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Accurals quality and price synchronicity

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DEDICATION

I dedicate this dissertation to the three women who have influenced my life the most. First is my late mother whose memory reminds me to smile every once and a while. Second I dedicate this to my wonderful wife who supported me while going through the doctoral program. I would have never made it through this without her. Lastly, I dedicate this to my daughter who was born while writing this dissertation.

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ABSTRACT

This study examines the relation between accruals quality and price synchronicity, a measure of the relative amount of firm-specific information reflected in price. Higher accruals quality imply better quality earnings news, hence, more firm-specific information is incorporated into price for firms with higher accruals quality. More firm-specific information reduces price synchronicity, hence, we hypothesize a negative relation between accruals quality and price synchronicity. On the other hand, literature shows that accruals quality reduces idiosyncratic volatility which tends to be negatively correlated with price synchronicity. If the latter effects dominate the relation between accruals quality and price synchronicity, we should observe a positive relationship between accruals quality and price synchronicity. Controlling for idiosyncratic volatility, we find a significant negative relation between accruals quality and price synchronicity after controlling for idiosyncratic volatility. We investigate this further by partitioning the sample by analyst following. If earnings information complements analysts' information, we expect to find a stronger negative relation between accruals quality and price synchronicity for firms that are followed by analysts. If, on the other hand, earnings information and analysts' information are substitutes, we expect to find a stronger negative relation between accruals quality and price synchronicity for those firms that are not followed by analysts. We find that accruals quality has a greater impact on price synchronicity for firms with an analyst following compared to firm that do not have an analyst following. This is consistent with the notion that earnings information complements analyst information.

1. INTRODUCTION

This dissertation investigates the association between accruals quality (a measure of uncertainty contained in accruals in predicting future cash flows) and price synchronicity (a measure of the relative amount of firm-specific information reflected in price). We propose that high accruals quality reduces uncertainty contained in earnings in predicting future cash flows, accordingly, price should reflect more firm-specific information for firms with higher accruals quality. In an economy where firms have diverse firm-specific information, firms with relatively more firm-specific information will have a lower correlation between firm returns and market or industry returns (i.e. lower price synchronicity). Hence, this study predicts firms with higher accruals quality will lead to less price synchronicity due to relatively more firm-specific information being impounded into price.

Development of measuring accruals quality has come a long way. Earnings management literature suggests that managers will manage accruals opportunistically. The managed accruals (i.e. discretionary accruals) decrease earnings quality. Studies differ in measuring the discretionary accruals (Dechow et al. 1995; Jones 1991; DeAngelo et al. 1994; Healy 1985). Dechow and Dichev (2002, DD) suggest high quality accruals should reduce the uncertainty of predicting cash flows and develop a measure reflecting variation of accruals that are not mapped into cash flows. This measure has been used by many studies in investigating quality of accounting information and market factors. An especially important study is Francis et al. (2004) who find that DD's accruals quality measure has the largest cost of equity capital effects relative to other accounting and market based earnings attributes. Following Francis et al. (2004; 2005), many studies use DD's accruals quality measure. Accordingly, this study also focuses our results using DD's accruals quality measure.

The findings that high accruals quality reduces cost of capital may be viewed from the effect of reduced information uncertainty and reduced information asymmetry[1]. Theoretical studies (Coles et al. 1995; Easley and O'Hara 2004; Lambert et al. 2007, 2008), in general, suggest that reduction of information uncertainty (i.e. improved precision) reduces estimation risk, hence, reduces cost of capital. Some studies (Diamond and Verrecchia 1991; Easley and O'Hara 2004) also suggest that better disclosure quality reduces information asymmetry which decreases cost of capital. However, other studies argue that information asymmetry cannot be priced in a rational expectations setting and the effect of information asymmetry can be diversified away (Hughes et al. 2007; Lambert et al. 2008). In investigating the underlying reason for the relation between accruals quality on cost of capital, Bhattacharya, Ecker, Olsson and Schipper (2007) conclude that information precision drives this relationship. Their results are consistent with theoretical results of Lambert et al. (2008) who show that the effect of information on cost of equity capital is driven by the average information precision across investors rather than information asymmetry per se.

Studies also look at the effect of information quality on idiosyncratic volatility (also termed as idiosyncratic risk). From the perspective of average information quality, higher information uncertainty increases idiosyncratic volatility (Pastor and Veronesi 2003), hence, it is conceivable that higher accruals quality reduces a firm's idiosyncratic risk. This is documented by Cohen (2008) and Rajgopal and Venkatachalam (2008). Studies on private information collection (e.g. Kim and Verrecchia 1991b, 1991a, 1994) show that idiosyncratic volatility may increase when the precision of an information announcement is high. Accordingly, high accruals quality will stimulate more trading, hence, increase idiosyncratic volatility. Empirical studies in

[1] We refer to information asymmetry as the information asymmetry among investors instead of the information asymmetry between investors and managers. This is in the spirit of the theoretical literature we rely on. (e.g. Easley and O'Hara 2004; Lambert et al. 2008)

general find that accruals quality reduces idiosyncratic volatility, consistent with the argument that high accruals quality increases information precision.

Since Morck, Yeung and Yu (2000), a growing number of studies have used price synchronicity as an inverse measure of the relative amount of firm-specific information impounded in price. Price synchronicity is defined as "the extent to which market and industry returns explain variation in firm-level stock returns" (Piotroski and Roulstone, 2004, p1120). Measurement of price synchronicity is typically derived from R^2 of a market pricing model (e.g. the Capital Asset Pricing Model (CAPM)[2]). Firms displaying low stock return synchronicity imply that their price depends less on market movements because there is a greater amount of firm-specific information that market participants rely on. Many studies (e.g. Chari and Blair Henry 2008; Durnev et al. 2003; Piotroski and Roulstone 2004; Wurgler 2000) provide evidence supporting the firm-specific information interpretation of price synchronicity. We follow these studies and use a logarithmic transformation of the coefficient of determination adjusted for degrees of freedom[3] (R^2) from a modified model that includes current and lagged returns for market and industry indexes to indicate the relative amount of firm-specific information impounded in price (Piotroski and Roulstone 2004).

In theory, ceteris paribus, a firm with higher degree of firm-specific information impounded in price will increase the variation in stock prices unrelated to systematic variance, hence, report a lower R^2 from CAPM. However, the converse is not true. That is, lower R^2 does not necessarily mean a higher degree of firm-specific information. This is because noise (either

[2] In the CAPM, investors attempt to form portfolios that maximize their return for a given level of risk. Investors can accomplish this by fully diversifying their portfolios and holding what is equivalent to the market portfolio. One result of the CAPM is that the expected return on any given portfolio (which may be a single firm) is a linear function the expected market return. The slope coefficient is the ratio of the covariance of portfolio returns with the market return and the variance of the market return. This slope coefficient is termed the portfolio "beta" or the firm's "beta".

[3] Throughout the paper, we refer to the adjusted R^2 simply as R^2. Since within our data the number of parameters is the same across estimations and the number of observations are similar, the results are similar regardless of the measure used.

from the trading process or from non-information based trading) will also increase idiosyncratic volatility, hence, reduce R^2. Some studies question the validity of using R^2 (Ashbaugh-Skaife et al. 2006; Kelly 2007; Rajgopal and Venkatachalam 2008; Teoh et al. 2008; West 1988). Using many market performance measures and firm-specific characteristics, Teoh et al. (2008) concludes that low R^2 is more associated with noise than firm-specific information. Specifically, they find accruals quality is positive correlated with price synchronicity, which is more consistent with the noise explanation of R^2. This empirical finding implies that noise, rather than firm-specific information drives idiosyncratic volatility; hence, using R^2 to measure degree of firm-specific information will not be valid if noise is not controlled.

In the CAPM setting, expected return (cost of capital) captures the systematic covariation between firm return and market return. This covariation (i.e. market beta, e.g.) is positively correlated with R^2. Francis et al (2004; 2005) document that accruals quality decreases cost of capital. These studies provide evidence that is consistent with the negative correlation between accruals quality and R^2. However, this connection is at best an indirect one. Firms may have similar cost of capital (i.e. similar beta) with very different R^2 because of either difference in noise or difference in firm-specific information that is impounded in price. This dissertation intends to directly document the association between accruals quality and price synchronicity through the aspect of firm-specific information.

We collect data from COMPUSTAT to estimate our accruals quality measures and data from CRSP to estimate price synchronicity. We use IBES data to identify analyst following. Our data requirements for accruals quality limit us to industries with at least 20 firms and firm with at least 7 years of accounting data. We also require each firm-year to have at least 45 weeks of returns data to estimate price synchronicity. Our sample has 33,771 observations across 15 years (1993 to 2007). We regress price synchronicity on accruals quality and control variables including idiosyncratic volatility and important firm characteristics, identified by previous

literature, that affect price synchronicity. We find accruals quality is negatively correlated with price synchronicity, consistent with our prediction that accruals quality increases information precision which in turn increases firm-specific information. Our findings are robust to using different accruals quality measures, taking into account the endogeneity of accruals quality choice, and including the Fama French (1992, 1993) factors in our model to estimate price synchronicity.

Following Francis et al. (2005) we also examine the association of the innate and discretionary components of accruals quality with price synchronicity. The innate component reflects the intrinsic features of a firm related to information uncertainty while the discretionary component represents noise or firms' opportunistic choices to either fool the market or to reveal private information (Francis et al. 2005). Francis et al. (2005) find innate accruals quality largely explains decreases in cost of capital, similarly, we find that innate accruals quality is consistently negatively related to price synchronicity. We find little evidence of a negative relation between the discretionary component of accruals quality and price synchronicity. If managers act opportunistically and the market is efficient, then we should find no relation between price synchronicity and discretionary accruals quality. If the market cannot or does not distinguish the innate and discretionary components of accruals quality, then we should find a negative relation between price synchronicity and the discretionary component of accruals quality. If managers use discretionary accruals to convey information, then we should find a positive association between price synchronicity and the discretionary component of accruals quality. Our results are consistent with some managers acting opportunistically and others attempting to convey information or that the market ignores the discretionary component.

We partition the sample into firm-years that have an analyst following at the time of the earnings announcement and those that do not. If earnings information complements analysts' information, then accruals quality should be more negatively related to price synchronicity when

firms have an analyst following. If earnings information and analysts' information are substitutes, then accruals quality should be more negatively related to price synchronicity for firms that are not followed by analysts. We find that accruals quality is significantly negatively related to price synchronicity for only the firms that are followed by analysts. When we examine the innate component of accruals quality, we find that the relation between accruals quality and price synchronicity is negative for both groups and is more negative for the firms that have an analyst following. We find the discretionary accruals component tends not to be significantly different from zero in both groups. Our results suggest that precision in earnings information complements analysts' information.

We also test if the relation between accruals quality and price synchronicity is sensitive to the regulatory changes brought about by Regulation Fair Disclosure (Reg. FD). We find innate component of accruals quality is more negatively related to price synchronicity in the pre-Reg. FD period whereas the discretionary component of accruals quality is more negatively related to price synchronicity in the post-Reg. FD period. The Reg. FD results are consistent with investors getting firm-specific information that complements earnings information through private communication with managers. When managers stopped disclosing information via private communications, the discretionary component of accruals quality conveyed more firm-specific information than before. Additionally, the Sarbanes-Oxley act (SOX) was past shortly after Reg. FD. During this period, earnings management via discretionary accruals decreases. Therefore, the discretionary component likely reflects relatively more firm-specific information in the post-Reg. FD period.

This dissertation contributes to the growing literature in several aspects. First, we document the importance of accruals (earnings) quality from the aspect of firm-specific information. Previous literature has shown accruals quality reduces cost of capital and reduces idiosyncratic risk. This is the first study (to our best knowledge) to show that higher accruals

quality leads to more firm-specific information impounded into price. We show that this is more than just a manifestation of the the impact of accruals quality and the firm's CAPM Beta. Second, concurrent literature reports a positive relationship between accruals quality and R^2; hence, the literature suggests price synchronicity is not a good indicator of firm-specific information. Conversely, we find lower price synchronicity is associated with higher accruals quality implying that lower price synchronicity is likely to be a good indicator reflecting more firm-specific information being impounded into price. We suggest continuing use of price synchronicity to measure firm-specific information; however, noise should be controlled to get stable results. Third, we document the difference in the relation between accruals quality and price synchronicity for firms that are followed by analysts and firms that are not and find evidence that earnings information is complementary to analysts' information. This complementary role implies that analysts can improve information quality especially when firms improve their reporting quality. Some researchers or policy makers may argue that investors can rely on intermediaries to improve on earnings information when earnings information is of poor quality, our results contradicts this conjecture.

The results of this study should be interesting to both academics and regulators. We provide some evidence consistent with price synchronicity being a measure of the relative amount of firm-specific information reflected in price. The evidence in the present study adds to the internal validity of studies using price synchronicity as a measure of firm-specific information. These studies include investigation of the adoption of International Financial Reporting Standards, which regulators in the U.S. are interested in, considering the eminent convergence of U.S. GAAP and international standards.

The rest of the paper continues as follows. Section 2 provides the background and a review of relevant literature. Section 3 develops our hypotheses. Section 4 describes the sample and

section 5 provides the empirical analysis. In Section 6 we provide some sensitivity analysis. Section 7 provides concluding remarks.

2. BACKGROUND AND LITERATURE REVIEW

In this section we review the literature related to the study. We first describe the theory that underlies price synchronicity. We then discuss the development of accruals quality. Next, we outline the theory on the market consequence of improved earnings quality. Following that, we discuss the empirical findings of the market consequences of improved accruals quality. We then discuss the empirical findings related to price synchronicity and its current application in accounting research. We end with a discussion of earnings quality and analysts information.

2.1 The Theory of Price Synchronicity

In this subsection we describe the theory that underlies price synchronicity developed in prior literature. We first define price synchronicity. We then explain how price synchronicity captures the relative degree of firm-specific information impounded in prices.

Consistent with Durnev et al. (2003), Piotroski and Roulstone (2004) define stock return synchronicity[4] as "the extent to which market and industry returns explain variation in firm-level stock returns" (pg 1120). Morck et al. (2000) attributes the idea that the lack of explanatory power indicates more firm-specific information to Roll (1988). They note: "as Roll (1988) makes clear, the extent to which stocks move together depends on the relative amounts of firm-level and market-level information capitalized into stock prices" (pg 216). We use Piotroski and Roulstone's definition and note that the explanatory power of market and industry indexes captures the relative amount of market, industry and firm-specific information impounded into prices.

While price synchronicity generally includes a market and an industry index, the logic behind the use of price synchronicity as a measure of firm-specific information can be shown in using the general case where firm returns are determined by multiple non-diversifiable factor and

[4] We use the terms stock return synchronicity and price synchronicity interchangeably.

firm-specific characteristics. The firm's risk premium[5] (the firm return above the return on a risk free asset) can be represented as[6]:

$$r_{i,t}^{*} = \beta_i \lambda_t^{*} + \gamma_i x_{i,t} + \omega_{i,t} \quad (1)$$

where $r_{i,t}^{*}$ is firm *i*'s risk premium, β_i is a vector of the firm's exposure to systematic risk factors, λ_t^{*} is a vector of factor risk premiums, γ_i is a vector of coefficients, $x_{i,t}$ is a vector of firm-specific characteristics[7] and $\omega_{i,t}$ is noise generated by the trading process. Under the CAPM, there is only one risk factor, market risk, and $\gamma = 0$. To the extent that a particular asset pricing model[8] is miss-specified, the error term from the estimation of the pricing model collects everything that is not contained in the model (i.e. $\varepsilon_{i,t} = \beta_i^{\#} \lambda_t^{\#} + \gamma_i x_{i,t} + \omega_{i,t}$ where $\beta_i^{\#} \lambda_t^{\#}$ are the risk factors and loadings that should be included in the model but are not and $\varepsilon_{i,t}$ is the error term from the asset pricing model).

One argument for using R^2 as a measure of firm-specific information is based on the omitted variables ($x_{i,t}$). If we assume that all relevant economic risk factors are included in our model but the firm lambda are not zero, the error term from the asset pricing model ($\varepsilon_{i,t}$) contains unobservable firm-specific factors. As relatively more of the firm-specific factors are incorporated into prices, the market beta is lower in magnitude and the lambda increase in magnitude. The increase in lambda increases the variance of the pricing model error which

[5] The theoretical literature on does not focus exclusively on firm risk premium *per se*, but uses related constructs such as current price or the cost of equity capital. While these construct differ, the implications for the effect of accruals quality on price synchronicity are similar.

[6] Hughes et al. (2007) presents similar model as a generic empirical specification for firm risk premium.

[7] The firm-specific characteristics could be public information (such as the firms reported earnings) or it could be private information (such as the results of the firm's research and development activities). Public information can be observed by anyone, whereas private information is only revealed through prices. In this respect, private information will always be an omitted variable.

[8] The asset pricing model could be the CAPM or it could be model that uses risk factors as explanatory variables. The particular pricing model commonly employed in the price synchronicity literature use a market index and an industry index.

decreases R^2. Further, the decrease in the market beta decreases the variance of the predicted value, which also decreased R^2.

As Roll (1988) notes, one problem with interpreting R^2 as a measure of firm-specific information arises because there is no easy way to separate the omitted variables from the error that is truly noise. While the omitted firm level variables can lead to deviations from the pricing model prediction, higher noise also increases the observed error which leads to the interpretation that lower R^2 is more a measure of noise rather than firm-specific information. Later we will discuss the empirical results that lend evidence to each interpretation.

2.2 Accruals Quality

In this subsection, we discuss the development of accruals quality. We begin with an example of accruals error. We then describe the Dechow and Dichev (2002) measure of accruals quality. We end with a description the innate and discretionary components of accruals quality.

When a firm makes a sale, the revenue is recorded in the year in which the merchandise is sold. If the customer pays cash, the transaction is complete. If the firm extends the customer a line of credit, the customer receives the merchandise now and pays when the invoice is due. Because the accounting equation (assets equal liabilities plus equity) must always balance, the firm opens an Accounts Receivable account (an asset) to offset the increase in Revenue (an equity account). When the customer eventually pays for the merchandise, the Cash account is increased and the Accounts Receivable account is decreased. If the customer pays the full amount owed, there is no problem. The problem arises when the customer is not able to pay the full amount. Firms often set up allowance accounts to reflect the fact that some customers will not pay their accounts in full. In setting up these allowance accounts, managers estimate how much customers will not pay in the future and this reduces the net income that is recorded for the period as well as the net value of the Accounts Receivables account. The extent to which the managers over/under estimate the allowance account represents the error in accruals.

