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Shareholder-Manager Disagreement and Corporate Investment*

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Abstract. We develop a simple theoretical argument that generates testable predictions about how disagreement affects corporate investment and find strong empirical support for these predictions. Investment is negatively related to a proxy for disagreement, after controlling for Tobin's q, and after dealing with the fact that Tobin's q and our disagreement proxy contain measurement error. This proxy is unrelated to traditional indicators of asymmetric information. We also find that variation in disagreement is an important component of the portion of the variation in Tobin's q that matters for investment, and that disagreement affects investment and Tobin's q more if the firm has greater financial flexibility.

JEL Classification: E22, G31, G32, G34

1. Introduction

How does the stock market drive corporate investment decisions? This topic has been of interest in finance and macroeconomics at least since Keynes' (1936) idea that "animal spirits" influence the real economy. The question is of central importance in understanding the micro underpinnings of firm investment, as well as macroeconomic issues, such as whether central banks should influence asset markets.

We address this question from a novel perspective. We examine the idea that potential disagreement between the manager and investors about the firm's investment policy can affect corporate investment. This can be thought of in the context of a firm that faces an investment opportunity with an uncertain payoff. If the manager and the investors have different prior assessments of the value of the project and this difference of opinion cannot be reconciled, then there may be instances in which investors will not endorse the manager's project choice. In the face of such disagreement, the manager may decide not to invest in the project, thereby creating a link between disagreement and corporate investment. This link operates via two

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channels. First, higher disagreement means that, from the investors' standpoint, there is a greater likelihood that the manager will invest in projects investors do not like, so the firm's stock price will be lower when disagreement is higher. The manager will be averse to a stock price decline because a hostile takeover will be more likely at a lower stock price, and this may adversely impact his compensation as well as his job security. Additional considerations like the social prestige associated with a higher stock price may also cause the manager to be averse to a stock price decline. The manager's reluctance to invest in projects due to investor disagreement may thus operate via the stock price channel. This effect will be stronger when the firm has greater financial flexibility because investors recognize that this flexibility gives the manager more leeway to undertake projects despite investor objections. Second, in the absence of unfettered financial flexibility, the manager's ability to invest may also be affected by disagreement, thereby creating a link between disagreement and corporate investment even independently of the relationship between disagreement and the stock price.[1]

Our empirical findings support this intuition. Given the newness of the empirical literature on manager-investor disagreement, we start our investigation by constructing our own proxy for disagreement: the difference between management's forecast of earnings per share and the mean analyst estimate of earnings per share no more than one month after the announcement of management's forecast. In constructing this proxy we ensure that the potential arrival of significant news between the time of management's and analysts' forecasts is not the source of any discrepancy between the two forecasts. We also take seriously the possible presence of noise in this proxy for the unobservable concept of disagreement, and we address this possibility in *three* ways. First, we present evidence that our proxy is unrelated to measures of asymmetric information between management and outside investors. Second, we show that it is disagreement between management and investors that affects firm investment, rather than disagreement among investors. Third, we use an estimator that provides consistent estimates of regression coefficients even though we are using an admittedly imperfect proxy for disagreement.

Using firm-level data from 1994 to 2005, we find a significant effect of disagreement on investment, holding constant Tobin's q. These results take into account the fact that *both* Tobin's q and our proxy for disagreement are imperfect proxies. In addition, we find a strong negative relationship between disagreement and Tobin's q itself. Together, these two results suggest not only that disagreement affects the stock price, which is the main source of variation in Tobin's q, but also

[1] Although we examine the implications of differences in beliefs between management and investors, we do not take a stand on who has the "correct " beliefs. Thus, our paper is not about the impact on corporate investment of the behavioral biases of management, such as overconfidence (e.g. Malmendier and Tate, 2005) or optimism (e.g. Ben-David et al., 2006).

ıat disagreement has an independent effect on investment. We also use the signal xtraction methodology in Bakke and Whited (2010) to test whether disagreement ffects investment *through* its effect on the stock price. We find that this channel ; important and that it is more important for financially flexible firms. This result onfirms the model's prediction that disagreement has a stronger effect on firms /ith a greater degree of flexibility in their decision making. Interestingly, we find ıat the stock price channel is equally important for firms that issue equity and ıose that do not. This result is important given the evidence in Dittmar and Thakor 2007) that disagreement affects equity issuance, and equity issuance in turn affects ıvestment. Our result implies that disagreement does not just affect investment ırough the channel of equity issuance.

Our paper adds empirical support to the literature on the effects of heterogeneous riors and disagreement. See, for example, Abel and Mailath (1994), Allen and Gale 1999), Barberis and Thaler (2003), Boot and Thakor (2010), Boot et al. (2006, 008), Dittmar and Thakor (2007), and Van Den Steen (2004, 2005, 2010). The asic message of this literature is that disagreement is a significant phenomenon ıat affects a variety of corporate finance practices, not only within the context of ıeoretical models, but also in terms of empirical evidence.[2]

Our paper also fits into the empirical literature on the role of the stock market n corporate investment. The modern empirical literature dates back to Fischer nd Merton (1984) argue that investment decisions should respond to stock price hanges, even when the stock market fluctuates irrationally. The subsequent evlence on this hypothesis has been mixed. Morck et al. (1990), Blanchard et al. 1993), Chirinko and Schaller (1996), and Bakke and Whited (2010) find evidence ıat investment is affected by stock price movements only via movements in funamentals. For evidence that stock market mispricing plays an independent role ı determining investment, see Chirinko and Schaller (2001, 2007), Baker et al. 2003), Gilchrist et al. (2005), and Polk and Sapienza (2009). Finally, Chen et al. 2009) provide evidence that investment is affected by information in the stock

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An interesting question this raises is: would disagreement survive in equilibrium given that we ould expect a clientele effect whereby investors least likely to disagree with the firm's manager e most likely to be long in the stock? The answer is yes. To see why, we can imagine that there is oss-sectional heterogeneity among investors in terms of their propensity to agree with the firm. If vestors were risk neutral and had no wealth endowment constraints, those with the highest level of greement would hold the stock in equilibrium. But if risk neutral investors are wealth-constrained or vestors are risk averse, then investors will limit their holding of any stock, forcing the firm to sell its ock to investors with lower levels of agreement. Consequently, in equilibrium, the marginal investors the stock will have the lowest level of agreement with the firm, with inframarginal investors having gher levels of agreement. Depending on the firm, the equilibrium level of disagreement of the arginal investor—which determines the stock price—may be quite low, implying that the force erted by disagreement on managerial decisions may be quite large.

price that is not in the manager's information set. Our paper is more closely related to this latter work than the work on mispricing inasmuch as we look at the effect of a specific type of information—disagreement.

