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Accounting comparability and the accuracy of peer-based valuation models

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Accounting Comparability and the Accuracy of Peer-based Valuation Models

Abstract

We examine the link between enhanced accounting comparability and the valuation performance of pricing multiples. Using the warranted multiple method proposed by Bhojraj and Lee (2002, *Journal of Accounting Research*) and controlling for economic comparability, we demonstrate how enhanced accounting comparability leads to better peer-based valuation performance. Empirical tests using firms from 15 EU countries over the period 1997-2011 (with comparable peers selected from the entire cross-section of foreign firms) document significant improvement in valuation performance measured as pricing accuracy, the ability of value estimates to explain cross-sectional variation in observed price, and the ability of the pricing multiple to predict future market-to-book multiples. Findings for a series of identification tests suggest that enhanced valuation performance is the consequence of improvements in the degree of cross-border accounting comparability that occurred during the sample window, and that a significant fraction of comparability gain operates through improved peer selection.

Keywords Equity valuation, pricing multiples, warranted multiple, peer selection, international accounting convergence, IFRS

I. INTRODUCTION

Valuation using comparable firm multiples is a standard topic in most financial statement analysis curricula, and valuation multiples are frequently used by analysts and investment professionals to estimate value and justify investment recommendations (Damodaran 2006, Demirakos et al. 2004). Identifying comparable firms is a key issue when using pricing multiples (Palepu et al. 2010: 326). While research documents the valuation benefits of controlling for underlying economic characteristics when selecting peers (Alford 1992, Bhojraj and Lee 2002), financial statement analysis textbooks also highlight variation in firms' accounting policies as an additional factor influencing comparability (Foster 1986, Damodaran 2006). All else equal, divergent accounting practices can make similar firms appear different and different firms appear similar, and as such risk confounding peer selection and reducing valuation accuracy when peers are identified using accounting realizations. Controlling for economic comparability, we examine how changes in accounting comparability affect multiples-based valuation performance in general and the peer selection stage of the process in particular.

Using the warranted multiple method proposed by Bhojraj and Lee (2002), we demonstrate how, holding underlying economic characteristics constant, enhancements in accounting comparability are expected to increase multiple-based valuation accuracy through improved peer selection. We then explore this prediction empirically in an international context. A growing body of evidence concludes that efforts to reduce international reporting differences through harmonization of accounting standards and improved regulation have enhanced the cross-border comparability of financial reporting outcomes (Brochet et al. 2012, Christensen et al. 2012, Ozkan et al. 2012, Yip and Young 2012, DeFond et al. 2011, Li 2010, Beuselinck et al. 2007, Land and Lang 2002). We exploit cross-country convergence in financial reporting

systems to examine the link between improvements in accounting comparability and the valuation performance the market-to-book pricing multiple computed using foreign peer firms selected on the basis of accounting realizations. Empirical tests exploring this predicted valuation outcome of comparability employ firms from 15 European Union (EU) countries over the period 1997 through 2011. (We also report results for the 1997-2008 subperiod to avoid confounding effects associated with the financial crisis and to ensure a consistent time-series of as-reported financial statement data from Thomson Extel, updates of which ceased in early 2009.) Tests are based on the market-to-book pricing multiple computed using the four most comparable foreign peers selected using a cross-country version of Bhojraj and Lee's warranted multiple model. Valuation performance is evaluated using three criteria: pricing accuracy, the ability of value estimates to explain cross-sectional variation in observed price, and the ability of the pricing multiple to predict one- and two-year-ahead market-to-book multiples.

We begin by testing whether the valuation performance of pricing multiples based on foreign comparable firms increased over the sample period in line with incremental improvements in international accounting comparability (Beuselinck et al. 2007, Land and Lang 2002). Consistent with our prediction, pricing accuracy for the market-to-book multiple computed using the four closest warranted multiple peers is economically and statistically significantly higher following mandatory adoption of international financial reporting standards (IFRS) in 2005. Scaled absolute errors decline by two (one) percent per year using the 1997-2008 (1997-2011) sample and the median absolute error is between 13 percent and 16 percent (eight percent and nine percent) lower post-2005 using the 1997-2008 (1997-2011) sample. Improvements in pricing accuracy using the market-to-book multiple based on foreign peers selected from the same two-digit SIC group are also evident, consistent with improvements in

convergence in international financial reporting practices enhancing valuation accuracy through a more comparable value driver (e.g., book value of equity). As expected, however, the incremental pricing improvement for warranted multiple peers over industry peers is larger because peer selection is a direct function (independent) of accounting data for warranted multiple (industry) peer selection method. This difference-in-differences test helps distinguish comparability effects on peer selection specific to accounting (which should be more pronounced for warranted multiple peer selection) from regulatory and economic improvements in comparability unrelated to accounting (which should affect industry peers and warranted multiple peers to a similar degree).

Explainability and predictability metrics yield identical conclusions regarding the link between accounting comparability and valuation performance. Value estimates derived from a market-to-book multiple based on the four closest warranted multiple foreign peers explain a significantly higher fraction of the cross-sectional variation in actual market values following IFRS adoption; and both the market-to-book pricing multiple based on the four closest warranted multiple foreign peers and the warranted market-to-book multiple itself display greater explanatory power for future market-to-book ratios after 2005.

Because factors other than improved peer selection due to accounting convergence could drive changes in valuation model performance over time in an international sample, we report a series of additional tests designed to assess the sensitivity and validity of our findings. Results consistently point to cross-border accounting convergence as a significant driver of improvements in valuation performance. Finally, we report two supplementary analyses aimed specifically at resolving the identification problem. The first test involves comparing pricing accuracy for warranted multiple foreign peers selected using internationally standardized

accounting data from Worldscope against pricing accuracy for foreign peers selected using as-reported. This difference-in-differences test allows us to hold all factors constant with the exception of the accounting data used to select warranted multiple foreign peers. Insofar as Worldscope's standardization process successfully mitigates a fraction of international reporting diversity, temporal changes in comparability should be less apparent for Worldscope data than as-reported data, and as a consequence improvements in pricing accuracy should be more pronounced for as-reported data. Difference-in-differences tests confirm that improvements in pricing accuracy over the sample period are confined to warranted multiple foreign peers selected using as-reported data.

Our second approach to testing whether enhanced reporting comparability improves valuation performance through better peer selection focuses on mandatory IFRS adoption in 2005. Research highlights a structural improvement in cross-border accounting comparability in response to the EU's IFRS mandate and associated enforcement changes (Brochet et al. 2012, Horton et al. 2012, Ozkan et al. 2012, Yip and Young 2012, Li 2010). All else equal, transition to IFRS should therefore lead to direct improvement in foreign peer-based valuation accuracy. Our identification strategy therefore involves conditioning changes in pricing accuracy surrounding IFRS adoption on the difference between closing shareholders' funds in the final local GAAP reporting period and opening shareholders' funds in the first IFRS reporting period.[1] Large (small) adjustments to opening shareholders' funds identify firms whose reporting practices differed materially from (overlapped significantly with) IFRS. We partition the sample

[1] Christensen et al. (2012) conclude that changes in the properties of accounting outcomes surrounding mandatory IFRS adoption are due, at least in part, to coincident changes in enforcement practices. We use the IFRS mandate to identify a structural shift in financial reporting comparability, and then test whether foreign peer selection and pricing accuracy changed as a consequence of that shift. As a result, identifying the specific source(s) of comparability improvements is less important for our analysis relative to studies seeking evidence on the economic consequences of mandatory IFRS adoption.

using this alignment measure and test whether firms in the low alignment group experienced larger gains in pricing accuracy in response to comparability improvement surrounding IFRS adoption. Tests confirm a statistically and economically larger increase in pricing accuracy for the low alignment group. Evidence that peer selection and pricing accuracy increased in direct response to a structural change in accounting values provides further support for the predicted link between financial reporting comparability and peer-based valuation performance.

Research examining the impact of peer choice on valuation accuracy highlights the importance of economic comparability (Bhojraj and Lee 2002, Liu et al. 2002, Kim and Ritter 1999, Alford 1992, Boatsman and Baskin 1981). In contrast, the impact of accounting comparability has been overlooked by researchers despite textbook concern and empirical evidence that firm-level accounting differences are a material source of variation in pricing multiples (Land and Lang 2002, Zarowin 1990, Beaver and Morse 1978). Ours is the first study of which we are aware to demonstrate that, holding economic fundamentals constant, peer-based valuation performance is increasing in the degree of accounting comparability. Our analysis also contributes to the burgeoning literature on international accounting convergence. Prior research attributes significant capital market benefits to mandatory IFRS adoption (Byard et al. 2011, Armstrong et al. 2010, Covrig et al. 2007) and coincident improvements in securities regulation (Christensen et al. 2012, 2011), whereas the impact of international reporting convergence on the equity valuation process has gone unexplored. It is well established that accounting differences affect foreign analyst following and forecast accuracy negatively, suggesting analysts cannot adjust fully for GAAP differences (Bae et al. 2008). Our evidence that cross-border accounting convergence is associated with improvements in the accuracy of multiple-based valuation techniques speaks directly to claims concerning the financial statement analysis benefits of

enhanced accounting comparability (SEC 2012 and 2003, AICPA 2011). Finally, our analysis extends empirical support for Bhojraj and Lee's warranted multiple peer selection method in an international setting.

II. BACKGROUD AND PREDICTIONS

Comparable firm valuation

The comparables approach presents firm value as the product of a value driver (e.g., earnings) and the corresponding pricing multiple derived from a set of peer firms. The method involves the following three steps (Palepu et al. 2010: 326): *(i)* identify the most appropriate value driver, *(ii)* select comparable firms and average their pricing multiple using the identified value driver, and *(iii)* apply the resulting average comparable firm multiple to the value driver of the firm being valued (hereinafter target firm). While theory provides limited insights concerning the choice of value driver, multiples based on forward earnings have been found to produce the most accurate value estimates (Liu et al. 2002, Kim and Ritter 1999). Averaging methods such as the harmonic mean (Liu et al. 2002) and the median (Alford 1992) that attribute less weight to extreme multiples are also associated with greater valuation accuracy.

At the heart of the multiples method is the identification of comparable firms used for estimating the latent pricing multiple of the target firm. Research demonstrates that valuation accuracy is increasing in the degree of economic comparability between the target firm and its peer set. For example, matching by growth (Boatsman and Baskin 1981) or a combination of risk and growth (Alford 1992) yields more accurate value estimates than selecting peer firms randomly, while Kim and Ritter (1999) find that peers identified by a specialist research firm generate lower absolute valuation errors than comparables selected using a mechanical same-sector algorithm. Consistent with firms in the same industry having similar economic

characteristics, Liu et al. (2002) find that industry-level multiples perform better than multiples derived from the entire cross-section. Bhojraj and Lee (2002) show that comparables selected on the basis of variables that explain cross-sectional differences in observed pricing multiples outperform peers identified using more naïve selection methods.

