Analysts' Forecasts and Asset Pricing: A Survey

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Abstract

This survey reviews the literature on sell-side analysts' forecasts and their implications for asset pricing. We review the literature on the supply and demand forces shaping analysts' forecasting decisions as well as on the implications of the information they produce for both the cash flow and the discount rate components of security returns. Analysts' forecasts bring prices in line with the expectations they embody, consistent with the notion that they contain information about future cash flows. However, analysts' forecasts exhibit predictable biases, and the market appears to underreact to the information in forecasts and to not fully filter the biases in forecasts. Analysts' forecasts are also helpful in estimating expected returns on securities, but evidence on the relation between analysts' forecasts and expected returns is still scarce. We conclude by identifying unanswered questions and offering suggestions for future research.

1. INTRODUCTION

This survey reviews the literature on sell-side analysts' forecasts and their implications for asset pricing. Analysts are information intermediaries who gather, analyze, and produce information for the investment community. As a result, analysts' forecasts have the potential to influence asset prices by conveying information about future cash flows and about the discount rates applied to future cash flows. We discuss the implications of the information produced by analysts for both the cash flow and the discount rate components of security returns. In doing so, we identify unanswered questions and offer suggestions for future research.

Understanding how analysts influence (and are influenced by) market prices is predicated on a detailed understanding of the information that analysts produce and their incentives to convey accurate and unbiased information. These dimensions jointly shape the information transmitted to investors, the timing of information transmission, and the extent to which market participants rely on analysts as information intermediaries. Thus, we begin by reviewing the literature on the supply and demand forces shaping the properties of analysts' outputs. A key insight from Section 2 is that the influence analysts' forecasts have on asset prices depends upon both the nature of the information they produce and their incentives to convey it accurately and without bias.

Analyst information is potentially useful for asset pricing because it provides essential inputs for security valuation. For example, earnings forecasts provide estimates of expected cash flows; stock recommendations and price targets can be useful in identifying mispriced stocks; dispersion in analysts' forecasts can be used to identify appropriate discount rates; and long-term growth forecasts can serve as benchmarks for calculating expected growth rates. All of these are relevant parameters in asset pricing models. In this sense, analyst research and asset pricing are closely intertwined.

Our survey proceeds by looking at the relation between analysts' forecasts and both the cash flow and discount rate components of asset prices. Specifically, Section 3 reviews the literature on analysts' forecasts and their implications for cash flow news. We begin with early evidence on the use of analysts' forecasts as a proxy for the market's expectations of future earnings and on the extent to which analysts' forecast revisions convey information about future cash flows. We then examine whether the market's response to analysts' forecasts is timely and complete. We conclude Section 3 with evidence on whether market prices unravel predictable biases in analysts' forecasts, or whether prices behave as if market participants fixate on analysts' forecasts with biases embedded in them. Collectively, the evidence suggests that although investors appear to recognize predictable sources of bias, they fail to fully factor these biases into market prices in a timely fashion.

Section 4 focuses on the implications of analysts' forecasts for expected returns. We first summarize the evidence on the use of analysts' forecasts in estimating expected returns. We proceed with a discussion of classical asset pricing models in which analysts play no role in affecting expected returns. We then introduce information frictions that allow analysts to influence expected returns. We focus on two types of frictions: (*a*) information uncertainty and (*b*) information asymmetry and liquidity. A central conclusion of Section 4 is that analysts' forecasts are helpful in mitigating both types of frictions. Consequently, analysts' forecasts influence asset prices through several channels (beyond cash flow expectations), and are thus relevant to a wide array of capital market studies on prices, expected returns, and liquidity.

A picture emerging from our survey is that, although extensive evidence identifies sources of cross-sectional and time-series variation in analysts' forecast bias and accuracy, it is not clear how forecast properties influence expected returns. We find limited evidence on (*a*) the channels through which analyst forecast properties impact expected returns; (*b*) the direction of these effects; and (*c*) how the various properties, such as bias, accuracy, timeliness, and intensity, interact.

Understanding these effects is crucial for assessing the efficacy of regulation, internal controls, and media scrutiny aimed at curtailing predictable biases and inaccuracies in analysts' forecasts.

Another fruitful area of research would be a deeper dive into modeling analysts' beliefs about firms' future performance. As we discuss in Section 2, as researchers we observe analysts' forecasts, which reflect a potentially biased indication of analysts' underlying expectations. Most prior research in this area explores the biased component of analysts' forecasts, whereas relatively little research sheds light on the formation of the nonbiased component. Much research focuses on the directional impact of analysts' employment incentives on forecast bias and accuracy, but it typically stops short of using the predictable links to study analysts' beliefs about firms' future cash flows. Understanding how analysts form and revise their true expectations about future earnings is crucial to how information about firm performance is disseminated to investors.

Last, a broader challenge for this area is the difficulty of obtaining exogenous variation in the properties of analysts' forecasts that could be used to make causal inferences. Generally, prior studies examine the link between market outcomes and analysts' forecasts without accounting for analysts' decision to initiate coverage and provide a forecast. Because of the first-stage selection problem underlying analysts' coverage decisions, it is difficult to attribute observable effects of forecast properties to the forecasts themselves versus to the underlying incentives that prompted the initial forecasting decision. As we briefly discuss in Section 2, asset pricing attributes (e.g., trading volume and stock liquidity) influence analysts' coverage decisions, which in turn influence how analysts' forecasts affect prices. In the spirit of isolating exogenous variations in forecast properties, we also survey the recent literature on regulation [e.g., Regulation Fair Disclosure (Reg FD) and the Global Settlement] as examples of avenues to study the sources of bias in analysts' forecasts and their implications for asset prices.

Before we proceed, we note that, because of its focus on asset pricing, our survey is not designed as a comprehensive review of the role analysts play in capital markets. We refer the interested reader to Givoly & Lakonishok (1984), Schipper (1991), Brown (1993), Ramnath, Rock & Shane (2008), Beyer et al. (2010), and Bradshaw (2011) for related reviews of the literature on analysts. Even within the asset-pricing framework, we restrict our focus to equity prices and as a result do not survey work on other securities (e.g., bond pricing). (For an example of early evidence on the role of bond analysts, see De Franco, Vasvari & Wittenberg-Moerman 2009.)

2. PROPERTIES OF ANALYSTS' FORECASTS

Analysts gather information about firms through several formal communication channels that include, but are not limited to, financial disclosures, news, and earnings conference calls. Analysts also supplement these formal channels with discussions with firms' management, brokerage clients, investors, etc. (Bradshaw 2011). As a part of this process, analysts produce information about firms in a variety of ways, including issuing earnings forecasts, growth forecasts, buy/sell recommendations, and target prices, which collectively manifest as an analyst report (Schipper 1991).

