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# Dividend Policy and Earnings Quality: A Curvilinear Relationship

**Ghassen Allani**

Univ. Polytechnique Hauts-de-France, LARSH  
[ghassen.allani@uphf.fr](mailto:ghassen.allani@uphf.fr)

**Yves Mard**

Université Clermont Auvergne, IAE, CleRMa  
[yves.mard@uca.fr](mailto:yves.mard@uca.fr)

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une revue de l'Association francophone de comptabilité*

## **Résumé :**

Cette étude examine l'impact de la politique de dividendes sur la qualité des résultats dans le contexte français sur la période 1994-2018. En utilisant quatre mesures de la qualité des résultats, nous constatons une relation en forme de U inversé entre le niveau des dividendes et la qualité des résultats. La qualité des résultats s'améliore lorsque le dividende augmente jusqu'à un certain niveau de distribution. Au-delà de ce seuil, l'augmentation du dividende entraîne une baisse de la qualité des résultats. Nous observons également que la diminution de la persistance des résultats, observée pour les valeurs élevées des ratios de dividendes, s'explique par la gestion des résultats. De plus, nous constatons que la relation curvilinéaire observée est moins marquée pour les grandes entreprises et pour les entreprises dont les dividendes sont volatils. Nos résultats dans le contexte français étendent la littérature existante et permettent de réconcilier les résultats divergents des travaux antérieurs.

Mots clés : politique de dividendes, qualité des résultats, relation curvilinéaire.

## **Abstract:**

This paper examines the impact of dividend policy on earnings quality in the French context over the period 1994-2018. Using four measures of earnings quality, we find an inverted U-shaped relationship between dividend level and earnings quality. Dividend level positively influences earnings quality up to a certain payout level. Beyond this threshold, the dividend increase is detrimental to earnings quality. We also observe that the decrease in earnings persistence observed for high values of dividend ratios is explained by earnings management. Moreover, we find that the curvilinear relationship between dividend level and earnings quality is moderated for large firms and firms with volatile dividends. Our results in the French context extend the existing literature and reconcile the mixed results in previous research.

Key-words: dividend policy, earnings quality, curvilinear relationship.

# 1 Introduction

This paper examines the association between dividend policy<sup>1</sup> and earnings quality in the French context. Our first motivation is that prior research proposes contrasted arguments and results about this association. On the one hand, some authors argue and show a positive relationship between dividend policy and earnings quality. For example, Skinner and Soltes (2011) consider that dividend policy sends a positive signal about earnings quality, and show that dividend-paying firms have more persistent reported earnings than non-dividend-paying firms. Tong and Miao (2011) complement these results by finding that dividend-paying firms have lower discretionary accruals and more value-relevant earnings. Dividend-paying firms are also less likely to commit financial statement fraud compared to non-paying firms (Caskey and Hanlon 2012). He et al (2017) extend these analyses to an international sample and show that dividend policy is negatively associated with earnings management, especially in countries with weak institutions and low transparency. They consider that dividend policy mitigates agency conflicts within the firm and acts as a governance mechanism.

On the other hand, some authors posit and find a negative relationship between dividend policy and earnings quality. They consider that dividend policy incites managers to manipulate earnings to sustain a sufficient level of earnings. Poor performance and dividend covenants in debt contracts can exacerbate the pressure on managers and their motivation to distort earnings (Daniel et al, 2008). Empirical evidence shows that dividend-paying firms are more likely to manage earnings to reach thresholds related to dividend targets. For example, Kasanen et al (1996) find that Finnish firms adopt dividend-driven earnings management behaviors to sustain dividend payments and limit taxes. Daniel et al (2008) also find that firms manage earnings to meet dividend thresholds, in the context of the US dividend tax cut in 2003. Liu and Espahbodi (2014) document that dividend-paying firms use both accruals and real activities to smooth earnings. Under this scenario, the accounting policy supports opportunistically the dividend strategy.

The French context is characterized by a high level of dividend payments. According to Janus Henderson Global Dividend Index of 2022, the amount of dividends paid in 2022 by French companies was 63 B\$, which ranks France fifth in the world behind the United States (574 B\$),

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<sup>1</sup> In this study, we use the expression “dividend policy” to simplify the presentation. This expression can refer to several proxies of dividend policy, such as payout ratio or yield ratio. Depending on the proxy, a positive association between dividend policy and earnings quality means that payout (or yield) ratio is positively associated with earnings quality.

the UK (89 B\$), Japan (73 B\$) and Australia (69 B\$). We can also notice a concentration of dividend payments among large firms of the CAC 40 index (59 B\$, i.e. more than 90 % of the total payments). A first explanation for the high level of dividends in France is the presence of institutional investors among large listed firms. Another explanation is the high level of ownership concentration among French firms, which can lead to agency conflicts between large shareholders and minority shareholders. In this context, dividend policy can discipline managers and prevent private benefits. A third explanation is that long-term incentives of French top managers involve less market-based bonuses than in other countries.

The mixed results from the literature led us to reconsider the relationship between dividend policy and earnings quality, by assuming a non-monotonic relationship. Considering dividend policy as an implicit contract between shareholders and managers (Kasanen et al 1996), we expect a positive relationship between dividend level and earnings quality for moderate levels of dividends. At these levels, the probability to cut dividends is low and it allows managers to be able to maintain a constant stream of dividends. Dividend thus offers a strong informative signal about permanent earnings. The low level of dividend ratios also limits the pressure on managers who are less induced to manipulate earnings to avoid a dividend cut.

Conversely, for high levels of dividends, the probability of cutting dividends increases and this situation puts pressure on managers who want to serve a constant stream of dividends. In this context, dividends become less informative about permanent earnings. Moreover, the high level of dividends can lead managers to manipulate earnings to honor their contract with shareholders. This is particularly the case in France, where the level of dividend payments is high. We thus expect a negative relationship between the levels of dividend and earnings quality, for high levels of dividends.

Our analysis focuses on non-financial French listed firms composing an initial sample of 8384 firm-year observations in the period 1994-2018. We test the association between dividend policy and four measures of earnings quality, based on accruals and earnings time series. We find an inverted U-shaped relationship between dividend level and earnings quality. We show that dividend level influences positively earnings quality for moderate levels of dividend ratios, and affects negatively earnings quality for high levels of dividend ratios. The inflection points vary from 32% to 55% for the dividend payout ratio and from 3.4% to 4.7% for the dividend yield ratio. A complementary test indicates that the decrease in earnings persistence observed for high values of dividend ratios can be explained by abnormal accruals. We also find that the

curvilinear relationship between dividend level and earnings quality is flattened for large firms and firms with volatile dividends.

Our study contributes to the literature in several ways. First, the French institutional setting is very different from the US context where most studies are conducted. France belongs to civil law countries, where investor protection is lower than in common law countries. Leuz et al (2003) consider that earnings management is higher in civil law countries than in common law countries. He et al (2017) thus observe that the relationship between dividend policy and earnings quality is stronger in code law countries than in common law countries.

Second, while prior studies use measures typically based on a single attribute of earnings quality, our analysis extends the literature by using four measures classified on two dimensions of earnings quality. The first dimension is based on accruals earnings management, using the accruals models developed by Dechow and Dichev (2002) and modified by McNichols (2002) (1) and also by Jones (1991) and modified by Kothari et al. (2005) (2). The second dimension, related to the earnings time series, is reflected by earnings persistence (3) and earnings predictability (4). This set of measures helps to capture earnings quality more comprehensively and provides the opportunity to analyze the association between dividend policy and the different dimensions of accounting quality, such as relevance and faithful representation view (IASB, 2018).

Third, our study complements the existing literature that mostly focuses on dividend status (dividend payers vs non-payers) and linear relationships. Our results bring out a non-linear relationship between dividend level and earnings quality. We show that dividends can be associated with higher or lower earnings quality, depending on the level of dividends. To our knowledge, our study is the first to show this curvilinear relationship between dividend level and earnings quality. Our findings also reconcile previous research, which found opposing results on the association between dividend policy and earnings quality.

The paper is organized as follows. In section 2 we develop the literature and present our hypothesis related to the relationship between dividend policy and earnings quality. Section 3 exposes the methodology of the paper. Section 4 presents the results of the relationship between dividend level and earnings quality. Section 5 provides additional analyses and robustness tests. Section 6 concludes the paper.

## 2 Literature review and hypothesis development

We expose conceptual background related to signaling and agency theories to explain the relationship between dividend policy and earnings quality and present the empirical evidence about this relationship. We then develop our hypothesis.

### 2.1 Conceptual background

#### 2.1.1 *Dividend, signaling theory and earnings quality*

The original work of Miller and Modigliani (1961) shows that, in the context of perfect markets, the dividend policy of a firm does not affect firm value. Relaxing the hypothesis of informational symmetry, the signaling models predict that dividends convey information about future earnings prospects of firms. An unexpected increase in dividends gives the market a positive signal on future earnings and growth opportunities, whereas the signal will be rather negative in the event of a dividend reduction (Bhattacharya 1979; Miller and Rock 1985).

Although empirical studies find that unanticipated dividend changes are accompanied by market reactions in the same direction<sup>2</sup>, their results do not find that these dividend changes are followed by changes in future earnings in the same direction. These results appear to be contradictory evidence about the ability of dividends to signal the meaning of future earnings (Healy and Palepu 1988; DeAngelo et al 1992; Grullon et al. 2005).

This puzzling evidence leads some studies to examine differently the informational content of dividends, focusing on the status of paying dividends rather than dividend changes as an informational signal about earnings. According to the literature on dividend signals, managers are reluctant to increase dividends unless they believe that dividends can be sustained at the new level. Indeed, firms are unwilling to cut dividends and they engage in dividend smoothing to maintain a constant stream of dividends (e.g., Lintner 1956; Brav et al. 2005; Skinner and Soltes 2011). It is, therefore, costly for managers to maintain dividends on earnings that do not reflect the underlying performance of the firm where real cash-flows are necessary to pay the dividends (Brav et al, 2005; Chay and Suh, 2009). Dividend-paying firms are more likely to report earnings that are associated with lower uncertainty about expected cash-flows and are

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<sup>2</sup> Numerous empirical studies document a significant positive reaction to announcements of dividend increases and a significant negative reaction to decreases (Aharony and Swary 1980, Koch and Sun 2004).

less contaminated by opportunistic management manipulation. Consequently, by committing to pay a dividend, managers convey information on their higher earnings quality.

### *2.1.2 Dividend, agency theory and earnings quality*

Prior studies recognize that managers have incentives to keep excess cash because this allows them to misappropriate or waste corporate resources for personal benefits at the expense of outside investors (Jensen 1986, Stulz 1990). If profits are not paid out to shareholders, they may be diverted by insiders for personal use or directed into unprofitable investments (La Porta et al. 2000; DeAngelo et al. 2006, Denis and Osobov 2008). In this context, dividends may be employed to convey a firm's commitment to act in the best interests of outside investors and thus attenuate the agency concerns (Rozeff 1982; Easterbrook 1984; Jensen 1986; La Porta et al. 2000; Myers 2000). Thus, firms paying dividends limit private control benefits available to insiders, as cash paid out provides fewer opportunities for insiders to consume these benefits (Pinkowitz et al. 2006).

Particularly, a part of the literature also documents that the consumption of private control benefits by the company insiders is positively associated with earnings manipulation. Specifically, Leuz et al. (2003) argue that misrepresentation of accounting information could arise from the incentives of insiders and controlling shareholders to camouflage their private control benefits. Gopalan and Jayaraman (2011) compare earnings management practices of insider and non-insider-controlled firms and conclude that earnings management is more prevalent in the former category of firms as consumption of private control benefits is higher in these firms. Dividend-paying firms may thus be less inclined to distort their true economic performance via earnings manipulation and may be more likely to report earnings with higher quality.