While research on peer selection emphasizes fundamental economic comparability, widespread use of accounting realizations to measure latent economic constructs introduces a second dimension of comparability in the form of financial reporting practices. The availability of alternative reporting options coupled with accrual accounting's reliance on estimates means that observations on economic fundamentals are determined in part by firms' accounting technology. Divergent reporting practices applied to the same transactions can create illusionary disparities among economically similar entities; and inappropriately applied accounting methods may cause economically different firms to appear unduly similar in terms of their reported outcomes. Accounting differences are frequently highlighted by academics and practitioners as a source of comparability problems in the context of pricing multiples. For example, Beaver and Morse (1978) and Zarowin (1990) attribute significant cross-sectional variation in U.S. firms' price-earnings multiple to accounting differences, while Land and Lang (2002) document a link between cross-country variation in pricing multiples and internationally divergent reporting practices. Foster (1986: 443) acknowledges the problem of diverse accounting methods for comparable firm valuation and advocates selecting peers by industry because firms from the same sector tend to use similar accounting methods. Reflecting the problems associated with diverse accounting practices, equity analysts often adjust reported numbers to enhance inter-firm comparability (Palepu et al. 2010: 335, Suozzo et al. 2001). Notwithstanding these concerns, the

link between accounting comparability and multiple-based valuation accuracy remains unexplored in the literature.

Accounting comparability and multiple-based valuation accuracy

The warranted multiple method proposed by Bhojraj and Lee (2002) provides an intuitive framework for developing and testing predictions about the link between accounting diversity and the accuracy of value estimates derived from pricing multiples. Warranted multiples offer a method for selecting comparable firms that is embedded in valuation theory. In this section, we outline the warranted multiple method proposed by Bhojraj and Lee (2002), extend their basic model to show how changes in accounting comparability affect valuation accuracy when peers are selected on the basis of accounting realizations, and use the resulting insight to develop testable predictions in an international context.[2] In addition to the effects described below for peer selection, accounting comparability may also impact multiple-based valuation performance directly through the accounting-based value driver (i.e., independent of peer selection method). Subsequent empirical tests capture both effects as well as distinguishing between them.

Valuing target firm *j* at time *t* using value driver *k* and a corresponding pricing multiple derived from peers selected on the basis of their warranted multiple involves four steps. In step one, the researcher or analyst estimates the following cross-sectional regression:

$$PM^{k}_{it-1} = \boldsymbol{\beta}\mathbf{X}_{it-1} + \varepsilon^{k}_{it-1}, \tag{1}$$

[2] The warranted multiple approach to identifying peer firms shares conceptual similarities with De Franco et al.'s (2011) method for measuring cross-firm comparability based on a mapping of economic news into earnings. Both approaches involve the mapping of accounting variables into price. However, while the De Franco et al. (2011) method focuses on information flows and earnings comparability, the Bhojraj et al. (2002) method takes a levels perspective based on a broader set of accounting information.

where *PM* is the pricing multiple computed using the k^{th} value driver, **X** is a vector variables that account for cross-firm variation in PM^k, $\boldsymbol{\beta}$ is a vector of parameters that define the mapping of **X** into PM^k, and ε is the regression residual, $\varepsilon \sim (0,1)$. In the second step, coefficient estimates $\hat{\boldsymbol{\beta}}$ from equation (1) are used to estimate a warranted pricing multiple (WM^k) for all *I* firms with available data at time *t*:

$$WM_{it}^{k} = \hat{\boldsymbol{\beta}}\mathbf{X}_{it}\,. \tag{2}$$

In step three, the warranted multiple for target firm *j* is compared with the corresponding multiple for all remaining *I* - *j* firms and *N* peers with the smallest absolute deviation from WM_j^k are selected as comparables for *j*. (Bhojraj and Lee set *N* arbitrarily equal to four.) Finally, an estimate of firm *j*'s intrinsic value (*IV*) is computed as:

$$IV_{jt} = \overline{PM}^{k} \times Driver_{jt}^{k}\,, \tag{3}$$

where $\overline{PM}$ is the harmonic mean of the k^{th} pricing multiple computed using actual multiples for the *N* peer firms at time *t* and *Driver* is the corresponding value driver for firm *j* at time *t*.

Holding economic fundamentals constant, low accounting comparability makes similar firms appear more different and different firms appear more similar. In the context of equation (1), comparability problems caused by diverse and inconsistent reporting practices represent measurement error in *(i)* accounting-based value driver *k* and *(ii)* accounting realizations of **X**.[3] Simplifying the right hand side of equation (1) to include a single latent economic factor *Z*,

[3] Consistent with Yip and Young (2012), we view comparability and accounting quality as related concepts. We define comparability broadly to include aspects of accounting quality such as earnings management that affect the degree to which reported numbers capture underlying economic reality. Accordingly, changes in accounting standards that increase accounting quality by limiting earnings management are also expected to improve comparability.

observations on which are the product of the accounting system, the warranted multiple regression estimated by the researcher or analyst is:

$$(PM^{k}_{it-1} + \mu_{it-1}) = \alpha + \beta(Z_{it-1} + \upsilon_{it-1}) + \varepsilon^{k}_{it-1}, \quad (4)$$

where μ and υ are accounting-based measurement errors associated with *k* and *Z*, respectively, resulting from incomparable reporting practices. It is well established that $\hat{\beta}$ in equation (4) is a biased and inconsistent estimate in the presence of υ. Bias in $\hat{\beta}$ will also occur where the correlation between μ and ($Z + \upsilon$) is non-zero, as is likely when observations on *k* and *Z* are products of the same accounting system. All else equal, bias in $\hat{\beta}$ will impact estimates of *WM* derived from equation (2) and as long as the effect on *WM* is non-constant across firms, the ranking and selection of peers used to compute $\overline{PM}$ in equation (3) will differ from the choice of comparable firms absent bias in $\hat{\beta}$. Further, because the reporting diversity that drives the bias in $\hat{\beta}$ causes similar (different) firms to appear different (similar), the set of peer firms selected when the bias in $\hat{\beta}$ is non-zero is likely to be less similar to firm *j* than the corresponding peer group absent such bias. Given extant findings indicating valuation accuracy is increasing in peer similarity, equation (3) is expected to yield more accurate estimates of *IV* when financial reporting comparability is high among the sample of firms used to estimate β in equation (1) and *WM* in equation (2). In the same way, changes in accounting comparability over time are expected to be positively associated with changes in multiple-based valuation accuracy.

We exploit developments in cross-country reporting comparability resulting from international convergence in accounting standards and regulatory systems to test the predicted association between reporting comparability and multiple-based valuation accuracy. Specifically, we estimate equation (1) using cross-sections of firms pooled across EU countries and use

warranted multiples from equation (2) to select foreign peers. All else equal, improvements in accounting comparability are expected to reduce bias in $\hat{\beta}$, leading to more appropriate peer selection via equation (2), and ultimately more accurate value estimates from equation (3).[4]

We utilize two aspects of international accounting convergence to develop complimentary tests of our prediction. In the spirit of Land and Lang (2002), our first test exploits incremental harmonization of reporting practices occurring among EU countries throughout our sample period (Beuselinck 2007, EUCE 2007, Street 2003). If accounting comparability affects multiple-based valuation accuracy through peer selection, then we expect to observe an improvement in valuation performance over time in response to incremental reporting convergence. Our second test concerns the documented structural break in cross-border accounting comparability associated with mandatory adoption of IFRS in 2005 (Brochet et al. 2012, Ozkan et al. 2012, Yip and Young 2012, DeFond et al. 2011, Wang 2011, Covrig et al. 2007) and coincident regulatory developments (Christensen et al. 2012). Taking comparability gains surrounding the EU's IFRS mandate as given, we expect to observe a material increase in foreign peer-based valuation accuracy as a direct consequence of transition to IFRS (i.e., distinct from any underlying time trend).

III. RESEARCH DESIGN

[4] These predictions do not represent a test of the warranted multiple method and are not expected to be rendered invalid by the specification and implementation problems highlighted by Sloan (2002). Our predictions are concerned with changes over time in valuation accuracy. Therefore, as long as the theoretical basis, specification, and implementation of the model remain constant over time, concerns about model estimation and implementation are not expected to bias tests in favor of observing a reduction in valuation accuracy over time or in response to accounting convergence.

This section reviews the key elements of our research design including the methods used to select peers and estimate firm value, and the approaches used to identify effects specific to international accounting convergence.

Valuation

This section summarizes the procedure for estimating intrinsic firm value using the price-to-book warranted multiple. The decision to use price-to-book is partly ad hoc and partly because this is one of the valuation ratios employed by Bhojraj and Lee (2002). Choice of driver is not a significant factor affecting the results as explained in Section V.[5] We set the valuation date for firm *j* equal to the fiscal year-end *t* plus four months and compute intrinsic value (*IV*) as follows:

$$IV_{jt+4} = \overline{PB}_{jt+4} \times BV_{jt}, \tag{5}$$

where $\overline{PB}$ is the harmonic mean market-to-book ratio computed using firm *j*'s peer group and *BV* is book value of shareholders funds at time *t*.

Empirical tests seek evidence on whether foreign peer selection using financial statement information is affected by improvements in international accounting comparability. We use the warranted multiple procedure described by Bhojraj and Lee (2002) and extended by Bhojraj et al. (2003) to represent the process of selecting foreign peers based on accounting realizations. Selecting peers for firm *j* from country *k* involves first estimating the following cross-sectional OLS model using all firms in our sample with available data where country ≠ *k*:

$$PB_{it} = \beta_0 + \beta_1 INDPB_t + \beta_2 CTYPB_t + \beta_3 PM_{it} + \beta_4 NEGPM_{it} + \beta_5 ROE_{it}$$

[5] Book values reflect the accumulation of past accounting choices, thereby dampening the effect of temporal improvements comparability. Liu et al. (2002) show that multiples with forecasted earnings per share (eps) yield the most accurate value estimates. We favor book value over forecasted eps as the value driver in our main tests because analysts do not forecast GAAP outcomes.

$$+ \beta_6 Growth_{it} + \beta_7 LEV_{it} + \beta_8 RD_{it} + \varepsilon_{it}. \quad (6)$$

The dependent variable in equation (6) is the market-to-book ratio. The denominator in the *PB* ratio is common shareholders' equity from Extel. The numerator is market value four months after fiscal year-end *t*. To ensure consistency between numerator and denominator with respect to the number of shares outstanding, we use pseudo market value defined as Datastream unadjusted price per share at *t* × Datastream unadjusted shares outstanding at the corresponding date × $\left(1 - \left[RI_{it+4} / RI_{it}\right]\right)$, where RI_{it} (RI_{it+4}) is the Datastream return index for firm *i* at time *t* (*t* + 4). Variable definitions for explanatory variables in equation (6) are as follows: *INDPB* is the industry harmonic mean *PB* for all firms pooled across countries in the same two-digit SIC industry to firm *i*; *CTYPB* is the country harmonic mean *PB* for all firms in the same country as firm *i*;[6] *PM* is operating profit margin, defined as operating profit after depreciation divided by net sales; *NEGPM* is equal to *PM* × *Dum,* where *Dum* is an indicator variable equal to one if *PM* < 0 and zero otherwise; *ROE* is net income before discontinued operations and extraordinary items divided by common shareholders' equity; *Growth* is the IBES consensus long-term earnings per share (eps) growth forecast at time *t* + 4 where available, or the implicit growth rate between the one- and two-year-ahead consensus eps forecasts otherwise; *LEV* is total long-term debt divided by common shareholders' equity; *RD* is research and development expenditure (R&D) charged directly to income in the period, divided by net sales; and ε is the regression residual. (Extel variable definitions are presented in Table 2.)