Conceptually, accruals are used to adjust cash flows such that earnings reflect the performance of the firm. Dechow and Dichev (2002) argue that the role of accruals is to "shift or adjust the recognition of cash flows over time so that the adjusted numbers (earnings) better measure firm performance." (Page 35) When a firm makes a sale, there is no difference between whether the firm gets cash at the time of the sale or the firm gets the cash in the future (adjusting for time value) from a performance standpoint. However, there is uncertainty inherent when cash is collected in the future because the exact amount of cash that will be collected is unknown. This uncertainty creates noise in earnings and affords managers opportunities to manipulate earnings opportunistically (Healy and Wahlen 1999; Watts and Zimmerman 1986; Dechow and Dichev 2002).

Dechow and Dichev (2002) model the error in accruals and derive the measure of the quality of accruals that we use. They assume that accruals that are created in one year reverse in the next year. As a result, the accruals (or the change in non-cash working capital) for the current period can be expressed as a linear function of current, lag, and lead cash flows. Specifically, they show that their model is equivalent to:

$$\Delta WC_{i,t} = \alpha + \beta_1 OCF_{i,t-1} + \beta_2 OCF_{i,t} + \beta_3 OCF_{i,t+1} + \varepsilon_{i,t} \quad (2)$$

where,

$\Delta WC_{i,t}$ = changes in non-cash working capital for firm *i* in year *t*;
$OCF_{i,t}$ = operating cash flows for firm *i* in year *t*.

Dechow and Dichev (2002) show that as the estimation error in accruals increases, the standard error in equation (2) increases. They refer to this standard deviation as the quality of accruals[9]. In the discussion to Dechow and Dichev (2002), McNichols (2002) shows that adding the change in revenue and the level of gross property, plant, and equipment to this estimation

[9] The term "accruals quality" is used to describe this standard deviation by Ecker et al. (2006) and Francis et al. (2005) among others.

greatly improves the explanatory power of the model. We use the McNichols (2002) modification to the Dechow and Dichev (2002) model to measure accruals quality.

Dechow and Dichev (2002) show that accruals quality is related to several factors that make estimating accruals difficult. Francis et al. (2005) use Dechow and Dichev's (2002) results to decompose accruals quality into two components, innate and discretionary. The innate component should capture the accruals quality that is inherent in making accruals estimations whereas the discretionary component captures the uncertainty induced by manager's uncertainty. The innate accruals quality model we use is the one used by Francis et al. (2005):

$$AQ_{i,t} = \alpha_0 + \alpha_1 SIZE_{i,t} + \alpha_2 \sigma\left(\frac{OCF}{Assets}\right)_{i,t} + \alpha_3 \sigma\left(\frac{SALES}{Assets}\right)_{i,t} + \alpha_4 OC_{i,t} + \alpha_5 NEG_{i,t} + \varepsilon_{i,t} \quad (3)$$

The predicted value from equation (3) is the innate portion and the residual is the discretionary component.

2.3 Theory on the Market Consequences of Improved Earnings Quality

This subsection presents the theory on the market consequences of better earnings quality. The theoretical literature (see for example Easley and O'Hara 2004; Lambert et al. 2007, 2008) on the impact of earnings quality on the cost of equity capital relies on three streams of literature[10]. First is the estimation risk literature. Within this literature, investors must estimate the parameters of the distribution of future cash flows and this estimation create greater unconditional volatility in returns and therefore greater risk (Barry and Brown 1985; Brown 1979; Coles et al. 1995). The second stream is the rational expectations literature in which theorists examine the effect of private information on price formation (Grossman and Stiglitz 1980; Verrecchia 1982a) and the effects of public information on the collection of private

[10] A fourth stream of literature that is sometimes referenced is the incomplete information model of Merton (1987). In this model, investors under diversify because they are unaware of some firms in the market. While improving disclosure quality in general may have an indirect effect by making more investors aware of the firm, it is more difficult to argue that earnings quality alone make investors more aware of a firm's existence.

information (Verrecchia 1982b, 1982a; Kim and Verrecchia 1991a). The last stream focuses on the effects of disclosure on cost of capital through adverse selection costs (Kyle 1985; Diamond and Verrecchia 1991).

In contrast to the traditional CAPM, the estimation risk literature examines the consequences of allowing the parameters of the distribution of future returns to be unknown. Brown (1979) relaxes the assumption of known parameters and shows that if investors have an unbiased estimate of the parameters of the future returns distribution, then expected returns and market betas are the same as they would be under the CAPM. In a similar setting, Barry and Brown (1985) allow firms to have differential amounts of information by varying the age of the firms. They show that a firm with a shorter time-series of information will have a higher market beta than it would in an environment where all firms had the same amount of information. Using a model base on future payoffs rather than returns, Coles et al. (1995) find that the results from Barry and Brown (1985) hold for the more general case when the mean and covariance matrix are unknown under a multi-period model. This literature suggests that firms that have more information will have lower betas than firms with less information available. This provides a foundation for future theory about earnings quality and market betas (see for example Easley and O'Hara 2004; Lambert et al. 2007, 2008).

Researchers use a rational expectation setting to investigate how information is reflected in price. Grossman and Stiglitz (1980) show that if prices fully reflect all information, then there is no incentive to invest in costly private information. This proves to be a paradox because if there is no incentive to collect private information, then no investor collects it and it cannot be reflected into prices. Thus no information is reflected in prices. Verrecchia (1982a) solves this problem by adding uncertainty to the supply of stock such that prices only partially reveal private information which makes prices noisy. When prices are noisy, investors cannot infer perfectly all the information in prices. Hence, investors will acquire private information. As the noise in

prices reduces, investors will invest less in private information when private information is costly and observing price is costless. Verrecchia (1982b) extends this logic to show that increasing the quality of public disclosure decreases private information collection. Along the same lines, Diamond (1985) shows that public disclosures can be cost effective because investors abstain from costly private information collection in the presence of public disclosure. Kim and Verrecchia (1991b, 1991a) examine the market reaction to earnings announcements and find that the variance of the change in price is increasing with the precision of the announcement but decreasing with the precision of investors' private information. Collectively, these studies suggest that firms with better earnings quality will have less idiosyncratic volatility as less private information is incorporated into price.

Using a rational expectations setting, studies have examined the effects of information quality on the cost of equity capital. Easley and O'Hara (2004) provide a model in which there are two groups of investors, uninformed, who only rely on public information, and informed, who have both public and private information. They argue that better disclosure quality reduces the information asymmetry between investors. Lambert et al. (2008) show that this effect is due to disclosures increasing the average quality of information rather than information asymmetry, *per se*. They argue that information asymmetry can only be priced in a setting similar to Kyle (1985), not in a rational expectations setting because the effect of information asymmetry can be diversified away. This suggests that information asymmetry alone will not affect systematic volatility but may affect idiosyncratic volatility. Later we discuss the literature on earnings quality in a Kyle (1985) type model.

Lambert et al. (2007) presents a model that captures the salient features of the models from the rational expectations and estimation risk literatures within a rational expectations framework. They present the expected firm risk premium as:

$$
\begin{aligned}
E(\tilde{R}_j \mid \Phi) - R_f &= [E(\tilde{R}_M \mid \Phi) - R_f]\beta_j \\
&= \frac{E(\tilde{R}_M \mid \Phi) - R_f}{Var(\tilde{R}_M \mid \Phi)}[Cov(\tilde{R}_j, \tilde{R}_M \mid \Phi)] \\
&= \frac{E(\tilde{R}_M \mid \Phi) - R_f}{Var(\tilde{R}_M \mid \Phi)} \frac{1}{P_j P_M}[Cov(\tilde{V}_j, \sum_{k \neq j} \tilde{V}_k \mid \Phi) + Cov(\tilde{V}_j, \tilde{V}_j \mid \Phi)]
\end{aligned} \tag{4}
$$

Where $\tilde{R}_j$ is the uncertain return for firm j, $\tilde{R}_M$ is the uncertain return for the market, $\tilde{V}_j$ ($\tilde{V}_m$) is the uncertain cash flow for the firm (market). R_f is the risk free return and Φ is the information set that investors use to condition their beliefs about future returns on. β_j is the firms market beta. P_j (P_M) is the current price of the firm (price of the market portfolio). The estimation risk literature is allowing uncertainty in the parameters of the future returns and Φ is then the investors' best guess at what those parameters are. The rational expectations literature captures how Φ differs across investors.

If we let $\Phi = \tilde{Z}_j = \tilde{V}_j + \tilde{\eta}_j$, where $\tilde{Z}_j$ is an earnings report then we have:

$$
Cov(\tilde{V}_j, \sum_{k \neq j} \tilde{V}_k \mid Z_j) = \frac{Var(\eta_j)}{Var(Z_j)} Cov(\tilde{V}_j, \sum_{k \neq j} \tilde{V}_k) \tag{5}
$$

As the ratio of the variance of the error in earnings relative to the variance of earnings ($Var(\eta_j)/Var(Z_j)$) decreases then the conditional covariance moves closer to the unconditional covariance and, as a result, market beta moves closer to zero. As accruals quality increases, the ratio of the variance of the error in the earnings signal to the variance of the signal itself decreases which in turn decreases the magnitude of the market beta. As the magnitude of the market beta decreases, systematic volatility decreases. If the firm's idiosyncratic volatility is held constant, price synchronicity declines. Therefore, we should expect firms with better accruals quality to have lower price synchronicity because the precision of their information about future cash flow is relatively better.

Theory also suggests that earnings quality affects factor risk premiums. Hughes et al. (2007) argue that more information asymmetry increase the factor risk premiums, but has no effect on the factor weights. If accruals quality decreases information asymmetry, then it is conceivable that the market risk premium decreases as accruals quality increases. Yee (2006) show that earnings quality can reduce the cost of equity capital within a consumption CAPM setting because poor earnings quality magnifies fundamental risk. He shows that the market risk premium has both an idiosyncratic portion, which is diversified away in large economies, and a systematic portion that is non-diversifiable. Both Hughes et al. (2007) and Yee (2006) suggest that the market risk premium decrease as earnings quality increases. Within our study, this suggests that, across time, accruals quality may be related to systematic volatility through the variation in market returns.

Kyle (1985) and Glosten and Milgrom (1985) stemmed a line of research that focuses on liquidity and how earnings announcements affect information asymmetry. These models use a secondary market setting where trade by both informed and uninformed investors is conducted through a market maker. When investors are more informed, the market maker faces higher adverse selection costs and increases the bid-ask spread in response. Higher bid-ask spreads increase the firm's cost of equity capital. Diamond and Verrecchia (1991) show that disclosure reduces information asymmetry, in general. On the other hand, Kim and Verrecchia (1994) and McNichols and Trueman (1994) argue that increased disclosure quality can increase information asymmetry. Kim and Verrecchia (1994) show that if there are investors with superior ability to interpret information, providing higher quality earnings increase information asymmetry. McNichols and Trueman (1994) argue that investors will gather more private information in anticipation of an earnings announcement, thus increasing information asymmetry. These studies suggest that while better accruals quality decreases information asymmetry in general, better accruals quality may increase information asymmetry, leading up to an earnings announcement.

As investors collect more information, idiosyncratic volatility increases. The effect of earnings quality in Diamond and Verrecchia (1991) would suggest that greater accruals quality would decrease idiosyncratic volatility because less private information is being collected. The results from Kim and Verrecchia (1994) and McNichols and Trueman (1994) suggest that accruals quality would increase idiosyncratic volatility because more private information is being collected.

Pastor and Veronesi (2003) models a firm's market-to-book ratio and shows that uncertainty in profitability increases the firms idiosyncratic volatility. In their model uncertainty about market values induces volatility because investors disagree about what the true price is. As uncertainty is resolved, prices converge to their underlying values. To the extent that accruals quality captures uncertainty in profitability, higher accruals quality decreases idiosyncratic volatility. This is contrary to the relation predicted by Kim and Verrecchia (1991b, 1991a, 1994).

The differences in the prediction of the relation between idiosyncratic volatility and accruals quality can be reconciled as follows. From Pastor and Veronesi (2003), we conclude that accruals quality should decrease idiosyncratic volatility. From Kim and Verrecchia (1991b, 1991a, 1994) we conclude that that better accruals quality increases idiosyncratic volatility. Initially, when investors are uncertain the fundamental value of the firm, they have different beliefs as to what the price should be. They trade because they hold different beliefs and this trade increases idiosyncratic volatility. If earnings are more likely to reveal the fundamental value of the firm, traders with low information collection costs will benefit by collecting private information about firm in order to profit from the announcement. Thus, firms with high accruals quality has may have higher or lower idiosyncratic volatility. Regardless of the relation between accruals quality and idiosyncratic volatility, accruals quality and systematic volatility is always predicted to have a non-positive relationship. Thus, we explicitly control for idiosyncratic volatility.

2.4 Empirical Findings on the Market Consequences of Improved Accruals Quality

This subsection provides some of the empirical findings on the market consequences of improved accruals quality. We first discuss evidence that accruals quality affects cost of equity capital, both directly and through information asymmetry. We then talk constructing a risk factor from accruals quality portfolios and whether it is a priced risk factor. We end by discussing evidence that suggests that accruals quality only affects idiosyncratic volatility.

Empirical evidence supports the theory of Lambert et al. (2007, 2008) and Easley and O'Hara (2004) that better quality earnings decrease a firm's cost of capital. Francis et al. (2004) examine the effects of different earnings attributes on the cost of equity capital. They find better quality earnings reduce cost of equity capital in general. They also find that the accruals quality measure of Dechow and Dichev (2002) has the greatest impact on cost of equity capital and they argue that this is because "accruals quality captures variation in the mapping of earnings into operating cash flows, a key element of the pay-off structure that is of interest to investors" (Francis et al. 2004).

Empirical studies further investigate the relationship between the Dechow and Dichev (2002) measure of accruals quality and cost of capital. Francis et al. (2005) decomposes accruals quality into innate and discretionary components and find that the innate component has a larger pricing effect. Bhattacharya et al. (2007a; 2007b) find that higher accruals quality reduces the information asymmetry among investors, although the relationship between accruals quality and cost of equity capital is primarily through information uncertainty rather than asymmetry (Bhattacharya et al. 2007b). These studies motivate our use of accruals quality in assessing the relative amount of firm-specific information impounded into prices.

In addition to examining the relation between the components of accruals quality and cost of capital, Francis et al. (2005) construct a portfolio based on accruals quality and argue that this accruals quality portfolio captures risk that is not related to other common risk factors such as

market beta, size, book-to-market, and momentum. They suggest that this accruals quality risk factor capture information risk[11] and show that the accruals quality risk factor explains firm returns incremental to traditional risk factors such as market risk, size, and book-to-market. Ecker et al.(2006) use portfolios based on accruals quality and they show that the loadings these portfolio returns (e-loadings) are related to the firms information environment. Specifically, these e-loadings are positively related to higher values of other earnings quality measure, lower earnings response coefficients, greater dispersion in analysts' earnings forecasts and less accuracy in analysts' earnings forecasts. They also find that e-loadings are lower and more stable for older firms, where there is likely to be more information about the firm. They find these e-loadings to be higher during years containing restatement announcements, lawsuit filings, or bankruptcies, where earnings quality is likely to be poor. These studies establish accruals quality as a priced risk factor.

A number of studies use the accruals risk factor to test hypotheses related to information risk. Chen et al. (2007a) support the notion that accruals quality represents a separate priced risk factor and provide evidence that the accruals quality is not related to cost of capital absent of fundamental risk, as predicted by Yee (2006). Aboody et al. (2005) finds that the profitability of insider trading higher for firms that have more exposure to the accruals quality risk factor. Chen et al. (2007b) find that changes in dividend policies are related the accruals risk factor loadings, consistent with an information risk interpretation. These studies support the notion that accruals quality captures information risk.

The interpretation that the accruals quality factor represents a price risk factor is not without controversy. Core et al. (2008) show that the tests in Francis et al (2005) are not well specified tests of whether a risk factor is priced. Using a different method of testing for a priced

[11] Francis et al. (2005) define information risk as "the likelihood that firm-specific information that is pertinent to investor pricing decisions is of poor quality"

risk factor, they fail to find evidence that the accruals quality factor constitutes a priced risk factor[12]. Using same method that is used by Core et al. (2008), Gray et al. (2009), Kim and Qi (2008) and Ogneva, (2008) find evidence consistent with accruals quality representing a priced risk factor. Gray et al. (2009) use Australian data, Kim and Qi (2008) eliminate low priced firms, and Ogneva (2008) explicitly controls for shocks in future cash flows. These studies suggest that the degree to which accruals quality represents a priced risk factor depends on the specification of the test of whether a risk factor is priced.

Some studies argue that information risk should not impact cost of equity capital at all. Hughes et al. (2007) and Lambert et al. (2008) show that in large economies, the risks related to the quality of information can be diversified away[13]. Consistent with this theory, Cohen (2008) and Liu and Wysocki (2007) show that after controlling for firm-specific characteristics, accruals quality is not related to systematic risk. Cohen (2008) controls for the determinants of disclosure quality, arguing that the firm's level of accruals quality is strategically chosen by management. Liu and Wysocki (2007) argue that after controlling for the operating volatility of the firm, accruals quality is not related to cost of capital. Further, they provide evidence that accruals quality and operating volatility may not capture the same underling construct. These studies suggest that improved accruals quality only reduces idiosyncratic volatility and is not related to systematic volatility.

2.5 Empirical Findings Related To Price Synchronicity

The Capital Asset Pricing Model (CAPM) predicts that firm level returns should be perfectly correlated with market returns. However, the R^2 from the CAPM is on average around

[12] While they fail to find evidence that the accruals quality factor is a priced risk factor, Core et al. (Core et al. 2008) do find that the accruals quality factor loadings are related to implied cost of capital.