Our work is perhaps most closely related to Dittmar and Thakor (2007), who develop a model of the timing of equity issues based on disagreement between managers and investors. In their model lower disagreement leads to a higher stock price and a greater likelihood of an equity issue. They provide empirical evidence that these equity issues are followed by higher capital expenditures, consistent with the prediction that the timing of equity issuance is motivated by the desire to finance projects with equity when manager-investor disagreement is low, rather than by equity mispricing. Several important differences exist between that paper and ours. First, unlike Dittmar and Thakor (2007), our focus is on corporate investment instead of security issuance. Second, we show that disagreement affects investment even when it does *not* operate through an equity channel. Third, unlike Dittmar and Thakor (2007), who show that both manager-investor disagreement and disagreement among investors affect equity issuance, our analysis shows that what matters for corporate investment is disagreement *between* management and investors, and not disagreement *among* investors. This result is also consistent with the findings in Bakke and Whited (2010), who only find a small, limited effect on investment of disagreement among investors. Fourth, we motivate and construct a novel measure of shareholder-manager disagreement. Finally, we establish the effect of disagreement on investment both through the stock price and independently.

The remainder of the paper is organized as follows. Section 2 develops our empirical hypotheses. Section 3 describes the data, Section 4 describes our tests and results, and Section 5 concludes.

2. Empirical Predictions

Our empirical predictions revolve around the central idea that disagreement between investors and managers can impede managers' plans to carry out capital budgeting projects. They therefore extend the notions in Boot and Thakor (2010) and Dittmar and Thakor (2007) that the firm's stock price is increasing in shareholders' propensity to agree with management, and that disagreement affects firms' financing choices.

To sharpen the intuition behind the hypotheses we test, we provide here an *illustration* of how disagreement can affect corporate investment. Imagine a world in which everyone is risk neutral, the riskless rate is zero, and the manager can invest effort $e \in [0, 1]$ to find a good project. The probability that the manager will find a project he views as good is $\theta(e)$, with $\partial\theta/\partial e > 0$, $\partial^2\theta/\partial e^2 < 0$ and the Inada onditions $\lim_{e\longrightarrow 0} \partial\theta/\partial e = 0$ and $\lim_{e\to 1} \partial\theta/\partial e = \infty$. The manager's personal ost of exerting effort e is e. A good project has an NPV of H and a bad project has n NPV of L, with $H > 0 > L$. We introduce manager-investor disagreement by ssuming that the probability is $\rho \in [0, 1]$ that investors will agree that the project is ;ood when the manager thinks it is good. Thus, disagreement is measured by $1 - \rho$, he probability that investors will view the project as bad when the manager thinks t is good. Let η represent the firm's "financial flexibility", which is the probability hat the firm will have sufficient internal resources to finance the project even if nvestor are unwilling to provide the financing. The manager's objective function s:

$$W = \theta P_s + \theta\delta P_m - e \tag{1}$$

vhere P_s is the stock price conditional on the manager finding a project, P_m s the manager's assessment of the "true" value of the project, δ is the relative veight the manager attaches to P_m, and e is the manager's cost of effort. Note hat $P_s = \rho H + [1 - \rho]\eta L + I$ and $P_m = \rho H + [1 - \rho]\eta H + I$, where I is the nvestment in the project. That is, when investors agree with the manager that he project is good (the probability of agreement is ρ), the project is accepted and he NPV is valued at H in both P_s and P_m. When investors disagree (which happens vith probability $1 - \rho$), the manager proceeds with the project with probability η, and rejects the project with probability $1 - \eta$ (in which case the NPV is zero). When he proceeds despite investor objections, investors value the project NPV as L whereas the manager values it as H. Note that the stock price prior to the arrival of the project will be $P_s^0 \equiv \theta P_s$, and Tobin's q will increase in P_s^0.

With this set-up, our main results obtain right away. The manager's first-order condition on effort is:

$$[\partial\theta/\partial e][P_s + \delta P_m] - 1 = 0. \tag{2}$$

From (2), it follows that $\partial^2\theta/\partial e\partial\rho < 0$. Given the concavity of θ in e, this means that when disagreement is lower (ρ is higher), the manager optimally chooses a higher effort e^*(i.e. $de^*/d\rho > 0$), leading to a higher probability (θ) of finding a project, and hence stochastically higher investment (*Result 1*). Further, $\partial P_s^0/\partial\rho = \theta[H - \eta L] + [\partial\theta^*/\partial\rho]P_s$. Since $\partial\theta^*/\partial\rho > 0$, it follows that $\partial P_s^0/\partial\rho > 0$. Hence, Tobin's q will be positively related to ρ or negatively related to disagreement (*Result 2*). Since this result implies that P_s^0 (and hence Tobin's q) as well as investment are increasing in ρ, investment will appear in the data to be affected by the specific variation in Tobin's q that stems from disagreement. Moreover, even if one ignores the effect of the stock price on investment by dropping P_s from the first-order condition (2), we see that $\partial^2\theta/\partial e\partial\rho = -H[1 - \eta]\theta\delta[P_m]^{-2} < 0$, so θ is increasing ρ. This means that disagreement exerts an independent effect on corporate investment, even apart from the stock price channel (*Result 3*). Finally with P_s reinstated in (2), we see that

$\partial^2\theta/\partial e \partial \rho = -\{\theta[H - \eta L] + \delta\theta H[1 - \eta]\}\{\theta P_s + \theta\delta P_m\}^{-2}$ has an *absolute value* that is decreasing in η. This means that the impact of ρ on the optimal θ is smaller at higher values of η. In other words, disagreement $(1 - \rho)$ has a stronger effect on corporate investment (and hence Tobin's q) when financial flexibility (η) is higher (*Result 4*).

For our analysis we use Tobin's q to represent movements in the firm's stock price. This use of Tobin's q is appropriate inasmuch as variation in Tobin's q is driven by variation in equity values, both in the cross-section of firms, and in the individual time series of each firm. The simple theoretical framework we used to illustrate the intuition leads to numerous testable predictions, which can be summarized as follows.

Prediction 1. *Disagreement between management and investors is negatively correlated with both investment and Tobin's q.*

This prediction follows from Results 1 and 2 above. Observed correlations between investment, disagreement and q are insufficient for understanding the economic mechanisms that generate these correlations. Our next prediction goes one level deeper to determine whether a possible impact of disagreement on the stock price passes through to firms' investment decisions.

Prediction 2. *Investment is affected by the specific variation in Tobin's q that stems from disagreement.*

This prediction follows from Result 2 above. Our next prediction deals with the possibility that investment might respond to disagreement via a channel that is separate from the stock-price channel.

Prediction 3. *Disagreement has an effect on investment independent of the effect of Tobin's q on investment.*

This prediction follows from Result 3. We now explore further the implication of the specific channel whereby disagreement affects investment.

Prediction 4. *Disagreement affects investment and Tobin's q more if the firm has greater financial flexibility.*

This prediction follows from Result 4. Finally, Dittmar and Thakor (2007) demonstrate that disagreement affects equity issuance and that this *specific* financing channel has an impact on corporate investment. It is therefore interesting to investigate whether disagreement affects investment only via an equity issuance channel or more generally.