[6] Bhojraj et al. (2003) include *CTYPB* partly to capture cross-country differences in accounting standards. To the extent that *CTYPB* controls for the effects on which our analysis seeks evidence, our decision to include this variable in the vector of explanatory variables is likely to dampen any effect associated with international accounting convergence. In sensitivity tests we repeat all analyses with *CTYPB* excluded. Results and conclusions are unaffected. We retain *CTYPB* in our main tests as a means of controlling for country-level structural differences in the market-to-book ratio unrelated to accounting standards and to ensure our tests are conservative.

Our sampling method does not constrain firms to have the same fiscal year-ends. Coefficients for equation (6) are therefore estimated separately for every country (*c*)-year (*y*)-month (*m*) combination during the sample period using the entire cross-section of foreign firms with year-ends in the 12-month window ending month *m – 1* of year *y*. For example, coefficients for March 2008 are estimated by country using all foreign firms with fiscal year-ends from March 2007 through February 2008. Resulting coefficient estimates are denoted $\hat{\beta}_{cmy}$. Firm *i*'s market-to-book warranted multiple (WM_{it}^{PB}) at fiscal year *t* is given by:

$$WM_{itc}^{PB} = \hat{\beta}_{0cmy} + \hat{\beta}_{1cmy} INDPB_t + \hat{\beta}_{2cmy} CTYPB_t + \hat{\beta}_{3cmy} PM_{it} + \hat{\beta}_{4cmy} NEGPM_{it} + \hat{\beta}_{5cmy} ROE_{it}$$
$$+ \hat{\beta}_{6cmy} Growth_{it} + \hat{\beta}_{7cmy} LEV_{it} + \hat{\beta}_{8cmy} RD_{it} . \quad (7)$$

where *m* and *y* are the month and calendar year, respectively, associated with year-end date *t* and *c* is firm *i*'s country of domicile. Foreign peers used to value firm *j* at *t* + 4 are selected by comparing the warranted multiple for *j* with the corresponding multiple for all other $i \neq j$ foreign firms whose year-end is either equal to *t* or precedes *t* by no more than six months. The peer set for firm *j* comprises the four foreign firms with the smallest absolute deviation from WM_{jt}^{PB}.[7] Actual price-to-book ratios at valuation date *t* + 4 are then used to compute the harmonic mean pricing multiple ($\overline{PB}_{jt+4}$) and estimate intrinsic value (IV_{jt+4}) following equation (5).

Three metrics are used to examine the link between international accounting convergence and valuation performance through peer selection. We use accuracy and explainability to assess the performance of intrinsic value estimates from equation (5) (Francis et al. 2000, Frankel and Lee 1998). Valuation accuracy measured as absolute valuation errors (AVE), defined as the

[7] Kim and Ritter (1999: 437) observe that practitioners do not restrict themselves to choosing comparable firms from the same SIC sector. Consistent with this view, results reported below are based on a selection process that does not impose any industry restriction when choosing peer firms. Results are either similar or stronger when we repeat the selection process using peers constrained to the same one-digit SIC sector as the target firm.

difference between pseudo market capitalization at date t + 4 months and IV_{t+4}, scaled by market value at fiscal year-end date t. Lower values for AVE are consistent with improved peer selection leading to more accurate pricing. Explainability reflects the explanatory power of value estimates for observed price, as measured by the R-squared from an OLS regression of pseudo market capitalization on IV_{t+4}. Intrinsic values that explain a higher proportion of the cross-sectional variation in observed market values are indicative of better peer selection leading to more reasonable value estimates.[8] Our third performance metric examines the ability of the PB pricing multiple to predict future PB ratios. Improved peer selection is expected to generate pricing multiples with greater predictive ability, as measured by the explanatory power of $\overline{PB}_{t+4}$ [and the corresponding warranted multiple from equation (6)] for one- and two-period-ahead PB ratios (Bhojraj and Lee 2002).

Identification

We use the structural break in cross-border accounting comparability associated with mandatory IFRS adoption in 2005 (Brochet et al. 2012, Ozkan et al. 2012, Yip and Young 2012, DeFond et al. 2011, Wang 2011, Covrig et al. 2007) and coincident regulatory developments (Christensen et al. 2012) to partition the sample into high accounting alignment (post-IFRS adoption) and low alignment (pre-2005) periods, and then test whether valuation performance improved from the low to the high alignment regime.

Isolating the impact of accounting comparability from other non-accounting factors causing improvement in peer selection and valuation performance such as international

[8] Our theory offers no clear predictions how improved peer selection impacts the relative degree of under- versus overvaluation. Neither do we have strong priors why investors might care more (or less) about over- or undervaluation of the same magnitude. Accordingly, we do not use signed valuation errors as a performance metric in our tests, although for completeness we report summary statistics for bias as part of our subsequent results.

convergence in growth forecasts and discount rate expectations, as well as a general shift toward greater market integration, is empirically challenging. We employ a number of strategies to address the identification problem in addition to controlling for potential omitted variables using standard regression procedures. First, we benchmark performance metrics against results for peers selected on the basis industry membership (Alford 1992) because factors unrelated to improvements in accounting comparability should affect both industry and warranted multiple (WM) peer selection approaches in a similar way. However, while greater accounting comparability is expected to improve the valuation performance of a naïve industry-based peer selection strategy through its impact on the accounting-based value drivers (e.g., book value), we expect to observe incrementally larger improvements for WM peers due to explicit use of accounting realizations in peer selection process. Using a difference-in-differences approach to test for incremental performance improvements for WM-based peer selection over industry-based peer selection therefore provides one means of isolating accounting-specific effects.

An alternative identification strategy involves comparing the valuation performance of WM peers selected using internationally standardized accounting data from Worldscope against the performance of peers selected using the same WM model method implemented with as-reported data. This difference-in-differences test enables us to hold all factors constant with the exception of the financial statement data used to select peers via equation (6) and (7). If accounting convergence is associated with better peer selection and improved valuation then the temporal decline in valuation errors should be incrementally more pronounced using as-reported.

Our third identification strategy conditions improvement in foreign peer-based valuation performance surrounding IFRS adoption on a firm-specific proxy for the degree of pre-adoption alignment between financial statements prepared using local GAAP and IFRS. If transition to

IFRS improved peer selection and valuation accuracy then the decline in valuation errors should be more (less) pronounced among firms characterized by low (high) pre-adoption reporting alignment. We expect this effect to exist for industry and WM peer selection procedures but the effect to be stronger for the latter approach.

IV. SAMPLE AND DATA

Tests examining the impact of accounting convergence among EU firms on the performance of peer-based valuation methods require as-reported financial statement data. The most established source of as-reported data for European firms was Thomson Extel prior to its withdrawal in early 2009.[9] Our Extel sample therefore comprises fiscal year-ends from December 1997 through December 2008. Truncating the sample at December 2008 also helps insulate valuation tests from the unprecedented levels of stock market volatility that accompanied the global financial crisis. Exclusive reliance on Extel data nevertheless yields a narrow post-IFRS adoption window. We address this problem by collecting data from Thomson Reuters Knowledge for year-ends from January 2009 through December 2011. Thomson Reuters Knowledge is marketed as a replacement for Extel, with similar sample coverage and many (but not all) financial statement items presented on an as-reported basis. In the interests of robustness we report results for both the Extel (1997-2008) and the combined Extel plus Reuters Knowledge (1997-2011) samples.

[9] Use of as-reported data is central to our empirical tests. Alternative data sources such as Thomson Reuters, Worldscope, Global Vantage, and Compustat Global adjust certain as-reported items to improve international comparability. In the latter two cases, coverage is also more limited. Using standardized data reduces our ability to capture temporal shifts in the comparability of reported results. Supplementary tests in section V confirm that Worldscope (Extel) data are associated with smaller (larger) valuation errors when international accounting comparability is low, and that this difference declines as comparability improves.

Our sampling frame comprises the following fifteen EU countries: Austria, Belgium, Germany, Denmark, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Sweden, and the U.K. Focusing on the largest and most economically significant countries limits unobservable heterogeneity and reduces pricing noise associated with less developed financial markets. Extel contains 58,393 firm-years between December 1997 and December 2008 with financial statements presented in a European currency, from which we retain nonfinancial firms (6000 > SIC > 6999) and observations where the market-to-book ratio is positive, unadjusted Datastream price per share at the balance sheet date is at least €0.20, and all data required for equation (6) are non-missing. Voluntary IFRS adoption firm-years and U.S. GAAP firm-years are retained prior to mandatory IFRS adoption, whereas U.S. and local GAAP firm-years subsequent to IFRS adoption are excluded.[10] The resulting sample of 19,408 observations is trimmed at the extreme percentiles for each continuous variable in equation (6), yielding a final warranted multiple estimation sample of 17,876 observations. All market and accounting data are converted to Euros as appropriate using Extel's exchange rate.