As in any industry, supply and demand forces shape the properties of analysts' outputs, forecasts, and stock recommendations. This survey focuses on analysts' forecasts, with a limited discussion of recommendations. Although the realization of earnings at earnings announcements provides a natural benchmark for studying variation in the bias, accuracy, and timeliness of analysts' forecasts, the open-ended nature of recommendations makes them less useful for evaluating analysts' performance and its implications for asset prices.

Two properties of analysts' forecasts have received considerable attention in the literature: forecast accuracy and forecast bias. Accuracy generally refers to the absolute difference between the analysts' forecast and the realization of an output, whereas bias generally refers to the signed difference between them. Forecast accuracy and bias are a function of the complexity of the task, the skill level of the analyst, and the incentives facing the analyst (e.g., effort). Complexity undermines accuracy, whereas skill enhances accuracy. Further, incentives can influence both the accuracy and bias in forecasts.

Understanding the drivers of cross-sectional and time-series variation in analysts' forecast accuracy and bias is important because the information content of analysts' forecasts is, of course, dependent on the extent to which analyst information is unbiased and precise (i.e., the first- and second-moment properties of errors in analysts' outputs). Bias and accuracy influence market prices as well as researchers' inferences. To the extent that market participants identify predictable variation in analyst accuracy, market prices respond more strongly to credible forecasts. Similarly, to the extent that market participants anticipate variation in forecast bias, researchers can improve estimates of earnings expectations by estimating the component of forecast bias that is unanticipated by market participants. To the extent that these weights are imperfect, understanding the predictive component of analysts' errors could also yield predictable patterns in stock returns (assuming that the expectation errors will eventually be corrected in the future) (see Frankel & Lee, 1998; Bradshaw, Richardson & Sloan 2001; Elgers, Lo & Pfeiffer 2003; So 2013).

Before we proceed, we note that an implicit assumption underlying papers that study analysts' forecasts is that firms receive analyst coverage in the first place. This is important because research shows that coverage decisions are a function of the relative costs and benefits shared among several market participants, including firms, analysts, and investors. For instance, an analyst faces strong economic incentives to follow firms that are expected to establish reputational credibility, yield higher salaries, secure investment banking business, and generate trading revenue for his/her employer. However, analysts must balance a series of considerations, including resource constraints and opportunity costs, as well as cater to firms' and users' objective functions.[1]

The implication of this literature for asset pricing is that the factors driving analysts' decisions to cover a firm are likely to capture direct properties of asset prices (e.g., trading volume, volatility, information asymmetry, etc.) as well as factors correlated with them (e.g., firm size, the presence of institutional investors, etc.). Further, the decision to cover a firm not only is influenced by asset prices, but also has the potential to influence asset prices. Regarding the latter, Kelly & Ljungqvist (2012) show that exogenous coverage terminations lead to a reduction in prices and an increase in expected returns because of increased adverse selection risk. As a result, because the factors driving the first-stage selection problem underlying analysts' coverage decisions are likely to be correlated with the factors driving variation in the properties of analysts' forecasts, it

[1]The literature on the determinants of analyst coverage is extensive and beyond the scope of this review. Among different features affecting the decision to cover a firm, early research focused on firm characteristics such as institutional holdings, firm size, and return variability (e.g., Bhushan 1989, O'Brien & Bhushan 1990). Subsequent studies have placed a greater emphasis on the role of the costs of acquiring information. Some studies document a positive association between analyst following and firms' disclosures (e.g., Lang & Lundholm 1996; Healy, Hutton & Palepu 1999; Hope 2003a,b; Lang, Lins & Miller 2004; De Franco, Kothari & Verdi 2011), whereas other research documents a positive relation between firm complexity (an inverse proxy for disclosure) and analyst following (e.g., Barth, Kasznik & McNichols 2001; Kirk 2011; Lehavy, Li & Merkley 2011). Another stream of the literature examines the link between investment banking incentives and analysts' coverage decisions (e.g., Dunbar 2000; Krigman, Shaw & Womack 2001; Bradley, Jordan & Ritter 2003; Cliff & Denis 2004; O'Brien, McNichols & Lin 2005; James & Karceski 2006; Ljungqvist, Marston & Wilhelm 2006; McNichols, O'Brien & Pamukcu 2007; Clarke et al. 2007). An inescapable conclusion from the literature on determinants of analyst coverage is that the demand for information from intermediaries (analysts) about firms with attractive prospects, large market capitalization, and potential for investment banking business (i.e., security issuances and corporate acquisition activity) largely influences analysts' coverage decisions. That is, it is the demand emanating from investor interest in a firm that creates the supply of analyst coverage.

is difficult to attribute observable effects of forecast properties to the forecasts themselves versus to the underlying incentives that drove the initial forecasting decision.

2.1. Forecast Accuracy

Forecast accuracy is perhaps the single most important attribute of the quality of an analyst's output. Naturally, it has attracted tremendous attention in the literature and in practice. A substantial portion of the existing literature on analysts' forecasts focuses on how and to what extent information processing costs, experience, and employment incentives impact the accuracy of analysts' forecasts.

Several characteristics are associated with the accuracy of analysts' forecasts. For example, forecast accuracy decreases with measures of uncertainty such as firm complexity and volatility in earnings and returns (Kross, Ro & Schroeder 1990; Lang & Lundholm 1996) and when firm performance is transitory (Heflin, Subramanyam & Zhang 2003). Forecast accuracy is also negatively associated with forecast horizon, as it is harder to forecast more distant firm performance (Sinha, Brown & Das 1997; Clement 1999; Brown & Mohd 2003). In addition, factors such as analysts' ability, available resources, and portfolio complexity also significantly influence forecast accuracy. For example, Clement (1999) shows that forecast accuracy is increasing with experience (a proxy for ability) and employer size (a proxy for available resources) and decreasing with the number of firms and industries followed (a proxy for portfolio complexity).

Another stream of research studies whether compensation incentives motivate analysts to provide accurate forecasts. Forecast accuracy and All-Star status granted by *Institutional Investor* are positively associated; this status, in turn, is likely to influence analysts' compensation and career prospects (e.g., Stickel 1992; Groysberg, Healy & Maber 2011). Using proprietary compensation data from a large investment bank, Groysberg, Healy & Maber (2011) show that analysts are primarily compensated for their ability to garner investment banking business, the size of their coverage portfolio, and their reputation as an All-Star. The evidence, however, seems to collectively document that compensation does not materially influence forecast accuracy. One explanation for this evidence is that analysts' employers, such as investment banks, do not rely on forecast accuracy as a first-order determinant of annual compensation because it is easy for analysts to free ride off of the forecasts of competing analysts. Because of the ease of mimicking other analysts' behavior, forecast accuracy is a noisy signal about analysts' ability and/or effort relative to other outcomes, such as motivating or securing investment banking business.

