What Factors Drive Global Stock Returns?[*]

Kewei Hou,[a] G. Andrew Karolyi,[a,**] Bong Chan Kho[b]

[a] *Fisher College of Business, Ohio State University, Columbus, OH 43210, USA*
[b] *College of Business Administration, Seoul National University, Seoul 151-916, Korea*

Abstract

This study seeks to identify which factors are important for explaining the time-series and cross-sectional variation in global stock returns. We evaluate firm characteristics, such as size, earnings/price, cash flow/price, dividend/price, book-to-market equity, leverage, momentum, that have been suggested in the empirical asset pricing literature to be cross-sectionally correlated with average returns in the United States and in developed and emerging markets around the world. For monthly returns of 26,000 individual stocks from 49 countries over the 1981 to 2003 period, we perform cross-sectional regression tests of average returns at the individual firm level and we construct factor-mimicking portfolios based on these firm-level characteristics to assess their ability to explain time-series return variation in country, industry and characteristics-sorted portfolios. We find that the momentum and cash flow/price factor-mimicking portfolios, together with a global market factor, capture substantial common variation in global stock returns. In addition, the three factors explain the average returns of country and industry portfolios, and a wide variety of single- and double-sorted characteristics-based portfolios.

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[**] Corresponding author contact information: Tel.: +1-614-292-0229; fax: +1-614-292-2418.
Email address: karolyi@cob.osu.edu (G. A. Karolyi)

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There has been considerable evidence that the cross-section of average returns are related to firm-level characteristics such as size, earnings/price, cash flow/price, dividend/price, book-to-market equity, leverage, momentum both in the United States and in developed and emerging markets around the world. Measured over long sample periods, small stocks earn higher average returns than large stocks (Banz, 1981; Reinganum, 1981; Keim, 1983; Kato and Schallheim, 1985; Hawawini and Keim, 1999; Heston, Rouwenhorst and Wessels, 1995). Fama and French (1992, 1996, 1998), Capaul, Rowley and Sharpe (1993), Lakonishok, Shleifer and Vishny (1994), Chui and Wei (1998), Achour, Harvey, Hopkins and Lang (1999a, 1999b), Estrada and Serra (2005) and Griffin (2002) show that value stocks with high book-to-market (B/M), earnings-to-price (E/P), or cash-flow-to-price (C/P) ratios outperform growth stocks with low B/M, E/P or C/P ratios. Moreover, stocks with high return over the past 3- to 12-months continue to outperform stocks with poor prior performance (Jegadeesh and Titman, 1993, 2001; Carhart, 1997; Rouwenhorst, 1998; Chan, Hameed and Tong, 2000; Chui, Titman and Wei, 2003; Griffin, Ji and Martin, 2003; Hou, Peng and Xiong, 2006a, 2006b).

The interpretation of the evidence is, of course, strongly debated. Some believe that the premiums associated with these characteristics are compensation for pervasive extra-market risk factors, others attribute them to inefficiencies in the way markets incorporate information into prices. Yet others propose that the premiums are just a manifestation of survivorship or data-snooping biases (Kothari, Shanken and Sloan, 1995; MacKinlay, 1995). Many of the studies listed above that focus on international markets motivate their efforts as a response to this latter criticism. That is, to the extent that developed or emerging markets move independently from U.S. markets, they provide independent verification of the size, value and momentum premiums.

We motivate our study in this same spirit, but we dare to broaden the investigation to over 26,000 stocks from 49 countries using monthly returns over the 1981 to 2003 period to re-examine the size, value/growth and momentum effects. To this end, we take advantage of the breadth and coverage of Thomson Financial's Datastream International and Worldscope databases. We assess a variety of firm attributes (including market capitalization, B/M, E/P, C/P, momentum, dividend yield, and financial leverage) for the cross-section of expected stock returns at the individual firm level.

Perhaps more importantly, we seek to identify which factors are important for explaining the common variation in global stock returns. For each of the firm attributes discussed above, we construct a zero-investment factor-mimicking portfolio (in the spirit of Huberman, Kandel and Stambaugh, 1987, using the methodology of Fama and French, 1993, and Chan, Karceski and Lakonishok, 1998) by going long in stocks that have high values of an attribute (such as B/M) and short in stocks with low values of the attribute. Examining the returns behavior of the different mimicking portfolios can help us evaluate and interpret the underlying factors (Charoenrook and Conrad, 2005). Finally, we assess the performance of different models combining these factor-mimicking portfolios to capture the time-series variation in a wide variety of characteristics-sorted portfolios and to explain the cross-sectional differences in average returns (Fama and French, 1993, 1996).

The identification of the common sources of comovement and, hence, possible sources of portfolio risk in international stock returns is, of course, just as important for investment practitioners as for academic researchers. The popularity of global factor models has grown dramatically in industry with their extensive use for portfolio risk optimization, active-risk budgeting, performance evaluation and style/attribution analysis. In addition to market, currency, macroeconomic and industry-specific risk factors, models such as BARRA's Integrated Global Equity Model (Stefek, 2002; Senechal, 2003), Northfield's Global Equity Risk Model (Northfield, 2005), ITG's Global Equity Risk Model (ITG, 2003) and Salomon Smith Barney's Global Equity Risk Management (GRAM, Miller et al., 2002) all include - what are referred to as - "style," "fundamental," "financial-statement ratio," or "bottom-up" factors. They all rationalize their choice of factor model specifications based on the joint goals of robustness and parsimony.

What do we find? First, our cross-sectional Fama-MacBeth (1973) tests of individual stock returns confirm the weak relationship between average returns and market betas (measured locally, relative to the national market index, or globally, relative to the world market portfolio, or within industry, relative to the industry portfolio to which a firm belongs). The positive relationship with B/M, momentum, C/P is reliable, but that with size is not. These effects are much stronger in developed countries than emerging markets and especially in the second half of the sample (1993-2003). Second, we uncover desirable attributes for factor-mimicking portfolios constructed on the basis of many of the same characteristics that were successful in the cross-sectional analysis. Global factor mimicking portfolios based on B/M, momentum, C/P, and now even size and E/P have statistically significant and appropriately-signed average returns and considerable time-series variability, comparable to global, industry and country market excess returns. Third, and finally, among the various multifactor models combining these candidate global factor mimicking portfolios, the momentum and C/P factor-mimicking portfolios, together with a global market factor, capture strong common variation in global stock returns. In addition, the three-factor model explains the average returns (using *F*-tests of Gibbons, Ross and Shanken, 1989) of country and industry portfolios, and even a broad set of single- and double-sorted characteristics-based portfolios. The only test assets that prove elusive for this parsimonious model are the double-sorted size-B/M portfolios, and their failure stems from returns of the extreme small, value stocks and only in January.

Our paper touches many strands of the domestic and international asset pricing literature, only a fraction of which have been cited above. Perhaps the two working papers that are closest to ours are Dahlquist and Sallstrom (2002) and De Moor and Sercu (2005b). Unlike our effort here, Dahlquist and Sallstrom focus on the success of a conditional asset pricing model with multiple exchange rate risks for a wide variety of test assets. De Moor and Sercu evaluate candidate factor specifications in the U.S. and beyond using some of the same style portfolios (size, B/M and momentum). While they evaluate exchange rate risk factors in the context of the Solnik (1974) and Sercu (1980) international asset pricing models that we do not, they fail to consider a number of popular firm-level attributes (C/P, E/P, dividend yield) as well as many other test asset portfolios that we investigate. Ultimately, their goal is to show how sensitive their results are to test design, while we show a remarkable consistency in the success of a small number of key factors for explaining both the time series and cross-section variations of expected returns across a variety of test methods.

One important contribution that is a by-product of our study is the fact that we measure all of our firm-level characteristics and construct our factor-mimicking portfolios on a country- or industry-adjusted basis. For example, in our cross-sectional tests, we evaluate not only whether B/M ratios are significantly related to average returns, but also whether those ratios relative to the country and/or industry average B/M ratio are priced. This is an important consideration given the concern over the disparity of accounting standards across countries and economic interpretations of these ratios for firms across industries. In addition, when we construct a B/M factor-mimicking portfolio based on buying firms from the highest-quintile of B/M ratios and selling firms from the lowest-quintile of B/M ratios, we do so three different ways: (i) firms are ranked globally across all countries and industries ("global factor-mimicking portfolio"), (ii) firms are ranked within each country ("country-neutral" because low B/M firms are subtracted from high B/M firms within the same country), and (iii) firms are ranked within each industry ("industry-neutral"). If industry (country) factors are important drivers of global stock returns, then we should observe significant differences in the ability of a "global" versus an "industry-neutral" ("country-neutral") factor-mimicking portfolio in our time-series tests. Our effort will shed helpful light on the debate that ensues over the relative importance of country versus industry factors (Roll, 1992; Heston and Rouwenhorst, 1994; Griffin and Karolyi, 1998; Cavaglia, Brightman and Aked, 2000; Brooks and Del Negro, 2004; Carrieri, Errunza and Sarkissian, 2005).

Finally, as important as it is to delineate at the outset what our study does, it is also important to delineate what it does not attempt to do. First, we do not seek to challenge the central place of market factor - globally or locally - for international stock returns. As the survey study by Karolyi and Stulz (2003) points out, however, there is mounting evidence that the international versions of the Sharpe-Lintner-Black capital-asset pricing model do not perform well (Stehle, 1977; Jorion and Schwartz, 1986; Harvey, 1991) so the pursuit of extra-market factors seems fruitful. Second, we do not seek to validate or invalidate the potential usefulness of global macroeconomic factor risks. In the U.S. and in international markets, Chan, Chen and Hsieh (1985), Chen, Roll and Ross (1986), Cho, Eun and Senbet (1986), Wheatley (1988), Campbell and Hamao (1992), Bekaert and Hodrick (1992), Ferson and Harvey (1991, 1993, 1994), Harvey (1995) and others document that innovations in macroeconomic factors, such as industrial production growth, changes in expected and unexpected inflation, consumption growth, oil price shocks, the level and slope of the term structure, and default risk can explain average returns. Also, there is important new work linking economic factors to characteristics-based factor mimicking portfolios like those we study (Liew and Vassalou, 2000; Vassalou, 2003; Brennan, Wang and Xia, 2004; Petkova, 2006). Third, we do not investigate whether and how exchange rate risk is priced. All of our returns are U.S.-dollar denominated at prevailing exchange rates and in excess of monthly U.S. Treasury bill rates. A key contribution of Solnik's (1974) seminal international asset pricing model that allows consumption baskets to differ across countries is that currency risk is priced. There is growing evidence in support of this hypothesis and that the magnitude of currency-risk exposures can be quite large (Dumas and Solnik, 1995; DeSantis and Gerard, 1997, 1998; Griffin and Stulz, 2001). Fourth, there are a number of firm-level return predictors that we do not consider and probably should, such as liquidity. Several important new studies have documented a strong cross-sectional relationship between average returns and liquidity proxies, especially in emerging markets (Rouwenhorst, 1999; Bekaert, Harvey and Lundblad, 2005; Lesmond, 2005; Lee, 2005). Finally, at our own peril, we ignore the dynamically changing structure of global markets over the past two decades, especially the forces of market liberalization in emerging markets. Numerous studies have shown that there are important consequences for market returns, return volatility, as well as market and fundamental risk factors (among others, Bekaert and Harvey, 1995, 2000; Henry, 2000; Bekaert, Harvey and Lumsdaine, 2002; Chari and Henry, 2004).

The next section outlines in detail the data, including summary statistics. Sections II through IV present the evidence in order on the cross-section of individual stock returns, on return characteristics of our factor-mimicking portfolios and on the time-series regression tests. In section V, we describe the conclusions of our exploratory analysis to date.

I. Data and Methodology

A. Sample construction

The sample construction begins with all firms included in the country lists and dead-firm lists provided by Datastream from July 1981 to December 2003.[1] From these lists containing over 50,000 stocks, we select those with sufficient information to calculate at least one financial variable such as book-to-market (B/M), cash flow-to-price (C/P), dividend-to-price (D/P), earnings-to-price (E/P), long-term debt-to-book equity (L/B), and market value of equity (Size). These company-accounts items in Datastream are obtained from the Worldscope database covers over 39,000 firms in more than 50 countries between 1981 and 2003, which includes over 29,000 currently-active companies in developed and emerging markets representing approximately 95% of global market capitalization.[2] We then select common stocks that are traded in the country's major exchange(s), excluding preferred stocks, warrants, REITs, closed-end funds, exchange-traded funds, and depositary receipts. For most countries, the exchange which has the largest number of traded stocks is selected, except that multiple exchanges are included in the sample for China (Shanghai and Shenzen exchanges), Japan (Osaka and Tokyo exchanges), and the United States (NYSE, AMEX, and NASDAQ). Finally, to be included in the sample, stocks must have at least 12 monthly stock returns during our sample period.

After imposing these sampling criteria, our final sample yields 26,615 common stocks across 49 countries and 34 industries as reported in **Table 1**. It is evident from Panel A of Table 1 that the data coverage becomes much better in the late 1980s, especially for emerging economies. This is because Worldscope included more firms into the database during this period but did not backfill the data for those newly added firms. Panel B shows the number of sample stocks included in each of the 34 industries over the sample period. The industry classifications follow FTSE's Global Classification system (www.ftse.com) Level 3 (10 economic sectors) and Level 4 (34 industries) groupings.

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1 A number of recent studies use Datastream International due to its broad and deep coverage, e.g., Griffin (2002), Griffin, Ji, and Martin (2003), Doidge (2004), Doidge, et al. (2004), De Moor and Sercu (2005a, 2005b), Lesmond (2005), and Lee (2005).

2 Note also that the Worldscope/Disclosure database carries only one representative type of share for each firm based on trading intensity and availability for foreign investors, although the Datastream International database carries more than one type of share for a given firm. In addition, Worldscope/Disclosure uses standard data definitions for financial accounting items in an attempt to minimize differences in accounting terminology and treatment across different countries. The data is collected from corporate documents such as annual reports and press releases, exchange and regulatory agency filings, and newswires. See www.thomson.com under "Worldscope Fundamentals" for more details. Worldscope incorporates data from its merger with Compact Disclosure which was effected in June 1995 by Worldscope and Datastream's original holding company, Primark Corporation, prior to its subsequent June 2000 acquisition by Thomson Financial.

In addition to the sampling criteria described above, we apply several screening procedures for monthly returns as suggested by Ince and Porter (2003) and others. First, in order to minimize potential biases arising from low-priced and illiquid stocks, we require a minimum price of \$1 in the previous month to be included. However, our results are robust when we remove this screen or impose alternative price screens. Second, any return above 300% that is reversed within one month is set to missing. Specifically, if R_t or R_{t-1} is greater than 300%, and $(1+R_t)(1+R_{t-1}) - 1 < 50\%$, then both R_t and R_{t-1} are set to missing. Finally, in order to exclude remaining outliers in returns that cannot be identifiable as stock splits or mergers, we treat as missing the monthly returns that fall out of the 0.1% and 99.9% percentile ranges in each country. We confirm (in results not reported) that this final sample produces average monthly returns on momentum, size, and value-growth factor mimicking portfolios which are close to the U.S. results reported in the existing literature. We also cross check our return data for U.S. firms with those from the CRSP database by matching their CUSIPs, and find that the average difference in monthly returns for all matched firms is only 0.01%. (De Moor and Sercu, 2005b, also show that their results are very similar for different sets of test assets when comparing the CRSP/Compustat universe to the Datastream/Worldscope U.S. sample).

To make sure that the accounting ratios are known before the returns, we follow Fama and French (1992) and match the financial statement data for fiscal year-end in year *t-1* with monthly returns from July of year *t* to June of year *t+1*. Book-to-market (B/M), cash flow-to-price (C/P), dividend-to-price (D/P), and earnings-to-price (E/P) are computed using a firm's market equity (number of shares outstanding times per share price) at the end of December of year *t-1*. Book equity is book equity per share (WC05476) multiplied by number of shares outstanding at fiscal year end. Cash flow is cash flow per share (WC05501) multiplied by number of shares outstanding. It is computed from funds from operations (WC04201), which is, in turn, computed as earnings before depreciation, amortization and provisions. Dividend yield is the dividends per share divided by the market price-year end. Dividends per share (WC05101) represents the total dividends (including extra dividends) per share declared during the calendar year for U.S. corporations and fiscal year for non-U.S. corporations. The dividends per share is based on the gross dividend, before normal withholding tax is deducted at a country's basic rate, but excluding the special tax credit available in some countries. Earnings yield is the earnings per share divided by the market price-year end. The earnings per share (WC05201) represent the earnings for the 12 months ended the last calendar quarter for U.S. corporations and the fiscal year for non-U.S. corporations. Leverage is defined as long-term debt divided by common equity. Long-term debt (WC03251) represents all interest-bearing financial obligations, excluding amounts due within one year, and is shown net of premium or discount. Common equity (WC03501) represents common shareholders' investment in a company. Appendix A details these variables. In addition, size is defined as the market equity at the end of June of year *t*, and momentum (Sret) for month *t* is the cumulative raw return from month *t-6* to month *t-2*, skipping month *t-1* to mitigate the impact of microstructure biases such as bid-ask bounce or non-synchronous trading. Finally, we also employ, for some of the tests, betas with respect to the value-weighted global-, country- and industry-portfolios to which a stock belongs. These betas are estimated annually for each stock at the end of June each year, using its previous 36 monthly returns (at least 12 monthly returns).

B. Summary Statistics

Table 2 presents summary statistics of monthly returns (denominated in U.S. dollars) and other firm characteristics for each country and industry in the final sample. The average monthly returns range from -0.26% for Indonesia to 3.71% for Russia. The monthly return volatility ranges from 3.51% for Luxembourg to 18.64% for Turkey. In Panel B, there is less cross-sectional dispersion across industries in mean monthly returns and standard deviations. Information Technology and Hardware has the highest average return of 1.89% and the highest volatility at 7.47%, whereas the two industrial groups in the Utility sector have the lowest average returns of 1.32% and 1.40% and volatility at 3.14% and 2.98%.

The median of total market capitalization for a country ranges from US$ 749 million for Sri Lanka to US$ 2,643,824 million for the US. Also reported are the time-series averages of median firm each year for June-ending market equity (size), fiscal year-end book-to-market (B/M), past six months' return with one-month skipped (Sret), cash flow-to-price (C/P), dividend-to-price (D/P), earnings-to-price (E/P), long-term debt-to-book equity (L/B), and June-ending betas with respect to value-weighted global-, country- and industry-portfolios. Firms with negative book equity are excluded from the analysis following Fama and French (1992).

There is considerable cross-sectional variation across countries and industries in of the average median B/M and L/B ratios, but much less so for the D/P, C/P, E/P ratios.[3] For example, the median U.S. firm's B/M ratio of 0.643 (compares favorably with 0.647 of the CRSP/Compustat US sample during the same period), but it ranges from as low as 0.431 (China) to as high as 2.430 (Russia). By contrast, the earnings yield (E/P) ranges from a low of 1.0% (Indonesia) to a high of 16.0% (also, Russia). The median global and industry betas are measurably smaller in magnitude than the country betas.

In order to render sufficient power to our cross-sectional and time-series tests and to have the ability to discriminate among these firm-level characteristics, we want to ensure sufficient cross-sectional dispersion in

[3] The unusually high time-series average D/P for China stems from an outlier firm, Shanghai Fangzheng (CH:SYI) in 1991 with an annualized dividend yield of 268%, among only the five other Chinese firms in that year. Without this firm in this year, the time-series average dividend yield for Chinese firms is 0.6%.

the variables and hope for sufficiently low correlations among them. **Table 3** reports the typical cross-sectional dispersion across individual stocks in the betas and variables that we observe in each year as well as the typical correlations among those variables in each year. Panel A presents the time-series averages of the mean, standard deviations and key percentiles of the distribution across all countries, for the U.S. sample only, and then developed (excluding US) and emerging markets separately. The yearly inter-quartile ranges for the global-, country, and industry-betas are comparable to those observed in prior U.S. and international studies. Similarly, the ranges for size, B/M, L/B, Sret are notable, but those for C/P, D/P and E/P are of significantly smaller magnitude. For example, within the U.S. markets in a given year, the inter-quartile range of six-month cumulative raw returns (Sret) runs from -14.54% to 14.03% whereas that for earnings yield (E/P) runs from 2% to 9%. Panel B presents time-series averages of the pair-wise correlations among the variables (with the corresponding time series standard deviations of those correlations in *italics* below). These correlations are computed across all stocks available in the global sample in any given year. The global-, country- and industry-betas are relatively highly correlated, as one would expect, around 0.70. Somewhat surprising, however, is the fact that the various valuation ratios are not correlated very highly. The highest among the pairings is C/P and B/M, which is 0.51 among all global stocks. The next highest pairing is D/P and E/P, which averages 0.29. The average negative correlations of our three betas with the B/M, C/P, E/P ratios are reminiscent of the preliminary summary statistics for U.S. stocks reported in Fama and French (1992, Table II, Panel B, reported by their equivalent pre-rank betas).

II. The Cross-Section of Expected Stock Returns

Our first experiment involves asset-pricing tests using the cross-sectional regression approach of Fama and MacBeth (1973). Each month, the cross-section of individual stock returns is regressed on variables hypothesized to explain expected returns. The time-series means of the monthly regression slopes then provide standard tests of whether different explanatory variables are on average priced.[4] Like Fama and French (1992), we implement these tests using individual stocks and not portfolios. This is reasonable to the extent that our variables of interest (B/M, C/P, L/B, Sret) are measured precisely for individual stocks.[5] We run into potential trouble with our estimated global-, country-, and industry-betas which will embody considerable errors-in-variables risk and bias against detecting betas being priced. We are, of course, also aware of other potential problems inherent with this conventional two-pass estimation methodology, such as

[4] Each coefficient in the cross-sectional regression can be considered as the return to a zero-cost minimum-variance portfolio with a weighted average of the corresponding regressor equal to one and weighted averages of all other regressors equal to zero. The weights are tilted towards firms with more volatile returns.

[5] We are concerned about overweighting extreme observations in the cross-sectional regressions. To mitigate our exposure to such influential observations, we winsorize the cross-sectional sample at the smallest and largest 0.5% of observations on B/M, C/P, D/P, E/P, and L/B. Observations beyond the extreme percentiles are set equal to the values of the ratios at those percentiles.

useless factors appearing as priced factors due to model mis-specification errors (Cochrane, 2001, Chapter 12; Kan and Zhou, 1999).

A. Fama-MacBeth Regressions

Table 4 presents the time-series averages of the slope coefficients (with associated *t*-statistics) from the month-by-month Fama-MacBeth (FM) regressions of the cross-section of individual stock returns on various betas, (log) size, and other variables (e.g., log B/M, log C/P). The average slopes provide standard tests for determining which variables on average have non-zero premiums during the July 1981 to December 2003 period. In Panel A, we report results across all stocks in all countries, for the U.S. only, for developed (excluding US) and emerging markets only, for separate subperiods and for January versus other months in the year (to highlight the effects of seasonalities (Keim, 1983)). We report results for "simple" regressions involving only one characteristic per regression model and "multiple" regressions including all of the listed variables in that row.