Equation (6) is estimated separately for each country-year-month combination using all available non-domestic fiscal years for the preceding 12 months. Fiscal years with start dates between January 1, 2005 and 20 December 2005 represent firms' first mandatory IFRS reports and are excluded from our valuation analysis to avoid mixing warranted multiple parameters estimated using local GAAP data with valuation-date book values prepared under IFRS. Intrinsic value estimates and associated absolute valuation errors are computed four months after the fiscal year-end for all remaining firm-years between December 1997 and December 2008. The

[10] This includes firm-years beginning on or after January 1, 2005 for firms listed on London's Alternative Investment Market (AIM) because mandatory IFRS adoption was delayed until 2007 on AIM. AIM firm-years prior to 2007 are retained for the purpose of estimating equation (6) because these firms applied U.K. GAAP.

final Extel valuation sample comprises 15,763 observations. We partition this sample into low and high accounting alignment subperiods and compare valuation performance across the two intervals. We use mandatory IFRS adoption as the breakpoint to maximize the differences in average comparability levels. The low alignment period comprises 11,542 firm-years with fiscal years beginning prior to January 1, 2005 (pre-mandatory IFRS adoption); the high alignment period comprises 4,221 firm-years with fiscal years beginning after December 20, 2006 (post-mandatory IFRS adoption).[11] Applying the same sampling criteria to Thomson Reuters Knowledge yields a further 5,442 firm-years for the period January 2009 through December 2011. The high alignment period sample for the combined Extel plus Reuters Knowledge dataset therefore comprises 9,663 observations. Details of the sample selection procedure are presented in Table 1 Panel A. Frequency counts for the valuation sample by year and country are reported in Panel B. Observations are evenly distributed across years with the exception of 1997 (December year-ends only) and 2004 (which also includes local GAAP reporters in 2005). Firms from France, Germany and the U.K. dominate the sample with 2,814 (18%), 1,927 (12%), and 4,304 (27%) observations, respectively.

[Insert Table 1 about here]

Table 2 presents summary statistics for warranted multiple regressions. Panel A reports descriptive statistics for the regression variables. The median sample firm has a market-to-book ratio of two, a gross profit margin of seven percent, return on equity of 12 percent, long-term forecasted eps growth of 15 percent, leverage of 29 percent, and zero R&D spend. Panel B of Table 2 presents median coefficient estimates and model summary statistics by calendar year for

[11] This partitioning approach is designed to provide a binary test of temporal changes in comparability rather than a direct test of IFRS adoption effects. A direct test of mandatory IFRS adoption effects is described in section V.

equation (6) estimated for each country-month-year combination. With the exception of *CTYPB* and the intercept, coefficient signs are consistent over time and with prior research (Bhojraj and Lee 2002, Bhojraj et al. 2003). Coefficient magnitudes vary across time, particularly for *Growth* and *R&D*.[12] Untabulated findings reveal the mean (median) market-to-book multiple is 2.1 (1.8) using the four international peers identified via the warranted multiple method. Pseudo market value four months after fiscal year *t* is skewed with a mean (median) value of €2,768 million (€333 million). The median signed valuation error (scaled by market capitalization at the balance sheet date) is 11 percent, indicating that our model underestimates value for the typical firm. The mean (median) absolute scaled valuation error for the pooled sample is 61 (44) percent. Untabulated evidence reveals a steady decline in median pricing errors from 1997 to 2007, followed by a temporary up-tick in 2008 and then a return to 2007 levels.

[Insert Table 2 about here]

V. RESULTS

Preliminary evidence

Table 3 Panel A reports univariate comparisons of AVE across low- and high-alignment regimes using both the Extel (1997-2008) and the combined Extel plus Reuters (1997-2011) samples. The top half of the panel reports comparisons using the pooled sample and the bottom half presents paired comparisons for firm-level mean AVE values computed for each subperiod using a balanced sample comprising firms with at least one observation in both subperiods. Tests

[12] The analysis in section II predicts a change in the properties of coefficient estimates from the first-stage warranted multiple regression as a consequence of improvements in accounting comparability. Consistent with this prediction, a Chow test comparing coefficients for the low and high alignment subperiods confirms the presence of a structural change in parameter estimates (F-value 32.99; probability value 0.01). Further analysis reveals a structural break for individual coefficient estimates on *INDPB*, *CTYPB*, *PM*, *NEGPM* and *ROE* from equation (6).

reveal consistently lower AVE in the high-alignment subperiod (p-values < 0.01) using the Extel sample. The decline in median AVE is also economically significant, ranging from 12.5 percent [(0.480 – 0.420) / 0.480] for the balanced sample paired test to 16 percent for the pooled sample. Similar results hold using the extended sample, albeit with a lower economic significance. Panel A also presents information on signed valuation errors for completeness although we have no expectations about the impact of improved accounting comparability and peer selection on bias. The evidence is mixed, consistent with the absence of clear predictions: median bias is less negative in the high alignment period whereas mean bias is more positive.

[Insert Table 3 about here]

Panel B of Table 3 reports a similar analysis using foreign peers selected from the same two-digit SIC group. While this naïve peer selection method is independent of accounting realizations, convergence in international financial reporting practices is expected to enhance valuation performance through more comparable market-to-book multiples. The evidence in Panel B supports this view, with consistently lower absolute valuation errors in the high alignment period for both the Extel and combined Extel plus Reuters samples.

Results in Panels A and B are consistent with cross-border accounting harmonization leading to more accurate multiple-based valuation via improved peer selection and enhanced comparability of the accounting-based value driver itself. It is possible, however, that temporal changes in valuation accuracy could be driven by convergence in macroeconomic or institutional factors unrelated to accounting. One means of isolating accounting-specific effects is to compare the magnitude of the valuation improvement for peers selected using the warranted multiple method with the magnitude of the valuation improvement for peers selected on the basis of industry. While non-accounting factors such as convergence in discount rates and growth

expectations should affect both peer groups similarly, the impact of accounting convergence is expected to be more (less) pronounced for the warranted multiple (industry) method because peer selection is a direct function (independent) of accounting realizations. Panel C of Table 3 reports results for the pairwise difference between AVE using warranted multiple peers (AVE^{WM}) and AVE using industry peers (AVE^{IND}). If improvements in accounting comparability lead to better peer selection and more accurate valuations then the incremental difference should be lower in the high alignment period. Results in Panel C for both the Extel and extended samples are consistent with this prediction. In all cases the mean (median) difference between AVE^{WM} and AVE^{IND} is significantly less positive (more negative) in the high alignment period. Focusing on the balanced sample results which represent a true difference-in-differences test, mean and median differences are consistently positive in the low alignment period indicating $AVE^{WM} > AVE^{IND}$. Comparable values for the high alignment period are either negative, indicating $AVE^{WM} < AVE^{IND}$, or significantly less positive for the mean of the combined sample. These difference-in-difference results support the view that enhanced accounting comparability improves the performance of peer-based valuation and that the effect operates at least in part through improvements in peer selection when peers are identified using accounting numbers.

To further address the possibility that temporal variation in valuation accuracy reflects omitted variables unrelated to accounting comparability, Table 4 examines the evolution of AVE over time after controlling for a range of firm- and market-level factors including firm size, price-to-book ratio, the presence of losses, R&D spending, country of listing, annual and seasonally-adjusted real GDP growth, stock market and firm-specific price volatility over 90 days preceding the valuation date, the standard deviation of long-term growth forecasts for target firm *i* and its four closest warranted multiple peers, and the standard deviation of discount rates

for target firm *i* and its four closest warranted multiple peers. Models 1 and 2 for the Extel sample and models 4 and 5 for the combined Extel and Reuters sample include a linear time-trend variable (*Timetrend)* defined as fiscal year minus 1997. The *Timetrend* coefficient is negative and significant at the 0.01 level in all models. Models 3 and 6 replace *Timetrend* with an indicator variable that takes the value of one for observations in the high alignment period and zero otherwise. The *Hi_align* indicator loads negatively and significantly as predicted.

[Insert Table 4 about here]

Table 5 evaluates changes in valuation model performance using explainability and predictability criteria. Greater accounting comparability leading to better warranted multiple peer selection is expected to generate (i) intrinsic value estimates that explain more cross-sectional variation in observed market value and (ii) market-to-book multiples that display superior predictive power for future pricing multiples. Explainability models reported in Panel A are associated with significantly higher adjusted R-squareds in the high alignment period. Explanatory power increases from 59.6 percent in the low alignment period to 74.3 (72.9) percent in the high alignment period using the Extel (combined Extel and Reuters) sample.[13] (Cramer's Z-test confirms the explanatory power is statistically higher in the latter period.)

Predictability results are presented in Panels B and C of Table 5. We examine the ability of the harmonic mean market-to-book multiple based on the four closest warranted multiple peers (*VM*) and the actual warranted multiple from equation (7) (*WM*) to predict one- and two-year-ahead multiples, over and above industry (*INDPB*) and country (*CTYPB*) harmonic mean pricing multiples. Findings reported in Panel B for one-year-ahead predictions are consistent

[13] Models reported in Panel A of Table 5 are estimated using the full (untrimmed) dataset. Re-estimating the models after trimming the dependent and explanatory variables at the top and bottom percentiles yields identical conclusions but with adjusted R-squareds above 80 percent and coefficient estimates on *Value estimate* close to one.

with enhanced accounting comparability leading to better peer selection. While *VM* and *WM* display incremental predictive power for one-year-ahead market-to-book ratios in both low and high alignment regimes, the effect is more pronounced for the high alignment period. The adjusted R-squared in the low alignment period increases by a factor of 1.3 from 7.3 percent (Model 1) to 9.5 percent (Model 2) after including *VM*, and by a factor of 1.6 with both *VM* and *WM* included (Model 3). Comparable increases for the high alignment period based on the Extel sample are 4.0 (from 3.5 percent to 14.3 percent in Model 5) and 5.0 (from 3.5 percent to 17.6 percent in Model 6). Results for the combined Extel and Reuters sample are even stronger, with the adjusted R-squared increasing by a factor of 4.9 from 3.2 percent (Model 7) to 15.8 percent (Model 8) after including *VM*, and by a factor of 6.8 after including both *VM* and *WM* (Model 9). Similar patterns are evident in Panel C when predicting two-year-ahead market-to-book ratios. These predictability results are entirely consistent with conclusions based on explainability and valuation accuracy criteria. Collectively, findings reported in Tables 3-5 support the prediction that greater accounting comparability leads to more informative valuation multiples when peers are selected using financial statement data.

[Insert Table 5 about here]

The robustness of results reported in Tables 3-5 is assessed in a series of supplementary tests. Analyses were repeated using the enterprise value-to-sales (EVS) multiple to determine whether findings are reliant on the choice of valuation multiple.[14] Results are entirely consistent with those reported above. We also repeated analyses with the valuation multiple computed

[14] The *EVS* ratio is equal to the market value of equity at time $t + 4$ (as previously defined) plus the book value of total debt [Ex.Debt] at t, divided by sales from continuing operations [Ex.Sales – Ex.SalesDiscontinued, Extel variable mnemonics are indicated using the prefix Ex.]. Equations (6) and (7) were amended by replacing *PB* with *EVS,* substituting *CTYPB* and *INDPB* with *CTYEVS* and *INDEVS*, respectively, and using return on assets in place of *ROE* (Bhojraj and Lee 2002).

using the six and eight closest peer firms from the WM method, with U.K. firms excluded, and with observations in calendar year 2008 (the onset of the financial crisis) excluded. In all cases the results are similar to those reported above. We also exclude data prior to adoption of the Euro in early 2002 to check that comparability improvements are independent of currency union effects. Results using fiscal year-ends from January 2003 onwards continue to show a structural improvement in valuation performance around IFRS adoption in 2005.

