The Benefits of Financial Statement Comparability

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ABSTRACT

Investors, regulators, academics, and researchers all emphasize the importance of comparability. However, an empirical construct of financial statement comparability is typically not specified. In addition, little evidence exists on the benefits of comparability to users. This study attempts to fill these gaps. We develop two measures of financial statement comparability. Empirically, these measures are positively related to analyst following and forecast accuracy, and negatively related to analysts' optimism and dispersion in earnings forecasts. These results suggest that financial statement comparability lowers the cost of acquiring information, and increases the overall quantity and quality of information available to analysts about the firm.

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The Benefits of Financial Statement Comparability

1. Introduction

Several factors point toward the importance of "comparability" of financial statement information across firms in financial analysis. According to the Securities and Exchange Commission (SEC) [2000], when investors judge the merits of investments and *comparability* of investments, efficient allocation of capital is facilitated and investor confidence nurtured. The usefulness of *comparable* financial statements is underscored in the Financial Accounting Standards Board (FASB) accounting concepts statement. Specifically, the FASB [1980, p. 40] states that "investing and lending decisions essentially involve evaluations of alternative opportunities, and they cannot be made rationally if *comparative* information is not available" (our emphasis).[1] Financial statement analysis textbooks almost invariably stress the importance of comparability across financial statements in judging a firm's performance using financial ratios.[2] For instance, Stickney and Weil [2006, p. 189] conclude that, "Ratios, by themselves out of context, provide little information." Despite the importance of comparability, a measure of financial statement comparability is not specified and there is little evidence on its benefits to financial statement users.

The term comparability in accounting textbooks, in regulatory pronouncements, and in academic research is defined in broad generalities rather than precisely. In this study, we focus on capturing the notion of *financial statement* comparability (hereafter comparability). As

[1] As an additional example of the importance of comparability in a regulatory context, comparability is one of three qualitative characteristics of accounting information included in the accounting conceptual framework (along with relevance and reliability). Further, according to the FASB [1980, p. 40], "The difficulty in making financial comparisons among enterprises because of the different accounting methods has been accepted for many years as the principal reason for the development of accounting standards." Here, the FASB argues that users' demand for comparable information drives accounting regulation.

[2] See, e.g., Libby, Libby and Short [2004, p. 707], Stickney, Brown, and Wahlen [2007, p. 199], Revsine, Collins, and Johnson [2004, pp. 213-214], Wild, Subramanyam, and Halsey [2006, p. 31], Penman [2006, p. 324], White, Sondhi, and Fried [2002, p. 112], and Palepu and Healy [2007, p. 5-1].

described in more detail in section 2, we build our definition of comparability based on the idea that the accounting system is a mapping from economic events to financial statements. We then develop two measures of comparability. The first measure, which we label "accounting" comparability, is based on the idea that for a given set of economic events, two firms have comparable accounting systems if they produce similar financial statements. The second measure, which we label "earnings" comparability, is based on the idea that firms with correlated economic events *and* similar accounting of these events will have correlated financial statements over time. To better isolate the similarity in accounting for the events, we control for similarity of business models and economic events in our tests when using earnings comparability.

Because our comparability measures are new, we first study the construct validity of these measures via an analysis of the textual contents of a hand-collected sample of sell-side analysts' reports. We find that the likelihood of an analyst using another firm in the industry (say, firm *j*) as a benchmark when analyzing a particular firm (say, firm *i*) is increasing in the comparability between the two firms. This shows that our measures of comparability are related to the use of comparable firms in analysts' reports, bolstering the construct validity of our comparability metrics.

We then document the benefits of comparability for sell-side analysts. Given a particular firm, we hypothesize that the availability of information about comparable firms lowers the cost of acquiring information, and increases the overall quantity and quality of information available about the firm. We expect these features to result in more analysts covering the firm. In addition, enhanced information should facilitate analysts' ability to forecast firm *i*'s earnings, for example by allowing analysts to better explain firms' historical performance or to use information from comparable firms as an additional input in their earnings forecasts. Thus we predict that

comparability will be positively associated with forecast accuracy and negatively associated with forecast optimism and forecast dispersion.

Consistent with these hypotheses, we find that comparability facilitates analyst following. Specifically, the likelihood that an analyst covering a particular firm (e.g., firm *i*) would also be covering another firm in the same industry (e.g., firm *j*) is increasing in the comparability between the two firms. Further, firms classified as more comparable are also covered by more analysts. These results suggest that analysts indeed benefit, i.e., face lower information acquisition and processing costs, from higher comparability. We also find that comparability helps analysts more accurately forecast earnings and this improvement comes, at least in part, through a reduction in forecast bias (i.e., optimism). Last, we provide some evidence that comparability is negatively related to analysts' forecast dispersion, consistent with the availability of superior public information about highly-comparable firms and an assumption that analysts use similar forecasting models.

Our study contributes to the literature in two ways. First, we develop two empirical measures of financial statement comparability that are firm-specific, output-based, and quantitative. These measures contrast with qualitative, input-based definitions of comparability, such as business activities or accounting methods. Our measures are intended to capture comparability from the perspective of users, such as analysts, who evaluate historical performance and forecast future firm performance, or make other decisions using financial statement information. While our primary focus is on developing comparability measures at the firm level, we also construct measures of relative comparability at the "firm-pair" level, in which a measure is calculated for all possible pairs of firms in the same industry.

Second, we provide evidence of the benefits of comparability to analysts. The ability to

forecast future earnings is a common task for users broadly defined to include not only analysts but also investors, particularly those engaged in valuation. Improved accuracy and reduced bias, for example, represent tangible benefits to this user group. These findings are consistent with the results in concurrent work by Bradshaw et al. [2009], who examine the relation between accounting method heterogeneity and analysts' forecast accuracy and dispersion. While comparability is generally accepted as a valuable attribute to users, little evidence exists beyond these studies that would empirically confirm this belief.

The next section defines our measures of financial statement comparability. Section 3 outlines our hypotheses that comparability provides benefits to analysts. We provide descriptive statistics and construct validity tests of our measures in Section 4. Section 5 presents the results of our empirical tests. The last section concludes.

2. Empirical Measures of Comparability

In the next subsections, we conceptually define financial statement comparability, explain how we compute our two empirical measures of comparability, and last, discuss the measures in the context of the extant literature.

2.1. CONCEPTUAL DEFINITION OF FINANCIAL STATEMENT COMPARABILITY

FASB (1980) states that, "comparability is the quality of information that enables users to identify similarities and differences between two sets of economic phenomena." We add structure to this idea by defining the accounting system as a mapping from economic events to financial statements. As such, it can be represented as follows:

$$Financial\ Statements_i = f_i(Economic\ Events_i) \quad (1)$$

where $f_i(\ )$ represents the accounting system of firm i. Two firms have comparable accounting systems if their mappings are similar.

Equation 1 states that a firm's financial statements are a function of the economic events and of the accounting for these events. Following this logic we conceptually define financial statement comparability in two ways. Our first definition is:

Two firms have comparable accounting systems if, for a given set of economic events, they produce similar financial statements.

That is, two firms, *i* and *j*, with comparable accounting should have similar mappings *f( )* such that, for a given a set of economic events X, firm *j* produces similar financial statements to firm *i*. This definition explicitly controls for the similarity in the economic events in order to isolate the similarity in the accounting functions.

Our second conceptual definition of comparability is:

Firms with correlated economic events and similar accounting of these events will have correlated financial statements over time.

The primary difference between this definition and the first definition is that, while the former explicitly controls for the economic transactions, the latter requires an indirect approach to control for the economic transactions. In the next section we describe the empirical method used to disentangle the accounting comparability from the economic events under these different approaches. Specifically, we describe our two empirical measures of comparability, *Comp Acct* and *Comp Earn*, which directly build on these two conceptual definitions, respectively.

2.2. FIRST EMPIRICAL MEASURE OF COMPARABILITY – *COMP ACCT*

As mentioned above, our first conceptual definition of comparability states that two firms have comparable accounting systems if, for a given set of economic events, they produce similar financial statements. To implement this definition, we develop a simple empirical model of the firm's accounting system. In the context of Equation 1, we proxy for the financial statements

using earnings, one important summary financial statement measure, and use stock return as a proxy for the net effect of economic events [Basu, 1997]. Specifically, for each firm we first estimate the following equation using 16 previous quarters of data:

$$Earnings_{it} = \alpha_i + \beta_i \, Return_{it} + \varepsilon_{it}. \quad (2)$$

where *Earnings* is the ratio of quarterly net income before extraordinary items to the beginning of period market value, and *Return* is the stock price return during the quarter. Defining *Return* using a longer (15-month) window (untabulated) produces inferences that are similar to the tabulated results. Under the framework in Equation 1, $\hat{\alpha}_i$ and $\hat{\beta}_i$ proxy for the accounting function *f( )* for firm *i*. Similarly, the accounting function for firm *j* is proxied by $\hat{\alpha}_j$ and $\hat{\beta}_j$ (estimated using the earnings and return for firm *j*).