The simple FM regressions across all countries show that betas do not help explain the average stock returns. The average slope is negative, though not reliably different from zero. By contrast, most other firm-level characteristics have notable explanatory power. The slope coefficient for (log) size is -0.10% (*t*-statistic of -3.09) indicating that small firms earn reliably higher returns, on average. Similarly, stocks with high book-to-market (B/M), high cash-flow-to-price (C/P), high past return (Sret), high dividend yield (D(+)/P), and high earnings yield (E(+)/P) all achieve reliably higher returns than their respective counterparts. The slope coefficient on financial leverage (L(+)/B) is insignificant, which is surprising relative to the U.S. results from Fama and French (1992) and Bhandari (1988).[6] For the dividend yield, earnings yield and financial leverage, we follow Fama and French (1992) in separating those firms with positive numerators, designating with "(+)" in the acronym, from those non-dividend-paying, negative earnings and unleveraged firms, which are included in D/P, E/P and L/B dummy variables. Both appear together in each simple FM regression, so the positive slope coefficient on E(+)/P (4.96%) implies that average returns increase with E/P when it is positive; the positive coefficient on E/P dummy (0.40%) further suggests that firms with negative E/P earn higher average returns.

We do not include the poor performing market betas and leverage (L/B) in the multiple FM regression. The slope coefficients for (log) B/M, (log) C/P, Sret, though smaller in magnitude, remain reliably significant and with the same signs. By contrast, the slope coefficients on size, D(+)/P, D/P dummy, E(+)/P, and E/P

[6] We confirm that the leverage effect is insignificant even when we replicate our analysis using the CRSP/Compustat universe for the 1981 to 2003 sample period. More details will follow below.

dummy are much weaker and marginally different from zero at best. This weak performance of size is quite different from the results in Fama and French (1992) obtained for US firms between 1963 and 1990 but are generally consistent with recent evidence that the size effect has significantly weakened in the US since the 1980s (Hou and Moskowitz, 2005).[7]

The remaining results in Panel A try to identify from where these findings might arise. The first supplemental set of tests focuses on the US markets over the 1981 to 2003 period. Recall from Table 1 that the 9,720 US stocks in the Datastream/Worldscope universe constitute more than one-third of the global sample. The simple FM regression tests almost perfectly parallel those of stocks in all countries; for example, the slope coefficients for (log) B/M, C/P and size are all modestly smaller in magnitude, though still reliably significant. The D/P, E/P coefficients are much smaller with the former now indistinguishable from zero. The multiple FM regressions on just the US stocks show that the size effect is robust to including country betas or E(+)/P and E/P dummy, but not so in combination with (log) B/M. Furthermore, both size and (log) B/M become weaker and not reliably different from zero when included with momentum (Sret) and (log) C/P, both with significant coefficients (1.03% per month for Sret, 0.14% per month for (log) C/P). The next series of supplemental tests show that the results obtained from all countries stem primarily from firms in developed markets and during the more recent decade (1992 to 2003). For emerging markets, only (log) C/P retains a significant slope coefficient. The B/M effect is demonstrably weaker in the more recent decade (1992 to 2003) than the prior one (1981 to 1992), whereas the opposite is true for C/P. Momentum is significant in both halves of the sample. Finally, the size effect is clearly concentrated in January, as expected, whereas the momentum and C/P effects are insignificant in January.

We have also performed a large number of additional robustness checks. To conserve space, these results are not tabulated, but can be made available upon request. For example, one might be concerned that the uniform $1 price screen we apply is overly restrictive for stocks traded outside the US, causing us to drop a disproportionately large number of international stocks from our analysis. (It turns out that a $1 price level corresponds to roughly the 10^{th} percentile of the distribution or prices for US stocks and the 25^{th} percentile for international stocks.) To address this concern, we remove the $1 price screen and re-estimate the cross-sectional regressions across all countries. We find that the coefficients on (log) B/M, (log) C/P, and momentum (Sret) remain positive and significant in both the simple and multiple regressions. Not surprisingly, (log) Size now becomes significantly negative in the multiple regressions after removing the $1 screen. In addition, we keep the $1 screen for US stocks but impose a less restrictive $0.20 screen for international stocks (which corresponds approximately with the 10^{th} percentile) and find that the results are

[7] Also see the recent survey by Van Dijk (2006) for many studies of other markets outside the U.S.

very similar to the case where the $1 screen is applied to all countries.[8] Therefore, our key findings that average returns are positively and significantly related to B/M, C/P, and Momentum are not sensitive to the particular kind of price screen we employ.

Another potential concern is that the differences across countries in the treatment of certain kinds of accounting items and in accounting standards overall may have undue influence on our results. For example, prior to early 1990s, many European countries did not have the tradition of reporting consolidated financial statements, which could make accounting items, such as book equity, difficult to compare across countries. To investigate this issue, we drop firms (countries) that do not report consolidated statements or follow purely local accounting standards and repeat the cross-sectional regressions. We find that the positive premia on B/M, C/P, and momentum are robust to the exclusion of these firms, which suggests that our results are not driven by the differences in accounting rules and standards across countries.

One might also argue that the significant premia from our cross-sectioal regressions do not represent feasible trading strategies from the perspective of a global investor since many emerging countries have restrictions on foreign equity ownership and, as a result, not all stocks in those countries are accessible to foreign investors. To this end, we utilize data from Standard & Poor's Emerging Markets Database (EMDB) to help us screen stocks from emerging countries based on the extent to which they are accessible to foreign investors. The EMDB provides a variable called the "degree open factor" that takes a value between zero (non-investable) and one (fully investable) for a stock to measure the investable weight that is accessible to foreigners. We find that excluding stocks from emerging countries that have an investable weight below various cutoffs (0.25, 0.5 and 1) has virturally no effect on our inferences.

Finally, we also replicate our US findings using the CRSP/Compustat database for the 1981 to 2003 sample period. This calibration exercise ensures that our results cannot be explained by the differences in coverage between CRSP/Compustat and Datastream/Worldscope.

B. Country and Industry Factors

Traditionally, country-specific factors, such as its business cycles, fiscal/monetary and regulatory policies, have been considered to be the dominant driving forces for international equity returns and there has been much empirical support for this view (Heston and Rouwenhorst, 1994; Griffin and Karolyi, 1998). With increased globalization of markets over the past decade, however, a number of recent studies have suggested

8 We also experiment with a uniform price screen at the 10th percentile for each country (which represents, for example, $0.001 for the Philippines, $0.23 for UK and $1 for US, $14 for Denmark and $64 for Switzerland) and find almost identical results.

the increasing importance of global industry factors (e.g., Cavaglia, Brightman and Aked, 2000) though not without controversy (Brooks and Del Negro, 2004; Bekaert, Hodrick and Zhang, 2005). Our analysis to date does not take the relative importance of country versus industry factors into account, though they may play an important role indirectly through the characteristics we do investigate.

In this section, we ask to what extent do the findings in our FM regression tests stem from the cross-sectional dispersion in *firm-specific* measures of the characteristics, like size, B/M, C/P, and D/P rather than from the cross-sectional dispersion in *country-level* or *industry-level* measures. It is quite possible, in spite of the considerable dispersion observed in Table 3, that there exist strong clustering of low B/M ratios, for example, in certain industries (e.g. Information Technology) and large firms in certain countries (e.g. U.S. and Japan) that drive the regression results. To study this question, we decompose the firm-level characteristics in two ways: (a) mean value of a variable according to country of domicile and the mean-adjusted value of the variable relative to its country mean; and (b) mean value of a variable according to the global industry (FTSE Classification Level 4) a firm belongs to and the mean-adjusted value of the variable relative to its global industry mean.[9]

Panel B of Table 4 reports both simple and multiple FM tests using mean (denoted "m") and mean-adjusted (denoted "dm") characteristics. (Betas are excluded from the analysis and we do not consider financial leverage given its poor performance in Panel A. We also do not mean-adjust the D/P and E/P dummy variables.) There is a notable pattern emerging from the simple regressions that the FM slope coefficients for the firm-specific (mean-adjusted) characteristics relative to their country or industry means are always statistically significant and correspond well in magnitude and sign to those found in Panel A. More interestingly, the slope coefficients for the country means of the characteristics (with the exception of B/M) are also significant and larger in magnitude than those for the country-demeaned characteristics. For example, the coefficient for the country-mean values of (log) C/P is 0.64% (*t*-statistic=2.21), and that for the corresponding mean-adjusted (log) C/P variables is 0.32% (*t*-statistic=5,53).[10] These results suggest that country factors play an important role in explaining the cross-section of average stock returns.

[9] Another potential benefit of this adjustment is that it can control to some extent for differences in accounting standards for reporting earnings, book value, cash flows and booking long-term debt. Fama and French (1997) are also concerned about this problem for different industries. An important literature in accounting debates the relative informativeness of disclosure rules and practices in different countries (Alford et al., 1993, Leuz et al., 2003), differences in the stock price responsiveness to those disclosures (Fan and Wong, 2002) and to the harmonization of reporting practices to international standards (Leuz and Verrecchia, 2000; Leuz, 2003).

[10] Due to multicollinearity problems between these country-level mean characteristics, most of them lose their statistical significance when they are included simultaneously in the multiple FM regressions.

By contrast, the FM slope coefficients for industry-mean characteristics are almost always small and not reliably different from zero. One important exception to this pattern is momentum (Sret). Though the slope coefficient for the firm-specific “dm” Sret variable is statistically significant and positive at around 1% per month (similar though a little smaller than that in Panel A), the coefficient for the industry-mean Sret variable is also statistically significant and positive (3.98% per month, *t*-statistic of 3.86 in the simple regression, 5.03% per month, *t*-statistic of 5.62 in the multiple regression). We interpret this result as showing that both firm-level and industry-level momentum forces are at work in global stock returns. This represents a useful extension to global markets of the finding of Moskowitz and Grinblatt (1999) in U.S. markets. We also replicate, but do not report, the firm- versus industry-level momentum regression test excluding the US stocks and find that the firm- and industry-level momentum variables both retain slope coefficients reliably different from zero and similar in magnitude to those including the US stocks.

C. The Next Step?

The cross-sectional firm-level FM tests for our global sample of 26,000 stocks over 1981 to 2003 suggest that two or three easily measured variables – namely, B/M, C/P and momentum (Sret) – seem to describe the cross-section of average returns. They are not necessarily the candidates we expected based on the prior evidence from the U.S. and other select countries around the world. In addition, we find that these results are reliably firm-specific in nature, but also contain important country-level but not necessarily industry-level influences. We see this as a preliminary exercise to help identify those variables around which to build potential candidate factor mimicking portfolios. This analysis follows in Section III.

III. Constructing and Evaluating the Behavior of Factor Mimicking Portfolios

Our key question is which factors best account for the common movements in international stock returns. To this end, we follow Fama and French (1993) and Chan, Karceski and Lakonishok (1998) in constructing proxy factors as returns on zero-investment portfolios that go long in stocks with high values of an attribute (such as B/M) and short in stocks with low values of the attribute. Examining the returns behavior of these proxy factors, or factor-mimicking portfolios (hereafter, FMP), will help us evaluate and interpret the underlying factors. If we find that a particular FMP exhibits significant time series variation, then it is a candidate factor to contribute a substantial common component to return movements. Furthermore, a sizeable average premium (consistent with the FM tests in the previous section) would imply that the factor can also help explain the cross-sectional variation of average stock returns.

Ultimately (in Section IV), our goal will be to employ the time-series regression approach of Black, Jensen and Scholes (1972), applied by Fama and French (1993, 1996) and others, in which returns on test portfolios are regressed on returns to a global market portfolio and various candidate FMPs. The time-series slopes will have natural interpretations as factor loadings, or factor sensitivities, and we will have the ability to judge how well parsimonious combinations of these FMPs can explain average returns across a wide variety of portfolios as test assets (with the *F*-test of Gibbons, Ross and Shanken, 1989).

We proceed in two steps. The first step constructs FMPs for each variable in a consistent manner. In the second step, we assess summary statistics of the FMPs, including their average premia, their volatility, autocorrelations and cross-correlations. To gauge success at this preliminary stage, we evaluate their statistical attributes one at a time relative to the excess return on the value-weighted global market returns (in excess of the one-month US Tbill rates), which we know should perform well (Chan, Karceski and Lakonishok, 1998), and relative to a random zero-investment portfolio that takes long and short positions according to numbers assigned to stocks from a random-number generator, which we know should perform poorly.

A. Constructing Factor Mimicking Portfolios

For each of the characteristics, we form quintile portfolios at the end of June of each year t (from 1981 to 2003) using accounting information from fiscal year ending in year t-1, and their value-weighted returns are calculated from July of year t to June of t+1, as in Fama and French (1992, 1993). We do not use negative or zero B/M, D/P, E/P, and L/B variables in forming the quintile portfolios. Once the quintile portfolios are formed, we compute FMP returns as the highest-quintile return minus the lowest-quintile return, except for Size FMP returns that are calculated as the smallest size-quintile return minus the largest size-quintile return. In addition, momentum FMP is formed following Jegadeesh and Titman's (1993) 6-month/6-month strategy where each month's return is an equal-weighted average of six individual strategies of buying winner quintile and selling loser quintile and rebalanced monthly.[11] In order to minimize the bid-ask bounce effect, we skip one month between ranking and holding periods in constructing the momentum FMP. Finally, as a benchmark, we construct a random long-short portfolio by assigning firms each year randomly into quintile portfolios using a random-number generator for our entire sample of firm-year observations (296,145 in total).

Our interest in the debate over the relative importance of country and industry factors in international

[11] For example, the momentum FMP return for January 2001 is 1/6 the return spread between winners and losers from July 2000 through November 2000, 1/6 the return spread between winners and losers from June 2000 through October 2000, 1/6 the return spread between winners and losers from May 2000 through September 2000, 1/6 the return spread between winners and losers from April 2000 through August 2000, 1/6 the return spread between winners and losers from March 2000 through July 2000, and 1/6 the return spread between winners and losers from February 2000 through June 2000.

stock returns motivates us to add another wrinkle to this experiment. We calculate the FMP returns in three different levels. First, global FMP returns are calculated across all 26,615 stocks over 49 countries with. Second and third, country-neutral (or industry-neutral) FMP returns are calculated by assigning stocks with the same intra-country (or intra-industry) ranking into the same quintile portfolio. This means that, for country-neutral portfolios, all countries are necessarily represented in the FMP at least proportionally to their market capitalization.[12] Over-representing some countries in the extreme quintiles that comprise the FMPs should inhibit the stronger within-quintile comovement compared to across-quintile comovement, leading to lower unconditional volatility in the long-short portfolio. This volatility-dampening factor will be especially strong if country factors are, in fact, important drivers of global stock return commovement. In addition, if country factors are also significant drivers of return premium associated with a FMP, the country-neutral FMP should display a smaller average premium.

We offer a note of caution to readers about direct comparisons of our size and B/M FMPs with Fama and French's (1993, 1996, 1998) SMB or HML. Recall that they break their U.S. sample into two size groups, small and big, based on the median size of NYSE stocks, and into three book-to-market groups based on also NYSE breakpoints for the bottom 30% (low), middle 40% and top 30% (high). Their HML, for example, is then the return difference between the simple averages of the small and big of the high book-to-market category and the simple averages of the small and big of the low book-to-market category. The goal is to minimize the correlation between the SMB and HML factors. We have no strong priors at this point as to which combinations of FMPs will rise to the challenge, so we construct them based on quintile extremes consistently for each variable.

B. Evaluating the Behavior of the Factor Mimicking Portfolios

Table 5 shows the means, standard deviations, autocorrelations and cross-correlations of monthly returns on various FMPs, together with the results for January and other months of the year. We focus our discussions on the value-weighted FMPs, although we have also constructed equal-weighted FMPs and reached similar conclusions.

The mean returns in the first column are generally consistent with the findings in Section II. Among the global FMPs, the market factor achieves an average excess return of 0.48% and it is only marginally different from zero over the 270-month horizon (*t*-statistic of 1.83). The E/P and C/P FMPs achieve the highest average returns of 0.74% (*t*-statistic of 2.39) and 0.70% (*t*-statistic of 3.10), respectively. The average returns for the size and B/M FMPs are considerably smaller. The B/M FMP achieves a mean return of 0.49% with a

[12] We do require a country to have a minimum of 15 stocks in a given year to qualify for the country-neutral FMPs.

t-statistic of 2.03 (Table 2 in Fama and French, 1993, report a mean HML of 0.40% with a *t*-statistic of 2.91). The size FMP of 0.46% per month (*t*-statistic of 2.30) is significant and consistent with the simple regression results in Table 3. The financial leverage (L/B) FMP performs poorly, with a negative premium of -0.05%, though statistically indistinguishable from zero. The average return of the random factor is -0.09% and also insignificantly different from zero.

Prior empirical research suggests that the behavior of stock returns around the world may be different around the turn of the year (Hawawini and Keim, 1999). Indeed, we see that the average January returns to the FMPs based on B/M, C/P, E/P and especially size are much larger than in the other months of the year. For example, the average January return for the size FMP is 3.47% per month (*t*-statistic of 5.10) and only 0.32% (*t*-statistic of 1.51) for February through November and -1.09% (*t*-statistic of -2.35) in December. The returns on the momentum FMP in January is noteworthy: past winners actually underperform past losers by 0.14% in Januarys (Chan, Karceski and Lakonishok, 1998, also uncover a significantly negative January return on their momentum FMP based on past 12-month returns).

While a low average premium on a factor does not necessarily imply that it is unimportant for return covariation, low volatility might. The third column of Panel A reports the standard deviation of returns across all months and subsequent columns for selected months. As a starting point, consider the return spreads that are induced by randomly grouping stocks into quintile portfolios ("Random"). Given the method of selection, the volatility of the return spread reflects only the residual component. This amounts to 1.10% per month.

In contrast, the volatilities associated with the other portfolios are much higher. The value-weighted market factor has a standard deviation of 4.29% per month, highlighting the fact that a factor that induces strong patterns of return comovement need not be associated with a large premium in returns. The E/P and D/P FMPs have the highest volatilities (5.12% and 5.07%) followed by momentum (Sret) at 4.48%. Though the B/M FMP had a relatively low average premium at 0.49%, it is associated with a substantial volatility of 3.99%. It is hard to detect large differences in volatility for each of the FMPs across different months of the year. We see lower volatility in Decembers, but that applies fairly uniformly across all FMPs.

Given the number of candidates for factors, our approach in Section IV must necessarily be selective. The correlations between the returns of the different FMPs provide one way to narrow the field. If the returns on several FMPs are highly correlated with each other, then it is likely that they are picking up similar underlying factors. All else being equal, then, less information about return comovements will be lost if we drop factors that are highly correlated with others. At the bottom of Table 5, we see that several of the FMPs associated with valuation ratios (C/P, B/M, E/P and D/P) are positively correlated around 0.80, which might be a basis for concern. The value-weighted market return is negatively associated with these and size around -0.40, but it will likely be necessary to build multi-factor models that include one or more of these valuation ratio FMPs in addition to the market factor. The momentum FMP appears to have low correlations (around 0.15) with most of the other FMPs. The autocorrelations of these FMPs are very close to zero for each lag up to 12 lags studied.

In Table 5, we also report summary statistics for the country-neutral and industry-neutral equivalent FMPs associated with each of these characteristics. There are several noteworthy findings. First, the premia across almost all FMPs fall and in some cases sharply. The premia for country-neutral C/P, D/P, E/P, and size FMPs drop significantly from the global FMPs, consistent with the findings in Table 4, Panel B that country-level C/P, D/P, E/P, and size are important determinants of the cross-section of global stock returns. On the other hand, the country-neutral B/M premium only drops slightly to 0.44% from 0.49% for the global B/M FMP. This result is again consistent with the finding in Table 4, Panel B that country-level B/M is not important for explaining average returns. For most industry-neutral FMPs, we only see a small (if any) decline in premium from their global counterparts, confirming our Table 4 findings that most industry-level characteristics are not significant predictors of average stock returns. The only exception is momentum. The industry-neutral momentum (Sret) premium drops to 0.51% from 0.65% for the global momentum FMP. This modest decline in premium is somewhat puzzling given our finding in Table 4 that global industry sectors are an important driver for the momentum effect. Second, while the volatilities of the country- and industry-neutral FMPs decline relative to the global FMPs, the decline is much more dramatic for the country-neutral FMPs. For example, the volatility of the E/P factor drops from 5.12% for the global FMP to 2.81% for the country-neutral FMP and only to 4.75% for the industry-neutral FMP. We interpret these results to mean that country factors are very important for understanding the common variation in global stock returns. The one industry-neutral FMP for which there is a notable decline relative to its equivalent global FMP is for momentum (3.78% versus 4.48%).

C. The Next Step?

Several candidate FMPs possess desirable statistical attributes for the time-series asset-pricing tests we pursue next. In addition to a market factor, we will likely propose a momentum factor in that it has a sizeable average premium and volatility and it has relatively low correlations with any of the other factors we consider. By contrast, we will not pursue a financial leverage FMP which affords us few desirable attributes. FMPs based on the valuation ratios B/M, C/P, D/P, and E/P are good candidates, but there is significant overlap among them. We are somewhat wary of the D/P and E/P FMPs given their weak performance in the

FM cross-sectional tests of Section II. Based on the experiments in this section as well as the FM cross-sectional tests, there is also reason to be cautious about a size-based factor for global stock returns.

IV. Multifactor Explanations of the Global Stocks Returns: Time Series Tests

In Fama and French (1996), many of the CAPM average-return anomalies were shown to be captured by a parsimonious three-factor model proposed in Fama and French (1993). The model says that the expected return on a portfolio in excess of the risk-free rate $\{E(R_i) - r_f\}$ is explained by the sensitivity of its return to three factors: (i) the excess return on a broad market portfolio ($R_m - r_f$); (ii) the difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks, SMB (small minus big); and, (iii) the difference between the return on a portfolio of high B/M stocks and the return on a portfolio of low B/M stocks (HML, high minus low). Specifically, they defined,

$$E(R_i) - r_f = b_i \{E(R_m) - r_f\} + s_i E(SMB) + h_i E(HML),$$

where $\{E(R_m) - r_f\}$, $E(SMB)$, $E(HML)$ are expected premiums and the factor sensitivities, or loadings, b_i, s_i, and h_i, are the slopes in the time-series regression,

$$R_i - r_f = a_i + b_i (R_m - r_f\} + s_i SMB + h_i HML + \varepsilon_i.$$

They show that this three-factor model provides a reasonably good description of average returns of U.S. portfolios formed on size and B/M (Fama and French, 1993), on single and various double-sorted portfolios formed on E/P, C/P, sales growth, and prior-five-year returns (Fama and French, 1996), but much less so for portfolios formed on momentum (Fama and French, 1996) and industry portfolios (Fama and French, 1997). An international two-factor equivalent based on the market and B/M FMPs describes the returns on B/M-, E/P-, C/P-, D/P-sorted portfolios for stocks in developed markets from the Morgan Stanley Capital International universe (Fama and French, 1998), although Griffin (2002) questions the reliability of this result showing that local components of the global SMB and HML factors likely drive their findings.

We follow a similar line of inquiry in this section, but we have no particular multi-factor model in mind. Our effort is more exploratory and we propose different combinations of FMPs based on our two experiments to now. The "playing field" comprises different sets of test assets including country portfolios, global industry portfolios (based the FTSE Classification Level 4), single-sorted global portfolios based on each of the firm-level characteristics (Size, B/M, C/P, D/P, E/P and momentum), and various double-sorted global portfolios based on combinations of these characteristics. Our criterion for success will be the Gibbons, Ross and Shanken (GRS) F-test statistic that the a_i are jointly equal to zero across the test assets of interest.[13] We

[13] An important limitation of this methodology is that it is unconditional and ignores the potential time variation in the premiums. We also ignore the fact that the slope coefficients (c_i, s_i, h_i) may also vary over time. Important conditional tests of international asset pricing models include Harvey (1991), Chan, Karolyi and Stulz (1992), Ferson and Harvey (1993, 1994), Dumas and Solnik (1995), Zhang (2001) and many others.

begin with the international CAPM as a starting point. For each set of test portfolios, we then add to the global market factor various combinations of FMPs. Ultimately, we identify a parsimonious three-factor model that consists of the global market factor and the momentum (Sret) and C/P FMPs and that seems to perform well for just about any set of test assets.