[13] Lambert et al. (2008) show that when cash flows are independent across firms, the effect of earnings quality on cost of capital can be diversified away. However, if the cash flows are correlated, better earnings quality can reduce cost of capital despite diversification. (see Lambert et al. (2007))

17% (Roll 1988). Arbitrage Pricing Theory[14] (APT) does little better with an average R^2 of about 25%. Roll (1988) argues that deviations from the CAPM are composed of random noise generated by the trading process and a firm-specific component generated by news being incorporated into the firm's stock price. As more news is incorporated into stock prices, deviations from the CAPM increase which lowers the R^2.

Studies find evidence consistent with low levels of price synchronicity reflecting more firm-specific information in price. Roll (1988) finds an improvement in the R^2 when he removes days that the firm is mentioned in the financial press. French and Roll (1986) investigate the observation that return variances during normal trading periods are substantially higher than return variances during non-trading periods. They conclude that the increase in volatility is due to more firm-specific private information being impounded into price rather than excess noise generated by the trading process. Durnev et al. (2003) examine the degree to which current returns reflect future earning for low R^2 firms. They assume that the private information that investors collect is about the future earnings of the company. Consistent with this conjecture, they find that the current returns for low R^2 firms are more highly correlated with future earnings. These studies provide evidence that low price synchronicity is related to relatively more firm-specific information.

A number of studies use price synchronicity as a measure of the relative degree of firm-specific information reflected in price. Studies find better capital allocation for firms with lower price synchronicity (Durnev et al. 2004), firms in industries with low synchronicity (Durnev et al. 2001) and for countries with low synchronicity (Wurgler 2000) consistent with the notion that lower price synchronicity firms have more informative prices which increases market monitoring (Holmstrom and Tirole 1993). Morck et al. (2000) shows that price synchronicity in emerging

[14]APT simply specifies that there are systematic factors that that affect firm returns but it does not specify what those factors are. The CAPM is equivalent to a single factor APT model.

markets is higher because of the lack of property protection rights which makes arbitrage and information based trading less profitable. Jin and Myers (2006) show that countries with high price synchronicity have less transparent financial systems[15]. Using a composite measure of capital market governance, Daouk et al. (2006) find that countries with lower price synchronicity have better capital market governance. Sami and Zhou (2008) find that price synchronicity decreases around implementation of new auditing standard in China[16]. Studies on the adoption of International Financial Reporting Standards (IFRS) find a decrease in price synchronicity following IFRS adoption (Beuselinck et al. 2008; Kim and Shi 2007). They conclude that the financial statements under IFRS are of better quality because prices reflect more firm-specific information. Haggard et al. (2008) find that firms with higher disclosure quality scores have lower price synchronicity. Using price synchronicity, Piotroski and Roulstone (2004) analyze the relative amount of firm-specific information compounded into price from the actions of insiders, institutional investors, and financial analysts and find that the trading activities of insiders and institutional investors generally provide more firm-specific information to the market while greater analyst revisions activities provide relatively more industry information. Using data from emerging markets, Chan and Hameed (2006) find analyst following also increases price synchronicity. These studies provide indirect support for the use of price synchronicity as a measure of the relative amount of firm-specific information impounded into prices.

While much of the evidence is consistent with the interpretation of price synchronicity as a measure of the relative amount of firm-specific information impounded into prices, there are a few studies that argue that price synchronicity is capturing noise in the trading process rather

[15] Jin and Myers (2006) use a number of measures of transparency including the Global Competitiveness Reports survey on disclosure quality, the number of professional auditors, an index of accounting standards develop by La Porta et al. (1998), a Global Opacity Index developed by PricewaterhouseCoopers, and the standard deviation of analyst forecasts.

[16] Sami and Zhou (2008) also find an increase in trading volume and price volatility and a decrease in earnings management following the implementation of these new auditing standards.

than firm-specific information. West (1988) provides a theoretical model where returns volatility is greater for firms that are priced base on less information. Kelly (2007) argues that R^2 does not capture informational attributes. Using market-microstructure measures of Easley et al. (1997), he finds that firms with low R^2 have fewer expected informed traders, higher information asymmetry, and a lower probability of a private information event. Rajgopal and Venkatachalam (2008) and Chen et al. (2008) find that the increasing trend in idiosyncratic returns volatility is positively related to the increasing trend in earnings volatility and the decline in earnings quality over the last forty years. Cohen (2008) finds that accruals quality decreases idiosyncratic volatility. Ashbaugh-Skaife et al. (2006) provide some evidence that price synchronicity is not a consistent measure of firm-specific information across countries. Teoh et al. (2008) find that accounting based anomalies are greater for firms with low price synchronicity. Specifically, Teoh et al. (2008) investigates the accruals anomaly (Sloan 1996), post-earnings announcement drift (Bernard and Thomas 1989, 1990), the net operating assets anomaly (Hirshleifer et al. 2004), and the Value-to-price (V/P) anomaly (Frankel and Lee 1998). These studies suggest that price synchronicity captures noise rather than firm-specific information.

Trying to reconcile the differences in the empirical findings of price synchronicity, Lee and Liu (2007) provide a model of idiosyncratic volatility. They show that idiosyncratic volatility can be decomposed into a noise component and an informational component. They further decompose the informational component into an information-updating part and an uncertainty-resolution part. The informativeness of price decreases with the noise component, but has a U-shaped relation with the information component.

2.6 Analyst Information

Research investigates the impact of analysts' information on price synchronicity. As mentioned above, Piotroski and Roulstone (2004) and Chan and Hameed (2006) find that analyst revision activity and analyst following increases with price synchronicity, which is consistent

with analyst providing more industry level information. Beuselinck et al. (2008) find that analyst activity led to more price synchronicity around IFRS adoption and Kim and Shi (2007) find that the reduction in price synchronicity around IFRS is attenuated for firms with high analyst following. These studies suggest better disclosure quality allows analysts to provide better industry information.

Studies have examined the relation between earnings quality and the properties of analysts' information. Using the precision measures of Barron et al. (1998), Byard and Shaw (2003) provide evidence that disclosure quality increases the precision of analyst common and private information. Lang and Lundholm (1996) find firms with better disclosure quality have higher analyst following, more accurate analyst earnings forecasts and lower forecast dispersion. On the other hand, Lobo et al. (2006) find that accruals quality decreases analyst following, forecast error and dispersion. While both of these studies agree that better quality disclosure improve analysts' forecasts, they differ on the relation between quality and analyst following. Lang and Lundholm (1996) argue that better disclosure quality decreases the analysts' information collection costs. Lobo et al. (2006) argue that better accruals quality reduces the benefit that analysts accrue from their information collection activities. This difference can be explained by the difference in the proxies for quality. Lang and Lundholm (1996) use a disclosure quality score that is based on analysts' assessment of the disclosure quality whereas Lobo et al. (2006) use a measure of earnings quality based on the properties of earnings themselves. Analysts are likely to take into consideration both cost and benefit when determining disclosure quality.

Studies have also investigated the effect of analyst following on market liquidity and asymmetry. Roulstone (2003) find that analyst following is positively related to liquidity and forecast dispersion is negatively related to liquidity. Easley et al. (1998) find that the probability of private information being reflected in trade is not related to analyst following. These studies

suggest that analyst increases liquidity and investor recognition, which may also explain the positive relation between analyst following and price synchronicity.

We conclude this section with a short summary of the literature. Theory suggests that firms with better earnings quality have less systematic volatility. Earnings quality can be related to higher or lower levels of idiosyncratic volatility. The reduction in systematic volatility comes from a reduction in market beta or a reduction in the expected market return. The higher idiosyncratic volatility is due to more information being impounded into price as the marginal benefit of collecting information increases. The lower idiosyncratic volatility is a result of less divergence of opinion and a reduction in the learning about the future profitability. There is empirical evidence to support both a reduction in systematic volatility and a reduction in idiosyncratic volatility. The literature on price synchronicity examines whether decreased co-movement in stock returns is associated with more firm-specific information being incorporated into prices. There is some direct evidence that firms with low price synchronicity have more informative prices. Consistent with this, studies also show that low price synchronicity is related to better capital allocations, greater property protection rights, better capital market governance, and higher quality disclosures. Studies have documented a negative relation between accruals quality and idiosyncratic volatility, which would imply, *ceteris paribus*, a positive relation between price synchronicity and accruals quality. Prior literature finds a positive relation between analysts and price synchronicity. This is consistent with two interpretations, that analysts provide industry level information or that analysts help provide liquidity to the market.

3. HYPOTHESES

3.1 The Components of R^2

Price synchronicity is the degree to which market and/or industry information is compounded into firm prices. It is commonly measured as the R^2 from the regression of the return of the firm on a market and industry index.[17] We start by describing R^2 of a simple regression with only market returns as a predictor of firm returns. This is the Capital Asset Pricing Model (CAPM). We then look at the theory on how accruals quality impacts the components of R^2 from the CAPM.

Under the CAPM, risk-averse investors maximize their utility by maximizing the return on their portfolios for a certain level of the variance of their portfolio. As a result, the firm returns can be expressed as the linear function of market returns:

$$r_{i,t}^{*} = \alpha_i + \beta_i r_{m,t}^{*} + \varepsilon_{i,t} \ , \tag{6}$$

where $r_{i,t}^{*}$ is the risk premium for firm *i* in period *t*, $r_{m,t}^{*}$ is the risk premium for a market index in period *t*, α_i is the excess return for firm *i*, β_i is the "beta" for firm *i* and $\varepsilon_{i,t}$ is the idiosyncratic return for firm *i* in period *t*. Under the CAPM, both the excess return and the idiosyncratic return are expected to be zero.

The R^2 is the ratio of the sample variance of the predicted value over the sample variance of the independent variable from a regression. The population equivalent of R^2 from the CAPM can be expressed as:

$$R^2 = \frac{\beta^2 \sigma_{r_m}^2}{\beta^2 \sigma_{r_m}^2 + \sigma_{\varepsilon}^2} \ . \tag{7}$$

[17] Despite the problems of the use of R^2 as a relative measure of goodness of fit across samples, R^2 is still pervasive in both the finance and accounting literature. In the accounting literature, R^2 from the regression of returns on book value and earnings is referred to as the value relevance of accounting information. Gu (2007) demonstrates some of the problems with using R^2 as a measure of goodness of fit within the context of the value relevance of accounting information.

We are interested in understanding how accruals quality impacts R^2. As we chow in section 2, theory suggests that β, $\sigma^2_{r_m}$ and/or σ^2_ε are functions of accruals quality.

$$\frac{\partial R^2}{\partial AQ} = \frac{\partial \dfrac{\beta^2\sigma^2_{r_m}}{\beta^2\sigma^2_{r_m}+\sigma^2_\varepsilon}}{\partial AQ} \tag{8}$$

$$= \frac{\dfrac{\partial \beta^2\sigma^2_{r_m}}{\partial AQ}\left(\beta^2\sigma^2_{r_m}+\sigma^2_\varepsilon\right) - \beta^2\sigma^2_{r_m}\left(\dfrac{\partial \beta^2\sigma^2_{r_m}}{\partial AQ}+\dfrac{\partial \sigma^2_\varepsilon}{\partial AQ}\right)}{\left(\beta^2\sigma^2_{r_m}+\sigma^2_\varepsilon\right)^2} \tag{9}$$

$$= \frac{\dfrac{\partial \beta^2\sigma^2_{r_m}}{\partial AQ}\sigma^2_\varepsilon - \beta^2\sigma^2_{r_m}\dfrac{\partial \sigma^2_\varepsilon}{\partial AQ}}{\left(\beta^2\sigma^2_{r_m}+\sigma^2_\varepsilon\right)^2} = \frac{\dfrac{1}{\beta^2\sigma^2_{r_m}}\dfrac{\partial \beta^2\sigma^2_{r_m}}{\partial AQ} - \dfrac{1}{\sigma^2_\varepsilon}\dfrac{\partial \sigma^2_\varepsilon}{\partial AQ}}{\dfrac{1}{\beta^2\sigma^2_{r_m}\sigma^2_\varepsilon}\left(\beta^2\sigma^2_{r_m}+\sigma^2_\varepsilon\right)^2} \tag{10}$$

Since $\dfrac{1}{\beta^2\sigma^2_{r_m}\sigma^2_\varepsilon}\left(\beta^2\sigma^2_{r_m}+\sigma^2_\varepsilon\right)^2 > 0$, the sign of $\partial R^2/\partial AQ$ is the same as the sign of the numerator. Using the fact that the derivative of a function divided by that function is the same as the derivative of the log of the function, the sign of $\partial R^2/\partial AQ$ can be expressed as:

$$\begin{aligned} \frac{\partial \ln \beta^2\sigma^2_{r_m}}{\partial AQ} > \frac{\partial \ln \sigma^2_\varepsilon}{\partial AQ} &\Rightarrow \frac{\partial R^2}{\partial AQ} > 0 \\ \frac{\partial \ln \beta^2\sigma^2_{r_m}}{\partial AQ} < \frac{\partial \ln \sigma^2_\varepsilon}{\partial AQ} &\Rightarrow \frac{\partial R^2}{\partial AQ} < 0 \end{aligned} \tag{11}$$

The relation between R^2 and accruals quality depends on the relative effects of accruals quality on the components of R^2.

3.2 Accruals Quality and Price Synchronicity

Our first hypothesis is about the relation between accruals quality and price synchronicity. Because accruals quality affects multiple aspects of the firm's information environment, (Bhattacharya et al. 2007b) and different informational aspects have different effects on price

synchronicity (Lee and Liu 2007), this relation could be positive or negative. We discuss the rational for each prediction below.

Figure 1 pictorially represents how systematic volatility and idiosyncratic volatility impact R^2. The darkened inner circle represents the systematic volatility and the outer circle represents total volatility. The portion of the outer circle that is not darkened is the idiosyncratic volatility. If the systematic volatility is held constant and the idiosyncratic volatility increases (as in situation 1), total volatility will increase. Since systematic volatility is held constant, the R^2 decreases. R^2 can also decrease because of a decrease in systematic volatility with idiosyncratic volatility constant (as in situation 2). When there is a decrease in both systematic and idiosyncratic volatility, the change in R^2 is ambiguous and may not change at all (as in situation 3). This can also be seen by inspecting equation (11)

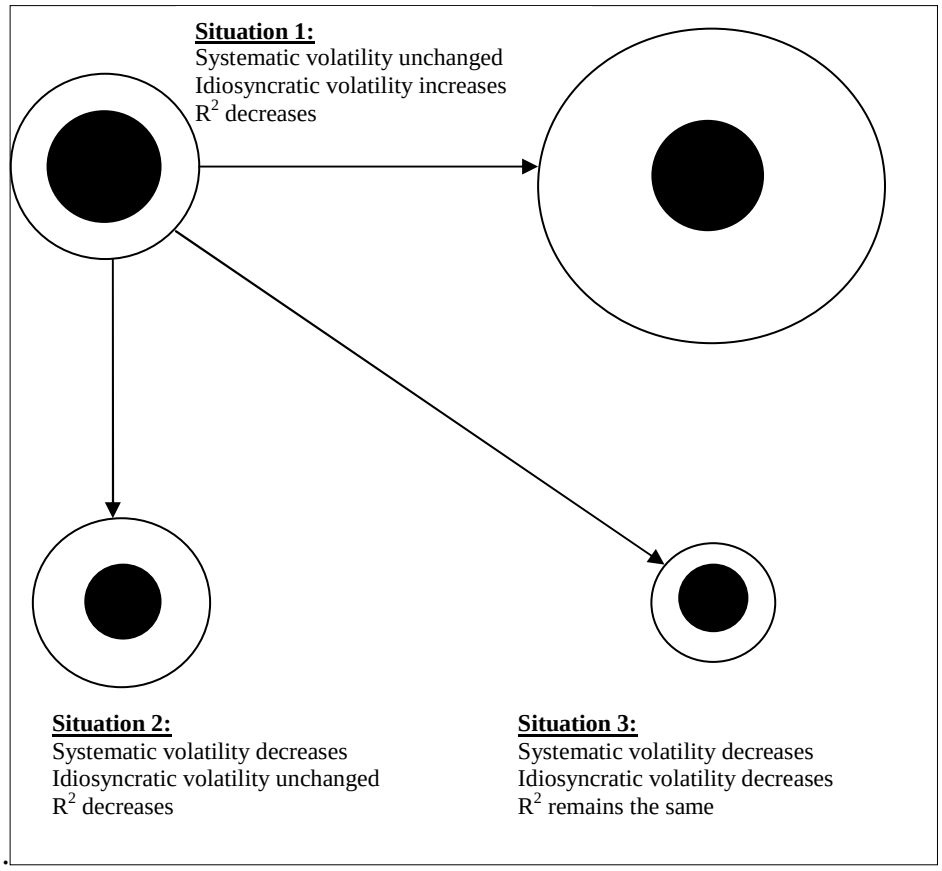

Figure 1 - Systematic and Idiosyncratic Volatility and R^2

Accruals quality may decrease price synchronicity because of more firm-specific information contributing to returns volatility. As accruals quality increases, firm-specific information becomes more precise and the firm's market beta decreases in magnitude (Lambert et al. 2007). Holding market variance constant, this implies $\partial \ln \beta^2 \sigma_{r_m}^2 / \partial AQ < 0$. With a smaller market beta, there is less co-movement between firm's returns and the returns of the market, cetera paribus, and firm return volatility reflect relatively more firm-specific information and less market related information. Therefore, firms with higher accruals quality will have lower price synchronicity via lower systematic volatility.

Accruals quality may be also increase price synchronicity. An increase in accruals quality decreases information asymmetry and increases liquidity (Bhattacharya et al. 2007a). The decrease in information asymmetry may decreases idiosyncratic volatility because there is less divergence of opinion (Kim and Verrecchia 1994). This implies $\partial \ln \sigma_\varepsilon^2 / \partial AQ < 0$. Additionally, the increase in liquidity allows macro-economic information to be factored into prices more quickly, increasing systematic volatility (Hou and Moskowitz 2005), which suggests $\partial \ln \beta^2 \sigma_{r_m}^2 / \partial AQ > 0$. Therefore there might be an increase in price synchronicity because of decreased information asymmetry.

