The Enterprise Multiple Factor and the Value Premium

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ABSTRACT

Following the work of Fama and French (1992, 1993), there has been wide-spread usage of book-to-market as a factor to explain stock return patterns. In this paper, we highlight serious flaws with the use of book-to-market and offer a replacement factor for it. The Enterprise Multiple, calculated as (equity value + debt value + preferred stock – cash)/ EBITDA, is better than book-to-market in cross-sectional monthly regressions over 1963-2008. In the top three size quintiles (accounting for about 94% of total market value), EM is a highly significant measure of relative value, whereas book-to-market is insignificant. The significance of EM is also confirmed with UK and Japanese data. We use the Enterprise Multiple to create an EMD factor which generates a return premium of 5.76% per year.

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I. Introduction

The book-to-market value premium of Fama and French (1992, 1993) has generated considerable discussion in the finance literature. The value premium is defined as the difference between the returns on high book-to-market (BE/ME) value stocks and low book-to-market growth stocks. Along with the market premium and the size premium, book-to-market is the third risk factor commonly used to describe cross-sectional returns. Recent results from Fama and French (2006) find a value premium of 4.8% per year over 1926-2004.

By identifying value and growth stocks and setting up a long-short portfolio, two relatively simple tasks for an investor, the value premium should be easy to exploit. Yet, capturing the value premium has been very difficult to do in practice. As an example, fund managers perennially underperform growth weighted indices like the Standard and Poor's 500 Index. Value fund managers do not consistently outperform growth fund managers.

On the contrary, Chan, Chen, and Lakonishok (2002) find that growth fund managers outperform value fund managers, after adjusting for style. Houge and Loughran (2006) report that small-cap growth funds average slightly higher returns than small-cap value funds. Davis (2001) finds that value managers realized negative abnormal returns of 2.75% per year. In his conclusion, Davis writes "*the biggest disappointment in the past three decades is the inability (or unwillingness) of funds to capture the value premium that has been observed in common stock returns during the period. When funds are ranked by their sensitivity to the value factor (HML), even the most extreme decile does not have much of a value tilt. Furthermore, the funds that had at least a small sensitivity to the value factor were the poorest performers*." There is a clear disconnect here: either the value premium does not actually exist, or it does not exist in a way that can be exploited by fund managers and other investors.

Several studies have questioned the validity of the value premium as a risk factor. Black (1993), MacKinlay (1995), and others attack the 3-factor model as mere data-mining and unlikely to be replicated out of sample. Kothari, Shanken, and Sloan (1995) claim that Compustat data biases result in an overstated BE/ME effect. Fama and French respond to these critics by testing the results out of sample with US stocks over 1929-1963 (Davis, Fama, and French (2000)), and by extending the evidence to international stocks (Fama and French (1998, 2006)).

Other critiques take a different tack. Lakonishok, Schleifer, and Vishny (1994) claim the book-to-market is not a "'clean' variable uniquely associated with economically interpretable characteristics of the firms." Daniel and Titman (1997), after sorting firms based on their return characteristics, reject the hypothesis that book-to-market is a risk factor. Pontiff and Woodgate (2008) find that the effect of share issuance dominates the size, book-to-market, and momentum effects. Cooper, Gulen, and Schill (2008) find similar results comparing the effect of asset growth against the other three factors. Chen and Zhang (2009) derive a different model based on *q*-theory using the market factor plus factors based on investment and return on assets.

Loughran (1997) examines the data used by Fama and French (1992) and finds that the results are driven by a January seasonal and the returns on microcap growth stocks. For the largest size quintile, accounting for about three-quarters of total market cap, Loughran finds that BE/ME has no significant explanatory power over 1963-1995. Furthermore, for the top three size quintiles, accounting for about 94% of total market cap, size and BE/ME are insignificant once

January returns are removed. Fama and French (2006) confirm Loughran's result over the post-1963 period. Thus, for nearly the entire market value of largest stock market (the US) over the most important time period (post-1963), the value premium does not exist.

However, what of the other 6% of market cap that falls outside of Loughran's critique? Keim (1983) shows that the January effect is primarily limited to the first trading days in January. These returns are heavily influenced by December tax-loss selling and bid-ask bounce in low-priced stocks. Since many fund managers are restricted in their ability to buy small stocks due to ownership concentration restrictions and are prohibited from buying low-prices stocks due to their speculative nature, it is unlikely that the value premium can be exploited.

Despite these criticisms, wide-spread use of the Fama and French HML factor persists. The lack of a better alternative is the main reason. Without a better alternative, researchers continue to use the 3-factor model as it was originally constructed.

In this paper, we improve on the previous literature by introducing a more complete and robust value-based ratio that is used by practitioners: the Enterprise Multiple (EM). The EM is calculated as the Enterprise Value (EV, the values of common stock, preferred stock, and debt, minus cash) divided by operating income before depreciation (EBITDA). Over the full sample period 1963-2008, EM appears similar to BE/ME in regression coefficients and t-statistics.

However, EM succeeds where BE/ME fails. In the top three size quintiles, accounting for about 94% of total market value, EM is a highly significant measure of relative value, whereas BE/ME is insignificant and size is only weakly significant. EM is also highly significant after controlling for the January seasonal and removing low-priced (<$5) stocks. Robustness checks indicate that EM is also better to Tobin's Q as a determinant of stock returns.

As BE/ME is used to create the HML factor, we use EM to compute EMD, a factor created to mimic the return differences of low versus high EM portfolios. EMD generates a premium of 0.48% per month, or 5.76% per year, significant at the 1% level. After January returns are removed, the EMD factor is only slightly lower at 0.47% per month while HML drops from 0.43% per month to 0.30% per month with lower statistical significance. EMD generates similar R-squared values to HML in regressions of stock portfolio returns.

EM also performs relatively well in regressions using stock returns from the two largest international markets: the United Kingdom and Japan. EM is significant at the 5% level in both markets. BE/ME is highly significant in both the UK and Japanese data when included with size and prior returns. When EM is included in the monthly regressions, book-to-market becomes insignificant for the UK sample.

Our results are an improvement over the existing literature because, rather than being driven by obscure artifacts of the data, namely the stocks in the bottom 6% of market cap and the January effect, our results apply to virtually the entire universe of US stocks. In other words, our results may actually be relevant to both Wall Street and academics.

Two reasons motivate the examination of EM as a value measure. The first reason is the recent rise in the use of EM (and EV) by practitioners. Recently, valuation textbooks have incorporated discussion of enterprise value and EM. The valuation textbook, “Damodaran on Valuation” (2^{nd} edition, 2006), dedicates a full chapter to value multiples based on enterprise value. McKinsey & Company’s widely-used text, “Valuation Measuring and Managing the Value of Companies” (4^{th} edition, 2005), contains a detailed discussion on the use of Enterprise Value Multiplies.

