PETER OERTMANN*

Why do Value Stocks earn Higher Returns than Growth Stocks, and Vice Versa?

1. Introduction

1.1 Exploration of a Phenomenon

Many studies document that value stocks earn higher returns than growth stocks. Facing the universe of equity investments, value stocks can be identified by high earnings-to-price (EP) ratios, dividend yields, or book-to-market (BM) ratios. In other words, the expected growth rates of corporate revenues implied by the prices of value stocks are below the overall market level of expected growth opportunities. The opposite is true for growth stocks.

In the early 1980s, the observation that stocks with high EP or BM ratios outperform those with low EP or BM ratios after adjusting for market risk was considered a pricing anomaly. In the meantime several explanations were introduced for the exceptional returns of value investments, often labeled 'value premium'. Some authors invoke market inefficiency to justify the phenomenon. DE BONDT and THALER (1985), and LAKONISHOK, SHLEIFER and VISHNY (1994) argue that the value premium is due to market overreaction and mispricing of stocks, respectively. Others identify problems with research data bases and test design. BANZ and BREEN (1986) call up the look-ahead bias as an explanation for superior returns of value stocks, LO and MACKINLAY (1990) address the issue of data snooping, and DAVIS (1995) brings the survivorship bias into the discussion. Finally, the higher average returns of value stocks are attributed to the systematic risk of such investments as it is measured in a multibeta pricing world. CHAN (1988), BALL and KOTHARI (1989), and FAMA and FRENCH (1992, 1996, 1998) argue that the observed difference between the returns on value and growth portfolios mirrors a compensation for bearing systematic risk. FAMA and FRENCH (1996) suggest an ad-hoc modification of the Capital Asset Pricing Model including the value-growth spread (high-minus-low BM factor, HML) as well as the return differential between small and large capitalization stocks (small-minus-big factor, SMB) to promote their inspiration that the value premium reflects a compensation for financial distress. LIEW and VASSALOU (1999) show that the performance of such an HML or an SMB portfolio is a leading indicator of future economic growth.

Most of the empirical research on the value-growth phenomenon is based on stock market data from the United States. FAMA and FRENCH

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(1998), and ARSHANAPALLI, COGGIN, and DOUKAS (1998), however, document the existence of value premiums also on stock markets outside the United States. They run tests on broad cross-sections of international stock markets. In accordance with these studies investors around the world should be able to benefit from the superior rewards of value investment strategies.

1.2 Some Open Questions

The existence of value premiums on global equity markets is still a phenomenon. Although the notion that the return differential between value and growth stocks is related to differences in risk profiles gains acceptance, there is an obvious lack of plausible economic explanations. In a most recent review paper, COCHRANE (1999) casts doubt on the line of reasoning originated by FAMA and FRENCH (1996). He simply argues that financial distress as an idiosyncratic factor should be diversifiable in the portfolio context, however, supporting the view on principle that the HML factor in the FAMA-FRENCH model proxies for some nondiversifiable investment risk.

Despite the apparent deficiencies with respect to an understanding of the fundamentals of the value-growth spread there is broad recognition among investment professionals that value stocks reveal attractive performance characteristics. In accordance with extensive empirical work, value investing might – indeed – be favorable in the long run. But it is definitely not a secure strategy over short investment horizons. ARSHANAPALLI, COGGIN, and DOUKAS (1998) show that the value-growth spreads on international stock markets substantially vary from year to year with respect to both signs and magnitudes. Reasons for such a cyclical behavior of value premiums are still unexplored. In addition, less is known concerning the co-movement of international value premiums; correlation analyses of ARSHANAPALLI, COGGIN, and DOUKAS (1998) and FAMA and FRENCH (1998) indicate that value-growth spreads are not highly synchronized across countries. Finally, links between global economic conditions and the magnitudes of value premiums on international markets are largely unexplored. This study contributes to these open issues.

1.3 Our Contribution to the Open Questions

We investigate the dynamics of value premiums on 18 stock markets of three global regions over the period from January 1980 to June 1999. We explore global economic forces driving the performance of value stocks relative to growth stocks. We identify observable instrumental variables that can be used to predict the value-growth spreads on international markets. Finally, we examine the conditional co-variation between value premiums across international markets.

Our results indicate that value premiums reveal a time variation similar to the movements of global economic risk premiums. A portion of this time variation is related to the global business cycle and the market climate. Moreover, expected (predicted) value premiums are higher correlated than ex-post observed value premiums, supporting the notion of globally integrated pricing of the risk related to the value style. Our findings contribute to the understanding of the dynamics of value-related returns. We point out strategies how investors can exploit the value-growth cycles by model-based tactical asset allocation.

The remaining part of the paper is organized as follows. Section 2 gives a brief description of the data base. Section 3 documents statistics on international value-growth spreads and their dynamic behavior. Section 4 includes an empirical analysis of the fundamentals of value premiums, providing evidence and discussion on economic driving forces, risk stories, and global integration. Section 5 examines active style rotation strategies exploiting the time-varying behavior of value premiums. Section 6 summarizes the most important findings.

1.4 Data

Our sample covers 18 stock markets located in Europe, North America, and the Pacific Rim over the period from January 1980 to June 1999. Country-specific value-growth spreads are calculated on the basis of the style indices provided by Morgan Stanley Capital International (MSCI). These are total return sub-indices of the MSCI standard country indices denominated in local currencies. The segmentation into value stocks and growth stocks is based on a country-specific ranking of the companies with respect to their previous month-end price-to-book (PB) ratios, which are equal to the 1/BM ratios. The value index includes the companies with the lowest PB ratios, covering half of the market capitalization of the country. The remaining stocks make up the growth index, respectively. Rebalancing of the style indices is performed semi-annually, by the month-ends of January and July. Both style indices are market capitalization weighted on the basis of the stocks in the MSCI universe and, hence, represent investable strategies. By construction of the indices there is no look-ahead or survivorship bias in the data.

