Cash Flow is King? Comparing Valuations Based on Cash Flow Versus Earnings Multiples

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Industry multiples are used often in practice, both to provide stand-alone "quick and dirty" valuations as well as to anchor more complex discounted cash flow valuations. To obtain a valuation, just multiply a value driver (such as earnings) for that firm by the corresponding multiple, which is based on the ratio of stock price to that value driver for a group of comparable firms. Choices for value drivers include various measures of cash flows, book value, earnings and revenues, but earnings and cash flows are by far the most commonly used. In this study we compare the valuation performance of earnings multiples versus multiples based on two measures of cash flows—operating cash flows and dividends—for a large sample of firms drawn from ten markets.

To clarify, valuation performance here does not refer to picking mispriced stocks.[1] We focus instead on how close valuations based on industry multiples are to traded prices. Our objective is to provide a comprehensive investigation of whether earnings or cash flows best represent a summary measure of value. Our main finding is that valuations based on forward earnings multiples are remarkably close to traded prices, and considerably more accurate than valuations based on cash flow multiples.

At a conceptual level, earnings should be a more representative value driver because earnings seek to reflect value changes regardless of when the cash flow occurs. For example, the promise to deliver health benefits later when employees retire is a compensation cost, similar to cash wages. Whereas current cash flows remain unaffected by this promise, earnings are reduced by an expense equal to the present value of that deferred compensation. Conversely the purchase of inventory for cash reduces operating cash flow whereas earnings remain unaffected, because it does not alter value. Still, many practitioners prefer to use cash flow multiples, arguing that accruals involve discretion and are often used to manipulate earnings. They also point out that expenses such as depreciation and amortization deviate substantially from actual value declines because they are based on ad hoc estimates which are in turn derived from potentially meaningless historical costs.

In Liu, Nissim and Thomas (2002), we find that multiples based on reported earnings outperform multiples based on a variety of reported operating cash flow measures. These

[1] For example, valuation performance could be measured as the returns earned by a strategy that invests short (long) in stocks with P/E ratios that are higher (lower) than the industry median, based on the argument that over (under) valued stocks will have relatively high (low) P/E ratios.

findings, however, are based on reported values of earnings and cash flows and a restricted sample (U.S. firms that satisfy extensive data requirements). In this study, we extend the analysis to determine if the balance tilts in favor of cash flows when we consider a) forecasts rather than reported numbers, b) dividends as well as operating cash flows, c) individual industries rather than all industries combined, and d) firms in other markets beyond the U.S.

We consider the first extension because reported operating cash flows often reflect non-recurring payments or receipts, which blur the relation between current cash flows and value. For example, a firm may engage in a large securitization transaction, thereby increasing operating cash flows above its normal, recurring level. To the extent that such transitory effects are excluded from cash flow forecasts (as analysts may not attempt to, or may not be able to, forecast such transactions), there should be a commensurate performance improvement as we move from reported cash flows to cash flow forecasts. Our results suggest that while operating cash flow forecasts do indeed outperform reported numbers, there is an even greater performance improvement for forecast earnings over reported earnings. That is, the performance gap between earnings and operating cash flows increases as we move from reported numbers to forecasts.

We consider the second extension because stock price is related more directly to expected dividends (Williams, 1938) than to expected operating cash flows. Moreover, managers might choose to signal long-term prospects via dividends. Although many firms do not pay dividends (only 30 percent of publicly-traded U.S. firms paid dividends in 2003), dividends may outperform operating cash flows within the subset of firms paying dividends. We find results similar to those observed for operating cash flows: reported earnings outperform reported dividends, and that lead increases as we move from reported numbers to forecasts. .[2]

The third extension allows us to investigate whether the performance of earnings and cash flow multiples vary across industries (hereafter “cash flow” includes both operating cash flows and dividends). Numerous arguments have been offered in the practitioner literature for why cash flows should perform well in some but not other industries. While there are performance differences across industries for cash flow multiples, our results suggest that earnings multiples continue to outperform cash flow multiples in most industries.

Our final extension is driven by the greater availability of cash flow forecasts for overseas firms, but it also allows us to document across-market patterns in the performance of earnings, operating cash flows, and dividends. We find our overall results are generally representative of the results within individual countries. One notable exception to this general pattern is Japan, where earnings multiples do not perform as well as in other countries, and as a result their performance is closer to that for dividend multiples.

Multiple-Based Valuation

Valuation based on industry multiples boils down a complex function of discount rates and future cash flows into a simple proportional relation: predicted value equals the level of the value driver for that firm times the corresponding industry multiple. Since the industry multiple is an “average” ratio of stock price to value driver for the remaining firms in the industry,

[2] Given that dividends are generally sticky, readers may not be surprised by the small performance improvement of forecast dividends over reported dividends. Interestingly, dividends are relatively less sticky in Australia and Hong Kong, and the relative superiority of forecast dividends over reported dividends is highest in these two countries.

predicted values based on multiples will be close to traded stock prices if firms in the industry are relatively similar in terms of the ratio of price to value driver. That is, our research question can be viewed intuitively as follows: are firms within an industry more homogeneous in terms of price-earnings ratios or price-cash flow ratios? Stated differently, if we plot histograms of the price-earnings and price-cash flow ratios within an industry, the value driver with a tighter distribution should result in better multiple valuations, because a tighter distribution indicates that firms' ratios are closer to each other and therefore closer to the industry average. While comparing the tightness of such distributions would allow us to rank earnings versus cash flows in each industry, it would not quantify the extent to which valuations from earnings and cash flow multiples deviate from traded stock prices. The methodology that allows us to do so is described next.