Damodaran shows in an unpublished study of 550 equity research reports that EM, along with Price/Earnings and Price/Sales, were the most common relative valuation multiples used.[1] He states, "In the past two decades, this multiple (EM) has acquired a number of adherents among analysts for a number of reasons."

The reasons Damodaran cites for EM's increasing popularity also point to the potential superiority of EM over book-to-market. One reason is that EM can be compared more easily across firms with differing leverage. We can see this when comparing the corresponding inputs of EM and BE/ME. The numerator of EM, Enterprise Value, can be compared to the market value of equity. EV can be viewed as a theoretical takeover price of a firm. After a takeover, the acquirer assumes the debt of the firm, but gains use of the firm's cash and cash equivalents. Including debt is important here.

To take an example, in 2005, General Motors had a market cap of $17 billion, but debt of $287 billion. Using market value of equity as a measure of size, General Motors is a mid-sized firm. Yet on the basis of Enterprise Value, GM is a huge company. Market value of equity by itself is unlikely to fully capture the effect GM's debt has on its returns. More generally, it is reasonable to think that changing firm debt levels may affect returns in a way not fully captured by market value of equity. Bhojraj and Lee (2002) confirm this, finding that EV is superior to market value of common equity, particularly when firms are differentially levered.

Kim and Ritter (1999), in a study on the valuation of IPOs using data from a boutique research firm, noted that the firm did not use BE/ME, saying the "arbitrariness of book values…makes [BE/ME] ratios poor valuation metrics." While the authors found that all

[1] "Damodaran on Valuation", 2006, pg. 234.

valuation metrics had significant shortcomings, EM performed similarly to P/E and substantially better when valuing older firms.

A second reason for using the enterprise multiple is the earnings variables used in EM and BE/ME. The denominator of EM is operating income before depreciation while net income (less dividends) flows into BE. The use of EBITDA provides several advantages that BE lacks. Damodaran notes that differences in depreciation methods across companies will affect net income and hence BE, but not EBITDA. Also, the McKinsey valuation text notes that operating income is not affected by nonoperating gains or losses. As a result, operating income before depreciation can be viewed as a more accurate and less manipulable measure of profitability, allowing it to be used to compare firms within as well as across industries. Critics of EBITDA point out that it is not a substitute for cash flow; however, EV in the numerator does account for cash.

Overall, Enterprise Multiple includes debt as well as equity, contains a clearer measure of operating profit and captures changes in cash from period to period. Thus, EM is a more complete measure of relative value than BE/ME.

II. Data Section and Summary Statistics

The sample selection process roughly follows Fama and French (1992) and includes all New York Stock Exchange (NYSE), American Stock Exchange (Amex), and Nasdaq firms with available CRSP and Compustat information. We use the Fama and French (1997) classification to define a firm's industry and remove all financial firms (industries: 45 (banking), 46 (insurance), 47 (real estate), and 48 (trading)) from the analysis. The final sample includes only firms with ordinary common equity as defined by CRSP. To avoid a back-filling bias, firms are required to have two years of Compustat data before entering our sample.

Table 1 describes the sample creation. There are 133,410 firms-year observations available from CRSP/Compustat. Three additional data screens are implemented: 5,860 firm-years are removed due to missing or negative book values; 266 have incomplete Tobin's Q values; and 19,791 firm-years are discarded due to missing or negative enterprise multiple values. Our final sample contains 107,493 firm-year observations during the 1963-2008 time period.

Stock returns and market capitalizations are from the monthly CRSP file. All accounting information is obtained from Compustat. Firms must have non-zero market values of equity as of June of year t and December of year t-1 to be included in the final sample.

Stock returns are measured from July 1963 through December 2008. Using the Fama and French (1992, 1993) methodology, we create the sample in June of year t. A firm's size is its market capitalization (stock price multiplied by shares outstanding) as of June of year t. The prior return is defined as the buy-and-hold return for the 12 months before portfolio formation. Stock returns are from July of year t through June of year t+1. The book value of equity is Compustat data item #60 plus balance sheet deferred taxes and investment tax credit (item #35).

Enterprise value (EV) is market value of equity plus total debt (Compustat data items #9 and #34 (short and long term debt)) plus preferred stock value (item #56) minus cash and short-term investments (item #1). The Enterprise Multiple (EM) is EV/EBITDA: enterprise value divided by operating income before depreciation (Compustat item #13). Throughout the paper, we will use the terms EBITDA and operating income before depreciation interchangeably.

Our use of operating income before depreciation differs from the method advocated in the McKinsey valuation text. In their textbook, Koller, Goedhart, and Wessels (2005) argue for the use of *forecasted* operating income. Clearly, the use of forward-looking operating income would be a better measure than the historical operating income we use. However, there exists no database, to our knowledge, that contains forecasted operating income for thousands of firms going back to the early 1960s.

Tobin's Q is market value of equity and book value of liabilities divided by total assets as of December of year t-1. Schlingemann, Stulz, and Walkling (2002) define Tobin's Q in an identical manner.

Table 2 reports the equally weighted summary statistics for the 107,493 firm-year observations over the 1963-2008 time period. The average market value is $1,518 million while the median value is $101.9 million. The mean and median share prices are $20.6 and $15.1.

It is worth noting that the 25th percentile of stock prices is $6.8. Many money managers are precluded from buying low-priced stocks in their portfolios and $5 per share is a common cutoff. Low-priced stocks tend to be small market cap stocks, and as mentioned previously, the value premium is primarily limited to the smallest two size quartiles, which make up roughly 6% of the market cap. This is one reason money managers will be limited in their ability to exploit the value premium as calculated using HML.

To limit the impact of outliers, the prior year return, subsequent year return, Enterprise Multiple, book-to-market, and Tobin's Q variables are all winsorized at the 1% and 99% percentiles. The average Enterprise Multiple value is 11.5 while the median value is 7.1. So for the average firm, investors pay $11.5 in debt and equity for every one dollar of operating income.

Table 3 examines the post-ranking value-weighted returns for quintile portfolios along two dimensions. Panel A divides the sample into 25 portfolios based on size and EM. Panel B divides the sample by size and BE/ME. The size quintiles cutoffs are determined using NYSE stocks only. Because the market-value based variable, EV, is in the numerator and the book-value based variable, EBITDA, is in the denominator, the EM variable should be interpreted in inverse fashion to BE/ME. That is, a low EM firm is a value firm and a high EM firm is a growth firm.

The annual buy-and-hold returns begin in July of year t and stop in June of year t+1. In each size quintile in Panels A and B, value outperforms growth. Small value stocks have the highest return: 19.5% in Panel A and 17.6% in Panel B. Small growth stocks have the lowest returns: 9.4% in Panel A and 7.6% in Panel B. It is worth noting that the 9.4% value in Panel A is relatively close to the other values in that column. However, the 7.6% value in Panel B is much lower than any other value in that column. Loughran (1997) notes that the value premium was heavily driven by poor returns on small (and young) growth stocks.