Table 1 reveals significant sample attrition as a consequence of our data requirements, which in turn raises questions about the potential generalizeability of our findings. For example, we lose 64 percent of the initial Extel population of non-financial firm-years between 1997 and 2008 as a result of our sampling criteria. The largest single cause of data loss is the requirement for long-term growth forecasts from IBES. Relaxing this restriction increases sample size to 25,431 observations (57 percent of the initial Extel non-financial population). Dropping *Growth* from equations (6) and (7) and re-running all analyses using this larger sample yields identical conclusions to those reported above.

The residual income valuation model (RIVM) does not involve peer selection and therefore the impact of accounting convergence on valuation accuracy should be less pronounced relative to multiple-based valuation. We therefore use the temporal pattern of valuation errors from RIVM as an alternative benchmark against which to evaluate changes in pricing accuracy.[15] Coefficient estimates on *Timetrend* for models 1, 2, 4 and 5 in Table 4 are indistinguishable from zero when models are estimated using AVE from RIVM, consistent with the improvement in valuation performance reported in Tables 3-5 being driven by improved peer selection. These

[15] RIVM implementation follows the three-period model from Frankel and Lee (1998, equation 3.3 and Appendix A). Cost of capital estimates are permitted to vary by firm and time by allowing beta (from Datastream) to vary by industry (two-digit SIC code) and year, and the risk free rate (annualized three-month Treasury Bill rate or equivalent) to vary by country and time.

results hold despite RIVM-based tests favoring increased valuation accuracy in the high alignment period due to improvements in analysts' earnings forecast accuracy following IFRS adoption (Byard et al. 2011, Horton et al. 2012). (Consistent with a structural improvement in analyst forecast accuracy following IFRS adoption, *Hi_align* in Table 4 continues to load negatively for RIVM absolute valuation errors.)

Prior tests partition the sample into high and low accounting alignment periods based on mandatory IFRS adoption. We adopt this approach because the wholesale switch to IFRS in 2005 presented a significant, externally defined breakpoint with regard to harmonization of international accounting practices. However, time trend results in Table 4 suggest valuation performance improved over an extended period. Using alternative partitioning dates before 2005 yields results similar those reported in Table 3-5. While this is consistent with significant convergence in accounting practices prior to formal IFRS adoption, the non-uniqueness of results using IFRS adoption as the cut-off date could indicate the effect of omitted variables unrelated to accounting convergence. To assess whether IFRS adoption was associated with an unusually large improvement in valuation performance, we compared the change in AVE over the IFRS transition period (i.e., from the last year of local GAAP to the second year of IFRS) with annual changes in AVE computed for all other sample years. Untabulated results reveal the decline in AVE surrounding IFRS adoption is significantly more pronounced than all other annual changes with the exception of 2001 (where the change in AVE is statistically insignificantly different from the IFRS transition period). These findings provide further evidence that partitioning on IFRS adoption captures comparability effects that more likely reflect accounting convergence effects than other non-accounting factors.

A maintained hypothesis underpinning our evidence is that improvement in valuation performance is a consequence of selecting more comparable peer firms as a consequence of enhanced financial statement comparability. We conduct direct tests for temporal improvements in economic comparability between target firm *i* and its international peer group selected via the warranted multiple technique in terms of industry membership (two-digit SIC), risk (Datastream beta), and expected growth (IBES long-term growth forecast). Untabulated results reveal the mean difference for all three economic characteristics between firm *i* and its four international warranted multiple peers is statistically smaller in the high alignment period.

VI. FURTHER ANALYSIS

This section reports details of two further identification tests designed to determine whether improvements in accounting comparability enhances multiples-based valuation when peers are selected using accounting data. The first test uses a difference-in-differences design to compare valuation accuracy for peers selected using as-reported financial statement data against valuation accuracy for peers selected using international standardized data. The second test conditions improvements in peer-based valuation performance on a firm-level measure of financial statement impact of mandatory IFRS adoption.

Supplementary identification test: Standardized versus as-reported data

This test exploits firm-level differences in the properties of accounting data to isolate accounting-specific comparability effect. Extel and Reuters Knowledge provide as-reported financial statement data. In contrast, Worldscope accounting items are standardized: Thomson analysts adjust reported numbers using a set of global templates to improve cross-country

reporting comparability.[16] Insofar as this standardization process successfully mitigates a fraction of international reporting diversity, temporal changes in comparability should be less apparent for Worldscope data than as-reported data. We define AVE^{AR} as absolute valuation errors based on peers selected after applying as-reported data in equations (6) and (7). Peer selection is then repeated using Worldscope data in equations (6) and (7). Worldscope-derived peers are then used in equation (5) in conjunction with as-reported book value to estimate value and compute absolute valuation errors (AVE^{WS}). For firm *j* at time *t*, the only difference between AVE_{jt}^{AR} and AVE_{jt}^{WS} is the accounting data used to select peers via equations (6) and (7). If changes accounting comparability affect peer selection and valuation performance, the decline absolute errors from the low alignment period to the high alignment period should be more pronounced for AVE_{jt}^{AR}.

Table 6 presents summary statistics for AVE^{AR} and AVE^{WS} partitioned by low and high alignment periods based on the extended sample. Results for the full (pooled) sample are reported first, followed by results for the balanced sample that represent a true difference-in-differences analysis. Valuation accuracy shows little evidence of improvement over time using standardized data from Worldscope: with the exception of the Wilcoxon rank signed test for the pooled sample, differences in AVE^{WS} across low and high alignment periods are indistinguishable from zero. Unsurprisingly, international accounting convergence during the sample period had little impact on peer selection using Worldscope data because their standardization template already adjusted for cross-border reporting differences. Consistent with results in Table 3,

[16] Worldscope analysts use standard data definitions in their coding of financial statement information with the aim of minimizing international differences in accounting terminology, presentation and language (http://www-cgi.uni-regensburg.de/Fakultaeten/WiWi/roeder/DownloadsGeneral/Datastream%20Worldscope.pdf). For proprietary reasons Thomson does not publish specific details of its Worldscope global template.

valuation accuracy improves significantly across the sample period when peers are selected using as-reported data. Mean and median AVE^{AR} are significantly lower in the high alignment regime for both the pooled and balanced samples.

[Insert Table 6 about here]

The final four columns of Table 6 present evidence on pairwise differences between AVE^{WS} and AVE^{AR} in each alignment period and the difference-in-differences across the two periods. The mean and median pairwise difference between AVE^{WS} and AVE^{AR} in the low alignment period is generally indistinguishable from zero. In contrast, mean and median AVE^{AR} are consistently smaller than AVE^{WS} in the high alignment period for both the pooled and balanced samples.[17] The two-tailed probability value for the difference-in-differences test is also significant at the 0.01 level in all tests, which confirms that the improvement in valuation accuracy over time is more pronounced when peers are selected using as-reported data. These findings provide strong support for the view that enhanced financial statement comparability leads to improvements in multiples-based valuation through better peer selection.

Supplementary identification test: Conditioning on pre-adoption alignment with IFRS

Research indicates structural improvement in international accounting comparability following mandatory IFRS adoption in 2005 (Yip and Young 2012) and coincident regulatory developments (Christensen et al. 2012). If peer-based valuation accuracy is positively associated with accounting comparability then we expect to observe incremental accuracy improvements surrounding the IFRS mandate distinct from any general time trend effect. Our strategy for

[17] This finding might be driven by the fact that IFRS doesn't restrict accounting choices to standardized reporting methods for firms that subject to different economic events and transactions. The Worldscope global template, on the other hand, might restrict the accounting choices to the same standardized accounting methods across firms no matter whether they are subject to different economic events and transactions or not.

identifying IFRS-specific effects involves linking changes in AVE with the magnitude of adjustments to opening shareholders' funds in firms' first mandatory IFRS reporting period. IFRS 1: *First-time Adoption of International Financial Reporting Standards* requires first-time adopters prepare financial statements as if they had always applied IFRS, subject to various exemptions and exceptions. We use the difference between closing shareholders' funds in the final local GAAP reporting period and opening shareholders' funds in the first IFRS reporting period as a measure of alignment between firms' local GAAP reporting practices and IFRS.[18] All else equal, large (small) adjustments to opening shareholders' funds identify firms whose reporting practices differed from (overlapped with) IFRS. If mandatory IFRS adoption is associated with incremental improvements in peer-based valuation accuracy beyond underlying temporal convergence trends then these improvements should be increasing in the size of first-time adoption adjustments.[19]

We measure book value restatements using data from Extel's web and CD platforms. Extel's policy in the event of an accounting statement was to retrospectively overwrite as-reported figures with restated numbers. Accordingly, Extel replaced closing shareholders' funds in the final local GAAP balance sheet with the corresponding restated opening book value from the first IFRS balance sheet. Retrieving data for closing (opening) shareholders' funds for the last local GAAP (first IFRS) reporting period from the web-based platform therefore yields IFRS

[18] Formally, the opening IFRS balance sheet is the balance sheet at the date of transition to IFRS, which IFRS 1 defines as the start of the comparative period (i.e., the year preceding the first IFRS reporting period). For a firm whose reporting period began on January 1, 2005, the first 12-month IFRS reporting period is January 2005 to December 2005; the comparative period is January 2004 to December 2004; and the opening IFRS balance sheet and associated date of transition to IFRS is January 2004. We measure the difference between local GAAP and IFRS at the start of the first IFRS reporting period rather than at the date of transition to IFRS to minimize sample attrition and survivorship bias caused by requiring firms to have four years of data. Results and conclusions are unchanged when the analysis in Table 7 is repeated using transition date restatements.

[19] In supplementary untabulated tests we used the magnitude of earnings restatements to partition firms with similar results.

restated numbers. Although Extel applied a similar policy to its monthly CD service, the inability to overwrite data on old CDs facilitates retrieval of original as-reported data for the last local GAAP (first IFRS) reporting period. Comparing data from the two platforms provides a firm-level measure of the adjustment in opening shareholders' funds at mandatory adoption. We use the absolute value of this adjustment (scaled by market value) to rank firms with data for the last local GAAP reporting period and the second mandatory IFRS reporting period. All else equal, firms in the upper restatement tercile had lower pre-adoption alignment with IFRS and therefore faced greater cross-border comparability problems as a group. Conversely, firms in the lower restatement tercile enjoyed higher pre-adoption alignment with IFRS and therefore faced lower cross-border comparability problems as a group. We estimate equation (6), select peer firms, and compute AVE separately for each tercile. Finally, we compute the change in AVE from pre- to post-adoption period for each firm and test whether the increase in valuation accuracy is more pronounced for the upper adjustment tercile. Results are reported in Table 7.

