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Is Cash Flow King in Valuations?

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Contrary to the common perception that operating cash flows are better than accounting earnings at explaining equity valuations, recent studies suggest that valuations derived from industry multiples based on reported earnings are closer to traded prices than those based on reported operating cash flows. The question addressed in the article is whether the balance tilts in favor of cash flows when the following are considered: (1) forecasts rather than reported numbers, (2) dividends rather than operating cash flows, (3) individual industries rather than all industries combined, and (4) companies in non-U.S. markets. In all cases studied, earnings dominated operating cash flows and dividends.

Industry multiples are used often in practice, both to provide stand-alone "quick and dirty" valuations and to anchor more-complex discounted cash flow valuations. To obtain a company valuation, one simply multiplies a value driver (such as earnings) for the company by the corresponding multiple, which is based on the ratio of stock price to that value driver for a group of comparable companies. Choices for value drivers include various measures of cash flow, book value, earnings, and revenues, but earnings and cash flows are by far the most commonly used. In the study reported here, we compared the valuation performance of earnings multiples with the performance of multiples based on two measures of cash flow—operating cash flow and dividends—for a large sample of companies drawn from 10 national markets.

"Valuation performance" in our study does not refer to picking mispriced stocks.[1] We focused on how close the valuations based on industry multiples were to traded prices. Our objective was to provide a comprehensive investigation of whether earnings or cash flows best represent a summary measure of value.

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

In Liu, Nissim, and Thomas (2002), we found that multiples based on reported earnings outperform multiples based on a variety of reported operating cash flow measures. These findings were based on reported values of earnings and cash flows, however, and on a restricted sample (U.S. companies that satisfied extensive data requirements). In this study, we extended the analysis to determine whether cash flows outperform earnings when we consider (1) forecasts rather than reported numbers, (2) dividends as well as operating cash flows, (3) individual industries rather than all industries combined, and (4) companies in markets beyond the United States.

We undertook the first extension because reported operating cash flows often reflect nonrecurring payments or receipts, which blur the relationship between current cash flows and value. For example, a company may engage in a large securitization transaction, thereby increasing operating cash flows above their normal, recurring level. If such transitory effects are excluded from cash flow forecasts (because analysts may not attempt to, or

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may not be able to, forecast such transactions), we should see a commensurate performance improvement as we change from using reported cash flows to using cash flow forecasts.

We undertook the second extension because stock price is related more directly to expected dividends than to expected operating cash flows (Williams 1938). Moreover, managers might choose to signal long-term prospects via dividends. Although many companies do not pay dividends (only 30 percent of publicly traded U.S. companies paid dividends in 2003), dividends may outperform operating cash flows as a measure of value within the subset of companies paying dividends.

The third extension allowed us to investigate whether the performance of earnings and cash flow multiples varies among 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.

Our final extension, to non-U.S. markets, was driven by the greater availability of cash flow forecasts for non-U.S. companies, but it also allowed us to document across-market patterns in the performance of earnings, operating cash flows, and dividends.

Multiples-Based Valuation

Valuation based on industry multiples boils down a complex function of discount rates and future cash flows into a simple proportional relationship: Predicted value equals the level of the value driver for that company times the corresponding industry multiple. Because the industry multiple is an "average" ratio of stock price to value driver for the remaining companies in the industry, predicted values based on multiples will be close to traded stock prices if companies in the industry are relatively similar in terms of the of price-to-value-driver ratio. That is, our research question can be viewed intuitively as follows: Are companies within an industry more homogeneous in terms of P/Es or price-to-cash-flow ratios (P/CFs)? Stated differently, if we plotted histograms of the P/Es and P/CFs in an industry, the value driver with the tighter distribution should result in better valuations because a tighter distribution indicates that companies' ratios are closer to each other and, therefore, closer to the industry average. However, although 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 valuations from cash flow multiples deviate from traded stock prices. The methodology that allows us to do that is described next.