The last column of each panel reports the value minus growth annual portfolio returns for each size quintile. Across the size quintiles, the return difference is consistently larger for EM than for book-to-market. That is, controlling for size, EM has a stronger effect than book-to-market. The annual return differences between value and growth portfolios for EM is 10.1%, 6.4%, 7.6%, 5.9%, and 4.0%. Although still substantial, the value minus growth portfolio differences for book-to-market are consistently smaller.

In the large quintile, the difference between Low versus High EM is 4.0%, much higher than the 2.2% difference between High versus Low BE/ME. During 1963-2008, the largest size quintile contains 76.99% of the aggregate US market cap compared to 5.8% for the smallest two quintiles. Thus, for the most important quintile, stock returns vary with changes in EM more than twice as much than with changes in BE/ME.

III. Cross-Sectional Regressions

Tables 4 through 7 examine the results of cross-sectional monthly regressions over the 1963-2008 sample period (546 sample-months), as well as across various subperiods and subsamples. The focus will be on the performance of EM versus BE/ME as significant factors explaining cross-sectional stock returns.

A. EM versus BE/ME: 1963-2008

The first regression in Table 4 replicates Fama and French (1992, Table III) with data through 2008. The size coefficient at -0.11 is identical to the value from Fama and French and has a more significant t-statistic of -2.73. The BE/ME factor is slightly smaller at 0.25 (versus 0.35) and has a similar t-statistic. Overall, the results remain similar to prior research even after extending the sample through 2008. Regression (2) adds the momentum factor of Carhart (1997). Prior return is the raw buy-and-hold return from month j-12 to month j-2. The size and BE/ME variables are generally unchanged. Momentum is highly significant (t-statistic of 5.41); this will be the case in all but one of the cross-sectional regressions in Tables 4 through 7.

In row (3), the only independent variable is the EM factor. Note that its sign is negative, but the coefficient value of 0.33 is larger than the BE/ME coefficient from rows (1) and (2). EM is also highly significant, with a t-statistic of –5.41. Regression (4) includes size, book-to-market, momentum, and enterprise multiple in the same regression. With the exception of the sign difference, BE/ME and EM have similar coefficients. For the full sample, neither factor appears to dominate the other.

Regression (5) uses the same model as (4), but with the January returns removed, still leaving 501 sample-months. This is to capture the January seasonal effect shown by Loughran (1997) to account for much of the BE/ME results of Fama and French (1992). If EM is merely a substitute for BE/ME, we should continue to see results similar to those in regression (4).

That is not the case, however. Removing the January returns renders both size and BE/ME insignificant. The size coefficient in row (5) is just –0.04, with a t-statistic of –1.09. The coefficient on BE/ME is more than halved, to 0.07, with a t-statistic of 1.32. By comparison, the coefficient for EM jumps from -0.18 to -0.29, and the t-statistic increases to -5.78.

The size result is similar to Keim (1983); the BE/ME result similar to Loughran (1997). If size and BE/ME are a common risk factors in the returns on stocks and bonds, their performance should not be negated by a single calendar month. For the 11 months outside of January, EM and the momentum factor are the only two significant factors. EM clearly outperforms BE/ME here.

While Keim (1983) noted the January effect on the size factor, what is it about January returns that eliminates the value premium, at least as measured by BE/ME? Keim (1983) found that small market value, low-priced stocks often see extreme returns in January, particularly in the first days of January. These returns are often caused by bid-ask bounce. A logical follow-up to the results of Table 4 would be to examine the performance of the BE/ME and EM factors after adjusting for extreme returns and low-priced stocks.

Table 5 has the results. The model in (1) is same as (4) from Table 4 and is used as a baseline reference for rows (2)-(5). Model (2) excludes the top and bottom 1% of returns from the sample. BE/ME is still significant, but the coefficient decreases from 0.17 to 0.11. EM increases in both coefficient and t-statistic. Once again, after altering the sample, BE/ME weakens while EM gets stronger.

It is also worth noting that the size effect completely disappears when extreme returns are excluded: the coefficient is 0.05. This is the Knez and Ready (1997) result. They find that the size effect disappears not only when the 1% most extreme observations are removed from each month, but also when the 16 months with the most extreme coefficients are removed from the sample.

The regressions in rows (3)-(5) control for low-prices stocks by removing all stocks with share prices below $5. This is a low price restriction commonly written into the charter of many mutual funds in order to prevent managers from purchasing such speculative and often illiquid stocks. Low-priced stocks are also most likely to suffer from bid-ask spread bounce (especially true prior to decimalization of stock prices in April, 2001). After the low priced stocks are removed in row (3), BE/ME is not statistically significant over the full sample period, with a coefficient of 0.10 versus 0.17 in row (1). The coefficient for EM, however, increases and remains statistically significant at the 1% level.

In the last 2 rows of Table 5, the sample is roughly split in half. Model (4) covers the 1963-1985 subperiod (270 months) and row (5) covers the 1986-2008 subperiod (276 months).

Over 1963-1985, the results are very similar to the results in row (1): both BE/ME and EM show similar coefficients and both are significant. However, in the later period (row (5)) we see the effect of removing low-priced stocks: BE/ME becomes insignificant with a coefficient of -0.00 while EM is highly significant with a coefficient of –0.38.

The results of Table 5 extend the results of Table 4. BE/ME fails against EM in regressions excluding extreme returns and returns on low-priced stocks, both of which help manifest the January effect. The results of the EM factor are robust across these subsamples as well as the full sample. What is extraordinary is that BE/ME gets weaker in nearly all the subsamples while EM gets stronger. From a baseline coefficient of 0.17 in row (1), the BE/ME coefficients in rows (2) through (5) are 0.11, 0.10, 0.20, and -0.00, respectively. For EM, the coefficient in row (1) is –0.18; the EM coefficients increase to –0.29, -0.29, -0.19, and –0.38 in regressions (2) through (5).

B. EM and BE/ME in the Top Three Size Quintiles

Table 6 examines the performance of BE/ME and EM focusing on the top three size quintiles. The top three quintiles comprise approximately 94% of the total market cap of the sample. Loughran (1997) notes that "size and book-to-market explain none of the cross-sectional variation in returns for the three largest size quintiles during 1963-1995 once January is excluded from the sample." In Table 6, however, this statement need not be restricted to non-January returns.

Again, as a baseline comparison, row (1) is the same as row (4) from Table 4. In regression (2) which includes only stocks in the top 3 size quintiles, both the size and the BE/ME variable are insignificant. Already we see that by cutting just 6% of total market cap, the results of Fama and French (1992) are completely eliminated.