A. The Global Market Factor

Table 6 shows, not surprisingly, that the excess return on the value-weighted global market portfolio captures much common variation in country and global industry returns over the 1981 to 2003 period. Across the twenty country portfolios,[14] the median R^2 is around 30% (Denmark). The median R^2 among the 34 global industry sectors is higher at 59% (Life Insurance). The world market betas for the country portfolios are somewhat smaller than one with the median hovering around 0.85. It ranges from lows at 0.47 and 0.54 for Austria and Switzerland, respectively, to a high of 1.17 for Japan. The world market betas for the global industry portfolios have a similar spread with a median of 0.91 (Real Estate) and a range from low values around 0.60 for Electricity and Other Utilities to 1.44 for Information Technology.

If the global CAPM completely describes expected returns, the regression intercepts should jointly equal to zero. The estimated intercepts say that the model leaves a large unexplained positive return for four country portfolios, including Belgium, Ireland, France, and the Netherlands, though only the intercepts for Belgium and Netherlands are more than two standard errors from zero and evidently not large enough to cause a statistical rejection of the model judging by the GRS *F*-statistic (*p*-value of 0.1095). By contrast, among the global industry portfolios, Engineering and Steel have large negative unexplained returns and there are seven with positive alphas that are reliably different from zero, including Beverages, Tobacco, Pharmaceuticals and Life Insurance. In fact, the GRS *F*-test for the global industry portfolios easily rejects the model (*p*-value less than 0.001).

Our country portfolios will obviously not represent an interesting venue within which to investigate the explanatory power of extra-market FMPs.[15] However, the same cannot be said for the global industry portfolios.

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[14] We only investigate those 20 among the 49 countries for which we have a complete time-series of returns for the entire sample period. We also examine different sets of country portfolios with shorter time horizons and obtain similar results.

[15] Prior evidence of tests of the global CAPM with country portfolios has rejected the null hypothesis that the model is adequate (Harvey, 1991, Table VII), but not always when investigated in unconditional form (Dumas and Solnik, 1995, Table III). The contemporaneous De Moor and Sercu (2005b) study evaluates 39 country test portfolios (their Table 35) and their Wald tests cannot reject the null at the 5% level, with only China, Chile, Greece and Mexico with significant, positive intercepts.

B. Single-Sorted Portfolios as Test Assets and the Global Market Factor

The next step is to construct characteristics-based test assets based on the variables that we have evaluated in the previous two experiments. **Table 7** presents summary statistics on monthly returns over the 1981 to 2003 horizon for decile portfolios sorted by size, B/M, momentum (Sret), C/P, D/P and E/P. At the end of June of each year, all stocks in our sample are placed into ten portfolios based on these variables. Value-weighted returns on the decile portfolios are computed from July to June of the following year. For the momentum portfolios, at the beginning of each month, all stocks are sorted into decile portfolios based on their cumulative returns over the past six months, skipping the most recent month and the value-weighted returns on the portfolios are computed over the following six months following Jegadeesh and Titman (1993).

The table shows that small stocks tend to have higher returns than big stocks, growth (low B/M, C/P, E/P) stocks have lower returns than value (high B/M, C/P, E/P) stocks, past winners have higher returns than past losers, and high dividend yield (D/P) stocks have higher returns than low dividend yield stocks (D/P). The final column reports the differences in the average returns of the extreme (10 minus 1) deciles and confirms that they are significantly different from zero.

Table 8 reports regression results of the global CAPM model across the 1981 to 2003 period for each of the six sets of single-sorted, characteristics-based test portfolios. The first panel for the size deciles portfolios confirms that small firms have lower global market betas than large firms and that the R^2 are increasing with size. The intercepts are monotonically decreasing with size. The positive intercepts for the three smallest deciles are all reliably different from zero (the extreme smallest decile reaches 0.89% per month), which means that the model leaves large unexplained returns for those stocks. The GRS *F*-statistic has a *p*-value less than 0.001.

A common pattern obtains for tests based on B/M, C/P, and E/P sorted portfolios. There is a distinct monotonically decreasing pattern in betas from lower to higher B/M (C/P, or E/P) deciles highly reminiscent of Fama and French (1993, Table 4). For each of these variables, the intercept for the extreme growth (Decile 1) portfolio is negative and always significantly different from zero, and those of highest four to six value (usually, Deciles 5 to 10) portfolios are positive and significant. The R^2 are all well over 60% and usually higher for the growth portfolios (around 85%) and decreasing in magnitude for the value portfolios (to around 60%). For each of these three sets of test portfolios based on valuation ratios, the GRS *F*-statistic easily rejects the hypothesis that the global CAPM explains the average returns (*p*-values in all cases less than 0.001). The interesting aspect of these portfolios is that the challenge for any extra-market FMPs to capture what the global CAPM leaves is notably asymmetric: there is much more left unexplained for the value-oriented deciles (high B/M, C/P, and E/P) of stocks.

The fifth panel in Table 8 examines dividend-yield portfolios (D/P). The findings are similar to those for the valuation ratios. The R^2 are much lower for the highest four dividend-yield deciles and the intercepts are large (0.42% to 0.71% per month) and reliably different from zero.

The momentum portfolios also easily reject the global CAPM based on the GRS *F*-statistic. Past losers (low Sret deciles) have actually higher market betas than those of past-return winners, but the intercepts are significantly negative for the three lowest deciles and significantly positive for the two highest deciles. The opportunities in terms of potentially capturing what is left unexplained by the global CAPM are much more symmetric among extreme past winners and losers.

C. Searching for A Parsimonious Global Factor Model

The list of candidates for extra-market factors to pick up where the global CAPM leaves off is a long one. So, we need a sensible process of elimination. Our previous experiments in Sections II and III have been helpful in eliminating several candidates, such as financial leverage (L/B). One approach toward narrowing the list is to consider FMPs based on the very characteristic on which the test asset portfolios are constructed. This is very sympathetic with the approach of Fama and French (1993). That is, for the size-based portfolios, we might build a simple extension to the global CAPM with its market factor in the form of a second size-based FMP. This is a conservative first step. The logic is that, if a FMP constructed on the basis of a characteristic cannot explain the average returns for test portfolios similarly constructed from that same characteristic, it is unlikely to have much potential to do so for other test portfolios.

In each of the panels of Table 8, we present the results of this simple experiment. Below the results for the global CAPM, we present in a similar manner tests of the following model:

$$R_i - r_f = a_i + b_i (R_m - r_f) + c_i FMP + \varepsilon_i,$$

where FMP is that associated with the variable as that used to build the test portfolios and c_i is the factor sensitivity or loading associated with it. For the size decile portfolios in the first panel, the loadings on the size FMP (small stocks less large stocks) are all statistically significant and decrease with increasing size, as expected, ranging from 0.97 to -0.11. The R^2 are higher (over 90%), especially for the small cap deciles. However, nine out of the ten intercepts are significantly different from zero. The intercept for the extreme small decile (Decile 1) is still positive, though smaller than that without the size FMP; but, now, the intercepts for eight of the other nine decile portfolios are negative (seven of which are significant). It appears that the size FMP based on the smallest and largest quintiles fails to capture a nonlinearity of CAPM intercepts across the size spectrum. The GRS *F*-statistic is now larger than with the global CAPM specification, which indicates a stronger rejection (*p*-value again below 0.001).

The B/M FMP performs well for the B/M test portfolios. The loadings on the B/M FMP are statistically significant ranging from -0.50 for the growth portfolios (low B/M) to 0.65 for the value portfolios (high B/M). The intercepts are indistinguishable from zero (with an exception for Decile 2) and the associated GRS *F*-statistic is statistically insignificant and we cannot reject that the expanded model explains the average returns. We observe a similar pattern for the C/P FMP and the C/P test portfolios. There are three C/P portfolios for which the intercepts remain significantly different from zero. The GRS *F*-statistic is much lower than that for the global CAPM and we again cannot reject the expanded model at the 5% level (*p*-value equals 0.0543). By contrast, the E/P FMP does not perform as expected for the E/P portfolios. The loadings are statistically significant and span a wide range of values and in the expected direction. Nevertheless, several of the intercepts are statistically significant and the GRS *F*-statistic is significant at the 1% level (*p*-value of 0.0073). The dividend yield (D/P) FMP, in a manner very similar to E/P, fails to explain the average returns for the D/P portfolios. The intercepts show no clear pattern across the dividend-yield portfolios.

The momentum test portfolios load significantly on the momentum FMP as we would expect. The loadings spread out monotonically from -0.74 for the lowest decile (past losers) to 0.50 for the highest decile (past winners). The R^2 are consistently above 70% and the intercepts are close to zero and never reliably different from zero. The resulting GRS *F*-statistic is very small (*p*-value of 0.99).

What do we learn? Among the FMPs based on valuation ratios, B/M and C/P warrant further consideration as part of a parsimonious model, but those based on E/P and D/P probably do not. The size FMP also fails to capture the cross-section of average returns among size portfolios, but that based on momentum performs well. One interesting consideration is that the returns on the B/M and C/P FMPs are reasonably highly correlated as shown in Table 5 so there is a risk that they will perform a similar function for other test assets. We opt for C/P, but will carry B/M to our final set of tests below, to be sure that we are satisfied with our choice. The correlations of the momentum FMP with either the B/M or C/P FMPs are sufficiently low so that potential collinearity in a parsimonious factor model is small.

For now, we identify the following three-factor model as our candidate work-horse:

$$R_i - r_f = a_i + b_i (R_m - r_f) + c_i F\_Sret + d_i F\_C/P + \varepsilon_i,$$

where *F_Sret* is the global momentum FMP and *F_C/P* is the cash-flow-to-price FMP, both as described in

Table 5, with c_i, d_i as their respective loadings or factor sensitivities. We evaluate its potential for explaining the cross-section of average returns using each set of the test asset portfolios examined to now. These results are presented in **Table 9** for the country and industry portfolios and in **Table 10** for the single-sorted, characteristics-based portfolios.

For the country portfolios, we see that the loadings on the momentum FMP are rarely significant. Exceptions include positive loadings (associated with past winners) for Italy, Belgium and the U.K. and negative loadings (past losers) for South Korea and Malaysia. Those for the cash flow-to-price (C/P) FMP, however, are almost always significant. Most countries have large positive loadings which are associated with the global value (high C/P) stocks (especially Norway, Hong Kong, Austria, and Singapore). Japan has a large negative loading which is associated with global growth (low C/P) stocks. Regardless of this additional explanatory power from the two FMPs, the GRS *F*-statistic is small (*p*-value of 0.6988) as it was just with the global market factor in Table 6.

There is a measurable improvement in explanatory power for the industry portfolios in Table 9. A few of the loadings on the momentum FMP (8 out of 34) are significant. The largest positive loadings (past winners) obtain for Personal Care and Household Products, Beverages, Real Estate, and Specialty Finance, while the large negative loadings (past losers) for Engineering, Steel, and Information Technology. There are few industries with negative loadings (associated with global growth stocks) on the C/P FMP, such as Specialty Finance, Telecom, and Information Technology, but over half (20 out of 34) with positive loadings (associated with global value stocks), including Life Insurance, Aerospace, Mining, Oil and Gas, and Tobacco. The R^2 are moderately higher than those in Table 6, with the three-factor model capturing about 63% of the return variation for the median industry. The model does offer significant improvement in explanatory power for the cross-section of average returns with a much smaller GRS *F*-statistic (*p*-value of 0.1732).

The top panel of Table 10 shows the estimation results of our model for the size portfolios. The loadings for the momentum factor are not significant, except for the largest decile (Decile 10). Those for the C/P FMP, however, are significant across the size spectrum and in a way that decreases with increasing size (from 0.23 to -0.03). This implies that small stocks behave like high C/P (value) stocks, which is similar to the findings in Fama and French (1996, Table I). The GRS *F*-statistic is much smaller (*p*-value of 0.0311) than for the two-factor model with the size FMP itself, but our three-factor model still cannot completely explain the cross-section of returns across size portfolios.[16]

The other five panels of Table 10 show even greater promise for this three-factor model with momentum and C/P FMPs. The loadings on the C/P FMP are reliably different from zero and monotonically increasing across the spectrum of B/M, C/P, D/P, and E/P test portfolios. The loadings on the momentum FMP are large and important for the momentum (Sret) test portfolios, as before, but they are also statistically significant for several middle-range decile portfolios for B/M, C/P and E/P. The resulting R^2 for each of these sets of single-sorted, characteristics-based portfolios are usually above 80%. Finally, the GRS *F*-statistics are all smaller than those in Table 8. The most noteworthy improvements are for the D/P portfolios (*p*-value of 0.1942 versus 0.0024) and E/P portfolios (*p*-value of 0.5891 versus 0.0073), which suggests that the momentum and C/P FMPs perform in a way that the FMPs constructed from their own characteristics do not.

As a final set of tests with these single-sorted portfolios as test assets, we investigate the potential of the three-factor model with momentum and C/P FMPs against two specific alternative three-factor models with size and B/M FMPs, and with momentum and B/M FMPs, a four-factor model with momentum, C/P and B/M FMPs, and a five-factor model with size, B/M, momentum and C/P FMPs. These results are summarized in **Table 11**. To conserve space, only the GRS statistics and the associated *p*-values for each of the experiments are reported. The results indicate that the alternative three-factor models do not explain the average returns as reliably across the test portfolios as the workhorse model with momentum and C/P FMPs. In the cases of industry portfolios as well as the C/P, D/P, E/P test portfolios, the alternative three-factor models easily reject the null hypothesis that the intercepts equal zero which, as we also saw in Table 10, is not the case for the momentum and C/P-based three-factor model. None of the three-factor models can avoid rejection for the size test portfolios at the 5% level; two out of three (the momentum and C/P-based three-factor model and the momentum and B/M-based three-factor model) cannot be rejected for momentum (Sret) test portfolios; and all three cannot be rejected for B/M portfolios and 20 country portfolios. It also appears that there is no additional benefit to adding the B/M FMP and the size FMP to create a four-factor or a five-factor model with momentum and C/P FMPs. Most notably, it does not alter our inferences with regard to the challenge of the size portfolios. In the cases of industry and D/P portfolios as test assets, adding both the size and B/M FMPs actually leads to a rejection of the five-factor model.

D. *Double-Sorted Portfolios as Test Assets*

Fama and French (1993, 1996) and Lakonishok, Vishny and Shleifer (1994) argue that sorting stocks on

[16] It turns out that the failure of our model is entirely due to the anomalous January effect. When we exclude the January months from the regressions, we can no longer reject the model (*p*-value=0.7874) (Table 14). This result is also evident in Figure 1 where we plot the three-factor model intercepts for size portfolios separately for January and February through December.

two variables more accurately distinguishes among stocks of different characteristics and produces larger spreads in average returns. We investigate the potential for the global factor models above for a number of different double-sorted, characteristics-based portfolios as test assets. Our goal is to raise the standard for any single parsimonious factor-model to reach.

We follow these studies above by sorting at the end of June of each year all stocks independently into three groups (bottom 30%, middle 40%, and top 30%) according to their size, B/M, C/P, D/P and E/P. In addition, at the beginning of each month, all stocks are sorted into three groups (same cutoff criteria, as above) based on their returns over the past six months skipping the most recent month (Sret). Four sets of nine double-sorted portfolios are then formed as the intersections of sorts on size and B/M, Sret and D/P, C/P and E/P or B/M and E/P. Value-weighted returns on these double-sorted portfolios are computed from July to June of the following year. We chose a variety of combinations that spanned these six variables in a representative manner. We did not, however, exhaustively examine each of the 15 pairings possible, though it is possible in principle.

Table 12 reports summary statistics for our four combinations of double-sorted portfolios (Panel A) and the regression results corresponding to the global three-factor model with momentum and C/P FMPs (Panel B). The portfolios are reported as combinations of two numbers ("*i* - *j*") where the first number is associated with the tricile of the first sorting variable ("*i*") and the second number is associated with the tricile of the second sorting variable ("*j*"). For the 3 × 3 size-B/M portfolios, we note that the small cap stock returns (1-1, 1-2, 1-3) are all higher than the corresponding returns for large cap stocks (3-1, 3-2, 3-3) and the value stocks (high B/M, 1-3, 2-3, 3-3) have higher average returns than the corresponding growth stocks (low B/M, 1-1, 2-1, 3-1). The returns across other two-way sorts are not always spread as clearly as for the size-B/M portfolios. For example, for momentum (Sret)-D/P portfolios, the past winner tricile only clearly beats the past loser tricile for the bottom and middle triciles by D/P ratios. There are similar non-monotonic patterns in returns for E/P portfolios among the low C/P tricile firms and across E/P portfolios in the lowest B/M tricile firms. These complex patterns no doubt reflect the difficulty in generating spreads given rather strong correlations in these valuation ratios across firms and present a challenge to our linear factor model.

Panel B shows that the global three-factor model with the momentum and C/P FMPs cannot explain the average returns for the global size-B/M double-sorted portfolios. The loadings on the momentum factor are not significant across the nine portfolios, but the loadings on the C/P factor increase with B/M and are positive and significant for the portfolios in the middle and highest triciles by B/M (value stocks), as expected. The intercepts for the two value portfolios in the smallest cap tricile, however, are positive and significant. The GRS *F*-statistic is large (*p*-value of 0.0065), indicating a rejection of the the hypothesis that the model explains the average returns of this set of test assets. By contrast, the model appears to explain the average returns for the three other sets of double-sorted portfolios with all three *p*-values above 0.20. The loadings on the momentum factor are reliably significant for the momentum (Sret)-D/P portfolios, but they are also reliably different from zero for select portfolios in the C/P-E/P (2-1, 3-2) and B/M-E/P (2-2) sets. The C/P FMP performs reliably across the value-growth ranges defined by any of the other valuation ratios (including C/P itself).

In **Table 13**, we evaluate the global three-factor model relative to other parsimonious combinations of the FMPs, including now the size and B/M FMPs instead of (or in conjunction with) the C/P FMP. We also push our model to seek to explain the average returns on more finely-stratified 5 × 5 double-sorted portfolios of select characteristics. To conserve space (as in Table 11), however, only the GRS statistics and the associated *p*-values for each of the experiments are reported.

Several patterns are noteworthy. First, the global three-factor model with momentum and C/P FMPs performs at least as well as and often reliably outperforms alternative three-factor models based on size and/or B/M factors. Consider, for example, the 5 × 5 double-sorted portfolios based on B/M and E/P, both the size-B/M three-factor model and B/M-momentum three-factor model fail to capture much of the average return effect left over by the global CAPM or a three-factor model that includes B/M and E/P FMPs (*p*-value of 0.0001 and 0.0007, respectively), but the global three-factor model does (*p*-value of 0.4465). Second, there are several experiments in which we investigate the potential additional explanatory power of the size and B/M FMPs over the momentum and C/P FMPs and find they offer little. As a case in point, consider the 3 × 3 momentum (Sret)-D/P, C/P-E/P and B/M-E/P sets of portfolios. Third, the inferences about the relative performance of the competing models for the finer 5 × 5 double-sorted portfolios are similar to those for the coarser 3 × 3 double-sorted portfolios.

The global three-factor model does face a challenge with the double-sorted size-B/M portfolios. In Table 13, for the coarsely-stratified 3 × 3 and finely-stratified 5 × 5 sets, we are able to reject that the model capture the average returns (*p*-values of 0.0065 and 0.0001, respectively). From Table 12, we saw that the challenge stems from the small cap, high B/M (value) stocks. In supplemental results reported in Table 14, we learn that the model's failure is acutely related to January months. We are unable to reject that the global three-factor model explains the February to December returns for both sets of size-B/M portfolios (*p*-values of 0.1776 and 0.1289, respectively). This result can also be seen in Figures 2 and 3 where the three-factor regression intercepts for the two sets of size-B/M portfolios are plotted for January and February-December separately.

E. Country-Neutral and Industry-Neutral Factor Mimicking Portfolios

Motivated by the on-going debate as to the importance of country versus industry factors in global stock returns (Heston and Rouwenhorst, 1994; Griffin and Karolyi, 1998; Cavaglia, Brightman and Aked, 2000; Brooks and Del Negro, 2004), we initiated several tests to now and found evidence favoring country factors over industry factors. The cross-sectional Fama-MacBeth tests in Table 4, for example, showed that most of the country-level characteristics (except B/M) are priced just as well as the country-mean-adjusted characteristics (C/P, in particular), whereas the only industry-level characteristic that is priced is momentum (Sret). We also showed in Table 5 that, compared to the global FMPs, most of the country-neutral FMPs experience a significant decline in both premium and volatility. This is not the case for the industry-neutral FMPs, except that the industry-neutral momentum FMP is hampered by significantly lower premium and volatility than its unrestricted global equivalent.

One important question then is whether the success of the momentum and C/P FMPs in explaining average returns is simply another manifestation of the explanatory power of country versus industry factors through those FMPs. To address this issue, we perform a final set of tests in which we replace the momentum and C/P FMPs of the three-factor model with their country-neutral ("F_Sret_CN" and "F_C/P_CN") and industry-neutral counterparts ("F_Sret_IN" and "F_C/P_IN"). If the country factors are important and if they drive the success of our global three-factor model, then the country-neutral factors should perform poorly. On the other hand, if industry factors are the main drivers, then using the industry-neutral factors in our three-factor model should perform poorly.

To explore further the importance of industry factors in explaining the momentum effect, in particular, we also use an industry-level momentum factor ("F_Sret_I"). That is, we construct a momentum (Sret) FMP by sorting value-weighted industry portfolios based on their cumulative return in the preceding six months and then taking long positions in the best-performing five industries and short positions in the worst-performing five industries with equal weights and hold them for six months.

Table 14 summarizes the results. In almost all experiments, we see that replacing the global momentum and C/P FMPs with the industry-neutral counterparts does not affect our inferences adversely, and, in the case of single-sorted size portfolios, it even offers a significant improvement in explaining average returns. By contrast, substituting the global FMPs with their country-neutral counterparts clearly has a adverse impact on our inferences. In many cases (for example, for the single-sorted D/P, double-sorted B/M-E/P portfolios), this switch results in a strong rejection of our global three-factor model. Finally, replacing the global momentum FMP with the industry-level momentum FMP has no effect on our inferences. These findings are preliminary, but they suggest that country factors play an important role in the success of the C/P and momentum factors with industry contributing at least to the success of the momentum factor.

V. Conclusions

This study seeks to identify which factors are important for driving the time-series and cross-section variation in global stock returns. It is an exploratory investigation of the usefulness of variables such as size, earnings/price, cash flow/price, dividend/price, book-to-market equity, leverage, momentum, that have been suggested in the empirical asset pricing literature to be cross-sectionally correlated with average returns in the United States and in developed and emerging markets around the world. For monthly returns of 26,000 individual stocks from 49 countries over the 1981 to 2003 period, we perform cross-sectional tests of average returns at the individual firm level and we construct factor-mimicking portfolios based on these characteristics to assess their ability to explain time-series and cross-sectional return variation in country, industry, and characteristics-based portfolios.

Our key finding is that the momentum and cash-flow-to-price factor-mimicking portfolios, together with a global market portfolio, reliably explain the average returns for country and global industry portfolios as well as a wide variety of single- and double-sorted characteristics-based portfolios. That these two extra-market factors have strong and pervasive influence for the cross-sectional and time-series variation in global stock returns is, of course, significant for practitioners building global equity risk models.