While accruals quality may affect price synchronicity through information precision and information asymmetry, the effect of information precision will likely have a larger influence on systematic volatility. Bhattacharya et al. (2007b) study the direct effect of accruals quality on the cost of equity capital and the mediated effect accruals quality on the cost of equity capital through information asymmetry. They find that the direct effect, which they attribute to information precision, dominates the mediated effect on average. Therefore, we expect the information precision effect will dominate in this situation as well and we will observe a negative relation between accruals quality and price synchronicity. This suggests that

$\partial \ln \beta^2 \sigma_{r_m}^2 / \partial AQ < \partial \ln \sigma_\varepsilon^2 / \partial AQ$. This in conjunction with equation (11) suggests that R^2 decreases as accruals quality increases. Thus we present our first hypothesis, stated in the alternative:

H1: Accruals quality is negatively related to price synchronicity.

We use the following empirical model:

$$Sync_{i,t} = b_0 + b_1 AQ_{i,t} + b_2 IDIORISK_{i,t} + \sum_{j=3}^{J} b_j Control_{j,i,t} \quad (12)$$

where Sync is our measure of price synchronicity, AQ is Dechow and Dichev (2002)'s measure of accruals quality, IDIORISK is idiosyncratic volatility and $Control_j$ is the *j*th control variable. A significantly positive coefficient of b_1 would support our first hypothesis.

3.3 Innate and Discretionary Components of Accruals Quality and Price Synchronicity

Francis et al. (2005) decompose accruals quality into two components, innate and discretionary. The innate accruals component is accruals quality that is determined by the underlying economic factors of the firm. Increases in innate accruals quality decrease the uncertainty of the information about future cash flows captured in earnings. This reduction of uncertainty decreases price synchronicity. The innate accruals quality component is less likely to have the off-setting information asymmetry effect compared to total accruals quality. This is because the innate accruals component is the portion of accruals quality that can be explained by the underlying economic condition of the firm. This leads to our second hypothesis, again stated in the alternative:

H2: The innate accruals quality component is negatively related to price synchronicity.

As with the first hypothesis, we estimate the effect of innate accruals quality with the following empirical model:

$$Sync_{i,t} = b_0 + b_1 InnateAQ_{i,t} + b_2 IDIORISK_{i,t} + \sum_{j=3}^{J} b_j Control_{j,i,t} \quad (13)$$

Again Sync is our measure of price synchronicity. InnateAQ is Francis et al. (2005)'s measure of innate accruals quality, IDIORISK is idiosyncratic volatility and $Control_j$ is the *j*th control. A negative and significant value of b_1 would support our second hypothesis.

The discretionary component of the accruals quality is variation in accruals that is likely caused by discretionary use of accruals. Managers may be exercising discretion over accruals to act opportunistically or to convey information to investors through earnings (Francis et al. 2005). If managers are acting opportunistically and the market recognizes this, increases in discretionary accruals quality would be ignored and we expect no relation between accruals quality and price synchronicity. If managers are acting opportunistically and investors are fooled or if investors do not distinguish between the innate and discretionary components of accruals quality, then the discretionary component will act in a manner similar to the innate accruals quality component. In this case, we predict a negative relation between the discretionary component of accruals quality and price synchronicity. If managers are using discretionary accruals to convey information to the market, then large deviations would contain more information. Therefore, *low* values of the discretionary component of accruals quality would be related to *more* firm-specific information in prices and we would expect a positive relation between the discretionary component of accruals quality and price synchronicity. Since the relation between the discretionary accruals component could go either way, we make our third hypothesis non-directional:

H3: The discretionary component of accruals quality is related to price synchronicity.

As with the first two hypotheses, we estimate the effect of discretionary accruals quality with the following empirical model:

$$Sync_{i,t} = b_0 + b_1 DisAQ_{i,t} + b_2 IDIORISK_{i,t} + \sum_{j=3}^{J} b_j Control_{j,i,t} \qquad (14)$$

Again Sync is our measure of price synchronicity. DisAQ is Francis et al. (2005)'s measure of discretionary accruals quality, IDIORISK is idiosyncratic volatility and $Control_j$ is the *j*th control. A negative and significant value of b_1 would support the notion that investors either cannot or do not distinguish the innate component of accruals quality from the discretionary component accruals quality. A positive and significant b_1 would suggest that managers are conveying information through accruals. If b_1 is not different from 0 then either the market does not take into account discretionary accruals quality or there is a mixture of the above two effects.

3.4 Accruals Quality, Price Synchronicity and Analyst Following

Our last hypothesis concerns how the presence of an analyst affects the relation between accruals quality and price synchronicity. Prior research shows that analyst activities are positively related to price synchronicity, primarily due to industry level information. It is conceivable, although highly unlikely, that analysts focus solely on industry information and the correlation of earnings between firms within an industry. In this case, the relation between accruals quality and price synchronicity would not differ between firms that are followed by analysts and firms that are not. However, the information collection activities of analysts suggest that they do gather firm-specific information (Schipper 1991).

The more interesting question is whether earnings information complements analysts information or rather is a substitute for it. If earnings information complements analysts' information, then increasing accruals quality will convey relatively more firm-specific information when the firm has an analyst following. This would be consistent with earnings quality decreasing the cost of information collection of analysts (Lang and Lundholm 1996). If analyst information is a substitute for earnings information, then increasing accruals quality will convey relatively more firm-specific information when the firm does not have an analyst following. This would be consistent with earnings quality decreasing the benefit of information

by analysts (Lobo et al. 2006). Because we have no reason to expect one effect to dominate the other, we present our final hypothesis as a non-directional hypothesis:

H4: If earnings information complements analysts information then accruals quality will be more negatively related to price synchronicity for firms that have an analyst following compared to those that do not. If earnings information is a substitute for analysts' information, then accruals quality will be less negatively related to price synchronicity for firms that have an analyst following compared to those that do not.

For our fourth hypothesis, we separate our sample into firms that are followed by analysts and those that are not and estimate the following equation for each of our accruals quality measures:

$$\begin{aligned} Sync_{i,t} = {} & b_0 + b_1 AQ_{i,t} + b_2 IDIORISK_{i,t} + \sum_{j=3}^{J} b_j Control_{j,i,t} \\ & + c_0 Followd + c_1 (Followd * AQ_{i,t}) \\ & + c_2 (Followd * IDIORISK_{i,t}) + \sum_{j=3}^{J} c_j (Followd * Control_{j,i,t}) \end{aligned} \quad (15)$$

Sync is our measure of price synchronicity. AQ is either total accruals quality, innate accruals quality or discretionary accruals quality, IDIORISK is idiosyncratic volatility and $Control_j$ is the *j*th control. Followd is a dummy variable equal to 1 if the firm has a following in the month of their earnings announcement, zero otherwise. Our fourth hypothesis is looking for differences between the two groups. A significantly positive value for c_1 would indicate that accruals quality is related to more price synchronicity when there is an analyst following. This would be consistent with a substitution effect between earnings and analysts information. A negative and significant c_1 would indicate that higher accruals quality reflects more firm-specific information for firms that are followed by analysts. This would support a complementary relation between earnings information and analysts' information.

While we frame our fourth hypothesis in terms of complements and substitutes, it may be the case that the existence of analysts increase the visibility of the firm and increases the liquidity of the firm. The increase in liquidity increases price synchronicity of the firm. If this is the case, then it could be that as accruals quality increases, firms that are not followed by analysts have the confounding effect of liquidity to contend with in addition to the information precision effect.

4. DATA MEASURES AND SAMPLE

4.1 Variable Measurement

This section details the measurement of our variables. We use accruals quality measures developed by Dechow and Dichev (2002) consistent with prior literature (e.g. Francis et al. 2005; Francis et al. 2004). As an inverse measure of firm-specific information, we use price synchronicity following Piotroski and Roulstone (2004) and Durnev et al. (2003) among others. We provide details of the measurement of each of these variables and additional control variables below.

4.1.1 Accruals Quality

Prior literature uses the Dechow and Dichev (2002) measure of accruals quality when investigating the market consequences of earnings information. This measure captures the degree to which accruals map into cash flows and is based on the relationship between current accruals and past, present, and future cash flows given. The model we use, following Dechow and Dichev (2002) as modified by McNichols (2002), is as follows:

$$\frac{\Delta WC_{i,t}}{Assets_{i,t}} = a_0 \frac{1}{Assets_{i,t}} + a_1 \frac{OCF_{i,t-1}}{Assets_{i,t}} + a_2 \frac{OCF_{i,t}}{Assets_{i,t}} + a_3 \frac{OCF_{i,t+1}}{Assets_{i,t}} + a_4 \frac{\Delta REV_{i,t}}{Assets_{i,t}} + a_5 \frac{PPE_{i,t}}{Assets_{i,t}} + e_{i,t} \qquad (16)$$

Where:

$\Delta WC_{i,t}$	=	Firm *i*'s change in working capital in year *t* defined as the change in accounts receivable plus the change in inventory less the change in accounts payable less the change in taxes payable plus the change in other assets (In terms of Compustat data item numbers: $\Delta WC_{i,t}$ = -(data302 + data303 + data304 +data305 +data307))
$OCF_{i,t}$	=	Firm *i*'s cash flow from operations (data308) less cash flow from extraordinary items (data124) in year *t*
$\Delta REV_{i,t}$	=	Firm *i*'s change in sales (data12) in year *t*
$PPE_{i,t}$	=	Firm *i*'s gross property, plant and equipment (data7) in year *t*
$Assets_{i,t}$	=	Firm *i*'s average total assets (data6) in years *t* and *t*-1

The accruals quality variable (AQ) is the standard deviation of the residual from equation (16). Consistent with Francis et al. (2005) equation (16) is estimated using ordinary least squares

by year and industry[18]. To ensure that the accruals quality is known in year *t*, we use the residuals from *t*-5 to *t*-1 in calculating accruals quality for year *t*[19]. We eliminate firms with less than four years of data between *t*-1 and *t*-5. Because the standard error is an inverse measure of quality, we negate AQ so that a larger value of AQ represents better accruals quality.

We measure the innate and discretionary components of accruals quality following Francis et al. (2005). This allows us to separate to some extent the accruals quality due to the underlying fundamental condition of the firm from the accruals quality resulting from managerial choice. We estimate the following regression annually:

$$AQ_{i,t} = \alpha_0 + \alpha_1 SIZE_{i,t} + \alpha_2 \sigma\left(\frac{OCF}{Assets}\right)_{i,t} + \alpha_3 \sigma\left(\frac{SALES}{Assets}\right)_{i,t} + \alpha_4 OC_{i,t} + \alpha_5 NEG_{i,t} + \varepsilon_{i,t} \quad (17)$$

Where:

$AQ_{i,t}$	=	The firm-specific standard deviation of the residuals from equation (16) over *t-5* to *t-1*.
$SIZE_{i,t}$	=	The natural log of total assets (data6)
$OCF_{i,t}$	=	Firm *i*'s cash flow from operations (data308) less cash flow from extraordinary items (data124) in year *t*
$SALES_{i,t}$	=	Firm *i*'s sales (data12) in year *t*
$OC_{i,t}$	=	Firm *i*'s operating cycle in year *t*
$NEG_{i,t}$	=	Firm *i*'s proportion of year with losses over years *t-5* to *t-1*
$Assets_{i,t}$	=	Firm *i*'s average total assets (data6) in years *t* and *t*-1

Innate accruals quality (INNATEAQ) is measured as the predicted value of equation (17) and the discretionary accruals quality (DISAQ) is measured as the residual.

4.1.2 Price Synchronicity

We follow Piotroski and Roulstone (2004) and Durnev et al. (2003) in measuring price synchronicity. Specifically, we run the following weekly firm-specific regression:

$$RET_{i,w} = \alpha_0 + \alpha_1 MKTRET_{i,w} + \alpha_2 MKTRET_{i,w-1} + \alpha_3 INDRET_{i,w} + \alpha_4 INDRET_{i,w-1} + \varsigma_{i,w} \quad (18)$$

Where:

$RET_{i,w}$	=	Compound return for company *i* for week *w*.

[18] Throughout the paper, we use 2-digit SIC to indicate industry membership unless otherwise noted.
[19] The requirement of five residuals actually requires seven years of data since each residual requires lead and lag cash flows.

$MKTRET_{i,w}$ = Compound weekly return for value weighted market index from CRSP excluding firm *i* for week *w*.

$INDRET_{i,w}$ = Compound weekly return for value weighted industry index from CRSP excluding firm *i* for week *w*.

We estimate equation (18) for the 12 month period ending in the month of the earnings announcement. The R^2 from this equation serves as a measure of price synchronicity. To calculate the industry index, we use 2-digit SIC industry and require at least 3 firms within an industry in a particular week. We also require firms to have 45 weeks of observations to estimate the regression. Consistent with Piotroski and Roulstone (2004) and Morck et al. (2000), we use a logarithmic transformation of the R^2 to define our price synchronicity variable (SYNC):

$$SYNC_{i,t} = \log\left(\frac{R^2_{i,t}}{1-R^2_{i,t}}\right) \tag{19}$$

This logarithmic transformation takes the R^2, which is bounded between 0 and 1, and transforms it to an unbounded continuous variable[20] (Piotroski and Roulstone 2004). As more firm-specific information is contained in prices, firm returns are less likely to be correlated with the market and industry returns and SYNC decreases.

4.1.3 Controls

Following Piotroski and Roulstone (2004) [21], we use several controls that prior literature has identified as related to price synchronicity. We include controls for size, industry concentration, firm diversification, the correlation in cash flows, institutional ownership, regulated industries, and analyst following. We also include a control for idiosyncratic risk.

We explicitly control for idiosyncratic risk. Accruals quality increases with the uncertainty of the profitability of the firm and decrease information asymmetry. Increasing the uncertainty of

[20] Using the adjusted R^2 instead of our SYNC variable yields qualitatively similar results.

[21] Piotroski and Roulstone (2004) also include a control for the standard deviation of the firm's return on assets (ROA). We exclude this control because it is highly correlated with the factors used to estimate the innate component of accruals quality.

profitability and/or information asymmetry increases idiosyncratic risk (Pastor and Veronesi 2003). The empirical observations of Rajgopal and Venkatachalam (2008), Teoh et al. (2008), and Cohen (2008) support the negative relation between idiosyncratic risk and accruals quality. Since idiosyncratic risk and price synchronicity are negatively related, we add the sum of squared residuals from the price synchronicity model to capture the idiosyncratic risk of the firm's return (IDIORISK). We expect idiosyncratic risk to be negatively related to price synchronicity.

We include size as a control to capture potential firm-specific informational characteristics that are unrelated to earnings uncertainty. We measure size (MV) as the log of the market value of equity at the end of the fiscal year as reported by COMPUSTAT. As the size of the firm increases, there is likely to be more information about that firm available to investors. Therefore price synchronicity should decrease with size. On the other hand, large firms are more likely to lead small firms in reporting the results of macro-economic events. Therefore, larger firms with have greater synchronicity. While size can have opposing effect on price synchronicity, Piotroski and Roulstone (2004) find a positive relation. Therefore, we expect a positive the relation between size and price synchronicity.

Consistent with Piotroski and Roulstone (2004), we include a control for industry concentration. We measure industry concentration as a sales based Herfendhal index of concentration within a 2-digit SIC industry using segment sales from COMPUSTAT. To make this a firm-specific measure, we take the weighted-average of the industry Herfendhal indexes (LOGHHIF) for the segments that the firm operates, where segment sales in the industry are used as the weight[22]. As the industry concentration increases there is more likely to be a leader in the industry that conveys macro-economic news about the industry. Because all firms in the industry

[22] We deviate slightly from Piotroski and Roulstone (2004) in this respect. Piotroski and Roulstone (2004) use the Herfindhal index for the firms primary 2-digit SIC industry.

respond similarly to the news of one firm, price synchronicity increases. Additionally, industries that have a higher concentration are likely to have a higher degree of dependence in their performance. We expect the relation between LOGHHIF and SYNC to be positive.

We also control for the degree to which a firm diversifies across many industries. As the firm diversifies its operations, it is less likely to be affected by shocks in its primary industry (Piotroski and Roulstone 2004) which would lead to lower price synchronicity. On the other hand, well diversified firms may have more price synchronicity because they act like diversified portfolios and reflect more market information in aggregate (Roll 1988). Consistent with Piotroski and Roulstone (2004), we measure diversification in terms of concentration. Specifically, diversification (DIVERS) is a firm-specific Herfendhal ratio of concentration across 2-digit industries using segment sales for the firm. We make no expectation about the relation between DIVERS and price synchronicity.

We control for the fundamental correlation between earnings within the industries. Piotroski and Roulstone (2004) argue that as the earnings within an industry as more correlated, the prices of firms within the industries are more likely to be correlated and therefore will have more price synchronicity with respect to the industry index. We measure fundamental correlation (FUNDCORR) as the R^2 from the regress of firm ROA on an industry ROA index using quarterly data from COMPUSTAT for the last three years. ROA is defined as income before extraordinary items per share divided by average total assets per share. We require at least 10 quarterly observations for each regression. We expect FUNDCORR to be positively related to price synchronicity.

We include controls for institutional ownership. Piotroski and Roulstone (2004) find the trading activities of institutions affects price synchronicity. Institutions with large holdings may use their large stake in the company to gain firm-specific information about the firm and may also provide monitoring over managers reports. Alternatively, institutions may trade based on

broad indexes (Piotroski and Roulstone 2004). We measure institutional ownership (LOGIO) as the log of one plus the percent of institutional owners as reported by Thompson Financial's CDA/Spectrum database in the quarter of the earnings announcement. Piotroski and Roulstone (2004) find a positive relation between the level of institutional holdings and price synchronicity, therefore we expect a positive relation between LOGIO and SYNC.

Firms in regulated industries are constrained in their financial reporting and economic activities. These firms are likely to have greater co-movements in prices (Piotroski and Roulstone 2004). We include a dummy variable (REG) equal to one if the firm's primary two-digit SIC code is 62 or 49. We expect regulated industries to have higher price synchronicity.

Piotroski and Roulstone (2004) and Chan and Hameed (2006) find a positive relation between analyst forecast revision activities and price synchronicity. They argue that analyst provide relatively more industry information in their earnings forecast. We include a control for analyst activity (NFOLLOW). We measure NFOLLOW as the number of analysts giving forecasts for the firm in the month of the earnings announcement in the IBES database. Consistent with Piotroski and Roulstone (2004), we expect analyst following to be positively related to price synchronicity.