When momentum and EM are added back to the regression in (3), size becomes weakly significant, while BE/ME remains insignificant. EM continues to be highly significant (t-statistic of –3.60), with a coefficient of –0.29. This will become a recurring theme in this table: for 94% of the total market cap of our sample, momentum and EM do a much better job of explaining the cross-sectional variation in returns over 1963-2008 than size and BE/ME.

In row (4), January returns are once again removed from the sample. Given the results of the prior two regressions and row (5) in Table 4, the results here are no surprise. Size and BE/ME are both insignificant. The coefficient for BE/ME is actually negative, though coefficients for both size and BE/ME are near zero. EM and momentum, by comparison, are both significant at the 1% level.

Regressions (5) and (6) again split the sample roughly in half. Over the 1963-1985 subperiod, size is significant at the 1% level, but BE/ME is not. Over the more recent subperiod, 1986-2008, neither size nor BE/ME is significant. In fact, only EM is significant at the 5% level; momentum is only significant at the 10% level.

The consistency of the EM factor is very impressive in these regressions. In regressions (3) through (6), the size coefficient ranges from -0.01 to -0.13, all smaller than the -0.14 value seen in the baseline regression. The BE/ME factor ranges from -0.06 to 0.12, much lower than the 0.17 value in the baseline regression. By comparison, the four coefficients for the EM variable are -0.29, -0.30, -0.30, and -0.29, respectively. All are considerably larger than the value of -0.18 seen in the baseline regression.

One potential problem with the results of Tables 4 through 6 is that they are the result of advantageous sorting. Berk (2000) warned that sorting data into groups introduces a bias toward rejecting the model being considered. For example, removing the January returns, extreme returns, and the returns of low-priced stocks may introduce a bias in regressions that use returns as the dependant variable. As a result, the BE/ME effect may appear insignificant when in fact it may be the "true" parameter.

We do not feel Berk's critique applies here. In general, the regressions only sort the data into two groups along one dimension: January versus non-January returns, extreme returns versus non-extreme returns, stocks with price greater than $5 versus those with price less than $5, the top three market quintiles versus the bottom two, and the 1963-1985 subperiod versus the 1986-2008 subperiod. In regressions (4) and (5) of Table 5, the data is sorted both by stock price and by subperiod. In regressions (5) and (6) of Table 6, the data is sorted both by market quintiles and by subperiod. Only in regression (4) of Table 6 is the data sorted along two variables relating to returns: market quintiles and January/non-January.

While it is possible that sorting into just two groups could result in BE/ME (and size, in some regressions) being rejected incorrectly, there is no evidence to support why it should bias the models in favor of EM. In Tables 4 through 6, there are 10 regressions with EM and BE/ME as independent variables that are sorted along at least one dimension: regression (5) in Table 4, regressions (2) through (5) in Table 5 and regressions (3) through (6) in Table 6. In all 10 regressions, the coefficient for EM increases, and the t-statistic increases in 9 out of 10 regressions, when compared to regression (4) in Table 4 (the baseline). By comparison, the coefficient for BE/ME decreases in 9 out of the 10 sorted regressions. The t-statistic for BE/ME goes down in all 10, and becomes insignificant at the 5% level in 8 out of the 10 regressions.

In short, we feel it is extremely unlikely to see such consistent results across so many different models as a result of measurement error. In no regression in Tables 4 through 6 does BE/ME outperform EM, and BE/ME is weaker (as measured by a lower t-statistic) in all 10 regressions. EM is clearly a better measure at explaining monthly stock returns than the widely-used BE/ME.

C. Tobin's Q

As a final robustness check using individual stock returns, we examine whether EM is simply a proxy for another commonly-used value measure: Tobin's Q. Tobin's (1969) model uses an arbitrage argument to determine that firms invest when investment is expected to be profitable, i.e. generate returns in excess of some benchmark. More specifically, the firm will invest if Q, the ratio of the market value of the firm's capital stock to its replacement value, exceeds one. Since the numerator of the Q ratio is somewhat similar to EV, it is possible that Q is the true factor of interest and that EM is just a substitute for Tobin's Q.

In Table 7, we introduce Tobin's Q into the regressions. By itself in model (1), or paired with size in model (2), Q has a negative coefficient which is highly significant. Q's impact drops when run together with size and BE/ME, however. The coefficient changes sign from –0.33 in regression (2) to 0.15 in regression (3), with an insignificant t-statistic. BE/ME appears to subsume the entire effect of Tobin's Q as an explanatory variable in the cross-section of returns.

In the last row of Table 7, we include size, BE/ME, Tobin's Q, prior returns, and EM as explanatory variables. The results are similar to the baseline regression (4) in Table 4. Tobin's Q is significant at the 5% level (t-statistic of 2.05), while the other variables are all significant at the 1% level. Tobin's Q clearly does not dominant BE/ME or EM in explaining the cross sectional monthly returns.

D. Creation of the EMD Factor

The Enterprise Multiple appears to be an excellent determinant of realized monthly stock returns. In this section, we create the EMD factor in a similar manner as the HML factor from Fama and French (1993). We create a factor that mimics the return differences of the Low versus High EM portfolios. Each June of year t (1963-2008), all NYSE, Amex, and Nasdaq firms with available Compustat information are used to create size and EM groups. First, size groups are created by using the median NYSE firm. The sample is then divided into 3 EM groups using only NYSE firms to create yearly breakpoints for the bottom 30% (Low), middle 40% (Middle), and top 30% (High). We exclude firms with negative or missing values in the EM ratio.

Hence, six portfolios, based on size and EM, are created each year. The EMD factor each month is the simple average of the value-weighted returns on the two Low EM portfolios minus the average value-weighted returns of the two High portfolios. Panel A of Table 8 reports the summary statistics across the full sample. The SMB factor is not statistically significant at the 5% level (t-statistic of 1.77) and is heavily skewed, with a mean of 0.24 and a median of only 0.06. Similar to prior full-sample results with individual stocks, the HML and EMD factors are both highly significant. HML has a mean factor value of 0.43% per month, or 5.16% per year, compared to 4.8% per year in Fama and French (2006). EMD has a mean factor value of 0.48% per month or 5.76% per year.

Panel B of Table 8 reports the factor values after removing January returns. Not surprisingly, size becomes insignificant. The HML factor mean falls from 0.43% per month to 0.30% per month, though still significant at the 5% level. EMD is slightly lowered to 0.47% per month and is still significant at the 1% level. The EMD factor has identical median values (0.51%) for the all months and non-January samples. Thus, the portfolio summary statistics roughly follow the regression results: the HML factor is weaker outside the month of January whereas EMD is about the same.

Panel C computes the monthly factor correlations for the full sample period and for the full sample minus January. The monthly correlation between the EMD factor and the SML is -0.2820. This compares to the monthly correlation between EMD and HML of 0.8033.