The economic interpretation of our results for academic research is, of course, more contentious. As with previous researchers, the results can be ascribed to three stories: (a) rational asset pricing in which multiple extra-market risk factors are priced; (b) irrational asset pricing with a premium for momentum or C/P that represents arbitrage opportunities; and, (c) a spurious result. Without a complete evaluation of the consequences of characteristics versus covariances for global stock returns in the spirit of Daniel and Titman (1997) and Davis, Fama and French (2000), we are unlikely to render a verdict between (a) versus (b). However, our study is primarily motivated as an out-of-sample experiment of two phenomena (momentum, value-growth) that we have seen before in other settings, which suggests that (c) is an unlikely explanation.

What then are the broader implications of our key findings? With regards to the phenomenon of momentum, we reaffirm its importance in U.S. and international markets. The phenomenon is pervasive across countries, industries and at the firm-level as well as at the industry level. This extends the findings of

Carhart (1997), Rouwenhorst (1998), Moskowitz and Grinblatt (1999), and Griffin, Ji and Martin (2003), among others, and calls for even greater understanding of the behavioral or fundamental risk-based forces that might be at work. With regard to the cash-flow-to-price factor, we recognize that its superceding book-to-market as a more relevant price-level attribute in global markets is potentially controversial. We are not sure how it might better trigger arbitrage opportunities, but there may be some logic in terms of fundamentals. Book value of equity reflects, after all, an accumulation of past earnings and the accounting literature has long argued that the accruals component of earnings can mitigate the mis-matching problems inherent in cash flow leading it to be a better predictor of future cash flows (DeChow, 1994). There is some debate that a direct measure of cash flow (from the cash flow statements) is better than simple cash-flow proxies used in finance research and relative to accruals under certain circumstances (Desai et al., 2004; Krishnan and Kumar, 2005). More importantly, there has been some recent research suggesting that the value relevance of accruals – and, thus, earnings – may be greatly weakened in less transparent accounting systems, so that cash flow measure may be more useful predictors (Swanson, Rees and Juarez-Valdes, 2001; Obinata, 2002; Davis-Friday and Gordon, 2002).

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Table 1: Distribution of Sample Stocks by Country, Industry, and Year

The table shows the number of the Thomson Financial's Worldscope stocks included in the sample. Each stock has at least 12 monthly returns and is listed in its country's major exchange(s) from 1981 to 2003. Panel A reports the number of stocks for each country, and Panel B for each industry. The industry classifications follow the FTSE Global Classification system, (Levels 3 and 4).

Panel A: Number of sample stocks by country and year

Country		Total	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Developed Markers	Australia	520	110	111	114	122	123	130	134	198	247	274	283	306	323	348	369	407	432	454	471	492	506	515	520
	Austria	128	31	32	32	32	35	39	47	52	57	65	74	81	88	95	103	105	109	112	115	122	128	128	128
	Belgium	157	31	31	32	32	35	73	78	80	81	83	85	85	88	91	91	95	111	127	148	154	156	157	157
	Canada	1125	229	240	266	290	313	351	399	425	515	577	594	625	671	750	784	849	918	978	1027	1073	1099	1114	1125
	Denmark	258	35	38	39	40	42	44	44	144	162	169	191	207	208	211	219	227	232	241	248	254	258	258	258
	Finland	171							4	28	42	48	52	56	59	82	96	106	119	133	155	166	171	171	171
	France	1220	134	136	137	139	143	147	154	211	467	519	556	570	584	629	656	694	802	928	1025	1136	1195	1218	1219
	Germany	876	148	148	149	158	166	178	184	230	353	371	391	405	412	422	440	453	485	557	720	829	872	876	876
	Hong Kong	132	48	51	54	54	57	60	62	94	97	97	98	101	107	111	113	118	126	126	127	130	131	132	132
	Ireland	67	27	27	29	29	30	34	35	39	45	48	50	50	50	51	52	53	56	60	64	66	67	67	67
	Italy	382	78	78	78	78	79	142	180	197	204	214	220	224	224	232	242	253	269	285	305	353	374	381	381
	Japan	2846	877	886	930	931	932	934	1027	1572	1688	1948	2026	2086	2131	2203	2294	2362	2423	2481	2563	2609	2737	2822	2812
	Luxembourg	28											1	18	18	19	19	19	23	25	25	28	28	28	27
	Netherlands	266	107	113	114	117	126	136	156	162	169	177	181	183	186	190	197	201	217	238	256	264	265	266	266
	New Zealand	80						7	8	35	36	37	38	42	47	54	58	63	66	68	69	72	79	80	80
	Norway	252	37	41	45	51	59	64	65	66	71	83	89	100	107	124	139	159	203	231	235	245	250	252	252
	Singapore	165	18	18	82	87	90	90	95	103	111	117	123	129	141	145	148	151	156	161	161	165	164	163	163
	Spain	192						9	63	68	106	115	120	129	138	139	142	143	156	169	181	184	190	192	192
	Sweden	412		25	28	34	36	42	47	70	113	132	140	146	152	172	196	214	275	319	357	389	406	412	412
	Switzerland	259	48	49	51	54	59	74	98	111	132	157	159	161	167	171	179	186	202	216	231	245	256	259	259
	U. K.	2271	810	836	868	925	983	1059	1160	1270	1348	1397	1425	1453	1496	1599	1672	1803	1959	2051	2090	2176	2231	2267	2271
	U. S. A.	9720	2284	2368	2548	2757	2914	3163	3431	3547	3594	3669	3775	4126	4497	4995	5402	5979	6571	7156	7527	7439	7084	6783	6369
Emerging Markets	Argentina	76								10	11	11	13	22	33	59	65	68	69	71	72	75	76	76	76
	Brazil	50										10	15	16	16	17	21	22	36	40	46	48	49	50	50
	Chile	93									13	62	68	74	79	80	83	83	90	93	93	93	93	93	92
	China	720											6	24	58	143	156	191	379	461	520	617	674	718	720
	Columbia	25												17	18	19	20	20	22	23	23	24	24	25	25
	Czech	68														41	66	66	67	68	68	68	68	68	68
	Greece	327								69	73	84	103	111	113	147	167	182	199	216	240	289	321	327	327
	Hungary	40											6	10	13	18	22	26	30	33	40	40	40	40	40
	India	313									2	201	206	215	242	266	277	286	293	300	301	305	309	313	313
	Indonesia	268										78	105	125	135	163	193	208	225	239	238	246	259	256	237
	Israel	79						14	14	15	15	16	18	20	42	46	47	50	52	72	76	77	79	79	79
	South Korea	767	2	2	2	26	290	301	321	370	452	536	557	563	571	590	609	645	698	714	718	735	747	755	742
	Malaysia	477	5	6	11	24	25	187	200	209	220	236	264	301	329	353	395	423	452	462	465	467	472	470	452
	Mexico	111								23	29	33	38	58	77	90	93	94	102	106	108	108	109	111	111
	Parkistan	65											6	14	55	61	64	64	65	65	65	65	65	65	65
	Peru	43											10	26	29	38	40	42	43	43	43	43	43	43	43
	Philippines	53	1	1	1	1	1	1	1	5	5	23	31	39	43	43	46	48	51	51	52	52	52	53	53
	Poland	69												3	5	7	9	17	22	42	53	61	69	69	69
	Portugal	122								47	62	69	74	83	87	94	103	105	109	115	118	122	122	122	122
	Russia	33																20	23	29	28	27	27	29	27
	South Africa	343	53	53	53	54	54	58	64	65	69	242	257	263	272	273	289	308	317	331	333	336	340	343	343
	Sri Lanka	16							8	10	10	10	11	12	14	16	16	16	16	16	16	16	16	16	16
	Taiwan	427								39	53	141	158	184	209	224	251	277	301	326	353	386	410	427	427
	Thailand	388							72	98	128	166	209	258	291	328	358	381	385	386	386	386	385	387	385
	Turkey	95								45	49	57	73	77	82	85	88	90	94	95	95	95	94	91	90
	Venezuela	16										8	9	9	9	11	11	11	12	13	15	16	16	16	16
	Zimbabwe	4								1	1	1	1	1	3	3	3	3	4	4	4	4	4	4	4
Total		26615	5113	5290	5663	6035	6592	7337	8151	9708	10830	12281	12909	13808	14719	16048	17103	18386	20066	21530	22669	23392	23610	23587	23129

Table 1 (Continued)

Panel B: Number of sample stocks by industry and year

Level 3 FTSE Economic Groups	Level 4 FTSE Industrial Sectors	Total	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Resources	Mining	485	115	119	128	134	146	164	178	214	267	319	329	343	355	372	393	416	430	441	453	458	462	466	462
	Oil & Gas	762	200	220	229	242	255	266	280	301	332	370	385	398	432	478	507	546	595	623	635	643	651	648	638
Basic Industries	Chemicals	927	235	237	247	252	273	291	318	410	450	532	556	580	611	658	685	709	758	797	817	848	864	871	865
	Construction & Building Materials	1470	361	371	384	399	443	493	541	670	732	822	861	920	983	1094	1165	1222	1287	1330	1363	1379	1388	1386	1368
	Forestry & Paper	313	67	69	73	77	82	94	96	125	146	176	186	196	207	224	234	254	277	284	288	293	297	297	289
	Steel & Other Metals	489	130	132	131	131	150	161	172	222	242	286	302	313	331	358	380	399	428	444	446	439	443	448	447
General Industrials	Aerospace & Defense	140	57	59	60	62	65	68	72	76	81	84	86	89	93	98	100	100	106	114	117	117	119	120	117
	Diversified Industrials	532	115	120	126	133	153	186	200	240	271	325	342	360	389	411	429	454	485	497	501	490	489	487	484
	Electronic & Electrical Equip.	1295	331	346	377	401	438	473	504	598	635	696	713	737	767	817	857	905	962	1017	1046	1069	1074	1077	1054
	Engineering & Machinery	1589	459	468	489	509	536	577	614	750	832	922	962	1000	1042	1104	1159	1218	1300	1367	1404	1420	1427	1426	1408
Cyclical Consumer Goods	Automobiles & Parts	655	165	167	173	190	203	218	231	288	321	367	386	402	421	457	481	508	548	582	593	598	596	599	593
	Household Goods & Textiles	1575	328	334	351	367	421	458	508	644	720	839	893	952	1026	1112	1182	1229	1321	1389	1437	1464	1465	1457	1428
Non-Cyclical Consumer Goods	Beverages	293	66	67	68	71	79	88	97	116	146	160	164	185	197	212	219	231	243	256	272	280	284	286	286
	Food Products & Processors	947	218	222	235	243	270	315	344	425	484	542	575	617	647	696	728	750	798	840	863	877	889	887	878
	Health	815	70	75	92	117	129	145	172	194	213	248	273	328	359	390	429	501	561	603	630	637	670	672	644
	Personal Care & Household Prod.	167	34	34	37	40	45	50	59	69	81	96	98	101	102	109	112	127	136	143	147	150	151	149	146
	Pharmaceuticals & Biotechnology	836	105	111	116	131	152	171	182	205	225	273	289	326	359	409	439	502	562	620	664	734	742	755	747
	Tobacco	53	10	10	12	12	12	15	16	22	24	31	32	34	36	37	40	42	46	47	49	48	47	47	47
Cyclical Services	Retailers, General	1054	188	192	206	219	237	261	292	348	385	433	461	510	554	628	668	712	781	853	900	935	955	960	939
	Leisure & Hotels	894	137	144	164	183	195	210	241	272	303	357	379	414	451	503	543	595	668	739	765	779	781	784	761
	Media & Entertainment	922	157	164	180	197	220	243	275	305	330	356	366	397	416	459	504	549	600	660	734	783	805	807	799
	Support Services	1111	173	184	202	221	239	261	302	349	384	414	426	455	476	519	569	625	728	814	877	893	897	892	866
	Transport	761	149	154	169	175	193	211	236	293	343	394	417	448	477	521	557	597	642	679	686	693	701	702	693
Non-Cyclical Services	Food & Drug Retailers	275	80	81	84	90	93	93	105	120	121	139	149	162	169	181	189	199	214	220	227	229	232	230	227
	Telecom Services	466	44	45	56	59	63	71	77	94	103	120	128	142	154	185	207	252	295	335	380	402	399	398	376
Utilities	Electricity	336	124	124	126	126	127	135	146	154	166	189	203	209	216	228	241	248	271	276	282	286	285	288	281
	Utilities, Other	258	107	107	110	113	113	117	120	124	136	153	157	165	172	183	187	195	207	215	219	220	203	203	202
Information Technology	Information Tech. Hardware	877	88	95	111	130	142	159	174	203	225	256	268	302	330	382	435	491	574	626	703	784	809	807	783
	Software & Computer Services	1986	51	61	79	103	122	145	179	206	241	277	306	348	400	472	541	686	885	1106	1432	1687	1750	1739	1680
Financials	Banks	1885	283	291	311	345	383	464	579	697	766	852	886	948	1022	1105	1202	1297	1406	1555	1605	1590	1557	1517	1469
	Insurance	441	114	119	123	129	140	162	181	200	222	246	267	283	307	333	348	366	387	386	392	385	383	377	367
	Life Insurance	130	49	52	54	54	56	63	67	70	75	81	83	82	85	89	94	94	98	101	102	103	102	101	101
	Real Estate	915	162	170	192	199	216	270	302	363	428	482	512	545	587	635	670	711	755	816	845	863	864	868	860
	Specialty & Other Finance	961	141	146	168	181	201	239	291	341	400	444	469	517	546	589	609	656	712	755	795	816	829	836	824
	Total	26615	5113	5290	5663	6035	6592	7337	8151	9708	10830	12281	12909	13808	14719	16048	17103	18386	20066	21530	22669	23392	23610	23587	23129

Table 2: Summary Statistics for Each country and Industry

The table shows summary statistics of the Thomson Financial's Worldscope stocks in Datastream International which have at least 12 monthly returns and have been listed in the country's major exchange(s) from 1981 to 2003. Number of stocks and industries are the total number of unique stocks and industries in the sample. Mean and standard deviation of the monthly return (%) for each country or industry are calculated from the equally-weighted portfolio return (in U.S. dollars). Median total market cap ($mill) is the time-series median of the monthly total value of all firms in that country or industry. Also reported are the time-series average of yearly medians for June-end firm size, year-end book-to-market (B/M), 6-month/6-month momentum strategy's monthly returns (Sret), cash flow-to-price (C/P), dividend-to-price (D/P), earnings-to-price (E/P), long-term debt-to-equity (L/B), June-end betas with respect to value-weighted global-, country-, and industry-portfolios comprised of its component stocks. Panel A is for each country, and Panel B is for each industry. The industry classification follows the FTSE Global Classification system, Level 3 and Level 4. Negative B/M and L/B observations are excluded from the analysis.

Panel A: Statistics by Country

Country	Total number of stocks	Avg. number of industries	Monthly returns (%) Mean	Monthly returns (%) Std. dev	Median total market cap ($mill).	Time-series average of: Median size ($mill)	Median B/M	Mean Sret	Median C/P	Median D/P	Median E/P	Median L/B	Median Global beta	Median country beta	Median industry beta
Developed Markets															
Australia	520	34	1.40	5.76	107,082	105	0.770	1.143	0.146	0.044	0.082	0.289	0.62	0.78	0.52
Austria	128	24	0.85	4.93	10,100	65	0.652	1.060	0.180	0.024	0.043	0.367	0.30	0.73	0.29
Belgium	157	31	1.05	4.62	20,580	54	0.994	1.053	0.252	0.032	0.085	0.312	0.53	0.75	0.46
Canada	1,125	34	1.15	4.92	201,157	64	0.709	1.500	0.155	0.014	0.055	0.414	0.78	0.83	0.67
Denmark	258	27	1.19	4.56	19,751	56	1.019	1.041	0.188	0.022	0.083	0.312	0.43	0.73	0.37
Finland	171	28	0.84	5.61	33,556	135	0.915	0.766	0.173	0.027	0.063	0.892	0.66	0.72	0.56
France	1,220	34	1.41	5.92	239,693	131	0.784	1.089	0.191	0.022	0.068	0.441	0.78	0.78	0.60
Germany	876	31	0.83	4.83	251,658	165	0.541	0.973	0.159	0.020	0.035	0.181	0.52	0.72	0.47
Hong Kong	132	23	1.75	8.20	56,760	273	0.864	0.942	0.107	0.046	0.086	0.097	0.94	0.87	0.75
Ireland	67	24	1.67	5.35	9,065	67	0.829	0.851	0.158	0.035	0.096	0.334	0.67	0.75	0.66
Italy	382	32	0.92	6.37	116,399	136	0.768	0.878	0.179	0.024	0.048	0.264	0.65	0.79	0.53
Japan	2,846	33	1.20	6.72	2,539,631	276	0.595	0.106	0.086	0.010	0.028	0.330	1.01	0.88	0.98
Luxembourg	28	14	0.77	3.51	21,058	103	0.774	2.193	0.162	0.027	0.046	0.322	0.42	0.43	0.34
Netherlands	266	31	1.16	4.87	103,899	80	0.990	1.046	0.254	0.037	0.100	0.369	0.61	0.79	0.51
New Zealand	80	27	1.16	5.37	21,552	114	0.695	1.242	0.132	0.047	0.083	0.436	0.50	0.81	0.52
Norway	252	30	1.32	5.67	17,841	52	0.801	1.236	0.197	0.018	0.064	1.495	0.54	0.70	0.41
Singapore	165	27	0.94	6.99	27,785	136	0.808	0.397	0.072	0.020	0.045	0.087	0.95	0.93	0.72
Spain	192	32	0.86	5.85	135,566	327	0.858	0.514	0.153	0.028	0.066	0.246	0.93	0.85	0.69
Sweden	412	32	1.21	5.93	39,095	86	0.630	0.735	0.157	0.022	0.061	0.626	0.66	0.74	0.51
Switzerland	259	29	0.99	4.50	41,468	91	0.792	1.002	0.143	0.025	0.056	0.508	0.53	0.81	0.45
U. K.	2,271	34	1.51	5.63	737,182	54	0.683	1.059	0.132	0.031	0.075	0.166	0.70	0.79	0.59
U. S. A.	9,720	34	1.63	5.35	2,643,824	88	0.643	1.143	0.136	0.012	0.060	0.294	0.85	0.93	0.75
Total Developed	21,527				7,394,703										
Emerging Markets															
Argentina	76	25	0.00	8.94	38,091	122	1.056	0.388	0.359	0.008	0.025	0.218	0.12	0.71	0.79
Brazil	50	19	1.68	10.19	13,752	61	1.897	-0.117	0.245	0.032	0.056	0.124	0.59	0.63	0.42
Chile	93	26	1.65	5.28	34,936	127	0.765	0.517	0.150	0.047	0.097	0.240	0.24	0.66	0.20
China	720	30	0.11	11.12	112,912	176	0.431	1.193	0.073	0.224	0.041	0.062	-0.25	0.94	-0.21
Columbia	25	12	0.03	6.95	6,126	237	1.235	2.093	0.160	0.045	0.082	0.152	0.16	0.83	0.15
Czech	68	22	0.99	7.34	10,555	61	1.599	0.469	0.308	0.008	0.093	0.104	0.27	0.64	0.29
Greece	327	32	2.12	10.84	16,005	51	0.557	1.248	0.112	0.032	0.060	0.053	0.36	0.87	0.37
Hungary	40	18	0.98	9.08	10,261	43	0.871	1.396	0.162	0.013	0.084	0.029	0.89	0.66	0.78
India	313	27	1.72	9.76	98,443	82	0.669	1.571	0.133	0.019	0.072	0.530	0.11	0.81	0.17
Indonesia	268	30	-0.26	14.30	23,933	44	0.923	-0.239	0.201	0.018	0.010	0.153	0.84	0.75	0.63
Israel	79	23	1.36	7.83	25,183	209	0.766	1.292	0.119	0.012	0.046	0.386	0.84	0.89	0.57
South Korea	767	30	1.53	11.15	109,156	51	1.203	-0.335	0.261	0.016	0.055	0.725	0.51	0.78	0.58
Malaysia	477	33	0.75	9.30	89,064	94	0.633	0.492	0.080	0.019	0.044	0.057	0.78	0.92	0.61
Mexico	111	24	1.04	7.52	72,877	223	0.978	1.352	0.175	0.007	0.079	0.254	0.78	0.73	0.56
Parkistan	65	19	0.79	6.50	6,668	36	0.734	0.956	0.196	0.047	0.113	0.238	0.11	0.63	0.15
Peru	43	14	1.77	10.50	4,767	16	0.966	0.613	0.212	0.014	0.088	0.109	0.33	0.84	0.26
Philippines	53	17	0.60	5.87	17,762	182	0.779	0.307	0.151	0.009	0.084	0.410	0.40	0.43	0.26
Poland	69	22	0.93	9.03	23,397	104	0.678	1.562	0.127	0.007	0.068	0.095	0.65	0.73	0.81
Portugal	122	26	0.47	4.93	23,347	58	0.818	0.178	0.151	0.018	0.057	0.305	0.47	0.66	0.34
Russia	33	13	3.71	14.66	34,583	305	2.430	-0.827	0.393	0.006	0.160	0.104	1.36	0.79	1.11
South Africa	343	30	1.31	7.27	63,243	178	0.637	0.868	0.156	0.043	0.103	0.092	0.66	0.81	0.71
Sri Lanka	16	8	-5.16	11.15	749	34	1.022	6.938	0.190	0.028	0.118	0.310	0.18	.	.
Taiwan	427	27	1.22	12.48	218,627	359	0.555	0.131	0.071	0.006	0.040	0.110	0.86	0.90	0.67
Thailand	388	31	1.30	8.76	39,084	45	0.870	0.545	0.181	0.050	0.073	0.177	0.72	0.73	0.56
Turkey	95	21	2.76	18.64	14,928	63	0.486	3.405	0.185	0.041	0.092	0.078	0.58	0.79	0.07
Venezuela	16	9	.	.	3,785	90	1.816	.	0.277	0.032	0.082	0.109	0.27	.	.
Zimbabwe	4	3	.	.	.	175	0.385	.	0.167	0.054	0.089	0.020	0.40	.	.
Total Emerging	5,088				1,112,233										
Total All	26,615				8,506,936										

Table 2 (Continued)

