

Discussion—Reactions to Dividend Changes Conditional on Earnings Quality

DORON NISSIM*

Corporate disclosures are an important source of information for investors. Many studies have documented strong price reactions to earnings, dividends, and other corporate announcements. For dividend announcements, the price implications appear straightforward: price is the present value of expected future dividends. Hence, to the extent that future dividends are related to current dividends, dividend changes should trigger price responses. Other corporate disclosures, such as earnings, may also be viewed as proxies for future dividends.

The price reaction to a particular disclosure should increase in the difference between the implied equity value based on that disclosure and price prior to the disclosure. The magnitude of price reaction should also increase in the precision of the disclosure and decrease in the precision of all prior price-related information (see, e.g., Holthausen and Verrecchia [1988]). Mikhail, Walther, and Willis (2003, MWW) test this precision effect focusing on dividend disclosures and using “earnings quality” (the association between future cash flow and past earnings) as a proxy for the precision of prior information.

In particular, MWW test whether the magnitude of price reactions to dividend change announcements is negatively related to earnings quality. They also use revisions in analysts’ earnings forecasts as an alternative proxy for the change in expected cash flows triggered by the dividend change announcement. For dividend increases, MWW find that the magnitudes of both price reactions and revisions in analysts’ earnings forecasts are negatively related to earnings quality. For dividend decreases, however, they find insignificant results.

The hypothesis that MWW test is simple, intuitive, and well established in the analytical literature. Their focus on dividend change announcements is also justified. Analytically, dividends are linked directly to stock prices, and empirically, dividend changes appear to convey relevant information to investors, as is evident by the significant price reactions (e.g., Aharony and Swary [1980]; Asquith and Mullins [1983]) and by the change in expected future earnings (e.g., Ofer and Siegel [1987]; Nissim and Ziv [2001]). Therefore, the research question is relevant. As discussed below, however, I have some concerns regarding the analysis, pri-

*Columbia University, Graduate School of Business
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marily the choice and measurement of the empirical proxies. I focus on issues that have implications for future research.

1. The Measure of Earnings Quality

Users of the financial statements differ in their views regarding the meaning of the phrase “earnings quality” (see, e.g., Bricker, Previts, Robinson, and Young [1995]). Some associate earnings quality with accounting conservatism, arguing that the quality of conservatively determined earnings is higher because they are less likely to prove overstated in the light of future developments. Others describe reported earnings as having high quality when they accurately reflect underlying events and conditions. A third interpretation of earnings quality focuses on persistence, suggesting that earnings are of high quality when they are expected to recur. Persistence affects predictability, but it is not the only determinant of predictability. A fourth interpretation of earnings quality generalizes the persistence view and associates earnings quality with earnings predictability. MWW offer yet a fifth interpretation: high-quality earnings facilitate precise predictions of future operating cash flows. In particular, MWW measure earnings quality as the adjusted R^2 from regressions of future cash flows on current earnings. They also estimate models that include lag values of earnings and separate reported earnings into components.

While MWW’s interpretation of earnings quality may be debatable, it is consistent with the hypothesis that they test. However, I have two concerns regarding the measurement of the empirical proxy. The first issue is the use of R^2 to measure the extent of information in earnings about future cash flows. The R^2 indeed decreases in the variance of residual future cash flows (i.e., future cash flows that can not be explained by current earnings), but it also increases in earnings variability. To see this, consider the following illustration. Assume that, on average, every dollar of earnings (e) is associated with a dollar of subsequent cash flows (cf); that is,

$$cf_{t+1} = e_t + \varepsilon_{t+1}, \quad (1)$$

where $E(cf_{t+1}|e_t) = e_t$. The R^2 from a time series regression of cf_{t+1} on e_t is

$$R^2 = \frac{\text{var}(e_t)}{\text{var}(e_t) + \text{var}(\varepsilon_{t+1})}. \quad (2)$$

Thus, as long as $\text{var}(\varepsilon_{t+1})$ is positive, the R^2 *increases* in $\text{var}(e_t)$. It would be difficult to argue that higher earnings volatility implies higher earnings quality.

The above illustration assumes that the slope and the residual variance of eq. (1) are cross-sectional constants. Of course, both parameters may vary in the cross section. If earnings variability is correlated with the parameters in a particular way (for example, if firms with high earnings variability have high residual variance or

a small slope), the relationship between R^2 and earnings variability could still be negative.

