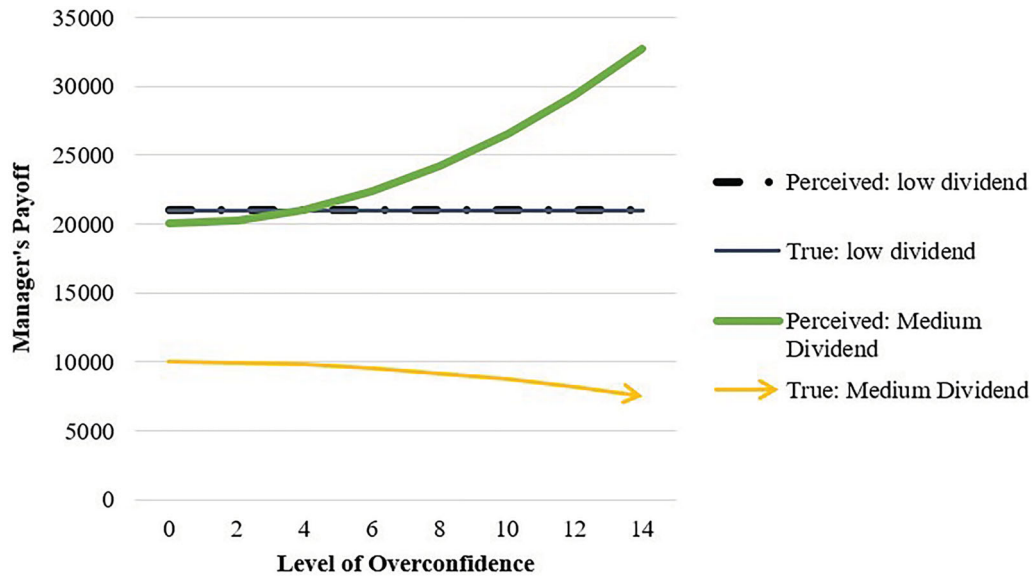

Figure 13. Manager's perceived payoff: low vs. medium dividend, and complete myopia ($\varphi = 1$) with short-run catering

the effect of investor irrationality: this drives corporate dividend catering behaviour. The existing behavioural corporate finance research documents mixed and ambiguous (theoretical and empirical) results when considering the relationship between managerial overconfidence and dividends. There is a debate in the literature as to whether the relationship is positive (higher overconfidence results in higher dividends) or negative (higher overconfidence results in lower dividends).

One contribution of our analysis is that we develop a formal theoretic model with solid underpinnings that can demonstrate when the relationship between managerial overconfidence and dividends is positive or negative.

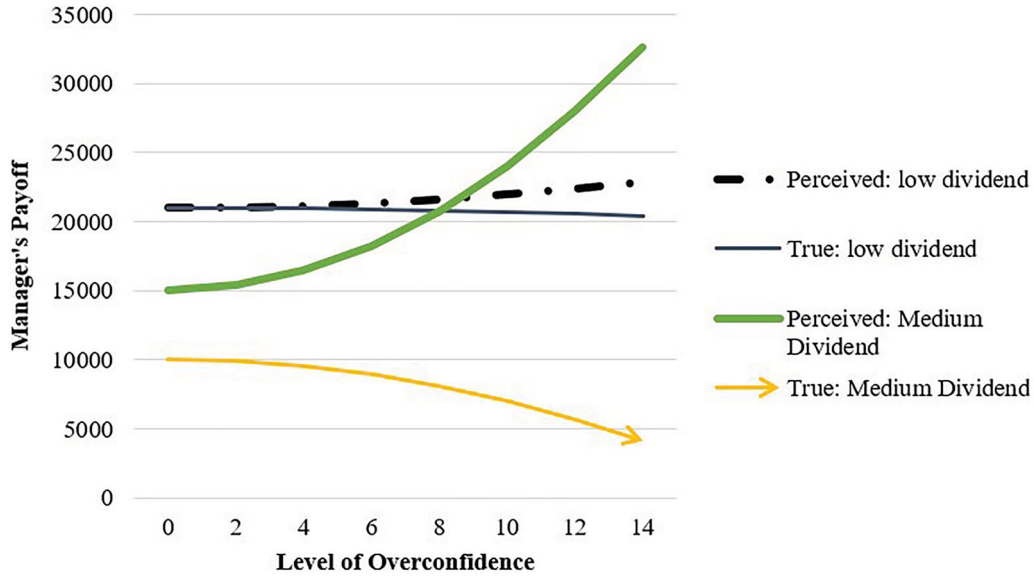

Figure 14. Manager's perceived payoff: low vs. medium dividend, and mixed myopic/far-sightedness ($\varphi = 0.5$) with short-run catering.