Despite the lack of evidence for an impact of accuracy on analyst compensation, research documents a strong relation between analysts' accuracy and other career outcomes (e.g., Mikhail, Walther & Willis 1999; Hong, Kubik & Solomon 2000; Wu & Zang 2009; Groysberg, Healy & Maber 2011). For example, Groysberg, Healy & Maber (2011) use proprietary compensation data from a prominent investment bank to document that inaccurate analysts are more likely to move to lower-status banks or to exit the I/B/E/S (Institutional Brokers' Estimate System) database, a sign of termination; however, they find no evidence of a relation between forecast accuracy and compensation. Overall, the evidence suggests that small deviations in accuracy have a minimal impact on analyst compensation, but large (negative) forecast inaccuracy can affect analyst wealth by increasing the probability of dismissal.

Overall, forecast accuracy appears to be a firm characteristic influenced by firm-level attributes such as the riskiness of its investments, firm size, and temporary shocks. It is likely that forecast accuracy appears to not be an analyst-specific attribute because analysts can free ride off of other analysts' forecasts. Still, the accuracy of an analyst's forecasts influences his/her career success, especially when it stands out positively or negatively.

2.2. Forecast Bias

Another attribute of analysts' forecasts that has attracted attention is whether they exhibit a bias. The source of bias could trace to information supplied by management or analysts' own economic motivations. We discuss the evidence and potential sources of bias in analysts' forecasts in this section. Prior literature documents various sources of bias in analysts' forecasts of earnings and in their recommendations (e.g., Michaely & Womack 1999; McNichols & O'Brien 1997; Groysberg, Healy & Maber 2011). A central theme in this literature is that forecast bias varies in the cross-section and over forecast horizon (i.e., long-term forecasts are generally too high, whereas short-term forecast are too low). We discuss the key mechanisms driving the variation in bias that is related to forecast horizon and in the cross-section.

A variety of economic temptations facing analysts introduce cross-sectional variation in analyst bias. For instance, in exchange for favorable coverage of deals that the analysts' employer underwrites, analysts might be rewarded for maintaining existing underwriting businesses or possibly attracting new ones.[2] Similarly, analysts might ingratiate themselves to management by optimistically biasing their earnings forecasts in order to gain access to private information. In both instances, the lure of a good relationship with management might motivate analysts to optimistically bias their forecasts. Motivated by this intuition, a significant part of the literature investigates the extent to which the optimistic bias in analysts' forecasts is explained by analysts' incentives to appease management and generate revenues for investment banks.

A commonly cited source of bias is analysts' incentives to gain access to management by issuing forecasts that conform to managers' preferences. Francis & Philbrick (1993) study firms with negative buy/sell recommendations and show that analysts who do not provide a recommendation are more likely to issue optimistic earnings forecasts. The study interprets this result as evidence that analysts generate bias in their forecasts to distinguish themselves from competing analysts (who previously provided unfavorable recommendations), in hopes of receiving access to management as part of a quid pro quo arrangement. Similarly, Das, Levine & Sivaramakrishnan (1998) find that analysts produce more optimistic earnings forecasts for firms with less predictable earnings. The study interprets this finding as evidence that when earnings are less predictable, analysts optimistically bias their earnings forecasts to ensure access to management's private information (see also Chen & Matsumoto 2006, Mayew 2008).[3] A related stream of research links investment banking affiliation to analysts' incentive to curry favor with management in order to have superior access to information, and finds that affiliated analysts are systematically overoptimistic relative to nonaffiliated ones (e.g., Hunton & McEwen 1997; Lin & McNichols 1998; Michaely & Womack 1999; Dechow, Hutton & Sloan 2000; Agrawal & Chen 2008).

Recently, research has begun to examine the role played by social and professional networks in influencing the accuracy and bias of the information supplied by analysts to investors. Westphal & Clement (2008) show that managers invest in, and leverage, personal relationships with analysts to deter them from conveying negative information. This points to a reciprocal relationship in which managers and analysts perform favors for one another. Cohen, Frazzini & Malloy (2010) show that shared backgrounds, as measured by education ties, serve as a conduit of information

[2] On a related topic, Hayes (1998) and Irvine (2000) demonstrate that analysts' desire to generate trading commissions for their employers creates an incentive for analysts to bias their forecasts. Additionally, Laster, Bennett & Geoum (1999) and Lim (2001) provide evidence that forecasters are rationally biased because the payoffs are higher when their forecast is accurate at times when other forecasts are inaccurate versus being inaccurate at times when other forecasts are accurate.

[3] Eames & Glover (2003), however, point out that the findings of Das, Levine & Sivaramakrishnan (1998) likely stem from the failure to control for the level of earnings. That is, the association between analysts' forecast error and earnings predictability is no longer significant once the level of earnings is controlled for.

between managers and analysts and that these shared backgrounds result in less biased analysts' forecasts and more profitable investment recommendations in the pre–Reg FD era (and this is still the case in the United Kingdom, where Reg FD restrictions do not apply). Related evidence from Brochet, Miller & Srinivasan (2014) shows that analysts tend to initiate coverage of firms when they have a past relationship with the firms' management, and these past relationships are associated with higher forecast accuracy. Overall, these studies suggest an influence of social and professional networks in both informing analysts' outputs and compromising their integrity.

Although we observe economic incentives facing analysts to bias their forecasts, we would naturally also expect offsetting forces such as reputational concerns that would rein in such bias. With respect to reputation, some studies find limited evidence of biased forecasts leading to more profitable investment banking deals for the analysts' employers (e.g., Krigman, Shaw & Womack 2001; Cowen, Groysberg & Healy 2006; Ljungqvist, Marston & Wilhelm 2006; Clarke et al. 2007; Kolasinski & Kothari 2008). Rather, these studies suggest that analysts are sufficiently concerned with their reputation as credible information intermediaries to be motivated to issue unbiased, accurate forecasts.

In addition, managers' preference for optimistically biased forecasts appears to be contextual or timing-specific. For instance, optimistic earnings forecasts are more difficult to beat, and evidence shows that meeting or beating targets are important managerial objectives (e.g., Burgstahler & Dichev 1997; Degeorge, Patel & Zeckhauser 1999; Brown 2001; Kasznik & McNichols 2002; Matsumoto 2002; Bartov, Givoly & Hayn 2002). (For survey evidence on managers' perceptions of analysts' targets and the potential price impact of beating analysts' targets, see Graham, Harvey & Rajgopal 2005.) Hence, if analysts indeed seek to appease management, we might expect analysts' forecasts to be pessimistic sometimes. Consistent with this intuition, by examining the intertemporal patterns of forecast bias, Richardson, Teoh & Wysocki (2004) and Ke & Yu (2006) document that managers seem to prefer initially optimistic forecasts, but also prefer to have those optimistic forecasts adjusted downward to beatable levels prior to earnings announcements. Similarly, Hilary & Hsu (2013) document evidence that analysts who consistently lowball forecasts (to curry favor with management by providing beatable targets) have better career prospects and better access to management's private information. This explanation is consistent with the findings of Hong & Kubik (2003), who document annual forecasts to be optimistic on average, whereas Matsumoto (2002) finds quarterly forecasts to be pessimistic on average.