Functions between two firms that are "closer" represent more comparability between the firms. To estimate the distance between functions, we invoke one implication of accounting comparability: if two firms have the *same* economic events, the more comparable the accounting between the firms, the more similar their financial statements. We use firm *i*'s and firm *j*'s estimated accounting function to predict what earnings would be if they had the same return (i.e., if they had the same economic events, $Return_{it}$). Specifically, we use the two estimated accounting functions for each firm with the economic event of *a single* firm. We calculate:

$$E(Earnings)_{iit} = \hat{\alpha}_i + \hat{\beta}_i \, Return_{it} \quad (3)$$

$$E(Earnings)_{ijt} = \hat{\alpha}_j + \hat{\beta}_j \, Return_{it} \quad (4)$$

$E(Earnings)_{iit}$ is the predicted earnings of firm *i* given firm *i*'s function and firm *i*'s return in period *t*; and, $E(Earnings)_{ijt}$ is the predicted earnings of firm *j* given firm *j*'s function and firm *i*'s return in period *t*. By using firm *i*'s return in both predictions, we explicitly keep the economic events constant. Untabulated tests in which we use S&P500 return to predict earnings instead of

firm *i*'s return produce similar inferences to our tabulated tests.

We define accounting comparability between firm *i* and *j* ($CompAcct_{ijt}$) as the negative value of the average absolute difference between the predicted earnings using firm *i*'s and *j*'s functions:

$$CompAcct_{ijt} = -1/16 * \sum_{t-15}^{t} | E(Earnings_{iit}) - E(Earnings_{ijt}) | \quad (5)$$

Higher values indicate higher accounting comparability. We estimate accounting comparability for each firm *i* – firm *j* combination for *J* firms within the same SIC 2-digit industry classification and whose fiscal year ends in March, June, September, or December.[3] Untabulated analyses show that inferences are unaffected when we replicate our tabulated tests using GICS and Fama-French [1997] industry classification measures.

We produce a firm-year measure of accounting comparability by aggregating the firm *i* – firm *j* $CompAcct_{ijt}$ for a given firm *i*. Specifically, after estimating accounting comparability for each firm *i* – firm *j* combination, we rank all *J* values of $Comp\ Acct_{ijt}$ for each firm *i* from the highest to lowest. $Comp4\ Acct_{it}$ is the average $CompAcct_{ijt}$ of the four firm *j*'s with the highest comparability with firm *i* during period *t*. (Results are similar if we use the top ten firm *j*'s instead.) Similarly, $CompInd\ Acct_{it}$ is the median $CompAcct_{ijt}$ for all firms in the same industry as firm *i* during period *t*. Firms with high *Comp4 Acct* and *CompInd Acct* have accounting functions that are more similar to those in the peer group and in the industry, respectively.

[3] We exclude holding firms. In some cases, Compustat contains financial statements for both the parent and subsidiary company, and we want to avoid matching two such firms. We exclude ADRs and limited partnerships because our focus is on corporations domiciled in the United States. Specifically if the word Holding, Group, ADR, or LP (and associated variations of these words) appear in the firm name on Compustat, the firm is excluded. We also exclude firms that have names highly similar to each other using an algorithm that matches five-or-more-letter words in the firm names, but avoids matching on generic words such as "hotels", "foods", "semiconductor", etc. Finally, we restrict the sample to industries with at least 20 firms per year based on the SIC two-digit classification.

2.3. SECOND EMPIRICAL MEASURE OF COMPARABILITY – *COMP EARN*

Our second conceptual definition of comparability, as mentioned above, states that firms with correlated economic events and similar accounting of these transactions will have correlated financial statements over time. To implement this definition, we first compute the pair-wise historical correlation between the earnings of two firms among all possible pairs of firms in the same industry. Ceteris paribus, firms with higher comparability are firms whose earnings covary more with the earnings of its peers firms. More specifically, using 16 quarters of earnings data we estimate:

$$Earnings_{it} = \Phi_{0ij} + \Phi_{1ij}\, Earnings_{jt} + \varepsilon_{ijt}. \quad (6)$$

We define our firm i – firm j measure of earnings comparability ($Comp\ Earn_{ijt}$) as the adjusted R^2 from this regression. (Hereafter, we use R^2 to mean adjusted-R^2.) Higher values indicate higher comparability. To avoid the influence of outliers on the R^2 measure, we remove observations in which *Earnings* for firm i is more than three standard deviations from the mean value of the 16 *Earnings* observations for firm i used to estimate Equation 6.

Following a similar procedure to our development of the *Comp Acct* variables above, we obtain $Comp\ Earn_{ijt}$ for each firm i – firm j pair for J firms in the same 2-digit SIC industry with available data. In addition, we compute a firm-level measure of earnings comparability, $Comp4\ Earn_{it}$, as the average R^2 for the four firm j's with the highest R^2s. $CompInd\ Earn_{it}$ is the median R^2 for all firms in the industry. Firms with high *Comp4 Earn* and *CompInd Earn* have earnings that covary more with earnings of firms in a peer group and firms in the industry, respectively.

As stated above, one issue with *Comp Earn* as a comparability metric is that, unlike *Comp Acct*, *Comp Earn* does not directly control for the economic shock, which is crucial to isolate accounting comparability. We address this issue in two ways. First, we estimate

Equation 6 among firms that are likely exposed to similar economic shocks as proxied by similar industry classifications. We then perform all our analysis within-industry, so that the economic shocks are (somewhat) constant across firms.

Second, we proxy for the similarity in economic shocks by developing return and cash flow comparability variables, measured analogously to *Comp Earn*. Bhojraj, Lee, and Oler [2003] for instance, use covariance in stock return as a way to measure economic relatedness among firms. We ex-post control for these variables in our hypothesis tests. *Comp CFO* is created in an identical manner to *Comp Earn* except that in Equation 6 we replace *Earnings* with *CFO*, which is the ratio of quarterly cash flow from operations to the beginning of period market value. It captures covariation in near-term economic shocks. *Comp Ret* is also defined in a manner that parallels the construction of *Comp Earn*. In Equation 6, instead of *Earnings* we use monthly stock returns taken from the CRSP Monthly Stock file, and instead of 16 quarters we use 48 months. *Comp Ret* captures covariation in economic shocks related to cash flow expectations over long horizons.

We then calculate pairwise firm *i* – firm *j* values (*Comp CFOij* and *Comp Retij*) and aggregated firm-level values (*Comp4 CFO*, *CompInd CFO*, *Comp4 Ret*, and *CompInd Ret*) for these measures. Given that our earnings comparability measure captures both accounting comparability and economic events, when we control for economic similarity, the earnings correlation will more likely capture accounting comparability. Given this indirect way of controlling for economic shocks, a caveat of this approach is that the earnings comparability measure will also capture any economic similarities that are un-modeled (e.g., an economic event that is expected and thus not in the returns of both firms) or inadequately modeled (e.g., some non-linear relation between similarity in economic events and similarity in earnings).

2.4. DISCUSSION OF COMPARABILITY MEASURES

We first highlight differences between our two comparability measures and then compare our two measures to other related measures used in the extant literature. Compared with our *Comp Earn* measure, *Comp Acct* has the relative advantage of explicitly controlling for the economic events. The *Comp Acct* measure, however, relies on firm-specific estimates of a simple linear model to proxy for a firm's accounting system. One advantage of *Comp Earn* over *Comp Acct* is that *Comp Earn* does not require us to specify and estimate the accounting system. Further, earnings between firms can be positively correlated, for instance two firms in the same industry experiencing a drop in raw material prices, or negatively correlated, for instance one competitor losing market share to the other. Our *Comp Earn* measure captures this notion. Finally, one important distinction between *Comp Acct* and *Comp Earn* is that the former compares *predicted* earnings whereas the latter compares *actual* earnings. This is important because the ability of return to explain earnings is for many firms limited. For example, two firms could have the same accounting function but one firm could have significantly more volatility in earnings. This would show up as differences in the function's error term, which the *Comp Acct* measure ignores but would be reflected in *Comp Earn*.

Turning to other measures in the literature, prior research has examined comparable *inputs* such as similar accounting methods. As an example, Bradshaw and Miller [2007] study whether international firms that intend to harmonize their accounting with U.S. GAAP adopt U.S. GAAP accounting methods. DeFond and Hung [2003] argue that accounting choice heterogeneity (e.g., differences in inventory methods such as LIFO versus FIFO) increases the difficulty in comparing earnings across firms. Bradshaw et al. [2009] define accounting heterogeneity based on whether accounting methods are atypical in an industry.

In contrast to these studies, in developing our measures we focus on earnings, a financial statement *output*. Our output-based method has a number of advantages over an input-based method. First, a measure of comparability on the basis of firms' accounting choices faces several challenges: which choices to use, how to weight those, how to account for variation in the implementation of the choices, etc. A researcher must make these difficult (and somewhat ad hoc) decisions in constructing a measure. In contrast, our methodology abstracts from these challenges and instead uses the actual weights used by firms when computing reporting earnings. Second, for a given economic shock, firms that use the same accounting inputs will produce the same output. However, it is possible that two firms with different accounting inputs might still produce the same output (e.g., LIFO versus FIFO when prices and inventory levels are constant). From the user's perspective, this lack of input comparability is not relevant and is not reflected in our measures. Finally, as a practical matter, it is often hard (or costly) to collect data on a broad set of accounting choices for a broad set of firms. In contrast, our measures are calculated using widely available financial statement and return data.

Other existing measures of comparability are based mainly on similarities in cross-sectional levels of contemporaneous measures (e.g., return on equity, firm size, price multiples) at a single point in time and designed to measure differences across countries (e.g., Joos and Lang [1994], Land and Lang [2002]). Our measures are dynamic, capturing similarities over time, and are firm-specific.