Table 1: Statistics on Value and Growth Stocks Returns (in %)
Period: 1980.01–1999.06

Countries	Growth stocks		Value stocks		Value-growth spread				
	Mean	SD	Mean	SD	Mean	SD	Min	Max	% V>G
Europe									
Austria	8.39	24.57	8.35	24.65%	–0.04	18.49	–30.68	20.59	51.28
Belgium	14.25	18.60	22.80	18.46%	7.48	10.38	–10.48	12.59	56.41
Denmark	17.84	21.53	14.59	19.49%	–2.76	17.77	–14.71	20.53	43.16
France	15.35	21.33	17.88	21.75%	2.20	12.19	–12.52	11.71	54.70
Germany	13.69	21.32	14.57	19.45%	0.77	10.09	–9.95	9.91	48.72
Italy	20.82	25.39	18.95	27.51%	–1.55	13.31	–14.04	15.06	50.00
Netherlands	17.29	18.98	23.49	19.31%	5.29	16.22	–15.72	19.89	54.27
Norway	5.01	28.15	18.49	26.94%	12.84	21.72	–14.44	24.77	57.69
Spain	21.61	24.86	24.15	23.30%	2.08	18.03	–20.89	16.57	50.00
Sweden	27.75	23.61	25.40	26.30%	–1.84	17.95	–15.86	16.44	50.43
Switzerland	12.89	17.02	16.17	19.86%	2.90	12.24	–21.06	11.12	55.13
U Kingdom	17.36	18.03	19.90	17.77%	2.17	9.28	–9.08	10.33	54.27
North America									
Canada	9.15	20.06	12.15	16.81%	2.75	12.74	–17.30	17.21	53.42
USA	18.38	16.49	17.60	14.37%	–0.66	7.98	–6.46	9.97	53.42
Pacific Rim									
Australia	11.44	25.09	16.62	20.08%	4.65	12.12	–10.10	15.91	55.13
Hong Kong	18.07	32.19	18.53	36.56%	0.39	14.60	–12.52	26.36	49.57
Japan	5.06	22.04	10.82	19.05%	5.48	11.74	–17.18	11.15	57.69
Singapore	8.01	26.64	10.44	29.50%	2.25	16.49	–21.91	27.63	48.72
Regions									
World	13.86	14.40	16.00	13.49%	1.88	5.82	–5.55	7.91	52.99
North America	17.78	16.28	17.27	14.31%	–0.43	7.57	–6.11	9.82	52.99
Europe	16.62	15.50	18.71	15.79%	1.79	5.98	–5.65	7.71	55.98
Pacific Rim	5.79	20.45	11.26	17.77%	5.17	10.55	–15.96	10.56	57.69

Value and growth stocks are represented by the style-specific total return indices provided by MSCI for countries and regions. Returns are denominated in local currencies. Means and standard deviations (SD) are reported on an annual basis. 'Min' denotes the smallest monthly value-growth spread, 'Max' the largest; '% V>G' gives the percentage of months in which the return of value stocks exceeds the return of growth stocks.

3. Statistics on International Value-Growth Spreads

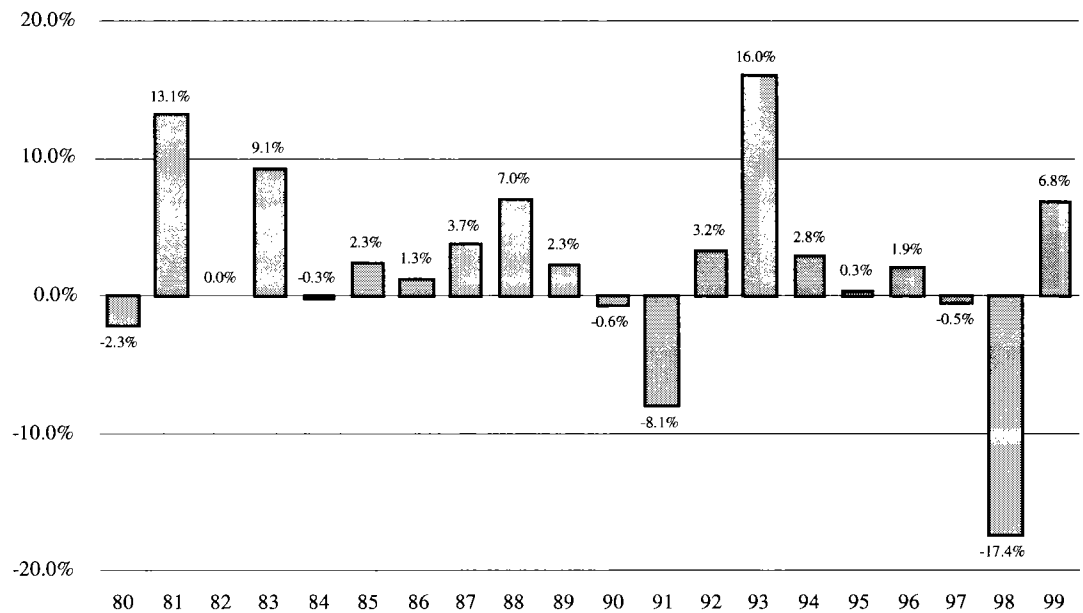
3.1 Long-Horizon Value Premiums

Over the period from January 1980 to June 1999 the average annual return spread between value and growth stocks in the MSCI global universe is 1.88%, denominated in local currencies. This value premium results from a rebalanced portfolio including long positions in the value stocks of each country and short positions in the growth stocks. The value-growth spread accounts for yearly 1.79% in Europe, 5.17% in the Pacific Rim, and minus 0.43% in North America. Evidently, there are substantial differences across global regions. Differences in value-growth spreads are even more pronounced on the individual country level. Long-horizon annual value premiums vary between minus 2.76% for Denmark and 12.84% for Norway, with an arithmetic mean of 2.47% across countries. However, in more than two thirds of the countries value stocks earn higher returns than growth stocks. In addition, the ratio of return and volatility is higher for value stocks in most of the countries. Table 1 documents statistics on style-related returns and premiums across the countries and regions in our sample. Our results somewhat deviate from findings reported in other studies. The international value-growth return spreads documented by ARSHANAPALLI, COGGIN, and DOUKAS (1998) for the period from 1975 to 1995 are larger on general. To give an example, in their study the long-horizon value premium in North America is 13.07% per year. This is because for that region their sample includes the 11.8% value premium of 1975 and the 22.9% value premium of 1976 and does not include the minus 31.1% value premium of 1998 which is in our data. Hence, figures on long-horizon return spreads between value and growth stocks seem to be extremely sensitive to the time window chosen for calculation.