While EMD and HML are highly correlated, the correlations are not perfect, and the differences in some of the values are noteworthy for when they occur in the sample. Figure 1 reports the time-series of monthly differences (HML minus EMD, in percentage) over 1963-2008. Note that the differences appear to be greatest around times of recessions, particularly around 1973, 1977, 1981, 2002, and 2008. Though more investigation is needed, these extreme differences during times when systematic risk is driving returns downward on a market-wide basis may be another explanation for why EMD (and EM) is a more significant factor in measuring cross-sectional returns.

In Table 9, we examine the adjusted R-squared values of portfolio regressions for each of the 25 size and BE/ME portfolios as was done in Fama and French (1993). In Panel A, the standard three-factor model is used. In Panel B, EMD is substituted for HML. Note that in Panel B, the cutoffs are still based on size and BE/ME, not size and EM, so EMD should be handicapped by comparison. While not much should be made about comparisons in R-squared, the goal here is to see if the R-squared values are similar across the two panels. With the exception of the High BE/ME quintile (i.e., value firms), this appears to be the case. Across the 25 cells, EMD R-squared values are higher than HML R-squared values in 6 of the 25 cells, and within 2% of HML R-squared values in 17 of the 25 cells. HML R-squared values are uniformly higher in the High BE/ME quintile by 4.50% to 8.90%.

E. International Evidence: UK and Japan

Fama and French (1998) extend the use of book-to-market to international markets, indicating that value stocks outperform growth stocks in 11 of 12 international markets using data from 1975 to 1995. In two-factor regressions using a global market portfolio and a portfolio of high BE/ME stocks, they find positive slopes on the BE/ME coefficient in all 12 countries tested, with t-statistics significant at the 5% level in 11 of the 12 countries.

In Table 10, we compare EM and BE/ME in regressions using data from largest non-US stock markets (the United Kingdom and Japan). The stock return data (in local currencies) is gathered from Datastream while all accounting information is obtained from Compustat Global. Panel A contains the UK results and Panel B reports the Japanese regressions. As before, all the independent variables are winsorized at the 1% and 99% percentiles.

The first regression in each panel has three independent variables (size, book-to-market, and prior returns). The dependent variable is the raw monthly stock return (in the local currency).

For UK firms, in the first row, book-to-market is highly significant, with a coefficient of 0.32 and t-statistic of 3.47. Model (2) contains EM by itself; it is also highly significant with a negative coefficient. Hence, both book-to-market and the enterprise multiple are highly significant in explaining monthly returns for UK firms during the 1989 to 2008 time period. For the UK data, the size variable has a significant positive coefficient. Thus, unlike the US evidence, larger UK firms have higher realized monthly returns.

When we add EM with size, book-to-market, and prior returns, the result is very similar to the evidence seen in previous tables: EM remains highly significant, while BE/ME is not. The coefficient of EM hardly changes, decreasing to -0.47 (t-statistic of -4.38), while the coefficient for BE/ME is only significant only at the 10% level. Hence, controlling for other factors, EM has higher explanatory power in explaining realized UK monthly stock returns than book-to-market.

Panel B contains the Japanese results. Again, both EM and BE/ME are highly significant in separate regressions. In a combined regression in the last row, we find our only (partially) contrary result. Here the BE/ME coefficient holds relatively stable, decreasing from 0.41 to 0.36, and still highly significant. EM drops in half, from -0.24 to -0.12, though still significant at the 5% level (t-statistic -2.01). For the Japanese data, neither size nor prior returns are significant.

Overall, the international evidence confirms the evidence from U.S. data: EM is a highly significant measure of relative value. In regressions simultaneously including size, BE/ME, prior returns, and EM, the enterprise multiple is significant at the 5% level in both the U.K. and Japan, while book-to-market is only significant in the Japanese data.

IV. Conclusion

Recent results from Fama and French (2006) find a value premium of 4.8% per year over 1926-2004. Yet, mutual fund managers have proven unable to capture this premium. Fund managers perennially underperform growth indices like the Standard and Poor's 500 Index and value fund managers do not outperform growth fund managers. Either the value premium does not actually exist, or it does not exist in a way that can be exploited by fund managers and other investors.

We extend and improve on the prior literature by introducing a more complete and robust value-based ratio that is heavily used by analysts: the Enterprise Multiple (EM). The valuation textbooks of Damodaran (2006) and Koller, Goedhart, and Wessels (2005) motivate our use of the Enterprise Multiple. EM often succeeds in areas in which book-to-market fails. In the top three size quintiles, accounting for about 94% of total market value, EM is a highly significant measure of relative value, whereas BE/ME is insignificant and size is only weakly significant. EM is also highly significant after controlling for the January seasonal and after removing low-priced (<$5) stocks. Robustness checks indicate that EM is also better than Tobin's Q as a factor to explain monthly stock returns.

As BE/ME is used to calculate the HML factor, we use the Enterprise Multiple to create EMD, a factor designed to mimic the return differences of low versus high EM portfolios. EMD generates a value premium of 0.48% per month, or 5.76% per year, significant at the 1% level. After January returns are removed, the EMD factor is slightly lower at 0.47% per month while HML drops from 0.43% per month to 0.30% per month with lower statistical significance. EM also performs relatively well when using UK or Japanese data. In short, EM appears to be a better measure of value than book-to-market in the cross-section of stock returns.

Our results are an improvement over the existing literature because, rather than being driven by obscure artifacts of the data, namely the stocks in the bottom 6% of market cap and the January effect. Our results apply to virtually the entire universe of US stocks and are not overly influenced by the January effect. In other words, our results may actually be relevant to both Wall Street and academics.