Panel B: Statistics by Industry

Level 3 FTSE Economic Groups	Level 4 FTSE Industrial Sectors	Total Number of stocks	Monthly returns (%) Mean	Monthly returns (%) Std. dev	Median total market cap ($mil).	Time-series average of: Median size ($mil)	Median B/M	Mean Sret	Median C/P	Median D/P	Median E/P	Median L/B	Median Global beta	Median country beta	Median industry beta
Resources	Mining	485	1.12	6.35	141,208	88	0.676	0.670	0.127	0.016	0.037	0.120	0.83	1.00	0.87
	Oil & Gas	762	1.34	5.59	475,043	131	0.631	0.886	0.183	0.010	0.049	0.431	0.88	0.87	0.93
Basic Industries	Chemicals	927	1.27	4.22	356,315	134	0.634	0.291	0.141	0.017	0.052	0.337	0.78	0.88	0.74
	Construction & Building Materials	1,470	1.30	4.48	380,940	90	0.772	0.861	0.151	0.018	0.059	0.306	0.78	0.89	0.72
	Forestry & Paper	313	1.17	4.40	95,782	136	0.795	0.418	0.190	0.020	0.057	0.572	0.84	0.93	0.65
	Steel & Other Metals	489	1.18	4.83	179,379	125	0.831	0.682	0.161	0.014	0.045	0.451	0.87	0.92	0.62
General Industrials	Aerospace & Defense	140	1.73	5.14	65,761	142	0.651	0.578	0.144	0.020	0.072	0.325	0.88	0.96	0.70
	Diversified Industrials	532	1.33	4.17	247,055	85	0.747	0.834	0.134	0.021	0.061	0.275	0.74	0.87	0.62
	Electronic & Electrical Equip.	1,295	1.55	5.34	342,455	87	0.561	0.616	0.108	0.007	0.042	0.184	1.00	1.04	0.79
	Engineering & Machinery	1,589	1.22	4.42	316,289	71	0.664	0.723	0.128	0.013	0.048	0.269	0.82	0.89	0.74
Cyclical Consumer Goods	Automobiles & Parts	655	1.41	4.28	316,783	125	0.735	0.737	0.166	0.016	0.058	0.309	0.76	0.85	0.66
	Household Goods & Textiles	1,575	1.30	4.24	229,459	51	0.750	1.080	0.144	0.015	0.061	0.235	0.74	0.83	0.64
Non-Cyclical Consumer Goods	Beverages	293	1.30	3.44	130,594	121	0.554	0.866	0.133	0.021	0.058	0.239	0.58	0.71	0.55
	Food Products & Processors	947	1.33	3.49	292,340	96	0.658	0.850	0.140	0.020	0.062	0.256	0.62	0.73	0.72
	Health	815	1.74	5.61	57,461	56	0.428	1.442	0.096	0.003	0.042	0.210	0.92	1.03	0.85
	Personal Care & Household Prod.	167	1.49	4.09	72,848	112	0.510	0.668	0.116	0.017	0.059	0.207	0.73	0.82	0.60
	Pharmaceuticals & Biotechnology	836	1.72	5.38	357,677	144	0.354	0.878	0.079	0.006	0.023	0.118	0.88	0.97	0.78
	Tobacco	53	1.63	3.86	121,512	283	0.562	1.045	0.134	0.042	0.086	0.127	0.65	0.73	0.30
Cyclical Services	Retailers, General	1,054	1.46	4.51	273,470	102	0.595	1.286	0.120	0.012	0.012	0.058	0.76	0.89	0.67
	Leisure & Hotels	894	1.46	4.21	125,319	72	0.619	1.254	0.121	0.009	0.053	0.379	0.72	0.81	0.70
	Media & Entertainment	922	1.64	4.58	256,734	114	0.473	0.796	0.111	0.015	0.054	0.236	0.82	0.89	0.74
	Support Services	1,111	1.59	5.09	108,279	58	0.499	1.249	0.120	0.011	0.055	0.195	0.87	0.95	0.83
	Transport	761	1.34	4.04	267,726	118	0.682	0.901	0.188	0.014	0.056	0.748	0.76	0.85	0.62
Non-Cyclical Services	Food & Drug Retailers	275	1.49	3.91	91,790	165	0.577	0.545	0.153	0.018	0.064	0.449	0.66	0.76	0.73
	Telecom Services	466	1.60	5.54	496,388	276	0.562	1.528	0.187	0.025	0.052	0.528	0.89	0.95	0.70
Utilities	Electricity	336	1.32	3.14	340,211	637	0.782	0.583	0.208	0.062	0.091	0.980	0.36	0.48	0.62
	Utilities, Other	258	1.40	2.98	112,579	233	0.731	0.738	0.199	0.053	0.053	0.083	0.45	0.52	0.48
Information Technology	Information Tech. Hardware	877	1.89	7.47	256,402	135	0.463	0.860	0.092	0.001	0.034	0.132	1.30	1.30	0.85
	Software & Computer Services	1,986	1.75	7.30	126,726	51	0.382	1.171	0.085	0.001	0.027	0.067	1.22	1.28	0.76
Financials	Banks	1,885	1.44	3.17	1,047,511	151	0.864	0.931	0.171	0.032	0.094	0.332	0.53	0.65	0.43
	Insurance	441	1.48	3.72	240,431	191	0.678	1.081	0.206	0.018	0.067	0.045	0.64	0.82	0.66
	Life Insurance	130	1.61	4.20	64,102	409	0.792	0.364	0.316	0.027	0.082	0.150	0.68	0.80	0.77
	Real Estate	915	1.27	4.01	145,579	78	0.880	1.016	0.084	0.025	0.054	0.490	0.63	0.73	0.52
	Specialty & Other Finance	961	1.45	4.62	363,160	97	0.715	1.332	0.129	0.019	0.070	0.314	0.84	0.94	0.49
All industries		26,615			8,506,936										

Table 3: Summary Statistics of Different Characteristics

Panel A reports summary statistics of various asset pricing characteristics. The definitions of global β, country β, industry β, size (market capitalization), B/M (book-to-market equity), Sret (past 6-month return), C/P (cash flow/price), D/P (dividends/price), E/P (earnings/price), and L/B (long-term debt/book equity) are described in Table 2. Each of the distributional statistics is calculated first across all firms in our sample for each year and then averaged over time. Panel B reports the annual cross-sectional correlations averaged over time and their associated time-series standard deviations (*in italics*).

Panel A: Summary Statistics

	Global β	Country β	Industry β	Size	B/M	Sret	C/P	D/P	E/P	L/B
					All Countries					
Mean	0.85	0.91	0.74	830.48	0.77	2.20	0.18	0.02	0.03	0.69
Std. Dev.	0.79	0.63	0.66	3894.42	0.59	28.13	0.18	0.02	0.17	1.32
1%	-0.87	-0.41	-0.71	1.89	0.07	-52.30	0.01	0.00	-1.10	0.00
25%	0.35	0.53	0.30	35.65	0.38	-13.65	0.08	0.00	0.02	0.06
Median	0.75	0.86	0.68	122.36	0.63	-0.33	0.13	0.02	0.06	0.28
75%	1.25	1.22	1.12	438.70	0.99	14.06	0.22	0.03	0.09	0.74
99%	3.16	2.85	2.55	12641.81	3.41	93.66	1.26	0.11	0.31	9.41
					US					
Mean	0.94	1.01	0.81	1054.01	0.74	1.69	0.17	0.02	0.02	0.68
Std. Dev.	0.82	0.80	0.68	5151.58	0.52	28.80	0.16	0.02	0.19	1.20
1%	-0.80	-0.63	-0.68	2.15	0.07	-56.00	0.01	0.00	-1.04	0.00
25%	0.42	0.49	0.37	31.99	0.38	-14.54	0.09	0.00	0.02	0.06
Median	0.85	0.93	0.75	86.71	0.64	1.14	0.14	0.01	0.06	0.29
75%	1.36	1.43	1.18	458.06	0.95	14.03	0.21	0.03	0.09	0.82
99%	3.36	3.36	2.72	17976.49	2.75	95.33	1.01	0.11	0.24	7.47
					Developed Countries, excluding US					
Mean	0.81	0.84	0.72	820.82	0.77	2.37	0.18	0.02	0.04	0.73
Std. Dev.	0.67	0.48	0.58	3176.80	0.57	23.42	0.18	0.02	0.14	1.44
1%	-0.61	-0.22	-0.49	2.07	0.07	-44.46	0.01	0.00	-0.66	0.00
25%	0.36	0.53	0.31	44.55	0.39	-11.35	0.08	0.01	0.02	0.06
Median	0.74	0.82	0.65	148.89	0.62	0.46	0.13	0.02	0.05	0.29
75%	1.19	1.12	1.08	493.40	0.99	12.76	0.22	0.04	0.09	0.72
99%	2.71	2.15	2.26	12135.01	3.00	76.67	1.08	0.10	0.28	9.35
					Emerging Countries					
Mean	0.64	0.85	0.61	368.54	0.90	3.79	0.22	0.04	0.05	0.57
Std. Dev.	0.81	0.45	0.72	931.87	0.75	31.07	0.23	0.03	0.20	1.21
1%	-1.46	-0.08	-1.16	3.21	0.08	-49.93	0.01	0.00	-0.77	0.00
25%	0.16	0.55	0.16	43.12	0.35	-13.56	0.08	0.02	0.04	0.01
Median	0.61	0.81	0.58	115.71	0.66	-0.10	0.14	0.03	0.08	0.17
75%	1.12	1.16	1.03	332.09	1.18	15.37	0.27	0.05	0.13	0.56
99%	2.67	1.97	2.50	4153.63	3.04	103.36	1.09	0.11	0.31	6.40

Panel B: Cross-Sectional Correlations, All Countries

	Global β	Country β	Industry β	Size	B/M	Sret	C/P	D/P	E/P	L/B
Global β										
Country β	0.71									
	0.15									
Industry β	0.77	0.59								
	0.07	*0.08*								
Size	0.04	0.03	0.09							
	0.04	*0.03*	*0.03*							
B/M	-0.11	-0.10	-0.13	-0.11						
	0.10	*0.09*	*0.10*	*0.02*						
Sret	-0.09	-0.05	-0.06	0.00	0.04					
	0.16	*0.16*	*0.12*	*0.03*	*0.07*					
C/P	-0.08	-0.07	-0.08	-0.04	0.51	0.05				
	0.07	*0.07*	*0.08*	*0.02*	*0.06*	*0.06*				
D/P	-0.24	-0.23	-0.21	0.02	0.25	0.07	0.19			
	0.08	*0.10*	*0.06*	*0.04*	*0.09*	*0.09*	*0.07*			
E/P	-0.10	-0.09	-0.08	0.03	-0.04	0.05	0.10	0.29		
	0.08	*0.07*	*0.05*	*0.02*	*0.13*	*0.07*	*0.17*	*0.07*		
L/B	0.00	0.00	0.00	0.03	-0.01	0.00	0.20	-0.02	-0.14	
	0.04	*0.05*	*0.03*	*0.03*	*0.03*	*0.04*	*0.03*	*0.02*	*0.04*	

Table 4: Fama-MacBeth (1973) Monthly Cross-Sectional Regressions of Individual Stock Returns on Various Characteristics: 8107-0312

Panel A reports the average coefficients and their t-statistics (*in italics*) from monthly Fama-MacBeth (1973) cross-sectional regressions of individual stock returns on various asset pricing characteristics. If dividend is positive, D(+)/P is D/P and D/P dummy is 0. If dividend is 0, D(+)/P is 0 and D/P dummy is 1. If earnings are positive, E(+)/P is E/P and E/P dummy is 0. If earnings are non-positive, E(+)/P is 0 and E/P dummy is 1. If L/B is positive, L(+)/B is L/B and L/B dummy is 0. If L/B is 0, L(+)/B is 0 and L/B dummy is 1. The rows labeled "Simple" present results from FM regressions of returns on each characteristic in isolation. The dummy variables (D/P dummy, E/P dummy, and L/B dummy) are combined with their corresponding level variables (D(+)/P, E(+)/P, and L(+)/B) in a single regression. Thus, there are 10 separate regressions reported in a single row. The rows labeled "Multiple" report multivariate regressions in which multiple characteristics are included as independent variables simultaneously. Panel B repeats the univariate and multivariate regressions where selected firm-level characteristics are decomposed into country or industry demeaned values (e.g. *dm*ln(Size)) and country or industry means (e.g. *m*ln(Size)).

Panel A

		Global β	Country β	Industry β	ln(Size)	ln(B/M)	Sret	ln(C/P)	D(+)/P	D/P Dummy	E(+)/P	E/P Dummy	L(+)/B	L/B Dummy
All Countries	Simple	-0.17	-0.11	-0.08	-0.10	0.38	1.14	0.37	10.66	0.52	4.96	0.40	0.01	0.02
		-1.21	*-0.71*	*-0.64*	*-3.09*	*4.54*	*3.75*	*5.32*	*3.83*	*2.60*	*4.74*	*2.45*	*0.38*	*0.35*
	Multiple				-0.05	0.15	1.08	0.19	4.22	0.32	1.40	-0.06		
					-1.50	*2.41*	*3.80*	*3.92*	*1.96*	*1.76*	*1.94*	*-0.55*		
US	Simple	-0.06	-0.02	-0.02	-0.10	0.29	1.06	0.26	1.45	0.21	2.95	0.27	-0.01	0.04
		-0.41	*-0.12*	*-0.14*	*-2.42*	*2.76*	*3.48*	*2.90*	*0.53*	*1.22*	*2.33*	*1.60*	*-0.47*	*0.38*
	Multiple		-0.01		-0.10									
			-0.05		*-2.34*									
	Multiple				-0.06	0.24								
					-1.37	*2.13*								
	Multiple				-0.09						2.26	0.12		
					-2.24						*1.78*	*0.80*		
	Multiple				-0.07	0.17					1.24	-0.02		
					-1.50	*1.74*					*1.41*	*-0.12*		
	Multiple				-0.07	0.09	1.03	0.14	-1.73	0.08	0.47	-0.05		
					-1.65	*1.51*	*3.84*	*2.67*	*-0.75*	*0.58*	*0.69*	*-0.44*		
Developed (ex US) only	Multiple				-0.02	0.20	0.95	0.16	5.54	0.00	1.52	0.09		
					-0.58	*2.90*	*2.92*	*2.69*	*1.94*	*0.03*	*1.69*	*0.71*		
Emerging only	Multiple				-0.12	-0.04	0.19	0.40	7.20	0.11	-1.62	0.28		
					-1.42	*-0.22*	*0.25*	*2.59*	*1.56*	*0.44*	*-0.82*	*0.71*		
198107-199206	Multiple				-0.06	0.19	1.08	0.14	1.98	0.02	0.70	-0.14		
					-1.44	*2.06*	*2.81*	*1.91*	*0.72*	*0.07*	*0.73*	*-0.77*		
199207-200312	Multiple				-0.03	0.11	1.07	0.24	6.36	0.62	2.06	0.02		
					-0.69	*1.33*	*2.58*	*3.69*	*1.94*	*2.21*	*1.93*	*0.17*		
January	Multiple				-0.40	0.48	-2.35	0.27	3.03	2.28	3.48	1.78		
					-3.78	*1.60*	*-1.85*	*1.50*	*0.42*	*2.76*	*1.09*	*5.36*		
February – December	Multiple				-0.02	0.12	1.38	0.18	4.32	0.15	1.21	-0.22		
					-0.50	*1.94*	*4.94*	*3.63*	*1.92*	*0.82*	*1.66*	*-2.09*		

Table 4 (Continued)

Panel B

	dm ln(Size)	*m* ln(Size)	*Dm* ln(B/M)	*m* ln(B/M)	*dm* Sret	*m* Sret	*dm* ln(C/P)	*m* ln(C/P)	*dm* D(+)/P	*m* D(+)/P	D/P Dummy	*dm* E(+)/P	*m* E(+)/P	E/P Dummy
Country/														
Simple	-0.07	-0.50	0.36	0.34	1.12	2.30	0.32	0.64	9.83	13.80	0.51	4.24	8.76	0.34
	-2.29	*-3.21*	*5.22*	*0.98*	*4.68*	*2.04*	*5.53*	*2.27*	*4.07*	*2.21*	*2.56*	*5.33*	*2.76*	*2.29*
Multiple	-0.04	-0.13	0.17	-0.76	1.00	2.01	0.17	0.54	2.97	-0.09	0.22	1.22	7.76	-0.06
	-1.26	*-0.86*	*3.66*	*-1.73*	*4.62*	*1.82*	*4.97*	*1.34*	*1.93*	*-0.01*	*1.58*	*2.61*	*1.94*	*-0.72*
Industry/														
Simple	-0.12	0.01	0.42	0.03	0.99	3.98	0.40	0.12	11.37	6.81	0.53	5.37	0.15	0.41
	-3.54	*0.07*	*5.67*	*0.13*	*3.69*	*3.86*	*6.60*	*0.57*	*4.47*	*1.23*	*2.67*	*5.47*	*0.06*	*2.52*
Multiple	*-0.06*	*-0.01*	*0.18*	*-0.07*	*0.93*	*5.03*	*0.20*	*0.12*	*4.32*	*1.03*	*0.28*	*1.55*	*-0.52*	*-0.03*
	-1.76	*-0.21*	*3.19*	*-0.34*	*3.61*	*5.62*	*4.30*	*0.72*	*2.27*	*0.22*	*1.58*	*2.21*	*-0.21*	*-0.32*

Table 5: Summary Statistics of Factor-Mimicking Portfolios (FMP)

The table reports summary statistics for value-weighted global, country-neutral, and industry-neutral factor mimicking portfolios (FMP). Based on each eligible stock's previous year-end book-to-market (B/M), cash flow-to-price (C/P), dividend-to-price (D/P), earnings-to-price (E/P), long-term debt-to-equity (L/B), and June-end firm size (Size), quintile portfolios are formed at the end of June each year. (Negative B/M observations are excluded from the analysis) The factor mimicking portfolio (FMP) returns are then calculated over the next 12 months as the highest-quintile return minus the lowest-quintile return, except for the Size FMP calculated as the smallest-quintile return minus the biggest-quintile return. The momentum FMP mean return is calculated based on Jegadeesh and Titman (1993)'s 6-month/6-month strategy (with one month skip), long in quintile winners and short in quintile losers, rebalanced every month. The random quintile portfolios are formed in each June and their Q5-Q1 returns are calculated over the next 12 months. Market Xret is the monthly return in excess of the one-month US Tbill rate of the global value-weighted market portfolio.

Attribute	All months					January					February to November					December				
	Mean return	t-stat	Std. dev.	Avg # Stk	# of Mon.	Mean return	t-stat	Std. dev.	Avg # Stk	# of Mon.	Mean return	t-stat	Std. dev.	Avg # Stk	# of Mon.	Mean return	t-stat	Std. dev.	Avg # Stk	# of Mon.
Global FMPs																				
Market Xret	0.48	1.83	4.29	10,187	270	1.03	1.25	3.88	9,918	22	0.30	1.02	4.46	10,199	225	1.67	3.07	2.61	10,333	23
B/M	0.49	2.03	3.99	1,612	270	1.42	1.67	3.99	1,573	22	0.43	1.56	4.09	1,615	225	0.27	0.45	2.86	1,622	23
C/P	0.70	3.10	3.70	1,368	270	1.14	1.44	3.70	1,339	22	0.61	2.40	3.79	1,370	225	1.19	2.02	2.81	1,381	23
D/P	0.69	2.24	5.07	1,152	270	0.50	0.50	4.70	1,137	22	0.66	1.90	5.21	1,153	225	1.17	1.38	4.06	1,157	23
E/P	0.74	2.39	5.12	1,370	270	0.90	0.78	5.40	1,350	22	0.68	1.95	5.21	1,371	225	1.27	1.50	4.06	1,378	23
L/B	-0.04	-0.21	3.36	1,425	270	-1.00	-1.67	2.82	1,394	22	0.06	0.25	3.30	1,427	225	-0.09	-0.10	4.32	1,434	23
Size	0.46	2.30	3.29	1,987	270	3.47	5.10	3.19	1,958	22	0.32	1.51	3.22	1,988	225	-1.09	-2.35	2.22	2,009	23
Momentum	0.65	2.38	4.48	1,914	270	-0.14	-0.15	4.41	1,884	22	0.51	1.71	4.47	1,923	225	2.76	3.13	4.23	1,857	23
Random	-0.09	-1.59	1.10	1,943	270	0.24	1.05	1.24	1,902	22	-0.12	-1.90	1.10	1,945	225	-0.13	-0.76	0.93	1,957	23
Country-neutral FMPs																				
B/M	0.44	2.44	2.94	1,598	270	0.24	0.32	3.51	1,559	22	0.44	2.33	2.87	1,601	225	0.55	0.83	3.15	1,607	23
C/P	0.46	2.73	2.80	1,353	270	0.22	0.30	3.33	1,321	22	0.45	2.47	2.75	1,355	225	0.82	1.39	2.82	1,364	23
D/P	0.47	2.41	3.17	1,148	270	0.02	0.03	3.26	1,131	22	0.51	2.40	3.16	1,149	225	0.48	0.72	3.22	1,152	23
E/P	0.49	2.88	2.81	1,366	270	0.37	0.47	3.69	1,346	22	0.48	2.63	2.72	1,367	225	0.77	1.29	2.87	1,373	23
L/B	-0.08	-0.54	2.45	1,411	270	-0.47	-1.01	2.17	1,379	22	-0.06	-0.38	2.46	1,414	225	0.11	0.20	2.67	1,419	23
Size	0.24	1.11	3.58	1,979	270	1.80	2.22	3.79	1,949	22	0.28	1.16	3.56	1,980	225	-1.58	-2.74	2.76	2,000	23
Momentum	0.58	2.71	3.53	1,903	270	-0.04	-0.05	3.92	1,872	22	0.47	2.03	3.45	1,911	225	2.31	3.10	3.56	1,847	23
Random	-0.07	-1.15	1.12	1,936	270	0.30	1.19	1.34	1,894	22	-0.09	-1.42	1.11	1,939	225	-0.19	-1.09	0.93	1,950	23
Industry-neutral FMPs																				
B/M	0.34	1.50	3.77	1,604	270	1.68	2.43	3.24	1,565	22	0.27	1.03	3.90	1,607	225	-0.17	-0.31	2.55	1,615	23
C/P	0.72	3.41	3.45	1,360	270	1.71	2.71	2.96	1,330	22	0.61	2.53	3.61	1,361	225	0.81	2.28	1.70	1,371	23
D/P	0.52	1.78	4.82	1,143	270	0.88	0.99	4.21	1,128	22	0.45	1.35	4.99	1,144	225	0.90	1.18	3.66	1,148	23
E/P	0.67	2.33	4.75	1,363	270	1.20	1.17	4.80	1,342	22	0.58	1.77	4.88	1,364	225	1.12	1.67	3.23	1,369	23
L/B	0.04	0.31	2.32	1,417	270	-0.14	-0.26	2.65	1,384	22	0.10	0.65	2.32	1,419	225	-0.33	-0.77	2.03	1,426	23
Size	0.39	2.00	3.19	1,978	270	3.18	4.62	3.23	1,947	22	0.26	1.25	3.12	1,979	225	-1.03	-2.30	2.15	1,999	23
Momentum	0.51	2.21	3.78	1,907	270	0.47	0.59	3.73	1,877	22	0.36	1.40	3.80	1,916	225	2.04	2.89	3.38	1,850	23
Random	-0.10	-1.67	1.12	1,936	270	0.20	0.91	1.18	1,895	22	-0.11	-1.70	1.12	1,938	225	-0.28	-1.56	0.96	1,950	23

Lag	Autocorrelations				Correlations								
	1	2	3	12	M Xret	B/M	C/P	D/P	E/P	L/B	Size	Mom	Rand
Market Xret	0.05	-0.04	0.00	-0.01	1.00								
B/M	0.07	0.10	0.09	0.03	-0.33	1.00							
C/P	0.06	0.04	0.11	-0.04	-0.42	0.81	1.00						
D/P	0.02	0.01	0.11	-0.01	-0.52	0.66	0.85	1.00					
E/P	0.04	0.02	0.09	-0.03	-0.41	0.70	0.87	0.92	1.00				
L/B	0.02	-0.03	0.05	-0.09	-0.11	0.06	0.18	0.03	-0.01	1.00			
Size	0.03	-0.04	-0.10	0.20	-0.47	0.56	0.45	0.45	0.47	-0.21	1.00		
Momentum	0.04	-0.09	0.01	0.03	-0.23	0.13	0.20	0.23	0.20	-0.03	0.14	1.00	
Random	-0.04	0.05	-0.07	0.03	0.12	-0.17	-0.26	-0.19	-0.17	-0.11	-0.09	-0.17	1.00

Table 6: CAPM Time-Series Regressions for Monthly Excess Returns (in Percent) on Country and Industry Portfolios: 8107-0312

$$R_i - R_f = a_i + b_i (R_M - R_f) + \varepsilon_i$$

Value-weighted returns on country and industry portfolios (with complete time series from 8107 to 0312) in excess of the one-month US Tbill rate ($R_i - R_f$) are regressed on the excess return of the global value-weighted market portfolio ($R_M - R_f$). Individual stocks are weighted by their end-of-June market capitalization within each portfolio. t( ) is the t-statistic for a coefficient. R^2 is the adjusted R-squared of a regression. GRS is the Gibbons, Ross, and Shanken (1989) F-statistic for the null hypothesis that the regression intercepts for a set of test portfolios are jointly equal to 0. p(GRS) is the p-value of GRS.

