Multifactor Asset Pricing Analysis of International Value Investment Strategies

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ABSTRACT

Using a large international equity market database that has not been previously used for such a purpose, this paper documents that value (i.e., high book-to-market) stocks outperform growth (i.e., low book-to-market) stocks, on average, in most countries during the January 1975 - December 1995 period, both absolutely and after adjusting for risk. The international evidence confirms the findings of previous work reported for the U.S.. For 1975-1995, the annual difference between the average returns on portfolios of high and low book-to-market stocks is 12.94% in North America, 10.42% in Europe, 17.26% in Pacific-Rim per year, and value stocks outperform growth stocks in 17 out of 18 national capital markets. Our analysis also shows that a three-factor model explains most of the cross-sectional variation in average returns on industry portfolios across countries and that the superior performance of the value investing strategy, documented in this study, is a manifestation of size and book-to-market effects. These results are consistent with those reported by Fama and French (1994, 1996) that show that the value-growth pattern in stock returns is largely explained by a three-factor asset pricing model. Our results suggest that the Fama and French (1996) three-factor asset pricing model is not limited to the U.S. stock market.

Several recent studies have documented that value strategies (i.e., investing in stocks that have low prices relative to earnings, dividends, historical prices, book assets, or other measures of value) produce higher returns. Among these studies are Basu (1977), Rosenberg, Reid, and Lanstein (1985), De Bondt and Thaler (1985, 1987), Jaffe, Keim, and Westerfield (1989), Chan, Hamao, and Lakonishok (1991), Fama and French (1992), and Lakonishok, Shleifer, and Vishny (1994), all of which show that stocks with high earnings/price ratios or high book-to-market values of equity earn higher returns.

A number of alternative explanations for the observed superior returns of value strategies exist. Fama and French (1992, 1993) argue that value strategies are fundamentally riskier and therefore the higher average returns associated with high book-to-market stocks reflect compensation for bearing this risk. A similar argument has been made by Chan (1988) and Ball and Kothari (1989). They suggest that the market overreaction (i.e., winner-loser effect) result of De Bondt and Thaler (1985) is due almost entirely to intertemporal changes in risks and expected returns. Lakonishok, Shleifer, and Vishny (1994), however, argue that value strategies yield higher returns because investors are able to identify mispriced stocks and not because they are fundamentally riskier. Ball, Kothari and Shanken (1995) report that the profitability of the value investing strategy is driven by performance measurement problems and microstructure effects. Kothari, Shanken and Sloan (1995) attribute the superior performance of value strategies to the research design and database used to conduct these studies [i.e., survivorship bias (see Davis (1994)], look-ahead bias [see Banz and Breen (1986)] and data snooping [see Lo and MacKinlay (1990)] in the selection of firms that are included in the CRSP and Compustat databases. Chan, Jagadeesh and Lakonishok (1995) show that this is not the case. Davis (1994) reports a value premium in U.S.stock returns prior to 1963 as well.

In a recent study, Fama and French (1996) document that the superior performance of the value investing strategy is a manifestation of size and book-to-market effects. Empirical work has discovered some stylized facts on the behavior of stock prices that cannot be explained by the capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965). However, this evidence is largely based on firms in the U.S., and it is not at all clear how these facts relate to different countries. Without testing the robustness of these findings outside the environment in which they were found, it is hard to determine whether these empirical regularities are merely spurious correlations that may not be confirmed across capital markets. This study fills this gap in the literature. In addition, we document for the first time the cross-sectional relationship between beta, size (SMB), book-to-market (HML) and average industry portfolio returns in a sample of 2,629 stocks in 18 equity markets (including the U.S.) over the 1975-1995 period.

The first objective of this article is to examine the robustness of the value-investing strategy using monthly data for 18 equity markets and four regions of the world economy (i.e., North America, Europe, Pacific Basin and International) obtained from the Independence International Associates, Inc.(IIA) database for the 1975-1995 period. We note that in this study the term "international" refers to both the U.S. and non-U.S. stock markets. There are 1,554-2,629 stocks in this database that are tracked by Morgan Stanley Capital International (MSCI) throughout this period. For each country there is a set of five portfolio returns: market, value, growth, small and large. The sample covers more than 75 percent of each country's market capitalization. There is no survivorship bias in the data set (as defined by the MSCI database) since each portfolio is calculated based on the companies that were actually in the MSCI database as of the January- rebalance date of each year. The use of such a broad international data set provides a unique opportunity for this analysis. By focusing on the 1975 to 1995 period, this paper studies the behavior of stock returns across countries using a large and updated database that has not been previously used for such a purpose. To the extent that other countries are similar to the U.S., they provide an independent sample to reproduce the regularities found in the U.S. and compare the results to those reported in earlier studies [1]. To the extent that our sample contains countries that are not similar to the U.S., it will increase our ability to shed additional light and help us understand the forces behind the superiority of value strategies.

The second objective of the article is to investigate whether value stocks are riskier than growth stocks, since this issue remains controversial among researchers. We focus on betas, coefficients of variation and Sharpe ratios for value and growth strategies. Consistent with the empirical findings of Lakonishok, Shleifer, and Vishny (1994), our analysis provides evidence in support of (i) the superior performance of the value-investing strategy and (ii) the view that such strategies are not fundamentally riskier in 18 equity markets. However, this pattern in international stock returns cannot rule out the possibility that the superior performance of the value-investing strategy is a manifestation of size and book-to-market effects, as reported for the U.S. by Fama and French (1996).

The third objective of this study is to examine whether the superior performance of value-investing in 18 capital markes is a CAPM related anomaly as argued by Fama and French (1996). This issue is addressed by implementing the Fama and French (1996) three-factor model internationally. However, our empirical investigation is based on portfolios that allow the slopes of the factors to vary over time as opposed to forming portfolios on size, book-to-market and other measures of value that result in factor loadings that are essentially non-time varying [see Fama and French (1996)]. Our evidence shows that the three-factor model explains most of the cross-sectional variation in average returns on industry portfolios across countries, and that the superior performance of value investing documented in eighteen stock markets (including the U.S.) is driven by relative size (SMB) and distress (HML) effects. Our results are consistent with those found for the U.S. by Fama (1994) and Fama and French (1996). Furthermore, the stock market evidence from around the world suggests that the Fama and French (1996) multi factor asset pricing model is not limited to the U.S. capital market. It holds across capital markets and regions of the world, although it does not uniformly explain portfolio returns in all markets.

The rest of the paper is organized as follows. Section I describes the data used in this study. Section II presents annualized return spreads for value and growth strategies based on value and growth portfolios formed on an annual basis for three different investment horizons. Section III examines whether the superior performance of value stocks is related to the upward movements in stock markets. Section IV investigates whether the arbitrage portfolio formed by buying value stocks and selling growth stocks is associated with the effects of firm size. Section V analyzes the robustness of value investing strategies using the Fama and French (1996) three-factor asset pricing framework, and Section VI concludes the paper.