For each value driver, we first calculate an industry multiple for each firm based on the prices and value drivers for all remaining firms in that industry/country/month combination. (Deleting the target firm from the industry before calculating the industry multiple is necessary to avoid the target's valuation being contaminated by its own price.) To obtain an industry multiple, analysts often use the average or median value of the ratio of price to value driver for the industry. Based on findings of academic research, we use the harmonic mean instead, where the harmonic mean is calculated by first finding the average value driver to price ratio for the industry and then inverting that average.[3]

To illustrate, assume that there are 5 companies in the steel industry in Australia in May 1989, indexed by i = 1, 2…5, with earnings per share (eps) of \$1.50, \$3.00, \$2.50, \$0.50 and \$2.00, and share prices of \$20, \$35, \$45, \$25 and \$30, respectively. Assume that we wish to calculate the industry multiple that is relevant for firm *i* = 3. If we had used the average ratio of price to eps of the remaining four firms, the industry multiple would be:

$$\text{average P/E ratio} = \frac{1}{4} \times \left[\frac{20}{1.50} + \frac{35}{3.00} + \frac{25}{0.50} + \frac{30}{2.00} \right] = 22.5$$

In contrast, if we use the harmonic mean P/E ratio, the industry multiple for firm i = 3 is the inverse of the mean E/P ratios for the remaining four firms.

$$\text{harmonic mean P/E ratio} = \frac{1}{\frac{1}{4} \times \left[\frac{1.50}{20} + \frac{3.00}{35} + \frac{0.50}{25} + \frac{2.00}{30} \right]} = 16.17$$

The large difference between the two multiples (22.5 and 16.17) is due primarily to firm *i*=4, which has a price-earnings ratio of 50 (= 25/0.50). Without this firm, the harmonic mean multiple is 13.19 and the average multiple is 13.33, which are closer to each other. To the extent that some high P/E values are caused by temporarily low values of eps, the average multiple is skewed upward by those firms. The harmonic mean provides a way to mitigate the effect of such

3 Baker and Ruback (1999) demonstrate that the magnitude of pricing errors tends to increase with price, and thus the harmonic mean is a better estimator of the industry multiple than other estimators such as the arithmetic mean or median. As demonstrated in the example below, the harmonic mean gives less weight to firms with relatively high price per share, consistent with the larger absolute valuation errors that typify these firms. Indeed, several subsequent studies (e.g., Beatty, Riffe, and Thompson (1999) and Liu, Nissim and Thomas (2002)) confirm that the harmonic mean performs well in terms of minimizing price-deflated pricing errors.

firms by first inverting the P/E ratio before finding the average; moving low values of eps from the denominator to the numerator reduces their impact on the industry multiple.

After obtaining an industry multiple for the target firm, we calculate the predicted value by multiplying the harmonic mean industry multiple by the eps for that firm. The predicted value for firm i=3 is $40.43 (= 16.17 × $2.50). Finally, we calculate a pricing error or valuation error by subtracting that predicted value from the actual price (valuation error is $4.57 = $45 – $40.43). To allow comparison of valuation errors across stocks of different value, we deflate all valuation errors by the stock price to get a price deflated valuation error (price deflated valuation error is 10.2% = $4.57/$45). We then repeat the process for the remaining firms in the industry to obtain a set of price deflated valuation errors based on eps for the steel industry in Australia in May, 1989. A similar set of price deflated valuation errors is computed for the same firms for operating cash flows and dividends. That entire process is repeated for other industries within each country and then repeated again for other months.

When comparing two value drivers across a country or industry, we pool together the price deflated valuation errors for that country/industry for each value driver. Since the mean price-deflated valuation error is expected to be zero, the value driver with smaller valuation errors will exhibit a tighter distribution of valuation errors, with many firms bunched close to zero. In effect, the dispersion of the distribution of price deflated valuation errors offers a convenient summary measure of how well different value drivers perform.

U.S. Evidence From an Earlier Study: The Dominance of Earnings and Earnings Forecasts

In Liu, Nissim and Thomas (2002), we examine the pricing performance of a large set of multiples using a sample of 19,879 U.S. firm-year observations during the period 1982 through 1999. **Table 1** presents statistics from the distributions of the price-deflated valuation errors of selected industry multiples: book value (BV), operating cash flow (OCF), earnings before interest, taxes, depreciation and amortization (EBITDA), earnings per share (EPS), revenue (SALES), and consensus analysts' one year out and two year out EPS forecasts (EPS1 and EPS2 respectively).

Examination of the standard deviation and three non-parametric dispersion measures (interquartile range or 75th percentile less 25th percentile, 90th percentile less 10th percentile, and 95th percentile less 5th percentile) suggests the following ranking of multiples. Forecasted earnings perform best—they exhibit the lowest dispersion of pricing errors. This result is intuitively appealing because earnings forecasts should reflect future profitability better than historical measures. Consistent with this reasoning, performance improves with forecast horizon: the dispersion measures for two-year out forward earnings (EPS2) are lower than those for one-year out earnings (EPS1). Among historical or reported value drivers, earnings dominate all other value drivers; SALES and OCF are the worst performers; and EBITDA and book value lie in the middle. These results are generally consistent with the view that accounting rules seek to link earnings to value changes; earnings outperform sales because they incorporate relevant expenses, and earnings outperform cash flows because they ignore current period cash flows that are not value-relevant and incorporate value-relevant cash flows that occur in other periods.

International Sample Used in this Study

We obtain forecast and reported (or actual) data from the IBES International Summary and Actual files, respectively. These files provide consensus analyst forecasts and reported numbers for different value drivers at a monthly frequency. The actual measures are for the most recently published annual report and the forecast measures we use are the consensus (mean) estimates during the month for the next full fiscal period. For example, actual EPS for a U.S. calendar-year firm in May of 1990 would refer to the EPS reported for 1989 (announced some time early in 1990) and forecast EPS would refer to the consensus EPS forecast for 1991, based on forecasts available as of the third Friday in May 1990.[4] Per share prices as of that date are also obtained from IBES. Even though we refer to the prior year's EPS as actual or reported EPS, IBES often adjusts them to remove some one-time items that analysts did not forecast. Since operating cash flow numbers are derived from earnings, actual operating cash flows reported by IBES may have also been adjusted to remove some one-time items. No adjustments are made by IBES to actual dividends.