On the other hand, dividends play a role in mitigating agency costs between managers and shareholders, by facilitating capital markets' monitoring of managerial decisions and performance (Easterbrook 1984). Paying dividends increases the likelihood that managers have to raise external financing, which in turn leads to closer monitoring of managers by investment banks, analysts, and capital providers, constraining managers from any opportunistic accounting manipulation and financial misreporting. Moreover, if managers pay dividends to limit their private control benefits inducing fewer reasons to manipulate earnings, these firms tend to build a good reputation in capital markets to facilitate access to external financing (La

Porta et al. 2000). Firms, indeed, may employ dividend payout as alternative governance mechanisms to mitigate their agency concerns to subsequently gain access to external funds.

## **2.2 Mixed empirical evidence about the dividend policy-earnings quality relationship**

Empirical literature about the relationship between dividend policy and earnings quality shows mixed evidence. Several authors find a positive association between dividends and earnings quality, while others exhibit a negative relationship.

### *2.2.1 Positive association between dividends and earnings quality*

Skinner and Soltes (2011) find evidence that reported earnings are more persistent for dividend-paying firms compared to non-payers, and suggest that dividend payout policies provide information concerning the sustainability of firms' reported earnings. Tong and Miao (2011) complement Skinner and Soltes (2011) paper. They find that dividend-paying firms have lower discretionary accruals, higher accrual quality, and more value-relevant earnings and that such an association is stronger in firms with larger dividend payouts. In China, Lu et al (2017) find that dividend payouts are associated with more persistent earnings, higher accruals quality, and greater earnings informativeness.

Using external indicators of earnings misstatement as an earnings quality measure, Caskey and Hanlon (2012) examine the role of dividends in reducing the probability of intentional accounting fraud. They find that dividend-paying firms are less likely to commit financial statement fraud than non-payers. Their results are consistent with dividends constraining fraudulent reporting and supporting the earnings quality information content of dividends.

Lawson and Wang (2015) extend prior studies in the context of audit pricing. They find that dividend-paying firms pay lower audit fees than non-payers, and that the negative association between audit fees and dividend payouts is stronger for firms with higher earnings quality. Their study suggests that auditors' pricing decisions are shaped by the information content of firms' dividend payout policies and the information conveyance is attributable to reduced earnings manipulation risk surrounding the quality of the firm's earnings.

He et al. (2017) examine the association between dividend policy and earnings management across firms from 29 developed and emerging markets. They find a robust negative relationship between earnings management and dividend policy, using paying status, dividend payout, dividend yield, and share repurchases as measures of dividend policy. They show that this



relationship is stronger in countries with weak investor protection and high opacity. They also find that the relationship is higher for firms that issue equity following dividend payments. He et al. (2017) explain their finding by the fact that dividend policy associated with low earnings manipulation conveys the management's intention to forgo private control benefits and to build a reputation that will facilitate future access to capital markets (La Porta et al. 2000).

Ham et al (2021) consider that dividends provide a strong signal about permanent earnings. They find that dividends substitute to earnings information and that the lower attention to earnings for dividend-payers translates into less earnings management. Kaplan and Pérez-Cavazos (2021) show that dividends provide a stronger signal about future earnings for firms with weak investment opportunities, than for firms with strong opportunities. They consider that profitable firms with weak investment opportunities use the level of dividends to differentiate themselves from less profitable firms.

### *2.2.2 Negative association between dividends and earnings quality*

Kasanen et al. (1996) use a sample of public Finnish firms, over the period 1970-1989, to document evidence of dividend-driven earnings management. They find that firms manage earnings upward to pay out dividends in response to pressure from large institutional shareholders if the unmanaged earnings are too low for paying out the target dividends. They show also, that firms manage earnings downwards to save taxes if the unmanaged earnings are higher than required for the dividend payments.

Daniel et al. (2008) examine whether firms manage earnings to meet dividend thresholds. Using a sample of S&P 1500 firms over the period 1992–2005, they find that dividend-payers manage accruals upward to attain dividend targets when pre-managed earnings are below last year's dividends. Moreover, they find that dividend-payers exhibit an unusually high frequency of earnings just above the expected dividend level. They also show that the earnings management behavior of dividend payers significantly decreases the likelihood of a dividend cut. Their results support the view that firms actively manage earnings to maintain dividend policy.

Liu and Espahbodi (2014) expand on Daniel et al. (2008) by investigating whether dividend-paying firms manipulate earnings through accruals and/or real earnings management largely than other firms. They find that dividend-payers engage in more downward (upward) earnings management in years of positive (negative) pre-managed earnings changes, than non-payers. They also show that dividend-paying firms use both real activities and accrual choices to manipulate earnings. Their findings are consistent with the idea that dividend-paying firms seek

to smooth earnings to maintain their dividend policy. They consider that the higher earnings persistence of dividend-payers documented by Skinner and Soltes (2011) can at least be partially explained by earnings management.

### **2.3 Hypothesis development**

Our hypothesis aims to integrate the antagonistic forces that act on the relationship between dividend policy and earnings quality. We consider that the link between dividend policy and earnings quality will depend on the level of dividends. For moderate levels of dividends, a distribution policy can send a signal about the quality of earnings. The payment of dividends is based on the firm ability to generate regular earnings and cash flows (Tong and Miao 2011). Dividend payments are therefore costly if the firm's earnings do not reflect its cash flows (Skinner and Soltes 2011), for example, when earnings management exists. Firms that want to maintain a high level of earnings quality will tend to pay moderate amounts of dividends.

Another argument in favor of a positive association between dividend policy and earnings quality is based on the agency theory. Indeed, the payment of dividends can reduce agency costs by limiting private control benefits and force managers to seek external financing (Easterbrook 1984, Leuz et al 2003). The increased control over the company provided by dividend policy leads managers to improve reporting quality. In this case, dividend policy acts as a governance mechanism beneficial to the quality of earnings. The French environment (code law) is less protective for investors than the Anglo-American (common law) context. In this context, the dividend policy is likely to replace other governance mechanisms to limit agency costs.

Conversely, firms that pay dividends engage to maintain a constant dividend policy and are reluctant to cut dividends (Lintner 1956; Brav et al. 2005; Skinner and Soltes 2011). The literature shows that dividend policy is an implicit contract between managers and shareholders (Kasanen et al, 1996) and that firms target both dividend level and dividend payout ratio (Liu and Espahbodi 2014). The pressure on managers to maintain a regular flow of dividends may lead them to manage earnings. Dividend policy then appears as a commitment that can drive to earnings management and erode earnings quality. In particular, the implementation of the dividend policy can lead managers to smooth earnings (Liu and Espahbodi 2014). The existence of covenants limiting the dividend payout in debt contracts also encourages earnings management (Watts and Zimmerman 1978; Daniel et al. 2008).

Kasanen et al (1996) also point out the impact of the institutional setting on dividend policies and the motivation to manage earnings. For example, they consider that the demand from institutional shareholders constitutes a key motivation for firms to pay dividends. Fenn and Liang (2001) also show that dividends are higher in companies where managers own few shares or stock options. The presence of institutional investors and the low indexation of executives' remuneration to stock market prices are among the explanations for the high level of dividends in France. Pressure from institutional investors is likely to induce top executives to manage earnings to meet their dividend payment expectations. This is particularly true for firms paying large dividends, for which the probability of a dividend cut is higher than for firms paying small dividends. We thus expect that firms paying large dividends will exhibit lower levels of earnings quality than firms paying moderate dividends will.

Overall, the link between dividends and earnings quality seems to be driven by two opposing forces. On the one hand, for moderate levels of dividends, dividend policy can send a signal on earnings quality and limit agency costs. For these levels of dividends, we expect a positive relationship between dividends and earnings quality. On the other hand, for high levels of dividends, dividend policy can create a commitment difficult to keep and lead managers to manage earnings and erode earnings quality. For these high levels of dividends, we thus expect a negative relationship between dividends and earnings quality.

Dividend level is positively related to earnings quality until a certain level of dividend payment, and it is negatively associated with earnings quality beyond this level. Higher levels of earnings quality are obtained for intermediate levels of dividends, whereas both low and large dividend ratios conduct to low levels of earnings quality. These developments lead us to consider a hypothesis, according to which dividend policy and earnings quality are non-monotonically related:

*Hypothesis: There exists an inverted U-shaped relationship between dividend level and earnings quality.*

## 3 Research design

### 3.1 Earnings quality measures

Difficult to measure, earnings quality is an elusive construct and a multi-dimensional concept. Dechow et al. (2010) observe that there is no single measure of earnings quality that is superior or appropriate for all decision models, and these proxies are not substitutes because they do not measure the same fundamental construct and support different types of decisions. The use of multiple measures helps to capture different dimensions of earnings quality and ensures that our results are not driven by any particular measure. We select therefore four measures to capture two main aspects of earnings quality. The first one is based on the accrual earnings management proxied by two measures of abnormal accruals determined by the residuals of the modified Dechow and Dichev (2002) model by McNichols (2002) and the performance-adjusted modified Jones (1991) model by Kothari et al. (2005). The second one is associated with the earnings time series proxied by earnings persistence and earnings predictability. We use negative values for some metrics because we adopt the convention that higher values of individual measures  $EQ_k$  imply better earnings quality.

#### 3.1.1 *Abnormal Accruals*

One common approach is to split accruals into “normal” and “abnormal” accruals. The normal accruals are meant to capture adjustments that reflect fundamental performance, while the abnormal accruals are meant to capture distortions induced by the application of the accounting rules or earnings management. The general interpretation is that if the normal component of accruals is modeled properly, then the abnormal component represents a distortion that is of lower quality (Dechow et al. 2010). Some models attempt to design accruals and isolate the managed or error component which reduces earnings quality. We select the Dechow and Dichev (2002) model as modified by McNichols (2002) and the performance-adjusted modified Jones (1991) model by Kothari et al. (2005). Residuals from these accrual models measure abnormal (or discretionary) accruals and capture managerial opportunistic discretion over financial reporting (Jones 1991; Dechow et al. 1996; Bowen et al. 2008).

Dechow and Dichev (2002) consider that earnings of better-quality map more closely into cash flows and propose a measure that captures the mapping of working capital accruals into last-period, current-period, and next-period cash flows from operations. The unexplained portion of

the variation in cash flows (the residuals of the model) is an inverse measure of earnings quality. The intuition behind this measure is that working capital accruals should shift or adjust the recognition of operating cash flows over a short period of time ( $t-1$ ,  $t$  and  $t+1$ )<sup>3</sup>. The Dechow and Dichev (2002) model as modified by McNichols (2002) to estimate earnings quality based on abnormal accruals, is presented as follows:

$$\frac{TCA_{j,t}}{Assets_{j,t}} = \varphi_{0,j} + \varphi_{1,j} \frac{CFO_{j,t-1}}{Assets_{j,t}} + \varphi_{2,j} \frac{CFO_{j,t}}{Assets_{j,t}} + \varphi_{3,j} \frac{CFO_{j,t+1}}{Assets_{j,t}} + \varphi_{4,j} \frac{\Delta Rev_{j,t}}{Assets_{j,t}} + \varphi_{5,j} \frac{PPE_{j,t}}{Assets_{j,t}} + \vartheta_{j,t} \quad (1)$$

where  $j$  and  $t$  are the firm and year indicators,  $TCA_{j,t}$  is total current accruals,  $Assets_{j,t}$  is average total assets in year  $t$ ,  $CFO_{j,t}$  is cash flow from operations in year  $t$ ,  $\Delta Rev_{j,t}$  is firm  $j$ 's change in revenues between year  $t-1$  and year  $t$ ,  $PPE_{j,t}$  is gross property, plant, and equipment in year  $t$ . We use operating cash flows directly from the cash flow statements.