For each value driver, we first calculated an industry multiple for each company based on the prices and value drivers for all remaining companies in that industry-country-month combination. (Deleting the target company from the industry before calculating the industry multiple was 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 used the *harmonic mean* instead, where the harmonic mean was calculated by first finding the average value driver to price for the industry and then inverting that average.[2]

For an illustration, assume there are five companies in the steel industry in Australia in May 1989, indexed by $i = 1, 2, \ldots 5$, with earnings per share 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 company $i = 3$. If we use the average ratio of price to EPS of the remaining four companies, the industry multiple will be

$$\text{Average P/E} = \frac{1}{4} \times \left(\frac{20}{1.50} + \frac{35}{3.00} + \frac{25}{0.50} + \frac{30}{2.00} \right) = 22.5.$$

But if we use the harmonic mean P/E, the industry multiple for company $i = 3$ is the inverse of the mean earnings-to-price multiples for the remaining four companies:

$$\text{Harmonic mean P/E} = \frac{1}{(1/4)[(1.50/20) + (3.00/35) + (0.50/25) + (2.00/30)]} = 16.17.$$

The large difference between the two multiples (22.5 versus 16.17) is primarily caused by company $i = 4$, which has a P/E of 50 (= 25/0.50). Without this company, the average multiple would be 13.33 and the harmonic mean multiple would be 13.19, which are closer to each other. When some high P/E values are caused by temporarily low values of earnings per share, the average multiple is skewed upward by those companies. The harmonic mean provides a way to mitigate the effect of such companies by first inverting the P/E 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 company, we calculated the predicted value by multiplying the harmonic mean industry multiple by the EPS for that company. The predicted value for company $i = 3$ is \$40.43 (= 16.17 × \$2.50). Finally, we calculated a pricing error or valuation error by subtracting that predicted value from the actual price (e.g., the valuation error for company i would be \$4.57 = \$45 – \$40.43). To allow comparison of valuation errors for stocks of different values, we deflated all valuation errors by the stock price to get a price-deflated valuation error (for company $i = 3$, the price-deflated valuation error would be 10.2 percent = \$4.57/\$45). We then repeated the process for the remaining companies in the industry to obtain a set of price-deflated valuation errors based on EPS—in the example, for the steel industry in Australia in May 1989. A similar set of price-deflated valuation errors was computed for the same companies for operating cash flows and dividends. That entire process was 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 pooled together the price-deflated valuation errors for that country/industry for each value driver. Because 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 companies 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.

Prior U.S. Evidence: Dominance of Earnings

In Liu et al. (2002), we examined the pricing performance of a large set of multiples applied to a sample of 19,879 U.S. company-year observations for the 1982–1999 period. **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), EPS, revenue (SALES), and consensus analyst one-year-out and two-year-out EPS forecasts (EPS1 and EPS2).

Examination of the standard deviation and three nonparametric 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. Forecast 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 do. 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 data 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 accrual accounting enhances the link between earnings and value; earnings outperform revenues because earnings incorporate relevant expenses, and earnings outperform cash flows because earnings ignore current-period cash flows that are not value relevant and incorporate value-relevant cash flows that occur in other periods.

Table 1. Distribution of Price-Deflated Valuation Errors from U.S. Industry Multiples, 1982–99

Value Driver	Mean	Median	Standard Deviation	75% – 5%	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: BV = book value; OCF = operating cash flow; EBITDA = earnings before interest, taxes, depreciation, and amortization; SALES = revenue; EPS1= consensus analyst one-year-out forecast; EPS2 = consensus analyst two-year-out EPS forecast. Sample is 19,879 company-years for all variables. EPS data are actual earnings from I/B/E/S.

Source: From Panel A of Table 2 in Liu et al. (2002).

International Sample

We obtained forecast data from the I/B/E/S International Summary files and reported (or actual) data from the I/B/E/S International Actual files. These files provide consensus analyst forecasts and reported numbers for various value drivers at a monthly frequency. The actual measures are from the most recently published annual report, and the forecast measures we used are the consensus (mean) estimates during the month for the next full fiscal period. For example, the actual EPS for a U.S. calendar-year company in May of 1990 would refer to the EPS reported for 1989 (announced some time early in 1990), and the forecast EPS would refer to the consensus EPS forecast for 1991, based on forecasts available as of the third Friday in May 1990.[3] We also obtained per share prices as of that date from I/B/E/S. Even though we refer to the prior year's EPS as actual or reported EPS, I/B/E/S often adjusts these data to remove some one-time items that analysts did not forecast. Because operating cash flow numbers are derived from earnings, actual operating cash flows reported by I/B/E/S may have also been adjusted to remove some one-time items. I/B/E/S makes no adjustments to actual dividends.