IBES currently collects forecasts for a total of 63 countries, but the number of observations that satisfy the sample selection requirements discussed below is relatively small for many countries. We identified the following 10 countries that had the most available data for earnings forecasts: Australia, Canada, France, Germany, Hong Kong, Japan, South Africa, Taiwan, UK, and US. We analyze the performance of EPS multiple valuations for each of these countries (see discussion of Figure 1 below). However, when we compare earnings and cash flow multiples, we use subsets of these countries where selection biases are less likely to affect the results.

The potential for selection bias exists because forecasts for operating cash flows and dividends are not as frequent as earnings forecasts, especially for certain country/sector combinations. Whereas earnings forecasts are almost always provided for firms followed by analysts, forecasts for operating cash flows and dividends appear to be provided on an optional basis. In particular, cash flow forecasts are more likely to be provided in sectors where earnings forecasts are less informative and cash flow forecasts are more informative, relative to other sectors (see, for example, the evidence in Defond and Hung, 2003 regarding US firms providing operating cash flow forecasts). Thus, to mitigate selection biases due to the non-randomness of the availability of cash flow forecasts, we require two conditions for a country to be included in the operating cash flow/dividend samples: a) there should be a sufficiently large fraction of firms with operating cash flow/dividend forecasts, and b) the across-sector distributions of these forecasts should resemble the corresponding distributions for earnings forecasts. For the first condition, we required that 30 percent of observations with earnings forecasts also have forecasts for cash flows/dividends. For the second condition, we calculate the absolute value of the difference between the percentages of sample firms in each sector with earnings forecasts less the corresponding percentage for operating cash flows/dividends, and require that the average absolute difference across all sectors for that country be less than 2 percent. We also examine the country/year distributions for the three value drivers to confirm that the forecasts are not concentrated in a few years. The countries with sufficient and representative forecasts for operating cash flow are Australia, France, Hong Kong, Taiwan and UK; the corresponding countries for dividend forecasts are Australia, France, Germany, Hong Kong, Japan, South Africa, and UK. These subsets of countries are used in the comparisons of earnings with cash flow from operations and dividends, respectively.

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4 While analysts also provide 1 year-out (for 1990) forecasts, we elected not to use them as they represent a mixture of actuals for interim periods already reported and forecasts for the remaining interim periods.

Comparison of firm-years with both earnings and operating cash flow forecasts with the remaining firm-years in our sample suggests that the former subgroup has larger market capitalization on average; the P/E ratios are however similar. Similarly, firm-years with both earnings and dividend forecasts have larger market capitalization than the remaining firm-years, although the difference is not as large as for the cash flow sample; again, the P/E ratios across both subgroups are comparable.

Appendix A discusses how per share earnings (EPS), operating cash flows (OCPS) and dividends (DPS) are calculated normally according to IBES. **Appendix B** summarizes how those variables are calculated in different countries and how they differ from the norm described in Appendix A. In terms of comparability across countries, dividends are comparable across the sample, operating cash flows are generally defined similarly (equal approximately to operating cash flows from the cash flow statement), and earnings are measured differently to the extent that accounting rules vary across countries and over time. For Germany, analysts follow their own conventions when calculating earnings, rather than the local accounting rules.[5] If the firm is followed on a diluted basis, we use the IBES dilution factor to convert per share variables to a primary basis.

To construct our sample, we merge the summary and actual files, and then select all observations where price, outstanding shares, and the actual and forecasted values for the value driver are non-missing (IBES reports separate observations for each value driver).[6] Next, we create one observation from each set of company-month observations, defining six variables corresponding to the actual and forecasted values of per share earnings, operating cash flows, and dividends. To maintain the largest possible sample size for each value driver, a firm-month observation is retained as long as at least one of the six variables is positive.[7] The initial sample includes 1,559,421 observations for 25,843 firms, and the sample period extends from January 1987 through September 2004. To mitigate the effect of influential observations, we set to missing values of variables that, when deflated by price, lie outside the 1st to 99th percentiles of the pooled distribution for that variable.

Our data requirements when making pair-wise comparison are: a) both value drivers have positive values, and b) there are at least six observations that satisfy the first requirement from the same country-industry-month combination (so that a minimum of five firms are available to calculate industry multiples for both value drivers). We use the intermediate Industry classification from the Sector/Industry/Group classification by IBES (see Appendix A), because visual examination of firms included in the same Sector suggests it is too broad a classification to

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5 The German financial analyst society, Deutsche Vereinigung fur Finanzanalyse (DVFA), has developed a system used by analysts (and often by firms) to adjust reported earnings data to provide a measure that is closer to permanent or core earnings. The adjustment process uses both reported financial information as well as firms' internal records.

6 To prevent duplication, we delete all observations with a "secondary" flag (for the actual or forecast). Also, to assure consistency when merging, we delete observations where the fiscal year end for the actual was not exactly 24 months before the fiscal year end of the forecast.

7 Since prices are positive, the multiples approach requires that both comparable and target firms have positive value drivers. The proportion of observations with negative values of actual (forecast) EPS and OCPS is 15 (5) and 8 (1) percent; no negative values are observed for actual or forecast DPS. While there are ordinarily few cases where the value driver is zero, this condition is observed often for the case of dividends (16 percent for actual dividends and 10 percent for forecast dividends) and occasionally for actual OCPS observations (1 percent).

allow the selection of homogeneous firms, and tabulation of the number of firms in different Groups suggests it is too narrow to allow the inclusion of sufficient comparable firms. Using pair-wise comparisons leaves us with substantially larger samples than if we had required non-missing data for all variables, which in turn increases the extent to which our results can be generalized.

International Results

We begin by comparing earnings with operating cash flows for the five countries in that sample and then repeat the process for earnings and dividends for the seven countries in the dividend sample. Our final set of results describes the performance of multiple valuations based on earnings forecasts for all ten countries.