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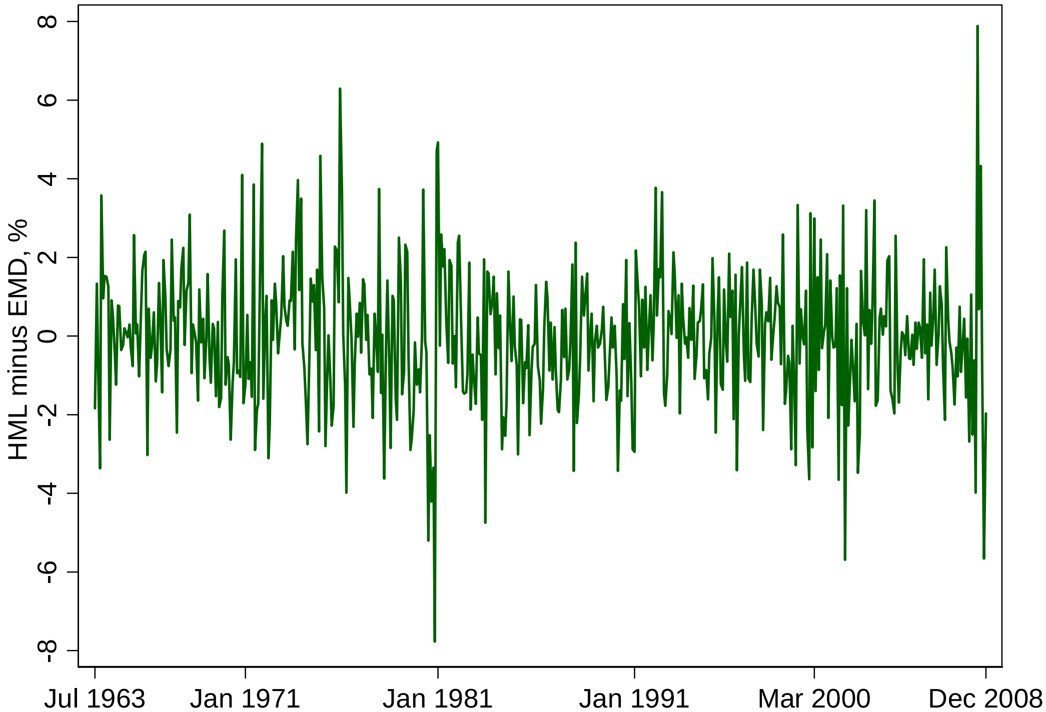

Figure 1. Time-series pattern of the monthly difference between the HML and EMD Factors, 1963-2008.

Table 1
Sample Creation, 1963-2008

This table outlines the impact of various data filters on creating the final sample. To be in the initial sample, firms must have a non-missing market value of equity as of June of year t and have two years of prior Compustat data availability. Tobin's Q is market value of equity and book value of liabilities divided by total assets as of December of year t-1. EM is the enterprise multiple, calculated as EV/EBITDA: enterprise value (equity value + debt value + preferred stock – cash)/operating income as of December of year t-1.

Source/Filter	Sample Size	Observations Removed
CRSP/Compustat Initial sample	133,410	
Missing or Negative Book value	127,550	5,860
Missing Tobin's Q	127,284	266
Missing or Negative EM	107,493	19,791
Firm-Year Observations	107,493	

Table 2
Summary Statistics, 1963-2008

All non-financial firms listed on the NYSE, Amex, or Nasdaq with CRSP and Compustat information are included in the sample. To be included in the table, firms must have non-negative and non-missing BE/ME, EM, and Tobin's Q values. There are 107,493 firm-year observations for the items in each row. A firm's size is its market capitalization (price times shares outstanding) as of June of year t. Prior return is the raw buy-and-hold return for the 12 months before the portfolio formation. EM is the enterprise multiple, calculated as EV/EBITDA: enterprise value (equity value + debt value + preferred stock – cash)/operating income as of December of year t-1. The book-to-market ratio (BE/ME) is the prior year's book value of equity divided by the firm's market value as of December of year t-1. Tobin's Q is market value of equity and book value of liabilities divided by total assets as of December of year t-1. The prior year return, subsequent year return, EM, book-to-market, and Tobin's Q variables are all winsorized at the 1% and 99% percentiles.

Item	Mean	25th	Median	75th
Market Value (in millions)	$1,518.3	$23.1	$101.9	$543.4
Share Price	$20.6	$6.8	$15.1	$27.8
Prior Year Return	17.1%	-16.3%	8.3%	37.5%
Subsequent Year Return	14.7%	-17.6%	7.0%	35.7%
EM	11.5	4.8	7.1	10.9
Book-to-Market	0.93	0.41	0.72	1.20
Tobin's Q	1.56	0.93	1.18	1.72

Table 3
Annual Value Weighted Subsequent Returns, 1963-2008

Portfolios are formed each June (1963-2008). The value weighted buy-and-hold returns are from July of year t to June of year t+1. Size quintiles are formed each June of year t using only firms listed on the NYSE. In panel A, EM is defined as EV/EBITDA: (equity value + debt value + preferred stock – cash)/ operating income as of December of year t-1. In panel B, book-to-market is book value of equity plus deferred taxes and investment tax credit scaled by market value of equity as of December of year t-1. The yearly EM and book-to-market cutoffs are determined using only NYSE firms. All non-financial firms listed on the NYSE, Amex, and Nasdaq with available CRSP and Compustat information are included in the table.

Panel A: EM Quintiles

Size Quintiles	Low (Value)	2	3	4	High (Growth)	Diff Low – High
Small	19.5%	18.0%	14.0%	14.4%	9.4%	10.1%
2	17.3%	16.4%	14.7%	14.5%	10.9%	6.4%
3	17.6%	16.5%	14.2%	12.6%	10.0%	7.6%
4	15.7%	15.8%	12.9%	11.4%	9.8%	5.9%
Large	13.6%	12.8%	10.1%	10.1%	9.6%	4.0%
Average	16.7%	15.9%	13.2%	12.6%	9.9%	6.8%

Panel B: Book-to-Market Quintiles

Size Quintiles	Low (Growth)	2	3	4	High (Value)	Diff High-Low
Small	7.6%	13.4%	14.7%	16.1%	17.6%	10.0%
2	10.4%	12.9%	15.1%	16.6%	15.9%	5.5%
3	11.2%	12.7%	13.4%	14.3%	17.0%	5.8%
4	11.0%	10.7%	12.2%	14.7%	14.5%	3.5%
Large	10.3%	9.9%	10.8%	11.4%	12.5%	2.2%
Average	10.1%	11.9%	13.2%	14.6%	15.5%	5.4%

Table 4

Average Parameter Values from Monthly Cross-Sectional Regressions of Monthly Return on Size, Book-to-Market, Prior Return, and EM July 1963-December 2008 (546 months)

The universe of firms (NYSE, Amex, and Nasdaq) includes all non-financial companies reporting CRSP and Compustat information as of June of year t. The dependent variable is the raw monthly return for firm i in calendar month j. A firm's size is its market capitalization (price times shares outstanding) as of June of year t. The book-to-market ratio (BE/ME) is the prior year's book value of equity divided by the firm's market value as of December of year t-1. Prior return is the raw buy-and-hold return from month j-12 to month j-2. EM is EV/EBITDA: (equity value + debt value + preferred stock – cash)/operating income as of December of year t-1. All independent variables are winsorized at the 1% and 99% percentiles. The first 4 rows have 546 monthly observations. The last row excludes the month of January and has 501 observations. The t-statistics are in parentheses. To be included in any of the regressions, firms must have non-negative and non-missing BE/ME, EM, and Tobin's Q values.

$$r_{ij} = a_{0j} + a_{1j}\ln(\text{Size})_{ij} + a_{2j}\ln(\text{BE/ME})_{ij} + a_{3j}\ln(1\text{+prior})_{ij} + a_{4j}\ln(\text{EM})_{ij} + e_{ij}$$