I/B/E/S currently collects forecasts for 63 countries, but the number of observations is relatively small for many countries. We identified the following 10 countries as having the most data available for earnings forecasts: Australia, Canada, France, Germany, Hong Kong, Japan, South Africa, Taiwan, the United Kingdom, and the United States. We analyzed the performance of EPS valuations for each of these countries, but for comparing earnings and cash flow multiples, we used subsets of these countries in which selection biases were least 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 and sector combinations.[4] Whereas earnings forecasts are almost always provided for companies 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 U.S. companies providing operating cash flow forecasts). Thus, to mitigate selection biases resulting from the nonrandomness of the availability of cash flow forecasts, we required two conditions for a country to be included in the operating cash flow/dividend samples: (1) the country should have a sufficiently large fraction of companies with operating cash flow/dividend forecasts, and (2) 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 calculated the absolute value of the difference between the percentages of sample companies in each sector with earnings forecasts and the corresponding percentage for operating cash flows (dividends); we required that the average absolute difference across all sectors for that country be less than 2 percent. We also examined the country-year distributions for the three value drivers to confirm that the forecasts were not concentrated in a few years.

The countries with sufficient and representative forecasts for operating cash flow were Australia, France, Hong Kong, Taiwan, and the United Kingdom. The corresponding countries for dividend forecasts were Australia, France, Germany, Hong Kong, Japan, South Africa, and the United Kingdom. We used these subsets of countries in the comparisons of earnings with, respectively, cash flow from operations and dividends.

Comparison of company-years that had forecasts of both earnings and operating cash flow with the remaining company-years in our sample suggested that the subgroup with both contained companies with larger market capitalizations on average; the P/Es, however, were comparable. Similarly, company-years that had both earnings and dividend forecasts had larger market caps than the remaining company-years, although the difference was not as large as for the cash flow sample; again, the P/Es for both subgroups were comparable.

Appendix A presents how I/B/E/S normally calculates EPS, OCF per share (OCPS), and dividends per share (DPS) and summarizes in a table how those variables are calculated in various countries and how they differ from the norm described for I/B/E/S. Calculations of dividends are comparable across the sample, OCF is generally defined similarly (equal approximately to operating cash flows from the cash flow statement), and EPS 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 company was followed on a diluted basis, we used the I/B/E/S dilution factor to convert per share variables to a primary basis.

To construct our sample, we merged the summary and actual files, and then we selected all observations for which price, outstanding shares, and the actual and forecast values of the value driver were available (I/B/E/S reports separate observations for each value driver).[6] Next, defining six variables corresponding to the actual and forecast values of EPS, OCPS, and DPS, we created one observation from each set of company-month observations. To maintain the largest possible sample size for each value driver, we retained a company-month observation as long as at least one of the six variables was positive.[7] The initial sample included 1,559,421 observations for 25,843 companies, and the sample period extended from January 1987 through September 2004. To mitigate the effect of influential observations, values of variables that when deflated by price lay outside the 1st to 99th percentiles of the pooled distribution were recorded as missing values.

Our data requirements when making pairwise comparisons were as follows: (1) both value drivers had positive values and (2) at least six observations satisfied the first requirement from the same country-industry-month combination (so a minimum of five companies were available for calculating industry multiples for both value drivers). We used the intermediate industry classification from the sector/industry/group classification by I/B/E/S because visual examination of companies included in the same sector suggested the sector classification was too broad to allow selection of homogeneous companies and because tabulation of the number of companies in different groups suggested that group classification was too narrow to allow the inclusion of enough comparable companies. Using pairwise comparisons left us with substantially larger samples than if we had required nonmissing data for all variables, which in turn, increases the extent to which our results can be generalized.

International Results

We began by comparing earnings with operating cash flows for the five countries in that sample and then repeated 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 10 countries.