I. Data Description

The data for this study are taken from the IIA database, which contains a set of monthly international portfolio returns covering 1,554 stocks in 1975 to 2,629 stocks in 1995 in 18 equity markets. The sample covers more than 75 percent of the capitalization of each individual capital market throughout the sample period. The sample period covered in this study is from January 1975 to the end of December 1995. IIA then creates value and growth portfolios market-by-market and ranks stocks by their book-to-market ratio. The book-to-market ratio has been shown to be as good as other measures of identifying growth and value stocks (see, for example, Lakonishok, Shleifer and Vishny (1994).[2] IIA selects the highest book-to-price stocks one-by-one from the top of the list of stocks tracked in each country until half of the capitalization of each market has been accumulated. These stocks then become the constituents of the value portfolio, and the remaining stocks are assigned to the growth portfolio. Hence, each portfolio contains half of each market's capitalization. The division is performed once a year, in January, based on the most recent data available to the investor at that time. The available data in January are usually second or third quarter results from the prior year, with some exceptions. The information may lag by up to 12 months because in some countries (e.g., Japan) companies are required to report only once a year. Thus, there is no "look-ahead bias" in the rebalancing procedure of the portfolios. As stated earlier, each portfolio for each country is formed based on the companies that were actually in the MSCI database as of each rebalance date.[3,4] The MSCI database includes historical data for firms that disappear without adding historical data for firms added to its database. This implies that there is no "survivor bias" in the data used in this study. The monthly return for each portfolio is computed by taking a weighted average of the total returns (price change plus dividends) on the underlying stocks, using outstanding total market capitalization (price per share times number of shares) as weights. Returns are monthly total returns in U.S. dollars, based on month-end prices and exchange rate. For each portfolio, we compute annualized returns for three different holding periods by rebalancing the value and growth portfolios on annual basis. IIA computes large-capitalization and small-capitalization portfolios in a similar fashion. However, in this case, stocks are ranked by their capitalization and each market is split 70/30. The large-capitalization portfolio encompasses 70% of the total market capitalization; the small-capitalization portfolio covers the bottom 30%. These portfolios are market-capitalization weighted based on 1,554 to 2,629 stocks tracked for the entire sample period.[5] Finally, it should be noted that the arbitrage portfolio which is formed by buying value (high book-to-market) stocks and selling growth (low book-to-market) stocks is a currency-neutral portfolio. The industry portfolios are formed by classifying the stocks into industry subgroups based on the MSCI market sector classification (Energy, Materials, Equipment, Consumer, Services, and Financial sectors) The stocks in each subgroup are then weighted relative to their market value at the beginning of the month. The total return at the end of the month for each stock is multiplied by its determined weight and the sum of the weighted returns represent the return for each industry portfolio for that month. For a more detailed description of the IIA database, see Arshanapalli, Coggin, Doukas, and Shea (1998).

II. Value and Growth Investment Strategies

Table I, shows the annualized return spreads for eighteen countries and four regions resulting from holding the arbitrage portfolio formed by buying value stocks (high B/M) and selling growth stocks (low B/M) over three different investment horizons (years 5, 20 and 21), assuming annual rebalancing based on the book-to-market measure of value. The performance difference between value and growth stocks is substantial. For instance, the annualized 5-year return spread (e.g., over the 1975-1977 period) between value and growth stocks for U.S. is 12.32 percent. This spread difference appears to be broadly consistent with the evidence documented in earlier studies. Fama and French (1992), however, report only a 5.67 percent annualized U.S.value-growth return spread for the 1973-1980 period, while Lakonishok, Shleifer, and Vishny (1994) document a 10.5 percent average annual value-growth spread based on 5-year holding periods over the 1968-1989 period.

Our results suggest that the U.S. spread between value and growth stocks has increased over the more recent years. The smaller spreads recorded in previous studies may be attributed to the use of equally-weighting computed portfolio returns, different sample periods and different universe of stocks used in the analysis. Our approach relies on value-weighting portfolio returns, a relatively long period and annual portfolio rebalancing. Furthermore, the value and growth strategies considered in this study represent the bottom half and top half of the market capitalization, respectively. Other studies, however, have considered more extreme value-growth investment strategies (i.e., invest in extremely low-priced stocks) that are likely to suffer from acute microstructure effects [see Ball, Kothari and Shanken (1995)] that may explain the 5.67 to 10.5 percent profitability range of value-investing strategies documented in these studies. Value-investing strategies loaded with very low-priced stocks may also be viewed as unhedged portfolio positions in microstructure-related biases that would probably be less attractive to investors.

The performance difference between U.S. value and growth stocks has remained essentially the same even for longer investment horizons. Over the 20-year period, the U.S. equity value-growth return spread is 12.05 percent while the 21-year spread that spans our entire sample period increases to 13.07 percent. The 5-year and 20-year Canadian value-growth return spreads are 4.54 percent and 10.27 percent, respectively. The Canadian spreads appear to be less pronounced compared to the U.S., and especially over the short horizon. These results confirm and extend the empirical evidence of others.[6] Our results also suggest that the outperformance of value stocks over growth stocks remains even with annual portfolio rebalancing and across different investment horizons over the

1975-1995 period. For the entire 21-year sample period, the annualized return spreads for U.S. and Canada are 13.07 percent and 10.72 percent, respectively.

European equity spreads between value and growth stocks appear to be consistent with the North American spreads. However, the 5-year equity spreads favor the value-investing strategy in only seven out of the 11 markets. Norway shows an astonishing 184.72 percent advantage switching from value to growth, while for Switzerland, Sweden and Netherlands there is a pickup return in favor of growth stocks of 18.37 percent, 2.07 percent and 1.84 percent, respectively. The 5-year value-growth spread for Norway is not meaningful because Norse Hydro, a chemical company that represented more than 60 percent of the Norwegian capital market in the late 1970s and early 1980s, is mainly responsible for the superior performance of growth stocks [see, Umstead, McElroy, Shea, and Fogarty (1997)]. When the impact of Norse Hydro is neutralized, the value-growth spread in Norway becomes similar to most European countries. For the 5-year period the Belgian value-growth return spread is 11.58 percent and remains more pronounced for the 20-year (15.32 percent) and the 21-year (16.07 percent) holding periods. The 5-year period French value-growth spread is in favor of growth stocks with a 12.06 percent difference, while the pickup return in favor of value stocks is 14.32 percent and 13.18 percent over the 20-year and 21-year periods, respectively. Germany shows a spread advantage for value stocks for the 5-year (6.91 percent), 20-year (9.87 percent) and 21-year (9.73 percent) investment periods, respectively. The value-growth spreads for Great Britain appear to be in the same direction as those of the U.S. but higher in magnitude by 261 to 344 basis points over the 21-year and 20-year investment horizons, respectively. Swiss, Swedish, Norwegian and Dutch spreads, however, seem to favor the buy and hold strategy of growth stocks for the 5-year horizons. Although the Swiss, Swedish and Dutch spreads turn positive over the long horizons, the Norwegian return spreads show a persistent advantage for growth stocks for the 20-year and 21-year investment horizons. While the 5-year return advantage for the Norwegian growth stocks is extremely high (184.72 percent), the 20-year (1.12 percent) and 21-year (4.01 percent) return spreads are less dramatic, but nevertheless sizable.

For seven out of 11 European equity markets the minimum annualized value investing advantage is 1.22 percent over the 5-year period. France (12.06 percent), Belgium (11.58 percent) and U.K. (11.68 percent) show the highest 5-year annualized value-growth return spreads in Europe. The annualized equity return advantage in favor of value stocks for these European capital markets appear to be similar to with the U.S. (12.32 percent) for the 1975-1995 period. It is interesting to note that the 20-year and 21-year annual European equity return spreads are all positive with Norway the only exception for the reason discussed earlier.