Based on equation (1), we derive our first measure for abnormal accruals  $AA_{DD}$  defined as the time-series standard deviation of the residuals  $\sigma(\hat{\vartheta}_{j,t})$  multiplied par minus one and calculated over  $t-4$  to  $t$ . Therefore, larger values of  $AA_{DD}$  indicate better mapping of accruals into cash flows, implying higher precision of earnings information and higher quality of financial reporting.<sup>4</sup>

The second abnormal accruals measure is calculated by using a cross-sectional estimation-by-industry-year approach to obtain residuals from the performance-adjusted modified Jones (1991) model by Kothari et al (2005), presented as follows:

$$\frac{TA_{j,t}}{Assets_{j,t-1}} = \alpha_{0,j} \frac{1}{Assets_{j,t-1}} + \alpha_{1,j} \frac{\Delta Rev_{j,t} - \Delta AR_{j,t}}{Assets_{j,t-1}} + \alpha_{2,j} \frac{PPE_{j,t}}{Assets_{j,t-1}} + \alpha_{3,j} ROA_{j,t-1} + \varepsilon_{j,t} \quad (2)$$

where  $TA_{j,t}$  is total accruals,  $\Delta AR_{j,t}$  is the change in accounts receivable between year  $t-1$  and year  $t$  and  $ROA_{j,t-1}$  is the lagged return on assets.

<sup>3</sup> Dechow and Dichev (2002) assume that any working capital accrual that is not explained by operating cash flows in  $t-1$ ,  $t$  or  $t+1$  is not responding to economic fundamentals. Thus, higher abnormal accruals (higher residuals) are indicative of lower accruals quality.

<sup>4</sup> In unreported results for brevity, we use also a measure for earnings quality based on abnormal accruals, calculated as the negative annual firm-specific absolute value of the residuals  $-|\hat{\vartheta}_{j,t}|$ . All measures for abnormal accruals generate consistent findings.

We use the negative absolute value of residuals from equation (2) as an earnings quality measure based on abnormal accruals, designated as  $AA_{JK} = -|\hat{\varepsilon}_{j,t}|^5$ . Larger values of  $AA_{JK}$  correspond to lower discretionary accruals and thus to higher earnings quality.

### 3.1.2 Earnings time-series

#### 3.1.2.1 Persistence

Persistence measures the extent that current earnings persist or recur in the future. Firms with more persistent earnings have a more ‘‘sustainable’’ earnings/cash flow stream that will make it a more useful input to equity valuation models (Dechow et al. 2010). High persistence is positively associated with high earnings quality since it indicates a stable, sustainable, and less volatile earnings generation process that is particularly valued by investors.

Our measure of the earnings persistence *Persist* constructed on the  $\alpha_1$  coefficient estimate from the following firm-specific regression model:

$$NI_{j,t+1} = \alpha_{0,j} + \alpha_{1,j}NI_{j,t} + \varepsilon_{j,t} \quad (3)$$

where  $NI_{j,t+1}$  and  $NI_{j,t}$  are income before extraordinary items for firm  $j$  in period  $t + 1$  and period  $t$ , scaled by firm total assets for period  $t-1$ .

We apply this model to each firm with at least 5 years of non-missing data. The resulting  $\alpha_{1,j}$  coefficient is an estimate of the persistence of an individual firm’s earnings *Persist*, with larger values for *Persist* indicating more persistent earnings and consequently higher earnings quality.

#### 3.1.2.2 Predictability

Predictability, defined as the ability of earnings to be predicted or to predict itself (Lipe 1990), is a measure of earnings quality based on the view that an earnings number that tends to repeat itself is of high quality. This view is not dissimilar to the view, implied by Dechow and Schrand (2004) that a high-quality earnings number is representative, that is, a good predictor, of future earnings. According to Francis et al. (2004), one common measure of earnings predictability is the negative square root of the error variance from Eq (3),  $Predict = -\sqrt{\sigma^2(\hat{\varepsilon}_{j,t})}$ . Then, larger values of *Predict* imply more predictable earnings, indicating higher earnings quality.

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<sup>5</sup> Francis et al. (2005) suggest taking the absolute values for an EQ measure and signed accruals for studying earnings management.

### 3.2 Model specification

To test our hypothesis, we examine the curvilinear association between dividend level and earnings quality. We conduct cross-sectional analyses by regressing  $k$  proxies for earnings quality attributes,  $EQ_k$ , on a dividend indicator, by including both  $Div$  and  $Div^2$ . We control for firm-specific variables,  $X_i(i= 1, \dots, N)$ , that have previously been found to affect earnings quality, including industry fixed effects and year fixed effects,  $FE$ , to control for time-varying shocks and shocks that affect all firms in the same industry:

$$EQ_{k_{i,t}} = \alpha + \beta_1 Div_{i,t} + \beta_2 Div_{i,t}^2 + \sum_i^n \gamma_{i,t} X_{i,t} + FE_{i,t} + \varepsilon_{i,t} \quad (4)$$

Eq. (4) forms our baseline regression throughout this study, where the key explanatory variable  $Div$ , used to capture dividend level, is measured by dividend payout ratios  $Div\_p$  and dividend yield ratios  $Div\_y$ , and computed as dividends per share scaled by earnings and dividends per share scaled by stock price, respectively. To validate our hypothesis, we expect to find a positive  $\beta_1$  coefficient and a negative  $\beta_2$  coefficient, implying an inverted U-shaped relationship between dividend and firm earnings quality. We also check the presence of curvilinear effects using the method of Lind and Mehlum (2010), which allows us to calculate inflection points as well. This test (U-test) ensures in particular that the estimated extremum point is not too close to the end point of the data range.<sup>6</sup>

The control variables are intended to control for factors, identified in prior research, to be associated with earnings quality. Therefore, we control for firm size using log market value  $Size$ , growth prospects using book-to-market ratio  $BTM$ , sales growth  $Grow$ , firm performance using returns on assets  $ROA$ , and an indicator variable for the presence of negative earnings  $Loss$ . We also include firms' age  $AGE$  and the ratio of retained earnings to total assets,  $RER$  to control for firms' maturity. Armstrong et al. (2010) indicate that large firms have higher earnings quality. High-growth firms may have more discretion in financial reporting (Smith and Watts, 1992) and more incentives to manipulate earnings (Skinner and Sloan, 2002). Kothari et al (2005) indicate that earnings performance is related to discretionary accruals. Firms' maturity is likely to be positively associated with earnings quality as mature firms are less likely to be growth firms (Tong and Miao 2011).

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<sup>6</sup> Lind and Mehlum (2010) provide an appropriate test of a U (or inversed U) shaped relationship in a regression model. Their test gives the exact necessary and sufficient conditions for the test of a U shape in both finite samples and for a large class of models, computing the inflexion point of these relationships.

We also control for external financing issues *EFI* (equity and debt issues) to control for financing incentives. Some studies suggest that frequent access to capital markets provides managers with incentives to manage earnings (Teoh et al. 1998) while other studies suggest that leverage and equity can reduce agency costs and constrain managerial opportunistic choices (Harris and Raviv 1991). We include leverage, measured by the ratio of debt to equity *LEV*, as a control variable. Following Lawson and Wang (2015) and He et al. (2017), we control for the effect of the free cash flow *FCF*. We likewise control for the operating cycle *Ocycle* because firms with longer operating cycles have larger accrual accounts, and a longer period for accruals to reverse, and hence have greater flexibility for accrual management (Dechow and Dichev 2002, Francis et al., 2004). The operating cycle is computed as the log of the sum of days in receivable and days in inventory. We similarly control for capital intensity *CapInt*, as Cohen et al (2008) find more capital-intensive firms have better quality earnings because capital intensity serves as a barrier to entry for future competitions, resulting in lower proprietary costs of disclosure. According to Hribar and Nichols (2007), tests of earnings management using unsigned earnings quality measures are misspecified if operating volatility is not controlled for. Hence, we control for volatility using the volatility of cash flows to total assets *CF\_Vol* over the past 5 years ( $\sigma(CFO/TA)$ ), and the volatility of sales to total assets *S\_Vol* over the last 5 years  $\sigma(Sales/TA)$ . We include a variable *IFRS* because accounting standards can influence earnings management and IFRS standards became mandatory in 2005 in France. *IFRS* takes the value 1 for the years from 2005, and 0 otherwise. We also control for the fraction of shares closely held by insiders and controlling shareholders *CHS*, because Salah and Jarbaoui (2022) show that ownership concentration positively moderates the impact of earnings management on dividend policy. The detailed definitions of variables used in our study are reported in the Appendix.

### **3.3 Sample selection and data**

The sample consists of French listed firms drawn from WorldScope including in Refinitiv Eikon databases, over a 25-year period from 1994 to 2018. To estimate earnings quality measures over this period, we require accounting and market data from 1990 to 2018 because all the earnings quality measures are computed over a 5-year rolling estimation period, and some of them involve items over two or three consecutive periods. We start our sample period with fiscal year 1994 because the availability of data from cash flow statements became effective, to calculate



our accruals and cash flow variables.<sup>7</sup> We require sufficient data to calculate all earnings quality measures for each firm in a yearly sample. To avoid excluding too many firms, we do not require data availability for each firm over the full period. As a consequence, the composition of firms in the yearly samples varies. Survivorship bias is expected to play a minor role in the analysis because it only arises for the five-year estimation periods and the data requirements constrain the sample to more stable and long-lived firms.

We drop all observations with missing data for dividend indicator, the control variables, and observations in financial industries<sup>8</sup> to arrive at an initial sample of 8384 firm-year observations for 918 firms. The number of firms in each year varies between 78 (for 1994) and 460 (for 2002), with an average of 335. In all subsequent analyses, the sample size depends on the measure of earnings quality and varies from 3802 observations for AQ to 7017 observations for *Persist*. All continuous and unbounded variables are winsorized at the top and bottom 1% level to control for outliers.<sup>9</sup>

Table 1 presents summary statistics for our main sample. Concerning the dividend variables, the mean value of the variable dividend payout *Div\_p* is 22.5% and the mean value of the variable dividend yield *Div\_y* is 1.7%. These values are consistent with He et al (2017) who find a mean value of 1.9% for dividend yield. We can also note a difference between dividend policies in France and the US. Previous research on US samples shows a mean value of between 0.8% and 1% for dividend yield (Tong and Miao, 2011; Liu and Espahbodi, 2014; Koo et al, 2017; He et al, 2017). These results highlight that dividend policies are more generous in France than in the US.

### **Table 1**

#### **3.4 Additional tests with matching approaches and reverse causality analysis**

Our empirical goal is to examine the earnings quality of firms associated with the decision on the magnitude of the dividend paid, holding constant firm characteristics. However, our primary

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<sup>7</sup> We obtain data directly from the cash flows statement because Hribar and Collins (2002) document that accrual and cash flow variables calculated from balance sheet data are likely to lead to problems such as noisy and biased estimates.

<sup>8</sup> Because these firms are subject to specific institutional and regulatory constraints.