We used the interquartile (IQ) range of the dispersion of price-deflated valuation errors as a measure of the performance of various value drivers. We did so because the IQ range is less sensitive to outliers than are other dispersion measures, such as standard deviation or root mean squared errors. When using alternative ranges (10–90 percent and 5–95 percent), however, we obtained results that are qualitatively similar to those reported here. We also confirmed 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). We measured the relative improvement (%IMP) in performance of variable 2 over variable 1 by calculating the percentage decrease in the interquartile range [%IMP = 100 percent × $(IQ_1 - IQ_2)/IQ_1$)]. We also computed a *t*-statistic for %IMP, derived from a bootstrap approach (see Liu et al. 2002 for details).

Operating Cash Flows vs. Earnings. Columns 1–4 in **Table 2** contain the results of comparing earnings forecasts with operating cash flow forecasts. Columns 1 and 2 contain the IQ ranges of percentage pricing errors, Column 3 reports the improvement in performance shown in Column 2 over Column 1 (negative values indicate lower IQ ranges or higher performance for the value driver in the first column), and Column 4 provides the sample size for each country. The mean and median IQ ranges for the distribution of percentage pricing errors for earnings forecasts reported in the bottom two rows of Column 1 (0.524 and 0.548) are substantially lower than the Column 2 mean and median IQ ranges for operating cash flow forecasts. The large negative values of %IMP in Column 3 for all five countries, between a high of almost 26 percent for the United Kingdom and a low of almost 18 percent for Taiwan, indicate the extent to which earnings forecasts outperformed operating cash flow forecasts for this period (all differences are statistically significant at the 1 percent level unless otherwise stated).[8]

Columns 5–8 repeat the comparison in terms of actual operating cash flows versus cash flow forecasts. The degree to which the IQ ranges for forecasts (Column 6) are lower than those for actuals (Column 5) is clear from the %IMP values reported in Column 7.

The next four columns (9–12) repeat the comparison in terms of actual earnings versus earnings forecasts. As with operating cash flows, we found the IQ ranges for forecasts (Column 10) to be substantially lower than those for actual earnings (Column 9), which is indicated by mean and median %IMP values in Column 11 of, respectively, 21.59 and 22.95 percent.

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

Table 2. Price-Deflated Valuation Errors by Country for Industry Multiples Based on OCPS and EPS, January 1987–September 2004

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

[a]Not significant.

Comparing the IQ ranges for earnings forecasts in Column 10 with those in Column 1 indicates the extent to which our comparisons of forecasts of earnings and operating cash flows are biased against earnings. The IQ ranges in Column 10 (mean and median of 0.478 and 0.481) are lower than those for the subset of company-years with both earnings and operating cash flow forecasts reported in Column 1, which suggests that OCF forecasts are less likely to be provided when earnings performance is relatively good.

The last four columns in Table 2 report the results for a comparison of reported earnings with reported operating cash flows. Although the %IMP values reported in Column 15 indicate that earnings clearly outperformed cash flows (except for the case of Taiwan, for which the difference is not significant), the level of superiority for actual earnings is less than the superiority exhibited by earnings forecasts (indicated by the more negative %IMP values reported in Column 3).

To supplement the results in Table 2, which confirm the overall superior performance of earnings forecasts over operating cash flow forecasts, we summarize the results of an industry-by-industry comparison in **Table 3**. In this part of the study, we pooled percentage pricing errors for each industry and selected the value driver with the lower IQ range. Table 3 reports the percentage of industries for which operating cash flows outperformed earnings (forecasts and actuals). The relatively low mean and median numbers reported in the first column suggest that for more than three-quarters of the industries, multiples based on EPS forecasts were more accurate than those based on OCF forecasts.[9] Also, the fact that the numbers in the first column are lower than those in the second column confirms that the Table 2 finding about the relative superiority of earnings over operating cash flows being greater for forecasts than for actuals is observed at the industry level.

Table 3. OCPS vs. EPS: Industry-by-Industry Results by Country, January 1987–September 2004

	% of Industries Where OCPS Was Better than EPS	
Country	Forecasts	Actuals
Australia	24.1%	24.0%
France	6.7	34.5
Hong Kong	33.3	35.7
Taiwan	35.7	57.1
United Kingdom	15.8	7.9
Mean	23.1	31.8
Median	24.1	34.5

■ *Dividends versus earnings*. The EPS-to-DPS comparison reported in **Table 4** is analogous to the EPS-to-OCPS comparison reported in Table 2. Columns 1 and 2 contain the IQ ranges of percentage pricing errors for, respectively, earnings and dividend forecasts. Column 3 reports the improvement in performance of Column 1 over Column 2, and Column 4 provides the sample size for each country. The mean and median IQ ranges for the distribution of percentage pricing errors for earnings forecasts are substantially lower than the corresponding mean and median IQ ranges for dividend forecasts. Although 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 have relatively large negative values of %IMP, whereas three countries (Hong Kong, Japan, and South Africa) have smaller values. All the differences, however, are significant at the 1 percent level.