We include controls for industry effects. First, we include the average number of firms within the industry (LOGNIND) used to calculate the weekly industry index to control for differences in SYNC arising from differences in sample size (Durnev et al. 2003; Piotroski and Roulstone 2004). We also include industry dummy variables based on 1-digit SIC code following Piotroski and Roulstone (2004). We do not report the coefficients on the industry dummy variables in any of our tables.

4.2 Sample Description

Accounting data come for the COMPUSTAT database. Data used to measure price synchronicity come from CRSP. We use I/B/E/S forecast data to determine analyst following.

Institutional ownership data come from Thompson Financial's CDA/Spectrum database. The sample contains observations from 1993 to 2007[23]. Table 1 summarizes the data availability for our sample.

Table 1
Sample Selection

	Firm-Year Observations	Percent of Initial Sample	Firms
Compustat data from 1993-2007 with sufficient data to compute accruals quality measures	44,918		6,767
Observations with insufficient price synchronicity data	9,369	16.50%	1,041
Observations with insufficient data for controls variables	1,778	3.13%	165
Final Sample:	33,771		5,561
Sample by Analyst Following:			
Followed	20,053		3,883
Not Followed	13,718		3,460
	33,771		

We start with all firms in Compustat that have available data to compute our accruals quality measures for the year 1993 to 2007. We require at least 20 firms within each industry-year regression to estimate the equation (16) and obtain the residuals. To compute the standard deviation, we require at least four of the last five years residuals. We also require data sufficient to estimation the innate and discretionary components of accruals quality. This results in a sample of 6,767 firms for a total of 44,918 firm-year observations.

We collect returns data for our price synchronicity measure from CRSP for all stocks with a share code of 10 or 11. We require at least three daily returns to calculate a firm's compound weekly return. We create a value weighted industry index based on 2-digit SIC industries and

[23] Cash flow statement data is available from COMPUSTAT starting with 1987 fiscal years. We need a total of seven years of data to compute the standard deviation, so the first usable year is 1993.

require at least three firms within the industry to calculate the index. To measure price synchronicity, we require a firm to have at least 45 weekly observations in estimating equation (18). These requirements eliminate 9,369 firm-year observations (1,041 firms) from the sample.

The requirements to compute the control variables eliminate another 1,778 firm-year observations (165 firms). This results in a final sample of 33,771 firm-year observations from 5,561 firms. Of this sample, 20,053 have analyst forecasts available from IBES. There are 3,883 firms that are followed and 3,460 that are not. This shows that firms can be in both the followed and the not followed sub-sample if it has an analyst following in only some years.

Table 2 panel A contains sample univariate statistics about our sample. Our average accruals quality is -0.073, which is lower than the averages given by some studies but are in line with the estimates in other studies[24]. Our average price synchronicity is -1.644 which is similar to the average -1.742 reported by Piotroski and Roulstone (2004). Compared to the averages presented by Piotroski and Roulstone (2004), our size variable (MV) has a slightly higher average (5.579 for our sample compared to the 4.836 they report). Our measure of industry concentration has an average of -3.301 whereas Piotroski and Roulstone (2004) report an average of 0.08. The average of the log of the number of industries used to calculate the industry index returns is 4.975 which is similar to the 5.087 reported by Piotroski and Roulstone (2004). The average diversification is 0.89 with a median of one which is similar to the values presented by Piotroski and Roulstone (2004) (mean of 0.874 and median of 1). This indicates that over half of the firms in our sample operate in only one industry. The fundamental correlation is -2.83 which corresponds to an average R^2 from the regression of firm level ROA on industry ROA of about 6%. Our institutional ownership variable has a mean of 0.293, which corresponds to roughly to 30% ownership by institutions on average. About 4% of our sample is in a regulated industry.

[24] For example, Francis et al. (2004) report an average of -0.026, Cohen (2008) reports an average of -0.051, and Aboody et al. (2005) reports an average of -0.073.

Table 2
Simple Statistics

Panel A: Descriptive statistics for the full sample (N=33771)

			Percentile				
	Mean	Std Dev	5%	25%	50%	75%	95%
SYNC	-1.644	1.102	-3.482	-2.368	-1.631	-0.869	0.119
AQ	-0.073	0.077	-0.207	-0.086	-0.050	-0.030	-0.014
INNATEAQ	-0.076	0.050	-0.176	-0.099	-0.064	-0.041	-0.020
DISAQ	0.004	0.063	-0.084	-0.013	0.009	0.030	0.081
MV	5.579	2.211	2.107	3.942	5.508	7.098	9.350
LOGHHIF	-3.301	0.674	-4.147	-3.822	-3.477	-2.846	-2.008
LOGNIND	4.975	1.073	2.984	4.228	5.027	5.926	6.312
DIVERS	0.898	0.186	0.500	0.884	1.000	1.000	1.000
FUNDCORR	-2.832	2.362	-7.266	-3.997	-2.446	-1.226	0.214
LOGIO	0.293	0.243	0	0	0.324	0.516	0.649
REG	0.036	0.186	0	0	0	0	0
IDIORISK	0.345	1.278	0.025	0.070	0.154	0.346	1.117

Panel B: Descriptive Statistics by Analyst Following

	Followed (N=20,174)			Not Followed (N=14,028)				
	Mean	Median	Std Dev	Mean	Median	Std Dev	Difference	P-value
SYNC	-1.31	-1.26	1.04	-2.13	-2.13	1.01	0.83	<.001
AQ	-0.06	-0.04	0.07	-0.09	-0.06	0.09	0.02	<.001
INNATEAQ	-0.07	-0.05	0.05	-0.09	-0.08	0.05	0.03	<.001
DISAQ	0.00	0.01	0.06	0.00	0.01	0.07	0.00	0.015
MV	6.61	6.49	1.82	4.08	3.83	1.84	2.53	<.001
LOGHHIF	-3.31	-3.49	0.68	-3.28	-3.43	0.67	-0.03	<.001
LOGNIND	4.98	5.04	1.08	4.97	5.02	1.07	0.00	0.748
DIVERS	0.90	1.00	0.19	0.90	1.00	0.18	0.00	0.094
FUNDCORR	-2.75	-2.35	2.40	-2.95	-2.56	2.31	0.20	<.001
LOGIO	0.45	0.48	0.16	0.07	0.00	0.14	0.38	<.001
REG	0.04	0.00	0.19	0.04	0.00	0.19	0.00	0.834
IDIORISK	0.22	0.12	0.97	0.53	0.25	1.61	-0.31	<.001

Refer to the appendix for variable definitions.

Idiosyncratic volatility is 0.345 on average.

Panel B of table 2 compares the means for firm that are followed by analysts and firms that are not. Firms that are followed by analysts tend to be larger (a difference of 2.53) and have better accruals quality (-0.06 compared to -0.09) which is to be expected. The firms followed by analysts tend to operate in slightly less concentrated industries (a difference of only -0.03, which is only a 1% change). Institutional ownership tends to be greater for firms that are followed by analysts (0.45 compared to 0.07). The average idiosyncratic risk is more than 50% greater for firms that are not followed by analysts.

Table 3 presents simple correlations. We find price synchronicity is positively correlated with total accruals quality as well as the innate component of accruals quality (with a correlation coefficient of 0.123). Size, as proxied by market value, is positively correlated to both synchronicity (with a correlation coefficient of 0.582) and accruals quality (with a correlation coefficient of 0.239), which drives the positive correlation between synchronicity and accruals quality. When we control for market value, the partial correlation between price synchronicity and accruals quality becomes negative as predicted. As table 3 shows, price synchronicity and accruals quality tend to covary with our control variables in the same direction. For example, the level of institutional ownership increases with both price synchronicity (0.437) and accruals quality (0.188). Idiosyncratic risk is negatively related to both price synchronicity (-0.110) and accruals quality (-0.122).

Table 3

Simple Correlations

	SYNC	AQ	INNATE AQ	DIS. AQ	MV	HHI	NIND
SYNC		0.180	0.308	-0.117	0.611	-0.003#	-0.043
AQ	0.123		0.649	0.439	0.346	0.191	-0.243
INNATEAQ	0.245	0.575		-0.292	0.584	0.214	-0.255
DISAQ	-0.045	0.761	-0.093		-0.207	0.004#	-0.022
MV	0.582	0.239	0.479	-0.089		0.012*	-0.074
LOGHHI	-0.001#	0.177	0.219	0.041	0.012*		-0.764
LOGNIND	-0.051	-0.212	-0.260	-0.052	-0.077	-0.724	
DIVERS	-0.074	-0.114	-0.192	0.014*	-0.146	-0.146	0.140
FUNDCORR	0.073	0.047	0.052	0.016	0.062	0.059	-0.058
LOGIO	0.437	0.188	0.312	-0.019	0.634	0.007#	-0.030
REG	0.072	0.058	0.091	-0.001#	0.053	-0.089	-0.015
IDIORISK	-0.110	-0.122	-0.170	-0.014*	-0.189	-0.043	0.064
NFOLLOW	0.450	0.153	0.308	-0.059	0.698	-0.007#	-0.003#

	DIVERS	FUND-CORR	LOGIO	REG	IDIORISK	NFOLLOW
SYNC	-0.094	0.081	0.453	0.065	-0.387	0.489
AQ	-0.147	0.057	0.204	0.103	-0.458	0.240
INNATEAQ	-0.225	0.060	0.338	0.115	-0.631	0.398
DISAQ	0.067	0.004#	-0.096	-0.020	0.126	-0.130
MV	-0.157	0.073	0.656	0.056	-0.596	0.729
LOGHHI	-0.202	0.070	-0.005#	-0.093	-0.147	-0.022
LOGNIND	0.170	-0.066	-0.020	-0.040	0.229	-0.004#
DIVERS		0.016	-0.032	-0.018	0.188	-0.040
FUNDCORR	0.017		0.056	-0.014*	-0.053	0.075
LOGIO	-0.030	0.047		-0.028	-0.370	0.788
REG	-0.005#	-0.010!	-0.025		-0.113	0.002#
IDIORISK	0.040	-0.012*	-0.140	-0.019		-0.382
NFOLLOW	-0.038	0.079	0.590	-0.008#	-0.102	

Pearson (spearman) correlations below (above) the diagonal.

All correlations are significant at the 1% level except: # indicates no significance, * indicates significant at only the 5% level.

Refer to the appendix for variable definitions.

5. EMPIRICAL ANALYSIS

This section discusses the results from the tests of our hypotheses presented in section 3. We first present the results on the relation between accruals quality and price synchronicity. We then discuss the differences in the association of accruals quality and price synchronicity between firms that are followed by analysts and firms that are not. Next, we present results related to the innate and discretionary components of accruals quality.

5.1 The Relation between Accruals Quality and Price Synchronicity

To investigate the relation between accruals quality and price synchronicity, we follow the model presented in Piotroski and Roulstone (2004). Specifically, we estimate the following regression:

$$\begin{aligned} SYNCH_{i,t} = {} & \beta_0 + \beta_1 AQ_{i,t} + \beta_2 MV_{i,t} + \beta_3 LOGHHIF_{i,t} + \beta_4 LOGNIND_{i,t} + \beta_5 DIVERS_{i,t} \\ & + \beta_6 FUNDCORR_{i,t} + \beta_7 LOGIO_{i,t} + \beta_8 REG_{i,t} + \beta_9 IDIORISK_{i,t} \\ & + \beta_{10} NFOLLOW_{i,t} + \sum_{j=1}^{8} \delta_j IND_{i,t}^{j} + \varepsilon_{i,t} \end{aligned} \tag{20}$$

$SYNCH_{i,t}$	=	Price synchronicity for firm *i* in year *t;*
$AQ_{i,t}$	=	Accruals quality for firm *i* in year *t*;
$MV_{i,t}$	=	Market value for firm *i* in year *t*;
$LOGHHIF_{i,t}$	=	Log of the Herfindahl index for firm *i* in year *t*;
$LOGNIND_{i,t}$	=	Log of the average number of firms used to create the industry index in equation (18) for firm *i* in year *t*;
$DIVERS_{i,t}$	=	Diversification index for firm *i* in year *t*;
$FUNDCORR_{i,t}$	=	Fundamental correlation of firm *i*'s quarterly earnings with an industry earnings index in years *t-2* to *t*;
$LOGIO_{,t}$	=	Log of one plus the percent of institutional ownership for firm *i* in year *t*;
$REG_{i,t}$	=	Dummy variable equal to one if firm *i*'s primary 2-digit SIC code is 62 or 49 in year *t*, zero otherwise;
$IDIORISK_{i,t}$	=	Idiosyncratic risk for firm *i* in year *t*;
$NFOLLOW_{i,t}$	=	Number of analyst forecasts made in the month of firm *i*'s earnings announcement for year *t*;
$IND^{j}_{i,t}$	=	Industry dummy variables based on 1-digit SIC codes.

In estimating equation (20), we use the relative rank of each variable within year and analyst following group to control for potential non linearity and the influence of outliers[25]. Specifically, for each year and each analyst following group, we take the rank of the variable minus one and divide by the number of observations in that year and group minus one. This limits our independent variables within the regressions to be between 0 and 1. We use standard errors clustered by firm and year to allow for cross-sectional and time-series dependence (Gow et al. 2009). Table 4 presents the results of our estimation of equation (20) for total accruals quality. We first present the results pooling all observations from our sample. We then run separate regressions for the firms that are followed by analysts and the firms that are not followed by analysts. We also provide tests of the difference of the coefficients between the two groups.

The first column in Table 4 presents the results of the regression of price synchronicity on total accruals quality for the pooled sample. Consistent with Piotroski and Roulstone (2004), size (MV) is positively related to price synchronicity (coefficient of 0.842). However, we do not find significant relations for our diversification (DIVERS) or concentration (LOGHHIF) variables nor do we find that the average number of firms within the industry (LOGNIND) or the percent of institutional owners (LOGIO) is significantly related to synchronicity. We find that the coefficient on the fundamental correlation between the firm's earnings and industry earnings (FUNDCORR) is positive (0.092) and statistically significant at the 1% level. Analyst following (NFOLLOW) and regulated industries (REG) are also significantly positively related to price synchronicity with coefficients of 0.07 and 0.283, respectively. We find that idiosyncratic risk (IDIORISK) is significantly negatively related to price synchronicity (coefficient of -0.365), consistent with our expectations.

[25] Using the standardized rank within year alone or using the raw variables and winsorizing at the 1st and 99th percentile, we find qualitatively similar results.

Table 4
Regression of price synchronicity (SYNC) on total accruals quality (AQ)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.560***	-2.674***	-2.857***	0.184
AQ	-0.092***	-0.129***	-0.043	-0.086
MV	0.842***	1.463***	1.314***	0.149
LOGHHIF	0.078	0.103	0.019	0.084
LOGNIND	0.033	0.067	0.057	0.010
DIVERS	-0.026	0.042	-0.004	0.046
FUNDCORR	0.092***	0.181***	0.048	0.133***
LOGIO	0.055	0.201***	-0.131***	0.331***
REG	0.283***	0.368***	0.094	0.275**
IDIORISK	-0.365***	-0.426***	-0.181***	-0.245***
NFOLLOW	0.070***			
R-SQUARE	28.70%	28.65%	16.80%	
ADJ R-SQ	28.67%	28.59%	16.70%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for variable definitions.

The coefficient on total accruals is -0.092 and is statistically significant at the 1% level. This supports our first hypothesis that accruals quality is negatively related to price synchronicity. Firms with higher accruals quality have better earnings information. As earnings information increases in quality, investors are better able to distinguish firm earnings from industry and market related earnings. As a result, firm returns are less correlated with market and industry returns and price synchronicity declines.

The remaining columns in table 4 examine the differences between firms that have an analyst following and firms that do not. The results for the analyst following group are comparable to the full sample results. Additionally, the percent of institutional ownership is positive and significant. The coefficient on accruals quality for the analyst following group is -0.129 and is statistically significant at the 1% level. However, for firms without an analyst following, size (MV), institutional ownership (LOGIO) and idiosyncratic risk (IDIORISK) are the only variables with coefficients that are significantly different from zero. The coefficient on accruals quality is -0.043 but is not statistically different from zero. We fail to find a significant difference in the coefficient on total accruals quality for firms that are followed by analysts compared to firms that are not followed by analysts.

The results from this table are consistent with our first hypothesis. We find that accruals quality is negatively related to price synchronicity. As the quality of earnings increases, investors are able to impound more firm-specific information into prices and will rely less on market or industry related news in pricing the firm. We find that this is especially true for firms that are followed by analysts. However, we do not find that there is a statistical difference in the relation between accruals quality and price synchronicity for firms that are followed by analysts compared to firms that are not followed by analysts.

5.2 The Relation between the Components of Accruals Quality and Price Synchronicity

Table 5 presents our results on the relation between the innate component of accruals quality and price synchronicity. For the pooled model, the coefficient on the innate component of accruals quality is -0.252 and is significant at the 1% level. Firms that are followed by analysts have a coefficient of -0.340 (with a significance level of 1%) whereas firms that do not have an analyst following only have a coefficient of -0.100, and is only significantly different from zero at the 10% level of significance. The difference in the coefficients on the innate component of accruals quality is -0.240 and is significantly different than zero at the 1% level. These results are consistent with our second hypothesis of a negative relation between the innate component of accruals quality and price synchronicity.

Table 6 presents the results from the regression of price synchronicity on the discretionary component of accruals quality. The coefficient on the discretionary component of accruals quality for the pooled model is -0.004. For the firms that are (not) followed by analysts, the coefficient on the discretionary component of accruals quality is -0.012 (-0.028). The coefficient is not statistically different than zero in any of the models. This may be a result of the mixture of uses managers employ with their discretion. Some managers may be trying to reveal information to investors through discretionary accruals; others may be acting opportunistically and managing earnings for personal gain.