Our measures are also different from commonly-studied earnings attributes, such as persistence, predictability, smoothness, timeliness, etc. These attributes are firm-specific and calculated independently of the attributes of other firms. As the FASB [1980] points out, "Comparability is…a quality of the relationship between two or more pieces of information."

Thus, if our measure captures comparability appropriately, we would expect our measures to be related to *similarities* in attributes across firms. For example, timeliness captures the ability of earnings to reflect the news in returns. Firms with earnings that are equally timely will produce similar β coefficients when we estimate our accounting function (i.e., Equation 2) and will have a higher measure of *Comp Acct*. As another example, the literature (e.g., Lipe [1990]) has established the time-series concept of earnings "predictability" in which earnings are regressed on lagged earnings. Our *Comp Earn* measure is a cross-sectional version of predictability. While earnings predictability or persistence measures have been around in the literature for quite some time (see, e.g., Lipe [1990], Francis, LaFond, Olsson, and Schipper, [2004]), the use of those metrics in developing a comparability measure in this study is unique.[4]

3. Hypotheses: The Effect of Comparability on Analysts

In this section, we develop hypotheses at the firm level about the effect of comparability on analysts and therefore on the properties of their forecasts. Our tests of these hypotheses are also at the firm level, although we do conduct some complementary tests at the firm i – firm j level.

As mentioned above, any lesson on financial statement analysis emphasizes the difficulty in drawing meaningful economics comparisons from a financial measure unless there is a "comparable" benchmark. FASB [1980, p. 40] echoes this point. Implicit is the idea that by making sharper inferences about economic similarities and differences across comparable firms,

[4] Our *Comp Earn* measure is also indirectly related to two other measures: stock price synchronicity and earnings beta. Stock price synchronicity is based on the R^2 from a regression of firm's stock return on market and industry stock return (Piotroski and Roulstone [2004] and Chan and Hameed [2006], among others). This measure captures co-movement in stock prices whereas we focus on accounting earnings. Earnings beta, which captures the covariance between a firm's earnings with the earnings at the industry or market level, was developed to study its relation with the market beta (see, e.g. Brown and Ball [1967], Beaver, Kettler, and Scholes [1970], Beaver and Manegold [1975], Gonedes [1973, 1975]). Our measure captures co-movement in earnings between the firm and a group of firms or every firm in the industry (as opposed to the average industry earnings).

the analyst is in a better position to understand and predict economic events. More comparable firms constitute better benchmarks for each other. In addition, information transfer among comparable firms should also be greater. Studies by Ramnath [2002], Gleason, Jenkins, and Johnson [2008], Durnev and Mangen [2009] among others, document the effect of one firm's financial statement information on the financial statements and operating decisions of other related firms. The net result is a higher quality information set for more comparable firms.

Based on the above arguments, we expect the effort exerted by analysts to understand and analyze the financial statements of firms with comparable peers to be lower than for firms without comparable peers. As a result of this difference in analysts' cost of analyzing a firm, we investigate variation in two dimensions of analysts' behavior – the number of analysts following a firm and the properties of analysts' forecasts.

Our first hypothesis examines whether financial statement comparability enhances analyst coverage. As discussed in Bhushan [1989] and in Lang and Lundholm [1996], the number of analysts following a firm is a function of analysts' costs and benefits. We argue that, ceteris paribus, since the cost to analyze firms with other comparable firms is lower, more analysts should cover these firms. Hypothesis 1 (in alternate form) is:

> *H1*: Ceteris paribus, financial statement comparability is positively associated with analysts' coverage.

The null hypothesis is that the better information environment associated with higher-comparability firms will decrease investor demand for analyst coverage. That is, the benefits to analysts will decrease as well. However, the literature on analysts suggests that analysts primarily interpret information as opposed to convey new information to the capital markets (Lang and Lundholm [1996], Francis, Schipper, and Vincent [2002], Frankel, Kothari, and Weber [2006], De Franco [2007]). Further, Lang and Lundholm [1996] and others in the

literature find that analyst coverage is increasing in firm disclosure quality. These empirical findings suggest that an increase in the supply of information results in higher analyst coverage, consistent with the lower costs of more information outweighing the potentially lower benefit of decreased demand. These previous findings support our signed prediction.

Our second set of hypotheses examines the relation between comparability and the properties of analysts' earnings forecasts. The first property we examine is forecast accuracy. As mentioned above, we expect that firms with higher comparability have higher quality information sets. Higher comparability could allow analysts to better evaluate firms' historical and current economic performance. Analysts could also better understand how economic events translate into accounting performance for higher comparability firms. This enhanced knowledge facilitate analysts' ability to forecast firm *i*'s earnings and thus leads to improved forecast accuracy. Hypothesis 2a (in alternative form) is:

> *H2a*: Ceteris paribus, financial statement comparability is positively associated with analysts' forecast accuracy.

Turning to optimism, prior research finds that analysts' long-horizon forecasts are optimistic on average (e.g., O'Brien [1988], Richardson et al. [2004]). Part of the bias in analysts' forecasts is explained by analysts strategically adding optimism to their forecasts. For example, analysts can add optimism to gain access to management's private information, which helps improve forecast accuracy.[5] If information from comparable firms serves as a substitute for information from management, then the incentive to strategically add optimistic bias to gain access to management is reduced. Further, if more objective information from comparable firms is available, it is easier to identify when analysts act strategically (i.e., to "catch" them) regardless of the reason for the optimism, which hence increases the cost to the analyst of

[5] Francis and Philbrick [1993], Das et al. [1998], and Lim [2001] provide support for this idea, although Eames et al. [2002] and Eames and Glover [2003] question these results.

strategic optimism. Analysts' forecasts of higher-comparability firms should hence be less optimistic. We state this prediction as hypothesis 2b (in alternate form):

> *H2b*: Ceteris paribus, financial statement comparability is negatively related to analysts' forecast optimism.

In support of the nulls of H2a and H2b, if information at comparable firms is noisy or biased, then increased comparability could lead to less accurate and more biased forecasts. We expect this effect to reduce the ability of our tests to provide support for these two predictions.

Last, we investigate the relation between comparability and analysts' forecast dispersion. If analysts have the same forecasting model, and if higher comparability implies the availability of superior public information, then an analyst's optimal forecast will place more weight on public information and less on her private information. This implies comparability will reduce forecast dispersion. Hypothesis 2c (in alternative form) is:

> *H2c*: Ceteris paribus, financial statement comparability is negatively associated with analysts' forecast dispersion.

We acknowledge that superior public information via higher comparability could generate more dispersed forecasts, which would support the null of H2c. The intuition here is that if some analysts process a given piece of information differently from other analysts, then the availability of greater amounts of public information for comparable firms could generate more highly-dispersed forecasts. A number of theoretical studies predict such a phenomenon. Harris and Raviv [1993] and Kandel and Pearson [1995] develop models in which disclosures promote divergence in beliefs. Kim and Verrecchia [1994] allow investors to interpret firm disclosures differently, whereby better disclosure is associated with more private information production.

4. Estimating and Validating a Measure of Comparability

4.1. DESCRIPTIVE STATISTICS FOR COMPARABILITY MEASURES

Our sample period spans the years 1993 to 2007. Table 1 presents descriptive statistics for our measures of comparability. The sample of 1,620,117 firm *i*–firm *j*-year observations represents 812,868 pairs of firms covered by analysts and 807,249 matched pairs of firms. This sample is used in the Table 3 tests. (Untabulated descriptive statistics are highly similar for the Table 2 sample; and we discuss descriptive statistics for other tests in the next section.) Panel A presents descriptive statistics for the pairwise firm *i* – firm *j* comparability measures. The mean value for *Comp Acctij* is -2.9 suggesting that the average error in quarterly earnings between firm *i* and firm *j* functions is 2.9% of market value. The mean value for *Comp Earnij* is 15.2 suggesting that on average firm *j*'s earnings explains 15% of firm *i*'s earnings. Similar values for *Comp CFOij* and *Comp Retij* are 11% and 15%. Panel B presents correlations among these variables. The correlations are all positive and significant. The correlations are modest in magnitude (ranging from 4% to 25%) reflecting the fact that the variables measure different constructs.

[Table 1]

4.2. VALIDATING THE COMPARABILITY MEASURES

In this section, we test the construct validity of our comparability measures. The test implicitly assumes that, for a given firm, analysts know the identity of comparable peer firms. This seems reasonable because analysts have access to a broad information set about each firm, which includes not only historical financial statements but also firms' business models, competitive positioning, markets, products, etc.

We make a testable prediction to fortify our measures' construct validity. The prediction relates to the assumption underlying our measures, namely, that the relative ranking of firm *i* - firm *j* comparability identifies a set of peers that analysts view as comparable to firm *i*. We predict that if an analyst issues a report about firm *i*, then we expect the analyst to more likely use peers that are "comparable" to firm *i* in her reports. The typical analyst report context is that the analyst desires to evaluate the current, or justify the predicted, firm valuation multiple, (e.g., Price/Earnings ratio), using a comparative analysis of peers' valuation multiples as benchmarks. Evidence of this prediction suggests that our measures of comparability are related to analysts' choice of comparable firms in their reports.