<sup>9</sup> In a non-reported work, we design our sample with keeping only observations with non-missing values for all variables (EQ variables, dividend payout variables and control variables) used in our study. The sample results in 2929 firm-year observations for 390 non-financial French firms, spanning the period 1999-2017, and generate similar findings to those with our initial sample.

analyses use a traditional model that may suffer from possible bias in the estimation of the effect of dividend policy on earnings quality owing to nonrandomization of the observations, incorrect functional form, and correlated omitted variables (Minutti-Meza, 2013; Shipman et al 2016). Dividend policy may be endogenously determined as firms self-select based on different characteristics such as earned/contributed capital mix, agency conflicts, profitability, or investment opportunities, among others (e.g., DeAngelo et al., 2006; Denis and Osobov, 2008; Chay and Suh, 2009). We apply the matching research design by performing two matching approaches: propensity-score and entropy balancing methods. As reverse causality issues cannot be excluded in our study, we also empirically investigate the causality of the relationship between dividend policy and earnings quality.

### 3.4.1 *Propensity score matching approach*

Propensity score matching (PSM) is performed by matching a dividend-paying firm-year (i.e., treatment effect) with a non-dividend paying firm-year (i.e., control group) along observable covariates relative to the treatment effect, based on a firm's propensity to pay dividends. To obtain the matched-pairs sample, we first estimate the probability of dividend payments given observable firm characteristics using the following logistical model:

$$Prob(Div_{i,t}) = \delta_0 + \sum_i^n \delta_{i,t} Covariates_{i,t} + FE_{i,t} + \varepsilon_{i,t} \quad (5)$$

The *Covariates* in this model represent the following common determinants of firms' dividend payouts: firm size (*Size*), leverage (*Lev*), free cash flows (*FCF*), growth prospects with market to book (*MTB*) and sales growth (*Grow*), performance (*ROA*), whether the firm reported a loss in the current fiscal year (*Loss*), age of the firm (*Age*), maturity of the firm (*RER*), and controls for unobservable industry and year fixed effects.

Next, we use the propensity scores obtained from the matching model to match our dividend-paying firm-years with non-dividend-paying firm-years. We might be able to minimize the spurious effect of factors driving both the dividend payment decision and the quality of earnings. Our matching process relies on one-to-one matching, within common support, without replacement of control observations, and using a caliper distance of 0.01<sup>10</sup>.

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<sup>10</sup> The use of propensity score matching tests require the researcher to make several design choices (Minutti-Meza 2013). Our study also follows Minutti-Meza (2013) and Lawson and Wang (2015) in using the matching without replacement option.

### 3.4.2 Entropy balancing matching approach

Developed by Hainmueller (2012) and Hainmueller and Xu (2013), entropy balancing uses an iterative process to re-weight observations in the control sample to match the observations in the treatment sample. Thus, in the entropy-balanced sample, the first three moments (mean, variance, skewness) of the control variables detailed above should be nearly identical for payers versus non-payers. Once balance conditions are met, the iterative process ceases, and control sample weights are retained. We test for the association between dividend policy and earnings quality by estimating the difference between the treated sample (dividend payers) and the weighted control sample (dividend non-payers) via a weighted regression version of Eq. (4). Treated observations have a weight of one and control sample observations have the weight identified by the entropy-balancing algorithm. Effectively, non-dividend paying firms with characteristics similar to dividend payers receive more weight in our estimations, relative to non-payers with dissimilar characteristics.

Compared to the PSM, entropy balancing has some primary conceptual advantages. Hainmueller (2012) notes that the entropy balancing approach is an “equal percent bias reducing” matching method, so, unlike PSM, it ensures that covariate imbalance improves after matching.<sup>11</sup> The entropy balancing technique ensures that higher-order moments of covariate distributions are nearly identical across treated and control samples, while propensity-score matching does not, focusing instead on balancing the estimated propensity score. Entropy balancing discards zero or very few observations, which increases power relative to PSM and avoids limiting the control sample to one (randomly) matched observation. Also, entropy balancing permits less researcher discretion, relative to propensity score matching. In particular, the use of entropy balancing saves researchers from having to specify the propensity-score model, decide to match with or without replacement, select caliper distance, conduct one-to-one versus one-to-many matching, and assess match quality.<sup>12</sup>

### 3.4.3 Reverse causality analysis

We also investigate the causality of the relationship between dividend policy and earnings quality. Indeed, as noted by He et al (2017, p. 275): “*it is also plausible that dividend payments*

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<sup>11</sup> Also, Zhao and Percival (2016) note that entropy balancing is “doubly robust with respect to linear outcome regression and logistic propensity score regression.”

<sup>12</sup> Shipman et al. (2016) find seemingly innocuous design choices greatly influence sample composition and estimate of propensity-score-matching treatment effects.

are an outcome of the past earnings which in turn may be related to accruals metrics, and we do not aim to rule out such reverse causality possibilities". We therefore test a model where earnings quality explains dividend policy. This model is similar to the model used in the propensity score matching analysis, except that it incorporates a lagged variable for earnings quality ( $EQ_{t-1}$ ) and all the control variables used in the study. The results of this test show that the coefficients of the variable  $EQ_{t-1}$  are insignificant for all measures of earnings quality, except for the measure of predictability, for which the coefficient is significant at the 10% level. These results suggest in our study that the causality does not go from the quality of earnings to the dividend policy.

## 4 Core analyses

In this subsection, we test our hypothesis of a curvilinear relationship between dividend level and earnings quality. Table 2 provides the main test results from applying Eq. (4), by regressing the four proxies for earnings quality on the level of dividend while controlling for firm-specific variables. We use two measures for dividend level  $Div$ : the dividend payout ratio  $Div_p$ , computed as dividends per share scaled by earnings, in models M1-M4, and dividend yield ratio  $Div_y$ , calculated as dividends per share scaled by stock price, in models M5-M8. The results of the primary OLS regression without matching are reported in Panel 2A. The additional multivariate matching analyses based on the propensity score matching and the entropy balancing matching approaches are reported in Panels 2B and 2C, respectively. Throughout the study, all multivariate regressions also include industry and year-fixed effects, and all associated p-values are computed based on standard errors adjusted for heteroscedasticity and firm-level clustering.

**Table 2**

### 4.1 Earnings quality based on abnormal accruals measures

Models M1-M2 and M5-M6 from Panel 2A show the results of the multivariate analyses of Eq. (4) for measures of earnings quality based on accruals. The results highlight a non-monotonic and statistically significant relationship between dividend level and earnings quality across the four regressions. Specifically, the coefficients of  $Div$  are positively significant at the 1% level while the coefficients of  $Div^2$  are negatively significant at the 1% level. We observe,

consequently, an inverted U-shaped relationship between dividend level and earnings quality. The U-test proposed by Lind and Mehlun (2010) shows the significance for each regression at least at a 5% level. This test ensures in particular that the estimated extremum point is not too close to the end point of the data range. Our results highlight an extreme point that varies from 34% to 55% for the dividend payout measure  $Div_p$  (M1-M2) and from 4.0% to 4.3% for the dividend yield measure  $Div_y$  (M5-M6). For example, Figure 1 graphically represents the relationship between dividend level (measured by both payout and yield ratios) and earnings quality determined by our first measure of abnormal accruals  $AA_{DD}$ . Figure 1 shows that earnings quality relates positively to dividend level when the payout (resp. yield) ratio is below 44% (resp. 4%), and the relationship becomes negative when the payout (resp. yield) ratio exceeds 44% (resp. 4%).

The results on the control characteristics are broadly consistent in the models of accruals earnings management (M1-M2 and M5-M7). Specifically, larger, more profitable, more capital-intensive firms with a larger proportion of closely-held shares are likely to exhibit higher earnings quality. In contrast, firms with larger  $OCF$ , higher cash-flow volatility, and issuing external financial resources are more prone to be associated with stronger earnings manipulation.

Models M1-M2 and M5-M6 from Panel 2B and Panel 2C present the results of propensity score and entropy balancing matching analyses, for measures of earnings quality based on abnormal accruals. The results are consistent with those of the primary analysis for the two measures of earnings quality. Results of Panel 4B and Panel 4C show an extreme point that varies from 38% to 55% for the dividend payout measure  $Div_p$  (M1-M2) and from 3.4% to 4.5% for the dividend yield measure  $Div_y$  (M5-M6). These multivariate matching analyses reinforce our finding about a non-monotonic and curvilinear association between dividend level and earnings quality, for measures of earnings quality based on accruals.

### **Figure 1**

#### **4.2 Earnings quality based on earnings time-series measures**

Models M3-M4 and M7-M8 from Panel 2A show the results of the multivariate analyses of Eq. (4) for measures of earnings quality based on the earnings time-series. The results highlight a non-monotonic and statistically significant relationship between dividend level and earnings quality across all time-series measures, except for persistent earnings measure  $Persist$  when

dividend level is measured by dividend yield  $Div\_y$  (M7). Specifically, when earnings quality is measured by earnings predictability  $Predict$  (M4 and M8), the coefficients of  $Div$  are positively significant at the 1% level while the coefficients of  $Div^2$  are negatively significant at the 1% level. When earnings quality is measured by earnings persistence  $Persist$ , the coefficients of  $Div$  and  $Div^2$  are statistically significant respectively at the 10% level and the 5% level, only when the dividend level is measured by dividend payout  $Div\_p$  (M3). We thus observe an inverted U-shaped relationship between dividend level and earnings quality as measured by the time series earnings trend. The U-test proposed by Lind and Mehlun (2010) shows the significance for each regression at least at a 5% level, except for M7 related to earnings persistence with the dividend yield measure. If we restrict to significant regressions, our results highlight an extreme point that varies from 34% to 51% for the dividend payout measure  $Div\_p$  (M3-M4) and is 4.5% for the dividend yield measure  $Div\_y$  (M8).

The results on the control characteristics differ according to time-series measures. Specifically, bigger and younger firms with larger  $OCF$  and less cash flow volatility are likely to exhibit higher earnings persistence. Additionally, firms showing a stronger earnings predictability are more disposed to be more profitable, more capital intensive with higher market-to-book equity, leverage, and turnover ratios, with longer operating cycles and a larger proportion of closely held shares.

Models M3-M4 and M7-M8 from Panel 2B and Panel 2C present the results of propensity score and entropy balancing matching analyses. The results are consistent with those of the primary analysis. They also confirm that the relationship is less robust for the measure of earnings quality related to earnings persistence, particularly for the dividend yield measure. For regressions M7 using the variable  $Persist$ , the U-tests are not significant for the PSM and the entropy balancing analyses. If we restrict to significant regressions, results of Panel 2B and Panel 2C show an extreme point that varies from 32% to 49% for the dividend payout measure (M3-M4) and from 4.6% to 4.7% for the dividend yield measure (M7-M8).

Overall, our results support the hypothesis of an inverted U-shaped relationship between dividend level and earnings quality. The inverted U-shaped relationship means that earnings quality is positively related to dividend for moderate levels of dividend payout and dividend yield ratios, and negatively associated to dividend level for high dividend ratios. The inflection point, depending on the measure of earnings quality, varies from 32% to 55% for the dividend payout ratios  $Div\_p$  and from 3.4% to 4.7% for the dividend yield ratios  $Div\_y$ . This inflection

point can be considered as an optimum as it corresponds to the level of dividends that maximizes earnings quality.