We use the inter-quartile (IQ) range of the dispersion of price deflated valuation errors as a measure of the performance of different value drivers. We do so because it is less sensitive to outliers, relative to other dispersion measures such as Standard Deviation or Root Mean Squared Errors. However, we obtain results that are qualitatively similar to those reported below when using alternative ranges (10%-90% and 5%-95%). We also confirm that these IQ ranges for the different pricing error distributions straddle a median that is approximately zero. When comparing two value drivers, say 1 and 2, we report the interquartile range for the distributions of pricing errors for both variables (IQ_1 and IQ_2), and then measure the relative improvement (%IMP) in performance of variable 2 over variable 1 by calculating the percentage decrease in the interquartile range (%IMP= 100% $\times$ ($IQ_1 - IQ_2$) / IQ_1). We also compute a *t*-statistic for %IMP, derived from a bootstrap approach (see Liu, Nissim, and Thomas, 2002 for details).

Operating Cash Flows versus Earnings. Columns 9 through 12 in Panel A of **Table 2** contain the results of comparing earnings forecasts with operating cash flow forecasts. Columns 9 and 10 contain the IQ ranges of percent pricing errors for earnings and operating cash flow forecasts, respectively, column 11 reports the improvement in performance (%IMP) for column 10 over column 9 (negative values indicate lower IQ ranges or higher performance for the value driver in the first column), and column 12 provides the sample size for each country. The mean and median IQ ranges for the distribution of percent pricing errors for earnings forecasts reported in the bottom two rows of column 9 (0.524 and 0.548, respectively) are substantially lower than the column 10 mean and median IQ ranges for operating cash flow forecasts (0.639 and 0.665, respectively). The large negative values of %IMP observed for all five countries in column 11, between a high of almost 26% for the UK and a low of almost 18% for Taiwan, indicate the extent to which earnings forecasts outperform operating cash flow forecasts (all differences are statistically significant at the 1 percent level).[8]

Columns 1 through 4 repeat the comparison in terms of actual operating cash flows versus forecasts. The degree to which the IQ ranges in column 2 for forecasts are lower than those in column 1 for actuals are represented by the %IMP values reported in column 3 (mean and median of 16.34 and 15.81 percent, respectively). The next four columns repeat the comparison in terms of actual earnings versus forecasts. As with operating cash flows, we find that the IQ ranges for forecasts in column 6 are substantially lower than those for actual earnings in column 5, indicated by mean and median %IMP values in column 7 of 21.59 and 22.95

[8] See Figure 1 and the related discussion for a graphical approach to illustrate performance differences.

percent, respectively. The important finding is that while moving from actuals to forecasts improves performance for both value drivers, that improvement is greater for earnings.

Comparing the IQ ranges for earnings forecasts in column 6 with those in column 9 indicates the extent to which our comparisons of forecasts of earnings and operating cash flows are biased against earnings. The lower IQ ranges for the larger samples in column 6 (mean and median of 0.478 and 0.481, respectively), relative to those for the subset of firm-years with both earnings and operating cash flow forecasts reported in column 9 (mean and median of 0.524 and 0.548, respectively) suggest that operating cash flow forecasts are less likely to be provided in cases where earnings performance is relatively better.

The last four columns in Panel A report the results for a comparison of reported earnings and operating cash flows. While the %IMP values reported in column 15 indicate that earnings clearly outperform cash flows (except for the case of Taiwan where the difference is not significant), the level of superiority for actual earnings is less than that exhibited by earnings forecasts (indicated by the more negative %IMP values reported in column 11).

To supplement the results in Panel A of Table 2, which confirm the overall superior performance of earnings forecasts over operating cash flow forecasts, we turn next to the results in Panel B of an industry-by-industry comparison. We pool percent pricing errors for each industry and select the value driver with the lower IQ range, and report the percent of industries where operating cash flows outperform earnings (forecasts are compared in the first column and actuals are compared in the second column). The relatively low mean and median numbers reported in the first column (23.1 and 24.1 percent, respectively) suggest that for over three quarters of the industries multiples based on earnings forecasts are more accurate than those based on operating cash flow forecasts.[9] Also, the lower numbers in the first column, relative to those in the second column, confirm that the overall conclusion regarding the relative superiority of earnings over operating cash flow being greater for forecasts than for actuals is also observed at the industry level.

Dividends versus Earnings. The earnings/dividends comparison reported in **Table 3** is analogous to the earnings/operating cash flow comparison reported in Table 2. Columns 9 and 10 in Panel A of Table 3 contain the IQ ranges of percent pricing errors for earnings and dividend forecasts, respectively, column 11 reports the improvement in performance (%IMP) for column 9 over column 10 (negative values indicate lower IQ ranges or higher performance for the value driver in column 9), and column 12 provides the sample size for each country. The mean and median IQ ranges for the distribution of percent pricing errors for earnings forecasts reported in the bottom two rows (0.526 and 0.557, respectively) are substantially lower than the corresponding means and median IQ ranges for dividend forecasts (0.628 and 0.632, respectively). While the mean and median values of %IMP are quite large and negative, the distribution across countries appears to be bimodal. Four of the seven countries (Australia, France, Germany, and UK) have relatively large values of %IMP, whereas the three remaining countries (Hong Kong, Japan, and South Africa) exhibit smaller magnitudes. All seven differences are significant at the 1 percent level, however.

9 Since the sample sizes are often very small for some industries, especially in countries with fewer forecasts, some of these comparisons are likely associated with error.

The comparison of actual versus forecast dividends reported in columns 1 through 4 confirms that moving from actuals to forecasts improves performance for industry multiples based on dividends. The relatively low values of %IMP reported in column 3 for most countries suggest that dividends are sticky and multiples based on forecasts are not substantially better than multiples based on reported dividends. However, the relatively large %IMP values for Australia (23.1 percent) and Hong Kong (21.5 percent) suggest that the value relevance of dividends in these two countries differs in some important way. (Additional analysis of that difference is reported below.). The results comparing actual earnings versus forecasts, reported in columns 5 through 8, are similar to the corresponding columns reported in Panel A of Table 2.