Prediction 5. *Disagreement affects investment and Tobin's q irrespective of whether the firm uses equity issuance to fund its investment.*

This prediction is clear from our analysis. Disagreement dearly affects corporate investment regardless of how the investment is financed.

3. Data and Summary Statistics

This section describes our data sources. It then moves on to define the major variables we use in our empirical analysis, and finally presents summary statistics.

3.1 DATA DESCRIPTION

The data come from four sources. The first is the combined annual, research, and full coverage 2006 Standard and Poor's Compustat industrial files. We select the sample by first deleting any firm-year observations with missing data. Next, we delete any observations for which total assets, the gross capital stock, or sales are either zero or negative. To avoid rounding error issues, we delete firms whose total assets are less than two million dollars and gross capital stocks are less than one million dollars. Further, we delete any observations that fail to obey standard accounting identities. Finally, we include a firm only if it has at least three consecutive years of complete data; and we omit all firms whose primary SIC classification is between 4900 and 4999 or between 6000 and 6999, since our model is inappropriate for regulated or financial firms.

Our data on monthly stock returns and volumes are from the 2006 CRSP tapes. For a firm-year observation to be included in our sample, the firm must have at least three years of complete return data preceding the year that the firm is in the Compustat sample. This requirement is necessary to estimate yearly CAPM betas, which we use to construct abnormal returns.

Our data on management's and analysts' earnings forecasts are from First Call. We include a firm if we can observe the mean and standard deviations of the analysts' earnings estimates one month from the end of the reporting date for the actual earnings estimates. We begin with all company-issued guidance on earnings per share available on First Call from 1990–2005. We include only forecasts of annual earnings per share and drop forecasts from 1990–1993 because coverage in those years is sparse. We next remove observations that do not have accompanying analysts' consensus earnings estimates from First Call. In cases in which management issues more than one forecast per fiscal year, we choose the earliest forecast for which there are no abnormal returns between the dates of management's and analysts' forecasts. After merging these three data sources we are left with an unbalanced panel of firms with between 169 and 716 observations per year with a sample period that runs from 1994 to 2005.

Because we drop a large fraction of our original, unmerged Compustat sample after merging it with CRSP and First Call, we must consider seriously the possibility of sample selection bias. However, we believe that this problem works in our favor in this particular application, because we have dropped primarily small, less well-known firms from our sample. For example, 62% of our original Compustat sample has total assets of less than 100 million dollars, whereas this percentage drops to 14% in our merged sample. Similarly, 44% of the firms in our merged sample have bond ratings, and only 21% of the firms in the original sample have bond ratings. Because one of the goals of this paper is to try to isolate the effects of disagreement, it is important to ensure that we are not picking up any effects of asymmetric information. It is advantageous, therefore, for our purposes, that these effects are unlikely to manifest themselves in a sample of large firms.

3.2 VARIABLE DEFINITIONS

First Disagreement Proxy: We first discuss our main proxy for disagreement. We define our earnings disagreement proxy to be management's forecast of earnings per share for the fiscal year end minus the mean analyst estimate reported no more than 30 days after the reporting date for management's forecast. These two figures can diverge for only two reasons: (i) disagreement between management and analysts/investors, and (ii) news obtained by analysts after management's forecast. We eliminate the second possibility by setting equal to zero observations in which the firm experiences an abnormal return between the dates of management's and analysts' forecasts. Abnormal returns are defined relative to the Fama-French three factor model, in which factor loadings are estimated with monthly data over a sample period that runs from three years to one month before the date of management's forecast. For a return to be classified as "abnormal," the excess return with respect to the three factor model must be larger than two standard deviations of that firm's predicted excess return. We refer to this proxy as our main disagreement proxy.

Second Disagreement Proxy: We also examine an alternative proxy for disagreement that was used by Dittmar and Thakor (2007). It is also based on analysts' earnings estimates: the difference between the actual value of earnings per share and the mean analyst estimate of earnings per share reported no more than 50 days before the reporting date for actual earnings. The intuition here is that the analysts' estimates represent investor opinion, and the realized figures represent what management already knew would happen.[3] Because firms have up to three months after

[3] We also use the three-month difference. We find that this proxy has little association with either investment or the stock price. Because of the longer time between the estimated and realized earnings

the end of the fiscal year to announce their actual earnings, the estimates we use often occur *after* the end of the fiscal year. This feature is important because it is unlikely at such a late date that asymmetric information could be driving any divergence between the estimated and realized values of earnings. We call this proxy an "earnings surprise" hereafter. Both of these proxies are signed so that they are increasing in the extent to which management is more optimistic than analysts.

Although the basic intuition behind these two proxies is similar, an important advantage of our main proxy is that it is difficult to interpret it as an indicator of asymmetric information, because analysts know management's forecast when they make their own. One potential concern with these two proxies is that they are not directly measures of future earnings but reflect measurements of current earnings. Future earnings are clearly more relevant to a forward-looking investment decision than current earnings. Nonetheless, we view this concern as minor. First, earnings tend to be highly positively serially correlated. For example, a panel autoregression from Holtz-Eakin et al. (1988) on our sample provides a first-order autoregressive coefficient on earnings of 0.61. This finding implies that current earnings are a reasonable forecast of future earnings. Second, to the extent that this forecast is not perfect, it adds noise to our proxy. Although noise can be a serious problem for empirical work, we correct for its presence in our estimations.

In addition to our direct measures of disagreement between managers and investors, we also examine a measure of disagreement *among* investors: the standard deviation of analysts' estimates. A higher standard deviation designates higher disagreement. To the extent that disagreement among investors naturally leads to disagreement between the manager and at least some of these investors, this variable may be capturing management-investor disagreement. However, the standard deviation has an alternative interpretation. As argued in Diether et al. (2002), Gilchrist et al. (2005), and Bakke and Whited (2010), high dispersion of investor opinion combined with short-sale constraints can lead to an over-valued stock price. Using this variable, therefore, also helps us distinguish between disagreement and overpricing.

We re-scale the levels and standard deviations of earnings estimates as a fraction of the capital stock instead of as a fraction of total shares. Our intent is to scale all of our variables by firm size, and the number of shares outstanding is an arbitrary number that does not necessarily measure the size of the firm. This rescaling is important for reducing heteroskedasticity in our regressions as well as for eliminating coefficient bias that may result from an incidental, and economically meaningless, correlation between firm size and the number of shares outstanding.

figures, this measure is less likely to measure disagreement and more likely to measure information asymmetry or a pure expectational error.

In interpreting the results that follow, it is important *not* to interpret the magnitudes of our disagreement proxies as a fraction of shares outstanding.