[Insert Table 7 about here]

The decline in AVE from the date of the last local GAAP balance sheet to the second mandatory IFRS balance sheet is significantly different from zero in both terciles. However, the fall is more pronounced for firms with large restatements. These firms were characterized by low intra-group reporting alignment pre-transition and therefore are expected to have enjoyed the largest comparability gains from adopting IFRS. Mean (median) AVE fell by -0.147 (-0.129) for firms in upper restatement tercile compared to -0.061 (-0.086) for firms in the lower tercile. The 23 percent drop in mean AVE for the upper restatement tercile is economically and statistically larger than the corresponding 10 percent decline for the lower restatement tercile. These results are consistent with the predicted impact of enhanced comparability on peer-based valuation

accuracy, as distinct from a general time trend effect that likely accounts for improvements experienced by firms in the lower restatement tercile. A degree of caution is nevertheless warranted here because we are unable to replicate this result using industry-based foreign peers and neither do we observe an incrementally significant decline in pricing accuracy for warranted multiple foreign peers over industry-based foreign peers. Whether these null results are due to factors unrelated to accounting comparability causing the patterns documented in Table 7, or a lack of statistical power due to the small sample size, is unclear.

VII. SUMMARY AND CONCLUSIONS

Comparable firm selection represents a critical implementation step when applying the pricing multiple method. The degree of comparability between a target firm and its peers comprises two dimensions. The first dimension concerns the extent to which firms share similar economic characteristics. Prior research demonstrates the accuracy of value estimates derived from the pricing multiple method is increasing in the level of economic comparability between a target firm and its peer set (Boatsman and Baskin 1981, Alford 1992, Bhojraj and Lee 2002). The second dimension of comparability is a function of firms' financial reporting decisions. Holding economic fundamentals constant, cross-sectional variation in accounting methods has the potential to make similar firms appear different and different firms look similar. The problem of cross-firm variation in accounting practices is widely acknowledged by analysts and investment professionals in the context of pricing multiples. However, no prior literature documents the effect of the problem on equity valuation.

We examine the link between accounting comparability and the valuation performance of pricing multiples. We use Bhojraj and Lee's (2002) warranted multiple framework to demonstrate how more comparable accounting leads to higher multiple-based valuation accuracy

when peer firms are selected using accounting realizations. Specifically, we show that higher accounting comparability results in the identification of more economically similar peer firms, which in turn leads to more accurate pricing. We test this linkage using an international dataset that maximizes the degree of accounting comparability and changes therein. Firm value is estimated using a market-to-book multiple, with peers restricted to foreign firms selected on the basis of their warranted multiple. In addition to examining pricing accuracy, we also use the ability of value estimates to explain cross-sectional variation in price, and the explanatory power of the market-to-book pricing multiple for future multiples as alternative performance metrics. Results reveal a statistically and economically significant improvement in valuation performance following mandatory adoption of IFRS by European firms in 2005. Further analysis supports the view that increased valuation performance is the consequence of improved peer selection resulting from enhanced accounting comparability. However, the nature of our research question and empirical setting is such we cannot rule out the possibility that our results are driven by one of more unspecified factors unrelated to accounting convergence and our conclusions should be interpreted with this caveat in mind.

Regulators, investors, and accounting practitioners frequently highlight the financial statement analysis gains to enhanced accounting comparability, particularly in an international context (SEC 2012 and 2003, AICPA 2011). All else equal, comparable financial reporting is predicted to improve investors' ability to compare financial results across reporting entities. Our study speaks to such claims by demonstrating a potentially important but hitherto unexplored financial statement analysis benefit of enhanced (international) accounting convergence in the form of improved peer selection. Although our study does not seek evidence on analysts' actual peer selection decisions and valuation model choices, our findings are nevertheless relevant in

this regard. Insofar as analysts are unable to adjust fully for international GAAP differences (Bae et al. 2008), evidence that enhanced cross-border accounting comparability improves the accuracy of valuation by multiples (through improved peer selection) suggests incremental benefits to choosing foreign peers. Further, even if enhanced accounting comparability does not change actual peer selection decisions, it likely reduces the cost of financial analysis by reducing the need to adjust reported data when comparing financial outcomes. This in turn could have implications for the use of peer-based valuation methods by analysts.

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Table 1 Sample selection criteria for the Extel sample (1997 to 2008) and the combined Extel plus Reuters Knowledge sample (1997 to 2011), and sample composition for the Extel sample.

Panel A: Sample selection

	Extel		Extel + Reuters	
Extel firm-year population with fiscal year-ends between Jan 1, 1997 and Dec 31, 2008 for 15 European Union countries; Extel reporting currency ≠ "USA", "BMU", "CHE", "CYM", "MCO" or "VGB"		58,393		72,689
Less:				
Firm-years where 6000 ≤ SIC ≤ 6999	14,011		16,512	
Market-to-book ratio ≤ 0	6,532		7,287	
Price < €0.20	3,131		3,422	
Missing data for variables in warranted multiple regression	14,795		19,048	
U.S. or local GAAP post-2005	118		195	
Trimming to remove extreme observations	1,532		2,509	
AIM firm-years post-2005	398	(40,517)	398	(49,371)
Sample used for warranted multiple parameter estimation		17,876		23,318
Less:				
Observations with fiscal year-ends before December, 1997	366		366	
First financial statements following mandatory IFRS adoption	1,518		1,518	
AIM firm-years prior to mandatory IFRS adoption	229	(2,113)	229	(2,113)
Final sample used in valuation tests		15,763		21,205

Panel B: Composition of valuation sample by calendar year and country of listing for Extel sample

Sample by calendar year:			Sample by country of listing:		
Year	N	%	Country	N	%
1997	864	5.48	Austria	306	1.94
1998	1,238	7.85	Belgium	464	2.94
1999	1,333	8.46	Germany	1,927	12.22
2000	1,705	10.82	Denmark	483	3.06
2001	1,486	9.43	Spain	665	4.22
2002	1,359	8.62	Finland	676	4.29
2003	1,427	9.05	France	2,814	17.85
2004	1,862	11.81	Great Britain	4,304	27.30
2006	1,255	7.96	Greece	591	3.75
2007	1,700	10.78	Ireland	255	1.62
2008	1,534	9.73	Italy	1,017	6.45
			Luxembourg	64	0.41
			Netherlands	961	6.10
			Portugal	216	1.37
			Sweden	1,020	6.47
Total	15,763	100.00		15,763	100.00

This table reports the sample construction (in Panel A) and frequency counts by year and country (in Panel B) for the primary sample of firm-year observations used to test for changes in valuation accuracy in response to improvements in cross-border accounting comparability. The Extel sample comprises observations from Extel between December 1997 and December 2008. The Extel + Reuters sample comprises observations from Extel between December 1997 and December 2008, and observations from Reuters Knowledge between January 2009 and December 2011.

Table 2 Summary statistics and warranted multiple parameter estimates for Extel sample (1998 to 2008)

Panel A: Descriptive statistics for variables in warranted multiple regression (after trimming)

	N	Mean	St. dev	Max	Q3	Median	Q1	Min
PB	17,876	2.9010	2.8208	26.7411	3.4202	2.0606	1.2865	0.3023
INDPB	17,876	1.3902	0.6703	9.8481	1.7871	1.3291	0.9547	0.0001
CTYPB	17,876	1.1950	0.5588	3.1291	1.5350	1.2954	0.8408	0.0004
PM	17,876	0.0542	0.2346	0.4820	0.1223	0.0680	0.0289	-4.2141
NEGPM	17,876	-0.0321	0.2078	0.0000	0.0000	0.0000	0.0000	-4.2141
ROE	17,876	0.0958	0.2086	0.8062	0.1880	0.1181	0.0492	-1.0000
Growth	17,876	0.2950	0.5712	6.5912	0.2759	0.1458	0.0825	-0.4425
LEV	17,876	0.4875	0.6345	5.3495	0.6742	0.2943	0.0539	0.0000
RD	17,876	0.0275	0.1134	2.0294	0.0112	0.0000	0.0000	0.0000

Panel B: Summary statistics for warranted multiple regression estimated by year using trimming data

	Median coefficient estimates and standard errors by year:											
Variable	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Intercept	-0.7981	-1.3293	-1.9371	-0.5259	1.2414	0.0883	-0.1179	0.2292	0.0079	0.7456	0.4705	0.4982
	(0.300)	(0.371)	(0.416)	(0.290)	(0.207)	(0.173)	(0.278)	(0.255)	(0.361)	(0.215)	(0.166)	(0.127)
INDPB	1.2237	1.4055	2.1938	1.5692	0.6348	0.7226	0.9478	0.7354	0.6201	0.5263	0.4315	0.5687
	(0.118)	(0.118)	(0.126)	(0.142)	(0.127)	(0.098)	(0.107)	(0.094)	(0.101)	(0.080)	(0.085)	(0.113)
CTYPB	0.0005	0.6595	0.4088	-0.0028	-0.2978	0.5872	0.5381	0.3731	0.3527	0.1091	0.1341	0.0437
	(0.144)	(0.234)	(0.258)	(0.167)	(0.142)	(0.163)	(0.169)	(0.132)	(0.159)	(0.079)	(0.086)	(0.112)
PM	7.7228	6.9058	7.6709	8.3905	7.3921	3.9813	3.4885	4.1141	3.3934	2.4915	4.1244	3.8881
	(1.215)	(1.189)	(1.487)	(1.046)	(0.818)	(0.562)	(0.746)	(0.757)	(0.804)	(0.730)	(0.578)	(0.485)
NEGPM	-8.7810	-9.2190	-9.1416	-7.7009	-7.1323	-4.5102	-3.5171	-5.6653	-5.2469	-3.7800	-5.0052	-4.0169
	(1.402)	(1.935)	(1.791)	(1.113)	(0.854)	(0.622)	(0.844)	(0.907)	(0.911)	(0.963)	(0.676)	(0.573)
ROE	6.9783	4.5331	4.9652	4.1908	2.0170	1.8086	2.2446	3.2610	7.2414	6.4537	4.7970	2.0594
	(0.543)	(0.485)	(0.618)	(0.431)	(0.264)	(0.199)	(0.273)	(0.313)	(0.424)	(0.387)	(0.304)	(0.188)
Growth	0.8765	0.8736	1.7930	0.7978	0.0891	0.0101	0.2007	0.4975	1.1635	0.9005	0.6065	0.1217
	(0.219)	(0.205)	(0.241)	(0.139)	(0.080)	(0.056)	(0.079)	(0.103)	(0.156)	(0.138)	(0.112)	(0.066)