For the Pacific-Rim equity markets the evidence confirms the return advantage associated with value investing, especially over long horizons that are likely to be more suitable for long-term investors. The Malaysian 5-year return spread of value stocks over growth stocks (24.61 percent) appears to be the highest in this region. However, the spread is substantially lower over the longer investment horizon. The 20-year and 21-year annual return spreads are 12.87 percent and 12.07 percent, respectively. The 20-year period value-investing return advantage for all five Pacific-Rim equity markets ranges from 9.65 percent (Hong Kong) to 18.59 percent (Japan). On average, the Australian and Japanese equity markets seem to have the highest value-growth return advantage in favor of value stocks for the longer investment periods. Throughout the 1975-1995 period, the annualized return spreads for Australia and Japan are 14.69 percent and 17.69 percent, respectively.

[Insert Table I About Here]

The last four rows report regional and international value-growth return spreads. Value stocks have, indeed, outperformed growth stocks for every investment horizon, over the 1975-1995 period, and geographical region. The Pacific-Rim equity markets seem to have the highest (17.27 percent per year) value-growth return advantage, while Europe has the lowest (10.42 percent per year) among the three regions. Regardless of geographical regions, these results suggest that if investors switch from growth to value stocks they could attain superior returns. Ignoring transaction cost associated with the annual rebalancing of the value investing strategy and taxes, the performance difference between value and growth stocks across regions is substantial. The results also show that the international "value" strategy outperforms the "growth" strategy for short and long-term investment horizons. The international value-growth spread ranges between 9.22 percent and 14.23 percent over the 5-year and 20-year periods, respectively. These magnitudes are as dramatic as those of the North American and Pacific-Rim spreads. The annualized international return spread is 13.99 percent for the 1975-1995 period. The magnitudes of the international value-growth spread is sizable and this implies that there might be substantial diversification benefits to be captured by value investing internationally.

Table II reports the annual performance of value and growth investments for North American, European, Pacific-Rim and International stocks. For North America, the year-by-year performance of value-focused investment produces superior returns 13 years out of 21 years, while the risk per unit of return associated with value-investing is lower (0.80) than that of growth-investing (1.12). For Europe and the Pacific-Rim, value-investing outperforms growth-investing 15 and 16 years, respectively, out of 21 years with lower coefficients of variation (i.e., 1.25 and 1.15, respectively) compared to those associated with growth-investing (i.e., 1.43 and 1.74, respectively). Similar results are observed for the international stocks. The international value stocks outperform the growth stocks in 15 years out of 21 years. The risk per unit of return for value stocks is 1.10 and 1.44 for growth stocks. The largest negative value-growth spread is 4.3 percent in 1980, while the other five are 0.5 percent (1979), 1.3 percent (1984), 0.9 percent (1986), 0.6 percent (1991), and 0.3 percent (1995), respectively. Apparently, there is no obvious pattern to the negative-spread years and this is evident across all three regions. Furthermore, estimates of Sharpe ratios of value- investing strategies appear to exceed those of growth-investing strategies across all the four regions.

In summary, the evidence in Table II is not consistent with the view that value-investing strategies are associated with higher returns because investors are exposed to higher risk, when risk is measured by the coefficient of variation and the Sharpe ratio.

[Insert Table II About Here]

Table III indicates that the value-growth spreads across countries are positively correlated and that they are relatively low. Only seven correlation coefficients out of 153 are higher than 0.5. This suggests that there are diversification benefits associated with the international value-investing strategy, given the low correlations across country spreads. While the value-growth spread has been documented in most countries, the low correlations across the spreads in different countries also suggest that the value-growth spread represents a country-specific financial factor. It is also worth pointing out that the spread correlations for all European and Pacific-Rim capital markets are much lower compared to the North American capital market. These results seem to suggest that European and Pacific-Rim investors may benefit more than U.S. investors from value-investing internationally.

[Insert Table III About Here]

III. Value-Investing and Market Movements

So far we have shown that value stocks, on an annualized basis, outperformed growth stocks over the 1975-1995 period, and the difference in performance was significant on a national and international basis. We have also shown that value stocks are associated with lower risk per unit of return than growth stocks. However, it is quite possible that the superior performance of value stocks might have been driven by upward movements in stock markets. Even though the period covered in this study is considered fairly long, it may still be argued that the superior returns of value stocks were linked to the 1980-1992 up-market movements in stock markets worldwide. Alternatively, it can be argued that the profitability of the value-investing strategy is a mere reflection of the differences in the beta values (i.e., the underlying systematic risk) of value and growth stocks. DeBondt and Thaler (1987) and Chopra, Lakonishok and Ritter (1992) show that the value-investing portfolio has a considerably higher up-market than down-market beta. To address this issue we regress value-growth spreads on the excess return of the corresponding national stock market portfolio returns. The regression analysis provides an estimate of the value-growth spread sensitivity coefficient (beta) relative to the national capital market. If the superior performance of value stocks is driven by up-market movements, betas are expected to be positive. However, if the beta of the spread is negative it would imply that the performance of value stocks is less sensitive to market fluctuations than growth stocks.

Table IV presents the regression results using the value-growth spread as the dependent variable and the excess return of the corresponding market portfolio as the independent variable. The results reveal that value stocks are inversely related to market movements. The sign of the beta of the spread is mostly negative with the exception of Belgium (with a t-value of 1.34), Denmark (

with a t-value of 1.34), France (with a t-value of 1.86), Sweden (with a t-value of 4.35), Hong Kong (with a t-value of 4.44), Malaysia (with a t-value of 5.59) and Singapore (with a t-value of 4.61). However, beta coefficients are not significant in most capital markets. Both the U.S. and Canada have negative betas (i.e., -0.148 and -0.143, respectively) with t-values of -4.78 and -4.18, respectively. The relationship between European value-growth return spreads and the corresponding market performance is mostly negative but not statistically significant at conventional levels (5% level or better), with the exception of Norway (with a t-value of -6.18). At the regional level, the evidence appears to be consistent with the country-specific results. For all three regions, the beta values are negative but statistically significant only in North America and the Pacific-Rim. The relationship between value-growth return spreads and international (global) excess market rates of return is also negative and relatively weak (with a t-value of -1.73). These results imply that the superior performance of value stocks is not due to their greater sensitivity to market movements compared with growth stocks.

Furthermore, the evidence suggests that the superior performance of value stocks reported earlier cannot be attributed to differences in beta values between value and growth stocks. As shown in Table IV, value stocks have lower beta values than growth stocks in 10 out of 18 countries while in six countries where value stocks have lower beta values, such as Austria, Germany, Great Britain, Netherlands, Spain and Switzerland, they are not statistically significant. Consequently, the lower beta values of value stocks in these countries should have caused them to under perform rather than outperform growth stocks for this period of the analysis. Among European countries, only in France and Sweden the value-growth spread appears to be sensitive to market movements. A more pronounced positive relationship between value-growth spreads and market movements is found in the Pacific-Rim countries with the exception of Australia. In sum, these results seem to suggest that the superior performance of the value-investing strategy is only partially attributed to the differences in beta values between value and growth stocks.