We also employ a variety of measures of asymmetric information. Numerous authors in the investment literature have used total assets, the existence of a bond rating, and the number of analysts following a firm as (self-explanatory) measures of asymmetric information. In addition to these proxies, we also use share turnover, which is defined as average monthly volume divided by shares outstanding. Because turnover is a measure of liquidity, to the extent that information is more easily available for more liquid stocks, this variable can be used as a proxy for asymmetric information.

Finally, we use a measure of financial flexibility from Whited and Wu (2006). This index is an estimate of the Lagrange multiplier on a constraint that restricts external finance in a dynamic model. It therefore measures not only whether the firm needs to tap external funds, but whether the firm pays a premium for external funds, or, at the limit finds them prohibitively expensive. Specifically, the index is given by:

$$-0.091CF - 0.062DIVPOS + 0.021TLTD - 0.044LNTA + 0.102ISG - 0.035SG. \tag{3}$$

Here, *DIVPOS* is an indicator that is one if the firm pays dividends, and zero otherwise; *SG* is own-firm real sales growth; *ISG* is three-digit industry sales growth, and *LNTA* is the natural log of book assets. Firms with a high Whited-Wu (WW) index are small, have high debt burdens, and low cash flow. Also, they are the slow-growing firms in fast-growing industries. Because this index is a measure of the shadow cost of external finance, it captures both the need of constrained firms to go external for finance and the high cost or scarce availability of finance.

The rest of our Compustat variables are defined as follows. Book assets is item 6, long-term debt is the sum of items 9 and 34, the capital stock is item 7, sales is item 12, dividends are the sum of items 19 and 21, cash flow is the sum of items 14 and 18, equity issuance is item 108, the number of common shares is item 25, and the share price is item 199. Tobin's q is defined as in Erickson and Whited (2000).

3.3 SUMMARY STATISTICS

Table I presents summary statistics for key variables in our data set. To construct this table we have sorted the data into quintiles on the basis of our earnings disagreement proxy. The first quintile contains firms for which analysts' estimates exceed management's estimates, and we have therefore labeled it low disagreement. The degree of disagreement increases monotonically until the fifth quintile, which we have labeled high disagreement. The table reveals only a slight association between our measure of disagreement and our four measures of asymmetric information.

Table I. Summary statistics

Calculations of sample means are based on a sample of nonfinancial firms from the annual 2006 COMPUSTAT industrial files. The sample period is 1994 to 2005. Disagreement is the difference between management's estimate of end-of-fiscal-year earnings per share and the mean analyst estimate one to thirty days after management announces its estimate. Earnings surprise is the difference between end-of-fiscal-year earnings per share and the mean analyst estimate ten to fifty days before the fiscal year end. Standard deviation is the standard deviation of analysts' estimates. Disagreement, earnings surprise, and standard deviation are rescaled as a fraction of the capital stock. Bond rating equals one if the firm has a bond rating and equals zero otherwise. Turnover is defined as average monthly volume divided by outstanding shares. The WW index is an indicator of the severity of external finance constraints from Whited and Wu (2006); it is increasing in the degree of finance constraints. Total assets are expressed in thousands of 1997 dollars. Investment to capital is the ratio of capital expenditures to the replacement value of the capital stock. The calculation of the replacement value of capital and Tobin's q are described in the appendix to Whited (1992).

	Low Disagreement				High Disagreement
Investment to capital	0.155	0.154	0.146	0.144	0.124
Tobin's q	2.258	2.018	2.086	2.134	1.844
Total assets	4087.381	2912.171	3466.296	5035.722	4163.331
Fraction of debt issuers	0.363	0.282	0.287	0.306	0.329
Fraction of equity issuers	0.251	0.272	0.284	0.248	0.218
Debt to assets ratio	0.171	0.160	0.166	0.166	0.193
WW index	0.299	0.351	0.341	0.328	0.322
Fraction with bond ratings	0.585	0.353	0.400	0.442	0.486
Number of analysts	7.433	5.891	6.503	6.936	6.721
Turnover	15.621	16.842	15.614	14.449	14.165
Earnings surprise	−0.013	0.005	−0.184	−0.002	0.001
Standard deviation	0.087	0.180	0.169	0.136	0.122
Disagreement	−0.486	−0.222	−0.012	0.017	0.173

Disagreement also appears to have little association with the earnings surprise or financial flexibility, as measured by the WW index. Next, disagreement among analysts and disagreement between insiders and outsiders appear to be largely unrelated to one another. This result suggests that disagreement among investors may not be picking up the type of disagreement we hypothesize to affect firm investment. In this sense, what we observe in the data on corporate investment is different from the finding in Dittmar and Thakor (2007) that disagreement among investors has good explanatory power for equity issues.

Table I also reveals an interesting association between investment and disagreement. First, low disagreement firms have higher Tobin's q's. Second, when moving from the low to the high disagreement groups, investment drops by more than Tobin's q in percentage terms. In other words, high disagreement firms invest much less relative to their level of Tobin's q than low disagreement firms. This last

Table II. Pairwise correlations between asymmetric information and disagreement proxies

Calculations are based on a sample of nonfinancial firms from the annual 2006 COMPUSTAT industrial files. The sample period is 1994 to 2005. Disagreement (or Dis.) is the difference between management's estimate of end-of-fiscal-year earnings per share and the mean analyst estimate one to thirty days after management announces its estimate. Earnings surprise is the difference between end-of-fiscal-year earnings per share and the mean analyst estimate ten to fifty days before the fiscal year end. Standard deviation is the standard deviation of these estimates. Disagreement, earnings surprise, and standard deviation are rescaled as a fraction of the capital stock. Bond rating equals one if the firm has a bond rating and equals zero otherwise. Turnover is defined as average monthly volume divided by outstanding shares. The WW index is an indicator of the severity of external finance constraints from Whited and Wu (2006); it is increasing in the degree of finance constraints. Total assets are expressed in thousands of 1997 dollars. An asterisk indicates significance at the 5% level.

	Total assets	WW index	Bond rating	Number of analysts	Turnover	Earnings surprise	Standard deviation	Dis.
Total assets	1.000							
WW index	−0.414*	1.000						
Bond rating	0.220*	−0.620*	1.000					
Number of analysts	0.286*	−0.582*	0.359*	1.000				
Turnover	−0.064	0.179	−0.152	0.115	1.000			
Earnings surprise	0.005	0.019	−0.019	−0.013	0.009	1.000		
Standard deviation	0.005	−0.013	−0.034	0.085	0.146	−0.010	1.000	
Disagreement	−0.022	0.171	−0.141	−0.085	−0.026	0.000	0.102	1.000

result suggests a strong impact of disagreement on real investment. This evidence also supports our Prediction 1 that high disagreement firms have lower equity values. Although this evidence is consistent with the idea that disagreement between investors and the manager feeds through to real investment decisions, it is only suggestive. We turn to more conclusive evidence below.