The analysis of actual versus forecast dividends reported in Columns 5–8 confirms that moving from actuals to forecasts improves performance for industry multiples based on dividends. The relatively low values of %IMP reported in Column 7 for most countries suggest that dividends are "sticky" (vary little over time) and multiples based on forecasts of dividends are not substantially better than multiples based on reported dividends. The relatively large %IMP values for Australia (23.1 percent) and Hong Kong (21.5 percent), however, suggest that the value relevance of dividends in these two countries differs in some important way from its role in the other countries. (Additional analysis of that difference is reported later.)

The results of comparing actual earnings with forecasts, reported in Columns 9–12, are similar to the corresponding columns reported in Table 2. As with the results for operating cash flows, the important finding is that, although moving from actuals to forecasts improves performance for both DPS and EPS, that improvement is greater for EPS. Also as with the Table 2 findings, the lower IQ ranges in Column 10 for earnings forecasts for the larger sample of companies (relative to those in Column 1 for the subset of companies that also had dividend forecasts) suggest that dividend forecasts are less frequent when earnings forecasts perform relatively well, and the comparisons in Columns 1–4 are biased against earnings forecasts exhibiting superior performance.

The last four columns in Table 4 report the results of a comparison of reported earnings and reported dividends. Similar to the bimodal distribution observed for %IMP values in Column 3, the %IMP values reported in Column 15 indicate that

Table 4. Price-Deflated Valuation Errors by Country for Industry Multiples based on DPS and EPS, January 1987–September 2004

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

reported earnings clearly outperformed dividends for Australia, France, Germany, and the United Kingdom, 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 3) suggest that the level of superiority for actual earnings over actual dividends is less than that exhibited by earnings forecasts over dividend forecasts.

In the industry-by-industry comparison reported in **Table 5**, the relatively low mean and median numbers reported in the first column suggest, again, that for more than three-quarters of the industries, multiples based on earnings forecasts are more accurate than those based on dividend forecasts.[11] Also, the fact that the numbers in the first column are lower than those in the second column confirms that the overall conclusion about the relative superiority of earnings over dividends being greater for forecasts than for actuals is also observable at the industry level.

The relatively large improvement for dividend forecasts over reported dividends observed for Australia and Hong Kong (Column 7 of Table 4) suggests that dividends are more responsive to value changes and, therefore, less sticky (more variable over time) in those two countries than in the others. According to the estimates of dividend tax preferences provided by LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (2000), the tax laws in these two countries are the least tilted (relative to other countries in our sample) in favor of capital gains over dividends. If companies in the other countries tend to follow sticky dividend policies because dividend clienteles are 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 and the difference between actual and forecasted dividends may also be relatively large. If dividend forecasts focus on the permanent component of dividends (because the transitory component is difficult to forecast), the large improvement from using DPS forecasts over actuals observed in Australia and Hong Kong could be related indirectly to the low tax disadvantage of paying dividends.

Table 5. DPS vs. EPS: Industry-by-Industry Results by Country, January 1987–September 2004

Country	% of Industries Where DPS Was Better than EPS: 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
United Kingdom	2.9	6.1
Mean	22.4	36.4
Median	22.6	37.0

To examine this explanation, we created a subsample consisting of all company-year observations with positive values for both actual DPS and actual EPS in the current year and nonmissing values for DPS and EPS in the prior year. To provide information on the level of dividends, we report in **Table 6** the mean (and 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 the interquartile

Table 6. Analysis of the Level and Volatility of Dividend Payouts, January 1987–September 2004