As with the results for operating cash flows, the important finding is that while moving from actuals to forecasts improves performance for both value drivers, that improvement is greater for earnings. Also similar to the Table 2 findings, the lower IQ ranges in column 6 for earnings forecasts for the larger sample of firms, relative to those in column 9 for the subset of firms that also had dividend forecasts, suggests that dividend forecasts are less frequent in cases where earnings forecasts perform relatively well, and the comparisons in columns 9 through 12 are biased against earnings forecasts exhibiting superior performance.

The last four columns in Panel A report the results of a comparison of reported earnings and dividends. Similar to the bimodal distribution observed for %IMP values in column 11, the %IMP values reported in column 15 indicate that reported earnings clearly outperform dividends for Australia, France, Germany, and UK, but the margin of superiority is lower for Hong Kong and South Africa and the relative ranking is reversed in the case of Japan (indicated by a positive and significant %IMP value of 12.8 percent).[10] As with operating cash flows, the lower values in column 15, relative to those in column 11, suggest that the level of superiority for actual earnings over actual dividends is less than that exhibited by earnings forecasts over dividend forecasts.

The results reported in Panel B of Table 3 refer to an industry-by-industry comparison of the performance of dividends versus earnings; forecasts are considered in the first column and actuals are considered in the second column. Again, the relatively low mean and median numbers reported in the first column (22.4 and 22.6 percent, respectively) suggest that for over three quarters of the industries multiples based on earnings forecasts are more accurate than those based on dividend forecasts.[11] Also, the lower numbers in the first column, relative to those in the second column, confirm that the overall conclusion regarding the relative superiority of earnings over dividends being greater for forecasts than for actuals is also observed at the industry level.

The relatively large improvement for dividend forecasts over reported dividends observed for Australia and Hong Kong (column 3 of Table 3, Panel A) suggests that dividends are more responsive to value changes and therefore less sticky in those two countries. According to the dividend tax preference estimates provided by LaPorta et al. (2000), the tax laws in these two

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10 Note that this contrary result observed in Japan is due primarily to the relatively poor performance of reported earnings rather than the superior performance of dividends; whereas the IQ range for reported dividends in Japan is close to the mean for other countries, the IQ range for reported earnings in Japan is considerably higher than the mean for other countries. See Charitou, Clubb and Andreou, (2000) for a potential explanation of the lower value relevance observed for reported earnings in Japan.

11 Since the sample sizes are often very small for some industries, especially in countries with fewer forecasts, some of these comparisons are likely associated with error.

countries are tilted the least in favor of capital gains over dividends among the countries in our sample (see column 8 in Table 4). If firms in the other countries tend to follow sticky dividend policies because dividend clienteles form based on investor tax rates—investors with high (low) tax rates prefer to hold low (high) dividend yield stocks—dividends should be relatively less sticky in Australia and Hong Kong. Accordingly, actual dividends in Australia and Hong Kong may include large transitory components, relative to dividends in other countries, and the difference between actual and forecasted dividends may also be relatively large. If dividend forecasts focus on the permanent component of dividends (since it is difficult to forecast the transitory component), the large improvement from using DPS forecasts over actuals observed in Australia and Hong Kong could be related indirectly to the lower tax disadvantage of paying dividends.

To examine the above explanation, we create a subsample consisting of all firm-year observations with positive values for both actual DPS and actual EPS in the current year, and non-missing value for DPS and EPS in the prior year. To provide information on the level of dividends, we report in columns 2 and 3 (4 and 5) of **Table 4** the mean (median) values of dividends scaled by price and earnings, D/P and D/E, respectively.[12] To provide information on the time-series variability of dividend payouts, we report in columns 6 and 7 the interquartile ranges for the distribution of dividend changes, scaled by price (ΔD/P), and changes in dividend payouts (Δ(D/E)), respectively. And the dividend tax preference estimates from LaPorta et al. (2000) are provided for reference in column 8. They represent the ratio of after-tax proceeds available to individual investors from a dollar of pre-tax dividends to the corresponding proceeds per pre-tax dollar retained in the firm. In effect, Australia and Hong Kong, with the highest values of this ratio, are the countries where capital gains receive the least favorable tax treatment relative to that for dividends. Our results suggest that not only is the level of dividends the highest in Australia and Hong Kong (indicated by the higher numbers in columns 2 through 5), dividends tend to be the least sticky (most variable over time) in these two countries (higher numbers reported in columns 6 and 7).

Absolute Valuation Performance of EPS Forecasts. We turn from the relative performance of earnings forecasts (relative to forecasts of operating cash flows and dividends) to an investigation of the absolute performance of earnings forecasts for all 10 countries. Our objective is to examine whether industry multiples based on earnings forecasts, which have been shown to provide remarkably accurate valuations for subsamples of US firms (e.g., see Kim and Ritter, 1999, for firms going public), represent a reasonable source for quick valuations when other US firms and firms in other markets are included. Rather than report just the IQ ranges for price deflated valuation errors, we provide the entire distribution in Figure 1 for each of the ten countries.

The horizontal axis in **Figure 1** contains the mid points of ranges of width equal to 0.1 (e.g. 0.05 refers to price deflated valuation errors lying in the range between 0 and 0.1 or between 0 and 10 percent) and the vertical axis represents the percent of the sample in each country with valuation errors that lie within that range. The superior performance of Australia, UK, and US, indicated by the more peaked distributions, and the relatively inferior performance of Germany, Japan, and Taiwan are clearly visible. Combining the percentages contained in the

[12] The resulting sample sizes (column 1) are lower than those in previous tables, primarily because a firm-year appears only once in Table 4, compared to a maximum of 12 times elsewhere (monthly observations).

two ranges identified by –0.05 and 0.05 suggests that approximately 25 percent of the sample for the three better-performing countries generates valuations that lie within ± 10 percent of observed prices. In contrast, only about 17 percent of the sample generates pricing errors within ± 10 percent for Japan. Including the observations in the adjacent ranges (-0.15 and 0.15) suggests that predicted prices lie within ± 20 percent of observed prices for almost 50 percent of the sample for the three countries with the best performance. Even for the three worst performing countries, about 50 percent of the sample is included within ± 30 percent of observed prices. This remarkable performance suggests that a) EPS forecasts are highly value relevant, and b) despite their parsimony and simplicity, industry multiples offer reasonably accurate valuations.