The comparable peers that an analyst uses in her analysis are not available in a machine-readable form in existing databases. We hand collect a sample of analyst reports from Investext and manually extract this information from the reports. Given the cost of collecting this information, we limit the analysis to one year of data, firms in our sample (i.e., firm *i*'s) with a fiscal year end of December 2005. For these firms, we search Investext to find up to three reports per firm *i*, each written by a different analyst and each mentioning "comparable" or "peer" firms (i.e., potential firm *j*'s) in the report. We then record the name and ticker of all firms used by the analyst as a peer for firm *i*. We match these peers with Compustat using the firm name and ticker. In total, we obtain 1,000 reports written by 537 unique analysts for 634 unique firm *i*'s. Each report mentions one or more peers as comparable to the firm for which the analyst has issued the report. The final sample for this test consists of 5,149 firms used as peers in the analysts' reports.[6]

[6] Part of the reason this process is labor intensive is because we do not know ex ante whether Investext covers firm *i*, and because not all analysts discuss comparable firms in their analysis. For example, many reports represent simple updates with no discussion of valuation methods. In other cases, analysts rely more heavily on a

For our tests, we estimate the following Probit model:

$$UseAsComp_{ikj} = \alpha + \beta_1 Compij_{ij} + \gamma Controls_j + \varepsilon_{ikj}. \quad (7)$$

UseAsComp is an indicator variable that equals one if analyst *k* who *writes a report* about firm *i* refers to firm *j* as a comparable firm in her report, and equals zero otherwise. $Compij_{ij}$ is one of the comparability measures for each firm *i* – firm *j* pair in our sample (i.e., *Comp Acctij*, *Comp Earnij*, *Comp CFOij*, or *Comp Retij*). We predict that the probability of an analyst using firm *j* in her report is increasing in *Compij*.

To ease comparisons across coefficients, when estimating Equation 7 we standardize all continuous variables to mean zero and unit variance. Instead of estimated coefficients, we report elasticities that can be interpreted as the change in probability of being selected as a peer for a one-standard-deviation change in the explanatory variable. We also include industry fixed effects at the 2-digit SIC industry classification and cluster the standard errors at the firm *i* level (results are similar if we cluster at the firm *i* and firm *j* levels instead).

The "treatment" sample (i.e., when the dependent variable equals one) includes peers chosen by analysts. We also require a sample of peers *not chosen* by analysts. For each analyst-chosen peer, we randomly select a peer from a pool of companies with available data in the same 2-digit SIC. These randomly-chosen peers provide observations in which the dependent variable equals zero. With a small number of exceptions, the number of analyst-chosen peers equals the number of matched peers on a per firm basis. For example, if the analyst chooses 15 peers, then that analyst also has 15 matched control peers. The treatment sample consists of 5,149 firms used as peers in the analysts' reports and 5,140 matched control peers.

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discounted flow analysis or use historical valuation multiples to predict future multiples. We exclude reports on Investext that are computer generated or not written by sell-side analysts.

We use *Size*, *Volume*, *Book-Market*, *ROA*, and industry fixed effects to control for variation in economic characteristics. Our choice of these controls follows their common use by other researchers who match control firms with treatment firms along these dimensions (e.g., Barber and Lyon [1996, 1997], Kothari, Leone, and Wasley [2005]). In addition to the levels of these variables, we control for the *differences* in characteristics between firm *i* and firm *j*. Differences are measured by the absolute value of the difference between firm *i*'s and firm *j*'s respective variables. The intuition for using both levels and differences is as follows: An analyst who reports on firm *i* is more likely to use a firm as a peer if the firm has similar economic characteristics (e.g., similar size, growth potential, and profitability) to firm *i*. This implies the larger the difference between firm *i* and firm *j,* the less likely it is to be covered by the analyst. However, large, high-growth, and highly-profitable firms are more likely to be covered by an analyst and recognized by investors, which motivates us to also include the levels of these firm characteristics in the regression.

Throughout our tests we also control for earnings volatility and predictability. For some tests (e.g., forecast accuracy and bias described below), these variables have an established relation with the dependent variables. In other cases, these variables represent natural controls given the method by which we develop our comparability measures. *Earn Volatility* is the standard deviation of 16 quarterly earnings (deflated by total assets), consistent with the horizon used to estimate earnings comparability. *Predictability* is the R^2 from a firm-specific AR1 model with 16 quarters of data.

Table 2 presents the regression results. In the first model, we include accounting comparability (*Comp Acctij*) and the controls. The coefficient on *Comp Acctij* is positive and statistically significant, suggesting that as the *Comp Acctij* increases, the odds of an analyst using

firm *j* as a peer in a report about firm *i* increases. In the next three models we include earnings comparability (*Comp Earnij*), controls for economic comparability (*Comp CFOij* or *Comp Retij*), and the remaining controls. In all cases the coefficient on *Comp Earnij* is positive and statistically significant. Similar to *Comp Acctij*, these results suggest that as *Comp Earnij* increases, the odds of an analyst using firm *j* as a peer in a report about firm *i* increases. In addition, *Comp CFOij* and *Comp Retij* also increase the likelihood that a firm is used as a comparable firm in the report.[7]

In terms of economic significance, a one-standard-deviation increase in *Comp Acctij* results in a 4% increase in the probability of being selected as a peer, while a similar change in *Comp Earnij* results in a 2% to 3% increase in the probability of being selected as a peer. That is, the unconditional probability increases from 50% to 52-53%. As benchmarks, this effect is lower than the 10% probability increase of being selected a peer associated with a one-standard-deviation decrease in size difference and is similar to the effect of one-standard-deviation decreases in volume, book-market, and ROA differences. We note that a one-standard-deviation increase in *Comp Retij* results in an 11% increase in the probability of being selected as a peer, so covariance in returns is also an important predictor. Overall, the results in Table 2 support the notion that an analyst who writes a report about a firm more likely chooses benchmark peers that have higher values of comparability, after controlling for economic similarity. This bolsters the construct validity of our comparability measures.

[Table 2]

[7] In Tables 2 and 3, we present three specifications for *Comp Earnij* depending on the inclusion of *Comp CFOij* or *Comp Retij*. In the subsequent analysis we present only the full model but the results are robust to the other specifications (i.e., including either only *Comp CFOij* or only *Comp Retij*).

5. Empirical Tests

5.1. CONDITIONAL ANALYST COVERAGE

In this section, continuing with our previous analysis in which we use pairwise firm *i* - firm *j* level comparability (as opposed to aggregated firm *i* level comparability), we provide initial evidence of our first hypothesis that higher comparability facilitates analyst coverage. This test is similar in spirit to the test in the previous section but now we use analysts' coverage choices instead of analysts' choices of comparable peers in their reports. We expect that the likelihood of an analyst covering a particular firm (e.g., firm *i*) also covering another firm in the same industry (e.g., firm *j*) is increasing in the comparability between these two firms. Hence, we not only predict that higher comparability leads to more analysts covering the firm (as we do in the next section), but also specifically predict which other firms the analyst will follow.

We estimate the following pooled Probit model:

$$CondCoverage_{ikjt} = \alpha + \beta_1 Compij_{ijt} + \gamma Controls_{jt} + \varepsilon_{ikjt}. \quad (8)$$

CondCoverage is an indicator variable that equals one if analyst *k* who *covers* firm *i* also covers firm *j*, and equals zero otherwise. An analyst "covers" a firm if she issues at least one annual forecast about the firm. *Compij* is one of the four comparability measures for each firm *i* – firm *j* pair in our sample (i.e., *Comp Acctij*, *Comp Earnij*, *Comp CFOij*, or *Comp Retij*). We predict that the probability of covering firm *j* is increasing in *Compij* (i.e., $\beta_1 > 0$).

The pooled sample for this test is quite large. The sample consists of the 1,620,117 firm *i* – firm *j* – year observations described in Table 1. For firm *i*, there are *K* analysts who cover the firm. For each firm *i* – analyst *k* pair there are *J* firms that analyst *k* also covers. Hence, our sample of observations in which *CondCoverage* equals one consists of *I* firms × *K* analysts × *J* firms. As in Table 2, we match each of these analyst-chosen peers with an equal number of

randomly selected set of non-analyst chosen peers from a pool of companies in the same 2-digit SIC as firm *j*.[8] Similar to the Table 2 analysis, instead of estimated coefficients, we report the change in probability of being selected as a peer for a one-standard-deviation change in the explanatory variable.

In estimating Equation 8, we control for other factors motivating an analyst to cover firm *j* by including the determinants of analyst coverage previously documented in the literature (e.g., Bhushan [1989], O'Brien and Bhushan [1990], Brennan and Hughes [1991], Lang and Lundholm [1996], Barth, Kasznik, and McNichols [2001]). *Size* is the logarithm of the market value of equity measured at the end of the year. *Volume* is the logarithm of trading volume in millions of shares during the year. *Issue* is an indicator variable that equals one if the firm issues debt or equity securities during the years *t-1*, *t*, or *t+1*, and zero otherwise. *Book-Market* is the ratio of the book value to the market value of equity. *R&D* is research and development expense scaled by total sales. *Depreciation* is depreciation expense scaled by total sales. Following Barth et al. [2001], we industry adjust the R&D and depreciation measures by subtracting the respective 2-digit SIC industry mean value. We also control for the *differences* in economic characteristics between firm *i* and firm *j*, following the analysis in Table 2. In particular we control for the differences in size, trading volume, book-to-market, and ROA. We also include industry and year fixed effects at the 2-digit SIC industry classification and cluster the standard errors at the firm *i* level.