## 5 Additional analyses

### 5.1 Dividend volatility effect on the dividend level-earnings quality relationship

The hypothesis construct is implicitly based on the fact that firms avoid cutting dividends and seek to maintain a stable dividend policy. We are therefore interested in assessing whether the curvilinear relationship between dividend level and earnings quality persists when firms' dividend policy is unstable and the level of dividend paid is highly volatile. To address this issue, we divide dividend payers into those with high and low dividend volatility by their respective medians for each year. We calculate dividend volatility as standard deviations of dividends, in the previous five years. We then replicate our model of Eq (4) where we introduce *HighDivV* variable as a moderator that takes the value of 1 if a dividend payer is above the median dividend volatility for each year, and 0 otherwise. Results are reported in table 3 based only on our unmatched sample for brevity.<sup>13</sup>

#### **Table 3**

We observe that the coefficients of the variables *Div* and *Div*<sup>2</sup> are statistically significant for all the measures of earnings quality. Moreover, the coefficients of the variables *Div* × *HighDivV* and *Div*<sup>2</sup> × *HighDivV* are also statistically significant for all the measures of earnings quality. These coefficients are respectively negative and positive, indicating a moderating effect of dividend instability on the curvilinear relation between dividend level and earnings quality. Figure 2 graphically represents the relationship between dividend level (measured by both payout and yield ratios) and our first measure of earnings quality *AA<sub>DD</sub>*, for low and high values of dividend volatility. The moderating effect of dividend uncertainty means that the relationship between dividend level and earnings quality is less pronounced for firms with high dividend volatilities. On the other hand, low dividend volatilities exacerbate the relationship and lead to higher values of earnings quality at the inflexion point.

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<sup>13</sup> The untabulated results based on multivariate matching analyses are consistent with our findings based on our initial unmatched sample.

## **Figure 2**

### **5.2 Firm size effect on the dividend level-earnings quality relationship**

It is usually argued that dividend-paying firms are typically large firms (He and al., 2017). Introducing the size effect allows us to examine the dividend-earnings quality association according to the degree of informational asymmetry since size is also used as a proxy of informational asymmetry. We therefore perform a second test to analyze the impact of firm size on the curvilinear relationship between dividend level and earnings quality. We thus introduce the variable (*Size*) as a moderator in Eq (4).

Table 4 shows that the relationship is globally robust to the introduction of the variable *Size* as a moderator. The coefficients of the variables *Div* and  $Div^2$  are significant for all measures of earnings quality, except for the variable *AA* (abnormal accruals). Moreover, the coefficients of the interaction variables  $Div \times Size$  and  $Div^2 \times Size$  are statistically significant across all models except for models based on abnormal accruals (M2 and M6). Results also show that these coefficients are respectively negative and positive, indicating a moderating effect of size on the curvilinear relation between dividend level and earnings quality. Consequently, the relationship is stronger for smaller firms than for larger ones. We can argue that large firms, less subject to informational asymmetry than small ones, are less likely to use the signal effect of dividend policy. However, small firms facing high levels of informational asymmetry, are more likely to use dividend policy as a signal of earnings quality.

## **Table 4**

### **5.3 Alternative test of the impact of dividend policy on earnings persistence**

In section 4, we observed a low significance of the relationship between dividend policy and earnings persistence. In this section, we reexamine this relationship by performing an alternative test. Following Skinner and Soltes (2009), we re-estimate the Eq. (3) related to earnings persistence measure by including our dividend variable, *Div*, and an interaction variable between dividend and the current earnings  $Div \times NI$ . We also break out current earnings into two components of pre-abnormal accruals earnings (pre-managed earnings) *PAAE* and abnormal accruals *AA* to test the impact of earnings management on earnings persistence (Liu and Espahbodi, 2014). Introducing the squared dividend level  $Div^2$ , a nonlinear



specification of the test is also proposed to examine the potential curvilinear association between dividend level and earnings persistence.

Results are reported in Table 5. Models M1-M4 and M5-M8 use respectively dividend payout ratios  $Div_p$  and dividend yield ratios  $Div_y$  as dividend level measures. Results about model M1 show that the coefficient of the interaction term  $Div_p \times NI$  is positive and statistically significant at 1% level, suggesting that the level of dividend positively influences the persistence of earnings. Results of model M2 show that the coefficients of the variables  $PAAE$  and  $AA$  are positive and statistically significant at 1% level, indicating that the persistence of earnings is driven both by pre-managed earnings and by abnormal accruals.

Models 3 and 4 explore a potential non-linear effect of dividend level on earnings persistence. Results of Model 3 highlight this non-linear effect since the coefficients of the variables  $Div_p \times NI$  and  $Div_p^2 \times NI$  are respectively positive and negative, and statistically significant at 1% level. It indicates that the level of dividend has a positive impact on earnings persistence until a certain level of dividend, but a negative impact beyond this level. Model 4 shows that the coefficients of the variables  $Div_p \times PAAE$  and  $Div_p \times AA$  are both positive and statistically significant. It indicates that both pre-managed earnings and abnormal accruals participate in the increase of earnings persistence when the dividend level is increasing until a certain level. Beyond this level, we observe that only the coefficient of the variable  $Div_p^2 \times AA$  is negative and significant, indicating that the negative impact of dividend level on earnings persistence for high values of dividends, can be explained by abnormal accruals. We find similar results based on the dividend yield measure  $Div_y$  in models M5-M8.

This test shows that the level of dividends influences earnings persistence. For moderate levels of dividend, we observe a positive impact of dividend level on earnings persistence. We also show that both pre-managed earnings and abnormal accruals explain the increase in earnings persistence. For high levels of dividend, we find a negative impact of dividend level on earnings persistence. We also find that abnormal accruals explain the decrease in earnings persistence. These results support the hypothesis of a non-linear impact of dividend level on earnings persistence, and that earnings manipulation can erode earnings quality for high levels of dividends.

### **Table 5**

## 5.4 Robustness tests

We perform several tests to evaluate the robustness of the relationship between dividend policy and earnings quality. We first analyze the impact of share repurchases on this relationship. We then investigate the stability of the relationship over our study period and particularly during the financial crisis of 2008. We also analyze how the relationship can be moderated by several characteristics of the firm: cash flow uncertainty, investment opportunities, and free-cash-flow issues.

### 5.4.1 *Share repurchases and total payout*

Although we are mainly interested in the association between dividend policy and earnings quality, we also propose to test whether earnings quality is associated with share repurchases. Prior literature suggests that a share repurchase decision can substitute or supplement a dividend payout policy (Banyi and Kahle, 2014). We thus introduce a continuous variable computed as the repurchase amount in year  $t$ , scaled by total assets. We also consider the total payout policy defined as the total payout that aggregates dividend payment and the amount of repurchases in year  $t$ , scaled by total assets.

Focusing only on repurchases, we do not find any significant association between share repurchases and earnings quality. This result is consistent with previous research based on an informational perspective (Guay and Harford 2000; Ham et al. 2021). These studies highlight that dividends and repurchases differ because dividends are highly persistent, whereas repurchases are transitory. Furthermore, focusing on the total payout policy, results are similar to those obtained with dividend policy only. We can notice that in the French context, dividend payout policy is dominated by dividend payout much more than share repurchases payout. This observation could explain the unchanged findings with total payout policy measures.

### 5.4.2 *Time stability and crisis period*

Our study period [1994-2018] is quite long and includes in particular the financial crisis of 2008. We test the robustness of our relationship over time and the potential effect of financial crisis on this relationship. Therefore, we have re-run our regressions by dividing the study period into three sub-periods: pre-crisis [1994-2006], crisis [2007-2009] and post-crisis [2010-2018]. Our results remain unchanged for the three sub-periods, except for the abnormal accruals

AA measure that is not significant during the crisis period. This finding could be attributed to specific accounting policies during the crisis period, in line with Ebrahimi et al (2017).

#### *5.4.3 Cash flow uncertainty*

Cash flow uncertainty has been viewed as one of the main factors affecting negatively dividend decisions (Chay and Suh, 2009; An et al., 2022). We propose, thus, to test the impact of cash flow uncertainty on the curvilinear relationship between dividend level and earnings quality. We calculate cash flow volatility as standard deviations of operating cash flows deflated by average total assets, calculated over the previous five years. The (untabulated) results of the estimations offer strong evidence that the relationship between dividend level and earnings quality is robust to the introduction of the uncertainty of cash flows as a moderator. However, we do not find any clear moderating effect of this variable on the relationship.

#### *5.4.4 Investment opportunities*

Kaplan and Pérez-Cavazos (2021) show that dividends provide a stronger signal about future earnings for firms with weak investment opportunities than for firms with strong opportunities. We thus test the impact of investment opportunities on the curvilinear relationship between dividend level and earnings quality. We use *Tobin's Q* as a proxy for investment opportunities. The (untabulated) results of the estimations offer strong evidence that the relationship between dividend level and earnings quality is robust to the introduction of the variable investment opportunities as a moderator. However, we do not find any clear moderating effect of this variable on the relationship.

#### *5.4.5 Free cash flows issues*

We also test the moderating effect of free cash flows issues on the curvilinear relationship between dividend level and earnings quality. We consider a firm to have free cash flow issues if it has both high (above the median) cash flows and low (below the median) growth, measured by the market-to-book ratio. The (untabulated) results of the estimations offer strong evidence that the relationship between dividend level and earnings quality is robust to the introduction of the variable free cash flows issues as a moderator. However, we do not find any clear moderating effect of this variable on the relationship.

## 6 Conclusion

This study examines the impact of dividend policy on earnings quality in the French context. The mixed results of the literature led us to reconsider the relationship between dividend policy and earnings quality, by assuming a non-monotonic relationship. Using four measures of earnings quality, we find an inverted U-shaped relationship between dividend ratios (both payout and yield ratios) and earnings quality. Earnings quality relates positively to dividend level until a certain level of dividend, and negatively beyond this level. The inflection point depends on the measure of earnings quality and ranges from 32% to 55% for the dividend payout ratio and from 3.4% to 4.7% for the dividend yield ratio. A complementary test reinforces the non-linear effect of dividend level on earnings persistence and indicates that the decrease in earnings persistence observed for high values of dividend ratios is explained by abnormal accruals. Moreover, we find that the curvilinear relationship between dividend level and earnings quality is flattened for large firms and firms with volatile dividends. We also show that the relationship is not driven by firm characteristics such as cash flow volatility, investment opportunities, and free cash flow issues.

Overall, our results in the French context complement the existing literature that mostly focused on dividend status (dividend payers vs non-payers) and linear relationships. Our findings also reconcile the mixed results in the literature, because we show that dividends can be associated with higher or lower earnings quality, depending on the level of the dividend. Higher earnings quality is observed for intermediate levels of dividend ratios, while low and large values of dividends drive to lower earnings quality. Dividends are positively related to earnings quality for moderate levels of dividend ratios. At these levels, if we consider dividend policy as an implicit contract between shareholders and managers (Kasanen et al, 1996), the probability of cutting dividends is low and it allows managers to be able to maintain a constant stream of dividends. The moderate level of dividend ratios also limits the pressure on managers who are less induced to manipulate earnings to avoid (or delay) a dividend cut.

On the opposite, when the level of dividends increases, the probability of cutting dividends becomes higher and puts pressure on managers who want to ensure their commitment to serve a constant stream of dividends. In this context, the high level of dividends can lead managers to manipulate earnings to honor their contract with shareholders. This is particularly true in France, where the level of dividend payments is high. French firms have therefore a higher probability to cut dividends, compared for example to US firms. In this context, managers are

subject to a high level of pressure to guarantee the dividend policy expected by shareholders, such as institutional investors. These explanations support the negative relationship between dividend level and earnings quality in France, for high levels of dividend. It could be interesting to study if these results hold in countries with different institutional and corporate governance characteristics.