Conclusion

Is cash flow King in equity valuation? Our multiples valuation analysis suggests it is not. In Liu, Nissim and Thomas (2002), we find that reported earnings dominate reported cash flows in the U.S. In the current study we extend the analysis to other markets and employ forecasts of operating cash flows, dividends and earnings. We find that although moving from reported numbers to forecasts improves the performance of operating cash flows, it improves the performance of earnings to an even greater extent. Earnings forecasts represent substantially better summary measures of value than operating cash flow forecasts in all five countries examined, and this relative superiority is observed in most industries. We repeat the cash flow versus earnings comparison by considering dividends rather than operating cash flows for a sample derived from seven countries where dividend forecasts are common. We find again that earnings forecasts are better summary measures of value than dividend forecasts in all countries and most industries, and that moving from reported numbers to forecasts improves performance more for earnings than dividends.

Overall, our results suggest that proponents of cash flow multiples consider using earnings multiples. The increased availability of earnings forecasts should provide a greater impetus to using earnings multiples, since valuations based on earnings forecasts are remarkably accurate for a substantial majority of firms.

We conclude with three caveats. First, since multiple valuations can only be calculated when the value driver is positive, we exclude firms with non-positive values for the multiples examined (earnings, cash from operations or dividends). Our inferences therefore cannot be generalized to situations where value drivers are non-positive. While this requirement eliminates many firms for most value drivers, earnings forecasts are positive in a substantial majority of cases, which supports our case that earnings forecasts be used for multiples. Second, non-earnings forecasts are more likely to be provided in sectors where earnings forecasts are less informative and non-earnings forecasts are more informative, relative to other sectors (e.g., DeFond and Hung, 2003). While we focus on countries where cash flow forecasts are relatively widespread, some selection bias likely remains. However, this bias works against our findings; that is, although we use observations where cash flow forecasts are likely to perform better than average, we still find that earnings dominate cash flows. The final caveat relates to our use of market price as a proxy for intrinsic ("true") value. To the extent that market inefficiencies are correlated with earnings or cash flow information, differences between the pricing accuracy of earnings and cash flow multiples may be due in part to market inefficiencies rather than to the multiple's ability to measure value. However, prior research suggests that while market inefficiencies may induce substantial bias in stock return tests, the magnitude of bias in price level analyses is likely to be negligible since cross-sectional variation in mispricing is likely to be small compared to cross-sectional variation in intrinsic values (Aboody, Hughes and Liu, 2002).

Appendix A. Variable Definitions (According to IBES)

Sector Industry Group Classification. I/B/E/S uses a proprietary classification scheme to categorize companies into homogenous groups according to business lines. In the United States a scheme similar to the S&P 500 Industry groupings is followed. For non-US companies a system based loosely on the Morgan Stanley Capital International Industry Classifications is used. I/B/E/S's classification system segregates companies at three different levels (Sector, Industry, Group). Sectors are subdivided into Industries, which are in turn subdivided into Groups.

Earnings Per Share (EPS). A corporation's net income from continuing operations (i.e., income after backing out discontinued operations, extra-ordinary charges, and other non-operating items) divided by the weighted average number of shares outstanding for the year.

Operating Cash Flow Per Share (OCPS). Net income plus depreciation and amortization plus net working capital, divided by the weighted average number of common shares outstanding for the year.

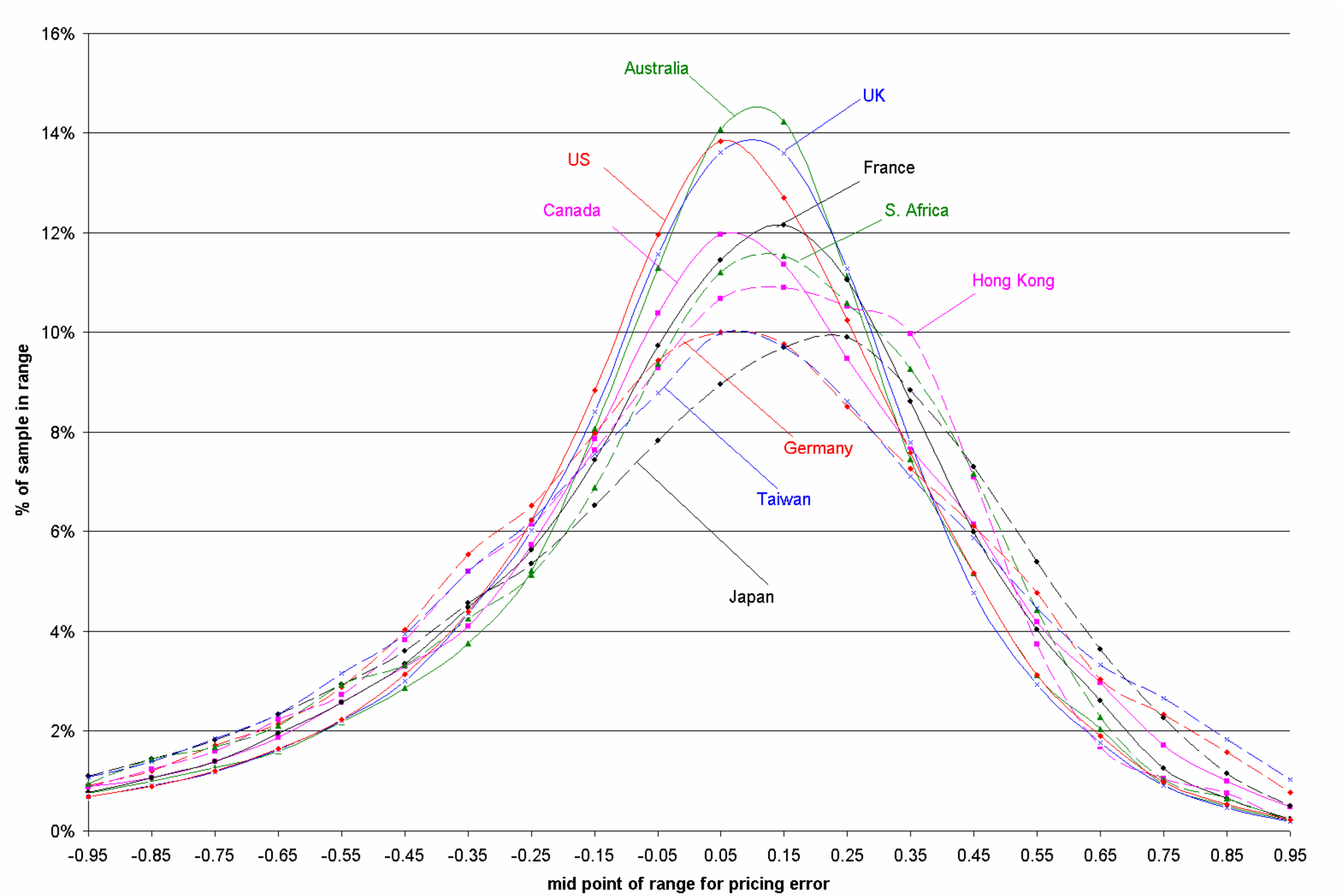
Dividends Per Share (DPS). A corporation's common stock dividends on an annualized basis, divided by the weighted average number of common shares outstanding for the year. In the US dividend per share is calculated before withholding taxes. But for some non-US companies, DPS is calculated after withholding taxes.