Finally, some studies depart from incentives-based explanations to analysts' forecast bias and explore how the cognitive limitations of analysts may affect forecast bias. Many studies show that analysts do not fully and rationally incorporate publicly available data (e.g., Lys & Sohn 1990, Abarbanell 1991, Abarbanell & Bernard 1992). Further, Sedor (2002) suggests that optimism in analysts' annual earnings forecasts are in part explained by their reactions to causal narratives that managers employ when communicating about enhancing future firm performance.

Collectively, research in this area shows that analysts' forecasts are often biased as a result of analysts' career concerns, compensation incentives, and desire to maintain reciprocal relationships. The interaction between analysts' incentives and management's preference for the nature of bias creates both cross-sectional and intertemporal variation in both the sign and magnitude of forecast bias. Future research will benefit from a deeper understanding of how litigation risk and sector-wide demands for analysts and their employers impact the information they supply to investors.

2.3. Role of Regulation

Before we conclude Section 2, we briefly discuss the role of regulation in analysts' behavior. (For comprehensive reviews, see Mehran & Stulz 2007; Ramnath, Rock & Shane 2008; Koch, Lefanowicz & Robinson 2013.) As we discussed above, firm and analyst characteristics, as well as incentives, influence the properties of analysts' forecasts. In particular, we highlight two sources of conflict of interest: (*a*) an incentive to maintain investment banking relationships and (*b*) a desire to maintain access to private managerial information. Regulatory responses such as Reg FD and the Global Settlement (NASD 2711 and NYSE 472) took place in the early 2000s to mitigate these potential conflicts of interest.

Specifically, Reg FD was intended to level the playing field by curtailing selective disclosure, so that analysts or institutional investors could no longer receive value-relevant information before others (i.e., smaller investors). A potential downside of Reg FD, however, is that it escalates the cost of analysts' services, which could lead to unintended consequences regarding the flow of information into the market. That is, if restricting private access to managerial information imposes a sufficient cost on analysts' information production process, the overall amount of information available to investors may decline, which in turn may cause information flows to deteriorate post–Reg FD.

Acknowledging this cost–benefit tension, academic work has focused on Reg FD's influence on the quantity and quality of analysts' services as well as its consequent implications for investor welfare. For instance, studies have shown that analysts' forecasts have become less precise (Gintschel & Markov 2004; Agrawal, Chadha & Chen 2006), analysts' forecast dispersion has increased (Bailey et al. 2003, Mohanram & Sunder 2006), and analyst coverage has declined (Mohanram & Sunder 2006). These results collectively suggest that private communications with managers were an important input for analysts in their production of information. Curbing private communication hence adversely affects financial markets by reducing both the quantity and quality of information provided by analysts.

Studies have also shown, however, that Reg FD indeed leveled the playing field among market participants (Bushee, Matsumoto & Miller 2004; Chiyachantana et al. 2004; Eleswarapu, Thompson & Venkataraman 2004; Ke, Petroni & Yu 2008). For example, Chiyachantana et al. (2004) document that informed trading around earnings announcements declined post–Reg FD, and Ke, Petroni & Yu (2008) find a decline in abnormal trading by transient institutional investors prior to a bad news break after the introduction of Reg FD. These studies collectively suggest that the loss of private information by informed investors created a more equitable information environment between informed and uninformed investors.

With respect to the Global Settlement, a stream of work has investigated the effects of separating the investment banking department and its research unit (i.e., Global Settlement, NASD 2711, and NYSE 472). These studies show that recommendations generally become more pessimistic postregulation (Barber et al. 2006, Kadan et al. 2009, Clarke et al. 2011). There is mixed evidence, however, on the regulation's effect on analyst coverage. Boni (2006) shows that the ten firms that agreed to the Global Settlement reduced coverage postregulation, whereas Kolasinski (2006) concludes that regulatory restrictions did not adversely impact analyst coverage prior to equity issuances, when conflicts of interest are potentially heightened.

3. ANALYSTS' FORECASTS AND CASH FLOW NEWS

In this section, we discuss evidence showing the information content of analysts' forecasts, i.e., evidence that they convey cash flow news to the market. We begin with early evidence on the use of analysts' forecasts as a proxy for the market's expectations of future earnings (a proxy for future cash flows). This is important because correctly assessing the influence of analyst-supplied cash flow news on asset prices hinges on the quality of the proxy for the market's expectation*s* of cash flows. We proceed to a discussion of the literature on the information content of analysts' forecasts—specifically, the market reaction to changes in analysts' forecasts (i.e., forecast revisions). We then turn our attention to examining whether the stock price response to analysts' forecasts is immediate and unbiased. This discussion primarily reviews the evidence on whether the market over-, under-, or unbiasedly reacts to analyst-provided cash flow news. We conclude this section with evidence on whether investors unravel predictable biases in analysts' forecasts when impounding news of cash flow revisions.

3.1. Analysts' Earnings Forecasts as a Proxy for Market Expectations for Earnings

Conceptually, news (or information) is thought to be the unexpected component of a release, be it a financial report or an analyst forecast. Quantifying the amount of cash flow news contained in any type of cash flow announcement requires a sound proxy for (unobservable) cash flow expectations. Motivated by this requirement, early studies investigate whether analyst earnings forecasts could serve as a proxy for the market's expectations of future earnings (e.g., Elton & Gruber 1972, Barefield & Comiskey 1975, Brown & Rozeff 1978, Fried & Givoly 1982, Brown et al. 1987). Although this is still debated, since the work of Fried & Givoly (1982) the industry standard has been to use analysts' forecasts as a proxy for market expectatoins, given their superiority in time-series models (see Bradshaw 2011). (For overviews of this literature, see also Lev 1989, Kothari 2001.)

3.2. Information Content of Analysts' Earnings Forecast Revisions

Having established that analysts' forecasts can be a proxy for the market's expectations about future cash flows, subsequent researchers investigate whether and to what extent revisions in analysts' forecasts contain news that moves contemporaneous stock prices. Analysts' forecast revisions are a significant source of cash flow information in financial markets. Unlike (quarterly) earnings announcements, analysts' forecast revisions do not have a predetermined periodicity; they occur throughout the quarter. A higher frequency of analysts' earnings forecast revisions results in timely updates about cash flow information to investors. Moreover, to the extent that analysts' forecasts reflect both public information and the analysts' private information, earnings forecast revisions serve to disseminate a valuable source of private information otherwise unattainable through public signals.