While most regression intercepts in Table IV are not statistically significant at conventional levels, we also examine whether the performance of value-investing strategy is sensitive to stock market movements through a formal asset pricing test. Specifically, we test the hypothesis that the intercepts are jointly equal to zero for all 22 portfolios using seemingly unrelated regressions (SUR) estimation procedures. The chi-squared test, reported at the bottom of Table IV, shows that the value-growth spreads across markets and regions are not solely related to stock market movements. The hypothesis that the regression intercepts are jointly equal to zero is rejected at the 1% level. This weak link between the value-growth spread and the market rate of return implies that, if investors perceive the spread as an extra element of risk that captures the relative financial distress state of the economy as argued by Fama and French (1996), asset returns may have an exposure on the value-growth risk factor among other factors as well.

[Insert Table IV About Here]

IV. Value-Investing and Firm Size

Earlier studies [see, for example, Fama and French (1992, 1996), and Heston, Rouwenhorst and Wessels (1996) among others] raise the possibility that stock returns' performance may be confounded with the firm size effect. In this section we examine whether the superior performance of value stocks is related to the effect of firm size. To evaluate this possibility, we perform regression analysis using the value-growth spread as the dependent variable, and the excess market rate of return and the small minus large return spread of the corresponding country as the two independent variables. To the extent that the historical superiority of value stocks over growth stocks is attributed to the effects of firm size, the gamma coefficient from this regression should be positive and significantly different from zero.

As shown in Table V, the results continue to support the inverse relationship between the value-growth spread variable and excess market return variable. These results appear to be consistent with those reported in Table IV. The results also show that the superior performance of value stocks documented earlier is positively and significantly associated with the firm size variable in 10 out of 18 countries. For U.S. and Canada the evidence shows that value stocks are associated with higher and statistically significant gamma values. However, the regression intercepts for both markets are positive and significant (with t-values of 2.85 and 2.18, respectively). This implies that the mean return of the arbitrage portfolio is independent of variation in the market and size factor loadings. This result appears to be consistent with Daniel and Titman (1997) who show that expected returns are not related to the size factor once they control for firm characteristics. For the European countries where value stocks have lower gamma values, such as Austria, Belgium, and Germany, they are not statistically significant at the 5% level or better. With the exception of France, Spain and Switzerland the other five European countries have positive and statistically significant gamma values. The results also point out that the Pacific-Rim performance of the value-investing strategy is very sensitive to size effects with the exception of Malaysia. These results, for the arbitrage portfolio formed by buying value stocks and selling growth, coupled with the insignificant regression intercept in most countries (15 out of 18) seem to suggest that the arbitrage profit is driven by the firm size effect. However, we also conduct a joint hypothesis test of whether the regression intercepts are simultaneously equal to zero using a formal asset pricing test. As shown at the end of Table V, the chi-squared test rejects the hypothesis that the regression intercepts are jointly equal to zero at the 1% level. Thus, the superior performance of value stocks is not related to market movements and size effects.[7]

Even though the value-growth return spread was found to vary across markets, consistent with the findings of previous studies we are able to document a sizable arbitrage profit between value and growth stocks in most countries over a relatively long period of time. This lasting superior return performance of value stocks was also found to be unrelated to differences in the beta and gamma values of value and growth stocks. That is, the performance of value-investing strategy does not appear to be influenced by the upward movements in stock markets or the size effect. However, this pattern in international stock returns does not rule out the possibility that the value-growth (HML) and small-large (SMB) spreads capture elements of risk [see, Chan and Chen (1991), and Fama and French (1996), and Huberman and Kandel (1987)] that are not embedded in the risk measured by the covariance with the market return. Therefore, the HML and SMB may capture two underlying risk factors or state variables of special hedging concern to investors that are nor captured by the market return. This issue is examined in the next section.

[Insert Table V About Here]

V. Fama-French Three-Factor Model Analysis

Our international empirical results presented here and the evidence recorded in previous studies suggest that average returns on common stocks are related to firm characteristics such as size, book-to-market equity, earnings/price, cashflow/price and past sales growth [Banz (1981), Basu (1983), Rosenberg, Reid and Lanstein (1985), and Lakonishok, Shleifer and Vishny (1994)] that cannot be explained by the capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965).

Fama and French (1996), however, show that these are CAPM related anomalies that can be explained by a three-factor asset pricing model. The Fama-French model implies that the expected return on a portfolio in excess of the risk-free rate is explained by the sensitivity of its return to the (a) excess market rate of return, (b) the difference between the return on a portfolio of small stocks to the return on a portfolio of large stocks (SMB), and (c) the difference between the return on a portfolio of high-book-to-market stocks and the return on a portfolio of low-book-to-market stocks (HML).

In this section we examine whether the behavior of average international stock returns can be explained by factors related to size and book-to-market as suggested by Fama and French (1993, 1996) using industry portfolios.[8] The choice of industry portfolios is dictated by the need to overcome the limitations of previous empirical tests (i.e., unconditional asset pricing tests) which rely on the assumption of constant risk premia over time by using portfolios formed on size, book-to-market and other measures of value such as earnings/price, cash flow/price, sales growth, and past return results. As noted by Fama and French (1996), the formation of portfolios on size and different measures of value results in loadings on the three factors that are essentially time-invarient. The use of industry-based portfolios, however, allows the slopes of the factors to vary over time and therefore to reflect the time-varying performance of industries. That is, forming industry portfolios permits to conduct asset pricing tests that recognize the intertemporal variation in the slopes of the three factors. We consider six monthly value-weighted industry-portfolio returns for all 18 countries in our analysis. This is the first attempt to address the issue of whether the value-investing superior performance is a CAPM related anomaly as shown by Fama and French (1996) for the U.S. using a broad sample of international stocks from 18 countries over the 1975-1995 period including the U.S. If the Fama-

French multifactor explanation of the value-investing anomaly is absent in international capital markets, this would imply that the U.S. evidence may have been unusual. In addition, the nature of portfolio returns used in our analysis allows us to examine the robustness of the Fama and French (1996) results across industries, countries and different regions.[9] Our investigation is implemented following the Fama and French (1996) three-factor model, given by time series regressions of the

$$R_{it} - R_f = a_i + b_i (R_m - R_f) + s_i \, SMB_t + h_i \, HML_t + e_{it}$$

form:

where R_{it} is the return on a portfolio i in month t, R_f and R_m are the U.S. Treasury Bill rate (U.S. T-Bill equivalent rates for the other countries) and the return on the value-weighted market return, respectively, SMB is the return on a portfolio of small stocks minus the return on a portfolio of large stocks (small minus big), and HML is the return on a portfolio of high-book-to-market stocks minus the return on a portfolio of low-book-to-market stocks (high minus low). The factor sensitivities, b_i, s_i, and h_i define the slopes in the time-series regression. Fama and French (1996) argue that SMB and HML proxy for the relative size and distress risk factors that are not captured by the market return and are compensated in average returns because they are of special hedging concern to investors. The use of the SMB and HML to explain returns is also consistent with the findings of Huberman and Kandel (1987), and Chan and Chen (1991) who show that there is covariation in returns on small stocks and relative distress, respectively, not captured by the market return and that they are compensated in average returns because they are of special hedging concern to investors. If the superior performance of value-investing strategy is a manifestation of size and book-to-market effects, the intercept of the regression, a_i , should not be significantly different from zero. That is, if the superior performance of value investing is a CAPM related anomaly, in the sense that it cannot be explained by a single factor model, it should be captured by the Fama-French three-factor model. Therefore, it is expected that the three-factor model should be able to explain much of the cross-sectional variation in average industry stock returns across countries.