Table 2 *continued*

LEV	0.8819	0.5585	0.2178	0.3857	0.0972	0.2044	0.3787	0.1662	0.2776	0.5644	0.2157	0.1746
	(0.173)	(0.167)	(0.182)	(0.117)	(0.091)	(0.064)	(0.073)	(0.086)	(0.094)	(0.090)	(0.067)	(0.052)
RD	13.9531	8.0823	8.0733	3.6516	2.5119	0.2996	2.0260	0.9577	0.9646	2.4275	1.3436	2.1608
	(2.448)	(1.767)	(1.638)	(0.677)	(0.555)	(0.418)	(0.518)	(0.655)	(0.608)	(0.680)	(0.448)	(0.364)
Adj-R^2												
N	1200.5	1256.5	1339.5	1625.5	1397.0	1330.0	1392.5	1478.0	1486.5	1538.0	1606.0	1467.0

Panel A reports summary statistics for variables used in the warranted multiple regression. Variable definitions are as follows (Extel variable mnemonics are indicated using the prefix Ex.): *PB* is Datastream unadjusted price per share at fiscal year-end date t × unadjusted number of shares at the corresponding date × (1 – [RI_{t+4}/RI_t]), divided by common shareholders' equity [Ex.ShareholdersEquity - Ex.ShareholdersEquityPreferShare - Ex.ShareholdersEquityParticipShare], where RI_{t+4} is the Datastream return index for firm i four months after the fiscal year end and RI_t is the corresponding return index at the fiscal year-end; *INDPB* is the cross-country two-digit SIC industry-level harmonic mean *PB* for firm i at time t; *CTYPB* is the country-level harmonic mean *PB* for firm i at time t; *PM* is operating profit after depreciation [(Ex.Sales – Ex.SalesDicontinued) – (Ex.TradingExpenses – Ex.TradingExpenseDiscontinued)] divided by net sales [Ex.Sales – Ex.SalesDicontinued]; *NEGPM* is equal to *PM* × *Dum,* where *Dum* is an indicator variable equal to one if *PM* < 0 and zero otherwise; *ROE* is net income (Ex.NetIncome) before discontinued operations (Ex.AfterTaxDiscontOperationsExp) and extraordinary items (Ex.ExtraOrdChrg) divided by common shareholders' equity; *Growth* is IBES consensus long-term growth forecast at time $t + 4$ where available, or the implicit growth rate between the one- and two-year-ahead consensus forecasts otherwise; *Lev* is total long-term debt [Ex.Debt – Ex.DebtSTLoans] divided by common shareholders' equity; and *RD* is research and development expenditure (R&D) charged directly to income in the period [Ex.TradingExpResearchAndDevelopAR] divided by net sales. Panel B reports median coefficient estimates and model summary statistics for OLS warranted multiple regressions estimated for m month in calendar year y using the entire cross-section of foreign firms with fiscal year-ends falling in the 12-month window ending in month m – 1 of year y.

Table 3 Univariate tests examining the link between changes in international accounting comparability and valuation errors from a market-to-book model, where the valuation multiple is computed using foreign peer firms.

	Extel: 1997-2008						Extel + Reuters: 1997-2011					
		Absolute valuation error			*Signed error*			*Absolute valuation error*			*Signed error*	
Sample partition	N	Mean	Std	Median	Mean	Median	N	Mean	Std	Median	Mean	Median
Panel A: Valuation errors using four closest warranted multiple foreign peers												
Pooled sample												
Low alignment period	11,542	0.641	0.762	0.461	-0.108	0.120	11,542	0.641	0.762	0.461	-0.108	0.120
High alignment period	4,221	0.521	0.571	0.387	-0.064	0.091	9,663	0.560	0.655	0.418	-0.108	0.107
p-value for difference		0.001		0.001	0.004	0.001		0.001		0.001	0.025	0.001
Balanced sample (paired)												
Low alignment period	1,652	0.601	0.483	0.480	-0.036	0.117	1,815	0.601	0.483	0.480	-0.036	0.117
High alignment period	1,652	0.534	0.482	0.420	-0.092	0.029	1,815	0.573	0.530	0.442	-0.147	0.027
p-value for difference		0.001		0.001	0.003	0.001		0.647		0.029	0.001	0.001
Panel B: Valuation errors using industry mean foreign peers												
Pooled sample												
Low alignment period	11,542	0.584	0.567	0.467	0.029	0.196	11,542	0.584	0.567	0.467	0.029	0.196
High alignment period	4,221	0.528	0.502	0.418	-0.026	0.123	9,663	0.537	0.534	0.430	-0.025	0.170
p-value for difference		0.001		0.001	0.001	0.001		0.012		0.001	0.001	0.001
Balanced sample (paired)												
Low alignment period	1,652	0.563	0.413	0.485	0.089	0.229	1,652	0.563	0.413	0.485	0.089	0.229
High alignment period	1,652	0.553	0.484	0.433	-0.070	0.077	1,652	0.557	0.514	0.448	-0.110	0.081
p-value for difference		0.462		0.001	0.001	0.001		0.311		0.084	0.001	0.001

Table 3 *continued*

Panel C: Incremental valuation errors

Pooled sample												
Low alignment period	11,542	0.057	0.652	-0.005	NA	NA	11,542	0.057	0.652	-0.005	NA	NA
High alignment period	4,221	-0.007	0.512	-0.014	NA	NA	9,663	0.023	0.562	-0.009	NA	NA
p-value for difference		0.001		0.001				0.001		0.001		
Balanced sample (paired)												
Low alignment period	1,652	0.038	0.399	0.001	NA	NA	1,652	0.038	0.399	0.001	NA	NA
High alignment period	1,652	-0.019	0.428	-0.015	NA	NA	1,652	0.010	0.416	-0.010	NA	NA
p-value for difference		0.001		0.001				0.015		0.039		

This table presents univariate tests of valuation accuracy for periods of low and high cross-border accounting alignment using two different samples. The low alignment period comprises firm-years with fiscal years beginning prior to January 1, 2005 (pre-mandatory IFRS adoption), while the high alignment period comprises firm-years with fiscal years beginning after December 20, 2006 (post-mandatory IFRS adoption). The pooled sample comparison is a two-sample test comparing valuation errors from all available firm-years in the low and high alignment periods. The balanced sample (paired) compares the change in the average firm-level valuation errors across low and high alignment periods, where the average firm-level error for the respective interval is computed using all available observations for firms with at least one observation in both periods. Panel A presents absolute and signed valuation errors based on the four closest foreign peers selected using the warranted multiple method. Valuation errors are defined as the difference between *Market value*$_{t+4}$ and *Value estimate*$_{t+4}$, scaled by *Market value*$_t$. *Market value*$_{t+4}$ is the Datastream unadjusted price per share at fiscal year-end date t × unadjusted number of shares at the corresponding date × $(1 - [RI_{t+4}/RI_t])$, where RI_{t+4} is the Datastream return index for firm i four months after the fiscal year end and RI_t is the corresponding return index at the fiscal year-end; *Value estimate*$_{t+4}$ is the intrinsic value four months after fiscal year-end date t estimated using market-to-book warranted multiple method; *Market value*$_t$ is the Datastream unadjusted price per share at fiscal year-end date t × unadjusted number of shares at the corresponding date. Panel B reports absolute and signed valuation errors with peers defined as all foreign firms from the same two-digit SIC group and with fiscal year-ends preceding date t for target firm i by no more than six months. Panel C presents incremental absolute valuation errors, defined as the absolute valuation errors computed using warranted multiple peers (Panel A) minus corresponding valuation errors based on industry peers (Panel B). Corresponding differences in signed valuation errors are not applicable (NA) and therefore not reported. Two-tailed probability values for two-sample tests relate to t-tests (means) and Wilcoxon Sign Rank tests (medians). Two-tailed probability values for paired sample tests relate to a paired t-test (means) and a paired Wilcoxon Signed Rank test (medians).

Table 4 Coefficient estimates and summary statistics for OLS regressions of absolute valuation errors on proxies for international accounting convergence and a vector of control variables. Two-tailed probability values computed using standard errors clustered by firm are reported in parentheses.

	Extel: 1997-2008			Extel + Reuters: 1997-2011		
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.787	0.843	0.649	0.790	0.818	0.710
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Timetrend	-0.021	-0.025		-0.014	-0.015	
	(0.001)	(0.001)		(0.001)	(0.001)	
Hi_align			-0.108			-0.058
			(0.001)			(0.001)
Market capitalization	0.000	0.000	0.000	0.000	0.000	0.000
	(0.003)	(0.008)	(0.010)	(0.016)	(0.047)	(0.050)
Price-to-book ratio	-0.007	-0.012	-0.011	-0.025	-0.029	-0.028
	(0.012)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Loss indicator	0.077	0.075	0.078	0.132	0.126	0.128
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R&D indicator	0.147	-0.020	-0.031	0.314	0.222	0.212
	(0.071)	(0.837)	(0.745)	(0.003)	(0.113)	(0.128)
EU Big3 indicator	0.034	0.024	0.037	0.025	0.028	0.033
	(0.043)	(0.185)	(0.046)	(0.069)	(0.063)	(0.029)
Annual GDP growth		0.235	0.610		-0.731	-0.512
		(0.733)	(0.391)		(0.027)	(0.119)
Quarterly GDP growth		-0.454	0.055		0.613	0.840
		(0.411)	(0.922)		(0.070)	(0.014)
Market volatility		0.000	0.000		0.000	0.000
		(0.952)	(0.632)		(0.101)	(0.037)
Firm volatility		0.000	0.000		0.000	0.000
		(0.081)	(0.225)		(0.808)	(0.601)
December FYR	-0.011	-0.030	-0.043	-0.052	-0.054	-0.063
	(0.599)	(0.199)	(0.064)	(0.004)	(0.005)	(0.001)
Forecasted growth spread		0.000	0.000		0.000	0.000
		(0.271)	(0.540)		(0.404)	(0.611)
Discount rate spread		0.018	0.016		0.017	0.020
		(0.332)	(0.384)		(0.369)	(0.287)
Industry indicators	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	1.92	2.01	1.58	2.62	2.43	2.21
N	15,763	12,747	12,747	21,166	17,751	17,751