Recognizing this importance, researchers have documented a robust positive relation between market prices and analysts' forecast revisions (e.g., Griffin 1976; Givoly & Lakonishok 1979; Elton, Gruber & Gultekin 1981; Imhoff & Lobo 1984). More recently, studies such as those by Lys & Sohn (1990), Asquith, Mikhail & Au (2005), and Frankel, Kothari & Weber (2006) confirm that revisions in analyst earnings forecasts not only incorporate publicly observed signals, but also provide new information to investors. That is, prices, trading activity, and liquidity all change around analysts' forecast revisions.[4]

Although these studies find that market prices move in the direction of forecast revisions (i.e., prices increase subsequent to upward revisions in earnings forecasts), the evidence for response incompleteness of market prices to analysts' forecast revisions (i.e., the degree to which the market under- or overreacts to the forecast revision) is muted.

[4]Our attention is primarily given to analyst earnings forecasts, but related research on the information content of analysts' recommendations also exists. For example, Bradley et al. (2014) document significant information content in analysts' recommendations using high-frequency data. Further, Cornett, Tehranian & Yalçin (2007) document that analysts' recommendation changes became less informative post–Reg FD, as it became more difficult for analysts to access value-relevant private information from managers.

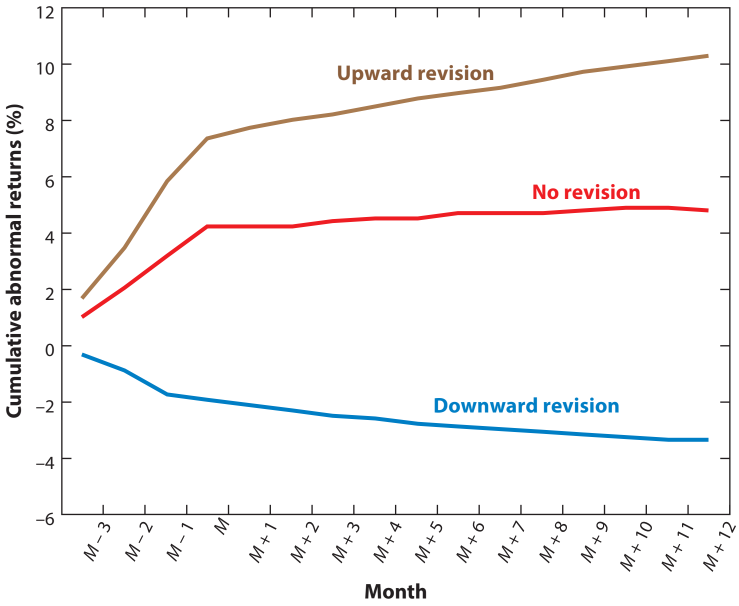

Figure 1

Cumulative abnormal returns around analysts' forecast revisions. The three lines plot the cumulative monthly return starting in month $M - 3$ and extending to month $M + 12$ for firms with an upward revision (*brown line*), downward revision (*blue line*), and no revision (*red line*) in their 1-year-ahead earnings forecast; M denotes the forecast revision month. The sample consists of all firms in the I/B/E/S Consensus file, 1976–2015, that are listed on the NYSE, Amex, and Nasdaq exchanges with a stock price above $1.

To illustrate the price movements around analysts' forecast revisions, **Figure 1** presents cumulative monthly returns around forecast revisions, where M denotes the forecast revision month. The sample for **Figure 1** consists of all firms contained in the I/B/E/S Consensus file spanning 1976–2015 that are listed on the NYSE, Amex, and Nasdaq exchanges with a stock price above $1. The graph shows that prices rise ahead of upward revisions, suggesting that analysts revise forecasts in the direction of past price movements, which is what we might expect if pricing is rational in the market. The return spread widens in month M, indicating that analysts' forecast revision also triggers a market reaction in the direction of the revision. Finally, the graph shows a drift in prices in the direction of the revision, indicating an incomplete reaction to the revision, which is gradually incorporated into market prices.

The evidence in prior research and **Figure 1** is important for our understanding of the price discovery process and asset pricing in general. If market reactions were complete, i.e., unbiased, then forecast revisions would have only short-term implications for stock prices. In contrast, if reactions are not complete, price drifts or reversals with respect to forecast revisions will be predictable. Section 3.3 reviews the literature that investigates the degree of completeness in market responses to analysts' forecast revisions, as well as the determinants that drive the heterogeneity in the market reaction.

3.3. Do Investors Fully React to Analysts' Forecast Revisions?

The extent to which market prices efficiently incorporate information has been a central theme of investigation in asset pricing for many years (e.g., Fama 1970). In this section, we review the literature that investigates how analysts' forecast revisions are incorporated into prices. In an informationally efficient market, analysts' forecast revisions, like any other observable, value-relevant signal, are priced in a timely and unbiased fashion. Put differently, initial price reactions to analysts' forecast revisions are not able to predict subsequent returns. In contrast, to the extent that the market should underreact to analysts' forecast revisions, prices would follow a predictable drift subsequent to the forecast. In addition, any conclusions drawn from such evidence will depend on whether the underreaction is driven by (*a*) investors' information processing biases, i.e., investors' ability to interpret analysts' forecasts in an unbiased fashion, or (*b*) market frictions, i.e., the severity of market microstructure and trading costs that might prevent arbitrageurs who understand and seek to capitalize on investors' biased processing of analysts' forecasts that results in security mispricing.[5]

Givoly & Lakonishok (1980) conducted the first study showing that market prices initially underreact to forecast revisions, resulting in short-term return drift. Subsequent studies, such as those by Stickel (1991) and Chan, Jegadeesh & Lakonishok (1996), confirm that market prices indeed initially underreact to analysts' forecast revisions, causing predictable drifts in stock prices. Stickel (1991), for example, demonstrates that the initial underreaction takes significant time to correct, resulting in long-term return predictability. Specifically, Stickel shows that firms whose consensus forecast has been recently revised upward tend to earn higher abnormal returns over the next 3–12 months than firms whose consensus forecast has been recently revised downward.

The initial underreaction to analysts' forecast revisions is often viewed as stemming from two broad reasons. First are market frictions that could potentially influence the information diffusion process. A poor information environment, for example, can inhibit the efficiency with which prices absorb available information, thus causing a gradual, delayed price response to analysts' forecast revisions. Second, investors' information processing biases with respect to specific attributes of the analysts' forecast revision (e.g., analyst reputation) might themselves cause a delayed price response.