Table VI reports estimates of the three-factor time-series regression. The estimated intercepts across industries, countries (these results are not reported here due to space limitations, but are available upon request) and geographic regions imply, with very few exceptions, that the superior performance of value investing recorded earlier is a manifestation of size and book-to-market effects. A very interesting observation is that the coefficient of the market risk factor, b , when the SMB and the HML are included in the regression, is close to one for most industry portfolios. This implies that sensitivity to the market factor does not explain much of the variation in average portfolio returns across industries, countries and regions. That is, most of the variation in average industry returns is explained by the SMB and HML factors.The market factor, however, explains why average industry stock returns are above the risk-free rate. With slopes on the market factor close to one, the market risk premium affects the everage return on all industries by roughly the same amount.The results also show that the three-factor model does capture most of the variation in average returns on industry portfolios. The lowest R^2 is 0.66, while in most regressions it is greater than 0.71. Even though our portfolios are sorted by industry, our results are consistent with those reported by Fama and French (1996) for large capitalization stock portfolios. Our results show that all U.S. industry portfolios appear to load negatively and significantly on size. This result also suggests that the industry portfolios may be tilted toward large capitalization stocks. The negative exposure on size is also documented for most countries and regions in our analysis. With respect to the relative distress variable, HML, the results suggest that exposure on distress varies in terms of magnitude and statistical significance across industries, countries and regions of the world.

For the U.S., the coefficient of the mimicking portfolio for book-to-market loads significantly in four out of six industries (i.e., Materials, Consumer, Services, and Financial) and with a positive sign for the Materials and Financial industries. The variation through time in the loadings of industries on the relative distress variable reflects the range of industry performance from growth to distress. The significant positive HML loadings for the Materials and Financial industries imply that investors require a premium largely because they are perceived as distressed industries [i.e., the industry portfolio is tilted toward weak firms with persistently low earnings (high Book-to-Market firms) and a positive slope on HML] over the period of our analysis. The positive exposure on HML suggests a higher cost of equity capital for these two industries. The Energy and Equipment industries do not appear to have a significant relative distress exposure for the U.S. This result may also suggest that these two industry portfolios contain firms with offsetting earnings characteristics.

Four out of six Canadian industries appear to have a significant but mostly negative exposure on the relative distress variable (i.e., Energy, Equipment and Consumer industries). The Canadian Financial industry, however, has a significant, (at the 10% level) positive HML loading. Sixteen of the European industry portfolios have significant positive HML loadings, mostly in the Energy industry, while 13 industry portfolios have significant negative exposure on HML. Four out of the 13 significant negative HML loadings are associated with the Consumer industry portfolio. The Pacific-Rim industries, however, exhibit mostly negative exposure on HML. Twelve of the Pacific-

Rim industry portfolios have significant negative HML loadings, while only six have significant positive HML exposure coefficients. At the regional level, 21 out of 24 industry portfolios are associated with significant HML loadings. Eight out of these 24 industry portfolios have negative distress exposures. These results imply that distress industries experience higher costs of equity than strong industries worldwide, mainly because distressed industries have greater HML exposure that is of hedging concern to investors.

Furthermore, even though most regression intercepts in Table VI are not statistically significant at conventional levels, we conduct a formal test of whether the intercept of the regression equals zero as required by an asset pricing model of excess stock returns. To perform this test, observations for all countries and regions are stacked by industry portfolios to form a system of six equations. This system of equations is then simultaneously estimated using the seemingly unrelated regression (SUR) procedure to minimize generalized sum of squares. With normally distributed errors the seemingly unrelated regressions estimation method is equivalent to the full information maximum likelihood (FIML) estimates. Under a set of parametric restrictions, the change in the generalized sum of squares is an asymptotically chi-squared test with a number of degrees of freedom equal to the number of restrictions imposed. The estimate of a specification in which the intercept coefficients of the Fama-French equation are set to zero and, thus, asset returns are related solely to the three specified economic risks is presented at the bottom of Table VI. The chi-squared test indicates that only the exposures to the market, SMB and HML are significant. That is, the hypothesis that the regression intercepts are jointly equal to zero could not be rejected.

In sum, consistent with the Fama and French (1996) evidence for the U.S., our analysis shows that adjusting for size and relative distress does change the observed pattern in international returns as well. Hence, the international superior performance of value investing reported earlier in this study is a manifestation of both size (SMB) and relative distress (HML) effects. Our analysis also shows that the three portfolios ((R_m-R_f), SMB and HML) originally found by Fama and French (1996) to describe U.S. returns and average returns, provide a parsimonious description of international industry returns as well.

[Insert Table VI About Here]

VI. Conclusions

This paper documents the superior performance of investment strategies that involve buying value (i.e., high book-to-market) stocks and selling growth (i.e., low book-to-market) stocks from January 1975 to December 1995 in eighteen equity markets. The evidence also shows that portfolios of value stocks generally had a risk-adjusted performance superior to that of growth stocks. In view of these results, and similar findings reported mainly for the U.S. and a few other major foreign capital markets, we examined whether such a cross-sectional pattern in international returns is a manifestation of size and book-to-market effects. Following Fama and French (1996), we addressed this concern by using a three-factor asset pricing model. The international evidence is consistent with the U.S. findings reported by Fama and French (1996) and shows that the three-factor model explains (i) most of the cross-sectional variation in average returns on industry portfolios, and (ii) the superior performance of value investing. The international evidence that value investing strategies outperform growth strategies is shown to be related to size and book-to-market effects. Therefore, our findings suggest that the Fama and French (1994, 1996) multifactor asset pricing model and their results are not limited to the U.S. stock marke.

Table I

Annualized Return Spreads for Value and Growth Stock Portfolios Based on the Book-to Market Measure of Value: January 1975- December 1995

At the end of each January, based on data available at year end, value and growth portfolios are formed based on the ratio of book value of equity to market value of equity. The returns, R_t , presented in the Table are annualized t-holding period returns assuming annual rebalancing. Value (Growth) refers to the portfolio containing stocks that are ranked highest (lowest) based on the book-to-market measure of value.