First, however, we examine whether we are picking up firms with high levels of asymmetric information when we categorize them with our main disagreement proxy. Table II therefore presents the pairwise correlation coefficients between our earnings disagreement proxy, the standard deviation, the earnings surprise and various traditional measures of asymmetric information. Firm size, the existence of a bond rating, and the number analysts following a firm are all positively and significantly correlated with one another. In contrast, these three asymmetric information proxies have negative and near-zero correlations with disagreement, as does turnover. This evidence leads us to conclude that disagreement and asymmetric information are unrelated to one another in our sample of firms. Finally, the correlation coefficients between our earnings disagreement proxy, our measure of earnings surprises, and the standard deviation are near zero.

4. Tests and Results

This section starts with the simplest type of test: an OLS regression. We then move onto tests that both deal with and exploit our use of imperfect proxies for investment opportunities and disagreement.

4.1 OLS REGRESSION TESTS

In this section we take a first pass at our first prediction, which specifies that both investment and Tobin's q should be negatively correlated with disagreement. We first regress investment on Tobin's q, the ratio of cash flow to the capital stock, and the debt-overhang correction in Hennessy (2004). We include cash flow because Cooper and Ejarque (2003) show that the presence of market power implies that investment is a function of Tobin's q and cash flow. Similarly, we include the overhang correction because Hennessy (2004) shows that when a firm has outstanding debt, investment is a function of Tobin's q and a debt-overhang correction. In estimating this regression, we do not incorporate firm fixed effects because a standard Hausman test cannot reject the null hypothesis of an uncorrelated error and regressor. Put more simply, including fixed effects has little economic or statistical effect on the estimated coefficients. This result is not surprising inasmuch as investment is a first-differenced variable; therefore, a potential fixed effect related to firm size has already been differenced out. Although it is standard to include fixed effects in any study that uses panel data, the use of panel data does not in and of itself causes a correlation between a regressor and potential fixed effects. Rather, it is the economics of the question being addressed. Because our investment regression does not appear to suffer from this problem, we prefer to conserve degrees of freedom and leave the fixed effects out. We do, however, include year dummies to control for common macroeconomic shocks, the omission of which does materially affect our results.

The first column of Table III contains the results from estimating this simple model. Not surprisingly, both q and cash flow carry positive and highly significant coefficients, and the coefficient on the overhang correction is, as predicted, negative. The next three columns contain the results from including our measure of disagreement and the standard deviation of analysts' estimates. We find that the estimates of the coefficients on disagreement are always significantly negative, a result that supports our Prediction 1. The estimated sensitivity of investment to the standard deviation is, in contrast, significantly greater than zero. This result is consistent with the positive correlation between the standard deviation and Tobin's q found in Bakke and Whited (2010), and it also indicates that our earnings disagreement proxy and the standard deviation of analysts earning forecasts convey different information. Interestingly, our earnings surprise proxy also enters the

Table III. OLS investment regressions

The dependent variable is the ratio of capital expenditures to the capital stock. Regressions are run with time dummies, whose coefficients are not reported. Standard errors are corrected for clustering at the firm level. Calculations are based on a sample of nonfinancial firms from the annual 2006 COMPUSTAT industrial files. The sample period is 1994 to 2005. Disagreement is the difference between management's estimate of end-of-fiscal-year earnings per share and the mean analyst estimate one to thirty days after management announces its estimate. Earnings surprise is the difference between end-of-fiscal-year earnings per share and the mean analyst estimate ten to fifty days before the fiscal year end. Standard deviation is the standard deviation of these estimates. Disagreement, earnings surprise, and standard deviation are rescaled as a fraction of the capital stock. Cash flow is the ratio of the sum of net income and depreciation to the capital stock. Overhang is the debt-overhang correction from Hennessy (2004).

	(1)	(2)	(3)	(4)	(5)
Tobins q	0.0052	0.0050	0.0051	0.0052	0.0049
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Cash flow	0.0436	0.0389	0.0426	0.0436	0.0372
	(0.0061)	(0.0063)	(0.0060)	(0.0061)	(0.0062)
Overhang	−0.0828	−0.0799	−0.0948	−0.0828	−0.0944
	(0.0424)	(0.0425)	(0.0426)	(0.0424)	(0.0428)
Disagreement		−0.0443			−0.0478
		(0.0141)			(0.0142)
Standard deviation			0.0118		0.0146
			(0.0072)		(0.0072)
Earnings surprise				−0.0004	−0.0005
				(0.0002)	(0.0005)
R^2	0.2182	0.2917	0.2192	0.2182	0.2932

regression with a negative and significant coefficient, although the estimated effect is much smaller than in the case of our main disagreement proxy.

To test the second part of our first prediction, we first regress Tobin's q on our disagreement proxies, while controlling for measures of asymmetric information. We are not as concerned about measurement error in our earnings disagreement proxies for this regression. Because most of these regression only contain one proxy of central interest, the coefficient on the proxy is biased towards zero. We lag all of our regressors one period, because our disagreement and asymmetric information proxies are measured at the end of the fiscal year, and because Tobin's q is measured at the beginning. The results are in Table IV, which shows that the coefficient on our main disagreement proxy is always negative and significantly different from zero. As in the case of the investment regressions, the coefficient on the standard deviation is significant and positive and the coefficient on the earnings surprise is significant and negative. In the fourth column of Table IV, we include both our disagreement proxies and our measures of asymmetric information. Although the coefficients on our two earnings disagreement proxies remain negative and ɔle IV. OLS q regressions

e dependent variable is Tobin's q. Regressions are run with time dummies, whose coefficients are : reported. Standard errors are corrected for heteroskedasticity and for clustering at the firm level. lculations are based on a sample of nonfinancial firms from the annual 2006 COMPUSTAT indusıl files. The sample period is 1994 to 2005. Disagreement is the difference between management's imate of end-of-fiscal-year earnings per share and the mean analyst estimate one to thirty days after nagement announces its estimate. Earnings surprise is the difference between end-of-fiscal-year nings per share and the mean analyst estimate ten to fifty days before the fiscal year end. Standard ʼiation is the standard deviation of these estimates. Disagreement, earnings surprise, and standard ʼiation are rescaled as a fraction of the capital stock.

	(1)	(2)	(3)	(4)
agreement	−0.0460			−0.0388
	(0.0139)			(0.0125)
ndard deviation		0.4253		0.1755
		(0.1818)		(0.2423)
nings surprise			−0.0260	−0.0306
			(0.0074)	(0.0097)
nber of analysts				0.0669
				(0.0052)
nover				0.0256
				(0.0021)
ıd rating				−0.4500
				(0.0362)
	0.0810	0.0316	0.0316	0.2629

;nificant, the coefficient on the standard deviation becomes insignificant. Not ·prisingly, our measures of asymmetric information have a significant negative ect on q. The estimated coefficients on the number of analysts and turnover are th significantly positive. Although the existence of a bond rating has a negative ect on q, this counter-intuitive result occurs because firm size and the existence of ·ond rating are highly positively correlated, and the bond rating dummy therefore :ks up a size effect. When we do include size (not reported), we find that the nd rating coefficient reverses sign and that size has a negative effect. From this .dence we bolster the conclusion we draw from Table II that disagreement has an ect on the stock price that is separate from the effect of asymmetric information.