Gleason & Lee (2003), for example, study how the above two channels jointly influence the dissemination of analysts' forecast revision information. Specifically, they find that postrevision drift (*a*) decreases with analyst reputation, (*b*) increases with revision quantity, and (*c*) decreases with the number of analysts following. They further point out that even after one controls for various firm characteristics known to be associated with expected returns, the market still appears to underreact to revisions. Specifically, investors appear to react more strongly to star analysts compared to less well-known analysts and analysts from smaller brokerage houses. They conclude that although certain analyst and firm characteristics enhance the dissemination process of forecast revision information, market prices overall do not seem to completely understand the subtler aspects (e.g., analysts' reputation) of analysts' forecast revisions.

Other studies investigate the above two channels in isolation (e.g., Stickel, 1992; Park & Stice 2000; Zhang 2006; Bonner, Hugon & Walther 2007; Hui & Yeung 2013). Zhang (2006), for example, investigates how information uncertainty (proxied by firm size, age, analyst coverage, dispersion in analysts' forecasts, return volatility, and cash flow volatility) influences postrevision drifts. Zhang (2006) finds that lower information uncertainty enables investors to react more completely to analysts' forecast revisions, resulting in lower postrevision drifts. Hui & Yeung

[5]This line of argument, known as limits to arbitrage, appears, for instance, in the work of Barber et al. (2001). They show that stock returns following analyst recommendation signals are dependent on the frequency of rebalancing, highlighting the importance of transaction costs in explaining the drift in returns following analyst recommendations.

(2013) focus on the properties of analysts' forecasts and show that investors do not fully understand the implied persistence of industry-wide analysts' forecasts.[6]

In sum, the literature shows that (*a*) investors tend to underreact to analysts' forecast revisions and (*b*) the underreaction is a function of both the information environment and analysts' forecast characteristics. On the latter point, the extent to which investors impound forecast revisions into prices is a function of information processing biases and market frictions.

3.4. Do Investors Unravel Predictable Biases in Analysts' Forecasts?

In Section 2 we reviewed the underlying determinants that drive biases in analysts' forecasts. Biases can be conscious, in the sense that analysts' self-interest might drive some of the biases, or unconscious, in the case of cognitive information-processing biases. In this section, we investigate (*a*) to what extent market prices are able to rationally unravel these biases and (*b*) what factors influence whether investors unravel analysts' forecast biases.

Evidence on whether investors unravel predictable biases in analysts' forecasts has been mixed, in part because of differences in research methodologies and settings. On the one hand, Hughes, Liu & Su (2008) find evidence suggesting that market prices fail to incorporate predictable biases in analyst forecasts. Specifically, they find that a strategy of sorting firms by predicted errors fails to generate abnormal returns, which they interpret as market efficiency with respect to predictable analyst errors. On the other hand, So (2013) highlights an important methodological limitation in the way (Hughes, Liu & So 2008) and other related studies calculate the predicted component of analyst errors.[7] So (2013) introduces an alternative approach. By showing profitable investment strategies based on the new measure of predicted analyst errors, he provides evidence of a market that is naïvely fixated on analysts' forecasts. In a similar vein, Frankel & Lee (1998) present indirect evidence consistent with market prices failing to incorporate the predictable component of analyst errors. They show this by demonstrating that their valuation model's performance in predicting the cross-section of stock returns improves when the predictable component of analyst errors is taken into account.

More broadly, studies in the anomalies literature suggest that investors naively fixate on analysts' forecasts (Abarbanell & Bernard 1992; Dechow & Sloan 1997; Bradshaw, Richardson & Sloan 2001). The underlying motivation behind these studies is to offer a potential explanation for well-known stock market anomalies such as the postearnings announcement drift (Ball & Brown 1968), the value anomaly (Basu 1977, Fama & French 1992), and the accruals anomaly (Sloan 1996). (For a recent survey of this literature, see Richardson, Tuna & Wysocki 2010.) Specifically, these studies investigate whether investors' fixation on biased analyst signals is responsible for anomalous returns. For example, Abarbanell & Bernard (1992) show that markets' naïve fixation on analysts' forecasts explains up to half of the postearnings announcement drift anomaly, and Dechow & Sloan (1997) show that bias in analysts' forecasts of future earnings growth explains over half of the returns to contrarian investment strategies.

[6] A related stream of work identifies how investors weight specific firm or analyst characteristics that are predictive of analysts' forecast errors. For instance, Clement & Tse (2003) find that investors respond more strongly to longer-horizon forecasts, which are known to be less accurate, than to shorter-horizon forecasts because investors are generally more uncertain about earnings earlier in the year.

[7] The traditional approach involves regressing realized forecast errors on observable, lagged firm characteristics. To the extent that these firm characteristics correlate with unobservable inputs to analyst forecasts such as analysts' incentive misalignment or private information, biases in the methodology emerge. Examples of other studies that use the traditional approach include, for example, those of Ali, Klein & Rosenfeld (1992), Elgers & Murray (1992), Frankel & Lee (1998), and Lo & Elgers (1998).

Lastly, a stream of research investigates how investors' characteristics influence how they might unravel analysts' biases. For instance, Bonner, Walther & Young (2003) show that sophisticated investors appear to have a better understanding of the factors that drive forecast accuracy than do unsophisticated investors. Similarly, Malmendier & Shanthikumar (2007) show that small investors, compared with large investors, are more naïve about analyst recommendations, which are overoptimistic because of underwriting incentives. More recently, Hilary & Hsu (2013) find evidence that institutional investors are better at unraveling consistent analyst errors (i.e., errors that are inaccurate with low standard deviation) compared to retail investors.

Overall, this literature suggests that investors partially unravel the biases in analysts' forecasts, and that partial unraveling results in predictable stock prices. Further, the degree to which investors unravel predictable biases in analysts' forecasts is a function of firm, analyst, and investor characteristics. Future research would benefit from a detailed understanding of the drivers of this variation, such as behavioral biases and capital constraints.

4. ANALYSTS' OUTPUTS AND EXPECTED RETURNS

In this section, we discuss channels through which analysts' forecasts are linked to expected returns. We preface this discussion by noting that although the implications of analysts' forecasts to cash flows is clear and the empirical evidence is vast, the links between analysts' forecasts and expected returns are less established. We review the literature below, but note that the current state of literature presents a promising opportunity for future research.

We begin this section with a discussion of the use of analysts' forecasts in developing expected return proxies within a valuation framework. We then discuss the relation between analysts' forecasts and expected returns in an asset-pricing framework, focusing on (*a*) the effect of analysts' forecasts on information uncertainty and (*b*) the effect of analysts' forecasts on information asymmetry and liquidity.

4.1. Use of Earnings Forecasts in Estimating Expected Returns

Analysts' forecasts influence expected returns and facilitate the estimation of expected return proxies. In this section, we focus on the latter (in Section 4.2 we focus on the former). We begin with an earnings-based valuation model to obtain an estimate of firm value that is independent of price. Then, by comparing the valuation to observed market price, one may estimate the discount rate that investors place on future earnings as a proxy for the firm's expected return.