We include both the innate and the discretionary components in the models in table 7. Both components are negative and significantly related to price synchronicity for the pooled model. The coefficient on the innate component of accruals quality is -0.266 (significant at the 1% level) and the coefficient on the discretionary component of accruals quality is -0.046 (significant at the 5% level. When we divide the sample by analyst following, we find the coefficient on the innate component of accruals quality decreases to -0.367 and the coefficient on the discretionary component deceases to -0.074. For the firms that do not have an analyst following, the

Table 5
Regression of price synchronicity (SYNC) on the innate component of accruals quality (INNATEAQ)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.625***	-2.769***	-2.878***	0.109
INNATEAQ	-0.252***	-0.340***	-0.100*	-0.240***
MV	0.904***	1.566***	1.333***	0.233
LOGHHIF	0.088	0.119	0.022	0.098
LOGNIND	0.017	0.048	0.050	-0.002
DIVERS	-0.042	0.024	-0.011	0.035
FUNDCORR	0.091***	0.181***	0.048	0.132***
LOGIO	0.055	0.196***	-0.128***	0.324***
REG	0.299***	0.393***	0.098	0.294**
IDIORISK	-0.447***	-0.532***	-0.212***	-0.320***
NFOLLOW	0.070***			
R-SQUARE	28.87%	28.94%	16.84%	
ADJ R-SQ	28.83%	28.88%	16.73%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for variable definitions.

Table 6
Regression of price synchronicity (SYNC) on the discretionary component of accruals quality (DISAQ)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.534***	-2.633***	-2.857***	0.224
DISAQ	-0.004	-0.012	-0.028	0.016
MV	0.835***	1.450***	1.307***	0.143
LOGHHIF	0.074	0.101	0.017	0.084
LOGNIND	0.042	0.079	0.061	0.019
DIVERS	-0.023	0.044	0.000	0.044
FUNDCORR	0.090***	0.179***	0.048	0.131***
LOGIO	0.055	0.200***	-0.130***	0.330***
REG	0.282***	0.365***	0.091	0.274**
IDIORISK	-0.331***	-0.379***	-0.165***	-0.214***
NFOLLOW	0.070***			
R-SQUARE	28.66%	28.56%	16.80%	
ADJ R-SQ	28.62%	28.50%	16.69%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for variable definitions.

coefficient on the innate component of accruals quality is -0.111 and only moderately significant at the 10% level. The coefficient on the discretionary component of accruals quality is -0.043 but is not significantly different from zero. The difference in the coefficient of the innate component of accruals quality between the analyst following groups is -0.256 and is significant at the 1% level.

The results from this section are consistent with our second hypothesis of a negative relation between price synchronicity and the innate component of accruals quality. However, we only find moderate support for our third hypothesis that there is a negative relation between price synchronicity and the discretionary component of accruals quality. Our finding of a consistently negative relation between only between the innate component of accruals quality and price synchronicity is consistent with the notion that the discretionary accruals component captures a mixture of information and opportunism. We also find that the relation between the innate component of accruals quality and price synchronicity is more negative for firms that are followed by analysts. This provides evidence in favor of a complementary relation between earnings information and analysts' information.

Table 7
Regression of price synchronicity (SYNC) on both the innate (INNATEAQ) and the discretionary (DISAQ) components of accruals quality

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.649***	-2.808***	-2.899***	0.091
INNATEAQ	-0.266***	-0.367***	-0.111*	-0.256***
DISAQ	-0.046**	-0.074**	-0.043	-0.031
MV	0.898***	1.555***	1.327***	0.228
LOGHHIF	0.088	0.118	0.023	0.095
LOGNIND	0.015	0.045	0.048	-0.003
DIVERS	-0.042	0.026	-0.011	0.037
FUNDCORR	0.092***	0.182***	0.049	0.133***
LOGIO	0.056	0.198***	-0.128***	0.326***
REG	0.297***	0.390***	0.096	0.294**
IDIORISK	-0.453***	-0.540***	-0.218***	-0.323***
NFOLLOW	0.070***			
R-SQUARE	28.88%	28.98%	16.85%	
ADJ R-SQ	28.84%	28.91%	16.74%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for variable definitions.

6. SENSITIVITY AND ADDITIONAL ANALYSIS

6.1 Alternative Measures of Accruals Quality

6.1.1 Longer Horizon for Accruals Quality

Our primary measure of accruals quality uses the standard deviation of the residual from equation (16) over the last five years. We use the standard deviation over the last ten years of the residual from equation (16) as an alternative measure of accruals quality. Tables 8, 9, 10, and 11 reproduce tables 4, 5, 6 and 7 using this alternative measure of accruals quality.

In table 8, we observe a coefficient of -0.091 between total accruals quality and price synchronicity in the pooled sample. For firms that have an analyst following, the coefficient on the longer horizon accruals quality is -0.124 and is statistically significant at the 1% level. Unlike our main analysis, the longer horizon accruals quality and price synchronicity are also negatively related for firms that do not have an analyst following (coefficient of -0.091). The difference in the coefficients between the two groups is not significantly different from zero. These results are consistent with the results in table 4 and support our first hypothesis.

The results in table 9 are similar to those in table 5. The coefficient on the innate component of accruals quality over the longer horizon is -0.248 and is significant at the 1% level. The coefficient is -0.337 for the analyst following group and -0.108 for the group without an analyst following. The difference of -0.229 in the coefficients is significant at the 1% level. These results support our analysis presented in table 5.

In tables 10, the coefficient on the discretionary component of accruals quality over a longer window continues to be not significantly different for the pooled model and the analyst following group. For firms that do not have an analyst following, the coefficient is -0.081 and is significantly related to price synchronicity at the 5% level. Further, the difference between the coefficient for the followed and not followed groups (0.094) is significantly different from zero at the 1% level.

Table 8
Regression of price synchronicity (SYNC) on total accruals quality (AQ10)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.555***	-2.664***	-2.865***	0.201
AQ10	-0.091*	-0.124**	-0.091*	-0.034
MV	0.844***	1.466***	1.317***	0.149
LOGHHIF	0.078	0.105	0.020	0.085
LOGNIND	0.032	0.066	0.050	0.016
DIVERS	-0.027	0.042	-0.008	0.049
FUNDCORR	0.092***	0.182***	0.050	0.132***
LOGIO	0.055	0.200***	-0.131***	0.331***
REG	0.283***	0.369***	0.093	0.276**
IDIORISK	-0.367***	-0.427***	-0.201***	-0.226***
NFOLLOW	0.070***			
R-SQUARE	28.70%	28.64%	16.84%	
ADJ R-SQ	28.66%	28.58%	16.74%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Variable Definitions:
AQ10 = Accruals quality measured as the 10 year rolling standard deviation of the residual from the Dechow and Dichev (2002) model as modified by McNichols (2002); Refer to the appendix for all other variable definitions.

Table 9
Regression of price synchronicity (SYNC) on the innate component of accruals quality (INNATEAQ10)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.623***	-2.766***	-2.880***	0.114
INNATEAQ10	-0.248***	-0.337***	-0.108*	-0.229***
MV	0.902***	1.562***	1.334***	0.228
LOGHHIF	0.087	0.119	0.022	0.097
LOGNIND	0.017	0.048	0.049	-0.001
DIVERS	-0.043	0.023	-0.012	0.035
FUNDCORR	0.091***	0.180***	0.048	0.132***
LOGIO	0.056	0.196***	-0.129***	0.325***
IDIORISK	-0.446***	-0.531***	-0.215***	-0.316***
REG	0.299***	0.392***	0.099	0.293**
NFOLLOW	0.070***			
R-SQUARE	28.86%	28.94%	16.84%	
ADJ R-SQ	28.83%	28.88%	16.74%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.

Variable Definitions:
INNATEAQ10 = Innate accruals quality measured as the predicted value of accruals quality (AQ10) consistent with Francis et al. (2005). Refer to the appendix for all other variable definitions.

Table 10
Regression of price synchronicity (SYNC) on the discretionary component of accruals quality (DISAQ10)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.531***	-2.624***	-2.875***	0.251
DISAQ10	0.002	0.013	-0.081**	0.094***
MV	0.836***	1.456***	1.298***	0.159
LOGHHIF	0.075	0.102	0.015	0.087
LOGNIND	0.042	0.080	0.056	0.024
DIVERS	-0.024	0.043	0.001	0.042
FUNDCORR	0.090***	0.178***	0.049	0.129***
LOGIO	0.055	0.199***	-0.130***	0.329***
IDIORISK	-0.331***	-0.380***	-0.167***	-0.213***
REG	0.282***	0.367***	0.087	0.279**
NFOLLOW	0.070***			
R-SQUARE	28.66%	28.56%	16.84%	
ADJ R-SQ	28.62%	28.50%	16.74%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Variable Definitions:
DISAQ10 = Discretionary accruals quality measured as the residual of the regression of accruals quality (AQ10) on economic factors consistent with Francis et al. (2005); Refer to the appendix for all other variable definitions.

Table 11
Regression of price synchronicity (SYNC) on both the innate (INNATEAQ10) and the discretionary (DISAQ10) components of accruals quality

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.635***	-2.779***	-2.920***	0.142
INNATEAQ10	-0.255***	-0.345***	-0.128**	-0.217***
DISAQ10	-0.029	-0.029	-0.095***	0.066*
MV	0.898***	1.557***	1.321***	0.236
LOGHHIF	0.087	0.118	0.021	0.097
LOGNIND	0.015	0.046	0.041	0.006
DIVERS	-0.042	0.024	-0.012	0.036
FUNDCORR	0.092***	0.181***	0.051	0.130***
LOGIO	0.056	0.197***	-0.128***	0.325***
IDIORISK	-0.448***	-0.533***	-0.227***	-0.306***
REG	0.297***	0.391***	0.093	0.298**
NFOLLOW	0.070***			
R-SQUARE	28.87%	28.94%	16.91%	
ADJ R-SQ	28.83%	28.88%	16.80%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Variable Definitions:
INNATEAQ10 = Innate accruals quality measured as the predicted value of accruals quality (AQ10) consistent with Francis et al. (2005); DISAQ10 = Discretionary accruals quality measured as the residual of the regression of accruals quality (AQ10) on economic factors consistent with Francis et al. (2005); Refer to the appendix for all other variable definitions.

Table 11 presents the model that includes both the innate and discretionary components of accruals quality estimated over the longer horizon. As with table 9, the coefficient on the innate component of accruals quality is negatively related to price synchronicity for the pooled model as well as both of the subsamples. The coefficient for the analyst following group continues to be more negative than the coefficient for the group that is not followed. This suggests that, over long horizon, the discretionary accruals plays more of a role in providing firm-specific information to the market for firms that are not followed by financial analysts compared to firms that are followed by financial analysts.

6.1.2 Abnormal Accruals as a Measure of Accruals Quality

The use of abnormal accruals for the Jones (1991) model as a measure of accruals quality is common in the literature (e.g. Francis et al. 2005). We use the modified-Jones model abnormal accruals computed as follows. We estimate the following regression equation by year and 2-digit SIC industry:

$$\frac{TA_{i,t}}{Assets_{i,t}} = \alpha_0 \frac{1}{Assets_{i,t}} + \alpha_1 \frac{\Delta REV_{i,t}}{Assets_{i,t}} + \alpha_2 \frac{PPE_{i,t}}{Assets_{i,t}} + \varepsilon_{i,t} \qquad (21)$$

Where:

$TA_{j,t}$ = Total accruals, defined as the difference between net income before extraordinary items (Compustat quarterly data item 8) and cash flow from operations (data308) less cash flow from extraordinary items (data124) in year t.

$Assets_{i,t}$ = Firm *i*'s average total assets (data6) in years *t* and *t*-1

$\Delta REV_{i,t}$ = Firm *i*'s change in sales (data12) in year *t*

$PPE_{i,t}$ = Firm *i*'s gross property, plant and equipment (data7) in year *t*

Abnormal accruals is defined as the difference between the observed level of total accruals and the fitted value of total accruals using change in revenue less change in receivables instead of just change in revenue. Specifically, abnormal accruals are defined as:

$$AAMJ_{i,t} = \frac{TA_{i,t}}{Assets_{i,t}} - (\hat{\alpha}_0 \frac{1}{Assets_{i,t}} + \hat{\alpha}_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{Assets_{i,t}} + \hat{\alpha}_2 \frac{PPE_{i,t}}{Assets_{i,t}}) \qquad (22)$$

Where ΔREC is the change in current receivables (data2), $\hat{\alpha}$ are the estimates from equation (6) and the other variables are as previously defined. We use the absolute value of AAMJ as an alternative measure of accruals quality (ABSAAMJ). The expected value of absolute value of AAMJ is an increasing function of the variance of the error term in equation (21). As such, the ABSAAMJ is sometimes interpreted as accruals quality.

Table 12 presents are results using ABSAAMJ as our measure of accruals quality. We find that, for the pooled sample, the coefficient on ABSAAMJ is -0.068 and is significant at the 1% level. We also find a negative and significant coefficient on ABSAAMJ for the analyst following group (-0.096). We fail to find a significant relation between accruals quality and price synchronicity. We also fail to find a significant difference between the followed and not followed groups. These results are similar to that of table 4 where we used total accruals quality.

We also consider abnormal accruals based on the modified-Jones model controlling for firm level performance. Kothari et al. (2005) suggest that abnormal accruals are correlated with firm performance. We measure abnormal accruals based on the modified Jones model controlling for firm level performance in a similar manner as ABSAAMJ, but we add a net income before extraordinary items as a control for firm performance in our estimation equation. Specifically we use the following equations to define our second measure of abnormal accruals:

$$\frac{TA_{i,t}}{Assets_{i,t}} = \alpha_0 \frac{1}{Assets_{i,t}} + \alpha_1 \frac{\Delta REV_{i,t}}{Assets_{i,t}} + \alpha_2 \frac{PPE_{i,t}}{Assets_{i,t}} + \alpha_3 \frac{NIBE_{i,t}}{Assets_{i,t}} + \varepsilon_{i,t} \quad (23)$$

$$AAMK_{i,t} = \frac{TA_{i,t}}{Assets_{i,t}} - (\hat{\alpha}_0 \frac{1}{Assets_{i,t}} + \hat{\alpha}_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{Assets_{i,t}} + \hat{\alpha}_2 \frac{PPE_{i,t}}{Assets_{i,t}} + \hat{\alpha}_3 \frac{NIBE_{i,t}}{Assets_{i,t}}) \quad (24)$$

Table 12
Regression of price synchronicity (SYNC) on the absolute value of abnormal accruals from the modified Jones Model (ABSAAMJ)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.564***	-2.675***	-2.866***	0.191
ABSAAMJ	-0.068***	-0.096***	-0.043	-0.052
MV	0.842***	1.458***	1.317***	0.142
LOGHHIF	0.074	0.099	0.017	0.082
LOGNIND	0.032	0.066	0.056	0.010
DIVERS	-0.023	0.044	-0.001	0.045
FUNDCORR	0.091***	0.180***	0.048	0.132***
LOGIO	0.055	0.201***	-0.131***	0.332***
REG	0.285***	0.370***	0.095	0.276**
IDIORISK	-0.344***	-0.399***	-0.172***	-0.227***
NFOLLOW	0.070***			
R-SQUARE	28.69%	28.62%	16.81%	
ADJ R-SQ	28.65%	28.56%	16.70%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Variable Definitions:
ABSAAMJ = absolute value of abnormal accruals from the modified Jones Model; Refer to the appendix for all other variable definitions.

Where:

$TA_{j,t}$ = Total accruals, defined as the difference between net income before extraordinary items (data18) and cash flow from operations (data308) less cash flow from extraordinary items (data124) in year t.

$Assets_{i,t}$ = Firm *i*'s average total assets (data6) in years *t* and *t*-1

$\Delta REV_{i,t}$ = Firm *i*'s change in sales (data12) in year *t*

$PPE_{i,t}$ = Firm *i*'s gross property, plant and equipment (data7) in year *t*

$\Delta REC_{i,t}$ = Firm *i*'s change in receivables (data2) in year *t*

NIBEi,t = Firm i's net income before extraordinary items (data18) in year *t*

Table 13 presents results using the absolute value of abnormal accruals based on the modified Jones model controlling for firm level performance (ABSAAMK) as a measure of accruals quality. As with table 4 and table 12, we find that the coefficient is negative and significant for the pooled model (-0.049) and for the analyst following group (-0.074). Again, we fail to find a significant relation between ABSAAMK and price synchronicity for the non-analyst following group and we do not find a significant difference in the coefficient on ABSAAMK between the two groups.

Using various different measures of accruals quality, we find results that are consistent with our main results. When we extend the number of years included in our accruals quality measures, we find total and innate accruals quality has a negative relation with price synchronicity, and this negative relation is greater for firms that have an analyst following. A result that is not present in our main result is a significantly negative relation between the discretionary accruals quality component and price synchronicity for firms that are not followed by analysts. This could suggest that the discretionary component of accruals quality may convey information to investors that is already present in analyst information. For our abnormal accruals measures (ABSAAMJ and ABSAAMK), we find results that are qualitatively similar to our main results using total accruals quality (table 4). Specifically, we find that the absolute value of

Table 13
Regression of price synchronicity (SYNC) on the absolute value of abnormal accruals from the modified Jones Model with controls for performance (ABSAAMK)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.552***	-2.660***	-2.857***	0.198
ABSAAMK	-0.049*	-0.074**	-0.029	-0.046
MV	0.839***	1.455***	1.314***	0.141
LOGHHIF	0.074	0.099	0.017	0.083
LOGNIND	0.038	0.074	0.059	0.015
DIVERS	-0.024	0.042	-0.001	0.043
FUNDCORR	0.091***	0.180***	0.048	0.132***
LOGIO	0.055	0.201***	-0.131***	0.332***
REG	0.282***	0.366***	0.093	0.273**
IDIORISK	-0.343***	-0.398***	-0.171***	-0.227***
NFOLLOW	0.070***			
R-SQUARE	28.68%	28.60%	16.80%	
ADJ R-SQ	28.64%	28.54%	16.69%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Variable Definitions:
ABSAAMK = absolute value of abnormal accruals from the modified Jones Model with controls for performance; Refer to the appendix for all other variable definitions.

abnormal accruals is negatively related to price synchronicity on average and is mainly due to the firms that are followed by analysts. The results from this section show that are main results are generally robust to alternative measures of accruals quality.