Appendix B. Across-Country Variation in Definition of Value Drivers

Country	Earnings	Operating Cash Flows
Australia	Normal	Normal
Canada	Normal	Normal
France	Before preferred dividends	Normal
Germany	After DVFA adjustments	Net income + depreciation on fixed assets - additions to fixed assets +/- change in pension and other long-term provisions +/- change in special items with reserve character +/- other expenses and income of material significance not involving payments +/- adjustments of exceptional expenses/income of material significance involving payments
Hong Kong	Normal	Normal
Japan	Incl. XI, less dividends	Net income + depreciation and amortization
South Africa	Normal	Normal
Taiwan	Incl. XI	Net change in cash before debts
UK	Normal	Normal
US	Normal	Normal

Notes: The definitions are extracted from IBES Manuals. Earnings and operating cash flows are reported per share, by dividing the firm-level numbers by the weighted average number of shares outstanding during the period. “Normal” equals the definitions reported in Appendix A. XI=extraordinary items.

Figure 1. Distribution of Price Deflated Valuation Errors from Industry Multiples based on EPS Forecasts



Notes: Valuation error equals the actual price less the predicted price, scaled by the actual price. The predicted price equals the forecast EPS for that firm multiplied by the harmonic mean of the price to forecast EPS ratio for the remaining firms in the industry. The mid points on the x-axis refer to ranges of width equal to 0.1 (e.g., 0.05 contains all firms with pricing errors between 0 and 0.1).

Table 1. Distribution of Price Deflated Valuation Errors from Industry Multiples in the US

Value Driver	Mean	Median	SD	75%-25%	90%-10%	95%-5%
BV	-0.016	0.066	0.560	0.602	1.266	1.710
OCF	-0.042	0.150	0.989	0.777	1.652	2.355
EBITDA	-0.017	0.066	0.573	0.553	1.163	1.631
EPS	-0.009	0.023	0.421	0.442	0.941	1.317
SALES	-0.032	0.163	0.859	0.738	1.645	2.357
EPS1	-0.005	0.015	0.321	0.348	0.744	1.037
EPS2	-0.004	0.021	0.290	0.317	0.677	0.935

Notes: Extracted from Panel A, Table 2 of Liu, Nissim, and Thomas (2002). Based on a sample of 19,879 firm-years for all variables. BV is book value of equity; OCF is cash flow from operations; EBITDA is earnings before interest, taxes, depreciation and amortization; EPS is IBES actual earnings; SALES is revenue; EPS1, EPS2 are one year out and two year out EPS forecasts.

Table 2. Price Deflated Valuation Errors for Industry Multiples based on Operating Cash Flows (OCPS) and Earnings (EPS)

Panel A: Country level results

	OCPS forecast versus OCPS actual				EPS forecast versus EPS actual				OCPS forecast versus EPS forecast				OCPS actual versus EPS actual			
	IQ Ranges for				IQ Ranges for				IQ Ranges for				IQ Ranges for			
Country	Actual	Forecast	%IMP	N	Actual	Forecast	%IMP	N	EPS	OCPS	%IMP	N	EPS	OCPS	%IMP	N
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
Australia	0.698	0.537	23.14%	18,069	0.538	0.400	25.65%	36,534	0.467	0.564	-20.86%	20,885	0.526	0.672	-27.79%	16,637
France	0.791	0.666	15.81%	20,139	0.624	0.481	22.95%	43,449	0.548	0.665	-21.21%	20,595	0.659	0.759	-15.24%	16,754
Hong Kong	0.794	0.707	10.90%	4,886	0.606	0.518	14.60%	17,878	0.572	0.713	-24.71%	5,926	0.655	0.766	-16.86%	4,198
Taiwan	0.781	0.679	12.97%	7,929	0.733	0.581	20.72%	22,965	0.578	0.681	-17.75%	8,663	0.734	0.754	-2.80%NS	7,257
UK	0.690	0.560	18.86%	52,685	0.541	0.411	24.02%	159,747	0.453	0.570	-25.84%	53,320	0.540	0.680	-25.88%	48,653
Mean	0.751	0.630	16.34%	20,742	0.608	0.478	21.59%	56,115	0.524	0.639	-22.07%	21,878	0.623	0.726	-17.71%	18,700
Median	0.781	0.666	15.81%	18,069	0.606	0.481	22.95%	36,534	0.548	0.665	-21.21%	20,595	0.655	0.754	-16.86%	16,637

Panel B: Industry by industry results.