Country Portfolios

	a	b	t(a)	t(b)	R^2
Australia	0.13	0.81	0.38	10.38	0.28
Austria	0.36	0.47	1.04	5.90	0.11
Belgium	0.61	0.74	2.23	11.63	0.33
Canada	-0.21	0.87	-1.01	18.19	0.55
Denmark	0.32	0.63	1.24	10.73	0.30
France	0.46	0.87	1.76	14.50	0.44
Germany	0.14	0.85	0.51	13.21	0.39
Hong Kong	0.28	1.01	0.56	8.77	0.22
Ireland	0.49	0.97	1.61	13.65	0.41
Italy	0.06	0.81	0.17	9.47	0.25
Japan	-0.15	1.17	-0.53	17.68	0.54
Netherlands	0.50	0.89	2.46	18.83	0.57
Norway	0.29	0.82	0.87	10.54	0.29
Singapore	-0.29	0.97	-0.78	11.25	0.32
Switzerland	0.28	0.54	1.19	10.09	0.27
U.K.	0.25	0.85	1.15	16.99	0.52
U.S.	0.22	0.91	1.38	24.22	0.69
South Korea	0.28	0.95	0.43	6.40	0.13
Malaysia	-0.34	0.81	-0.66	6.93	0.15
South Africa	0.08	0.80	0.18	7.90	0.19

GRS=1.40, p(GRS)=0.1095

Industry Portfolios

	a	b	t(a)	t(b)	R^2
Mining	0.01	0.85	0.03	10.13	0.27
Oil & Gas	0.20	0.79	0.91	15.24	0.46
Chemicals	0.04	1.00	0.25	30.08	0.77
Construction & Bldg Materials	-0.13	1.03	-0.70	24.55	0.69
Forestry & Paper	-0.11	0.99	-0.51	19.62	0.59
Steel & Other Metals	-0.29	1.16	-1.24	21.09	0.62
Aerospace & Defense	0.17	0.83	0.71	15.39	0.47
Diversified Industrials	0.14	0.98	0.98	30.03	0.77
Electronic & Electrical Equip.	-0.15	1.19	-0.90	30.96	0.78
Engineering & Machinery	-0.28	1.12	-1.86	32.31	0.80
Automobiles & Parts	0.01	0.97	0.04	25.63	0.71
Household Goods & Textiles	-0.19	1.04	-1.40	33.64	0.81
Beverages	0.52	0.70	2.71	15.87	0.48
Food Products & Processors	0.28	0.66	1.87	18.86	0.57
Health	0.21	0.77	0.96	15.00	0.45
Personal Care & Household Prod.	0.59	0.66	2.91	14.14	0.43
Pharmaceuticals & Biotechnology	0.50	0.73	2.76	17.36	0.53
Tobacco	0.92	0.63	2.90	8.53	0.21
Retailers, General	0.24	0.97	1.40	24.18	0.68
Leisure & Hotels	0.03	0.89	0.18	25.01	0.70
Media & Entertainment	0.12	0.99	0.77	27.07	0.73
Support Services	-0.04	0.94	-0.27	26.95	0.73
Transport	-0.05	1.00	-0.32	26.22	0.72
Food & Drug Retailers	0.41	0.69	2.70	19.57	0.59
Telecom Services	-0.02	0.90	-0.12	18.84	0.57
Electricity	0.32	0.56	1.56	11.78	0.34
Utilities, Other	0.18	0.69	1.03	17.01	0.52
Information Tech. Hardware	0.03	1.44	0.10	20.50	0.61
Software & Computer Service	0.05	1.13	0.17	15.80	0.48
Banks	0.19	1.00	1.00	23.02	0.66
Insurance	0.27	0.89	1.55	22.27	0.65
Life Insurance	0.49	0.83	2.74	19.72	0.59
Real Estate	-0.09	0.91	-0.44	18.67	0.56
Specialty & Other Finance	0.10	1.32	0.50	29.41	0.76

GRS=2.12, p(GRS)=0.0002

Table 7: Summary Statistics for Raw Monthly Returns (in Percent) on Characteristic-Sorted Decile Portfolios: 8107-0312

At the end of June of each year from 1981 to 2003, all stocks in our sample are placed into 10 portfolios based on their size, B/M, C/P, D/P, and E/P. Value-weighted returns on the decile portfolios are computed from July to June of the following year. In addition, at the beginning of each month, all stocks are sorted into 10 portfolios based on their returns over the past 6 months skipping the most recent month (Sret), and value-weighted returns on the momentum decile portfolios are computed over the following 6 months. For each portfolio, the table reports the average monthly returns (Mean), the standard deviation of the monthly returns (Std), and the time series t-statistic (t(Mean)).

		Deciles										
		1	2	3	4	5	6	7	8	9	10	10 – 1
Size	Mean	1.66	1.33	1.21	1.14	1.06	0.99	0.93	0.94	0.98	0.95	-0.71
	Std	3.90	3.91	3.96	4.06	4.07	4.15	4.17	4.33	4.39	4.39	3.70
	t(Mean)	6.99	5.59	5.02	4.60	4.27	3.91	3.67	3.57	3.68	3.56	-3.14
B/M	Mean	0.72	1.00	0.98	1.11	1.06	1.09	1.16	1.24	1.26	1.45	0.73
	Std	5.73	4.97	4.76	4.38	4.17	4.16	3.87	4.04	4.28	4.88	4.82
	t(Mean)	2.07	3.32	3.38	4.16	4.17	4.31	4.94	5.04	4.86	4.87	2.47
Sret	Mean	0.62	0.67	0.70	0.77	0.91	0.95	0.98	1.07	1.23	1.40	0.78
	Std	7.17	5.45	4.74	4.08	3.90	3.79	3.87	4.13	4.42	5.49	5.74
	t(Mean)	1.42	2.01	2.43	3.11	3.83	4.12	4.15	4.26	4.56	4.20	2.23
C/P	Mean	0.54	0.82	0.90	0.93	1.18	1.09	1.29	1.35	1.31	1.46	0.92
	Std	6.28	4.83	4.48	4.37	4.31	4.19	3.97	3.85	4.01	4.41	4.75
	t(Mean)	1.41	2.79	3.29	3.49	4.50	4.29	5.35	5.77	5.35	5.43	3.17
D/P	Mean	0.65	0.83	0.90	1.04	1.09	1.10	1.29	1.40	1.37	1.45	0.80
	Std	6.24	5.80	5.11	4.36	4.03	4.14	4.21	4.02	3.78	3.35	5.59
	t(Mean)	1.71	2.36	2.90	3.91	4.46	4.35	5.05	5.71	5.97	7.11	2.35
E/P	Mean	0.54	0.83	0.86	1.12	1.18	1.16	1.28	1.41	1.39	1.52	0.98
	Std	6.92	5.89	4.85	4.26	4.24	3.99	4.04	3.92	4.10	4.59	5.70
	t(Mean)	1.27	2.31	2.91	4.32	4.58	4.79	5.21	5.90	5.55	5.42	2.82

Table 8: CAPM and Two-Factor Time-Series Regressions for Monthly Excess Returns (in Percent) on Characteristic-Sorted Decile Portfolios: 8107-0312

$$R_i - R_f = a_i + b_i (R_M - R_f) + \varepsilon_i$$
$$R_i - R_f = a_i + b_i (R_M - R_f) + c_i F + \varepsilon_i$$

Value-weighted returns on size, B/M, Sret, C/P, D/P , and E/P decile portfolios in excess of the one-month US Tbill rate ($R_i – R_f$) are regressed on the excess return of the global value-weighted market portfolio (R_M - R_f) and returns on the corresponding global factor mimicking portfolios (F). For example, the explanatory returns for size decile portfolios are the global market excess returns and returns on the global size factor mimicking portfolios (F_Size). The formation of the global factor mimicking portfolios is described in Table 5. t( ) is the t-statistic for a coefficient. R^2 is the adjusted R-squared of a regression. GRS is the Gibbons, Ross, and Shanken (1989) F-statistic for the null hypothesis that the regression intercepts for a set of test portfolios are jointly equal to 0. p(GRS) is the p-value of GRS.

		Deciles									
		1	2	3	4	5	6	7	8	9	10
Size	a	0.89	0.53	0.39	0.29	0.20	0.10	0.04	0.01	0.04	-0.01
	b	0.60	0.67	0.72	0.77	0.81	0.85	0.87	0.94	0.98	1.02
	t(a)	4.93	3.24	2.51	1.99	1.48	0.83	0.33	0.15	0.48	-0.42
	t(b)	14.32	17.68	19.98	22.77	26.56	30.09	33.13	40.78	54.34	146.56
	R^2	0.43	0.54	0.60	0.66	0.72	0.77	0.80	0.86	0.92	0.99
		GRS=4.84, p(GRS)=0.0001									
	a	0.28	-0.05	-0.14	-0.18	-0.20	-0.23	-0.24	-0.19	-0.09	0.06
	b	0.95	1.01	1.02	1.04	1.04	1.04	1.03	1.06	1.06	0.98
	c_Size	0.97	0.92	0.83	0.74	0.62	0.53	0.44	0.33	0.21	-0.11
	t(a)	4.75	-2.48	-2.73	-2.72	-2.72	-2.85	-2.79	-2.33	-1.32	2.50
	t(b)	62.29	197.66	80.08	61.90	55.08	50.14	47.01	49.83	58.32	164.67
	t(c_Size)	48.45	138.16	49.93	33.74	25.33	19.33	15.21	11.80	8.72	-14.31
	R^2	0.94	0.99	0.96	0.93	0.92	0.90	0.89	0.91	0.93	0.99
		GRS=8.02, p(GRS)=0.0001									
B/M	a	-0.34	0.00	-0.01	0.17	0.14	0.19	0.30	0.37	0.39	0.54
	b	1.21	1.11	1.07	0.98	0.92	0.89	0.81	0.83	0.83	0.91
	t(a)	-2.27	-0.01	-0.09	2.10	1.71	1.87	2.77	3.04	2.67	2.94
	t(b)	35.38	52.77	58.64	53.66	48.48	37.95	31.60	29.23	24.59	21.52
	R^2	0.82	0.91	0.93	0.91	0.90	0.84	0.79	0.76	0.69	0.63
		GRS=4.87, p(GRS)=0.0001									
	a	-0.02	0.16	-0.01	0.08	0.02	-0.01	0.08	0.10	0.02	0.12
	b	1.06	1.03	1.07	1.02	0.98	0.99	0.91	0.95	1.01	1.11
	c_B/M	-0.50	-0.25	0.01	0.13	0.19	0.31	0.35	0.41	0.58	0.65
	t(a)	-0.17	2.21	-0.14	1.09	0.29	-0.08	1.06	1.37	0.32	1.14
	t(b)	46.39	59.74	55.36	57.20	57.26	54.97	50.06	51.52	71.06	44.00
	t(c_B/M)	-20.25	-13.32	0.31	6.93	10.23	15.81	17.89	20.84	37.92	24.03
	R^2	0.93	0.95	0.93	0.93	0.93	0.92	0.90	0.91	0.95	0.88
		GRS=1.06, p(GRS)=0.3907									
Sret	a	-0.53	-0.36	-0.28	-0.14	0.02	0.07	0.09	0.16	0.29	0.40
	b	1.41	1.16	1.05	0.91	0.88	0.85	0.87	0.91	0.95	1.09
	t(a)	-2.22	-2.67	-3.01	-1.99	0.23	1.09	1.30	1.95	2.79	2.28
	t(b)	25.55	36.76	49.11	55.85	56.69	57.86	56.99	48.67	38.83	26.67
	R^2	0.71	0.83	0.90	0.92	0.92	0.93	0.92	0.90	0.85	0.73
		GRS=4.48, p(GRS)=0.0001									
	a	0.04	0.00	-0.05	-0.03	0.03	0.03	-0.01	-0.02	0.02	0.02
	b	1.23	1.05	0.98	0.88	0.87	0.86	0.90	0.97	1.04	1.22
	c_Sret	-0.74	-0.48	-0.30	-0.15	-0.02	0.05	0.13	0.24	0.35	0.50
	t(a)	0.30	0.01	-1.03	-0.49	0.45	0.53	-0.25	-0.45	0.50	0.19
	t(b)	39.22	89.37	91.07	62.41	54.90	58.02	67.60	80.55	93.05	43.50
	t(c_Sret)	-24.73	-42.42	-29.32	-10.77	-1.28	3.24	10.21	20.49	33.18	18.56
	R^2	0.91	0.98	0.98	0.94	0.92	0.93	0.94	0.96	0.97	0.88
		GRS=0.24, p(GRS)=0.9919									

Table 8 (Continued)

		Deciles									
		1	2	3	4	5	6	7	8	9	10
C/P	a	-0.58	-0.17	-0.05	0.00	0.26	0.19	0.43	0.49	0.44	0.56
	b	1.34	1.07	0.99	0.95	0.92	0.88	0.81	0.80	0.82	0.88
	t(a)	-3.63	-1.86	-0.58	-0.04	2.48	1.74	3.55	4.58	3.63	3.94
	t(b)	36.39	51.44	48.44	42.54	37.60	34.17	28.70	32.26	29.10	26.64
	R^2	0.83	0.91	0.90	0.87	0.84	0.81	0.75	0.79	0.76	0.72
		GRS=8.86, p(GRS)=0.0001									
	a	-0.02	0.03	-0.17	-0.20	0.05	-0.11	0.09	0.18	-0.01	0.07
	b	1.11	0.99	1.04	1.03	1.01	1.01	0.95	0.93	1.00	1.08
	c_C/P	-0.63	-0.23	0.14	0.23	0.25	0.35	0.39	0.35	0.51	0.57
	t(a)	-0.27	0.37	-2.00	-2.30	0.49	-1.30	0.94	2.26	-0.11	0.80
	t(b)	48.30	50.43	48.79	47.88	42.75	46.86	41.22	46.15	66.67	52.49
	t(c_C/P)	-23.76	-9.93	5.61	9.05	9.04	14.13	14.75	15.10	29.44	23.71
	R^2	0.95	0.93	0.91	0.90	0.88	0.89	0.86	0.89	0.94	0.91
		GRS=1.81, p(GRS)=0.0543									
D/P	a	-0.45	-0.21	-0.08	0.11	0.22	0.22	0.42	0.55	0.56	0.71
	b	1.30	1.18	1.07	0.94	0.83	0.83	0.84	0.78	0.70	0.56
	t(a)	-2.55	-1.22	-0.61	1.09	1.89	1.70	3.11	3.97	3.95	4.90
	t(b)	31.91	29.61	33.22	39.57	30.60	27.26	27.21	24.36	21.21	16.69
	R^2	0.79	0.77	0.80	0.85	0.78	0.73	0.73	0.69	0.63	0.51
		GRS=8.11, p(GRS)=0.0001									
	a	0.13	0.28	0.17	0.07	-0.03	-0.11	0.05	0.14	0.11	0.29
	b	0.94	0.88	0.91	0.97	0.98	1.04	1.07	1.03	0.98	0.82
	c_D/P	-0.59	-0.50	-0.26	0.04	0.25	0.34	0.37	0.41	0.46	0.43
	t(a)	1.56	2.45	1.37	0.69	-0.28	-1.15	0.57	1.67	1.48	3.14
	t(b)	42.92	29.21	27.79	34.84	37.91	40.37	43.36	45.06	49.10	34.13
	t(c_D/P)	-31.62	-19.46	-9.28	1.71	11.50	15.67	17.67	21.20	27.10	21.03
	R^2	0.96	0.90	0.85	0.85	0.85	0.86	0.88	0.88	0.90	0.81
		GRS=2.73, p(GRS)=0.0024									
E/P	a	-0.62	-0.24	-0.12	0.19	0.28	0.30	0.42	0.56	0.53	0.61
	b	1.42	1.23	1.06	0.94	0.88	0.80	0.81	0.77	0.79	0.89
	t(a)	-3.03	-1.47	-1.16	2.28	2.40	2.43	3.25	4.28	3.73	3.86
	t(b)	30.03	33.13	43.42	47.46	32.07	27.70	27.12	25.19	23.97	24.14
	R^2	0.77	0.80	0.88	0.89	0.79	0.74	0.73	0.70	0.68	0.68
		GRS=8.72, p(GRS)=0.0001									
	a	-0.02	0.24	0.07	0.12	0.02	-0.01	0.05	0.19	0.10	0.18
	b	1.12	1.00	0.96	0.98	1.01	0.96	0.99	0.96	1.01	1.11
	c_E/P	-0.62	-0.49	-0.20	0.08	0.27	0.32	0.37	0.38	0.45	0.45
	t(a)	-0.16	2.96	0.83	1.38	0.24	-0.14	0.75	2.56	1.49	1.84
	t(b)	43.40	49.55	43.07	46.78	44.43	45.17	54.19	52.43	63.36	46.74
	t(c_E/P)	-28.44	-28.83	-10.79	4.56	14.02	18.17	24.30	25.17	33.43	22.59
	R^2	0.94	0.95	0.91	0.90	0.88	0.88	0.92	0.91	0.94	0.89
		GRS=2.42, p(GRS)=0.0073									

Table 9: Three–Factor Time-Series Regressions for Monthly Excess Returns (in Percent) on Country and Industry Portfolios: 8107-0312

$$R_i - R_f = a_i + b_i (R_M - R_f) + c_i\ F\_Sret + d_i\ F\_C/P + \varepsilon_i$$

Value-weighted returns on country and industry portfolios (with complete time series from 8107 to 0312) in excess of the one-month US Tbill rate ($R_i - R_f$) are regressed on the excess return of the global value-weighted market portfolio (R_M - R_f), the returns on the global momentum factor mimicking portfolios (F_Sret), and the global C/P factor mimicking portfolio (F_C/P). t( ) is the t-statistic for a coefficient. R^2 is the adjusted R-squared of a regression. GRS is the Gibbons, Ross, and Shanken (1989) F-statistic for the null hypothesis that the regression intercepts for a set of test portfolios are jointly equal to 0. p(GRS) is the p-value of GRS.

Country Portfolios	a	b	c	d	t(a)	t(b)	t(c)	t(d)	R^2
Australia	-0.20	0.94	-0.01	0.39	-0.60	11.17	-0.14	4.00	0.32
Austria	-0.09	0.65	0.09	0.43	-0.25	7.53	1.17	4.34	0.17
Belgium	0.27	0.87	0.12	0.29	0.96	12.70	1.98	3.65	0.37
Canada	-0.46	0.98	0.00	0.29	-2.24	19.01	-0.04	4.94	0.59
Denmark	0.17	0.69	0.04	0.13	0.66	10.49	0.67	1.71	0.30
France	0.13	1.00	0.09	0.30	0.49	15.40	1.49	4.02	0.47
Germany	-0.19	0.98	0.03	0.35	-0.67	14.15	0.51	4.38	0.43
Hong Kong	-0.06	1.16	-0.11	0.48	-0.12	9.15	-0.95	3.31	0.25
Ireland	0.17	1.09	0.12	0.26	0.54	14.08	1.75	2.95	0.43
Italy	-0.24	0.92	0.17	0.20	-0.64	9.79	2.05	1.83	0.27
Japan	0.40	0.94	0.02	-0.65	1.51	14.35	0.36	-8.62	0.64
Netherlands	0.16	1.03	0.02	0.38	0.82	21.02	0.40	6.63	0.63
Norway	-0.26	1.05	0.05	0.59	-0.79	12.87	0.67	6.29	0.38
Singapore	-0.58	1.09	-0.12	0.43	-1.53	11.71	-1.41	4.00	0.35
Switzerland	0.04	0.64	0.10	0.19	0.16	10.77	1.82	2.79	0.30
U.K.	-0.08	0.98	0.10	0.29	-0.39	18.42	2.10	4.76	0.56
U.S.	-0.03	1.02	-0.03	0.32	-0.21	26.45	-0.81	7.22	0.73
South Korea	0.63	0.83	-0.41	-0.05	0.96	5.07	-2.79	-0.28	0.15
Malaysia	-0.50	0.90	-0.19	0.36	-0.97	6.92	-1.65	2.41	0.17
South Africa	-0.15	0.89	0.03	0.24	-0.34	7.94	0.26	1.89	0.19
	GRS=0.81, p(GRS)=0.6988								

Industry Portfolios	a	b	c	d	t(a)	t(b)	t(c)	t(d)	R^2
Mining	-0.32	0.99	-0.04	0.42	-0.87	10.84	-0.53	3.98	0.31
Oil & Gas	-0.13	0.93	-0.03	0.41	-0.61	17.31	-0.61	6.63	0.54
Chemicals	-0.08	1.05	-0.04	0.17	-0.55	29.15	-1.35	4.13	0.78
Construction & Bldg Materials	-0.03	0.99	-0.05	-0.07	-0.14	21.25	-1.19	-1.34	0.69
Forestry & Paper	-0.42	1.12	-0.03	0.39	-2.00	21.32	-0.66	6.40	0.64
Steel & Other Metals	-0.19	1.13	-0.15	0.02	-0.79	18.60	-2.79	0.27	0.63
Aerospace & Defense	-0.27	1.01	-0.05	0.54	-1.25	19.04	-0.99	8.80	0.58
Diversified Industrials	-0.01	1.04	0.05	0.13	-0.10	29.13	1.72	3.08	0.78
Electronic & Electrical Equip.	-0.05	1.15	-0.07	-0.06	-0.26	27.00	-1.80	-1.21	0.78
Engineering & Machinery	-0.21	1.10	-0.12	0.03	-1.38	28.99	-3.49	0.61	0.80
Automobiles & Parts	-0.16	1.05	-0.04	0.22	-0.97	25.59	-1.06	4.77	0.73
Household Goods & Textiles	-0.16	1.03	-0.06	0.01	-1.13	29.97	-1.82	0.37	0.81
Beverages	0.26	0.80	0.10	0.20	1.38	16.75	2.37	3.65	0.52
Food Products & Processors	0.10	0.73	0.04	0.17	0.66	19.29	1.21	3.93	0.59
Health	-0.09	0.89	0.09	0.27	-0.41	16.13	1.75	4.30	0.50
Personal Care & Household Prod.	0.34	0.76	0.12	0.19	1.65	14.93	2.55	3.19	0.46
Pharmaceuticals & Biotechnology	0.42	0.76	0.08	0.02	2.23	16.19	1.88	0.44	0.53
Tobacco	0.55	0.78	0.03	0.40	1.72	9.78	0.39	4.34	0.26
Retailers, General	0.17	1.00	-0.05	0.12	0.96	22.56	-1.15	2.37	0.69
Leisure & Hotels	-0.26	1.01	0.00	0.33	-1.82	28.25	0.03	8.03	0.76
Media & Entertainment	-0.02	1.05	0.02	0.15	-0.13	26.09	0.59	3.16	0.74
Support Services	-0.31	1.05	0.01	0.30	-2.17	29.50	0.47	7.25	0.77
Transport	0.02	0.97	-0.02	-0.06	0.12	22.84	-0.65	-1.26	0.72
Food & Drug Retailers	0.22	0.77	0.02	0.20	1.42	20.28	0.70	4.64	0.62
Telecom Services	0.15	0.83	-0.03	-0.17	0.72	15.76	-0.69	-2.87	0.58
Electricity	0.30	0.56	0.04	-0.02	1.39	10.62	0.95	-0.26	0.34
Utilities, Other	0.02	0.75	0.08	0.11	0.11	16.83	2.14	2.16	0.53
Information Tech. Hardware	0.28	1.34	-0.09	-0.21	0.90	17.31	-1.36	-2.31	0.62
Software & Computer Service	0.15	1.09	-0.02	-0.09	0.47	13.64	-0.31	-1.03	0.48
Banks	0.16	1.00	0.09	-0.04	0.80	20.85	2.07	-0.76	0.67
Insurance	0.00	0.99	0.06	0.25	0.01	23.49	1.73	5.07	0.68
Life Insurance	0.05	1.01	0.03	0.49	0.30	25.98	0.91	10.86	0.72
Real Estate	-0.10	0.91	0.10	-0.08	-0.47	16.79	2.17	-1.26	0.57
Specialty & Other Finance	0.21	1.27	0.10	-0.22	1.09	26.01	2.27	-3.93	0.78
	GRS=1.22, p(GRS)=0.1732								

Table 10: Three–Factor Time-Series Regressions for Monthly Excess Returns (in Percent) on Characteristic-Sorted Decile Portfolios: 8107-0312

$$R_i - R_f = a_i + b_i (R_M - R_f) + c_i F\_Sret + d_i F\_C/P + \varepsilon_i$$

Value-weighted returns on size, B/M, Sret, C/P, D/P , and E/P decile portfolios in excess of the one-month US Tbill rate ($R_i – R_f$) are regressed on the excess return of the global value-weighted market portfolio (R_M - R_f), the returns on the global momentum factor mimicking portfolios (F_Sret), and the global C/P factor mimicking portfolio (F_C/P). t( ) is the t-statistic for a coefficient. R^2 is the adjusted R-squared of a regression. GRS is the Gibbons, Ross, and Shanken (1989) F-statistic for the null hypothesis that the regression intercepts for a set of test portfolios are jointly equal to 0. p(GRS) is the p-value of GRS.