6.2 Endogeneity of Accruals Quality

We present the argument that higher accruals quality allows investors to distinguish firm-specific earnings from market and industry earnings, thereby reducing price synchronicity. An alternative view is that low price synchronicity increases the monitoring done by the market and is jointly determined along with other monitoring mechanisms and accruals quality. Thus accruals quality is endogenously determined. We use a two-stage regression technique similar to the one used by Cohen (2008) and Brown and Hillegeist (2007). Following Cohen (2008), we estimate the following first stage regression:

$$\begin{aligned} AQ_{i,t} = {} & \alpha_0 + \alpha_1 OWNER_{i,t} + \alpha_2 GROWTH_{i,t} + \alpha_2 LIT_{i,t} + \alpha_3 LEV_{i,t} + \alpha_4 OC_{i,t} + \alpha_5 AGE_{i,t} \\ & + \alpha_6 HHIF_{i,t} + \alpha_7 NSEG_{i,t} + \alpha_8 ASSETS_{i,t} + \alpha_9 PUBLICISSUE_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (25)$$

Where:

$AQ_{i,t}$	=	Accruals quality for firm *i* in year *t*;
$OWNER_{i,t}$	=	Natural log of the number of shareholders of firm *i* in year *t* (data100) minus natural log of the mean number of shareholders (in thousands) in the firm's size decile;
$GROWTH_{i,t}$	=	Growth in firm *i*'s sales (data6) over year *t*,
$LIT_{i,t}$	=	Dummy variable equal to one if firm *i* is in a "high-litigation" industry in year *t*, zero otherwise;
$LEV_{i,t}$	=	Leverage for firm *i* in year *t*, calculated as long-term debt (data9) plus debt in current liabilities (data34) divided by firm value (data199 times data25);
$OC_{i,t}$	=	Operating cycle for firm *i* at time *t*, measured in days as, where AR is the firm's accounts receivable, INV is the firm's inventory, and COGS is the firm's cost of goods sold;
$AGE_{i,t}$	=	Firm *i*'s age, natural logarithm of number of months the company has been listed on CRSP;
$HHIF_{i,t}$	=	Weighted average Herfindahl index of industry level concentration based on segment sales within 2-digit SIC industry.
$NSEG_{i,t}$	=	Number of two-digit SIC code industries that firm *i* is engaged in year *t*;
$ASSETS_{i,t}$	=	Natural log of total assets for firm *i* in year *t*;
$PUBLICISSUE_{i,t}$	=	Dummy variable equal to one if firm *i* issued debt or equity during the years *t* to *t*+2, and zero otherwise;

Equation (25) is estimated by year and 2-digit SIC industry. Our second stage uses the predicted value from equation (25) in place of our accruals quality. Table 14 presents the results from this instrumental variable regression. The coefficient on accruals quality is -0.165 and is significant at the 5% level for the pooled model. For the analysts following group, we find a significantly negative (at the 5% level) coefficient of -0.208. The coefficient on accruals quality for firms that do not have an analysts following is -0.106, but this is not statistically different from zero. Additionally, the difference between the coefficients for the analyst following groups is not significantly different from zero. These results are similar to the results for total accruals quality presented in table 4. This suggests that our results are robust to the endogenous nature of accruals quality choice.

6.3 Synchronicity to Fama And French (1993) Three Factor Model

Price synchronicity is typically measured based on a market and industry index. Generally small, high growth firms have low accruals quality. If prices are responding to size and growth factor rather than market or industry factors, accruals quality could be capturing this effect rather than responses to firm-specific information. To investigate the possibility, we include size and book-to-market factors[26] to explain firm returns. Specifically, we run the following weekly firm-specific regression:

$$\begin{aligned} RET_{i,w} = {} & \alpha_0 + \alpha_1 MKTRET_{i,w} + \alpha_2 MKTRET_{i,w-1} + \alpha_3 INDRET_{i,w} + \alpha_4 INDRET_{i,w-1} \\ & + \alpha_5 SMB_{i,w} + \alpha_6 SMB_{i,w-1} + \alpha_7 HML_{i,w} + \alpha_8 HML_{i,w-1} + \varepsilon_{i,w} \end{aligned} \quad (26)$$

Where:

$RET_{i,w}$	=	Compound return for company *i* for week *w*.
$MKTRET_{i,w}$	=	Compound weekly return for value weighted market index from CRSP excluding firm *i* for week *w*.
$INDRET_{i,w}$	=	Compound weekly return for value weighted industry index from CRSP excluding firm *i* for week *w*.
$SMB_{i,w}$	=	Compound weekly return on a size portfolio based on market value of equity.
$HML_{i,w}$	=	Compound weekly return on a growth portfolio based on market-to-book value.

[26] We use the weekly size and growth index returns from Kenneth French's web site: (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html)

Table 14
Two stage regression of price synchronicity (SYNC) on accruals quality (IVAQ)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.622***	-2.743***	-2.909***	0.166
IVAQ	-0.165**	-0.208**	-0.106	-0.102
MV	0.908***	1.555***	1.354***	0.201
LOGHHIF	0.085	0.120	0.019	0.101
LOGNIND	-0.005	0.031	0.023	0.008
DIVERS	-0.044	0.013	-0.007	0.020
FUNDCORR	0.092***	0.180***	0.048	0.132***
LOGIO	0.056	0.201***	-0.130***	0.331***
REG	0.295***	0.394***	0.100	0.295**
IDIORISK	-0.373***	-0.418***	-0.196***	-0.221***
NFOLLOW	0.070***			
R-SQUARE	28.74%	28.72%	16.87%	
ADJ R-SQ	28.70%	28.66%	16.76%	
N	32983	19553	13430	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Variable Definitions:
IVAQ = predicted value of accruals quality from the first stage regression consistent with Cohen (2008); MV = Log of the firm's market value at fiscal year end from COMPUSTAT; Refer to the appendix for all other variable definitions.

In table 15, we present results using price synchronicity from equation (26) which parallels table 4. We find a significantly negative relation between total accruals quality and price synchronicity for the pooled model (coefficient of -0.060) and the analyst following subsample (coefficient of -0.074). As with table 4, we fail to find a significant relation between total accruals quality and price synchronicity. The difference in the coefficient on total accruals quality between the followed and not followed groups is also not significant.

Table 16 presents the results for the innate component of accruals quality using the Fama-French model. The coefficient on the innate component of accruals quality is -0.166 and is significant at the 1% level for the pooled sample. For the analyst following group, we find also find a negative and significant relation between the innate component of accruals quality and price synchronicity (coefficient of -0.224). We find no significant relation for the not followed group. The relation for the followed group is significantly more negative than the not followed group (a difference of -0.165). These results are consistent with table 5.

Table 17 presents the result for the discretionary component of accruals quality. We fail to find any significant relation between the discretionary component of accruals quality and price synchronicity. The results are consistent with the results presented in table 6.

When we include both the innate and discretionary components in the model (Table 18), we find a negative and significant relation between both the innate and discretionary components of accruals quality and price synchronicity for the pooled model (coefficients of -0.178 and -0.037, respectively). For the analyst following group, we find a coefficient of -0.242 on the innate component of accruals quality and a coefficient of -0.050 for the discretionary component of accruals quality. For the not followed group, we find that the innate component of accruals quality is not significantly related to price synchronicity (coefficient of -0.070). However, the discretionary component of accruals quality is significantly negative with a coefficient of -0.070 at the 5% level. The difference in the coefficients between the followed and not followed is

significant for the innate component of accruals quality (coefficient of -0.172) but not for the discretionary component of accruals quality (coefficient of 0.005).

The results in this section are consistent with our main results. Specifically, we find that accruals quality is negatively related to price synchronicity. This relation is mainly due to the innate accruals quality component. Further, firms that have an analyst following have a more negative relation between accruals quality and price synchronicity compared to firms that are not followed. Therefore our results are robust to the alternative explanation that firms with high accruals quality are related to size of book-to-market risk factors and do not necessarily have more firm-specific information impounded into prices.

6.4 Regulation Fair Disclosure

In October of 2000, the SEC implemented Regulation Fair Disclosure (Reg-FD) which prohibited selective disclosure of information by managers to analysts. The intention was to reduce the incentives of analysts to issue optimistic forecasts in exchange for private information from managers. Another piece of legislation during the same period was the Sarbanes-Oxley act, which was intended to improve the quality of financial reports. We examine how the relation between accruals quality and price synchronicity changed around the time that Reg-FD was enacted. Private communications by managers may aid analysts in providing firm-specific information to the market. Alternatively, managers may choose to disseminate firm-specific information through discretion in accruals, making analyst information redundant. The information in discretionary accruals may be distorted by managers acting opportunistically. Additionally, the Sarbanes-Oxley Act of 2002 (SOX) reduced the use of accruals as an earnings management tool which may make earnings more informative after 2002. We partition the sample by time period. We consider observations before 2000 as the pre Reg-FD period and observations after 2000 as the post Reg-FD period. We remove observations in the year 2000. Tables 19 through 22 present our results partitioned by Reg-FD period.

Table 15
Regression of price synchronicity with Fama-French (1993) factors (FFSYNC) on total accruals quality (AQ)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-1.699***	-1.681***	-1.998***	0.317
AQ	-0.060**	-0.074*	-0.039	-0.035
MV	0.620***	1.026***	0.995***	0.031
LOGHHIF	0.060	0.082	0.015	0.068
LOGNIND	0.047	0.098	0.028	0.070
DIVERS	-0.059*	-0.020	-0.030	0.010
FUNDCORR	0.061***	0.128***	0.024	0.104***
LOGIO	0.051*	0.166***	-0.094***	0.260***
IDIORISK	-0.226***	-0.284***	-0.076	-0.208***
REG	0.241***	0.314***	0.091	0.222**
NFOLLOW	0.050***			
R-SQUARE	26.56%	25.47%	16.87%	
ADJ R-SQ	26.52%	25.41%	16.77%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.

Variable Definitions:
FFSYNC = Price synchronicity measured as the logit transformation of the R^2 from the regression of weekly firm returns on current and prior market, industry weekly returns as well as the current and prior weekly returns the Fama and French (1993) size and market-to-book factor indexes; Refer to the appendix for all other variable definitions.

Table 16
Regression of price synchronicity with Fama-French (1993) factors (FFSYNC) on the innate component of accruals quality (INNATEAQ)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-1.742***	-1.748***	-2.006***	0.259
INNATEAQ	-0.166***	-0.224***	-0.059	-0.165***
MV	0.661***	1.095***	1.005***	0.090
LOGHHIF	0.067	0.093*	0.016	0.078
LOGNIND	0.036	0.085	0.025	0.060
DIVERS	-0.069**	-0.032	-0.033	0.001
FUNDCORR	0.061***	0.128***	0.024	0.104***
LOGIO	0.051*	0.163***	-0.093***	0.255***
IDIORISK	-0.281***	-0.358***	-0.089*	-0.269***
REG	0.251***	0.330***	0.094	0.236***
NFOLLOW	0.050***			
R-SQUARE	26.69%	25.70%	16.88%	
ADJ R-SQ	26.65%	25.64%	16.78%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Variable Definitions:
FFSYNC = Price synchronicity measured as the logit transformation of the R^2 from the regression of weekly firm returns on current and prior market, industry weekly returns as well as the current and prior weekly returns the Fama and French (1993) size and market-to-book factor indexes; Refer to the appendix for all other variable definitions.

Table 17
Regression of price synchronicity with Fama-French (1993) factors (FFSYNC) on the discretionary component of accruals quality (DISAQ)

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-1.684***	-1.659***	-2.002***	0.343*
DISAQ	-0.009	-0.010	-0.035	0.026
MV	0.614***	1.018***	0.987***	0.031
LOGHHIF	0.058	0.081	0.013	0.068
LOGNIND	0.052	0.105	0.030	0.075
DIVERS	-0.057*	-0.019	-0.027	0.008
FUNDCORR	0.060***	0.127***	0.024	0.103***
LOGIO	0.051*	0.166***	-0.093***	0.259***
IDIORISK	-0.204***	-0.257***	-0.062	-0.195***
REG	0.239***	0.312***	0.089	0.223**
NFOLLOW	0.050***			
R-SQUARE	26.53%	25.42%	16.87%	
ADJ R-SQ	26.49%	25.35%	16.77%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Variable Definitions:
FFSYNC = Price synchronicity measured as the logit transformation of the R^2 from the regression of weekly firm returns on current and prior market, industry weekly returns as well as the current and prior weekly returns the Fama and French (1993) size and market-to-book factor indexes; Refer to the appendix for all other variable definitions.

Table 18
Regression of price synchronicity with Fama-French (1993) factors (FFSYNC) on both the innate (INNATEAQ) and discretionary (DISAQ) components of accruals quality

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-1.761***	-1.774***	-2.029***	0.254
INNATEAQ	-0.178***	-0.242***	-0.070	-0.172***
DISAQ	-0.037*	-0.050*	-0.045**	-0.005
MV	0.656***	1.088***	1.000***	0.088
LOGHHIF	0.067	0.092*	0.016	0.076
LOGNIND	0.035	0.082	0.022	0.060
DIVERS	-0.069**	-0.030	-0.033	0.003
FUNDCORR	0.061***	0.129***	0.025	0.105***
LOGIO	0.052*	0.164***	-0.092***	0.256***
IDIORISK	-0.285***	-0.364***	-0.095**	-0.268***
REG	0.250***	0.328***	0.092	0.236***
NFOLLOW	0.050***			
R-SQUARE	26.70%	25.73%	16.91%	
ADJ R-SQ	26.66%	25.66%	16.80%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.

Variable Definitions:
FFSYNC = Price synchronicity measured as the logit transformation of the R^2 from the regression of weekly firm returns on current and prior market, industry weekly returns as well as the current and prior weekly returns the Fama and French (1993) size and market-to-book factor indexes; Refer to the appendix for all other variable definitions.

Table 19 presents the regression of price synchronicity on total accruals quality partitioned by time period. For the post Reg-FD period, the coefficient on total accruals quality is -0.068 and is significant at the 10% level. For the pre Reg-FD period, the coefficient on total accruals quality is -0.090 and is significant at the 1% level. Although not significant, we do find that accruals quality is more negative in the pre Reg-FD period.

Table 20 presents the results for the innate accruals quality. We do not find a significant relation in the post Reg-FD period. However, we find that in the pre Reg-FD period, innate accruals quality is significantly negatively related to price synchronicity with a coefficient of -0.313. The difference in the coefficients (0.217) is significant at the 1% level. This is consistent with the argument that private conversations allow investors to better interpret accruals quality related to fundamental uncertainty.

Table 21 presents the results for the discretionary component. The coefficient on the discretionary component of accruals quality is -0.05 in the post Reg-FD period and 0.038 in the pre Reg-FD period. While we fail to find coefficients that are significantly different from zero in either period, we do find that difference of -0.087 in the relation between discretionary accruals quality and price synchronicity is significant at the 5% level. This suggests that the discretionary component of accruals quality is more negatively related to price synchronicity in the post Reg-FD period compared to the pre Reg-FD period. This is consistent with the literature that shows that discretionary accruals are less likely to contain opportunistic manipulation by managers in the post-SOX period (see, for example, Cohen et al. 2008).

In Table 22, we include both innate and discretionary accruals components in the model. We find that both the innate and the discretionary components are significantly negatively related to price synchronicity in the post Reg-FD period (coefficients of -0.122 and -0.071 respectively). However, only innate accruals quality component is significantly related to price synchronicity in the pre Reg-FD period (coefficient of -0.313). We find that the innate

Table 19
Regression of price synchronicity (SYNC) on total accruals quality (AQ) partitioned by Regulation Fair Disclosure (Reg-FD) period

	Pooled	Post Reg-FD	Pre Reg-FD	Difference
INTERCEPT	-2.473***	-2.378***	-2.671***	0.294
AQ	-0.072***	-0.068*	-0.090***	0.022
MV	0.804***	0.892***	0.761***	0.131**
LOGHHIF	0.090	0.086	0.114**	-0.028
LOGNIND	-0.007	0.035	0.017	0.019
DIVERS	-0.030	-0.035	-0.033	-0.002
FUNDCORR	0.093***	0.128***	0.046*	0.083*
LOGIO	0.075**	0.165***	0.011	0.154***
IDIORISK	-0.434***	-0.569***	-0.280***	-0.288***
NFOLLOW	0.071***	0.064***	0.069***	-0.006
REG	0.283***	0.403***	-0.056	0.459***
R-SQUARE	29.70%	33.66%	26.41%	
ADJ R-SQ	29.66%	33.59%	26.32%	
N	31290	16858	14432	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for all variable definitions.

Table 20
Regression of price synchronicity (SYNC) on the innate component of accruals quality (INNATEAQ) partitioned by Regulation Fair Disclosure (Reg-FD) period

	Pooled	Post Reg-FD	Pre Reg-FD	Difference
INTERCEPT	-2.524***	-2.389***	-2.771***	0.382*
INNATEAQ	-0.200***	-0.096	-0.313***	0.217***
MV	0.854***	0.913***	0.838***	0.075
LOGHHIF	0.098	0.092	0.120**	-0.029
LOGNIND	-0.019	0.034	-0.001	0.035
DIVERS	-0.043	-0.041	-0.049	0.009
FUNDCORR	0.093***	0.128***	0.045*	0.083*
LOGIO	0.075**	0.162***	0.018	0.144***
IDIORISK	-0.500***	-0.588***	-0.393***	-0.195***
NFOLLOW	0.071***	0.063***	0.070***	-0.007
REG	0.297***	0.407***	-0.034	0.441***
R-SQUARE	29.80%	33.67%	26.73%	
ADJ R-SQ	29.76%	33.59%	26.64%	
N	31290	16858	14432	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for all variable definitions.

Table 21
Regression of price synchronicity (SYNC) on the discretionary component of accruals quality (DISAQ) partitioned by Regulation Fair Disclosure (Reg-FD) period

	Pooled	Post Reg-FD	Pre Reg-FD	Difference
INTERCEPT	-2.454***	-2.377***	-2.632***	0.256
DISAQ	-0.010	-0.050	0.038	-0.087**
MV	0.798***	0.876***	0.762***	0.115*
LOGHHIF	0.088	0.082	0.114**	-0.032
LOGNIND	0.000	0.043	0.022	0.020
DIVERS	-0.027	-0.031	-0.032	0.001
FUNDCORR	0.092***	0.128***	0.041	0.087*
LOGIO	0.075**	0.166***	0.015	0.151***
IDIORISK	-0.407***	-0.542***	-0.243***	-0.299***
NFOLLOW	0.071***	0.064***	0.069***	-0.006
REG	0.281***	0.398***	-0.051	0.449***
R-SQUARE	29.67%	33.65%	26.37%	
ADJ R-SQ	29.63%	33.58%	26.28%	
N	31290	16858	14432	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for all variable definitions.