My second concern deals with estimation error. MWW measure earnings quality using the R^2 from regressions that include between two and thirteen parameters. The number of observations per regression ranges between 10 and 15 (depending on the model). With so many parameters relative to the number of observations, the reliability of the R^2 estimates is questionable. The econometric literature provides no clear benchmark for the minimum number of observations per parameter that yields acceptable reliability, but a rule of thumb that is often used is a minimum of five degrees of freedom per parameter.

2. Common Information

As MWW hypothesize, the magnitude of price reaction to a corporate disclosure should increase in the precision of the price-related information contained in the disclosure and decrease in the precision of prior price-related information. However, the magnitude of price response is also related to the “overlap” in the new and old information. For example, if dividend-increasing firms typically experience high earnings in the years prior to the dividend change (see, e.g., Benartzi, Michaely, and Thaler [1997]), the market reaction to dividend increase announcements may be weak even if dividend increases are good indicators of firm value, because price already reflects the strong past earnings performance. On the other hand, if the dividend change contains unique price-related information, it may trigger a relatively strong market response even if its precision is low relative to that of the nondividend information. The analytical studies cited in MWW recognize this common information effect and show that the magnitude of price reaction should decrease in the extent to which the new and old information releases are substitutes (see, e.g., Holthausen and Verrecchia [1988]).

In the context of MWW’s analysis, this concern is important only if the degree of common information varies in the cross section in a way that is correlated with any of the explanatory variables. The example in the previous paragraph suggests that such correlation is plausible. Dividend increases by firms that experienced high and persistent past earnings (and therefore have high “earnings quality”) may contain more common information than other dividend increases. As a result, earnings quality may proxy for the extent of common information (in the dividend change and prior information) in addition to the precision of prior information.

3. Earnings Versus All Available Information

MWW use their proxy for earnings quality as a measure of the precision of all prior information. While I have some concerns regarding the construction of this proxy (discussed above), it is not clear to me that even a perfect proxy for earnings quality is positively related to the precision of prior information. Financial information is not the only source of information available to investors, and re-

ported earnings may be a poor proxy even for financial information, as the financial statements and accompanying footnotes contain many additional items besides current year earnings.

MWW attempt to mitigate concerns regarding the construct validity of their earnings quality measure by showing (in the sensitivity section) that it is positively related to the earnings response coefficient (ERC). While such evidence may mitigate concerns regarding the construct validity of the earnings quality measure, it also demonstrates the availability of other, potentially better, proxies for the precision of financial information, namely, the ERC itself or the variance of earnings announcement returns relative to the variance of non-announcement returns. Both constructs have the advantage over the MWW's measure of earnings quality that they use price information in assessing the extent of price-related information in earnings. The second construct has the additional advantage that it measures the price implications of all the financial information disclosed on the earnings announcement date, not only bottom line earnings.

4. Control Variables

MWW assume that dividend per share follows a random walk, and hence they measure the unexpected change in dividends as the total change in dividend per share. This is a strong assumption that, for the reasons discussed below, is not likely to hold. In fact, MWW only need to assume that the control variables included in the regression (such as size and the dividend yield) fully capture the expected change in dividends. However, this implies that the regressions should include all variables that have been shown to predict dividend changes.

Capturing the expected change in dividends is not the only reason for including control variables. The market reaction to a dividend change announcement depends not only on the size of the unexpected component of the dividend change, but also on the implications of the change for expected cash flows. Studies have suggested several explanations for the effect of dividend changes on expected cash flows. MWW control for some of the explanations, but not for all of them.

Besides the variables that MWW include, additional predictors of either the dividend change or the market response to the unexpected component of the dividend change are as follows.

4.1 Earnings or Cash Flows Prior to the Dividend Change

Firms are more likely to increase dividends when they experience high profits or cash flows (see, e.g., Benartzi, Michaely, and Thaler [1997]). Hence, firm-specific measures of profitability, or economywide measures of performance (for example, the rate of change in the industrial production index), are likely to contain information about the expected change in dividends.