3.2 Short-Horizon Value Premiums

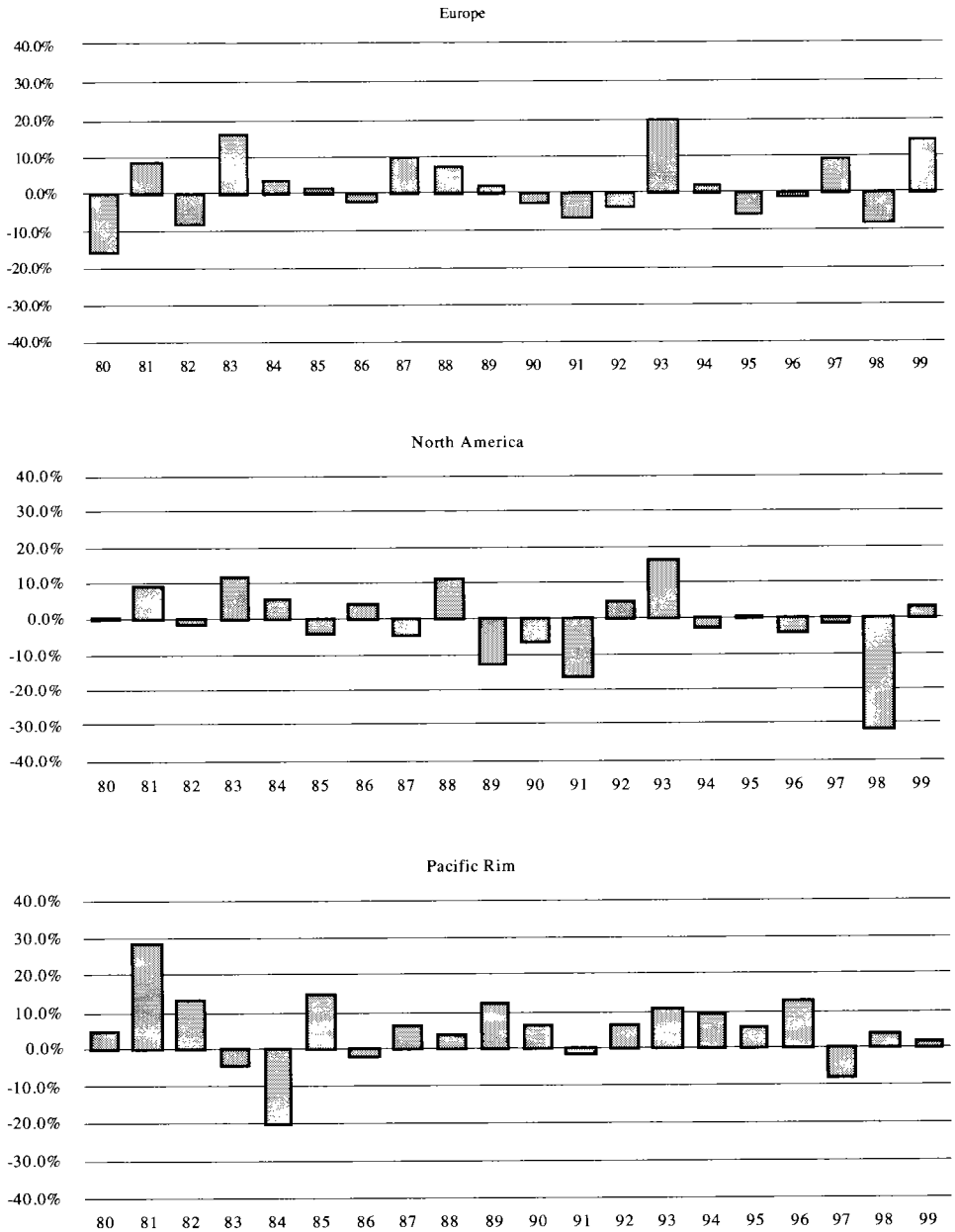
Year-to-year value-growth spreads considerably vary with respect to both signs and magnitudes.

Figure 1: Year-to-Year Value-Growth Spreads in the MSCI Global Stock Universe



Annual returns of value stocks relative to annual returns of growth stocks in the MSCI stock universe. Value-growth return differences are denominated in local currencies, respectively.

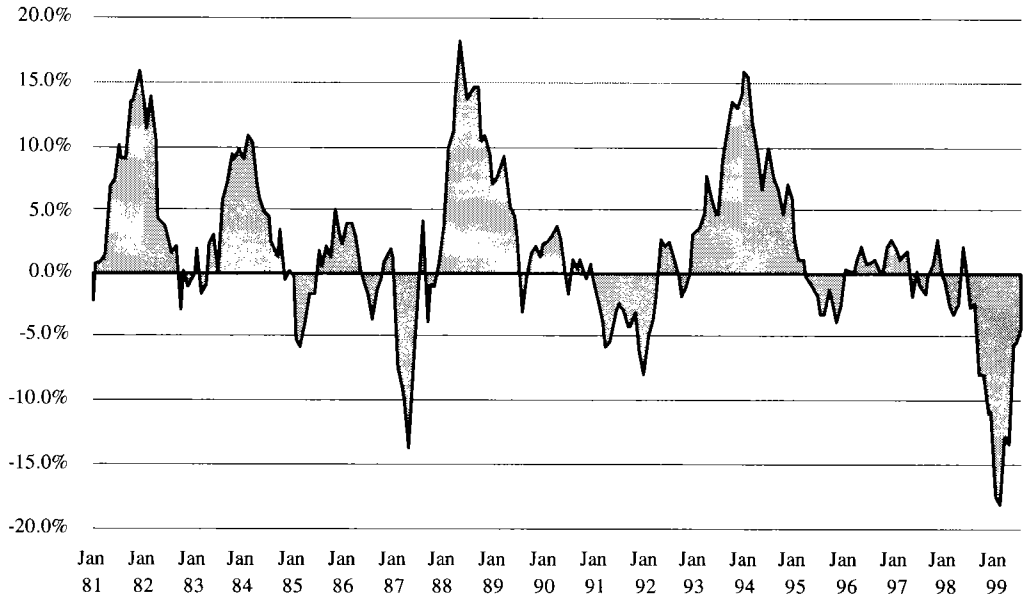
Figure 2: Year-to-Year Value-Growth Spreads in the 3 Global Regions



Annual returns of value stocks relative to annual returns of growth stocks in global regions. Value-growth return differences are denominated in local currencies, respectively.

Table A1 in the appendix documents the value premiums in the 18 countries and global regions on a yearly basis from 1980 to 1999, Table A2 in the appendix provides a statistical description of these premiums. The annual value-growth spread for the global MSCI aggregate of stocks varies between minus 17.4% and plus 16.0%, with a standard deviation of 7.04%. There are six years with negative and twelve years with positive value premiums. Figure 1 and Figure 2 display year-to-year value-growth spreads for the global and the regional aggregates.