Table 3 presents the results. The coefficient on *Comp Acctij* is positive and statistically

[8] In addition to requiring valid data for all our measures, we require each analyst *k* to cover at least five firms. In estimating the model, we rely on the coverage choice of an analyst within an industry, and therefore require the availability of at least a few observations per analyst per industry for which *CondCoverage* equals one. This restriction should exclude junior analysts, analysts in transition, and data-coding errors. We exclude analysts who cover more than 40 firms. Covering greater than 40 firms is rare (less than one percent of analysts) and could be a data-coding error in that the observations refer to the broker rather than an individual analyst.

significant as predicted. Further, the coefficient on *Comp Earnij* is positive and statistically significant (as well as the coefficients on *Comp CFOij* and *Comp Retij*). These results suggest that the firm *j*'s we identify as "comparable" to firm *i* are more likely to be followed by the analysts who also cover firm *i*. The economic significance of our comparability measures is similar to that in Table 2. A one-standard-deviation increase in *Comp Acctij* results in a 3% increase in the probability of being selected as a peer (i.e., the unconditional probability increases from 50% to 53%), while a similar change in *Comp Earnij* results in a 2% to 3% increase in the probability of being selected as a peer. The effects of the control variables on the probability of being selected as a peer are also economically similar to those in Table 2. Overall, we conclude that the likelihood of an analyst covering firm *j,* conditional on the analyst covering firm *i,* increases in the comparability between firms *i* and *j*. This is consistent with higher comparability reducing the information acquisition and processing costs of covering the firm. It also suggests that the lower costs of covering firms with high comparability outweigh the potential decreased benefit from investors' reduced demand for analysts' information about highly-comparable firms.

[Table 3]

5.2. FIRM LEVEL COMPARABILITY

In the previous sections we investigated the consequences of pairwise firm *i* - firm *j* level comparability. In the following sections we examine the benefits to analysts of aggregated firm *i* level comparability.

5.2.1. Sample and Dependent Variables. To test our comparability hypotheses we restrict the sample to firms with available data to compute the dependent variables and the control variables. The sample consists of 16,699 firm-level observations. (This is the sample for

the analyst coverage tests; the sample is smaller for the remaining dependent variables.)

The four dependent variables in the tests below are defined as follows. *Coverage (Raw)* is the number of analysts issuing an annual forecast for firm *i* in year *t*. *Coverage*, the logarithm of *Coverage (Raw)*, is used in our tests.

Analyst forecast accuracy is the absolute value of the forecast error:

$$Accuracy_{it} = |Fcst\ EPS_{it} - Actual\ EPS_{it}|/Price_{it-1} \times -100. \quad (9)$$

$Fcst\ EPS_{it}$ is analysts' mean I/B/E/S forecast of firm-*i*'s annual earnings for year *t*. For a given fiscal year (e.g., December of year *t+1*) we collect the earliest forecast available during the year (i.e., we use the earliest forecast from January to December of year *t+1* for a December fiscal year-end firm). $Actual\ EPS_{it}$ is the actual amount announced by firm *i* for fiscal period *t+1* as reported by I/B/E/S. *Price* is the stock price at the end of the prior fiscal year. Because the absolute forecast error is multiplied by -100, higher values of *Accuracy* imply more accurate forecasts.

We measure optimism in analysts' forecasts using the signed forecast error:

$$Optimism_{it} = (Fcst\ EPS_{it} - Actual\ EPS_{it})/Price_{it-1} \times 100. \quad (10)$$

Dispersion is the cross-sectional standard deviation of individual analysts' annual forecasts for a given firm, scaled by price, multiplied by 100.

Table 4, Panel A presents descriptive statistics for the dependent variables and the comparability measures. The mean (median) number of analysts covering the firm is seven (five) analysts. Mean forecast accuracy is 5.3% of share price. Mean forecast optimism is 2.8% of share price, which is consistent with prior research that analysts tend to be optimistic on average. However, the median is only 0.2%, also consistent with previous research. The mean forecast dispersion is 0.9% of share price. The mean value for *Comp4 Acct* is -0.6, suggesting

that the average error in quarterly earnings for the top four firms with the highest accounting comparability to firm *i* is 0.6% of market value. By construction, this value is higher than the mean value for *CompInd Acct* which is -2.7. The mean value for *Comp4 Earn* is 54.7 indicating that the earnings of the four most comparable firms explain, on average, 54.7% of firm *i*'s earnings. Mean values for *Comp4 CFO* and *Comp4 Ret* are 45.3% and 27.5% respectively.

Panel B of Table 4 presents the correlation matrix. Consistent with our predictions, analyst coverage and forecast accuracy are mostly positively correlated with the comparability measures whereas forecast optimism is negatively associated with firm comparability. The correlations between forecast dispersion and the comparability measures are negative for the *Comp Acct* but not for the *Comp Earn* measures. The correlations among the comparability measures are generally positive, particularly for the top-4-firm and average-industry versions of the same measure. For example, the Pearson correlation is 0.84 between *Comp4 Acct* and *CompInd Acct*.

[Table 4]

5.2.2. Analyst Coverage Tests. To test whether analyst coverage and comparability are positively related, our first hypothesis, we estimate the following firm-level OLS regression:

$$Coverage_{it+1} = \alpha + \beta_1 Comparability_{it} + \gamma Controls_{it} + \varepsilon_{it+1}. \quad (11)$$

Comparability is one of the firm-level comparability measures (e.g., *Comp4 Acct*, *CompInd Acct*, *Comp4 Earn*, or *CompInd Earn*). Throughout the remaining analysis, for continuous variables that we do not take the logarithm of, we winsorize the data annually at the 1% and 99% percentiles. We also include industry and year fixed effects. Because the estimation of Equation 11 likely suffers from time-series dependence, we estimate the model as a panel and cluster the

standard errors at the firm level (in addition to the year fixed effects). We control for other factors motivating an analyst to cover firm *j* as described in the prior section.

Table 5 presents the regression results. Both accounting comparability measures (*Comp4 Acct* and *CompInd Acct*) are positively associated with analyst coverage. In terms of economic significance, a one-standard-deviation change in *Comp4 Acct* is associated with an increase in the logarithm of analyst following of 0.06 (= 0.016 × 3.87). Given that the median firm in our sample is covered by 5 analysts, this effect translates to an increase of 0.30 analysts, a relative increase in analyst coverage of 6%, suggesting that the effect is modestly significant on an economic basis. Similarly, *Comp4 Earn* and *CompInd Earn* are also positively associated with analyst coverage (in this case a one-standard-deviation change in *Comp4 Earn* translates to an increase in coverage of 2%). We note that CFO comparability and return comparability are also positively associated with analyst coverage. Overall, the regression results in Table 5 confirm the conditional analyst coverage findings in Table 3, and are consistent with hypothesis 1 that predicts a positive association between analyst coverage and comparability.

[Table 5]

5.2.3. Forecast Accuracy, Optimism, and Dispersion Tests. To test hypothesis 2 we estimate the following OLS specification:

$$Forecast\ Metric_{it+1} = \alpha + \beta_1\ Comparability_{it} + \gamma\ Controls_{it} + \varepsilon_{it+1}. \quad (12)$$

Forecast Metric is *Accuracy*, *Optimism*, or *Dispersion*. Hypothesis 2 predicts that accuracy is increasing in comparability, and that optimism and dispersion are decreasing in comparability.

We control for other determinants of these forecast metrics as previously documented in the literature. *SUE* is the absolute value of firm *i*'s unexpected earnings in year *t* scaled by the stock price at the end of the prior year. Unexpected earnings are actual earnings minus the

earnings from the prior year. Firms with greater variability are more difficult to forecast, so forecast errors should be greater (e.g., Kross, Ro and Schroeder [1990], Lang and Lundholm [1996]). Consistent with Heflin, Subramanyam and Zhang [2003], earnings with more transitory components should also be more difficult to forecast. We include the following three variables to proxy for the difficulty in forecasting earnings. *Neg UE* equals one if firm *i*'s earnings are below the reported earnings a year ago, zero otherwise. *Loss* equals one if the current earnings is less than zero, zero otherwise. *Neg SI* equals the absolute value of the special item deflated by total assets if negative, zero otherwise. We expect these three variables to be positively related to optimism given that optimism is greater when realized earnings are more negative.

$Days_{it}$ is a measure of the forecast horizon, calculated as the logarithm of the number of days from the forecast date to firm-*i*'s earnings announcement date. The literature shows that forecast horizon strongly affects accuracy and optimism (Sinha et al. [1997], Clement [1999], Brown and Mohd [2003]). We also control for *Size* because firm size is related to analysts' forecast properties (e.g., Lang and Lundholm [1996]). Last, we include industry and year fixed effects. Similar to the estimation of Equation 11, we estimate the model as a panel and cluster the standard errors at the firm level.

Table 6 presents the regression results for analysts' forecast accuracy. Both accounting and earnings comparability are positively associated with accuracy. In terms of economic significance, a one-standard-deviation change in *Comp4 Acct* is associated with an increase in accuracy of about 2.20%, which represents an improvement in accuracy of about 40% for the average firm in the sample. Economic significance for *Comp4 Earn* is more modest, with a similar change in the variable resulting in a 6% increase in accuracy. These results support hypothesis 2a that higher comparability increases analysts' forecast accuracy.

[Table 6]

Table 7 presents the results for forecast optimism. In support of hypothesis 2b, we find a consistent negative relation between our measures of comparability and analyst optimism. As with forecast accuracy, the result is also economically significant suggesting a reduction in analyst optimism for the average firm in the sample that ranges from 9% with *Comp4 Earn* to 27% with *Comp4 Acct* for a one-standard-deviation change in the respective variable. Together with the findings using forecast accuracy, these results suggest that one way comparability improves forecast accuracy is via a reduction of analysts' optimism.