Model	Intercept	ln(Size)	ln(BE/ME)	ln(1+prior)	ln(EM)
(1) All Firms	1.85	-0.11	0.25		
(1963-2008)	(5.16)	(-2.73)	(3.66)		
(2) All Firms	1.84	-0.14	0.25	0.97	
(1963-2008)	(5.65)	(-3.54)	(3.89)	(5.41)	
(3) All Firms	1.96				-0.33
(1963-2008)	(9.24)				(-5.41)
(4) All Firms	2.24	-0.14	0.17	0.93	-0.18
(1963-2008)	(7.89)	(-3.79)	(2.85)	(5.29)	(-3.50)
(5) All Firms	1.62	-0.04	0.07	1.35	-0.29
(No January)	(5.86)	(-1.09)	(1.32)	(8.39)	(-5.78)

Table 5
Average Parameter Values from Monthly Cross-Sectional Regressions of Monthly Return on Size, Book-to-Market, Prior Return and EM, July 1963 - December 2008

The universe of firms (NYSE, Amex, and Nasdaq) includes all non-financial companies reporting CRSP and Compustat information as of June of year t. The dependent variable is the raw monthly return for firm i in calendar month j. A firm's size is its market capitalization (price times shares outstanding) as of June of year t. The book-to-market ratio (BE/ME) is the prior year's book value of equity divided by the firm's market value as of December of year t-1. Prior return is the raw buy-and-hold return from month j-12 to month j-2. EM is EV/EBITDA: (equity value + debt value + preferred stock - cash)/operating income. All independent variables are winsorized at the 1% and 99% percentiles. Row 2 removes the top and bottom 1% of returns from the sample. Row 4 has 270 observations while row 5 has 276. The t-statistics are in parentheses.

$$r_{ij} = a_{0j} + a_{1j}\,\ln(\text{Size})_{ij} + a_{2j}\,\ln(\text{BE/ME})_{ij} + a_{3j}\,\ln(1\text{+prior})_{ij} + a_{4j}\,\ln(\text{EM})_{ij} + e_{ij}$$

Model	Intercept	ln(Size)	ln(BE/ME)	ln(1+prior)	ln(EM)
(1) All Firms	2.24	-0.14	0.17	0.93	-0.18
(1963-2008)	(7.89)	(-3.79)	(2.85)	(5.29)	(-3.50)
(2) All Firms	1.26	0.05	0.11	1.19	-0.29
No extreme Returns	(5.29)	(1.53)	(2.26)	(8.51)	(-7.65)
(3) Price >$5	1.98	-0.08	0.10	1.13	-0.29
(1963-2008)	(7.12)	(-2.38)	(1.58)	(6.25)	(-5.24)
(4) Price > $5	2.22	-0.14	0.20	1.30	-0.19
(1963-1985)	(5.25)	(-2.88)	(2.05)	(4.75)	(-2.59)
(5) Price >$5	1.75	-0.02	-0.00	0.96	-0.38
(1986-2008)	(4.82)	(-0.39)	(-0.07)	(4.06)	(-4.69)

Table 6
Average Parameter Values from Monthly Cross-Sectional Regressions of Monthly Return on Size, Book-to-Market, Prior Return and EM, July 1963 - December 2008

The universe of firms (NYSE, Amex, and Nasdaq) includes all non-financial companies reporting CRSP and Compustat information as of June of year t. The dependent variable is the raw monthly return for firm i in calendar month j. A firm's size is its market capitalization (price times shares outstanding) as of June of year t. The book-to-market ratio (BE/ME) is the prior year's book value of equity divided by the firm's market value as of December of year t-1. Prior return is the raw buy-and-hold return from month j-12 to month j-2. EM is EV/EBITDA: (equity value + debt value + preferred stock - cash)/operating income. All independent variables are winsorized at the 1% and 99% percentiles. Rows 2 to 6 restrict the sample to only firms in the top 3 market value quintiles (approximately 94% of the total market value). Row 5 has 270 observations while row 6 has 276. To be included in any of the regressions, firms must have non-negative and non-missing BE/ME, EM, and Tobin's Q values. The t-statistics are in parentheses.

$$r_{ij} = a_{0j} + a_{1j}\ln(\text{Size})_{ij} + a_{2j}\ln(\text{BE/ME})_{ij} + a_{3j}\ln(1\text{+prior})_{ij} + a_{4j}\ln(\text{EM})_{ij} + e_{ij}$$

Model	Intercept	ln(Size)	ln(BE/ME)	ln(1+prior)	ln(EM)
(1) All Firms	2.24	-0.14	0.17	0.93	-0.18
(1963-2008)	(7.89)	(-3.79)	(2.85)	(5.29)	(-3.50)
(2) Top 3 Mkt	1.50	-0.07	0.12		
Quintiles	(3.54)	(-1.67)	(1.41)		
(3) Top 3 Mkt	1.88	-0.07	0.03	1.11	-0.29
Quintiles	(4.69)	(-1.82)	(0.40)	(4.75)	(-3.60)
(4) Top 3 Mkt	1.65	-0.05	-0.05	1.34	-0.30
Quintiles	(4.03)	(-1.26)	(-0.74)	(5.78)	(-3.55)
(No January)					
(5) Top 3 Mkt	2.31	-0.13	0.12	1.60	-0.30
Quintiles	(4.31)	(-2.62)	(1.07)	(4.93)	(-2.90)
(1963-1985)					
(6) Top 3 Mkt	1.46	-0.01	-0.06	0.62	-0.29
Quinitiles	(2.46)	(-0.18)	(-0.67)	(1.88)	(-2.29)
(1986-2008)					

Table 7
Average Parameter Values from Monthly Cross-Sectional Regressions of Monthly Return on Size, Book-to-Market, Tobin's Q, Prior Return, and EM, July 1963 - December 2008

The universe of firms (NYSE, Amex, and Nasdaq) includes all non-financial companies reporting CRSP and Compustat information as of June of year t. The dependent variable is the raw monthly return for firm i in calendar month j. A firm's size is its market capitalization (price times shares outstanding) as of June of year t. The book-to-market ratio (BE/ME) is the prior year's book value of equity divided by the firm's market value as of December of year t-1. Tobin's Q is market value of equity and book value of liabilities divided by total assets as of December of year t-1. Prior return is the raw buy-and-hold return from month j-12 to month j-2. EM is EV/EBITDA: (equity value + debt value + preferred stock - cash)/operating income. All independent variables are winsorized at the 1% and 99% percentiles. To be included in any of the regressions, firms must have non-negative and non-missing BE/ME, EM, and Tobin's Q values. All rows contain 546 monthly observations. The t-statistics are in parentheses.

$$r_{ij} = a_{0j} + a_{1j}\ln(\text{Size})_{ij} + a_{2j}\ln(\text{BE/ME})_{ij} + a_{3j}\ln(\text{Tobin's Q})_{ij} + a_{4j}\ln(1+\text{prior})_{ij} + a_{5j}\ln(\text{EM})_{ij} + e_{ij}$$