Figure 3: Cumulated Return of Value Stocks Relative to Growth Stocks (MSCI Universe)
Sliding 12-months investment horizons



Return difference between value and growth stocks in the MSCI stock universe determined on the basis of a sliding 12-months data window. Example: The 'Jan 89' entry represents the time period from January 1, 1988, to January 1, 1989. Value-growth return differences are denominated in local currencies, respectively.

There is no country or region in which the yearly value premium is consistently positive or negative. Often the overall picture is influenced by some extremely positive or negative observations. Countries in which the year-to-year value-growth spread varies over a broad range of values include Austria, Denmark, Netherlands, Norway, Spain, Sweden, and Hong Kong; in these countries the standard deviation of the spread measured on the basis of calendar years is higher than 20%. Countries with relatively stable value premiums are Belgium, and Canada.

Figure 3 shows the return difference between value and growth stocks across the global MSCI universe for one-year investment horizons determined on the basis of a sliding 12-months data window. Apparently, the performance of value stocks relative to growth stocks reveals certain cycles. Such a pattern is fairly representative for all regions and countries. In others words, over short investment horizons value investing is not a reliable strategy to enhance the performance.

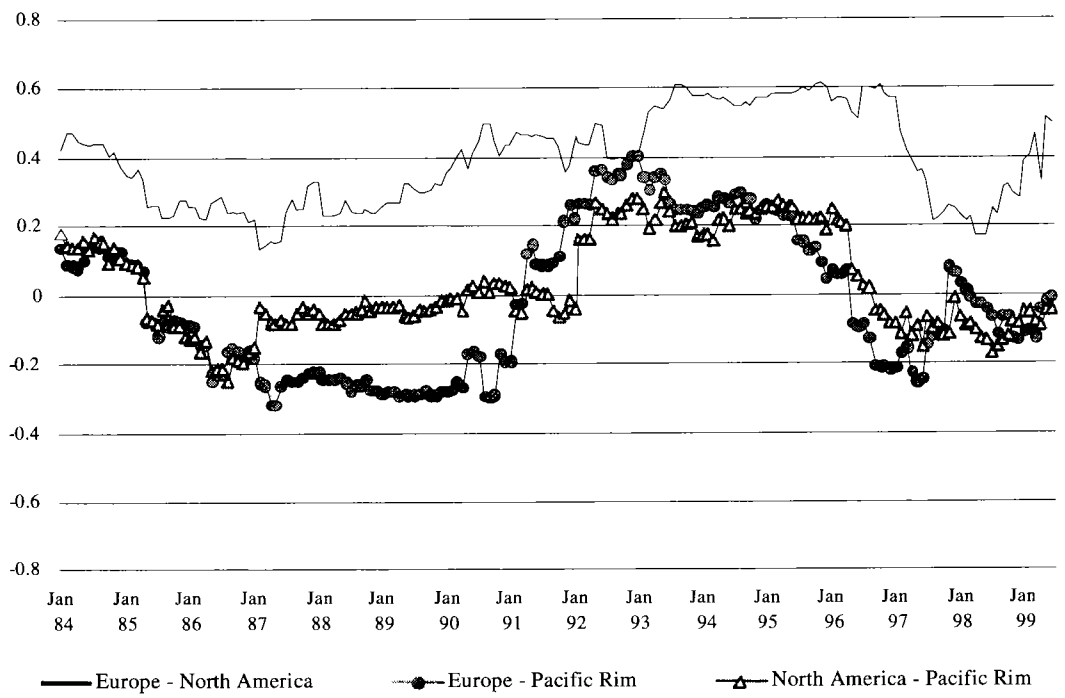
3.3 International Correlations of Value Premiums

The correlations of value premiums across global markets are typically low. Measured on a monthly basis the average correlation coefficient is 0.036 across the 18 countries in our sample. On a year-to-year basis cross-country correlations are larger with an average of 0.092. This is our first considerable result, because higher correlations of yearly value premiums imply that the common performance characteristics of value and growth stocks across international markets are reflected in medium-term cycles rather than short-term return differences.

Table A3 in the appendix documents the figures of the correlation analysis of yearly value premiums

across countries and regions. The co-movement of value premiums is notably more pronounced across countries which are economically linked.
Examples of such pairs of countries include France and United Kingdom (0.57), Switzerland and Germany (0.46), Switzerland and Italy (0.63), and United Kingdom and United States (0.63), among others. Value-growth spreads on European and Asian stock markets are often negatively correlated.
In general, the pattern of value premiums in the Pacific Rim characteristically deviates from the patterns in the other two regions; the correlation of Pacific Rim to Europe and North America is around zero, minus 0.04 and minus 0.01, respectively. This is in contrast with the remarkable correlation of 0.56 between the value premiums across Europe and North America. However, correlations are not stable over time. Figure 4 depicts the correlations across the regional value-growth spreads calculated on the basis of a sliding 48-months data window. There is a weak positive trend with respect to the patterns in Europe and North America; the R-Square of the trend regression is 0.152.
What do the findings of our examination imply for the investor? Simply, the low correlations of the value premiums across international stock markets call for country-specific style management. The lack of synchronicity across countries regarding the relative performance of value and growth stocks makes it ambitious to produce sufficient performance results by globally diversified portfolios with a clear tilt towards the value or growth style.

Figure 4: Correlation of Value-Growth Spreads in Europe, North America, and Pacific Rim
Estimation on the basis of a sliding 48-months data window



Correlations across the regional value-growth spreads determined on the basis of a sliding 48-months data window. Example: The 'Jan 89' entry represents the time period from January 1, 1985, to January 1, 1989. Value-growth return differences are denominated in local currencies, respectively.

4. Economics of International Value-Growth Spreads

4.1 Starting Point

We face two major characteristics with respect to the dynamics of value premiums: First, short-horizon value premiums – the year-to-year return differences between value and growth stocks – substantially vary over time. There exist characteristic value-growth patterns on each stock market. Second, the correlations of value premiums across countries and global regions seem to be affected by the degree of economic interaction between the countries and global regions, respectively.