Table 22
Regression of price synchronicity (SYNC) on the both the innate (INNATEAQ) and discretionary (DISAQ) components of accruals quality partitioned by Regulation Fair Disclosure (Reg-FD) period

	Pooled	Post Reg-FD	Pre Reg-FD	Difference
INTERCEPT	-2.546***	-2.429***	-2.772***	0.342
INNATEAQ	-0.213***	-0.122*	-0.313***	0.191***
DISAQ	-0.043*	-0.071**	-0.002	-0.070*
MV	0.848***	0.904***	0.838***	0.066
LOGHHIF	0.098	0.091	0.120**	-0.029
LOGNIND	-0.022	0.029	-0.001	0.030
DIVERS	-0.042	-0.040	-0.049	0.010
FUNDCORR	0.094***	0.128***	0.045*	0.083*
LOGIO	0.076**	0.165***	0.018	0.147***
IDIORISK	-0.505***	-0.596***	-0.393***	-0.202***
NFOLLOW	0.071***	0.063***	0.070***	-0.007
REG	0.295***	0.407***	-0.034	0.441***
R-SQUARE	29.81%	33.70%	26.73%	
ADJ R-SQ	29.77%	33.62%	26.63%	
N	31290	16858	14432	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for all variable definitions.

component of accruals quality is more negatively related to price synchronicity in the pre Reg-FD period compared to the post Reg-FD period, whereas the discretionary component is more negatively related to price synchronicity in the post Reg-Fd period compared to the pre Reg-FD period. This consistent with the argument that, in the pre Reg-FD period, managers disclosed information to investors that allowed them to incorporate more firm-specific information into prices. After Reg-FD, the innate accruals quality component provided relatively less firm-specific information because it was more difficult for investors to interpret them without the guidance of managers. The discretionary component of accruals quality has a more negative impact in the post Reg-FD period, which may reflect managers conveying more firm-specific information through earnings. The more negative relation of discretionary accruals quality component may also reflect the decrease in the use of accruals as an earnings management technique following the passage of the Sarbanes-Oxley act.

6.5 Market Beta as a Control Variable

We show in our hypothesis development that accruals quality is related to price synchronicity through the magnitude of the coefficients of the pricing model. Lambert et al. (2007) suggest that accruals quality affects cost of capital through market beta. Our results may be simply a manifestation of the relation between accruals quality and market beta. To test this alternative hypothesis, we include the firm's CAPM beta as an additional control variable. We estimate the firm's CAPM beta using weekly returns over the same period we use to estimate price synchronicity. We use beta squared because price synchronicity increases with magnitude of beta. As with our other independent variables, we use the relative rank of the squared CAPM beta[27].

[27] Using the raw, squared beta or the unsquared ranked or raw beta produces qualitatively similar results.

Table 23 presents results similar to the ones from table 7 controlling for the market beta. The coefficient on the innate accruals quality is -0.091 and significant at the 10% level for the pooled sample. This is about one-thirds of the magnitude of the coefficient in table 7 (-0.266), which indicates that the market beta does play a large role in the relation between accruals quality and price synchronicity. However, innate accruals quality still has explanatory power after controlling for market beta. This is due to the reduction in the co-movement between the firm's return and the industry return. As with our main results, we find that the negative relation between innate accruals quality and price synchronicity is more negative in the analyst following group (a difference of -0.085). We also find that the discretionary accruals component is significantly negatively related to price synchronicity for firms with an analyst following (a coefficient of -0.033).

6.6 Analyst Forecast Dispersion

Bryan and Tiras (2007) find that when analyst forecast dispersion is high, accounting numbers better explain market prices and analysts rely less on accounting information in providing their estimates. This indicates that the degree to which earnings reflect more firm specific information may depend on analyst forecast dispersion Therefore the relation between accruals quality and price synchronicity may be conditional on analyst forecast dispersion. We investigate this possibility by separating our sample by forecast dispersion. We require that a firm have at least three analysts' estimates in the month of the announcement and that the dispersion be greater than zero for this analysis. This results in 13,484 observations. We divide this subsample into two groups based on whether they are above (high dispersion) or below (low dispersion) the median forecast dispersion by year.

Table 24 presents are results partitioned by analysts forecast dispersion. We find that for both high and low dispersion groups, the innate component of accruals quality is negatively

Table 23
Regression of price synchronicity (SYNC) on both the innate (INNATEAQ) and the discretionary (DISAQ) components of accruals quality with market beta as a control

	Pooled	Followed	Not Followed	Difference
INTERCEPT	-2.299***	-2.171***	-2.772***	0.601***
INNATEAQ	-0.091*	-0.106**	-0.021	-0.085*
DISAQ	-0.020	-0.033*	-0.022	-0.011
MV	0.063	0.365***	0.536***	-0.171**
LOGHHIF	0.040	0.037	-0.002	0.039
LOGNIND	-0.053	-0.068	0.006	-0.075
DIVERS	-0.010	0.020	0.025	-0.005
FUNDCORR	0.039**	0.090***	0.025	0.065**
LOGIO	-0.080***	-0.015	-0.116***	0.101**
BETA	2.173***	2.231***	2.072***	0.160***
IDIORISK	-1.523***	-1.658***	-1.249***	-0.409***
REG	0.239***	0.309***	0.089	0.220***
NFOLLOW	0.070***	0.023***	0.000	0.000
R-SQUARE	54.00%	59.10%	44.47%	
ADJ R-SQ	53.97%	59.06%	44.40%	
N	33771	20053	13718	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for all variable definitions.

Table 24

Regression of price synchronicity (SYNC) on both the innate (INNATEAQ) and the discretionary (DISAQ) components of accruals quality by analysts dispersion groups

	Pooled	High Dispersion	Low Dispersion	Difference
INTERCEPT	-1.856***	-1.845***	-1.827***	-0.019
INNATEAQ	-0.403***	-0.437***	-0.374***	-0.063
DISAQ	-0.074	-0.028	-0.132***	0.104*
MV	0.868***	0.836***	0.877***	-0.042
LOGHHIF	0.145*	0.111	0.214*	-0.104
LOGNIND	0.018	-0.088	0.164	-0.252
DIVERS	-0.023	-0.039	0.020	-0.058
FUNDCORR	0.219***	0.243***	0.184***	0.060
LOGIO	0.136***	0.114**	0.156***	-0.042
IDIORISK	-0.766***	-0.847***	-0.696***	-0.151*
REG	0.521***	0.591***	0.394***	0.196
NFOLLOW	0.023***	0.020***	0.027***	-0.007
R-SQUARE	23.37%	25.68%	20.79%	
ADJ R-SQ	23.27%	25.47%	20.57%	
N	13484	6751	6733	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.

Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.

Refer to the appendix for all variable definitions.

related to price synchronicity (coefficients of -0.437 and -0.374, respectively). There difference between the two groups is not significant. We find that the discretionary component of accruals quality is negative only for the low dispersion group (-0.132). This is consistent with managers manipulating earnings in both the low and high forecast dispersion groups, but in the high dispersion group, managers attempt to convey information through discretionary accruals.

6.7 Further Investigation of Analyst Following

Our main analysis investigates the relation between accruals quality and price synchronicity for firms that are followed by analysts and firms that are not. We extend this analysis by investigating how the level of analyst following affects the relation between accruals quality and price synchronicity. We first group firms by analysts following and look at the differences between the two groups. We then look at the impact of the interaction between accruals quality and analyst following on price synchronicity. From our analyst following group, we divide firms into quartile each year and compare the highest quartile to the lowest quartile. Table 25 presents our results for these extremes. We firms with the highest analysts following have innate accruals quality is more negatively related to price synchronicity than firms with the lowest analysts following (-0.583 compared to -0.219). This difference (-0.364) is significant at the 5% level. This is consistent with our main result that firms with better innate accruals quality have more firm specific information impounded into prices when analysts are present. We also find that firms with the lowest following have a negative relation between the discretionary component of accruals quality and price synchronicity. This is consistent with more earnings management when analyst following is low. And when analyst forecast dispersion is high, managers are more likely to convey information through discretionary accruals.

We further investigate the role of the level of analyst following by looking at the impact of the interaction between accruals quality and the number of analyst following on price synchronicity. Specifically we estimate the following regression:

Table 25
Regression of price synchronicity (SYNC) on both the innate (INNATEAQ) and the discretionary (DISAQ) components of accruals quality for the highest and lowest analyst following quartile

	Pooled	(Q4) High Following	(Q1) Low Following	Difference
INTERCEPT	-2.163***	-0.749**	-2.801***	2.052***
INNATEAQ	-0.404***	-0.583***	-0.219	-0.364**
DISAQ	-0.069*	-0.084	-0.093**	0.010
MV	1.410***	0.534***	1.714***	-1.180***
LOGHHIF	0.080	0.117	0.085	0.033
LOGNIND	0.004	-0.027	0.112	-0.139
DIVERS	0.003	-0.071	0.056	-0.127
FUNDCORR	0.133***	0.217***	0.039	0.177**
LOGIO	0.132*	-0.130	0.095	-0.225**
IDIORISK	-0.562***	-1.032***	-0.294***	-0.738***
REG	0.237**	0.239	0.278**	-0.039
NFOLLOW	0.018***	0.023***	0.160***	-0.138***
R-SQUARE	36.41%	18.41%	18.10%	
ADJ R-SQ	36.31%	18.13%	17.85%	
N	11916	5462	6454	

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence. Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for all variable definitions.

$$
\begin{aligned}
SYNCH_{i,t} = {} & \beta_0 + \beta_1 INNATEAQ_{i,t} + \beta_2 DISAQ_{i,t} + \beta_3 MV_{i,t} + \beta_4 LOGHHIF_{i,t} + \beta_5 LOGNIND_{i,t} \\
& + \beta_6 DIVERS_{i,t} + \beta_7 FUNDCORR_{i,t} + \beta_8 LOGIO_{i,t} + \beta_9 REG_{i,t} + \beta_{10} IDIORISK_{i,t} + \sum_{j=1}^{8} \delta_j IND_{i,t}^{j} \\
& + NFOLLOW_{i,t} * (\lambda_0 + \lambda_1 INNATEAQ_{i,t} + \lambda_2 DISAQ_{i,t} + \lambda_3 MV_{i,t} + \lambda_4 LOGHHIF_{i,t} \\
& + \lambda_5 LOGNIND_{i,t} + \lambda_6 DIVERS_{i,t} + \lambda_7 FUNDCORR_{i,t} + \lambda_8 LOGIO_{i,t} + \lambda_9 REG_{i,t} + \lambda_{10} IDIORISK_{i,t} \\
& + \sum_{j=1}^{8} \upsilon_j IND_{i,t}^{j}) + \varepsilon_{i,t}
\end{aligned} \tag{27}
$$

In equation (27) the number of analyst issuing estimates in the month of the earnings announcement (NFOLLOW) is interacted with each independent variable. Table 26 presents the results from estimating equation (27). The first column (Not Followed) are the estimates when NFOLLOW is zero (the estimates for the β_k) while the second column presents the results for the interaction (the estimates for the λ_k). The first column is identical to the results presented in Table 7 for the not followed group. Consistent with our main results, the interaction between the number of analysts following and the innate component of accruals quality is negative (-0.024) and significant at the 1% level. This supports our main finding that earnings information complements analysts' information.

Table 26
Regression of price synchronicity (SYNC) on both the innate (INNATEAQ) and the discretionary (DISAQ) components of accruals quality interacted with the number of analyst following

	Not Followed	Interaction
INTERCEPT	-2.745***	0.298***
INNATEAQ	-0.111*	-0.024***
DISAQ	-0.043	-0.008
MV	1.327***	-0.186***
LOGHHIF	0.023	0.006
LOGNIND	0.048	-0.010
DIVERS	-0.011	-0.007
FUNDCORR	0.049	0.007**
LOGIO	-0.128***	-0.013*
IDIORISK	-0.218***	-0.070***
REG	0.096	0.029**
R-SQUARE		31.70%
ADJ R-SQ		31.64%
N		33771

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively, based on two tailed hypotheses.
Significance based on 2-way cluster standard errors to account for time-series (firm) and cross-sectional (year) dependence.
Independent variables are the standardized rank (i.e. the rank within the group divided by the number of observations in the group) within year and following group.
Refer to the appendix for all variable definitions.

7. SUMMARY AND CONCLUSION

This study examines the relation between accruals quality and price synchronicity. Studies find a negative relation between accruals quality and idiosyncratic risk (Cohen 2008; Rajgopal and Venkatachalam 2008) and conclude that price synchronicity should increase with accruals quality (Ashbaugh-Skaife et al. 2006). Because accruals quality could affect price synchronicity absent idiosyncratic risk, we examine the relation between price synchronicity and accruals quality after controlling for idiosyncratic volatility. We find a negative relation between accruals quality and price synchronicity.

Accruals adjust cash flows to earnings such that earnings better reflect the performance of the firm. As such the underlying value of the firm can be more easily inferred from earnings as accruals quality increases. If investors rely more on earnings and other related firm-specific information, the correlation between firm returns and market returns declines. Therefore, we hypothesize and find a negative relation between accruals quality and price synchronicity. We find that this negative relation is robust to different measures of accruals quality, the endogeneous choice of the quality of accruals, and alternative measures of price synchronicity.

We decompose accruals quality into its innate and discretionary components following Francis et al. (2005). We find a consistently negative relation between the innate component of accruals quality and price synchronicity. However, we find only weak evidence of a negative relation between the discretionary component of accruals quality and price synchronicity. This is consistent with Francis et al. (2005) who find that the innate component of accruals quality has a larger pricing effect. As they make clear, the discretionary component has elements of both managers acting opportunistically for personal gain and managers trying to convey information to the market through accruals.

This study also examines the effect of analysts following on the relation between accruals quality and price synchronicity. If earnings information complements information provided by

analysts, then the relation between accruals quality and price synchronicity should be strengthened by the presence of analysts. Alternatively, if analysts provide information that substitutes for earnings information, then the relation between accruals quality and price synchronicity should be weaken by the presence of financial analysts. We find evidence consistent with the theory that earnings complement analysts' information.

As with all studies, there are a number of caveats to consider. While we find evidence consistent with the notion that price synchronicity captures the relative level of firm-specific information incorporated in price, we explicitly control for idiosyncratic volatility. We argue that idiosyncratic volatility captures the noise affecting price synchronicity. We cannot fully separate out the noise that occurs naturally form the noise caused by institutional or even firm-specific factors. Therefore, our results should be interpreted with care.

Our sensitivity analysis related to Regulation FD suggests some extensions to the present study. We find that innate accruals quality provides more firm-specific information in the pre-Reg FD period whereas discretionary accruals quality provides more firm-specific information in the post-Reg FD period. Extensions our study could investigate to what extent this result is related to the change in the type of firms analysts follow. Studies could also explore whether managers are using discretionary accruals to convey information that they previously conveyed privately to analysts or whether the discretionary accruals quality convey more firm-specific information because of a reduction in earnings management.

Future research can examine the inclusion of the accruals risk factor in price synchronicity. We use price synchronicity from a modified market model with current and lagged market and industry indexes. We provide sensitivity analysis that incorporates the Fama-French three factor model with little difference to our main result. Ecker et al. (2006) show that factor loadings on an accruals quality risk factor are related to firm-specific factors that represent the firm's information environment. Future research can incorporate this accruals quality risk factor in a

price synchronicity setting. If low synchronicity is related to more firm-specific information, then the addition of an information factor such as the accruals quality factor should capture the informational portion while the idiosyncratic portion should capture more of the noise component of returns variation.

This study should be relevant to regulators considering the convergence of U.S. GAAP and International Financial Reporting Standard. Studies find that price synchronicity decreases around the adoption of the international standards and conclude that these standards help more firm-specific information to be incorporated into prices. Some studies question the use of price synchronicity as a measure of firm-specific information. We provide evidence that better earnings quality is positively related to price synchronicity, adding credence to studies that adoption of the international standards increase the amount of firm-specific information in prices. We also show that financial analysts' information is complementary to earnings information rather than a substitute for it. From a regulatory standpoint, this suggests that, while market participants may look for firm-specific information, this information does not substitute for firm-specific information that is provided by managers via financial statements.

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APPENDIX

VARIABLE DEFINITIONS

SYNC	=	Price synchronicity measured as the logit transformation of the R^2 from the regression of weekly returns on the market index and an industry index;
AQ	=	Accruals quality measured as the 5 year rolling standard deviation of the residual from the Dechow and Dichev (2002) model as modified by McNichols (2002) multiplied by negative one;
INNATEAQ	=	Innate accruals quality measured as the predicted value of accruals quality consistent with Francis et al. (2005);
DISAQ	=	Discretionary accruals quality measured as the residual of the regression of accruals quality on economic factors consistent with Francis et al. (2005);
MV	=	Log of the firm's market value at fiscal year end from COMPUSTAT;
LOGHHIF	=	Log of the weighted average Herfindahl index of industry level concentration;
LOGNIND	=	Log of average number of firms used to calculate the weekly industry returns;
DIVERS	=	Diversification measured as a Herfindahl index of firm diversification across 2-digit SIC industries using sales;
FUNDCORR	=	fundamental correlation measured as the logit transformation of the R^2 from the regression of firm ROA on a value weighted industry index of ROA;
LOGIO	=	The natural log of one plus the percent of shares outstanding held by institutional investors;
REG	=	Dummy variables equal to 1 if the firm's primary 2-digit SIC is 62 or 49;
IDIORISK	=	Sum of squared errors from the regression of weekly firm returns on current and prior market and industry weekly returns;
NFOLLOW	=	The number of analysts used in the IBES estimate in the month of the earnings announcement.

VITA

Joseph Johnston was born in Shreveport, Louisiana, but grew up in Queens, New York. He returned with his family to Shreveport in 1991. He attended Caddo Magnet High School. Out of high school, he attended Louisiana State University in Shreveport but transferred to Louisiana Tech University in 2000. He earned his Bachelor of Science in Business Administration with an emphasis in accounting from Louisiana Tech University in 2001. In 2002, he received his Master of Professional Accountancy from Louisiana Tech University. That same year he was married his wife, Elizabeth. He has one child, Mary. After graduation, Joseph will continue to teach for a year as a lecture at Louisiana State University. His teaching interests are in financial accounting and accounting information systems. His research interest is on the effects of financial reporting on the firm's information environment.