		Mean		Median		IQ Range		
Country	Sample Size	D/P	D/E	D/P	D/E	ΔD/P	ΔD/E	Dividend Tax Preference
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
United Kingdom	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

ranges for the distribution of dividend changes, scaled by price (ΔD/P), and changes in dividend payouts (ΔD/E), respectively. The estimated dividend tax preferences from LaPorta et al. (2000) are provided for reference. They represent the ratio of after-tax proceeds available to individual investors from a dollar of pretax dividends to the corresponding proceeds per pretax dollar retained in the company. In effect, Australia and Hong Kong, which have the highest values of this ratio in Table 6, are the countries where capital gains receive the least favorable tax treatment relative to the treatment of dividends. Our results suggest that not only is the level of dividends the highest in Australia and Hong Kong (indicated by the larger numbers for the means and medians) but also that dividends tend to be the least sticky in these two countries (larger numbers reported for the IQ range).

Absolute Valuation Performance of EPS Forecasts. We now turn from our study of 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 was to examine whether industry multiples based on earnings forecasts, which have been shown to provide remarkably accurate valuations for subsamples of U.S. companies (e.g., see Kim and Ritter 1999 for companies going public), represent a reasonable source of quick valuations when other U.S. companies and companies in other markets are included. Rather than report simply the IQ ranges for price-deflated valuation errors, we provide the entire distribution for each country in **Figure 1**.

The horizontal axis in Figure 1 contains the midpoints 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 percentage of the sample in each country with valuation errors that lay within that range. The superior performance of EPS forecasts as a value indicator in Australia, the United Kingdom, and the United States (indicated by the more peaked distributions) and the relatively inferior performance of EPS forecasts in Germany, Japan, and Taiwan are clearly visible. Combining the percentages contained in the two ranges identified by –0.05 and 0.05 suggests

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 a company multiplied by the harmonic mean of the ratio of price to forecast EPS for the remaining companies in the industry.

that approximately 25 percent of the sample for the three countries with better-performing EPS forecasts would generate valuations within ±10 percent of observed prices. In contrast, only about 17 percent of the sample generated pricing errors within ±10 percent for Japan. Including the observations in the adjacent ranges (–0.15 and 0.15) suggests that predicted prices lay within ±20 percent of observed prices for almost 50 percent of the sample for the three countries where EPS forecasts gave the best performance. Even for the three countries where EPS forecasts gave the worst performance, about 50 percent of the sample was included within ±30 percent of observed prices. This remarkable performance suggests that (1) EPS forecasts are highly value relevant and (2) despite their parsimony and simplicity, industry multiples offer reasonably accurate valuations.

Conclusion

Is cash flow king in equity valuation? Our analysis suggests that it is not. In Liu et al. (2002), we found that reported earnings dominate reported cash flows as summary measures of value in the United States. In the current study, we extended the analysis to other markets and used forecasts of operating cash flows, dividends, and earnings. We found 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. EPS forecasts represented substantially better summary measures of value than did OCF forecasts in all five countries examined, and this relative superiority was observed in most industries.

When we compared dividends rather than operating cash flows with earnings for a sample derived from seven countries where dividend forecasts are common, we found, again, that earnings forecasts were a better summary measure of value than dividend forecasts in all countries and most industries. And we found that moving from reported numbers to forecasts improved performance more for earnings than for dividends.

Overall, our results suggest that proponents of cash flow multiples should consider using earnings multiples instead because valuations based on earnings forecasts are remarkably accurate for a substantial majority of companies. The increased availability of earnings forecasts should be an impetus to use earnings multiples.

We conclude with three caveats. First, because valuations based on multiples can be calculated only when the value driver is positive, we excluded companies with nonpositive values for the multiples examined (earnings, cash from operations, or dividends). Our inferences, therefore, cannot be generalized to situations where value drivers are not positive. Nevertheless, although this requirement eliminates many companies for most value drivers, earnings forecasts are positive in a substantial majority of cases, which supports our call that earnings forecasts be used for multiples. Second, nonearnings forecasts are more likely to be provided in sectors where nonearnings forecasts are more informative than earnings forecasts (see DeFond and Hung 2003). Although we focused on countries where cash flow forecasts are relatively widespread, some selection bias probably remained in our samples. However, this bias worked *against* our findings; that is, we used observations where cash flow forecasts were likely to perform better than average but we still found 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 multiples and cash flow multiples may arise partly from market inefficiencies rather than the multiple's ability to measure value. Prior research suggests, however, that, although market inefficiencies may induce substantial bias in stock return tests, the magnitude of the bias in price-level analyses is likely to be negligible because cross-sectional variation in mispricing is likely to be smaller than cross-sectional variation in intrinsic values (Aboody, Hughes, and Liu 2002).