MEASUREMENT ERROR CORRECTIONS

though the above results are supportive of our first prediction, none provide direct .dence on our second and third predictions, which specify that disagreement ·rks both through the stock price (Tobin's q) and independently. For example, :n though our disagreement proxies are correlated with q, and even though ·estment is correlated is also correlated with q, correlations are not transitive.

Further, as demonstrated in Erickson and Whited (2000), Tobin's q contains a great deal of measurement error, which produces biased OLS estimates of coefficients on regressors that are correlated with q.

The rest of our testing strategy, therefore, is based on the high-order moment estimators in Erickson and Whited (2000, 2002). We pick this technique for two reasons. First, as explained in Erickson and Whited (2000), other, more traditional errors-in-variables remedies require implausible assumptions such as serially uncorrelated measurement errors. Second, Erickson and Whited (2000) demonstrate that this technique has good finite-sample properties in the case of cross-sectional investment regressions. In particular, the coefficient estimates exhibit almost no finite sample bias, and the GMM J-test has good power to detect misspecification.

The measurement error problem is complicated in the current context because our proxy for disagreement is also imperfect. As explained in detail in Klepper and Leamer (1984), coefficient biases in the case of two imperfect proxies are often impossible to bound without the use of strong prior information. As shown in Erickson and Whited (2002), high-order moment estimators can be extended easily to this case. The estimators employ the structure of the classical errors-in-variables model. Applied to a single cross section, this model can be written as:

$$y_i = z_i\alpha + \chi_{1i}\beta_1 + \chi_{2i}\beta_2 + u_i, \tag{4}$$

$$x_{1i} = \gamma_1 + \chi_{1i} + \varepsilon_{1i}, \tag{5}$$

$$x_{2i} = \gamma_2 + \chi_{2i} + \varepsilon_{2i}, \tag{6}$$

in which y_i is the ratio of investment to assets for firm i, χ_{1i} is the true incentive to invest (true q), x_{1i} is an estimate of its true q, χ_{2i} is true disagreement between shareholders and investors, x_{2i} is a disagreement proxy, and z_i is a row vector of perfectly measured regressors, whose first entry is one. The regression error, u_i, and the measurement errors, ε_{1i} and ε_{2i}, are assumed to be independent of each other and of $(z_i, \chi_{1i}, \chi_{2i})$, and the observations within a cross section are assumed *i.i.d.* The intercepts in (5) and (6) allows for bias in the measurement of true q and disagreement.

Using the third and higher order moments of (x_{1i}, x_{2i}, y_i), the Erickson and Whited estimators provide consistent estimates of the slope coefficients, $(\alpha, \beta_1, \beta_2)$, as well as of the variances of the unobservable variables $(\chi_{1i}, \chi_{2i}, u_i, \varepsilon_i)$. These estimators are identified only if $\beta_1 \neq 0$, $\beta_2 \neq 0$ and either χ_{1i} or χ_{2i} has a non-zero third moment. Erickson and Whited (2002) develop a test of the null hypothesis that $\beta_1 = \beta_2 = 0$ and that both χ_{1i} and χ_{2i} are symmetrically distributed. This identification test fails to reject the null in the first three years of our sample, almost certainly because of our small sample sizes in those years. We therefore omit these three years from all of the analysis that follows.

ɔle V. GMM investment regressions

e dependent variable is the ratio of capital expenditures to the capital stock. Estimation is done :h the two-mismeasured regressor fourth-order estimator from Erickson and Whited (2002). Fama-ıcBeth standard errors are in parentheses under the parameter estimates. An asterisk indicates t the associated t-statistic exceeds its finite-sample critical value from a block bootstrap using the hnique in Hall and Horowitz (1996). Calculations are based on a sample of nonfinancial firms from annual 2006 COMPUSTAT industrial files. The sample period is 1994 to 2005. Disagreement he difference between management's estimate of end-of-fiscal-year earnings per share and the an analyst estimate one to thirty days after management announces its estimate. Earnings surprise he difference between end-of-fiscal-year earnings per share and the mean analyst estimate ten to y days before the fiscal year end. Standard deviation is the standard deviation of these estimates. ıagreement, earnings surprise, and standard deviation are rescaled as a fraction of the capital stock. ɜh flow is the ratio of the sum of net income and depreciation to the capital stock. Overhang is the ıt-overhang correction from Hennessy (2004).

	(1)	(2)	(3)	(4)	(5)
ins q	0.0172*	0.0186*	0.0186*	0.0142*	0.0140*
	(0.0025)	(0.0048)	(0.0072)	(0.0022)	(0.0028)
h flow	−0.0384	0.0214	−0.0225	−0.0367	−0.0325
	(0.0457)	(0.0273)	(0.0245)	(0.0213)	(0.0195)
:rhang	−0.0740*	−0.0454	−0.0713	−0.0601*	−0.0726
	(0.0284)	(0.0347)	(0.0806)	(0.0276)	(0.0398)
agreement		−0.0501*			−0.0417*
		(0.0125)			(0.0142)
ıdard deviation			0.0030		0.0149
			(0.0064)		(0.0486)
ıings surprise				0.0346	0.0214
				(0.0737)	(0.0635)
	0.3123*	0.3872*	0.3703*	0.3286*	0.3890*
	(0.0269)	(0.0359)	(0.0502)	(0.0502)	(0.0291)

Because these estimators can only be applied to samples that are arguably *i.i.d.*, obtain these estimates in two steps. First, we estimate our regression for each ıss section of our unbalanced panel. Second, we pool these estimates via the pro-lure in Fama and MacBeth (1973). Recently, Petersen (2008) has re-emphasized t Fama-Macbeth standard errors are often inappropriate in panel data. We deal :h this issue by using the bootstrap in Hall and Horowitz (1996) to calculate finite-sample distribution of the t-statistics produced with the Fama-MacBeth ndard errors. The unit of observation for resampling is the firm. Not surprisingly, find that some of these finite-sample critical values are above their asymptotic :ical values, especially for the test of the null that the coefficient on Tobin's q is o.