The forces driving the magnitudes of value premiums on global equity markets and, hence, the cross-market correlations of value premiums are largely unexplored. It is, however, widely accepted that the spread between the returns on value and growth stocks measured over long horizons is a compensation for taking risk; FAMA and FRENCH (1998) name the risk 'financial distress'. We contribute to that line of reasoning by linking the variation of value premiums to instrumental variables that are commonly used to explain the variation of systematic risk premiums. Our argumentation is as follows: Value premiums are risk premiums. Risk premiums vary over time corresponding to changes in economic conditions and the market climate. Hence, value premiums should pick up the conditional time variation of risk premiums.

4.2 Instrument Regression Framework

We examine the variation of value premiums by global instrumental variables in the following regression framework:

$$R_{V,t} - R_{G,t} = C_0 + C_1 \cdot Z_{1,t-1} + C_2 \cdot Z_{2,t-1} + ... + C_k \cdot Z_{k,t-1} + \varepsilon_t \quad (1)$$

where $R_{V,t} - R_{G,t}$ denotes the difference between the returns of value and growth stocks in period t, and $Z_{j,t-1}, j = 1,...,k$, stands for the level of the jth instrumental variable at the beginning of the period, at time t – 1. C_0 is a constant, $C_j, j = 1,...,k$, captures the influence of the jth instrument, observed at time t – 1, on the value-growth spread in period t. Finally, ε_t is a mean-zero residual.

In sum, our approach is to regress the time series of ex-post measured value-growth spreads on time series of lagged instrumental variables. This allows to explore the predictable variation of value premiums on a country-by-country basis. The model decomposes value premiums into (1) a constant component, (2) a time-varying component related to the levels of the lagged instruments, and (3) an unsystematic component. This methodology is commonly put to use in research on predictable variation in stock returns and conditional asset pricing.

We implement our model on the basis of eight instrumental variables $Z_{j,t-1}$. In accordance with economic theory and former empirical work on the variation of risk premiums on capital markets the variables we employ are good proxies for global business conditions and market climate. The variables include:

- US purchasing manager index (BUSCLI): Index proxying for expected business conditions provided by the US National Association of Purchasing Management. Risk premiums on capital market should be negatively related to the level of such a leading business indicator.
- Global stock market volatility (GLVOLA): Standard deviation of the daily returns of the Datastream global stock market index calculated over the preceding month, respectively. Global volatility increases when the level of uncertainty on equity markets increases; hence, global risk premiums should be positively related to global volatility.

Table 2: Estimation Results of Instrument Regressions – Equation (1)
t-statistics of regression coefficients and R-squares
Period: 1986.01–1999.03

Countries	Instrumental variables								R-Square
	BUSCLI	GLVOLA	INVRELW	GLREAL	CREDSP	TEDSPR	TERMSP	GLDIVY	
Europe									
Austria	0.147	1.486	–0.988	–0.062	0.283	0.144	0.170	–0.280	0.029
Belgium	–0.036	1.737	2.511	–1.245	–0.857	1.464	1.221	0.472	0.162
Denmark	–0.490	–1.775	2.788	1.266	0.899	0.351	–0.395	–3.391	0.096
France	1.238	0.452	–1.265	0.139	–0.117	–0.833	–1.214	0.959	0.035
Germany	–0.902	0.871	–1.955	0.284	–0.132	1.796	1.362	–0.284	0.062
Italy	2.104	–0.005	–1.340	–3.072	–0.320	–0.617	0.641	2.017	0.106
Netherlands	–1.111	0.678	–2.085	0.280	–0.342	1.194	0.510	–0.467	0.054
Norway	0.252	–0.898	–0.343	0.650	1.322	–0.170	–0.369	–0.095	0.027
Spain	0.105	0.209	0.052	–2.164	–2.060	0.819	0.602	0.522	0.062
Sweden	–0.834	0.790	–2.468	–1.342	–0.380	0.819	1.126	1.799	0.060
Switzerland	0.646	0.016	–0.893	–0.123	–0.681	0.654	0.340	0.166	0.026
U Kingdom	1.429	0.131	–0.850	0.285	1.697	–0.505	0.053	1.010	0.051
North America									
Canada	–0.494	–1.546	1.066	–0.417	–1.733	1.187	1.055	1.164	0.082
USA	1.538	0.752	–1.289	–0.768	1.531	–0.847	1.541	2.590	0.095
Pacific Rim									
Australia	1.784	–1.158	–0.077	–2.035	0.223	0.490	1.322	0.982	0.072
Hong Kong	0.493	1.140	–0.941	–0.755	1.004	–1.754	–0.344	1.939	0.051
Japan	0.637	0.474	–0.692	–1.684	–0.981	0.788	0.615	1.230	0.033
Singapore	–0.074	1.441	–1.330	0.862	0.967	–0.572	–0.728	0.474	0.036
Regions									
World	1.799	0.911	–2.054	–2.068	–0.208	0.442	1.476	3.021	0.103
North Amer.	1.457	0.598	–1.190	–0.821	1.344	–0.683	1.628	2.676	0.093
Europe	1.255	0.581	–2.087	–0.513	0.444	0.518	0.596	1.112	0.063
Pacific Rim	0.799	0.686	–0.859	–1.876	–0.931	0.752	0.620	1.466	0.040

t-statistics testing for significance of the coefficients in regressions of country-specific value-growth return spreads on global instrumental variables. BUSCLI stands for the US purchasing manager index, GLVOLA for the global stock market volatility, INRELW for inverse relative wealth, GLREAL for the global real interest rate, CREDSP for the US credit spread (Moody's), TEDSPR for the Treasury-Eurodollar spread, TERMSP for the global term spread, and GLDIVY for the global dividend yield. Value and growth stocks are represented by the style-specific total return indices provided by MSCI for countries and regions. Returns are denominated in local currencies.

- Inverse relative global wealth (INRELW): Weighted sum of the MSCI global stock market index levels measured at the beginning of each of the preceding 12 months relative to the current index level, respectively. Increasing relative wealth – mirrored by a decreasing inverse ratio – implies a decreasing risk aversion of the market participants and, hence, should imply decreasing risk premiums.