A central goal of valuation analysis is to incorporate the latest information about the amount, timing, and uncertainty of expected future cash flows in developing estimates of firm value, which may be compared against prevailing market prices. Under classical valuation models (e.g., the dividend discount model), the fundamental value of a firm is defined as the present value of its expected future dividends. Using these approaches, firm value can be expressed as a function of two central inputs: (*a*) its expected future dividends and (*b*) the discount rate applied to the firm's future dividends. More specifically, firm value at time t can be expressed as

$$\text{Value}_t = \sum_{i=1}^{\infty} \frac{E_t(D_{t+i})}{(1+r_e)^i}, \tag{1}$$

where $E_t(D_{t+i})$ is the firm's expected future dividends based on all information available in period t and r_e is the (constant) market discount rate applied to future dividends.

A key challenge in implementing the dividend discount model shown in Equation 1 is the need to forecast the stream of firms' future dividends, particularly among firms that do not issue dividends. Recognition of this issue gave rise to valuation models that rely on the clean surplus relation (Ohlson 1995), which states that changes in a firm's book value must be attributable to either earnings or dividends. That is,

$$B_t = B_{t-1} + E_t - D_t, \tag{2}$$

where B_t denotes a firm's book value, E_t is the firm's earnings in period t, and D_t is the firm's dividends in period t. Rearranging the clean surplus relation, dividends for period t can be expressed as

$$D_t = E_t - (B_t - B_{t-1}). \tag{3}$$

Substituting Equation 3 into Equation 1, firm value can be expressed as

$$\text{Value}_t = \frac{[E_t - (B_t - B_{t-1})]}{(1+r_e)^1} + \frac{[E_{t+1} - (B_{t+1} - B_t)]}{(1+r_e)^2} + \frac{[E_{t+2} - (B_{t+2} - B_{t+1})]}{(1+r_e)^3} + \ldots. \tag{4}$$

Equation 4 relates to valuation analysis using the Q model of Tobin (1969), which relies on forecasting firms' ability to generate value, i.e., cash flows in excess of the cost of capital, rather than on their stream of future dividend payments. Valuation analysis using the Q model compares the market value of a firm to the replacement value of its physical assets.

Like the Q model, researchers commonly implement Equation 4 by estimating a firm's future residual income. The notion of residual income captures the idea that expected future accounting rates of return that exceed the firms' costs of obtaining capital create economic value. These expected earnings represent cash flows that exceed the costs of acquiring assets and thus create value for shareholders. Using this intuition, a substantial literature in economics, finance, and accounting operationalizes valuation analysis using a residual income (RI) model, where RI refers to a firm's earnings minus the required rate of return on equity multiplied by the beginning-of-period book value:

$$\text{RI}_t = E_t - r_e B_{t-1}. \tag{5}$$

Substituting Equation 4 into Equation 5 expresses firm value as a function of a firm's book value and forecasted earnings per share. More specifically, the residual income model re-expresses firm value as

$$\text{Value}_t = B_t + \sum_{i=1}^{\infty} \frac{E_t[(\text{ROE}_{t+i} - r_e)B_{t+i-1}]}{(1+r_e)^i}, \tag{6}$$

where ROE_{t+i} is the return on book equity corresponding to period $t+i$. The application of clean surplus accounting shifts the focus of valuation exercises from forecasting dividends to forecasting earnings.

Both academics and practitioners commonly use these valuation models because, as illustrated in Equation 6, they provide estimates of firm value by inputting forecasts of future earnings, current book values, and discount rates. By replacing firm value with the market price of a firm's equity and using analysts' forecasts to proxy for expected future earnings, prior research demonstrates how to derive the implicit discount rate (e.g., Gebhardt, Lee & Swaminathan 2001; Easton 2004; Easton & Monahan 2005; Guay, Kothari & Shu 2011). These estimates can be informative to investors in predicting future returns as well as to corporate managers in making internal capital investment decisions.

The estimated discount rate is commonly referred to as a firm's implied cost of capital (ICC). ICCs have gained appeal in recent decades, first in accounting and now increasingly in finance, as a proxy for firms' expected returns. These studies suggest that ICCs offer an alternative approach for implementing empirical asset-pricing tests. (For a review of the accounting literature on ICCs, see

Easton & Sommers 2007.) In finance, ICCs have been used to test the intertemporal capital asset-pricing model (CAPM) (Pástor, Sinha & Swaminathan 2008), international asset-pricing models (Lee, Ng & Swaminathan 2009), and the pricing of default risk (Chava & Purnanandam 2010).

The ability of ICCs to proxy for expected returns hinges upon several key assumptions, including whether analysts' forecasts accurately reflect the market's expectation of earnings. Given the predictable and recurring nature of analysts' biases discussed in Sections 2 and 3, prior research has attempted to refine ICCs as a proxy of expected returns by removing predictable biases in analysts' forecasts (e.g., Easton & Monahan 2005; Easton 2009; Hou, van Dijk & Zhang 2012; Larocque 2013). Similarly, Guay, Kothari & Shu (2011) show that sluggishness in analysts' forecast revisions creates biased ICC estimates. They develop techniques to mitigate this form of bias. Collectively, these studies show that analysts' forecasts can facilitate the estimation of firm-level expected returns using an ICC approach, and they also point to a need to recognize and address the impact of predictable variation in the biases, inaccuracies, and timeliness of analysts' forecasts.

4.2. Analysts' Forecasts and Models of Expected Returns

Valuation is a function of two unobservables: risk and cash flows. Models show that uncertainty surrounding these unobservables affects valuation. Analysts, as information intermediaries, can influence the uncertainty around estimates of risk and cash flows through their output (forecasts, recommendations, and qualitative discussion). We begin with a classical model that ignores uncertainty. We then overlay uncertainty about the parameters and examine the role played by analysts' outputs in reducing uncertainty.

In classical asset-pricing models such as the CAPM, the expected return of an asset is a function of the covariance between the firm's return and the return of the market, commonly referred to as the firm's beta. Classical models implicitly assume that the investor knows the covariance between the firm's return and that of the market. In other words, there is no information uncertainty about the firm's beta. Further, because investors have homogenous beliefs, there is no source of risk arising from information asymmetry among market participants. As a result, in such models there is little opportunity for analysts to influence the expected return of a stock by supplying information to the market.