4.2 Inflation Prior to the Dividend Change

In periods of inflation, firms may be expected to increase dividends to preserve the real dividend. Hence, the inflation rate prior to the dividend change is likely to be positively related to the expected dividend change (see, e.g., Bernheim and Wantz [1995]).

4.3 Personal Tax Rates

Paying dividends increases the portion of stock returns subject to high-rate dividend taxes and decreases the portion subject to low-rate capital gains taxes. Thus, all else equal, the expected change in dividends should decrease in the wedge between the dividend and capital gains tax rates. Moreover, several studies have demonstrated that the signaling benefit of dividends (and hence the dividend announcement return) depends on personal tax rates (e.g., Bhattacharya [1979]; Bernheim and Wantz [1995]; Kemsley, Nissim and Williams [2002]). During MWW's sample period, there was substantial variation in personal tax rates.

4.4 Price per Share

Bajaj and Vijh (1990, 1995) document that price reactions to dividend changes are larger for low-priced stocks. They suggest this relationship is due to low price shares having larger transaction costs, which leads to less information production activities by investors and thus to relatively more information being conveyed by dividend change announcements.

Although the above variables (and those included in MWW) help predict the expected dividend change and the price reaction to the dividend change, they are not likely to be the only predictors. Therefore, to further control for omitted factors, one may include industry and time (annual, quarterly, or monthly) dummy variables. To the extent that the average effect of omitted factors varies across industries or over time, the inclusion of such qualitative control variables may improve power and mitigate potential bias. Indeed, time dummy variables would span the personal tax rates as well as all other economywide variables.

5. The Deflator of the Dividend Change Variable

In the conference (current) version of their paper, MWW deflated the dividend change variable by the prior dividend (preannouncement price). In their previous choice of deflator, MWW were not completely inconsistent with prior studies. While deflating the dividend change by price is more prevalent in the literature, deflating by the prior dividend is not uncommon. As I show below, however, deflating by price is likely to result in a more precise measure of the magnitude of the dividend change, at least in the context of announcement return regressions.

Although it no longer applies to MWW, I include this discussion because of its relevance for future research.

One approach to identify the appropriate deflator for the dividend change variable is to start with a model that relates price to current dividends, and then manipulate the equation to obtain the relation between stock returns and dividends. The Gordon (1962) model, for example, specifies:

$$P_0 = \frac{1 + g}{r - g} D_0 \quad (3)$$

where P_0 is price per share at time zero, D_0 is the dividend per share at time zero, g is the expected growth rate in dividend per share, and r is the expected stock return. Thus, if g and r are constants, a dividend change announcement should trigger a price reaction that satisfies

$$\Delta P_0 = \frac{1 + g}{r - g} \Delta D_0 \quad (4)$$

where ΔP_0 is the change in price associated with the announcement of the dividend change ΔD_0 . Dividing both sides of the equation by price prior to the dividend change announcement (P_{-1}), we get:

$$r_0 \equiv \frac{\Delta P_0}{P_{-1}} = \frac{1 + g}{r - g} \frac{\Delta D_0}{P_{-1}} \quad (5)$$

where r_0 is the announcement return. Hence, if the dividend announcement does not change g or r , the appropriate deflator for the dividend change variable is the prior price.

The Gordon model may not provide a good description of the relationship between price and dividends, and dividend change announcements may also alter the expected rate of dividend growth or the expected return. However, even under less stylized models, one may expect the size of the price change to be related to the size of the dividend change, as is implicitly assumed when relating the announcement return to the price-deflated dividend change. In contrast, when the dividend change is deflated by the prior dividend, the announcement return is assumed to be proportional to the *rate* of change in dividend per share, independent of the *size* of the dividend change. So, for example, a firm that increases its dividend per share from 1 cent to 2 cents has the same value for the dividend change variable as that of a firm with the same price per share that increases its dividend from 10 cents to 20 cents. One may expect a stronger price reaction for the second firm.