## Appendix: Variable Definitions

Variables	Definition
<b>Earnings quality variables</b>	
<i>Abnormal Accruals measures</i>	
$AA_{DD}$	Accruals quality: $-\sigma(\hat{\vartheta}_{j,t})$ from Dechow–Dichev model modified by McNichols (2002): $\frac{TCA_{j,t}}{Assets_{j,t}} = \varphi_{0,j} + \varphi_{1,j} \frac{CFO_{j,t-1}}{Assets_{j,t}} + \varphi_{2,j} \frac{CFO_{j,t}}{Assets_{j,t}} + \varphi_{3,j} \frac{CFO_{j,t+1}}{Assets_{j,t}} + \varphi_{4,j} \frac{\Delta Rev_{j,t}}{Assets_{j,t}} + \varphi_{5,j} \frac{PPE_{j,t}}{Assets_{j,t}} + \vartheta_{j,t}.$
$AA_{JK}$	Abnormal accruals: $- \hat{\varepsilon}_{j,t} $ from Jones model modified by Kothari et al. (2005): $\frac{TA_{j,t}}{Assets_{j,t-1}} = \alpha_{0,j} \frac{1}{Assets_{j,t-1}} + \alpha_{1,j} \frac{\Delta Rev_{j,t} - \Delta AR_{j,t}}{Assets_{j,t-1}} + \alpha_{2,j} \frac{PPE_{j,t}}{Assets_{j,t-1}} + \alpha_{3,j} ROA_{j,t-1} + \varepsilon_{j,t}.$
<i>Earnings time-series measures</i>	
<i>Persist</i>	<i>Persistence</i> : Slope coefficient $\alpha_1$ from: $NI_{j,t+1} = \alpha_{0,j} + \alpha_{1,j} NI_{j,t} + \varepsilon_{j,t}$
<i>Predict</i>	<i>Predictability</i> : $-\sqrt{\sigma^2(\hat{\varepsilon}_{j,t})}$ from: $NI_{j,t+1} = \alpha_{0,j} + \alpha_{1,j} NI_{j,t} + \varepsilon_{j,t}$
<b>Payout variables</b>	
<i>Div_p</i>	Dividend payout ratio computed as dividends per share scaled by earnings
<i>Div_y</i>	Dividend yield ratio defined as dividends per share scaled by stock price
<i>HighDivV</i>	A dummy variable that takes the value of 1 if a dividend payer is above the median dividend volatility for each year, computed as standard deviation of dividends in the previous 5 years, and 0 if the firm is below the median dividend volatility.
<b>Control variables</b>	
<i>Size</i>	Market value measured as log of market capitalization
<i>MTB</i>	Ratio of market to book value of equity calculated as market value of equity scaled by book value of equity
<i>Grow</i>	Sales growth calculated as change in sales scales by beginning period sales
<i>ROA</i>	Return on assets calculated as earnings before extraordinary items divided by average total assets
<i>Loss</i>	Loss dummy which is set to 1 if earnings before extraordinary items is less than zero, and 0 otherwise.
<i>Lev</i>	Leverage calculated as the sum of current and long-term debt divided by market value of equity.
<i>Turn</i>	Turnover ratio measured as sales divided by end of year total assets.
<i>OCF</i>	Annual net cash flow from operating activities divided by end of year total assets.
<i>OCyc</i>	Operating cycle computed as the log of the sum of days in accounts receivable and days in inventory, calculated as $360 ((AR/SALES) + (INV/ \text{cost of goods sold}))$ .
<i>CapInt</i>	Capital intensity calculated as net PPE divided by total assets
<i>Age</i>	Firm age calculated as the natural log of the number of years since a firm is included in DataStream
<i>RER</i>	Ratio of retained earnings to total assets.
<i>FCF</i>	Annual free cash flow divided by end of year total assets.
<i>CF_Vol</i>	Cash flows Volatility as standard deviation of cash flows deflated by average total assets ( $\sigma(CFO)/TA$ ), calculated over the current and prior four years.
<i>S_Vol</i>	Sales volatility as standard deviation of sales deflated by average total assets ( $\sigma(\text{Sales})/TA$ ) calculated over the current and prior four years
<i>EFI</i>	External financing issues dummy set to 1 if the firm issues debt or equity during the year that amounts to 20% or more of existing debt or equity, and 0 otherwise.
<i>IFRS</i>	A dummy variable that takes the value of 1 for a firm in the years after 2005 mandatory IFRS adoption and 0 otherwise
<i>CHS</i>	Fraction of shares closely held by insiders and controlling shareholders
<b>Other variables used</b>	
<i>NI</i>	Net income before extraordinary items scaled by lagged total assets
<i>PAAE</i>	Pre-abnormal accruals earnings calculated as the difference between net income <i>NI</i> and abnormal accruals <i>AA</i>

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**Table 1: Descriptive statistics**

Variable	N	Mean	Median	SD	25 <sup>th</sup> percentile	75 <sup>th</sup> percentile	90 <sup>th</sup> percentile
<b><i>EQ Variables</i></b>							
<i>AA<sub>DD</sub></i>	3802	-0.038	-0.029	0.030	-0.049	-0.018	-0.012
<i>AA<sub>JK</sub></i>	5207	-0.054	-0.037	0.058	-0.070	-0.016	-0.006
<i>Persist</i>	7017	0.609	0.643	0.486	0.280	0.942	1.187
<i>Predict</i>	6282	-0.042	-0.025	0.049	-0.052	-0.012	-0.007
<b><i>Dividend variables</i></b>							
<i>Div<sub>p</sub></i>	7787	0.225	0.196	0.242	0.000	0.369	0.567
<i>Div<sub>y</sub></i>	8384	0.017	0.013	0.020	0.000	0.027	0.043
<b><i>Control variables</i></b>							
<i>Size</i>	8384	12.224	11.955	2.212	10.587	13.597	15.492
<i>MTB</i>	8384	2.200	1.588	2.488	0.957	2.674	4.351
<i>Grow</i>	8384	0.095	0.054	0.278	-0.019	0.146	0.312
<i>ROA</i>	8384	0.012	0.031	0.110	0.002	0.060	0.100
<i>Lev</i>	8384	0.719	0.324	1.239	0.102	0.819	1.650
<i>Loss</i>	8384	0.233	0.000	0.423	0.000	0.000	1.000
<i>Turn</i>	8384	1.019	0.970	0.525	0.646	1.295	1.687
<i>OCF</i>	8384	0.061	0.069	0.113	0.025	0.113	0.166
<i>OCyc</i>	8384	5.044	5.030	0.593	4.714	5.336	5.746
<i>CapInt</i>	8384	0.189	0.143	0.169	0.053	0.276	0.416
<i>Age</i>	8384	3.039	3.091	0.420	2.833	3.367	3.555
<i>FCF</i>	8384	0.029	0.045	0.361	0.005	0.138	0.339
<i>RER</i>	8384	-0.017	0.011	0.148	-0.046	0.054	0.102
<i>CF<sub>Vol</sub></i>	7626	0.053	0.035	0.054	0.021	0.063	0.109
<i>S<sub>Vol</sub></i>	8346	0.178	0.128	0.169	0.067	0.227	0.378
<i>EFI</i>	8384	0.639	1.000	0.480	0.000	1.000	1.000
<i>IFRS</i>	8384	0.642	1.000	0.479	0.000	1.000	1.000
<i>CHS</i>	8384	54.897	58.515	25.970	36.910	74.160	87.030

This table presents descriptive statistics for our sample of observations over the period 1994-2018. The table presents summary statistics of firm earnings quality measures, dividend policy indicators, and firm characteristics as control variables. All continuous and unbounded variables are winsorized at the top and bottom 1% level. Refer to the Appendix for detailed definitions of all variables used in this analysis.

**Table 2: Relationship between dividend level and earnings quality**• **Panel 2.A: Primary analysis**

<i>EQ measures</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>
	M1	M2	M3	M4	M5	M6	M7	M8
	<i>Div = Div<sub>p</sub></i>				<i>Div = Div<sub>y</sub></i>			
<i>Div</i>	0.0497*** (5.470)	0.0569*** (3.550)	0.2807* (1.66)	0.1075*** (10.250)	0.4260*** (4.58)	0.4043*** (2.71)	-0.6412 (-0.37)	0.9834*** (9.59)
<i>Div</i> <sup>2</sup>	-0.0559*** (-5.65)	-0.0519*** (-3.08)	-0.4139** (-2.11)	-0.1062*** (-9.44)	-5.2699*** (-4.40)	-4.6509*** (-2.72)	14.5849 (0.74)	-10.8623*** (-9.36)
<i>Size</i>	0.0021*** (4.34)	0.0022*** (2.99)	0.0391*** (3.61)	0.001 (1.54)	0.0021*** (4.54)	0.0023*** (3.53)	0.0335*** (3.18)	0.0015** (2.49)
<i>MTB</i>	-0.0006* (-1.74)	-0.0008 (-1.61)	0.0054 (1.11)	-0.0004 (-1.10)	-0.0005 (-1.50)	-0.0007 (-1.43)	0.0066 (1.30)	-0.0002 (-0.50)
<i>Grow</i>	-0.0004 (-0.16)	-0.0032 (-0.71)	-0.0034 (-0.10)	-0.0233*** (-5.01)	-0.001 (-0.36)	-0.0044 (-1.02)	-0.0055 (-0.16)	-0.0244*** (-5.44)
<i>ROA</i>	0.0233 (1.49)	0.0977*** (3.07)	-0.0159 (-0.11)	0.0599*** (2.81)	0.0287* (1.87)	0.0983*** (3.21)	-0.0714 (-0.49)	0.0634*** (3.15)
<i>Loss</i>	-0.0015 (-0.67)	0.0084** (2.40)	0.0268 (0.76)	-0.0091*** (-2.83)	-0.0019 (-0.98)	0.0034 (1.12)	-0.0198 (-0.68)	-0.0111*** (-4.24)
<i>Lev</i>	0.0005 (0.59)	-0.0004 (-0.30)	-0.011 (-0.93)	0.0025*** (2.76)	0.0003 (0.40)	-0.0008 (-0.67)	-0.0155 (-1.47)	0.0019*** (2.70)
<i>Turn</i>	0.0036* (1.67)	0.0014 (0.48)	0.0447 (1.15)	0.0125*** (4.26)	0.0039* (1.84)	0.001 (0.33)	0.0392 (1.01)	0.0126*** (4.58)
<i>OCF</i>	-0.0018 (-0.19)	-0.0575* (-1.66)	0.4684*** (3.00)	0.0137 (1.00)	-0.0027 (-0.30)	-0.0639* (-1.90)	0.4507*** (2.84)	0.0121 (0.90)
<i>OCyc</i>	0.0009 (0.53)	-0.0011 (-0.45)	0.0581 (1.61)	0.0071*** (2.77)	0.0013 (0.73)	-0.0009 (-0.40)	0.0604* (1.68)	0.0074*** (3.07)
<i>CapInt</i>	0.0151** (2.45)	0.0346*** (4.52)	-0.1577 (-1.23)	0.0300*** (4.48)	0.0171*** (2.84)	0.0366*** (5.01)	-0.1419 (-1.12)	0.0300*** (4.63)
<i>Age</i>	-0.0047* (-1.83)	-0.0060** (-1.98)	-0.1331** (-2.49)	-0.0017 (-0.46)	-0.0042* (-1.67)	-0.0053* (-1.82)	-0.1245** (-2.32)	-0.0013 (-0.36)
<i>RER</i>	0.0031 (1.14)	-0.0041 (-0.92)	0.0489 (1.17)	0.0115** (2.36)	0.0031 (1.04)	-0.0039 (-0.84)	0.0657 (1.56)	0.0118** (2.49)
<i>FCF</i>	-0.0025 (-0.44)	0.0313** (2.31)	-0.3014*** (-3.13)	0.0034 (0.37)	-0.0034 (-0.61)	0.0334** (2.45)	-0.2938*** (-3.12)	0.0025 (0.29)
<i>CF_Vol</i>	-0.1548*** (-6.49)	-0.2259*** (-5.98)	-0.6685** (-2.14)	-0.3405*** (-8.81)	-0.1633*** (-6.72)	-0.2329*** (-6.42)	-0.7360** (-2.42)	-0.3384*** (-9.55)
<i>S_Vol</i>	0.0002 (0.03)	-0.0116 (-1.11)	0.0282 (0.33)	-0.0346*** (-3.84)	0.0005 (0.09)	-0.0105 (-1.06)	0.0454 (0.54)	-0.0340*** (-3.99)
<i>EFI</i>	-0.0023** (-2.30)	-0.0019 (-1.17)	-0.0106 (-0.59)	0 (0.02)	-0.0022** (-2.23)	-0.0023 (-1.46)	-0.0145 (-0.82)	-0.0003 (-0.25)
<i>IFRS</i>	-0.0074** (-2.47)	0.0014 (0.18)	-0.1505** (-2.08)	-0.0059 (-1.16)	-0.0090*** (-3.02)	0.0000 (0.00)	-0.1262* (-1.82)	-0.0074 (-1.51)
<i>CHS</i>	0.0001*** (2.97)	0.0001 (1.55)	-0.0006 (-0.92)	0.0001*** (2.82)	0.0001*** (3.17)	0.0001* (1.75)	-0.0005 (-0.69)	0.0001*** (3.26)