	Model	Intercept	ln(Size)	ln(BE/ME)	ln(Tobin's Q)	ln(1+prior)	ln(EM)
(1)	All Firms	1.37			-0.55		
	(1963-2008)	(5.81)			(-4.98)		
(2)	All Firms	1.87	-0.12		-0.33		
	(1963-2008)	(5.18)	(-2.81)		(-3.03)		
(3)	All Firms	1.85	-0.12	0.35	0.15		
	(1963-2008)	(5.21)	(-2.75)	(3.62)	(0.95)		
(4)	All Firms	2.26	-0.15	0.34	0.29	0.92	-0.20
	(1963-2008)	(7.99)	(-3.84)	(3.78)	(2.05)	(5.26)	(-3.89)

Table 8
Factor summary statistics and correlations

The monthly factor returns are in percentages. Thus, 0.24 for SMB in Panel A is 24 basis points per month. The SML (small minus large), HML (value minus growth), and UMD (momentum) Fama and French factors are from Wharton Research Data Services. The EMD is a factor created to mimic the return difference between Low EM and High EM portfolios. The monthly EMD factor is the simple average of the value-weighted returns on the two Low EM portfolios minus the average value-weighted returns of the two High EM portfolios.

Panel A: All months, 1963-2008 (N = 546)

Item	SMB	HML	UMD	EMD
Mean	0.24	0.43	0.86	0.48
Median	0.06	0.41	0.86	0.51
t-value on Mean = 0	1.77	3.46	4.96	4.40

Panel B: Non-January months, 1963-2008 (N = 501)

Item	SMB	HML	UMD	EMD
Mean	0.07	0.30	1.05	0.47
Median	-0.01	0.36	0.93	0.51
t-value on Mean = 0	0.49	2.41	6.21	4.16

Panel C: Monthly factor correlations (N = 546)

	SMB	HML	UMD	EMD
SMB	1.0000			
HML	-0.2634	1.0000		
UMD	0.0099	-0.1308	1.0000	
EMD	-0.2820	0.8033	-0.0028	1.0000

Panel D: Non-January monthly factor correlations (N = 501)

	SMB	HML	UMD	EMD
SMB	1.0000			
HML	-0.3601	1.0000		
UMD	0.1142	-0.1411	1.000	
EMD	-0.3174	0.8119	-0.0372	1.0000

Table 9
R-squared Values by Size and Book-to-Market Portfolios, 1963-2008

Each year, the CRSP and Compustat non-financial stock universe is sorted into size and book-to-market quintiles using NYSE firms to determine yearly cutoffs. Value weighted monthly portfolio returns for each of the 25 cells is regressed against the 3-factor model and against the factors with EMD instead of HML. In panel A, the adjusted R-squared values for each of the 25 cells are reported using the Fama-French 3-factor model. In panel B, the adjusted R-squared values for each of the 25 size and book-to-market quintiles are reported using the EMD factor instead of HML. All regressions have 546 monthly observations.

$$Portfolio\ Return_t - R_{ft} = a + b[R_{mt} - R_{ft}] + s\text{SMB}_t + h\text{HML}_t + e_t$$
$$Portfolio\ Return_t - R_{ft} = a + b[R_{mt} - R_{ft}] + s\text{SMB}_t + h\text{EMD}_t + e_t$$

Panel A: Adjusted R-squared values with HML factor

Book-to-Market Quintiles

Size Quintiles	Low (Growth)	2	3	4	High (Value)
Small	85.32%	90.73%	91.30%	91.05%	90.58%
2	90.44%	92.19%	90.08%	90.36%	90.15%
3	90.85%	87.40%	86.10%	87.34%	85.26%
4	90.13%	84.91%	85.13%	83.93%	79.00%
Large	91.79%	86.83%	79.04%	81.06%	69.65%

Panel B: Adjusted R-squared values with EMD factor

Book-to-Market Quintiles

Size Quintiles	Low (Growth)	2	3	4	High (Value)
Small	86.09%	90.36%	90.28%	88.73%	86.08%
2	90.29%	92.19%	89.88%	88.68%	85.95%
3	90.42%	88.05%	86.08%	83.63%	79.27%
4	89.16%	85.58%	85.71%	80.27%	72.52%
Large	91.67%	87.78%	80.61%	80.05%	60.75%

Table 10
Average Parameter Values from Monthly Cross-Sectional Regressions of Monthly Return on Size, Book-to-Market, Prior Return, and EM across UK and Japanese Markets

The universe of firms includes all companies reporting DataStream and Compustat Global information as of June of year t. Returns, stock prices, and market values are from Datastream. All accounting information is from Compustat Global. The dependent variable is the raw monthly return (in local currencies) for firm i in calendar month j. In Panel A (UK data), only firms with a stock price at the time of portfolio formation of more than $1 are in the regressions. A firm's size is its market capitalization (price times shares outstanding) as of June of year t. The book-to-market ratio (BE/ME) is the prior year's book value of equity divided by the firm's market value as of December of year t-1. Prior return is the raw buy-and-hold return from month j-12 to month j-2. EM is EV/EBITDA: (equity value + debt value – cash)/operating income as of December of year t-1. All independent variables are winsorized at the 1% and 99% percentiles. The t-statistics are in parentheses. To be included in any of the regressions, firms must have non-negative and non-missing BE/ME and EM values.

$$r_{ij} = a_{0j} + a_{1j}\ln(\text{Size})_{ij} + a_{2j}\ln(\text{BE/ME})_{ij} + a_{3j}\ln(1\text{+prior})_{ij} + a_{4j}\ln(\text{EM})_{ij} + e_{ij}$$

Panel A: UK Data (July 1989 to December 2008)

Model	Intercept	ln(Size)	ln(BE/ME)	ln(1+prior)	ln(EM)
(1) All Firms	-0.04	0.12	0.32	1.43	
	(-0.09)	(2.04)	(3.47)	(4.67)	
(2) All Firms	1.80				-0.54
	(5.02)				(-4.71)
(3) All Firms	0.77	0.12	0.14	1.39	-0.47
	(1.69)	(2.01)	(1.72)	(4.32)	(-4.38)

Panel B: Japanese Data (July 1990 to December 2008)

Model	Intercept	ln(Size)	ln(BE/ME)	ln(1+prior)	ln(EM)
(1) All Firms	-0.02	-0.01	0.41	-0.18	
	(-0.04)	(-0.08)	(4.15)	(-0.43)	
(2) All Firms	0.60				-0.24
	(1.66)				(-2.88)
(3) All Firms	0.28	-0.01	0.36	-0.19	-0.12
	(0.49)	(-0.15)	(3.86)	(-0.45)	(-2.01)