Value-Growth Spreads

North America	**R5**	**R20**	**R21**
United States	0.12320	0.12054	0.13070
Canada	0.04547	0.10269	0.10726
Europe			
Austria	0.06034	0.08252	0.07045
Belgium	0.11584	0.15532	0.16074
Denmark	0.05376	0.03342	0.01939
France	0.12057	0.14319	0.13177
Germany	0.06912	0.09865	0.09730
Great Britain	0.11679	0.15496	0.15685
Netherlands	-0.01843	0.05081	0.09185
Norway	-1.84072	-0.01121	-0.04010
Spain	0.01222	0.04818	0.05173
Sweden	-0.02068	0.14885	0.14765
Switzerland	-0.18367	0.04662	0.02669
Pacific-Rim			
Australia	0.08722	0.14383	0.14690
Hong Kong	0.02147	0.09654	0.12269
Japan	0.17911	0.18594	0.17688
Malaysia	0.24613	0.12867	0.12078
Singapore	0.11631	0.13677	0.11927
Regional			
North America	0.11815	0.11953	0.12940
Europe	0.04250	0.10491	0.10422
Pacific-Rim	0.17059	0.18012	0.17267
International	0.09214	0.14238	0.13990

Table II

Annual Performance of Value and Growth Stock Portfolios Based on the Book-to-Market Measure of Value: January 1975 - December 1995

	North America				Europe				Pacific-Rim				International			
YEAR	**VALUE**	**GROWTH**	**V-G SPREAD**	**V/G RATIO**	**VALUE**	**GROWTH**	**V-G SPREAD**	**V/G RATIO**	**VALUE**	**GROWTH**	**V-G SPREAD**	**V/G RATIO**	**VALUE**	**GROWTH**	**V-G SPREAD**	**V/G RATIO**
1975	0.392	0.274	0.118	1.432	0.416	0.400	0.016	1.040	0.359	0.164	0.195	2.193	0.368	0.290	0.078	1.271
1976	0.339	0.110	0.229	3.088	-0.062	-0.092	0.029	0.676	0.271	0.172	0.098	1.571	0.067	0.006	0.061	10.293
1977	-0.036	-0.107	0.071	0.337	0.254	0.227	0.027	1.121	0.233	0.032	0.200	7.126	0.224	0.122	0.101	1.826
1978	0.074	0.080	-0.006	0.925	0.261	0.220	0.041	1.189	0.490	0.439	0.050	1.115	0.347	0.297	0.050	1.170
1979	0.230	0.195	0.035	1.179	0.132	0.129	0.002	1.020	-0.026	-0.065	0.039	0.399	0.083	0.089	-0.005	0.939
1980	0.257	0.354	-0.097	0.725	0.047	0.204	-0.157	0.231	0.374	0.337	0.036	1.108	0.200	0.243	-0.043	0.822
1981	0.005	-0.100	0.106	-0.052	-0.100	-0.145	0.045	0.687	0.154	0.004	0.149	33.381	0.019	-0.066	0.086	-0.297
1982	0.208	0.174	0.033	1.192	0.014	0.066	-0.051	0.223	-0.033	-0.087	0.053	0.385	-0.004	-0.018	0.014	0.243
1983	0.279	0.171	0.108	1.631	0.275	0.124	0.151	2.217	0.238	0.262	-0.024	0.907	0.268	0.205	0.062	1.306
1984	0.101	0.009	0.091	10.965	0.019	-0.031	0.050	-0.618	0.083	0.160	-0.077	0.519	0.043	0.056	-0.013	0.762
1985	0.283	0.329	-0.045	0.861	0.773	0.770	0.002	1.003	0.403	0.382	0.021	1.055	0.518	0.505	0.013	1.026
1986	0.188	0.156	0.032	1.205	0.444	0.422	0.022	1.053	0.865	0.909	-0.044	0.950	0.628	0.637	-0.009	0.984
1987	0.036	0.063	-0.027	0.565	0.092	0.011	0.081	7.932	0.407	0.352	0.054	1.153	0.274	0.208	0.066	1.317
1988	0.218	0.122	0.096	1.785	0.200	0.097	0.102	2.048	0.403	0.194	0.208	2.073	0.330	0.159	0.170	2.069
1989	0.265	0.339	-0.073	0.782	0.295	0.266	0.028	1.108	0.091	-0.035	0.126	-2.590	0.157	0.062	0.094	2.512
1990	-0.070	-0.007	-0.062	8.929	-0.055	-0.035	-0.019	1.562	-0.322	-0.360	0.037	0.895	-0.223	-0.239	0.015	0.933
1991	0.229	0.361	-0.131	0.635	0.097	0.157	-0.060	0.617	0.116	0.093	0.023	1.245	0.111	0.118	-0.006	0.943
1992	0.092	0.033	0.059	2.788	-0.060	-0.046	-0.013	1.286	-0.161	-0.213	0.051	0.756	-0.117	-0.135	0.018	0.863
1993	0.181	0.019	0.161	9.221	0.395	0.191	0.204	2.071	0.385	0.310	0.075	1.242	0.383	0.248	0.135	1.546

1994	-0.002	0.017	-0.019	-0.136	0.033	0.019	0.014	1.734	0.181	0.071	0.110	2.539	0.105	0.043	0.061	2.415
1995	0.373	0.360	0.013	1.035	0.198	0.249	0.050	0.798	0.028	0.010.	0.018	2.742	0.208	0.211	-0.003	0.787
Coefficient of Variation	0.80	1.12			1.25	1.43			1.15	1.74			1.10	1.44		
Sharpe Ratio	0.69	0.41			0.42	0.33			0.49	0.22			0.50	0.28		

Table III

Correlations of Value-Growth Spreads: January 1975 - December 1995

Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. United States	1.0000																	
2. Canada	0.3888	1.0000																
3. Austria	0.0172	-0.0219	1.0000															
4. Belgium	0.3223	0.2381	0.1037	1.0000														
5. Denmark	0.2028	0.0443	0.0493	0.0861	1.0000													
6. France	0.1833	0.1946	0.1633	0.3891	0.0468	1.0000												
7. Germany	0.2095	0.1420	0.3510	0.4560	0.1434	0.3250	1.0000											
8. Great Britain	0.3532	0.4189	0.0037	0.2283	0.0844	0.1546	1.1781	1.0000										
9. Netherlands	0.4593	0.4503	0.1263	0.3680	0.1464	0.2878	0.4195	0.3956	1.0000									
10. Norway	0.3101	0.3963	0.0029	0.2745	0.0244	0.2255	0.1804	0.1481	0.3369	1.0000								
11. Spain	0.2476	0.1175	0.1216	0.3256	0.1522	0.1588	0.2287	0.1522	0.1403	0.0454	1.0000							
12. Sweden	0.2206	0.275	0.2264	0.1650	0.1023	0.0844	0.2695	0.2226	0.1976	0.0766	0.2452	1.0000						
13. Switzerland	0.3442	0.2732	0.1737	0.4833	0.1763	0.2988	0.5814	0.3036	0.5367	0.2948	0.1999	0.3360	1.0000					
14. Australia	0.5220	0.4357	0.0485	0.3144	0.0693	0.2040	0.2756	0.3398	0.5009	0.3580	0.2073	0.1931	0.4177	1.0000				
15. Hong Kong	0.4355	0.4357	0.0472	0.2545	0.1148	0.1316	0.2675	0.2957	0.5008	0.2593	0.0981	0.1416	0.3702	0.5678	1.0000			
16. Japan	0.1214	0.0202	0.0757	0.0501	0.1973	0.1095	0.1144	0.1030	-0.1043	-0.0615	0.3161	0.2684	0.0776	-0.0270	-0.0493	1.0000		
17. Malaysia	0.4387	0.2459	0.0603	0.2158	0.0453	0.0921	0.2867	0.3636	0.2990	0.2742	0.1705	0.2352	0.3259	0.4088	0.4306	0.0791	1.0000	
18. Singapore	0.4589	0.3412	0.0398	0.2348	0.0905	0.1773	0.2653	0.3962	0.3946	0.3290	0.1793	0.1708	0.3347	0.5132	0.4822	0.0344	0.1615	1.0000

Table IV
Value-Growth Return Spreads and Market Returns
January 1975 - December 1995

Regressions: $R_V - R_G = a_i + \beta_i (R_M - R_f) + e_i$

$R_V - R_G$ is the monthly value-growth return spread. Value (R_V) and Growth (R_G) returns are in U.S. dollars, based on month-end prices (including dividends) and exchange rates. R_M is the corresponding market rate of return. The market return is the value- weight return on all stocks traded in the corresponding national stock exchange. R_f is the one-month U.S.Treasury Bill rate (or its equivalent for the other countries) observed each month. The regression R^2 are adjusted for degrees of freedom.