To empirically evaluate the deflators, I sorted all changes in regular quarterly cash dividends from CRSP according to either the rate of change in dividend per share or the price-deflated dividend change. For each sorting, I constructed portfolios consisting of 50 consecutive observations. I then calculated the portfolios' mean values for the dividend variable and for the cumulative abnormal return

(CAR, cumulative stock return during days -1 , 0 , and 1 relative to the dividend declaration, minus the contemporaneous return on the CRSP value-weighted index). Panel a (panel b) of Figure 1 plots the mean CAR against the mean value for the rate of change in dividend per share (price-deflated dividend change). As shown, the relationship between CAR and the dividend change is substantially stronger and closer to linear when the dividend change is deflated by price. Regression analysis using the individual observations confirms these differences. The R^2 from a regression of CAR on the rate of change in dividend per share (price-deflated dividend change) is approximately 1 percent (5%), and the difference between the two R^2 measures is highly significant.

6. Use of Linear Specification

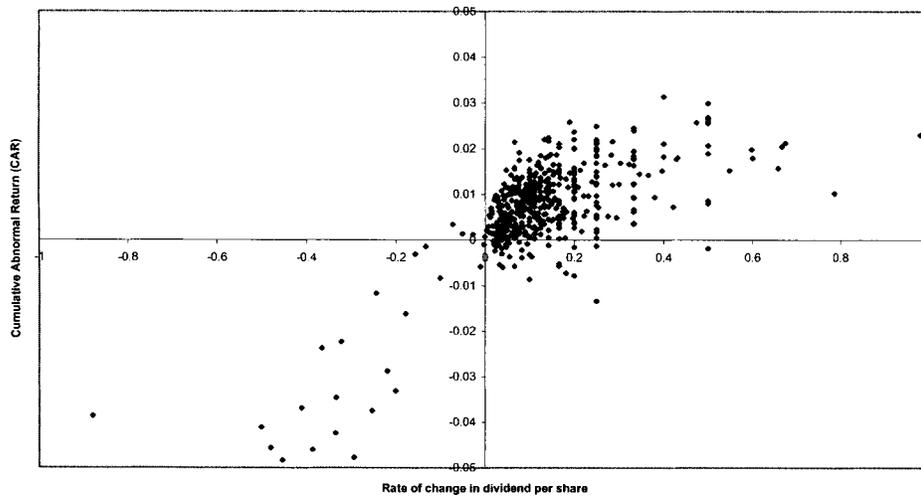
MWW state that their objective is to “investigate if market participants’ reactions to dividend changes are related to earnings quality.” To address this research question, MWW examine the relation between dividend announcement returns and earnings quality. An alternative approach is to examine the relation between the “dividend response coefficient” (i.e., the slope coefficient when regressing the announcement return on the dividend change) and earnings quality.¹ Although MWW’s choice is consistent with most previous studies that examine dividend announcement returns (exceptions include Bernheim and Wantz [1995]; Kemsley, Nissim, and Williams [2002]), the alternative approach seems more consistent with the research question, because the hypothesized earnings quality effect concerns the link between dividend changes and announcement returns rather than representing an independent effect on announcement returns.

Indeed, most previous studies that investigated the relation between the market reaction to earnings announcements and determinants of the information environment (an issue similar to the one addressed by MWW) use the alternative approach. That is, rather than regressing earnings announcement returns on the information environment variables, they examine the relationship between those variables and the earnings response coefficient.

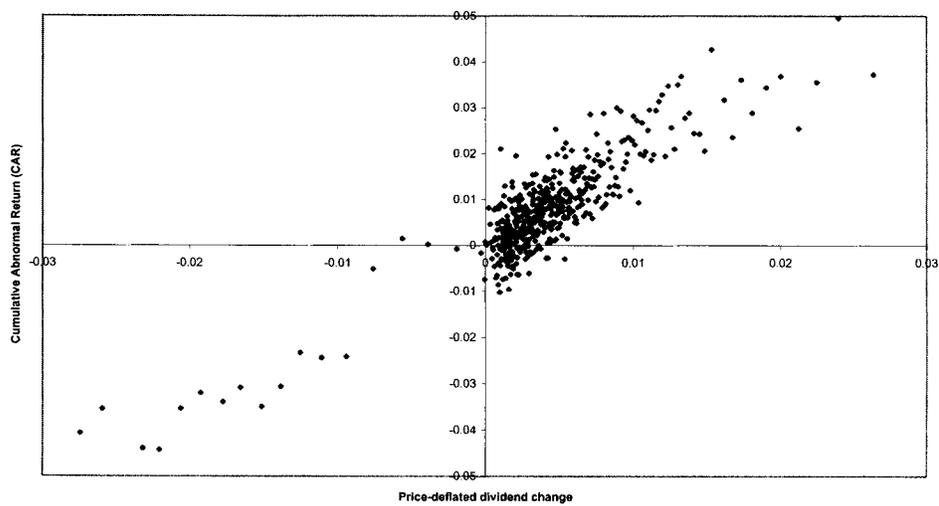
1. There are at least three different statistical procedures to implement this approach (see Kemsley, Nissim, and Williams [2002]): (1) a nonlinear regression of dividend announcement returns on the dividend change and control variables, where the dividend change coefficient is specified as a function of earnings quality; (2) a two-stage approach, where in the first stage, the dividend response coefficient is estimated for portfolios sorted by earnings quality, and in the second stage, the dividend response coefficient is regressed on the portfolios’ mean values for earnings quality and for the control variables; and (3) a two-stage approach, where in the first stage, the dividend announcement return is regressed on earnings quality and control variables for portfolios sorted by the dividend change, and in the second stage, the correlation between the coefficient on earnings quality and the portfolios’ mean values for the dividend change is examined. The second approach has the advantage over the third approach in that it is more consistent with the assumed causal effect, but the third approach facilitates a better control for interactions between the dividend change and the control variables (see Bernheim and Wantz [1995]).