[Table 7]

The results for forecast dispersion are presented in Table 8. In this case the results are more mixed. While *Comp Acct* is negatively associated with forecast dispersion, the tests provide no evidence of a relation between *Comp Earn* and forecast dispersion. Still, the result with *Comp4 Acct* suggests a reduction in forecast dispersion of 64% for a one-standard-deviation change in *Comp4 Acct*.

[Table 8]

In sum, these results support the hypotheses that analysts' accuracy is increasing in comparability and that analysts' optimism is decreasing in comparability; they provide some evidence that forecast dispersion is decreasing in comparability. While the results with our second measure, earnings comparability, are more modest, the evidence with our first measure, accounting comparability, are consistent and economically significant across all the tests. These results support the idea that analysts benefit from the higher quality information sets associated with firms that have higher comparability.

6. Conclusion

This paper develops two measures of financial statement comparability and then studies the effect of these measures on analysts. A key innovation is the development of empirical, firm-specific, output-based, quantitative measures of financial statement comparability. The first measure, "accounting" comparability, is based on the idea that for a given set of economic events, firms with comparable accounting systems will produce similar financial statements. The second measure, "earnings" comparability, is based on the strength of the historical covariance between a firm's earnings and the earnings of other firms in the same industry, as evidenced by the R^2 values. We first provide construct validity of our measures. The likelihood of an analyst using firm *j* as a benchmark when analyzing firm *i* in a report is increasing in the comparability between firms *i* and *j*. This suggests that our measures are correlated with the use of comparable firms in analysts' reports.

We then test whether comparability manifests any benefits to financial statement users as gleaned from the effect on analyst coverage and the properties of their forecasts. Analyst coverage is increasing in comparability. Tests also indicate that the likelihood of an analyst covering firm *i* also covering firm *j* is increasing in the comparability betweens firms *i* and *j*. Hence, we not only show that comparability leads to greater analyst following, but also specifically predict which other firms an analyst will follow. In addition, the results suggest that comparability helps analysts to forecast earnings more accurately and that the improvement comes, at least in part, through a reduction in forecast optimism. Last, we show that comparability is negatively related to analysts' forecast dispersion. These results provide evidence consistent with our hypotheses that comparability lowers the cost of acquiring information, and increases the overall quantity and quality of information available to analysts

about the firm.

We believe our financial statement comparability measures could be used in a number of contexts, with modifications to the measure tailored to suit the needs. Our measure could be used to help assess the changes in comparability as a result of changes in accounting measurement rules or reporting standards, accounting choice differences, or of adjustments. For example, the primary objective of the International Financial Reporting Standards (IFRS) is to develop a single set of "global accounting standards that require high quality, transparent and *comparable* information in financial statements and other financial reporting" (our emphasis) (IASCF [2005]). Our measure could be used to assess whether IFRS achieves the intended consequence of enhanced financial statement comparability (see e.g., Barth et al. [2009], Beuselinck et al. [2007]).

Our measure could also assist practitioners, such as analysts and boards, in their objective selection of comparable firms. Choosing comparables is often considered an "art form" (see Bhojraj and Lee, 2002) and the inherent discretion in this choice can lead to strategic behavior. Our measures could be used to study the impact of comparability on peer selection. For example, Albuquerque, De Franco, and Verdi [2009] provide evidence that firms strategically choose peers in the context of benchmarking CEO compensation. Finally, our measures could be used to assess the impact of comparability on portfolio diversification and contracting settings more generally.

Notwithstanding the above benefits, some caveats are in order. We do not study the determinants of financial statement comparability and thus our study cannot speak to a firm's equilibrium level of comparability. Our results are consistent with higher comparability enriching firms' information environments, and thus providing tangible benefits for firms. We

do not, however, study other potential benefits and costs to firms of comparability. Our analysis is also silent on what firms could do to improve cross-sectional comparability. For example, firms can certainly choose to have more comparable accounting choices. In contrast, we speculate that economic innovations, which by definition distinguish firms from their peers, could lead to decreased firm demand for comparability. Furthermore, while earnings are arguably the most important summary measure of accounting performance, it captures only one financial statement dimension. An opportunity exists to create a multi-dimensional financial statement measure.

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APPENDIX
Variable Definitions

Variable	Definition
Accuracy	= Absolute value of the forecast error multiplied by -1, scaled by the stock price at the end of the prior fiscal year, where the forecast error is the I/B/E/S analysts' mean annual earnings forecast less the actual earnings as reported by I/B/E/S.
Book-Market	= Ratio of the book value to the market value of equity.
CondCoverage	= Indicator variable that equals one if analyst *k* who *covers* firm *i* also covers firm *j*, and equals zero otherwise. An analyst "covers" a firm if she issues at least one annual forecast about the firm.
Coverage	= Logarithm of the number of analysts issuing a forecast for the firm.
Coverage (Raw)	= Number of analysts issuing a forecast for the firm.
Comp Acctij	= The absolute value of the difference of the predicted value of a regression of firm *i*'s earnings on firm *i*'s return using the estimated coefficients for firm *i* and *j* respectively. It is calculated for each firm *i* – firm *j* pair, $(i \neq j)$, j = 1 to J firms in the same 2-digit SIC industry as firm *i*.
Comp Earnij	= R^2 from a regression of firm *i*'s quarterly earnings on the quarterly earnings of firm *j*. It is calculated for each firm *i* – firm *j* pair, $(i \neq j)$, j = 1 to J firms in the same 2-digit SIC industry as firm *i*.
Comp CFOij	= R^2 from a regression of firm *i*'s quarterly CFO on the quarterly CFO of firm *j*. It is calculated for each firm *i* – firm *j* pair, $(i \neq j)$, j = 1 to J firms in the same 2-digit SIC industry as firm *i*.
Comp Retij	= R^2 from a regression of firm *i*'s monthly return on the monthly return of firm *j*. It is calculated for each firm *i* – firm *j* pair, $(i \neq j)$, j = 1 to J firms in the same 2-digit SIC industry as firm *i*.
Comp4Acct	= Average of the four highest *Comp Acctij* for firm *i*.
Comp4 Earn	= Average of the four highest *Comp Earnij* for firm *i*.
Comp4 CFO	= Average of the four highest *Comp CFOij* for firm *i*.
Comp4 Ret	= Average of the four highest *Comp Retij* for firm *i*.
CompInd Acct	= Median *Comp Acctij* for firm *i* for all firms in the industry.
CompInd Earn	= Median *Comp Earnij* for firm *i* for all firms in the industry.
CompInd CFO	= Median *Comp CFOij* for firm *i* for all firms in the industry.
CompInd Ret	= Median *Comp Retij* for firm *i* for all firms in the industry.
Days	= Logarithm of the number of days from the forecast date to the earnings announcement date.
Depreciation	= Firm's depreciation expense scaled by total sales, less the respective 2-digit SIC industry mean value of depreciation expense scaled by total sales.
Dispersion	= Cross-sectional standard deviation of individual analysts' annual forecasts, scaled by the stock price at the end of the prior fiscal year.
Earn Volatility	= Standard deviation of 16 quarterly earnings.
Issue	= Indicator variable that equals one if the firm issues debt or equity securities during the preceding, current, or following year, and zero otherwise.
Loss	= Indicator variable that equals one if the current earnings is less than zero, and equals zero otherwise.
Neg SI	= Absolute value of the special item deflated by total assets if negative, and equals zero otherwise.
Neg UE	= Indicator variable that equals one if firm *i*'s earnings are below the reported earnings a year ago, and equals zero otherwise.
Optimism	= Signed value of the forecast error, scaled by the stock price at the end of the prior fiscal year, where the forecast error is the I/B/E/S analysts' mean annual earnings forecast less the actual earnings as reported by I/B/E/S.

(*Continued*)

APPENDIX – *Continued*

Variable	Definition
Predictability	= R^2 of a regression of annual earnings on prior-year annual earnings for the same firm.
R&D	= Firm's research and development expense scaled by total sales, less the respective 2-digit SIC industry mean value of research and development expense scaled by total sales.
Size	= Logarithm of the market value of equity measured at the end of the year.
Size-$	= Market value of equity measured at the end of the year.
SUE	= Absolute value of unexpected earnings, scaled by the stock price at the end of the prior year, where unexpected earnings is actual earnings less a forecast based on a seasonal-adjusted random walk time-series model.
UseAsComp	= Indicator variable that equals one if analyst *k* who *writes a report* about firm *i* refers to firm *j* as a comparable firm in her report, and equals zero otherwise.
Volume	= Logarithm of trading volume in millions of shares during the year.
Suffix	
Differenceij	= Absolute value of the difference between firm *i*'s and firm *j*'s respective variables.