	Alpha Value	t(a)	Beta Value	$t(\beta)$	R^2
North America					
United States	0.004	3.00	-0.148	-4.777	0.08
Canada	0.005	2.44	-0.143	-4.177	0.07
Europe					
Austria	0.002	0.95	-0.067	-1.743	0.01
Belgium	0.003	1.53	0.043	1.342	0.01
Denmark	-0.000	-0.12	0.075	1.344	0.01
France	0.003	1.56	0.049	1.865	0.01
Germany	0.002	1.67	-0.042	-1.762	0.01
Great Britain	0.002	1.51	-0.006	-0.271	0.00
Netherlands	0.000	0.14	-0.022	-0.579	0.00
Norway	0.002	0.48	-0.306	-6.179	0.13
Spain	0.002	0.65	-0.068	-1.463	0.01
Sweden	0.001	0.33	0.164	4.348	0.07
Switzerland	0.000	0.18	-0.016	-0.510	0.00
Pacific-Rim					
Australia	0.006	2.81	-0.106	-3.778	0.05
Hong Kong	-0.001	-0.38	0.109	4.442	0.07
Japan	0.005	2.65	0.000	0.185	0.00
Malaysia	0.001	0.66	0.157	5.594	0.11
Singapore	0.000	0.18	0.114	4.611	0.08
Regional					
North America	0.004	3.14	-0.134	-4.627	0.08
Europe	0.002	1.79	-0.003	-0.150	0.00
Pacific-Rim	0.006	3.52	-0.081	-3.044	0.04
International	0.004	3.51	-0.036	-1.736	0.01

Asset Pricing	Test Statistic	p-value
Chi-squared Test* H_0 ($a_i = 0$, i= 1...22)	42.47	0.01

*This tests the joint hypothesis that the regression intercepts for a set of twenty two portfolios are all simultaneously equal to zero using seemingly unrelated regressions estimation procedures.In order to conduct this test, observations from all countries and regions are stacked to form a system of twenty two equations.With normally distributed errors, the seemingly unrelated regressions estimation method is equivalent to the full information maximum likelihood. Under a set of parametric restrictions, the change in generalized sum of squares objective function is an asymptotically chi-squared test with a number of degrees of freedom equal to the number of restrictions imposed.

Table V
Value-Growth Return Spreads and the Small-Large Return Factor
January 1975 - December 1995

Regressions: $R_V \; \& \; R_G \; ' \; a_i \; \% \; ß_i(R_M \; \& \; R_f) \; \% \; ?_i(R_S \; \& \; R_L) \; \% \; e_i$

Two-factor regressions for monthly value-growth returns on the excess market return on all stocks traded in the corresponding national stock exchange and the difference between the return on a portfolio of small stocks R_S and the return on a portfolio of large stocks (R_L). The R_S and R_L are computed by IIA in a similar fashion to value and growth returns. Stocks are ranked by their capitalization and each market is split into 70/30. The large capitalization portfolio encompasses 70% of the total market capitalization while the small capitalization portfolio covers the bottom 30%. These portfolios are market-capitalization weighted.

	Alpha Value	**t(a)**	**Beta Value**	**t(ß)**	**Gamma Value**	**t(?)**	**R^2**
North America							
United States	0.004	2.85	-0.191	-6.513	0.427	6.684	0.22
Canada	0.004	2.18	-0.331	-4.085	0.451	5.588	0.17
Europe							
Austria	0.002	0.99	-0.070	-1.832	-0.071	-1.400	0.02
Belgium	0.003	1.54	0.040	1.223	-0.022	-0.275	0.01
Denmark	0.000	0.06	0.046	1.077	0.812	13.507	0.43
France	0.003	1.45	0.055	2.047	0.100	1.297	0.02
Germany	0.002	1.71	-0.049	-1.842	-0.038	-0.595	0.01
Great Britain	0.002	1.59	-0.036	-1.726	0.354	5.611	0.11
Netherlands	0.000	0.21	0.027	0.691	0.094	1.921	0.02
Norway	-0.000	-0.14	-0.133	-2.840	0.526	9.094	0.35
Spain	0.002	0.61	-0.074	-1.602	0.123	1.474	0.02
Sweden	-0.001	-0.36	0.169	4.957	0.513	7.374	0.24
Switzerland	0.000	0.18	-0.016	-0.500	0.002	0.025	0.00
Pacific-Rim							
Australia	0.003	1.89	-0.023	-0.855	0.472	7.946	0.25
Hong Kong	-0.003	-1.39	0.092	4.238	0.497	8.424	0.28
Japan	0.004	2.62	0.000	0.012	0.439	7.631	0.19
Malaysia	0.002	0.68	0.158	5.632	0.071	1.510	0.12
Singapore	-0.001	-0.27	0.136	5.854	0.270	6.436	0.21
Regional							
North America	0.004	2.97	-0.175	-6.358	0.418	6.599	0.22
Europe	0.001	1.71	-0.007	-0.389	0.322	5.249	0.10
Pacific-Rim	0.004	3.00	-0.037	-1.534	0.461	8.214	0.24
International	0.003	3.17	-0.021	-1.216	0.496	9.648	0.28

Asset Pricing	Test Statistic	p-value
Chi-squared Test* H_0 ($a_i = 0$, i= 1...22)	40.25	0.01

*This tests the joint hypothesis that the regression intercepts for a set of twenty two portfolios are all simultaneously equal to zero using seemingly unrelated regressions estimation procedures.In order to conduct this test, observations from all countries and regions are stacked to form a system of twenty two equations.With normally distributed errors, the seemingly unrelated regressions estimation method is equivalent to the full information maximum likelihood. Under a set of parametric restrictions, the change in generalized sum of squares objective function is an asymptotically chi-squared test with a number of degrees of freedom equal to the number of restrictions imposed.