Subsequent studies relax the assumption of no information uncertainty by acknowledging that the beta parameter needs to be estimated, and such uncertainty introduces so-called estimation risk (e.g., Brown 1979, Barry & Brown 1984, Coles & Loewenstein 1988). More recently, researchers have linked the estimation risk literature to corporate disclosure (Hughes, Liu & Liu 2007; Lambert, Leuz & Verrecchia 2007). The idea is that firms' disclosures are imperfect signals about future cash flows and, as a result, better disclosures can reduce expected returns via a reduction in the (estimation of) firm beta. As discussed by Lambert, Leuz & Verrecchia (2007), this effect is nondiversifiable because it manifests through the covariance of a firm's cash flows and the market cash flows (i.e., it lowers the cash flow beta).

The insights from the estimation risk literature have implications for the literature on analysts' forecasts because analysts, by supplying information into the market, can alter the extent of information uncertainty in the markets. Specifically, the literature on estimation risk predicts that firms with richer information sets stemming from analysts' information production will have lower expected returns because analysts' forecasts reduce estimation risk, which translates to a lower beta.

Another stream of literature relaxes the assumption that investors have homogenous beliefs and exploits the extent to which information asymmetry between investors gives rise to a source of priced risk. For example, Easley & O'Hara (2004) study a model of asymmetric information and argue that information asymmetry is a source of nondiversifiable risk. Lambert, Leuz & Verrecchia (2011) argue that the effect proposed by Easley & O'Hara (2004) is diversifiable in models of perfect competition, but show that information asymmetry is a source of nondiversifiable risk in markets with imperfect competition. (For empirical evidence, see Armstrong et al. 2011; Akins, Ng & Verdi 2012.) A related stream of research uses a rational expectations equilibrium framework that links information asymmetry to asset prices by lowering demand from uninformed traders (e.g., Grossman & Stiglitz 1980, Hellwig 1980, Admati 1985, Wang 1993).

The relation between analysts' information production and expected returns via changes in information asymmetry, however, is more subtle. On the one hand, by supplying previously private information to the public domain, analysts' forecasts can reduce information asymmetry. This would predict that analyst-supplied information would reduce expected returns through a reduction in information asymmetry. On the other hand, analysts are compensated on the basis of their ability to garner trading commissions, and thus they may cater to large institutional investors. To the extent that analysts provide selective access to their reports, analysts could also exacerbate information asymmetry among market participants, which would increase expected returns.

4.3. Empirical Evidence

Evidence on the link between analysts' forecasts and expected returns is relatively scarce. One potential explanation for this scarcity is that the expected link between analysts' forecasts and asset prices is ambiguous, given two potentially offsetting effects from uncertainty and asymmetry, as discussed above. Additionally, other forces such as market mispricing and trading frictions potentially confound the empirical link between analysts' outputs and market prices (e.g., Miller 1977; Diether, Malloy & Scherbina 2002).

In the context of Reg FD, some studies directly test the information uncertainty versus information asymmetry mechanisms by investigating changes in cost of capital as a proxy for expected returns around the regulation's passage. Consistent with the argument that Reg FD increased the information acquisition costs for analysts, Gomes, Gorton & Madureira (2007) document a decrease in information (i.e., higher analysts' forecast errors and higher volatility) for small firms, causing a higher cost of capital after the passage of Reg FD. The authors interpret this result as Reg FD restricting analysts' private access to managerial information, thus leading analysts to choose to produce less information (i.e., higher information uncertainty); this in turn adversely affected small firms.

In contrast, consistent with the argument that Reg FD reduced information asymmetry by leveling the playing field, Chen, Dhaliwal & Xie (2010) document that the cost of capital for medium and large firms declined after the passage of the new regulation. This suggests that, prior to Reg FD, analysts, especially in big firms, selectively provided information to large investors and that this channel was reduced subsequent to the new regulation.

In a similar vein, other studies show that analysts increase liquidity by mitigating information asymmetry among investors. For example, Brennan & Subrahmanyam (1995), Easley, O'Hara & Paperman (1998), and Roulstone (2003) show that analysts create a more equitable information environment among investors by publicly disclosing information that would otherwise be costly to process. Similarly, Chung, Elder & Kim (2010) suggest that analysts help mitigate information asymmetry between firms and investors by serving a governance role, deterring corporate wrongdoing. In contrast, researchers such as Irvine, Lipson & Puckett (2007), Juergens & Lindsey (2009), and Christophe, Ferri & Hsieh (2010) suggest that analysts may also increase adverse selection risk among investors by sharing information privately with preferred clientele before publicly releasing their forecasts or recommendations.

Finally, an influential study by Diether, Malloy & Scherbina (2002) investigates the relation between analysts' forecast dispersion and the cross-section of future returns, finding that analysts' forecast dispersion is negatively associated with future returns. The authors interpret this result as differences in opinion driving overvaluation in the stock (a theory set forth by Miller 1977). (For evidence of a similar pattern using idiosyncratic volatility and the cross-section of returns, see Ang et al. 2006; Stambaugh, Yu & Yuan 2015.) Other studies attribute the findings of Diether, Malloy & Scherbina (2002) to trading costs (Sadka & Scherbina 2007) and to financial distress (Avramov et al. 2009). Regardless of whether forecast dispersion captures information uncertainty or asymmetry (in the form of disagreement) among analysts or a correlated factor (e.g., trading costs or distress risk) reflecting fundamental risk (and as a result information risk), the evidence seems inconsistent with the argument that analysts' forecast dispersion is associated with priced information risk.

5. CONCLUSIONS

This survey reviews the literature on sell-side analysts' forecasts and their implications for asset pricing. Section 2 reviews the literature on the supply and demand forces shaping analysts' forecasting decisions, noting that research on the impact of analyst forecasts on asset prices needs to account for the information analysts produce, which firms they cover, and their incentives to convey accurate and unbiased information. Section 3 reviews the literature on analyst forecasts and their implications for cash flow news, which highlights both instantaneous and delayed reactions to analysts' forecasts as well as the role of market over- versus underreaction. Section 4 reviews the literature on analyst forecasts' implications for expected returns.

Despite a substantial literature on the intersection of analysts' forecasts and asset pricing, the specific mechanisms through which analysts' forecasts influence asset prices, and expected returns in particular, are still not entirely clear. We identify unanswered questions and offer suggestions for future research to better understand the channels through which analysts' forecasts influence expected returns, the formation of analysts' beliefs, and techniques to causally link forecasts to market outcomes.

Before we conclude, we note that it has been more than 20 years since Schipper (1991) highlighted a disproportionate focus within academic research on analysts' forecasts, largely because of the availability of analyst forecast data and the use of this data within studies of earnings news (for a similar remark, see Bradshaw 2011). In our view, this disproportion remains despite the proliferation of new data sources and technologies, such as textual analysis, that afford researchers the ability to paint a more complete view of the information analysts themselves convey to the market. We encourage future research to help fill this void and, in doing so, to enhance our understanding of how information supplied by analysts becomes reflected in market prices.

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