FIGURE 1
Measurement of the Dividend Change Variable

(a) Deflating by prior dividend



(b) Deflating by prior price



7. Conclusion

Many studies in accounting and finance examine the price implications of corporate disclosures as well as other information releases. Although analytical research has recognized that the magnitude of price reaction should increase in the precision of the disclosure and decrease in the precision of all prior price-related information, most empirical studies do not explicitly account for this effect. MWW investigate this relative precision effect in the context of dividend change announcements and report supporting evidence. To the extent that their empirical proxies capture the underlying effects, MWW's results have implications for information research in general, and event studies in particular.

REFERENCES

- Aharony, J., and I. Swary. 1980. "Quarterly Dividend and Earnings Announcements and Stockholders' Returns: An Empirical Analysis." *Journal of Finance* 35:1–12.
- Asquith, P., and D. Mullins. 1983. "The Impact of Initiating Dividend Payments on Shareholders' Wealth." *Journal of Business* 56:77–96.
- Bajaj, M., and A. Vijh. 1990. "Dividend Clienteles and the Information Content of Dividend Changes." *Journal of Financial Economics* 26:193–219.
- . 1995. "Trading Behavior and the Unbiasedness of the Market Reaction to Dividend Announcements." *Journal of Finance* 50:255–279.
- Benartzi, S., R. Michaely, and R. Thaler. 1997. "Do Changes in Dividends Signal the Future or the Past?" *Journal of Finance* 52:1007–1034.
- Bernheim, D., and A. Wantz. 1995. "A Tax-Based Test of the Dividend Signaling Hypothesis." *American Economic Review* 85:532–551.
- Bhattacharya, S. 1979. "Imperfect Information, Dividend Policy, and the Bird in the Hand Fallacy." *Bell Journal of Economics* 10:259–270.
- Bricker, R., G. Previts, T. Robinson, and S. Young. 1995. "Financial Analyst Assessment of Company Earnings Quality." *Journal of Accounting, Auditing & Finance* 10:541–554.
- Gordon, M. 1962. *The Investment, Financing, and Valuation of the Corporation*. Homewood, Ill.: Irwin.
- Holthausen, R., and R. Verrecchia. 1988. "The Effect of Sequential Information Release on the Variance of Price Changes in an Intertemporal Multi-Asset Market." *Journal of Accounting Research* 26: 82–106.
- Kemsley D., D. Nissim, and M. Williams. 2002. "Taxes and the Information Content of Dividends." Working paper, Columbia University.
- Mikhail, M., B. Walther, and R. Willis. 2003. "Reactions to Dividend Changes Conditional on Earnings Quality." *Journal of Accounting, Auditing & Finance* 18(1) (this issue).
- Nissim, D., and A. Ziv. 2001. "Dividend Changes and Future Profitability." *Journal of Finance* 56: 2111–2133.
- Ofer A., and D. Siegel. 1987. "Corporate Financial Policy, Information, and Market Expectations: An Empirical Investigation of Dividends." *Journal of Finance* 42:889–911.