This article qualifies for 1 PD credit.

Appendix A. Variable Definitions

The following definitions are those of I/B/E/S. **Table A1** provides the definitions of earnings and operating cash flows used by each of the 10 countries in the study.

- *Earnings per share (EPS).* A corporation's net income from continuing operations (i.e., income after backing out discontinued operations, extraordinary charges, and other nonoperating 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 United States, dividend per share is calculated before withholding taxes, but for some non-U.S. companies, DPS is calculated after withholding taxes.

Table A1. Variations among Country in Definitions of Value Drivers

Country	Earnings	Operating Cash Flows
Australia	Normal	Normal
Canada	Normal	Normal
France	Before preferred dividends	Normal
Germany	After adjustments by Deutsche Vereinigung fur Finanzanalyse und Asset Management	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	Including XI, less dividends	Net income + Depreciation and amortization
South Africa	Normal	Normal
Taiwan	Including XI	Net change in cash before debts
United Kingdom	Normal	Normal
United States	Normal	Normal

Notes: Earnings and operating cash flows are reported per share by dividing the company-level numbers by the weighted average number of shares outstanding during the period. "Normal" means the definition is the same as the I/B/E/S definition. XI = extraordinary items.

Notes

1. For example, valuation performance could be measured, based on the argument that over- (under-) valued stocks will have relatively high (low) P/Es, as the returns earned by a strategy that invests short (long) in stocks with P/Es that are higher (lower) than the industry median.
2. Baker and Ruback (1999) demonstrated 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 such estimators as the arithmetic mean or median. As demonstrated in the example in the text, the harmonic mean gives less weight to companies with relatively high price-to-value-driver ratios, which is consistent with the larger absolute valuation errors that typify these companies. Indeed, several studies (e.g., Beatty, Riffe, and Thompson 1999; Liu et al. 2002) confirmed that the harmonic mean performs well in terms of minimizing price-deflated pricing errors.
3. Although analysts also provide one-year-out (for 1990) forecasts, we elected not to use them because they represent a mixture of actuals for interim periods already reported and forecasts for the remaining interim periods.
4. 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 Index industry groupings is followed. For non-U.S. companies, a system based loosely on the Morgan Stanley Capital International industry classifications is used. The I/B/E/S classification system segregates companies at three levels (sector, industry, and group). Sectors are subdivided into industries, which are, in turn, subdivided into groups.
5. The German financial analyst society, Deutsche Vereinigung fur Finanzanalyse und Asset Management (DVFA), has developed a system used by analysts (and often by companies) to adjust reported earnings data to provide a measure that is close to permanent or core earnings. The adjustment process uses both reported financial information and companies' internal records.
6. To prevent duplication, we deleted all observations with a "secondary" flag (for the actual or forecast). Also, to assure consistency when merging, we deleted observations for which the fiscal year-end for the actual was not exactly 24 months before the fiscal year-end of the forecast.
7. Because prices are positive, the multiples approach requires that both comparable and target companies have positive value drivers. The proportion of observations with negative values of actual (forecast) EPS and OCPS is 15 percent (5 percent) and 8 percent (1 percent); no negative values were observed for actual or forecast DPS. There were few cases in which the value driver was zero except for the case of dividends (16 percent for actual dividends and 10 percent for forecast dividends) and, occasionally, for actual OCPS observations (1 percent).
8. See Figure 1 and the related discussion for a graphical approach to illustrate performance differences.
9. Because the sample sizes were very small for some industries, especially in countries with few forecasts, some of these comparisons are probably associated with error.
10. This contrary result observed in Japan is primarily a result of the relatively poor performance of reported earnings rather than the superior performance of dividends; the IQ range for reported dividends in Japan is close to the mean for other countries, but 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. Because the sample sizes are very small for some industries, especially in countries with fewer forecasts, some of these comparisons are probably associated with error.
12. The resulting sample sizes are smaller than those in previous tables, primarily because a company-*year* appears only once in Table 6.

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