The results from applying the two-mismeasured regressor estimator based on to fourth order moments are in Table V. In the first column, we present the imates obtained from our baseline specification, which includes Tobin's q, cash flow, and the overhang correction. In contrast to the findings in Table III, the coefficient on cash flow ceases to be significant, and both the coefficient on q and the regression R^2 are estimated to be much larger than their OLS counterparts. The next three columns contain results from regressions that augment this baseline specification by adding our three proxies one at a time. We find that the coefficient on our main disagreement proxy remains significantly different from zero even when we use the bootstrapped critical values for the t-test. Also, the coefficients on our other two proxies cease to be significantly different from zero. Given that standard deviation does not directly capture disagreement between management and investors, and given that the earnings surprise can also be interpreted as a measure of asymmetric information, we conclude that our results support our third prediction that disagreement has an effect on investment independent of its effect on the stock price.

4.3 SIGNAL EXTRACTION TESTS

Although interesting, our results on disagreement do not shed light on Prediction 2; i.e., that disagreement affects investment via its effect on the stock price. To examine this question, we turn to the methodology in Bakke and Whited (2010), which is also based on the classical errors-in-variables model, but a version in which there is only one mismeasured regressor. This model can be written as a simplified version of equations (4)–(5):

$$y_i = z_i\alpha + \chi_{1i}\beta_1 + u_i, \tag{7}$$

$$x_{1i} = \gamma_1 + \chi_{1i} + \varepsilon_{1i}, \tag{8}$$

in which all symbols are defined as in the previous section. This one-mismeasured regressor version of the errors-in-variables model can also be estimated with the Erickson and Whited estimators. For the purposes of our investigation, the technique allows us to estimate an important quantity: the ratio of signal to the sum of signal and noise for Tobin's q, which is the population R^2 of Equation (8), and which we denote τ^2. Under our assumptions, it can be written as:

$$\tau^2 = \frac{\text{var}(\chi_{1i})}{\text{var}(x_{1i})} = \frac{\text{var}(\chi_{1i})}{\text{var}(\chi_{1i}) + \text{var}(\varepsilon_{1i})}. \tag{9}$$

From a purely econometric point of view, a value of τ^2 close to one implies that the proxy is quite informative about variation in χ_i. Conversely, a value close to zero implies that the proxy is nearly worthless. As explained in more detail in Bakke and Whited (2010), in economic terms the variable χ_{1i} represents *by definition* from (7) the component of observed Tobin's q that the manager views as relevant for investment, and ε_{1i} represents the component of observed Tobin's q that is not.

'o determine whether disagreement affects investment via its effect on the stock :e (Tobin's q), we first regress Tobin's q on each of our disagreement proxies one time and collect the residuals, which we denote as w_{1i}, and which can be thought s Tobin's q minus the variation that stems from disagreement. When we remove ation from Tobin's q, we remove it either from the component that is relevant n investment (χ_{1i}) or the component that is irrelevant for investment (ε_{1i}). To :rmine which of these scenarios is the case, we substitute w_{1i} in for x_{1i} in (8), :timate (7) and (8), and obtain a new estimate of τ^2, which we denote τ^2_w. If in first-stage regression of Tobin's q on a disagreement proxy, we have removed ation that is relevant for investment, τ^2_w should fall. Conversely, if in the first- ;e regression of Tobin's q on a disagreement proxy, we have removed variation is irrelevant for investment, τ^2_w should rise. To test whether disagreement cts investment via its effect on Tobin's q, we then form the difference $\tau^2_w - \tau^2$ test whether this difference is significantly greater or less than zero. In this nework, our null hypothesis is $\tau^2_w - \tau^2 = 0$. Our first alternative hypothesis firm investment responds to disagreement can be expressed as $\tau^2_w - \tau^2 < 0$. ' second alternative hypothesis that management ignores disagreement can be ressed as $\tau^2_m - \tau^2 > 0$.

ı this testing setup a failure to reject the null can arise for a variety of reasons. t, this can happen if the first stage regression of Tobin's q on the disagreement ‹y yields a zero coefficient. As seen in Table IV, however, for none of our proxies ıis the case. A second reason for a failure to reject is managerial attention to a tion of disagreement combined with managerial inattention to the rest. We deal ı this possibility in the robustness section below. A final scenario that can lead failure to reject the null is noise in our imperfect proxies for disagreement. As ıonstrated Monte Carlo simulations in Bakke and Whited (2010), however, the ;ence of measurement error in these proxies only lowers the power of the tests tive to a situation in which one uses (hypothetical) perfect measures. It does not ; the tests. Nonetheless, even with reduced power, we find several rejections of null.

)ur results for using this test on the full sample are in the first row of Table VI. estimates are from the fourth-order moment estimator in Erickson and Whited)2). We report the estimated coefficient on q, the estimate of τ^2 from the original :ession of investment on q, cash flow, and the overhang correction. We omit the :r coefficient estimates for brevity. Finally, in the last three columns, we report statistics $\tau^2_w - \tau^2$ that correspond to each of our disagreement proxies.

'he coefficient on q is similar in magnitude to the estimate from Table V. This ılt is important because the significance of our main disagreement proxy in the :ession (4) necessarily implies that the regression (7) is mispecified. However, stability of the coefficient on q across the two specifications indicate that this ɔlem is unlikely to affect inference in a material way. Also supporting our

Table VI. Signal extraction tests

The dependent variable is the ratio of capital expenditures to the capital stock. Estimation is do with the one-mismeasured regressor fourth-order estimator from Erickson and Whited (2002 Fama-MacBeth standard errors are in parentheses under the parameter estimates. An asteri indicates that the associated t-statistic exceeds its finite-sample critical value from a block boo strap using the technique in Hall and Horowitz (1996). τ^2 is the ratio of signal to the sum of signal ar noise for Tobin's q. The a positive value for the signal extraction test statistic indicates that the variab in question does not affect investment. The a negative value for the signal extraction test statist indicates that the variable in question does affect investment. Calculations are based on a sample nonfinancial firms from the annual 2006 COMPUSTAT industrial files. The sample period is 19 to 2005. Disagreement (*DIS*) is the difference between management's estimate of end-of-fiscal-ye earnings per share and the mean analyst estimate one to thirty days after management announces i estimate. Earnings surprise (*ES*) is the difference between end-of-fiscal-year earnings per share ar the mean analyst estimate ten to fifty days before the fiscal year end. Standard deviation (*SDEV*) the standard deviation of these estimates. Disagreement, earnings surprise, and standard deviatic are rescaled as a fraction of the capital stock.

			Signal extraction tests		
	q	τ^2	*DIS*	*SDEV*	*ES*
Full sample	0.0172*	0.5356*	−0.1011*	−0.0212	0.0111
	(0.0025)	(0.0558)	(0.0250)	(0.0129)	(0.1201
Financially constrained	0.0229*	0.5715*	−0.0640	−0.0424	−0.0091
	(0.0056)	(0.0818)	(0.1297)	(0.0266)	(0.0459
Financially unconstrained	0.0181*	0.4878*	−0.1456*	0.0273*	−0.0918
	(0.0051)	(0.0906)	(0.0488)	(0.0113)	(0.0311
Low equity issuance	0.0307*	0.4661*	−0.0625*	−0.0463	−0.0145
	(0.0073)	(0.0342)	(0.0150)	(0.0315)	(0.0640
High equity issuance	0.0193*	0.5600*	−0.0654*	0.0237	0.0042
	(0.0059)	(0.0856)	(0.0212)	(0.1045)	(0.0877

conclusion of minimal distortion in inference are the tests of the overidentifyin restrictions for each of the yearly estimates underlying the averages reported i Table VI. For none of the years do we find a rejection of the overidentifyin restrictions, and Erickson and Whited (2000) find that these tests have good smal sample power to detect misspecification.