Table VI

Three-Factor Time Series Regressions for Monthly Percent Excess Returns on Six Portfolios Formed Based on Industry Classification: January 1975 - December 1995

Regressions: $R_{it} - R_{ft} = a_i + b_i (R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + e_{it}$

The regression is estimated over monthly observations from January 1975 to December 1995. R_{it} is the monthly industry portfolio return, R_{ft} is the one-month U.S. Treasury bill rate (or its equivalent for the other countries) observed at the beginning of the month, R_{mt} is the value-weight return on all stocks traded in the corresponding national stock exchange, SMB_t is the small minus big spread formed by ranking stocks based on their capitalization and splitting each market into 70/30; the large capitalization portfolio encompasses 70% of the total market capitalization while the small capitalization portfolio covers the bottom 30% and are market-capitalization weighted, HML is the high minus low return spread formed by selecting the highest book-to-price stocks one-by-one from the top of the list of stocks, IIA tracks, in each country until half of the capitalization of each market has been accumulated ; these stocks then become the constituents of the value portfolio and the remaining stocks form the growth portfolio once a year, in January, based on data available at year-end in the Morgan Stanley Capital International database. The monthly portfolio return series are computed by taking a weighted average of the total returns (price change plus dividends) on the underlying stocks, using outstanding total market capitalization (price per share times number of shares) as weights. Returns are monthly returns in U.S. dollars, based on month-end prices and exchange rates.

Panel A: Energy	a_i	$t(a_i)$	b_i	$t(b_i)$	s_i	$t(s_i)$	h_i	$t(h_i)$	R^2
Region									
North America	0.17	(1.34)	0.92	(35.12)	-0.34	(-8.52)	-0.12	(-3.70)	0.76
Europe	0.24	(1.47)	0.81	(49.79)	-0.19	(-9.18)	0.04	(2.07)	0.69
Pacific-Rim	0.36	(1.29)	0.88	(37.72)	-0.29	(-10.52)	0.04	(1.90)	0.74
International	0.25	(1.49)	0.85	(70.54)	0.24	(-16.21)	0.02	(1.92)	0.78

Panel B: Materials	a_i	$t(a_i)$	b_i	$t(b_i)$	s_i	$t(s_i)$	h_i	$t(h_i)$	R^2
Region									
North America	-0.20	(-1.43)	1.13	(40.42)	-0.27	(-6.19)	0.09	(2.46)	0.77
Europe	-0.23	(-1.60)	0.99	(80.45)	0.11	(-7.31)	0.07	(4.73)	0.77
Pacific-Rim	-0.05	(-0.42)	0.94	(54.26)	-0.16	(-7.59)	0.06	(2.95)	0.80
International	-0.17	(-2.76)	0.99	(105.60)	-0.13	(-11.49)	0.08	(5.55)	0.78

Panel C: Equipment	a_i	$t(a_i)$	b_i	$t(b_i)$	s_i	$t(s_i)$	h_i	$t(h_i)$	R^2
Region									
North America	-0.13	(-0.80)	1.10	(32.90)	-0.18	(-5.06)	-0.13	(-3.56)	0.70
Europe	-0.28	(-1.46)	1.02	(82.05)	-0.04	(-2.95)	-0.05	(-3.16)	0.80
Pacific-Rim	-0.63	(-0.15)	0.95	(33.05)	-0.22	(-7.39)	-0.11	(-9.04)	0.69
International	-0.16	(-2.26)	1.03	(88.77)	-0.15	(-1.89)	-0.05	(-4.05)	0.74

Panel D: Consumer	a_i	$t(a_i)$	b_i	$t(b_i)$	s_i	$t(s_i)$	h_i	$t(h_i)$	R^2
Region									
North America	0.26	(1.18)	0.87	(34.10)	-0.29	(-10.81)	(-0.10)	(-4.49)	0.75
Europe	0.23	(1.24)	0.98	(28.65)	-0.10	(-2.08)	-0.02	(-1.81)	0.78
Pacific-Rim	0.03	(0.20)	0.67	(26.83)	-0.12	(-3.87)	0.11	(1.79)	0.63
International	0.18	(1.23)	0.91	(30.68)	-0.31	(-2.01)	-0.01	(-0.31)	0.71

Panel E: Services	a_i	$t(a_i)$	b_i	$t(b_i)$	s_i	$t(s_i)$	h_i	$t(h_i)$	R^2
Region									
North America	0.26	(1.50)	0.78	(35.15)	-0.10	(- 3.03)	-0.06	(-2.12)	0.74
Europe	0.06	(0.63)	0.93	(69.56)	-0.20	(-12.95)	-0.03	(-2.50)	0.75
Pacific-Rim	0.16	(1.52)	0.87	(60.41)	-0.27	(- 1.98)	-0.13	(-7.86)	0.78
International	0 .10	(1.01)	0.90	(98.84)	-0.12	(-11.18)	-0.12	(-2.33)	0.75

Panel F: Financial	a_i	$t(a_i)$	b_i	$t(b_i)$	s_i	$t(s_i)$	h_i	$t(h_i)$	R^2
Region									
North America	0.06	(0.41)	0.98	(32.27)	-0.22	(-5.79)	-0.07	(1.99)	0.69
Europe	0.02	(0.24)	1.00	(83.39)	-0.07	(-4.46)	0.05	(1.29)	0.83
Pacific-Rim	0.05	(0.55)	1.09	(77.07)	-0.15	(-10.61)	-0.03	(-1.90)	0.90
International	0 .03	(0.56)	1.03	(46.66)	-0.13	(-12.94)	-0.01	(-1.56)	0.85

Asset Pricing Chi-squared Test*	**Test Statistic**	**p-value**
H_o (a_i =0, i=1...6)	11.29	0.08

*This tests the joint hypothesis that the regression intercepts for a set of six portfolios are all simultaneously equal to zero using seemingly unrelated regressions estimation procedures.In order to conduct this test,observations from all countries are stacked by industry portfolios that form a system of six equations.With normally distributed errors, the seemingly unrelared regressions estimation method is equivalent to the full information maximum likelihood. Under a set of parametric restrictions,the change in generalized sum of squares objective function is an asymptotically chi-squared test with a number of degrees of freedom equal to the number of restrictions imposed.

Footnotes

1. Capaul, Rowley and Sharpe (1993) using value and growth stock indexes, formed based on the book-to-market ratio , for France, Germany, Japan, Switzerland and U.K. report higher returns for value (high B/M) stocks in all five countries over the 1981-1992 period.

2. Lakonishok, Shleifer and Vishny (1994) have looked at a variety of contrarian strategies from 1968 to 1990 and found that the book-to-market measure of value is as good as other measures of fundamentals (i.e., price-to-cash flow ratio and price-to-earnings ratio among others) in identifying value and growth stocks.

3. IIA use similar methodology as in Lakonishok, Shleifer and Vishny (1994) for the construction of book-to-market based value and growth portfolios.

4. This measure has received increasing attention among researchers and found to be useful for U.S.equities [Fama and French (1992)] and foreign [Capaul, Rowley and Sharpe (1993)].

5. The total number of securities tracked for the formation of value and growth portfolios IIA as of 1995 are as follows: North America (687), Europe (1044), Pacific- Rim (910), and International (2641).

6. Fama and French (1992), over the January 1973 through December 1980 period, report a 5.67% annualized U.S. value-growth spread, Capaul, Rowley and Sharpe (1993), over the January 1981 through June 1992 period, find a value-growth spread of 1.36%, Lakonishok, Shleifer and Vishny (1994), over the 1968-1989 period, document a 10.5 percent average annual return based on 5-year holding periods.

7. Even when we replace the country market return with the world market return in the

regressions of Tables IV and V, the results remain essentially unchanged.

8. Industry portfolio returns were not available for Norway.

9. Our empirical reliance on industry-portfolios returns is also attributed to the unavailability of individual stock return data to form portfolio returns similar to those used by Fama and French (1996).

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