Country	% of industries where OCPS is better than EPS	
	Forecasts	Actuals
Australia	24.1%	24.0%
France	6.7%	34.5%
Hong Kong	33.3%	35.7%
Taiwan	35.7%	57.1%
UK	15.8%	7.9%
Mean	23.1%	31.8%
Median	24.1%	34.5%

Notes: Panel A provides the results of four comparisons: a) forecasts vs. actuals for OCPS, b) forecasts vs. actuals for EPS, c) forecasts of OCPS vs. EPS forecasts, and d) actual OCPS vs. actual EPS. For each comparison, we report the interquartile ranges of the valuation errors for the two value drivers being compared, the improvement in valuation error (%IMP) from using the second value driver relative to the first, where %IMP for x vs. y equals $(IQ_x - IQ_y) / IQ_y$, and the sample size (N). Except for cells marked with NS, all %IMP values in Panel A are significant at the 1% level, based on t-stats from a bootstrap procedure. Panel B compares OCPS and EPS separately for each industry, and reports the fraction of industries with better performance for OCPS.

Table 3. Price Deflated Valuation Errors for Industry Multiples based on Per Share Dividends (DPS) and Earnings (EPS)

Panel A: Country level results

	DPS forecast versus DPS actual				EPS forecast versus EPS actual				DPS forecast versus EPS forecast				DPS actual versus EPS actual			
	IQ Ranges for				IQ Ranges for				IQ Ranges for				IQ Ranges for			
Country	Actual	Forecast	%IMP	N	Actual	Forecast	%IMP	N	EPS	DPS	%IMP	N	EPS	DPS	%IMP	N
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
Australia	0.565	0.434	23.1%	22,193	0.538	0.400	25.7%	36,534	0.408	0.485	-18.9%	25,748	0.479	0.555	-15.9%	21,051
France	0.769	0.661	14.1%	23,083	0.624	0.481	22.9%	43,449	0.518	0.684	-32.0%	26,537	0.618	0.753	-21.9%	21,191
Germany	0.730	0.656	10.2%	11,628	0.685	0.561	18.2%	35,219	0.568	0.727	-28.1%	14,920	0.640	0.746	-16.6%	10,904
Hong Kong	0.711	0.558	21.5%	10,504	0.606	0.518	14.6%	17,878	0.570	0.606	-6.3%	11,947	0.633	0.701	-10.8%	9,609
Japan	0.668	0.646	3.2%	134,920	0.755	0.598	20.9%	127,036	0.598	0.646	-8.0%	104,340	0.753	0.657	12.8%	89,388
South Africa	0.675	0.590	12.6%	7,881	0.601	0.506	15.7%	22,700	0.557	0.615	-10.4%	9,465	0.612	0.649	-6.0%	8,166
UK	0.713	0.621	13.0%	89,284	0.541	0.411	24.0%	159,747	0.463	0.632	-36.5%	87,201	0.560	0.703	-25.7%	80,456
Mean	0.690	0.595	14.0%	42,785	0.622	0.496	20.3%	63,223	0.526	0.628	-20.0%	40,023	0.613	0.681	-12.0%	34,395
Median	0.711	0.621	13.0%	22,193	0.606	0.506	20.9%	36,534	0.557	0.632	-18.9%	25,748	0.618	0.701	-15.9%	21,051

Panel B: Industry level results

	% of industries where DPS is better than EPS	
Country	Forecasts	Actuals
Australia	22.6%	37.0%
France	21.9%	30.0%
Germany	25.0%	22.7%
Hong Kong	31.8%	52.6%
Japan	33.3%	66.7%
South Africa	19.0%	40.0%
UK	2.9%	6.1%
Mean	22.4%	36.4%
Median	22.6%	37.0%

Notes: Panel A provides the results of four comparisons: a) forecasts vs. actuals for DPS, b) forecasts vs. actuals for EPS, c) forecasts of DPS vs. EPS forecasts, and d) actual DPS vs. actual EPS. For each comparison, we report the interquartile ranges of the valuation errors for the two value drivers being compared, the improvement in valuation error (%IMP) from using the second value driver relative to the first, where %IMP for x vs. y equals $(IQ_x - IQ_y) / IQ_y$, and the sample size (N). All %IMP values in Panel A are significant at the 1% level, based on t-stats from a bootstrap procedure. Panel B compares DPS and EPS separately for each industry, and reports the fraction of industries with better performance for DPS.

Table 4. Analysis of the Level and Volatility of Dividend Payouts

Country	Sample Size	Mean		Median		IQ range		Div. tax pref.
		D/P	D/E	D/P	D/E	ΔD/P	Δ(D/E)	
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Australia	1,829	0.044	0.796	0.042	0.660	0.037	0.492	0.900
France	1,595	0.019	0.370	0.017	0.307	0.021	0.280	0.640
Germany	762	0.021	0.417	0.018	0.357	0.024	0.353	0.860
Hong Kong	852	0.035	0.592	0.033	0.394	0.032	0.336	1.000
Japan	3,339	0.011	0.549	0.010	0.249	0.009	0.263	0.700
South Africa	627	0.032	0.398	0.028	0.349	0.028	0.233	0.850
UK	4,758	0.032	0.520	0.029	0.414	0.028	0.293	0.830
Mean	1,966	0.028	0.520	0.025	0.390	0.025	0.321	0.826
Median	1,595	0.032	0.520	0.028	0.357	0.028	0.293	0.850

Notes: D/P and D/E refer to the ratio of dividends to price and earnings, respectively. ΔD/P is the first difference in dividends, scaled by price. Δ(D/E), is the first difference in dividend payout, or the ratio of dividends to earnings. Dividend tax preference is taken from Table A.1 in LaPorta et al. (2000). It represents the ratio of after-tax amounts (after both corporate and personal taxes) received by representative individual investors in the different countries per dollar of pre-tax dividends to the after-tax amounts received per pre-tax dollar retained in the firm (i.e., per pre-tax dollar of capital gain).

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