- Global real interest rate (GLREAL): GDP-weighted aggregate of long-term interest rates in the G7 countries minus the countries' inflation rates for the previous month, respectively. Increasing global real interest rates reflect increasing premiums for taking risks by bond investing. Under the assumption of integrated financial markets, bond market risk premiums should be positively correlated to stock market risk premiums.
- Moody's US credit spread (CREDSP): Spread between interest rates for BAA corporate bonds and AAA corporate bonds in the US, calculated by Moody's. The spread decreases when the economic situation improves and increases when conditions worsen and should, therefore, be positively related to risk premiums on capital markets.
- Treasury-Eurodollar spread (TEDSPR): Spread between the interest rate for 90 day US Treasury bills and the 3-months Eurodollar interest rate. The spread is a proxy for the current and expected health of the global financial system and should be negatively related to global risk premiums.
- Global term spread (TERMSP): GDP-weighted aggregate of the spreads between the yields of long-term government bonds and 3-months interest rates in the G7 countries. The term spread is positively to expected economic conditions and should, therefore, be negatively related to global risk premiums.
- Global dividend yield (GLDIVY): GDP-weighted aggregate of the dividend yields on the stock markets in the G7 countries. On the basis of the simple dividend discount model the level of the dividend yield corresponds to risk-adjusted expected returns and should, hence, be positively related to risk premiums.

Table A4 in the appendix documents the correlations between the eight instruments, and Table 2 shows the results of our instrumental regressions.

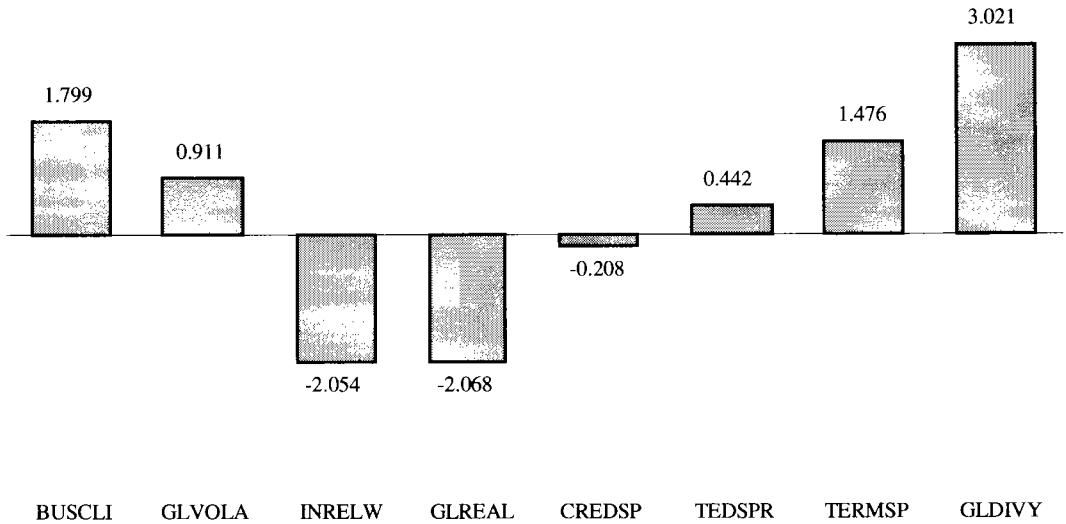
4.3 Global Forces Driving Value Premiums

The estimation period starts in January 1986 and ends in March 1999 due to data restrictions for the instrumental variables. The model explains between 2.94% (Austria) and 10.59% (Italy) of the monthly variation of the value-growth spreads across countries, with a mean R-square of 6.34%. Our instruments account for 6.33% of the variance of the value premium in Europe, 9.34% in North America, 4.05% in the Pacific Rim, and 10.32% of the value-growth spread changes across the global MSCI aggregate. The R-square values are low but they are in a range which is rather typical for such instrumental regressions. Nevertheless, the regressions testify that there is predictable variation in the value premiums on international equity markets.

Signs and significance levels of the regression coefficients vary considerably across the countries. Results are more stable across the global regions; the regional value-growth spreads are uniformly driven by 6 instruments: BUSCLI (pos), GLVOLA (pos), INRELW (neg), GLREAL (neg), TERMSP (pos), and GLDIVY (pos). The t-statistics of the instrument coefficients describing the value-growth spread in the global MSCI aggregate are shown in Figure 5. BUSCLI, TERMSP, GLDIVY, INRELW, and GLREAL show up with a reliable influence. The global value premium expands when the purchasing manager index (BUSCLI) increases, global term spreads (TERMSP) widen, aggregate risk aversion declines due to high relative wealth (INRELW), global real interest rates (GLREAL) decrease, and the global dividend yield (GLDIVY) goes up. All the signs of the regression coefficients, except the sign for the dividend yield, indicate that value stocks are likely to outperform growth stocks when business conditions are expected to improve.

We document that the value premiums on international stock markets are driven by changes in the global economic outlook. This is consistent with the recent findings of LIEW and VASSALOU (1999).

Figure 5: Forces Driving Value Premiums
MSCI global stock universe: t-statistics of instrument regression coefficients
Period: 1986.01–1999.03



t-statistics testing for significance of the coefficients in the regression of the value-growth return spread in the MSCI stock universe on global instrumental variables. BUSCLI stands for the US pur-chasing manager index, GLVOLA for the global stock market volatility, INRELW for inverse relative wealth, GLREAL for the global real interest rate, CREDSP for the US credit spread (Moody's), TEDSPR for the Treasury-Eurodollar spread, TERMSP for the global term spread, and GLDIVY for the global dividend yield.