TABLE 1

Financial Statement Comparability: Descriptive Statistics

Panel A: Pairwise firm *i* – firm *j* level comparability - Descriptive statistics (all numbers in %)

Variable	No. of Obs	Mean	STD	10th Percent	Median	90th Percent
Comp Acctij	1,620,117	-2.9	6.0	-6.3	-1.1	-0.2
Comp Earnij	1,620,117	15.2	18.5	0.3	7.6	43.3
Comp CFOij	1,620,117	11.4	13.8	0.2	5.9	31.6
Comp Retij	1,620,117	15.3	15.8	0.4	9.7	40.0

Panel B: Pairwise firm *i* – firm *j* level comparability - Correlations

	Comp Acctij	*Comp Earnij*	*Comp CFOij*	*Comp Retij*
Comp Acctij	1.000	0.058	0.040	0.099
Comp Earnij	0.095	1.000	0.226	0.252
Comp CFOij	0.076	0.136	1.000	0.181
Comp Retij	0.212	0.176	0.127	1.000

This table provides descriptive statistics of the firm *i* – firm *j* pair level financial statement comparability metrics. Panel A present descriptive statistics. Panel B presents Pearson (Spearman) correlations above (below) the main diagonal. Variables are defined in the Appendix.

TABLE 2

Use of Comparable Firms in Analysts' Reports

	Prediction	(1)	(2)	(3)	(4)
Comp Acctij	+	**0.04*** (5.78)**			
Comp Earnij	+		**0.03*** (5.01)**	**0.03*** (3.81)**	**0.02*** (3.22)**
Comp CFOij	+		0.04*** (6.21)		0.03*** (5.40)
Comp Retij	+			0.11*** (11.95)	0.11*** (11.77)
$Size_j$	+	0.07*** (5.06)	0.06*** (4.35)	0.05*** (3.07)	0.04*** (2.94)
$Volume_j$	+	0.14*** (9.31)	0.15*** (10.29)	0.14*** (9.40)	0.14*** (9.49)
$Book\text{-}Market_j$	?	-0.01 (-0.68)	-0.01 (-0.86)	-0.01 (-1.02)	-0.01 (-1.20)
ROA_j	?	-0.01 (-0.45)	-0.00 (-0.25)	0.01 (1.10)	0.01 (1.23)
$Predictability_j$	+	0.01 (1.11)	-0.00 (-0.35)	0.00 (0.27)	-0.00 (-0.18)
$Earn\ Volatility_j$	–	-0.01 (-0.89)	-0.02** (-2.32)	-0.02** (-2.15)	-0.02** (-2.21)
Size Differenceij	–	-0.10*** (-10.24)	-0.10*** (-10.37)	-0.10*** (-9.60)	-0.09*** (-9.48)
Volume Differenceij	–	-0.05*** (-4.40)	-0.04*** (-3.99)	-0.03*** (-3.15)	-0.03*** (-3.03)
Book-Market Differenceij	–	-0.02*** (-3.13)	-0.03*** (-4.08)	-0.02*** (-3.31)	-0.02*** (-3.26)
ROA Differenceij	–	-0.03*** (-3.22)	-0.03*** (-3.17)	-0.02* (-1.87)	-0.02* (-1.79)
Industry FE		Yes	Yes	Yes	Yes
Pseudo R^2		17.16%	17.52%	19.07%	19.33%
No. of Obs.		10,289	10, 289	10, 289	10, 289

This table reports an analysis of the relation between the pairwise financial statement comparability measures and analysts' use in their reports of firms in the same industry as the sample firm for the year 2005. We estimate various specifications of the following pooled Probit model:

$$UseAsComp_{ikj} = \alpha + \beta_1 Compij_{ij} + \gamma\ Controls_j + \varepsilon_{ikj}.$$

Industry fixed effects are included but not tabulated. The reported coefficient is the elasticity, which represents the change in the probability of a peer being selected for a one-standard-deviation change in the independent variable. Coefficient *z*-statistics are in parentheses and are clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the Appendix.

TABLE 3
Conditional Analysts' Coverage of Comparable Firms

	Prediction	(1)	(2)	(3)	(4)
Comp Acctij	+	**0.03*** (10.16)**			
Comp Earnij	+		**0.03*** (18.52)**	**0.02*** (13.91)**	**0.02*** (13.04)**
Comp CFOij	+		0.02*** (14.14)		0.02*** (10.79)
Comp Retij	+			0.09*** (30.97)	0.09*** (30.53)
$Size_j$	+	0.13*** (25.32)	0.12*** (24.12)	0.11*** (21.35)	0.10*** (21.18)
$Volume_j$	+	0.15*** (26.55)	0.15*** (27.73)	0.14*** (26.91)	0.14*** (27.36)
$Book\text{-}Market_j$	–	0.01*** (6.63)	0.01*** (7.78)	0.01*** (4.66)	0.01*** (4.60)
ROA_j	+	-0.04*** (-14.08)	-0.04*** (-14.62)	-0.03*** (-12.39)	-0.03*** (-12.42)
$Predictability_j$	+	-0.01*** (-3.83)	-0.01*** (-7.38)	-0.01*** (-6.28)	-0.01*** (-6.58)
$Earn\ Volatility_j$	–	-0.02*** (-8.28)	-0.03*** (-10.45)	-0.03*** (-10.89)	-0.03*** (-10.99)
Size Differenceij	–	-0.08*** (-24.23)	-0.08*** (-23.92)	-0.07*** (-20.28)	-0.07*** (-20.30)
Volume Differenceij	–	-0.05*** (-17.28)	-0.05*** (-17.32)	-0.05*** (-15.74)	-0.05*** (-15.71)
Book-Market Differenceij	–	0.01*** (4.39)	0.00 (0.76)	0.01*** (3.88)	0.01*** (3.99)
ROA Differenceij	–	-0.03*** (-10.89)	-0.04*** (-12.79)	-0.03*** (-12.11)	-0.03*** (-12.04)
Industry & Year FE		Yes	Yes	Yes	Yes
Pseudo R^2		20.27%	20.42%	21.42%	21.46%
No. of Obs.		1,620,117	1,620,117	1,620,117	1,620,117

This table reports an analysis of the relation between the pairwise financial statement comparability measures and analyst coverage of firms in the same industry as the sample firm. We estimate various specifications of the following pooled Probit model:

$$CondCoverage_{ikj} = \alpha + \beta_1 Compij_{ij} + \gamma Controls_j + \varepsilon_{ikj}.$$

Industry fixed effects are included but not tabulated. The reported coefficient is the elasticity, which represents the change in the probability of a peer being selected for a one-standard-deviation change in the independent variable. Coefficient *z*-statistics in parentheses are clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the Appendix.

TABLE 4

Financial Statement Comparability: Descriptive Statistics

Panel A: Descriptive statistics (all number are in %)

Variable	No. of Obs	Mean	STD	10th Percent	Median	90th Percent
Coverage (Raw)	16,699	7.2	6.8	1	5	17
Coverage	16,699	1.5	1.0	0.0	1.6	2.8
Accuracy	14,052	-5.3	16.9	-10.5	-1.2	-0.1
Optimism	14,052	2.8	13.5	-2.1	0.2	8.1
Dispersion	9,646	0.9	2.5	0.1	0.3	2.0
Comp4 Acct	16,699	-0.6	1.6	-1.2	-0.2	-0.1
Comp4 Earn	16,699	54.7	14.1	35.8	54.6	73.7
Comp4 CFO	16,699	45.3	11.1	30.6	45.3	59.7
Comp4 Ret	16,699	27.5	11.5	14.4	25.3	44.3
CompInd Acct	16,699	-2.7	3.3	-5.2	-1.7	-0.8
CompInd Earn	16,699	7.1	4.1	3.0	6.0	12.6
CompInd CFO	16,699	4.9	2.2	2.9	4.4	7.6
CompInd Ret	16,699	4.4	3.9	1.2	3.2	9.3

(*Continued*)

TABLE 4 – *Continued*

Panel B: Correlation matrix

	Coverage	*Accuracy*	*Optimism*	*Dispersion*	*Comp4 Acct*	*Comp4 Earn*	*Comp4 CFO*	*Comp4 Ret*	*CompInd Acct*	*CompInd Earn*	*CompInd CFO*	*CompInd Ret*
Coverage	1.00	0.20	-0.13	-0.17	0.13	0.03	0.07	0.25	0.18	0.06	0.13	0.15
Accuracy	0.28	1.00	-0.80	-0.64	0.16	0.00	0.02	0.03	0.22	0.02	0.05	0.00
Optimism	-0.12	-0.37	1.00	0.43	-0.09	-0.01	-0.03	-0.06	-0.12	-0.03	-0.04	-0.05
Dispersion	-0.25	-0.65	0.23	1.00	-0.23	0.03	-0.01	0.06	-0.32	0.00	-0.06	0.08
Comp4 Acct	0.18	0.34	-0.05	-0.41	1.00	0.05	0.07	0.05	0.84	0.02	-0.01	-0.03
Comp4 Earn	0.01	-0.04	-0.01	0.07	0.12	1.00	0.30	0.20	-0.04	0.55	-0.02	0.07
Comp4 CFO	0.04	0.04	-0.02	-0.01	0.18	0.29	1.00	0.16	-0.04	0.01	0.39	0.00
Comp4 Ret	0.26	-0.06	-0.06	0.17	0.04	0.21	0.14	1.00	-0.03	0.10	-0.01	0.74
CompInd Acct	0.17	0.29	-0.06	-0.39	0.51	-0.13	-0.14	-0.15	1.00	0.07	0.05	-0.04
CompInd Earn	0.03	-0.01	-0.04	0.03	0.03	0.57	0.03	0.09	0.10	1.00	0.17	0.20
CompInd CFO	0.10	0.07	-0.06	-0.06	-0.02	0.01	0.44	-0.01	0.15	0.13	1.00	0.12
CompInd Ret	0.11	-0.13	-0.05	0.22	-0.14	0.05	-0.04	0.72	-0.05	0.14	0.08	1.00

This table reports descriptive statistics for the dependent variables and the financial statement comparability metrics. The sample is restricted to observations with available data to calculate all the variables in this analysis. Panel A presents descriptive statistics. Panel B presents Pearson (Spearman) correlations above (below) the main diagonal. Variables are defined in the Appendix.