		Deciles									
		1	2	3	4	5	6	7	8	9	10
Size	a	0.67	0.30	0.19	0.11	0.07	-0.02	-0.04	-0.05	-0.01	0.00
	b	0.69	0.77	0.80	0.85	0.87	0.90	0.91	0.97	1.01	1.01
	c	0.03	0.00	-0.01	-0.03	-0.04	-0.02	-0.04	-0.02	-0.03	0.01
	d	0.23	0.26	0.24	0.23	0.17	0.15	0.12	0.09	0.08	-0.03
	t(a)	3.68	1.88	1.23	0.77	0.53	-0.13	-0.34	-0.50	-0.15	0.15
	t(b)	15.24	19.03	20.95	23.62	26.28	29.42	31.53	38.21	50.97	133.58
	t(c)	0.71	-0.02	-0.26	-0.93	-1.21	-0.73	-1.37	-0.84	-1.65	2.06
	t(d)	4.39	5.62	5.37	5.61	4.59	4.32	3.60	3.16	3.63	-3.64
	R^2	0.47	0.58	0.63	0.69	0.74	0.78	0.81	0.86	0.92	0.99
		GRS=1.99, p(GRS)=0.0311									
B/M	a	0.04	0.18	0.04	0.04	-0.05	-0.09	-0.04	0.01	-0.04	0.08
	b	1.06	1.03	1.05	1.03	1.00	1.01	0.95	0.98	1.01	1.10
	c	0.05	-0.01	-0.05	0.03	0.03	0.00	0.00	-0.01	-0.02	-0.03
	d	-0.47	-0.20	-0.01	0.12	0.20	0.31	0.39	0.43	0.51	0.54
	t(a)	0.32	2.19	0.45	0.53	-0.73	-1.04	-0.49	0.06	-0.34	0.55
	t(b)	36.15	49.54	52.33	53.38	54.83	49.48	48.97	44.80	38.14	29.40
	t(c)	1.79	-0.68	-2.64	1.64	1.85	0.16	0.13	-0.60	-0.91	-0.82
	t(d)	-13.95	-8.38	-0.36	5.32	9.38	13.34	17.58	17.08	16.68	12.66
	R^2	0.90	0.93	0.93	0.92	0.92	0.91	0.90	0.89	0.85	0.77
		GRS=0.76, p(GRS)=0.6639									
Sret	a	0.10	0.05	-0.06	-0.07	-0.07	-0.07	-0.10	-0.08	0.02	0.16
	b	1.20	1.03	0.98	0.89	0.91	0.91	0.94	1.00	1.04	1.16
	c	-0.74	-0.47	-0.30	-0.15	-0.03	0.03	0.12	0.23	0.35	0.51
	d	-0.08	-0.06	0.01	0.05	0.12	0.13	0.11	0.08	0.01	-0.17
	t(a)	0.77	0.93	-1.23	-1.13	-1.05	-1.25	-1.96	-1.68	0.32	1.38
	t(b)	35.54	83.04	84.28	59.32	57.12	62.45	71.15	79.98	85.93	39.93
	t(c)	-24.46	-42.81	-29.23	-11.16	-2.16	2.63	10.23	20.73	32.83	19.90
	t(d)	-2.07	-4.00	1.01	2.81	6.67	7.96	7.41	5.33	0.74	-5.15
	R^2	0.91	0.98	0.98	0.95	0.93	0.94	0.95	0.96	0.97	0.89
		GRS=1.56, p(GRS)=0.1134									
C/P	a	-0.01	0.03	-0.14	-0.19	0.03	-0.09	0.07	0.14	-0.02	0.07
	b	1.11	0.99	1.03	1.03	1.02	1.00	0.95	0.94	1.00	1.08
	c	-0.02	0.01	-0.05	-0.01	0.02	-0.04	0.02	0.07	0.01	0.00
	d	-0.63	-0.23	0.15	0.23	0.25	0.36	0.39	0.34	0.51	0.57
	t(a)	-0.16	0.32	-1.63	-2.19	0.34	-1.02	0.78	1.73	-0.25	0.82
	t(b)	47.46	49.70	48.20	47.05	43.32	46.13	40.84	47.51	65.89	51.62
	t(c)	-0.75	0.34	-2.66	-0.63	1.00	-2.00	1.09	4.09	0.98	-0.21
	t(d)	-23.48	-9.89	5.95	9.05	8.86	14.34	14.52	14.95	29.11	23.52
	R^2	0.95	0.93	0.91	0.90	0.88	0.89	0.86	0.89	0.94	0.91
		GRS=1.31, p(GRS)=0.2200									
D/P	a	0.08	0.16	0.10	-0.03	-0.07	-0.17	0.01	0.12	0.08	0.27
	b	1.08	1.03	0.99	1.00	0.95	0.99	1.01	0.96	0.90	0.74
	c	-0.03	0.00	-0.01	0.04	0.03	0.05	0.02	0.02	0.03	0.00
	d	-0.58	-0.42	-0.20	0.13	0.30	0.40	0.45	0.48	0.52	0.50
	t(a)	0.61	0.99	0.71	-0.29	-0.65	-1.62	0.08	1.15	0.88	2.54
	t(b)	32.81	26.60	28.91	39.10	37.28	38.38	41.02	38.45	37.44	28.47
	t(c)	-0.94	-0.09	-0.34	1.61	1.39	2.27	0.76	1.02	1.50	0.12
	t(d)	-15.32	-9.30	-5.08	4.45	10.38	13.62	15.97	16.64	18.88	16.80
	R^2	0.89	0.82	0.82	0.86	0.84	0.85	0.86	0.85	0.84	0.76
		GRS=1.36, p(GRS)=0.1942									
E/P	a	0.04	0.21	0.09	0.06	0.00	-0.10	0.01	0.12	0.05	0.12
	b	1.15	1.05	0.97	0.99	1.00	0.96	0.98	0.95	0.99	1.10
	c	-0.08	0.02	0.01	0.06	0.00	0.07	0.01	0.03	0.00	0.00
	d	-0.68	-0.52	-0.25	0.10	0.32	0.40	0.47	0.48	0.55	0.57
	t(a)	0.25	1.67	0.90	0.71	0.04	-1.01	0.08	1.34	0.58	1.04
	t(b)	31.01	33.96	40.79	47.23	38.90	41.00	44.14	43.56	44.54	39.57
	t(c)	-2.34	0.68	0.63	3.40	0.22	3.34	0.33	1.58	-0.16	0.01
	t(d)	-15.96	-14.78	-9.16	4.06	10.76	14.70	18.24	19.27	21.58	17.93
	R^2	0.89	0.89	0.90	0.90	0.86	0.86	0.88	0.88	0.88	0.86
		GRS=0.84, p(GRS)=0.5891									

Table 11: Summary of Time Series GRS Tests for CAPM, Two-, Three- , Four-, and Five-Factor Regressions: 8107-0312

This table summarizes the time series regressions employing alternative combinations of factor mimicking returns. The explanatory factor returns include the global value-weighted market portfolio (R_M - R_f), six global factor mimicking portfolios (F_Size, F_B/M, F_Sret, F_C/P, F_D/P, and F_E/P). GRS is the Gibbons, Ross, and Shanken (1989) F-statistic for the null hypothesis that the regression intercepts for a set of test portfolios are jointly equal to 0. p(GRS) is the p-value of GRS.

Dependent Portfolios	Explanatory Factors					GRS	p(GRS)	Dependent Portfolios	Explanatory Factors					GRS	p(GRS)
20 Country	$R_M - R_f$					1.40	0.1095	34 Industry	$R_M - R_f$					2.12	0.0002
20 Country	$R_M - R_f$	F_Size	F_B/M			1.20	0.2462	34 Industry	$R_M - R_f$	F_Size	F_B/M			2.88	0.0001
20 Country	$R_M - R_f$			F_Sret	F_C/P	0.81	0.6988	34 Industry	$R_M - R_f$			F_Sret	F_C/P	1.22	0.1732
20 Country	$R_M - R_f$		F_B/M	F_Sret		0.79	0.7343	34 Industry	$R_M - R_f$		F_B/M	F_Sret		1.53	0.0255
20 Country	$R_M - R_f$		F_B/M	F_Sret	F_C/P	0.82	0.6924	34 Industry	$R_M - R_f$		F_B/M	F_Sret	F_C/P	1.11	0.3002
20 Country	$R_M - R_f$	F_Size	F_B/M	F_Sret	F_C/P	1.20	0.2456	34 Industry	$R_M - R_f$	F_Size	F_B/M	F_Sret	F_C/P	1.64	0.0107
10 Size	$R_M - R_f$					4.84	0.0001	10 C/P	$R_M - R_f$					8.86	0.0001
10 Size	$R_M - R_f$	F_Size				8.02	0.0001	10 C/P	$R_M - R_f$	F_C/P				1.81	0.0543
10 Size	$R_M - R_f$	F_Size	F_B/M			9.76	0.0001	10 C/P	$R_M - R_f$	F_Size	F_B/M			5.06	0.0001
10 Size	$R_M - R_f$			F_Sret	F_C/P	1.99	0.0311	10 C/P	$R_M - R_f$			F_Sret	F_C/P	1.31	0.2200
10 Size	$R_M - R_f$		F_B/M	F_Sret		2.36	0.0090	10 C/P	$R_M - R_f$		F_B/M	F_Sret		3.11	0.0006
10 Size	$R_M - R_f$		F_B/M	F_Sret	F_C/P	2.84	0.0016	10 C/P	$R_M - R_f$		F_B/M	F_Sret	F_C/P	1.41	0.1674
10 Size	$R_M - R_f$	F_Size	F_B/M	F_Sret	F_C/P	5.62	0.0001	10 C/P	$R_M - R_f$	F_Size	F_B/M	F_Sret	F_C/P	1.49	0.1370
10 B/M	$R_M - R_f$					4.87	0.0001	10 D/P	$R_M - R_f$					8.11	0.0001
10 B/M	$R_M - R_f$		F_B/M			1.06	0.3907	10 D/P	$R_M - R_f$	F_D/P				2.73	0.0024
10 B/M	$R_M - R_f$	F_Size	F_B/M			1.38	0.1830	10 D/P	$R_M - R_f$	F_Size	F_B/M			4.70	0.0001
10 B/M	$R_M - R_f$			F_Sret	F_C/P	0.76	0.6639	10 D/P	$R_M - R_f$			F_Sret	F_C/P	1.36	0.1942
10 B/M	$R_M - R_f$		F_B/M	F_Sret		1.03	0.4136	10 D/P	$R_M - R_f$		F_B/M	F_Sret		2.97	0.0010
10 B/M	$R_M - R_f$		F_B/M	F_Sret	F_C/P	0.88	0.5486	10 D/P	$R_M - R_f$		F_B/M	F_Sret	F_C/P	1.43	0.1606
10 B/M	$R_M - R_f$	F_Size	F_B/M	F_Sret	F_C/P	0.84	0.5879	10 D/P	$R_M - R_f$	F_Size	F_B/M	F_Sret	F_C/P	1.91	0.0390
10 Sret	$R_M - R_f$					4.48	0.0001	10 E/P	$R_M - R_f$					8.72	0.0001
10 Sret	$R_M - R_f$			F_Sret		0.24	0.9919	10 E/P	$R_M - R_f$	F_E/P				2.42	0.0073
10 Sret	$R_M - R_f$	F_Size	F_B/M			3.62	0.0001	10 E/P	$R_M - R_f$	F_Size	F_B/M			3.90	0.0001
10 Sret	$R_M - R_f$			F_Sret	F_C/P	1.56	0.1134	10 E/P	$R_M - R_f$			F_Sret	F_C/P	0.84	0.5891
10 Sret	$R_M - R_f$		F_B/M	F_Sret		0.70	0.7264	10 E/P	$R_M - R_f$		F_B/M	F_Sret		2.74	0.0023
10 Sret	$R_M - R_f$		F_B/M	F_Sret	F_C/P	1.55	0.1155	10 E/P	$R_M - R_f$		F_B/M	F_Sret	F_C/P	0.87	0.5612
10 Sret	$R_M - R_f$	F_Size	F_B/M	F_Sret	F_C/P	0.82	0.6057	10 E/P	$R_M - R_f$	F_Size	F_B/M	F_Sret	F_C/P	1.03	0.4177

Table 12: Summary Statistics and Three–Factor Time-Series Regressions for Monthly Excess Returns (in Percent) on Double-Sorted Portfolios: 8107-0312

$$R_i - R_f = a_i + b_i (R_M - R_f) + c_i F\_Sret + d_i F\_C/P + \varepsilon_i$$

At the end of June of each year from 1981 to 2003, all stocks in our sample are sorted independently into 3 groups (bottom 30%, middle 40%, and top 30%: 1, 2, and 3) according to their size, B/M, Sret, C/P, D/P, and E/P. In addition, at the beginning of each month, all stocks are sorted into 3 groups (bottom 30%, middle 40%, and top 30%) based on their returns over the past 6 months skipping the most recent month (Sret). Four sets of 9 double-sorted portfolios are then formed as the intersections of sorts on size and B/M, Sret and D/P, C/P and E/P, or B/M and E/P. Value-weighted returns on these double sorted portfolios are computed from July to June of the following year. Panel A reports, for each portfolio, the average monthly returns (Mean), the standard deviation of the monthly returns (Std), and the time series t-statistic (t(Mean)). Panel B reports the results of time series regressions of excess returns on the double-sorted characteristic portfolios on the excess return of the global value-weighted market portfolio (R_M - R_f), the returns on the global momentum factor mimicking portfolios (F_Sret), and the global C/P factor mimicking portfolio (F_C/P). t( ) is the t-statistic for a coefficient. R^2 is the adjusted R-squared of a regression. GRS is the Gibbons, Ross, and Shanken (1989) F-statistic for the null hypothesis that the regression intercepts for a set of test portfolios are jointly equal to 0. p(GRS) is the p-value of GRS.

		1–1	1–2	1–3	2–1	2–2	2–3	3–1	3–2	3–3
Panel A: Summary Statistics										
Size and B/M	Mean	1.07	1.40	1.69	0.79	1.14	1.31	0.87	1.08	1.28
	Std	5.87	4.28	3.97	5.53	4.11	4.13	5.07	4.10	4.27
	t(Mean)	3.00	5.38	6.98	2.36	4.55	5.21	2.83	4.35	4.92
Sret and D/P	Mean	0.72	0.95	1.33	0.59	1.08	1.32	0.89	1.14	1.38
	Std	6.90	5.24	5.19	5.36	4.00	3.55	5.63	4.23	4.04
	t(Mean)	1.71	2.97	4.23	1.81	4.43	6.12	2.60	4.42	5.61
C/P and E/P	Mean	0.62	1.08	1.08	0.85	1.15	1.36	1.19	1.27	1.52
	Std	5.81	4.27	5.26	5.09	4.09	4.25	4.93	4.05	4.01
	t(Mean)	1.74	4.17	3.37	2.75	4.63	5.24	3.95	5.17	6.23
B/M and E/P	Mean	0.73	1.18	1.01	0.96	1.14	1.40	1.04	1.24	1.56
	Std	5.95	4.32	5.05	5.33	3.94	4.02	4.84	4.15	4.26
	t(Mean)	2.02	4.49	3.30	2.96	4.77	5.74	3.52	4.91	6.03
Panel B: Three-Factor Regressions										
Size and B/M	a	0.04	0.34	0.56	-0.11	0.07	0.16	0.10	-0.05	-0.03
	b	1.00	0.85	0.81	1.09	0.91	0.89	1.04	1.01	1.05
	c	0.03	0.00	0.00	-0.06	-0.03	-0.05	0.00	0.01	-0.02
	d	0.08	0.25	0.38	-0.08	0.25	0.40	-0.29	0.24	0.49
	t(a)	0.16	2.01	3.54	-0.67	0.56	1.16	1.80	-0.92	-0.39
	t(b)	15.12	20.01	20.74	25.81	29.96	25.03	78.97	70.42	50.84
	t(c)	0.46	-0.07	0.06	-1.49	-1.13	-1.60	0.24	1.15	-0.84
	t(d)	1.06	5.17	8.39	-1.56	7.12	9.77	-18.77	14.87	20.78
	R^2	0.49	0.61	0.62	0.77	0.78	0.71	0.97	0.95	0.91
					GRS=2.55, p(GRS)=0.0065					
Sret and D/P	a	0.43	-0.04	0.15	-0.09	-0.11	0.10	-0.17	-0.16	0.04
	b	1.01	1.09	1.04	0.97	0.95	0.84	1.06	0.96	0.92
	c	-0.50	-0.33	-0.31	-0.03	0.02	0.02	0.45	0.29	0.17
	d	-0.49	0.29	0.59	-0.34	0.35	0.48	-0.31	0.26	0.46
	t(a)	2.37	-0.30	0.88	-0.66	-1.16	1.07	-1.01	-1.32	0.29
	t(b)	22.76	33.69	24.81	27.13	40.31	36.21	25.65	31.00	29.84
	t(c)	-12.56	-11.34	-8.25	-0.95	1.02	1.05	12.20	10.53	6.01
	t(d)	-9.56	7.71	12.24	-8.15	12.82	17.99	-6.44	7.27	12.79
	R^2	0.83	0.85	0.74	0.82	0.86	0.83	0.79	0.79	0.77
					GRS=1.36, p(GRS)=0.2008					
C/P and E/P	a	0.05	-0.05	-0.25	-0.02	-0.05	0.04	0.18	-0.02	0.16
	b	1.03	0.99	1.07	1.04	0.98	1.01	0.98	0.99	0.99
	c	0.01	0.02	0.02	-0.07	0.02	0.03	0.05	0.09	0.01
	d	-0.59	0.25	0.47	-0.08	0.35	0.49	0.05	0.41	0.57
	t(a)	0.63	-0.48	-1.21	-0.13	-0.52	0.34	0.99	-0.24	2.25
	t(b)	52.12	36.96	20.84	32.07	43.40	37.48	22.05	44.68	54.71
	t(c)	0.36	0.77	0.49	-2.52	0.86	1.07	1.24	4.66	0.88
	t(d)	-25.60	8.10	7.89	-2.19	13.36	15.77	1.00	16.03	27.38
	R^2	0.95	0.84	0.62	0.84	0.88	0.84	0.68	0.88	0.92
					GRS=0.96, p(GRS)=0.4727					
B/M and E/P	a	0.14	0.02	-0.30	0.17	-0.06	0.09	-0.12	0.00	0.18
	b	1.06	1.00	1.10	1.00	0.97	0.98	0.99	0.97	1.02
	c	0.03	0.01	0.00	-0.03	0.06	0.03	0.03	0.03	0.00
	d	-0.59	0.29	0.44	-0.21	0.32	0.51	0.27	0.40	0.60
	t(a)	1.54	0.14	-1.72	1.08	-0.81	1.00	-0.65	0.01	1.85
	t(b)	45.76	35.85	25.66	25.17	53.96	46.22	21.55	34.11	42.12
	t(c)	1.37	0.53	-0.05	-0.78	3.56	1.42	0.74	1.28	0.10
	t(d)	-22.17	8.99	9.00	-4.69	15.40	20.78	5.08	12.09	21.34
	R^2	0.94	0.83	0.72	0.78	0.92	0.89	0.64	0.82	0.87
					GRS=1.33, p(GRS)=0.2145					

Table13: Summary of Time Series GRS Tests for CAPM, Two-, Three-, Four-, and Five-Factor Regressions: 8107-0312

This table summarizes the time series regressions employing alternative test portfolios and factor mimicking returns. The additional sets of test portfolios include 9 (3x3) and 25 (5x5) double-sorted portfolios on size and B/M, Sret and D/P, C/P and E/P, or B/M and E/P. The explanatory factor returns include the global value-weighted market portfolio (R_M - R_f), six global factor mimicking portfolios (F_Size, F_B/M, F_Sret, F_C/P, F_D/P, and F_E/P). GRS is the Gibbons, Ross, and Shanken (1989) F-statistic for the null hypothesis that the regression intercepts for a set of test portfolios are jointly equal to 0. p(GRS) is the p-value of GRS.