Ind. & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AdjR <sup>2</sup>	0.3745	0.2046	0.0632	0.486	0.3607	0.2009	0.0529	0.4738
N	3536	4537	6006	5398	3801	4856	6483	5843
Extreme point	0.4443	0.5474	0.339	0.5062	0.0404	0.0435	0.022	0.0453
t_Utest	5.3247	2.4438	1.6354	7.7971	3.8121	2.5218	0.3688	8.2692
p_Utest	0.00	0.01	0.05	0.00	0.00	0.01	0.36	0.00

• **Panel 2.B: Propensity score matching analysis**

<i>EQ measures</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>
	M1	M2	M3	M4	M5	M6	M7	M8
	<i>Div = Div<sub>p</sub></i>				<i>Div = Div<sub>y</sub></i>			
<i>Div</i>	0.0455*** (4.25)	0.0185* (1.79)	0.1909 (0.91)	0.1284*** (9.99)	0.4095*** (3.27)	0.2703* (1.79)	-0.6047 (-0.30)	1.0833*** (8.70)
<i>Div</i> <sup>2</sup>	-0.0534*** (-4.35)	-0.0167* (-1.87)	-0.1428 (-0.58)	-0.1321*** (-7.92)	-4.6052** (-2.54)	-3.3041* (-1.85)	15.6052 (0.64)	-11.4371*** (-6.68)
Ctrl variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AdjR <sup>2</sup>	0.2788	0.2197	0.089	0.4124	0.25	0.1916	0.0738	0.3821
N	1089	1406	1794	1593	1248	1592	2049	1830
Extreme point	0.4261	0.5539	0.6686	0.4859	0.0445	0.0409	0.0194	0.0474
t_Utest	4.0472	1.4792	0.315	6.1674	1.9538	1.1881	0.2989	4.899
p_Utest	0.00	0.07	0.38	0.00	0.03	0.10	0.38	0.00

• **Panel 2.C: Entropy balancing matching analysis**

<i>EQ measures</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>
	M1	M2	M3	M4	M5	M6	M7	M8
	<i>Div = Div<sub>p</sub></i>				<i>Div = Div<sub>y</sub></i>			
<i>Div</i>	0.0289*** (3.66)	0.0356*** (2.75)	0.1857** (2.04)	0.1081*** (12.58)	0.2347*** (2.66)	0.2765** (2.13)	-0.1398 (-0.09)	1.0143*** (10.89)
<i>Div</i> <sup>2</sup>	-0.0376*** (-4.11)	-0.0335** (-2.50)	-0.2896* (-1.85)	-0.1116*** (-11.34)	-3.4153*** (-2.83)	-3.2813** (-2.12)	6.3278 (0.33)	-11.0109*** (-9.83)
Ctrl variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AdjR <sup>2</sup>	0.3201	0.2954	0.1247	0.4521	0.2877	0.2654	0.1151	0.4118
N	3536	4537	6006	5398	3801	4856	6483	5843
Extreme point	0.384	0.5311	0.3206	0.4841	0.0344	0.0421	0.011	0.0461
t_Utest	3.6603	2.0435	1.4208	9.1725	2.6369	1.9124	0.0856	8.1183
p_Utest	0.00	0.02	0.08	0.00	0.00	0.03	0.47	0.00

This table reports results from an analysis of the association between dividend payment level and earnings quality. Panel 2.A presents regression analyses using equation (4). The dependent variable in each model (M1-M8) is one of the four proxies for earnings quality. The two first measures are based on abnormal accruals dimension  $AA_{DD}$  and  $AA_{JK}$  and calculated, respectively, from residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002) and the performance-adjusted modified Jones (1991) model by Kothari et al. (2005). The two last earnings persistence *Persist* and earnings predictability *Predict* are based on earnings time series dimension. The explanatory variables are a continuous measure of dividend *Div* and dividend squared *Div*<sup>2</sup> used to capture dividend level and measured by dividend payout ratios *Div<sub>p</sub>* (M1-M4) and dividend yield ratios *Div<sub>y</sub>* (M5-M8). Panel 2.B and Panel 2.C present analyses using respectively PSM test and entropy balancing matching test. Continuous and unbounded variables are winsorized at the top and bottom 1% level. Refer to the Appendix for detailed definitions of all variables used in this analysis. All regressions include industry and year-fixed effects. All associated *p-values* reported in parentheses below parameter estimates are computed based on standard errors adjusted for heteroskedasticity and firm-level clustering. Significance levels are denoted as \*\*\* (1%), \*\* (5%), and \* (10%). N is the number of observations, and AdjR<sup>2</sup> is the adjusted R-squared. The method of Lind and Mehlum (2010) is used to test the presence of an (inverse) U-shaped relationship for every regression. The *t-value* and the *p-value* of the test are reported as well as the extreme point of the shape of the relationship.

**Table 3: Dividend volatility effect on the dividend level - earnings quality relationship**

<i>EQ measures</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>
	M1	M2	M3	M4	M5	M6	M7	M8
	<i>Div = Div<sub>p</sub></i>				<i>Div = Div<sub>y</sub></i>			
<i>Div</i>	0.0766*** (5.16)	0.0727*** (3.46)	0.5258* (1.88)	0.1343*** (7.45)	0.7664*** (4.46)	0.7356*** (2.94)	5.9948** (2.17)	1.3904*** (6.78)
<i>Div</i> <sup>2</sup>	-0.0869*** (-4.93)	-0.0735*** (-3.21)	-0.8654*** (-2.61)	-0.1290*** (-6.34)	-8.3201*** (-3.69)	-10.1764*** (-2.80)	-87.6999** (-2.47)	-15.1892*** (-5.67)
<i>HighDivV</i>	0.0201 (0.81)	0.0022 (0.07)	0.5772 (1.45)	0.0182 (0.57)	0.0115 (0.49)	0.0055 (0.17)	0.6148 (1.56)	0.0073 (0.23)
<i>Div</i> × <i>HighDivV</i>	-0.0587*** (-3.50)	-0.0425* (-1.65)	-0.5527* (-1.85)	-0.0620*** (-3.14)	-0.7200*** (-4.00)	-0.6426** (-2.24)	-7.3968** (-2.44)	-0.8124*** (-3.75)
<i>Div</i> <sup>2</sup> × <i>HighDivV</i>	0.0622*** (3.24)	0.0497* (1.78)	0.8028** (2.24)	0.0538** (2.43)	6.4376*** (2.77)	8.8284** (2.21)	105.0031*** (2.72)	8.3285*** (2.99)
Ctrl var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ctrl var. x <i>HighDivV</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched sample	No	No	No	No	No	No	No	No
N	3536	4537	6006	5398	3801	4856	6483	5843
AdjR <sup>2</sup>	0.3928	0.2085	0.0955	0.5007	0.3807	0.204	0.084	0.4888
Extreme point	0.4407	0.4945	0.3038	0.5204	0.0461	0.0361	0.0342	0.0458
t_Utest	4.3469	2.7112	1.8782	4.7767	2.9262	2.529	2.17	4.5843
p_Utest	0.00	0.00	0.03	0.00	0.00	0.01	0.02	0.00

This table presents the results of an analysis of the association between the level of dividend payout and earnings quality based on whether firms have high dividend payout volatility. Models M1-M8 replicate the same regressions as in Table 2.A, using Eq. (4), while we introduce the *HighDivV* variable as a moderator that takes the value of 1 if a dividend payer is above the median dividend volatility for each year, computed as the standard deviation of dividends in the previous 5 years, and 0 if the firm is below the median dividend volatility. Models M1-M4 use dividend payout ratios *Div<sub>p</sub>* as dividend level measure, whereas, models M5-M8 are performing with dividend yield ratios *Div<sub>y</sub>* as dividend level measure. Continuous and unbounded variables are winsorized at the top and bottom 1% level. Refer to the Appendix for detailed definitions of all variables used in this analysis. All regressions include industry and year-fixed effects. All associated *p-values* reported in parentheses below parameter estimates are computed based on standard errors adjusted for heteroskedasticity and firm-level clustering. Significance levels are denoted as \*\*\* (1%), \*\* (5%), and \* (10%). N is the number of observations, and AdjR<sup>2</sup> is the adjusted R-squared. The method of Lind and Mehlum (2010) is used to test the presence of an (inverse) U-shaped relationship for every regression. The t-value and the p-value of the test are reported as well as the extreme point of the shape of the relationship.