TABLE 5

Financial Statement Comparability and Analyst Coverage

	Prediction	(1)	(2)	(3)	(4)
Comp4 Acct	+	**3.87*** (6.15)**			
CompInd Acct	+		**2.40*** (8.09)**		
Comp4 Earn	+			**0.27*** (4.96)**	
CompInd Earn	+				**0.47*** (2.73)**
Comp4 CFO	+			0.14* (1.93)	
Comp4 Ret	+			0.56*** (6.42)	
CompInd CFO	+				0.93*** (2.84)
CompInd Ret	+				0.59** (2.31)
Size	+	0.25*** (26.09)	0.24*** (25.59)	0.24*** (24.89)	0.25*** (25.70)
Book-Market	–	0.07*** (3.74)	0.06*** (3.53)	0.05*** (2.63)	0.06*** (3.20)
Volume	+	0.24*** (25.08)	0.25*** (25.73)	0.23*** (23.13)	0.24*** (24.16)
R&D	+	0.15** (2.36)	0.16** (2.47)	0.14** (2.11)	0.18*** (2.72)
Depreciation	+	0.16 (0.95)	0.21 (1.21)	0.04 (0.23)	0.04 (0.21)
Issue	+	0.04** (2.40)	0.03** (2.30)	0.04*** (2.78)	0.04** (2.43)
Predictability	+	0.04 (1.28)	0.04 (1.20)	-0.00 (-0.06)	0.02 (0.55)
Earn Volatility	–	-3.17*** (-8.80)	-2.71*** (-7.29)	-3.90*** (-11.08)	-3.75*** (-10.63)
Industry & Year FE		Yes	Yes	Yes	Yes
Adj. R^2		66.96%	67.08%	67.02%	66.74%
No. of Obs.		16,699	16,699	16,699	16,699

This table reports an analysis of the relation between financial statement comparability and analyst coverage. The sample is restricted to observations with available data to calculate all the variables in this analysis. The table reports the results of various specifications of the following OLS regression:

$$Coverage_{it+1} = \alpha + \beta_1 Comparability_{it} + \gamma\ Controls_{it} + \varepsilon_{it+1}.$$

Industry and year fixed effects are included for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the Appendix.

TABLE 6

Financial Statement Comparability and Analysts' Forecast Accuracy

	Prediction	(1)	(2)	(3)	(4)
Comp4 Acct	+	**137.91*** (4.21)**			
CompInd Acct	+		**80.06*** (5.63)**		
Comp4 Earn	+			**2.09* (1.73)**	
CompInd Earn	+				**6.58* (1.78)**
Comp4 CFO	+			-1.83 (-1.30)	
Comp4 Ret	+			-5.15*** (-2.71)	
CompInd CFO	+				-2.54 (-0.41)
CompInd Ret	+				-2.80 (-0.51)
SUE	–	-0.08*** (-3.87)	-0.07*** (-3.46)	-0.11*** (-4.47)	-0.11*** (-4.44)
Neg UE	–	-0.43 (-1.42)	-0.61** (-2.00)	-0.30 (1.01)	-0.32 (-1.07)
Loss	–	-5.35*** (-9.81)	-4.83*** (-9.06)	-5.55*** (-9.85)	-5.68*** (-10.02)
Neg SI	–	-0.52 (-0.19)	-0.16 (-0.06)	-1.09 (-0.38)	-0.91 (-0.32)
Days	–	-3.89*** (-6.53)	-3.87*** (-6.57)	-3.74*** (-6.30)	-3.76*** (-6.32)
Size	+	2.06*** (14.95)	2.00*** (14.54)	2.31*** (14.11)	2.19*** (14.39)
Predictability	+	-1.23* (-1.75)	-1.30* (-1.85)	-1.36* (-1.75)	-1.32* (-1.73)
Earn Volatility	–	-27.86** (-2.09)	-14.28 (-1.03)	-38.64*** (-3.11)	-39.73*** (-3.18)
Industry & Year FE		Yes	Yes	Yes	Yes
Adj. R^2		16.32%	16.56%	15.13%	15.06%
No. of Obs.		14,052	14,052	14,052	14,052

This table reports an analysis of the relation between financial statement comparability and forecast accuracy. The sample is restricted to observations with available data to calculate all the variables in this analysis. The table reports the results of various specifications of the following OLS regression:

$$Accuracy_{it+1} = \alpha + \beta_1 Comparability_{it} + \gamma Controls_{it} + \varepsilon_{it+1}.$$

Industry and year fixed effects are included for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the Appendix.

TABLE 7

Financial Statement Comparability and Analysts' Forecast Optimism

	Prediction	(1)	(2)	(3)	(4)
Comp4 Acct	–	**-47.78*** (-2.62)**			
CompInd Acct	–		**-26.62*** (-2.96)**		
Comp4 Earn	–			**-1.69* (-1.81)**	
CompInd Earn	–				**-7.25** (-2.45)**
Comp4 CFO	–			1.09 (0.91)	
Comp4 Ret	–			-0.38 (-0.31)	
CompInd CFO	–				-2.68 (-0.50)
CompInd Ret	–				-9.55** (-2.47)
SUE	?	0.01 (0.83)	0.01 (0.64)	0.02 (1.55)	0.02 (1.60)
Neg UE	+	0.74*** (2.91)	0.79*** (3.13)	0.70*** (2.76)	0.69*** (2.74)
Loss	+	3.49*** (7.90)	3.32*** (7.70)	3.62*** (7.94)	3.67*** (8.05)
Neg SI	+	0.23 (0.10)	0.12 (0.05)	0.43 (0.18)	0.28 (0.12)
Days	+	2.96*** (5.61)	2.95*** (5.61)	2.92*** (5.58)	2.95*** (5.63)
Size	–	-1.07*** (-11.04)	-1.05*** (-10.88)	-1.11*** (-10.28)	-1.07*** (-10.48)
Predictability	–	0.21 (0.35)	0.23 (0.38)	0.35 (0.54)	0.47 (0.75)
Earn Volatility	+	10.67 (1.11)	6.33 (0.63)	15.17* (1.65)	15.54* (1.69)
Industry & Year FE		Yes	Yes	Yes	Yes
Adj. R^2		8.67%	8.69%	8.44%	8.51%
No. of Obs.		14,052	14,052	14,052	14,052

This table reports an analysis of the relation between financial statement comparability and forecast bias. The sample is restricted to observations with available data to calculate all the variables in this analysis. The table reports the results of various specifications of the following OLS regression:

$$Optimism_{it+1} = \alpha + \beta_1 Comparability_{it} + \gamma\ Controls_{it} + \varepsilon_{it+1}.$$

Industry and year fixed effects are included for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the Appendix.

TABLE 8

Financial Statement Comparability and Analysts' Forecast Dispersion

	Prediction	(1)	(2)	(3)	(4)
Comp4 Acct	–	**-35.88*** (-3.20)**			
CompInd Acct	–		**-18.85*** (-3.94)**		
Comp4 Earn	–			**0.06 (0.23)**	
CompInd Earn	–				**0.22 (0.27)**
Comp4 CFO	–			0.50** (2.25)	
Comp4 Ret	–			0.95*** (3.38)	
CompInd CFO	–				1.47 (1.29)
CompInd Ret	–				1.30 (1.48)
SUE	?	0.02*** (2.96)	0.02*** (2.66)	0.02*** (3.21)	0.02*** (3.17)
Neg UE	+	0.16*** (3.22)	0.19*** (3.66)	0.13*** (2.76)	0.14*** (2.83)
Loss	+	1.14*** (10.53)	1.05*** (10.15)	1.20*** (10.45)	1.22*** (10.72)
Neg SI	+	-0.37 (-0.41)	-0.48 (-0.52)	-0.35 (-0.37)	-0.36 (-0.38)
Days	+	0.41*** (2.66)	0.37** (2.43)	0.40*** (2.73)	0.39*** (2.67)
Size	–	-0.34*** (-9.92)	-0.33*** (-9.59)	-0.39*** (-9.42)	-0.37*** (-9.01)
Predictability	–	0.09 (0.83)	0.11 (0.94)	0.03 (0.22)	0.03 (0.21)
Earn Volatility	+	4.94 (1.43)	2.37 (0.63)	7.08** (2.23)	7.35** (2.34)
Industry & Year FE		Yes	Yes	Yes	Yes
Adj. R^2		24.05%	24.01%	21.43%	21.31%
No. of Obs.		9,646	9,646	9,646	9,646

This table reports an analysis of the relation between financial statement comparability and forecast dispersion. The sample is restricted to observations with available data to calculate all the variables in this analysis. The table reports the results of various specifications of the following OLS regression:

$$Dispersion_{it+1} = \alpha + \beta_1 Comparability_{it} + \gamma\ Controls_{it} + \varepsilon_{it+1}.$$

Industry and year fixed effects are included for each model but not tabulated. We estimate each model as a panel and cluster the standard errors at the firm level. Coefficient *t*-statistics are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels, respectively. Variables are defined in the Appendix.