This table reports coefficient estimates and model summary statistics for OLS regressions of absolute valuation errors on proxies for international accounting convergence and a vector of control variables. Models 1 to 3 are estimated using all firm-years with non-missing data from Extel for fiscal year-ends between December 1997 and December 31, 2008 (excluding those between December 20, 2005 and December 20, 2006). Models 4 to 6 are estimated using all firm-years with non-missing data from Extel and Reuters Knowledge for fiscal year-ends between December 1997 and December 31, 2011 (excluding those between December 20, 2005 and December 20, 2006). Variable definitions for regression variables are as follows: absolute valuation error is the absolute difference between *Market value*$_{t+4}$ and *Value estimate*$_{t+4}$, scaled by *Market value*$_t$ for firm *i* from country *c* at fiscal year-end *t* (see Table 3 for definitions); *Timetrend* is equal to fiscal year minus 1997; *Hi_align* is equal to one for observations

Table 4 *continued*

with fiscal year-ends on or after December 20, 2006 and zero otherwise; *Market capitalisation* is equal to Datastream unadjusted price at fiscal year-end t × the unadjusted number of shares at the corresponding date; *Price-to-book ratio* is Datastream unadjusted price per share at fiscal year-end date t × unadjusted number of shares at the corresponding date × $(1 - [RI_{t+4}/RI_t])$, divided by common shareholders' equity, where RI_{t+4} is the Datastream return index for firm i four months after the fiscal year-end and RI_t is the corresponding return index at the fiscal year-end; *Loss indicator* is equal to one when return on equity is negative and zero otherwise; *R&D indicator* is equal to one where the amount spent on research and development in year t is positive and zero otherwise; *EU Big3 indicator* is an indicator variable equal to one if firm i is from France, Germany or the United Kingdom, and zero otherwise; *Annual GDP growth* is the real growth in GDP for country c over the four-quarters ending in the quarter for fiscal year-end t; *Quarterly GDP growth* is the seasonally adjusted real growth in GDP for country c over the three-month period ending in the month of fiscal year-end t; *Market volatility* is standard deviation of daily closing prices computed over the 90-day trading period ending on valuation date $t + 4$ for country c's primary stock index; *Firm volatility* is the standard deviation of stock price for firm i computed over the 30-day trading window ending on valuation date $t + 4$; *December FYR* is an indicator for firms December fiscal year-ends; *Forecasted growth spread* is the standard deviation of dispersion in the IBES long-term growth forecast based on the target firm i and its four closest peers identified by the warranted multiple method; *Discount rate spread* is the standard deviation of the cost of equity based on the target firm i and its four closest peers identified by the warranted multiple method, where cost of equity is computed using CAPM; *Industry indicators* is a vector of indicator variables relating to one-digit SIC codes.

Table 5 Coefficient estimates and regression summary statistics for models explaining observed market price (Panel A) and predicting future market-to-book ratios (Panels B and C).

	Low alignment period (Extel)	High alignment period (Extel)	High alignment period (Extel + Reuters)
Panel A: Explaining observed market value			
	Model 1	Model 2	Model 3
Intercept	1144.697	936.406	818.824
	(0.001)	(0.001)	(0.001)
Value estimate	0.613	0.697	0.718
	(0.001)	(0.001)	(0.001)
Adj-R^2 (%)	59.60	74.30	72.90
N	11,542	4,221	9,663

Panel B: Predicting one-year-ahead market-to-book ratios

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept	1.021	0.872	0.766	1.250	0.799	0.465	1.643	1.498	1.185
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001	(0.001)
INDPB	0.839	0.587	0.250	0.411	0.173	0.059	0.607	0.038	-0.306
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.204)	(0.001)	(0.345)	(0.001)
CTYPB	0.334	0.319	0.324	0.141	-0.064	-0.158	0.136	-0.236	-0.462
	(0.001)	(0.001)	(0.001)	(0.003)	(0.164)	(0.001)	(0.001)	(0.001)	(0.001)
VM		0.235	0.068		0.441	0.255		0.709	0.341
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
WM			0.302			0.359			0.719
			(0.001)			(0.001)			(0.001)
Adj-R^2 (%)	7.34	9.54	11.80	3.54	14.33	17.59	3.23	15.77	22.05
N	9,071	9,071	9,071	2,674	2,674	2,674	8,468	8,468	8,468

Panel C: Predicting two-year-ahead market-to-book ratios

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept	1.716	1.625	1.603	1.488	0.969	0.672	2.511	2.398	2.153
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001	(0.001)	(0.001)
INDPB	0.517	0.347	0.274	0.188	0.049	-0.054	0.305	-0.141	-0.406
	(0.001)	(0.001)	(0.001)	(0.001)	(0.377)	(0.338)	(0.001)	(0.062)	(0.001)
CTYPB	0.102	0.085	0.085	-0.065	-0.181	-0.250	-0.197	-0.489	-0.677
	(0.052)	(0.103)	(0.101)	(0.258)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
VM		0.158	0.122		0.324	0.178		0.554	0.277
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
WM			0.065			0.291			0.558
			(0.002)			(0.001)			(0.001)
Adj-R^2 (%)	2.60	3.59	3.69	0.83	10.52	13.42	0.66	7.97	11.45
N	8,550	8550	8,550	1,185	1,185	1,185	7,552	7,552	7,552

This table reports results for explainability and predictability models estimated separately for periods of low and high cross-border accounting alignment. The low alignment period comprises firm-years with fiscal years beginning prior to January 1, 2005 (pre-mandatory IFRS adoption). The high alignment period (Extel) comprises firm-years with available data from Extel with fiscal years from December 2006 through December 2008 (post-mandatory

Table 5 *continued*

IFRS adoption). The high alignment period (Extel + Reuters) comprises firm-years with available data from Extel and Reuters Knowledge with fiscal years from December 2006 through December 2011 (post-mandatory IFRS adoption). Panel A reports coefficient estimates and model summary statistics for OLS regressions of *Market value*$_{t+4}$ on *Value estimate*$_{t+4}$,. *Market value*$_{t+4}$ is the Datastream unadjusted price per share at fiscal year-end date t × unadjusted number of shares at the corresponding date × $(1 - [RI_{t+4}/RI_t])$, where RI_{t+4} is the Datastream return index for firm i four months after the fiscal year end and RI_t is the corresponding return index at the fiscal year-end; *Value estimate*$_{t+4}$ is the intrinsic value four months after fiscal year-end date t estimated using market-to-book warranted multiple method. Panel B (C) reports coefficient estimates and model summary statistics for OLS regressions of one-year-ahead (two-year-ahead) observed market-to-book ratios for firm i on current-period (time t) market-to-book multiples computed using the following peer selection methods: *INDPB* is the harmonic mean market-to-book ratio computed using all firms with available data (foreign and domestic) in the same two-digit SIC group as firm i at time t; *CTYPB* is the harmonic mean country-level market-to-book ratio computed using all firms with available data from the same country as firm i at time t; *VM* is the harmonic mean market-to-book ratio based on the four closest peers to firm i at time t selected using the warranted multiple method; and *WM* is the corresponding warranted market-to-book multiple estimated for firm i at time t using equation (7).

Table 6: Analysis of firm-level differences in absolute valuation errors when peers are selected using Worldscope and as-reported data.

		AVE^{WS}			AVE^{AR}			Difference		p-value for difference	
	N	Mean	Std	Median	Mean	Std	Median	Mean	Median	T-test	Wilcoxon
Pooled sample											
Low alignment period	9,744	0.575	0.591	0.445	0.597	0.701	0.438	-0.023	0.009	0.001	0.263
High alignment period	8,243	0.561	0.591	0.426	0.514	0.540	0.405	0.047	0.023	0.001	0.001
p-value for difference		0.118		0.003	0.001		0.001	0.001	0.001		
Balanced sample											
Low alignment period	1,452	0.568	0.403	0.468	0.572	0.426	0.462	-0.004	0.016	0.675	0.143
High alignment period	1,452	0.590	0.454	0.475	0.542	0.443	0.428	0.048	0.034	0.001	0.001
p-value for difference		0.135		0.967	0.033		0.001	0.001	0.001		

This table reports descriptive statistics for absolute valuation errors derived from peers based on warranted multiples estimated using as-reported data (AVE^{AR}) and standardized data from Worldscope (AVE^{WS}). Tests are based on the combine Extel and Reuters sample for the period 1997 through 2011. As-reported data are taken from Extel in the low alignment period and a combination of Extel (2006-2008) and Reuters (2009-2011) in the high alignment period. For every firm-year observation for which data are available, we estimate equation (6) and select peers separately using Worldscope and as-reported data. The resulting two peer sets for each firm-year are used in conjunction with shareholders' funds data from Extel to estimate intrinsic value via equation (5). The pooled sample comparison is a two-sample test comparing valuation errors from all available firm-years in the low and high alignment periods. The balanced sample compares the change in the average firm-level valuation errors across low and high alignment periods, where the average firm-level error for the respective interval is computed using all available observations for firms with at least one observation in both periods. Two-tailed probability values for paired sample tests relate to a paired t-test (means) and a paired Wilcoxon Signed Rank test (medians).

Table 7: Changes in absolute valuation errors conditional on alignment with IFRS reporting practices at mandatory adoption.

	Absolute valuation error (*AVE*) conditional on restatement of opening shareholders' funds in the first IFRS reporting period:						P-value for two-sample difference:	
	Upper restatement tercile			Lower restatement tercile				
	N	Mean	Median	N	Mean	Median	T-test	Wilcoxon
AVE pre-IFRS adoption	443	0.6362	0.5078	381	0.6087	0.5102		
AVE post-IFRS adoption	443	0.4893	0.3942	381	0.5478	0.4391		
ΔAVE	443	-0.1470	-0.1289	381	-0.0610	-0.0855	0.023	0.022
P-value for paired change		0.001	0.001		0.070	0.001		

This table reports average absolute valuation error (*AVE*) for firms partitioned according to the size of the adjustment to opening book value of shareholders' funds in the first IFRS balance sheet for year-ends beginning on or after January 1, 2005. The sample comprises firms with data available for the last financial statements prepared under local GAAP and the second set of financial statements prepared under IFRS. Restatement magnitude is measured as the absolute value of the difference between the as-reported value of opening shareholders' funds (retrieved from Extel's CD platform) and the corresponding restated value (retrieved from Extel's web-based platform), scaled by market value. Firms are allocated to terciles based on their restatement magnitude ranking, with the upper (lower) tercile comprising firms with the largest (smallest) proportionate transitional balance sheet adjustment. The process of estimating equation (6), selecting peer firms, and computing absolute valuation errors (*AVE*) is performed separately for each tercile group. *ΔAVE* is the change in absolute valuation error from pre- to post-adoption period. Two-tailed probability values are reported for paired and two-sample t- (Wilcoxon) tests.