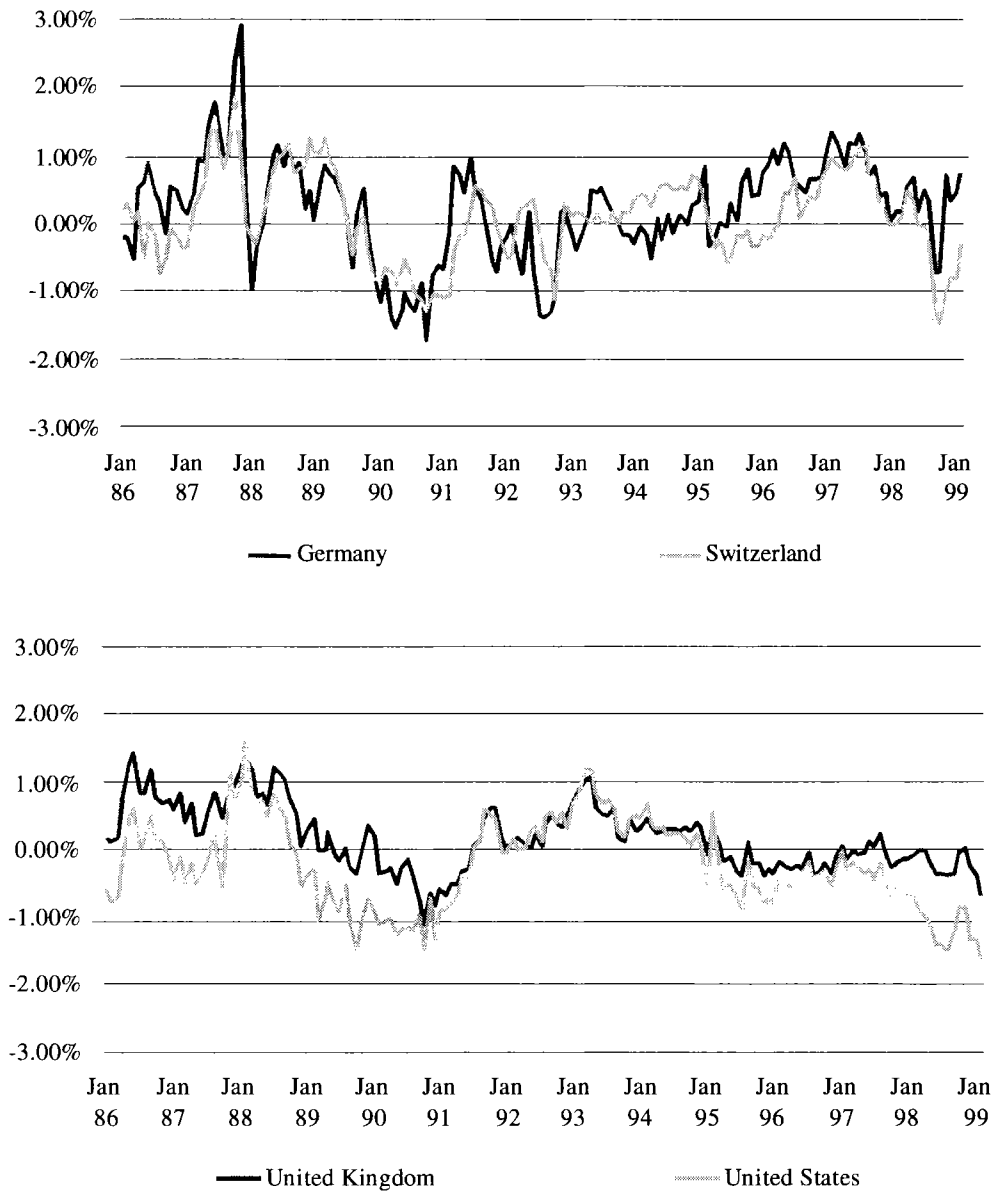
They study the 'economics' of value premiums from the opposite direction, showing that value premiums include information with respect to future economic growth. We contribute to that issue documenting that the variation of value-growth spreads is to some extent predictable by lagged indicators of expected business conditions and market climate. There is no strict consistency across individual countries with respect to the interaction between instruments and the magnitudes of the value premiums. Nevertheless, the regression results for global regions show that value stocks tend to outperform growth stocks when the outlook is good and the risk premiums on capital markets are low.

Our findings are also consistent with the risk story of FAMA and FRENCH (1998) on the value-growth performance differential. They argue that the long-horizon value premium is a compensation for taking higher risk of financial distress. When the business climate improves it is likely that the premium for financial distress declines – if any such premium exists. Consequently, the prices of stocks with a high exposure to that source of risk, relative to the market, should rise. This is because in such a scenario the shareholders discount expected cash flows on the basis of lower distress premiums. Our empirical results support that story: Value stocks tend to yield higher returns than growth stocks when our instrumental variables indicate improving economic conditions. In scenarios of indicated economic deterioration growth stocks outperform value stocks, which might be a result of higher distress premiums applied to discount the cash flows of value stocks.

4.4 Global Integration of Value Premiums

Our analyses provide the notion that the value premiums on international equity markets mirror a compensation for risk, presumably a premium for the peril of financial distress. Furthermore, the magnitudes of value premiums seem to correspond to the business cycle, suggesting that the reward for the underlying risk is not stable over time. In accordance with our contemporary understanding of asset pricing this is a characteristic feature of risk premiums on capital markets. We

Figure 6: Co-movement of Expected Value-Growth Return Spreads in Different Countries
Basis: fitted values from instrument regressions



Co-movement of predicted (conditional) value premiums across countries. Predicted value premiums are generated on a month-to-month basis using the time series of fitted values from the instrument regression model.

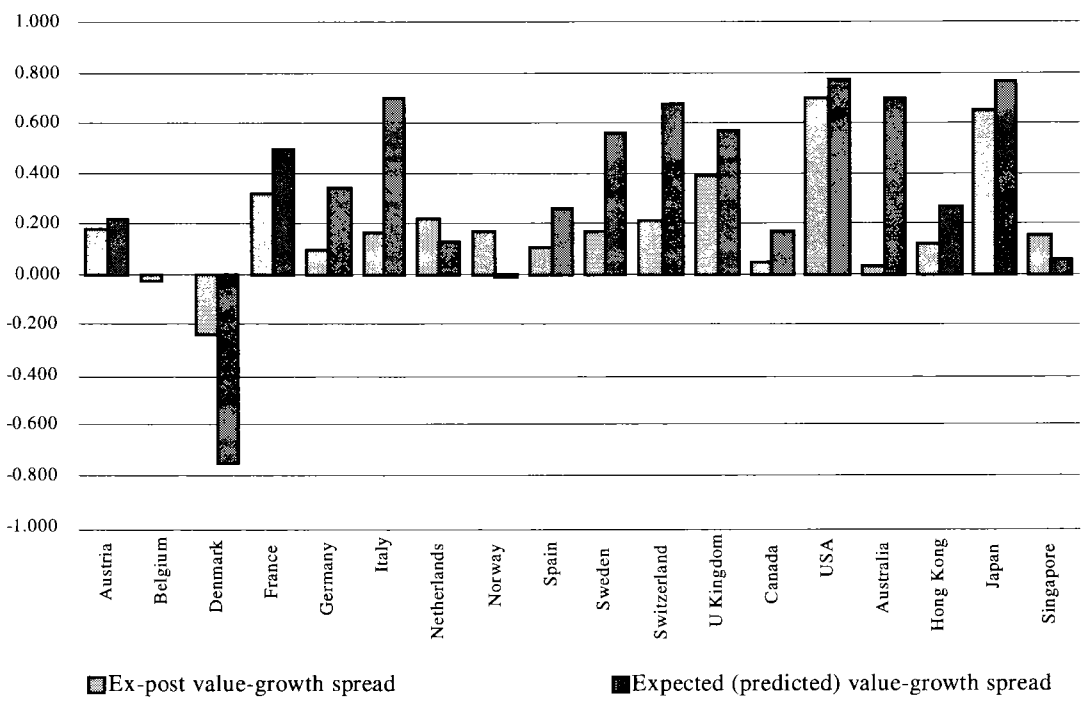
are able to explain a reasonable portion of the variation of value-growth spreads on the basis of instrumental variables representing global or US information on the economic climate. It is a natural extension of our approach to examine whether there exists co-movement of expected value premiums across international equity markets. If any such covariation can be observed, this would be an indication of a globally integrated pricing of the underlying risk.