Dependent Portfolios	Explanatory Factors					GRS	p(GRS)	Dependent Portfolios	Explanatory Factors					GRS	p(GRS)
9 Size and B/M	R_M - R_f					7.93	0.0001	25 Size and B/M	R_M - R_f					7.27	0.0001
9 Size and B/M	R_M - R_f	F_Size	F_B/M			5.31	0.0001	25 Size and B/M	R_M - R_f	F_Size	F_B/M			4.49	0.0001
9 Size and B/M	R_M - R_f			F_Sret	F_C/P	2.55	0.0065	25 Size and B/M	R_M - R_f			F_Sret	F_C/P	2.44	0.0001
9 Size and B/M	R_M - R_f		F_B/M	F_Sret		3.35	0.0004	25 Size and B/M	R_M - R_f		F_B/M	F_Sret		3.25	0.0001
9 Size and B/M	R_M - R_f		F_B/M	F_Sret	F_C/P	4.11	0.0001	25 Size and B/M	R_M - R_f		F_B/M	F_Sret	F_C/P	3.88	0.0001
9 Size and B/M	R_M - R_f	F_Size	F_B/M	F_Sret	F_C/P	3.57	0.0002	25 Size and B/M	R_M - R_f	F_Size	F_B/M	F_Sret	F_C/P	3.16	0.0001
9 Sret and D/P	R_M - R_f					5.37	0.0001	25 Sret and D/P	R_M - R_f					4.25	0.0001
9 Sret and D/P	R_M - R_f			F_Sret	F_D/P	1.76	0.0713	25 Sret and D/P	R_M - R_f			F_Sret	F_D/P	1.57	0.0352
9 Sret and D/P	R_M - R_f	F_Size	F_B/M			2.46	0.0086	25 Sret and D/P	R_M - R_f	F_Size	F_B/M			1.99	0.0024
9 Sret and D/P	R_M - R_f			F_Sret	F_C/P	1.36	0.2008	25 Sret and D/P	R_M - R_f			F_Sret	F_C/P	1.25	0.1836
9 Sret and D/P	R_M - R_f		F_B/M	F_Sret		2.13	0.0240	25 Sret and D/P	R_M - R_f		F_B/M	F_Sret		1.73	0.0135
9 Sret and D/P	R_M - R_f		F_B/M	F_Sret	F_C/P	1.40	0.1828	25 Sret and D/P	R_M - R_f		F_B/M	F_Sret	F_C/P	1.31	0.1402
9 Sret and D/P	R_M - R_f	F_Size	F_B/M	F_Sret	F_C/P	1.55	0.1245	25 Sret and D/P	R_M - R_f	F_Size	F_B/M	F_Sret	F_C/P	1.26	0.1723
9 C/P and E/P	R_M - R_f					7.54	0.0001	25 C/P and E/P	R_M - R_f					4.87	0.0001
9 C/P and E/P	R_M - R_f	F_C/P	F_E/P			1.64	0.0992	25 C/P and E/P	R_M - R_f	F_C/P	F_E/P			1.30	0.1472
9 C/P and E/P	R_M - R_f	F_Size	F_B/M			3.82	0.0001	25 C/P and E/P	R_M - R_f	F_Size	F_B/M			2.37	0.0001
9 C/P and E/P	R_M - R_f			F_Sret	F_C/P	0.96	0.4727	25 C/P and E/P	R_M - R_f			F_Sret	F_C/P	0.84	0.6922
9 C/P and E/P	R_M - R_f		F_B/M	F_Sret		2.65	0.0048	25 C/P and E/P	R_M - R_f		F_B/M	F_Sret		1.62	0.0258
9 C/P and E/P	R_M - R_f		F_B/M	F_Sret	F_C/P	0.94	0.4921	25 C/P and E/P	R_M - R_f		F_B/M	F_Sret	F_C/P	0.85	0.6765
9 C/P and E/P	R_M - R_f	F_Size	F_B/M	F_Sret	F_C/P	1.01	0.4269	25 C/P and E/P	R_M - R_f	F_Size	F_B/M	F_Sret	F_C/P	0.96	0.5190
9 B/M and E/P	R_M - R_f					7.02	0.0001	25 B/M and E/P	R_M - R_f					5.16	0.0001
9 B/M and E/P	R_M - R_f		F_B/M		F_E/P	3.25	0.0006	25 B/M and E/P	R_M - R_f		F_B/M		F_E/P	2.04	0.0016
9 B/M and E/P	R_M - R_f	F_Size	F_B/M			3.27	0.0006	25 B/M and E/P	R_M - R_f	F_Size	F_B/M			2.55	0.0001
9 B/M and E/P	R_M - R_f			F_Sret	F_C/P	1.33	0.2145	25 B/M and E/P	R_M - R_f			F_Sret	F_C/P	1.01	0.4465
9 B/M and E/P	R_M - R_f		F_B/M	F_Sret		2.64	0.0049	25 B/M and E/P	R_M - R_f		F_B/M	F_Sret		2.15	0.0007
9 B/M and E/P	R_M - R_f		F_B/M	F_Sret	F_C/P	1.54	0.1278	25 B/M and E/P	R_M - R_f		F_B/M	F_Sret	F_C/P	1.24	0.1933
9 B/M and E/P	R_M - R_f	F_Size	F_B/M	F_Sret	F_C/P	1.05	0.0961	25 B/M and E/P	R_M - R_f	F_Size	F_B/M	F_Sret	F_C/P	1.31	0.1368

Table 14: Summary of Additional Time Series GRS Tests for Three-Factor Regressions: 8107-0312

This table summarizes time series regressions employing alternative factor mimicking returns. The explanatory factor returns include the global value-weighted market portfolio (R_M - R_f), two global factor mimicking portfolios (F_Sret and F_C/P), two additional country-neutral factor mimicking portfolios based on Sret and C/P (F_Sret_CN and F_C/P_CN) and two additional industry-neutral factor mimicking portfolios based on Sret and C/P (F_Sret_IN and F_C/P_IN) as described in Table 5, and an industry momentum factor mimicking portfolio (F_Sret_I), which is formed based on a 6-month/6-month strategy of buying winning industries (the 5 industries with the best past 6-month returns) and shorting losing industries (the 5 industries with the worst past 6-month returns), rebalanced each month. GRS is the Gibbons, Ross, and Shanken (1989) F-statistic for the null hypothesis that the regression intercepts for a set of test portfolios are jointly equal to 0. p(GRS) is the p-value of GRS.

Dependent Portfolios	Explanatory Factors			GRS	p(GRS)
20 Country	R_M - R_f	F_Sret	F_C/P	0.81	0.6988
20 Country	R_M - R_f	F_Sret_CN	F_C/P_CN	0.94	0.5338
20 Country	R_M - R_f	F_Sret_IN	F_C/P_IN	1.22	0.2229
20 Country	R_M - R_f	F_Sret_I	F_C/P	0.82	0.6934
10 Size	R_M - R_f	F_Sret	F_C/P	1.99	0.0311
10 Size (Feb-Dec)	R_M - R_f	F_Sret	F_C/P	0.63	0.7874
10 Size	R_M - R_f	F_Sret_CN	F_C/P_CN	3.60	0.0001
10 Size	R_M - R_f	F_Sret_IN	F_C/P_IN	1.55	0.1158
10 Size	R_M - R_f	F_Sret_I	F_C/P	1.81	0.0531
10 B/M	R_M - R_f	F_Sret	F_C/P	0.76	0.6639
10 B/M	R_M - R_f	F_Sret_CN	F_C/P_CN	0.94	0.4978
10 B/M	R_M - R_f	F_Sret_IN	F_C/P_IN	0.91	0.5227
10 B/M	R_M - R_f	F_Sret_I	F_C/P	0.75	0.6795
10 Sret	R_M - R_f	F_Sret	F_C/P	1.56	0.1134
10 Sret	R_M - R_f	F_Sret_CN	F_C/P_CN	1.17	0.3045
10 Sret	R_M - R_f	F_Sret_IN	F_C/P_IN	0.46	0.9179
10 Sret	R_M - R_f	F_Sret_I	F_C/P	1.54	0.1193
9 Size and B/M	R_M - R_f	F_Sret	F_C/P	2.55	0.0065
9 Size and B/M (Feb-Dec)	R_M - R_f	F_Sret	F_C/P	1.41	0.1776
9 Size and B/M	R_M - R_f	F_Sret_CN	F_C/P_CN	3.76	0.0001
9 Size and B/M	R_M - R_f	F_Sret_IN	F_C/P_IN	2.47	0.0084
9 Size and B/M	R_M - R_f	F_Sret_I	F_C/P	2.35	0.0121
9 Sret and D/P	R_M - R_f	F_Sret	F_C/P	1.36	0.2008
9 Sret and D/P	R_M - R_f	F_Sret_CN	F_C/P_CN	3.11	0.0010
9 Sret and D/P	R_M - R_f	F_Sret_IN	F_C/P_IN	1.26	0.2542
9 Sret and D/P	R_M - R_f	F_Sret_I	F_C/P	0.83	0.5893
34 Industry	R_M - R_f	F_Sret	F_C/P	1.22	0.1732
34 Industry	R_M - R_f	F_Sret_CN	F_C/P_CN	1.96	0.0007
34 Industry	R_M - R_f	F_Sret_IN	F_C/P_IN	1.93	0.0009
34 Industry	R_M - R_f	F_Sret_I	F_C/P	1.33	0.0951
10 C/P	R_M - R_f	F_Sret	F_C/P	1.31	0.2200
10 C/P	R_M - R_f	F_Sret_CN	F_C/P_CN	2.87	0.0014
10 C/P	R_M - R_f	F_Sret_IN	F_C/P_IN	1.57	0.1108
10 C/P	R_M - R_f	F_Sret_I	F_C/P	1.55	0.1141
10 D/P	R_M - R_f	F_Sret	F_C/P	1.36	0.1942
10 D/P	R_M - R_f	F_Sret_CN	F_C/P_CN	3.80	0.0001
10 D/P	R_M - R_f	F_Sret_IN	F_C/P_IN	2.27	0.0120
10 D/P	R_M - R_f	F_Sret_I	F_C/P	1.27	0.2426
10 E/P	R_M - R_f	F_Sret	F_C/P	0.84	0.5891
10 E/P	R_M - R_f	F_Sret_CN	F_C/P_CN	3.47	0.0001
10 E/P	R_M - R_f	F_Sret_IN	F_C/P_IN	1.46	0.1497
10 E/P	R_M - R_f	F_Sret_I	F_C/P	0.80	0.6279
25 Size and B/M	R_M - R_f	F_Sret	F_C/P	2.44	0.0001
25 Size and B/M (Feb-Dec)	R_M - R_f	F_Sret	F_C/P	1.32	0.1289
25 Size and B/M	R_M - R_f	F_Sret_CN	F_C/P_CN	3.80	0.0001
25 Size and B/M	R_M - R_f	F_Sret_IN	F_C/P_IN	2.53	0.0001
25 Size and B/M	R_M - R_f	F_Sret_I	F_C/P	2.15	0.0007
25 Sret and D/P	R_M - R_f	F_Sret	F_C/P	1.25	0.1836
25 Sret and D/P	R_M - R_f	F_Sret_CN	F_C/P_CN	2.55	0.0001
25 Sret and D/P	R_M - R_f	F_Sret_IN	F_C/P_IN	1.15	0.2706
25 Sret and D/P	R_M - R_f	F_Sret_I	F_C/P	0.97	0.5073

Table 14 (Continued)

Dependent Portfolios	Explanatory Factors			GRS	p(GRS)	Dependent Portfolios	Explanatory Factors			GRS	p(GRS)
9 C/P and E/P	$R_M - R_f$	F_Sret	F_C/P	0.96	0.4727	25 C/P and E/P	$R_M - R_f$	F_Sret	F_C/P	0.84	0.6922
9 C/P and E/P	$R_M - R_f$	F_Sret_CN	F_C/P_CN	3.17	0.0008	25 C/P and E/P	$R_M - R_f$	F_Sret_CN	F_C/P_CN	1.97	0.0027
9 C/P and E/P	$R_M - R_f$	F_Sret_IN	F_C/P_IN	1.27	0.2492	25 C/P and E/P	$R_M - R_f$	F_Sret_IN	F_C/P_IN	0.97	0.5102
9 C/P and E/P	$R_M - R_f$	F_Sret_I	F_C/P	1.08	0.3749	25 C/P and E/P	$R_M - R_f$	F_Sret_I	F_C/P	0.96	0.5222
9 B/M and E/P	$R_M - R_f$	F_Sret	F_C/P	1.33	0.2145	25 B/M and E/P	$R_M - R_f$	F_Sret	F_C/P	1.01	0.4465
9 B/M and E/P	$R_M - R_f$	F_Sret_CN	F_C/P_CN	2.81	0.0027	25 B/M and E/P	$R_M - R_f$	F_Sret_CN	F_C/P_CN	2.20	0.0005
9 B/M and E/P	$R_M - R_f$	F_Sret_IN	F_C/P_IN	1.71	0.0812	25 B/M and E/P	$R_M - R_f$	F_Sret_IN	F_C/P_IN	1.37	0.1045
9 B/M and E/P	$R_M - R_f$	F_Sret_I	F_C/P	1.27	0.2458	25 B/M and E/P	$R_M - R_f$	F_Sret_I	F_C/P	0.99	0.4712

Figure 1: Three-Factor Regression Intercepts for Size Decile Portfolios: 8107-0312

$$R_i - R_f = a_i + b_i (R_M - R_f) + c_i \text{ F\_Sret} + d_i \text{ F\_C/P} + \varepsilon_i$$

Value-weighted returns on size decile portfolios in excess of the one-month US Tbill rate ($R_i - R_f$) are regressed on the excess return of the global value-weighted market portfolio ($R_M - R_f$), the returns on the global momentum factor mimicking portfolios (F_Sret), and the global C/P factor mimicking portfolio (F_C/P). The regressions are estimated for all calendar months (January-December), January only, and February-December only. The regression intercepts are plotted below.

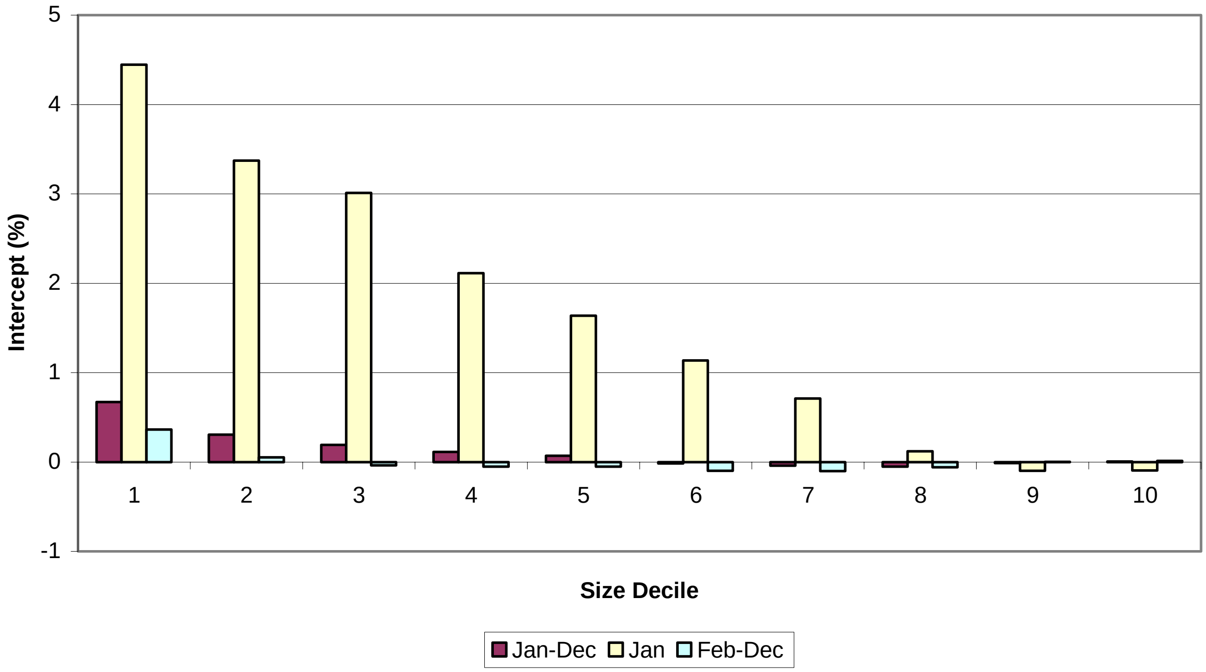


Figure 2: Three-Factor Regression Intercepts for Size-B/M (3 × 3) Portfolios: 8107-0312

$$R_i - R_f = a_i + b_i (R_M - R_f) + c_i\, F\_Sret + d_i\, F\_C/P + \varepsilon_i$$

Value-weighted returns on 3 × 3 double-sorted size-B/M portfolios in excess of the one-month US Tbill rate ($R_i - R_f$) are regressed on the excess return of the global value-weighted market portfolio ($R_M - R_f$), the returns on the global momentum factor mimicking portfolios (F_Sret), and the global C/P factor mimicking portfolio (F_C/P). The regressions are estimated for all calendar months (January-December), January only, and February-December only. The regression intercepts are plotted below.

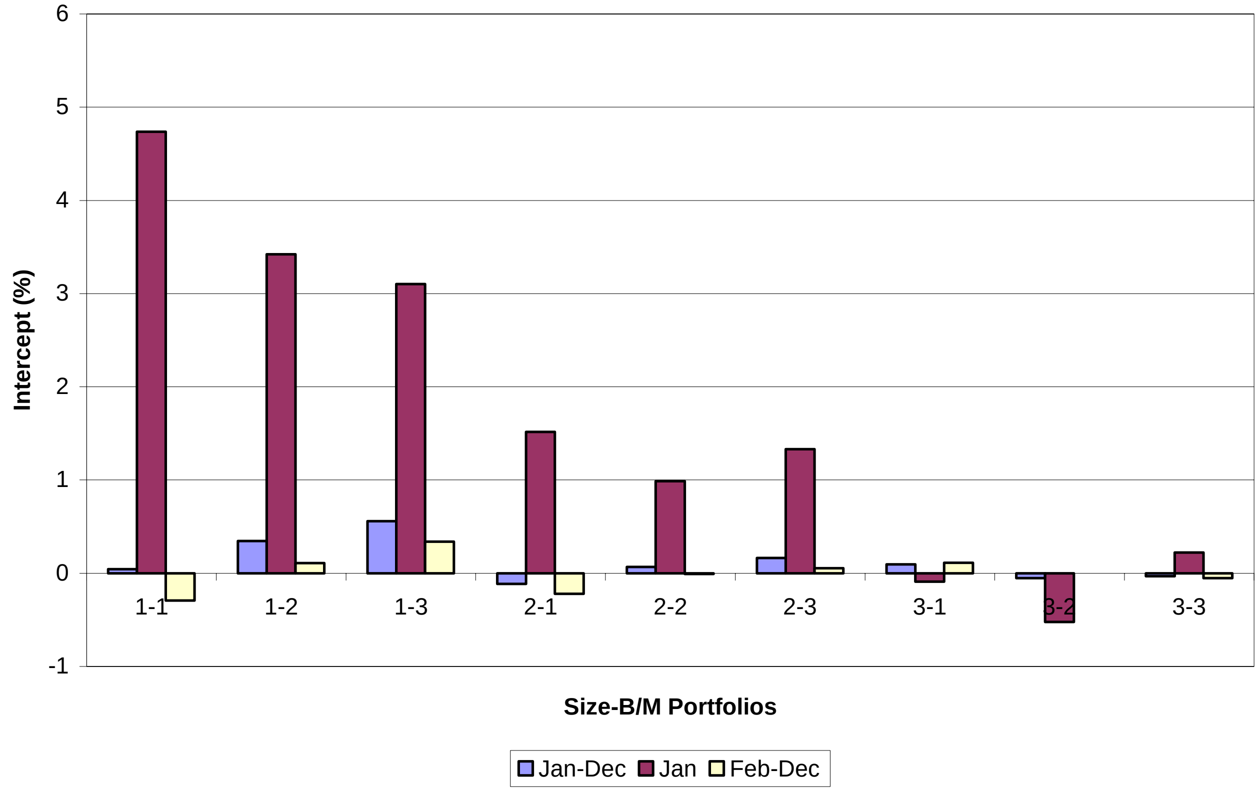
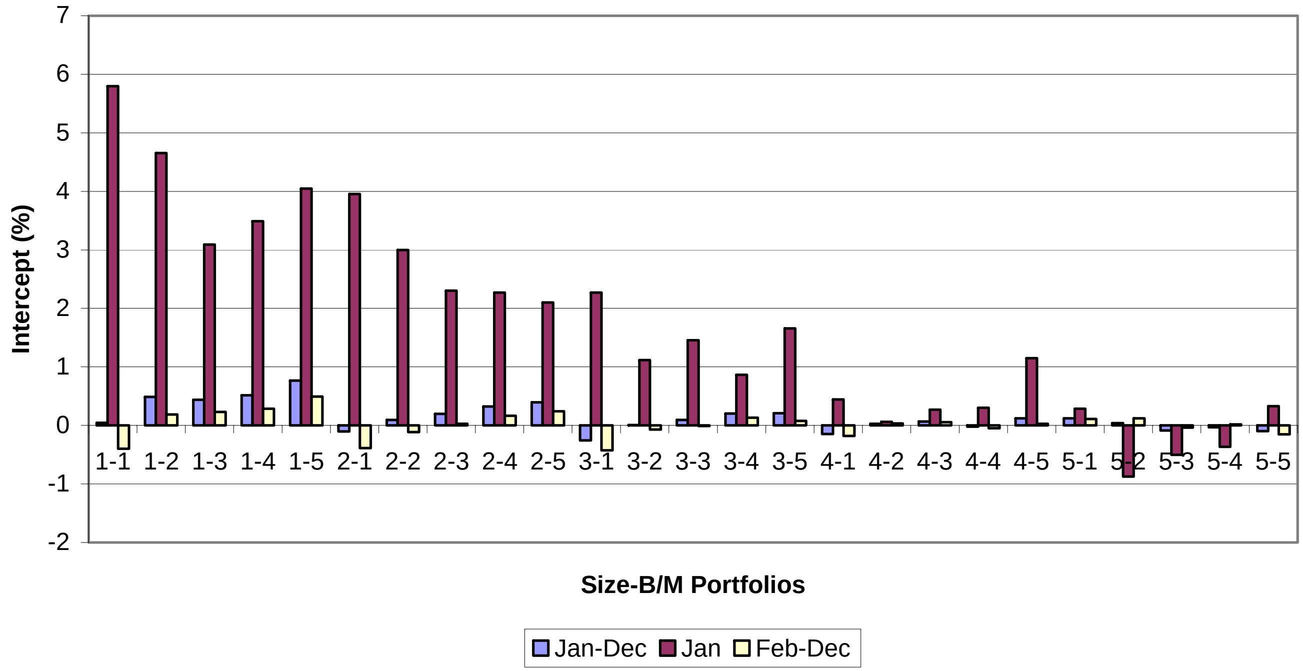


Figure 3: Three-Factor Regression Intercepts for Size-B/M (5 × 5) Portfolios: 8107-0312

$$R_i - R_f = a_i + b_i (R_M - R_f) + c_i\ F\_Sret + d_i\ F\_C/P + \varepsilon_i$$

Value-weighted returns on 5 × 5 double-sorted size-B/M portfolios in excess of the one-month US Tbill rate ($R_i - R_f$) are regressed on the excess return of the global value-weighted market portfolio ($R_M - R_f$), the returns on the global momentum factor mimicking portfolios (F_Sret), and the global C/P factor mimicking portfolio (F_C/P). The regressions are estimated for all calendar months (January-December), January only, and February-December only. The regression intercepts are plotted below.



Appendix A
Datastream (DS) and Worldscope (WC) Variables

Variable	Definition	Datatype
Price/Book Value Ratio	This is the market price-year end divided by the book value per share. We take an inverse of this ratio to get the B/M ratio used in the analysis. The market price-year end (WC05001) represents the closing price of the company's stocks at December 31 for U.S. corporations and fiscal year end for non-U.S. corporations. The book value per share (WC05476) represents the book value (proportioned common equity divided by outstanding shares) at December 31 for U.S. corporations and fiscal year end for non-U.S. corporations.	WC09304
Price/Cash Flow Ratio	This is the market price-year end divided by the cash flow per share. We take an inverse of this ratio to get the C/P ratio used in the analysis. The cash flow per share (WC05501) represents the cash earnings per share of the company, where the cash earnings represent Funds from Operations (WC04201). This is the earnings per share before depreciation, amortization and provisions. For emerging markets sourced in Worldscope, the cash earnings per share are based on cash flow generated from operations.	WC09604
Dividend Yield	This is the dividends per share divided by the market price-year end. The dividends per share (WC05101) represents the total dividends (including extra dividends) per share declared during the calendar year for U.S. corporations and fiscal year for non-U.S. corporations. The dividends per share is based on the gross dividend, before normal withholding tax is deducted at a country's basic rate, but excluding the special tax credit available in some countries.	WC09404
Earnings Yield	This is the earnings per share divided by the market price-year end. The earnings per share (WC05201) represent the earnings for the 12 months ended the last calendar quarter for U.S. corporations and the fiscal year for non-U.S. corporations. Preferred stocks have been included in the share base if it participates with the common shares in the profits of the company.	WC09204
Long Term Debt/ Common Equity	This is the long term debt divided by the common equity. The long term debt (WC03251) represents all interest bearing financial obligations, excluding amounts due within one year, and is shown net of premium or discount. The common equity (WC03501) represents common shareholders' investment in a company.	WC08226
Market Value of Equity (Size)	This is the month-end common shares outstanding times month-end market price of the stock.	MV