**Table 4: Firm size effect on the dividend level - earnings quality relationship**

<i>EQ measures</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>	<i>AA<sub>DD</sub></i>	<i>AA<sub>JK</sub></i>	<i>Persist</i>	<i>Predict</i>
	M1	M2	M3	M4	M5	M6	M7	M8
	<i>Div=Div<sub>p</sub></i>				<i>Div = Div<sub>y</sub></i>			
<i>Div</i>	0.1806*** (3.46)	-0.0762 (-0.69)	3.8469*** (3.98)	0.2334*** (3.84)	2.0411*** (3.77)	0.0847 (0.09)	41.4145*** (4.20)	2.3375*** (3.90)
<i>Div</i> <sup>2</sup>	-0.1769*** (-3.27)	0.0969 (0.90)	-2.4106** (-2.29)	-0.2258*** (-3.67)	-19.3506*** (-3.23)	1.8569 (0.19)	-314.8714*** (-3.05)	-25.2991*** (-3.83)
<i>Size</i>	0.0034 (0.53)	0.0064 (0.81)	-0.2869*** (-2.85)	0.0037 (0.55)	0.0039 (0.63)	0.0092 (1.18)	-0.3037*** (-3.04)	0.0065 (1.01)
<i>Div</i> × <i>Size</i>	-0.0110*** (-2.59)	0.0113 (1.19)	-0.3026*** (-3.80)	-0.0105** (-2.12)	-0.1358*** (-3.11)	0.0299 (0.37)	-3.4619*** (-4.10)	-0.1120** (-2.26)
<i>Div</i> <sup>2</sup> × <i>Size</i>	0.0099** (2.29)	-0.0128 (-1.43)	0.1830** (2.19)	0.0098** (2.02)	1.1872** (2.54)	-0.5642 (-0.68)	26.9843*** (3.08)	1.2001** (2.20)
Ctrl var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ctrl var. × <i>Size</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind. & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched sample	No	No	No	No	No	No	No	No
N	3536	4537	6006	5398	3801	4856	6483	5843
AdjR <sup>2</sup>	0.3919	0.2329	0.1211	0.4988	0.3781	0.2249	0.11	0.4841
Extreme point	0.5105	0.3932	0.7979	0.5168	0.0527	0.0127	0.0658	0.0462
t_Utest	2.7523	0.6897	0.5978	3.1004	2.4404	0.0776	1.6956	3.4679
p_Utest	0.00	0.25	0.28	0.00	0.01	0.47	0.05	0.00

This table presents the results of an analysis of the effect of firm size on the association between the level of dividend payout and earnings quality. Models M1-M8 replicate the same regressions as in Table 2.A, using Eq. (4), while we introduce *Size* as a moderator variable. Models M1-M4 use dividend payout ratios *Div<sub>p</sub>* as dividend level measure, whereas, models M5-M8 are performing with dividend yield ratios *Div<sub>y</sub>* as dividend level measure. Continuous and unbounded variables are winsorized at the top and bottom 1% level. Refer to the Appendix for detailed definitions of all variables used in this analysis. All regressions include industry and year-fixed effects. All associated *p-values* reported in parentheses below parameter estimates are computed based on standard errors adjusted for heteroskedasticity and firm-level clustering. Significance levels are denoted as \*\*\* (1%), \*\* (5%), and \* (10%). N is the number of observations, and AdjR<sup>2</sup> is the adjusted R-squared. The method of Lind and Mehlum (2010) is used to test the presence of an (inverse) U-shaped relationship for every regression. The t-value and the p-value of the test are reported as well as the extreme point of the shape of the relationship.

**Table 5: Alternative tests of dividend policy and earnings persistence**

Dependent variable	M1	M2	M3	M4	M5	M6	M7	M8
	<i>Div = Div_p</i>				<i>Div = Div_y</i>			
	$NI_{t+1}$							
$NI_t$	0.7157*** (18.28)		0.6928*** (16.68)		0.7372*** (19.33)		0.7143*** (17.62)	
$PAAE_t$		0.7746*** (18.83)		0.7549*** (17.29)		0.7933*** (19.96)		0.7738*** (18.25)
$AA_{JK_t}$		0.3528*** (7.19)		0.3203*** (6.28)		0.3679*** (7.49)		0.3355*** (6.58)
$Div$	0.0320*** (4.34)	0.0341*** (4.73)	0.1129*** (5.21)	0.1194*** (5.71)	0.4825*** (4.48)	0.5500*** (5.16)	1.7437*** (6.32)	1.7215*** (6.30)
$Div^2$			-0.1094*** (-4.16)	-0.1180*** (-4.68)			- 24.7812*** (-6.04)	-23.3165*** (-5.72)
$Div \times NI_t$	0.6081*** (4.81)		1.2496*** (3.59)		2.1451*** (4.36)		6.2815*** (3.59)	
$Div^2 \times NI_t$			-1.0998** (-2.55)				- 33.3322*** (-2.37)	
$Div \times PAAE_t$		0.4469*** (3.55)		0.8445** (2.51)		0.1515*** (4.14)		3.2677*** (3.32)
$Div \times AA_{JK_t}$		1.0500*** (6.46)		2.3860*** (5.75)		7.2075*** (3.86)		20.6193*** (3.91)
$Div^2 \times PAAE_t$				-0.6785 (-1.64)				-10.462 (-0.19)
$Div^2 \times AA_{JK_t}$				-2.2192*** (-4.31)				-209.9162*** (-2.87)
Ind. & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5920	5920	5920	5920	5920	5920	5920	5920
AdjR <sup>2</sup>	0.4877	0.5007	0.4916	0.5051	0.4822	0.4963	0.4863	0.5009

This table presents alternative tests of dividend policy and earnings persistence. Model M1 reports results of the re-estimation of the Eq. (3):  $NI_{j,t+1} = \alpha_{0,j} + \alpha_{1,j}NI_{j,t} + \varepsilon_{j,t}$ , by including the dividend variable,  $Div$ , and an interaction variable between the dividend and the current earnings  $Div \times NI$ . Model M2 reports results where we break out current earnings  $NI$  into two components of pre-abnormal accruals earnings  $PAAE$  and abnormal accruals, calculated from the performance-adjusted modified Jones (1991) model by Kothari et al. (2005),  $AA_{JK}$ . Models M3-M4 propose a nonlinear specification test replicating M1-M2 and introducing the squared dividend level  $Div^2$ . Models M1-M4 and M5-M8 use respectively dividend payout ratios  $Div_p$  and dividend yield ratios  $Div_y$  as dividend level measures. Continuous and unbounded variables are winsorized at the top and bottom 1% level. Refer to the Appendix for detailed definitions of all variables used in this analysis. All regressions include industry and year-fixed effects. All associated  $p$ -values reported in parentheses below parameter estimates are computed based on standard errors adjusted for heteroskedasticity and firm-level clustering. Significance levels are denoted as \*\*\* (1 %), \*\* (5 %), and \* (10 %). N is the number of observations, and AdjR<sup>2</sup> is the adjusted R-squared.



**Figure 1: Dividend – Earnings Quality Association**

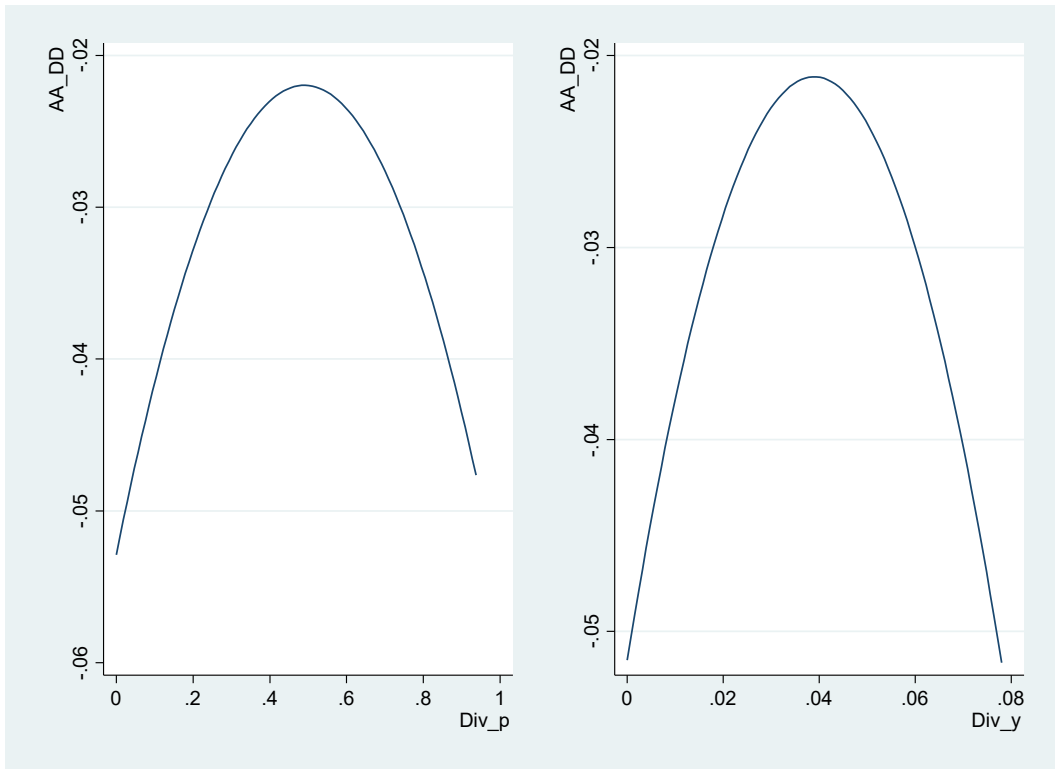


Figure 1 shows the inverted-U relationship between dividend levels, measured by the dividend payout ratios  $Div_p$  for the left-hand diagram, and by dividend yield ratios  $Div_y$  for the right-hand diagram, and earnings quality based on abnormal accruals  $AA_{DD}$  determined by the modified Dechow and Dichev (2002) model by McNichols (2002).

**Figure 2: Dividend – Earnings Quality Association by Dividend Volatility**

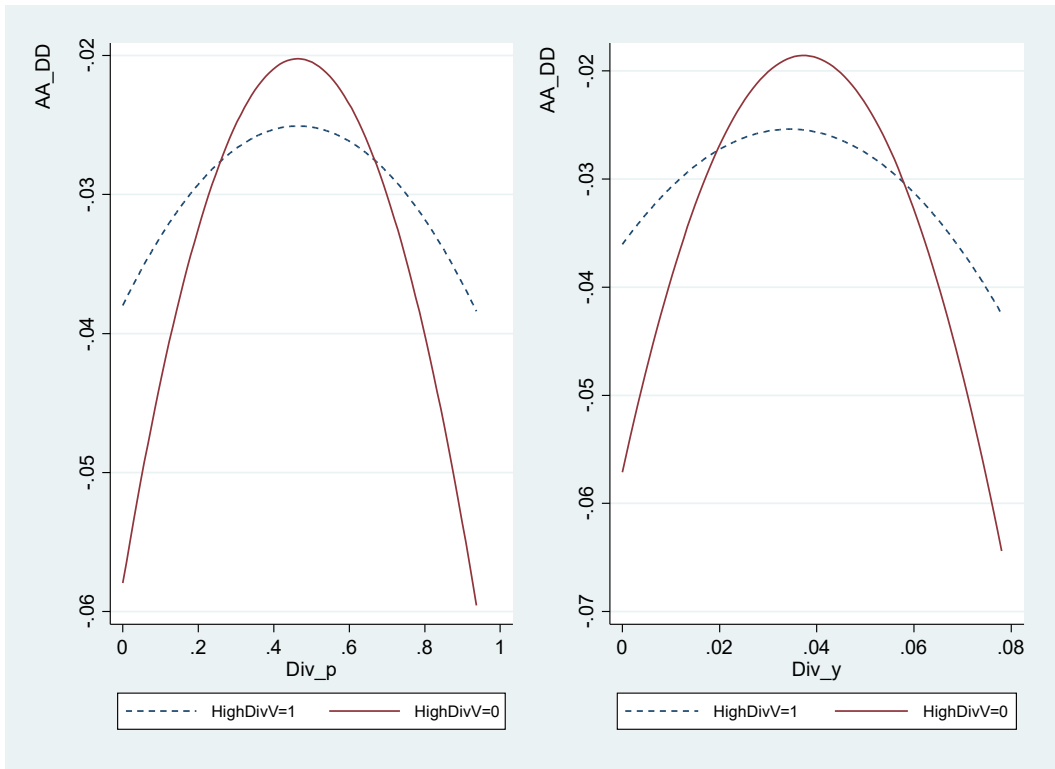


Figure 2 shows the moderating effect of dividend volatility on the inverted-U relationship between dividend levels, measured by the dividend payout ratios  $Div_p$  for the left-hand diagram, and by dividend yield ratios  $Div_y$  for the right-hand diagram, and earnings quality based on abnormal accruals  $AA_{DD}$  determined by the modified Dechow and Dichev (2002) model by McNichols (2002).  $HighDivV$  variable takes the value of 1 if a dividend payer is above the median dividend volatility for each year, and 0 otherwise.