A further contribution of our analysis is that we interact overconfidence with agency/moral hazard issues (in the form of effort-shirking) and managerial myopia (an emerging area of research in behavioural corporate finance). Finally, we take Baker, Ruback, and Wurgler's (2007) suggestion to combine two approaches in behavioural corporate finance: irrational managers plus irrational investors. We do so by introducing dividend catering into our model.

Our theoretic analysis adds to Fisher Black's famous observation that dividend policy is a puzzle. This puzzle becomes even more acute when we interact standard economic (moral hazard/agency) issues with behavioural factors (overconfidence, myopia, investor irrationality).

In existing (theoretical and empirical) behavioural corporate finance research, the relationship between managerial overconfidence and dividends has been seen to be ambiguous. Some researchers find a positive link, while others find a negative correlation. Our theoretical analysis captures, and provides an understanding of these ambiguities. We considered the interaction of overconfidence in ability on current projects (driving high dividends to commit to high effort, which drives high current value in the financial markets), overconfidence in the value of future projects (driving low current dividends in order to be able to invest in future projects), and the overarching effect of managerial myopia/far-sightedness. We also considered the effect of short-term dividend catering pressures in the face of investor irrationality. We suggest that our theoretical model settings provide a basis for empirical testing of these complex relationships. Our model thus gives rise to the following testable hypotheses.

H1: Overconfidence in ability on current projects increases dividends, for a given level of myopia/far-sightedness.

H2: Overconfidence in the value of future projects reduces dividends for a given level of myopia/far-sightedness.

H3: Increasing far-sightedness (mitigating myopia) reduces dividends for a given level of overconfidence (in either current or future projects).

H4: Increasing dividend catering pressure (investor short-run demand for dividends) increases dividends for a given level of myopia/far-sightedness and overconfidence (in either current or future projects).

And then, the set of H1 – H4 leads to the following:

H5: The overall relationship between overconfidence, myopia, and investor (short-run) demand for dividends (catering) and dividends is ambiguous.

In closing, the relationship between managerial overconfidence and dividends is complex. In this paper, we have provided the first steps towards developing an integrated theoretic model that attempts to unravel these complexities. Our analysis provides a basis for future theoretical and empirical research in this area.

Note

1. Some behavioural corporate finance researchers have developed game-theoretic models to analyse the combined effects of economic (agency/moral hazard) and behavioural factors in other interesting areas. For example, Fairchild (2018) and Fairchild, Crawford, and El-Fakir (2019) consider the effect of economic and behavioural factors in the hedge fund industry, and in a development bank's relationships with its private equity financiers and entrepreneurs. Ahmed, Fairchild, and Guney (2020) develop a theoretical analysis of the effects of managerial agency issues and overconfidence on the corporate hedging decision.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix

This table reflects the results in the propositions (reading across) for the effects of overconfidence on dividends for fixed levels of myopia (propositions 2.1–2.4) and down the columns for the effects of myopia for fixed levels of overconfidence. Note that in our numerical example, our critical overconfidence/myopia interaction interval has the critical far-sighted overconfidence level (where

the manager switches from the low to the medium dividend) at the lower end, and the critical myopic overconfidence level at the upper end. Thus, consider an overconfidence level in the 'middle' of that interval: e.g. 11.5. As the level of myopia increases, we 'hit' the critical myopia level where the manager switches from medium to low dividend: this is reflected in the figures in section 3.

Table A1. The results of the propositions as per overconfidence and myopia levels.

Myopia/Overconfidence	0–10.5	10.5	11	11.5	12	12.5	12.5 +
1 (Myopic)	Low	Low	Low	Low	Low	Low	Medium
0.8	Low	Low	Low	Low	Low	Low	Medium
0.6	Low	Low	Low	Low	Low	Low	Medium
0.4	Low	Low	Low	Medium	Medium	Medium	Medium
0.2	Low	Low	Medium	Medium	Medium	Medium	Medium
0 (Far-sighted)	Low	Medium	Medium	Medium	Medium	Medium	Medium

Note: The cells show the effect of the interaction of managerial myopia and overconfidence on the manager's dividend choice (low or medium). Bottom row: completely far-sighted. Upwards movement: increasing myopia. Top row: Completely myopic. Critical overconfidence/myopia interaction interval 10.5–12.5. The reason why we do not have high dividends in the figures is because high dividends were ruled out in the equilibrium as they provided inferior managerial payoff, i.e. they were dominated by the low dividend.