The next column of the table reports the estimate of τ^2, which is approximatel 50%–a figure close to the estimates from Erickson and Whited (2000). The tes based on the difference $\tau_w^2 - \tau^2$ indicate that when we remove variation in Tobin's that stems from our main disagreement proxy, we remove variation that is relevar for investment. Such is not the case with the other two proxies, for which we fail t reject the null. To understand the economic significance of the result for our mai proxy, we follow Bakke and Whited (2010) by calculating the quantity $R^2_{x\omega}/\tau^2$ in which $R^2_{x\omega}$ is the R^2 from regressing Tobin's q on the disagreement proxy an which can be found at the bottom of Table IV. Bakke and Whited (2010) sho ıt the ratio $R^2_{x\omega}/\tau^2$ provides an upper bound on the percent of the variation in $_i$ that is due to the disagreement proxy. We find a value of approximately 15%, ıich we feel is realistic. Although much of the variation in χ_{1i} probably stems ɪm fundamental investment opportunities, and although disagreement is unlikely be related to such fundamentals, some of the variation in χ_{1i} also stems from ms' ability to finance these investment projects. For a sample of large firms such ours, our results indicate that a nontrivial portion of this financing is affected by ıagreement.

SAMPLE SPLITTING TESTS

ɜ now turn to testing our fourth and fifth predictions: that disagreement mat-'s more for firms with more financial flexibility and that disagreement matters espective of whether the firm is issuing equity. We test these predictions us-ɡ the above signal extraction tests on samples split by measures of financial nstraints and equity issuance. Although it would also be interesting to run the o-mismeasured regressor estimator to look at an independent effect of disagree-ɜnt in these subsamples, this estimator is not identified on any of our subsamples cause of sample size.

The second and third rows of Table VI provide estimates for samples split by ɜ index of a *binding* external finance constraint from Whited and Wu (2006), ıich we use as an indicator of flexibility. We find that the signal extraction test pports the prediction that manager-shareholder disagreement matters more for ɔre financially flexible firms, and this evidence is confirmed with our main ıagreement proxy as well as with the earnings surprise. Interestingly, we find ıt for these financially unconstrained firms the standard deviation of analysts' imates comprises a statistically significant portion of the variation in Tobin's q ıt does not matter for investment. This result confirms a similar result in Bakke d Whited (2010), who use standard deviation as a proxy for over-pricing.

We next investigate whether the effect of disagreement on investment operates 'ough an equity financing channel, i.e., we test Prediction 5. Dittmar and Thakor)07) show that higher investment is linked to equity issues, which are in turn ɜater when stock prices and agreement are higher. To extend this result, we need eliminate the possibility that disagreement affects investment solely through this annel. We therefore examine two groups of firms: those that never issue equity ıile they are in our sample, and those that issue equity at least once. Although uity issuance is clearly endogenously determined with investment, splitting the nple on the basis of a consistent history of avoiding equity issuance mitigates s concern. A long-run policy of not funding the firm with new equity is likely be orthogonal to yearly fluctuations in investment. Interestingly, as shown in the last two rows of Table VI, we find that disagreement affects investment in both groups of firms, a result that supports our Prediction 5.

4.5 ROBUSTNESS

In this subsection we examine three key issues that have the potential to undermine our results. The first is the interpretation of the instances in which we fail to reject the null that $\tau_w^2 - \tau^2$ is zero. In particular, it might be the case that management finds a portion of the disagreement relevant, and another portion irrelevant. This situation would leave the estimate of τ_w^2 fairly unchanged relative to the estimate of τ^2, and yet management could still care about investor disagreement. To address this concern, we formulate a slightly different test based on the difference $\text{var}(\chi_{1i})_w - \text{var}(\chi_{1i})$, in which the subscript w indicates that a mispricing proxy has been partialled out of Tobin's q. These tests are easier to interpret. The null hypothesis is that mispricing does not matter, and the difference in the estimated variances is therefore never greater than zero. The null is rejected if it is significantly less than zero. Our results using this test give identical inferences to those in Table VI. We prefer not to use this test for our main analysis, however, because Bakke and Whited (2010) show that it has inferior finite sample performance to the test based on τ^2.

The second problem we consider is rounding error. The First Call earnings estimates are adjusted for stock splits and rounded to two decimal points. Diether et al. (2002) point out that such data contain serious rounding errors. This problem can either amplify or diminish the differences in management's and analysts' forecasts. Further, this problem is likely to occur in fast-growing firms, which tend to do stock splits often. These firms are therefore likely to have the noisiest earnings disagreement proxies. However, this problem should not affect the results in Table V, which are produced with an estimator that is consistent in the presence of measurement error in our disagreement proxy.

A final problem centers around a plausible alternative interpretations of our disagreement proxy as a proxy for managerial optimism. This interpretation is plausible inasmuch as our proxy is managerial expectations minus analysts' expectations of future earnings. This alternative explanation is easy to eliminate given an asymmetry in our story. If management is more pessimistic than analysts, then disagreement in and of itself should have no effect on investment because management will not opt to undertake any investment projects no matter what analysts' think. Therefore, if optimism is driving our story, we should see weaker results when we eliminate those observations in which management's forecast is less optimistic than analysts', which is the case for approximately 38% of our sample. When we re-run our tests using this alternative proxy, the OLS actually become stronger. The GMM results also remain qualitatively similar, but in some instances we lose statistical

;nificance because we have mechanically lowered the variance of our proxy. We ;refore conclude that optimism is not driving our results.

Conclusion

; examine empirically whether disagreement between management and investors ;ects corporate investment. We develop a proxy for disagreement, demonstrating ıt it does not inadvertently measure asymmetric information. Along this line ; also find that while value and investment depend on management-investor ;agreement, they are unrelated to measures of disagreement among investors. :erestingly, we find that neither value nor investment is related to a measure disagreement among investors. We also find that holding Tobin's q constant, ;agreement has an independent negative effect on investment, even when we ntrol for measurement error in both our proxy and in Tobin's q. Finally, we ıd that disagreement also affects investment via its negative effect on the firm's ›ck price. We find that this relationship hold for firms that issue equity and also r firms that do not. The relationship is stronger for firms with more financial :xibility. In sum, our paper extends research on the link between the stock market d investment by identifying a specific economic mechanism that helps forge this .k—manager-investor disagreement.

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