We model month-to-month expected value premiums using the time series of fitted values from our instrumental regression model. In other words, we employ the regression coefficients estimated for an individual stock market or a region, and the time series of global instruments, to calculate expected value premiums for the stock market or the region over the sample period. The focus of our examination is the co-movement between these time series of predicted value-growth spreads.

The average correlation of predicted value premiums across the 18 countries is 0.078, which is twice as large as the average correlation measured for ex-post value premiums (0.036). Some examples: The correlation between conditional value premiums in Switzerland and Germany is 0.68 relative to 0.46 in the cas of ex-post measurement, and for United Kingdom and United States it is 0.82 (conditional) relative to 0.63 (ex-post Figure 6 shows the co-movement of predicted value premiums in these countries.

Figure 7 compares the correlations between the value-growth spreads on individual stock markets and the MSCI world aggregate for ex-post measurement and regression-based prediction. It shows

Figure 7: Global Integration of Value Premiums
Correlations between value-growth spreads in countries and in the MSCI universe
Period: 1986.01–1999.03



Correlations between value-growth return spreads on individual stock markets and in the MSCI global stock universe. Value premiums measured ex-post are compared to predicted value premiums. Value-growth return spreads are denominated in local currencies, respectively.

Table 3: Risk and Return of Tactical Style Rotation versus Passive Style Investment
Period: 1986.01–1999.03

Countries	Tactical style rotation				Growth investing			Value investing		
	Mean	Volatility	RR ratio	# TA	Mean	Volatility	RR ratio	Mean	Volatility	RR ratio
Europe										
Austria	6.78%	26.71%	0.254	36	3.18%	25.00%	0.127	9.00%	28.02%	0.321
Belgium	23.06%	18.46%	1.249	42	14.20%	18.76%	0.757	22.54%	18.29%	1.232
Denmark	19.23%	19.90%	0.967	28	13.61%	20.57%	0.662	10.13%	19.42%	0.521
France	16.48%	22.54%	0.731	25	14.66%	21.82%	0.672	14.74%	22.33%	0.660
Germany	13.04%	21.70%	0.601	30	8.42%	23.59%	0.357	11.39%	20.61%	0.553
Italy	19.99%	26.55%	0.753	26	13.85%	24.97%	0.555	11.76%	27.46%	0.428
Netherlands	22.82%	19.37%	1.178	21	14.42%	18.44%	0.782	19.55%	19.07%	1.025
Norway	16.28%	28.61%	0.569	25	3.88%	26.42%	0.147	13.39%	28.98%	0.462
Spain	27.02%	25.95%	1.041	22	22.93%	27.87%	0.823	20.80%	24.25%	0.858
Sweden	28.34%	25.33%	1.119	32	24.79%	24.52%	1.011	16.20%	27.03%	0.599
Switzerland	18.91%	18.77%	1.007	25	13.60%	19.03%	0.715	15.10%	22.28%	0.678
U Kingdom	17.78%	18.02%	0.987	21	14.26%	17.90%	0.797	16.78%	18.04%	0.930
North America										
Canada	12.80%	16.34%	0.783	31	9.65%	17.01%	0.567	9.83%	15.93%	0.617
USA	21.98%	16.40%	1.340	14	19.42%	16.80%	1.156	16.36%	14.91%	1.098
Pacific Rim										
Australia	19.16%	20.69%	0.926	20	12.65%	24.74%	0.511	14.24%	19.93%	0.715
Hong Kong	22.47%	34.10%	0.659	34	15.54%	30.56%	0.509	17.09%	35.61%	0.480
Japan	5.34%	23.06%	0.231	17	–0.36%	24.58%	–0.015	4.87%	20.81%	0.234
Singapore	17.55%	29.06%	0.604	35	7.25%	26.97%	0.269	10.34%	31.19%	0.331
Regions										
World	15.88%	14.73%	1.078	16	12.47%	15.19%	0.821	13.40%	14.35%	0.934
North Amer.	20.68%	15.86%	1.304	14	18.81%	16.48%	1.141	16.01%	14.76%	1.084
Europe	16.69%	16.64%	1.003	19	13.88%	16.71%	0.830	15.44%	16.99%	0.909
Pacific Rim	6.11%	20.93%	0.292	17	1.10%	22.60%	0.049	5.98%	19.30%	0.310

Tactical style rotation is based on a monthly switching between value stocks and growth stocks using the signals from country-specific instrument regressions. Mean and volatility are given as annualized values, denominated in local currencies. 'RR ratio' denotes the ratio of mean return to volatility; '# TA' stands for the number of transactions to implement the active strategy. Value and growth stocks are represented by the style-specific total return indices provided by MSCI for countries and regions. Returns are denominated in local currencies.

that the correlations of predicted value premiums are substantially larger. The mean correlation between countries and the world aggregate is 0.33 for the predicted spreads and 0.19 for the ex-post measured spreads. For some countries including Germany, Italy, Sweden, Switzerland, and Australia, that difference is remarkable.

Over the global regions the correlations of expected value premiums are like-wise notably larger than the correlations of ex-post value premiums. The correlation between expected value premiums in Europe and North America is 0.62, compared to 0.48 for ex-post premiums. The corresponding figures are 0.54 and minus 0.06 for Europe and Pacific Rim, and 0.31 and 0.03 for North America and the Pacific Rim. These are, again, tremendous differences. Our correlation results overall indicate that there is notable common variation of expected value-growth spreads. This implies that international value growth-spreads are related to a global risk factor that seems to be priced consistently across major stock markets.

5. Tactical Style Rotation Strategies

5.1 Starting Point

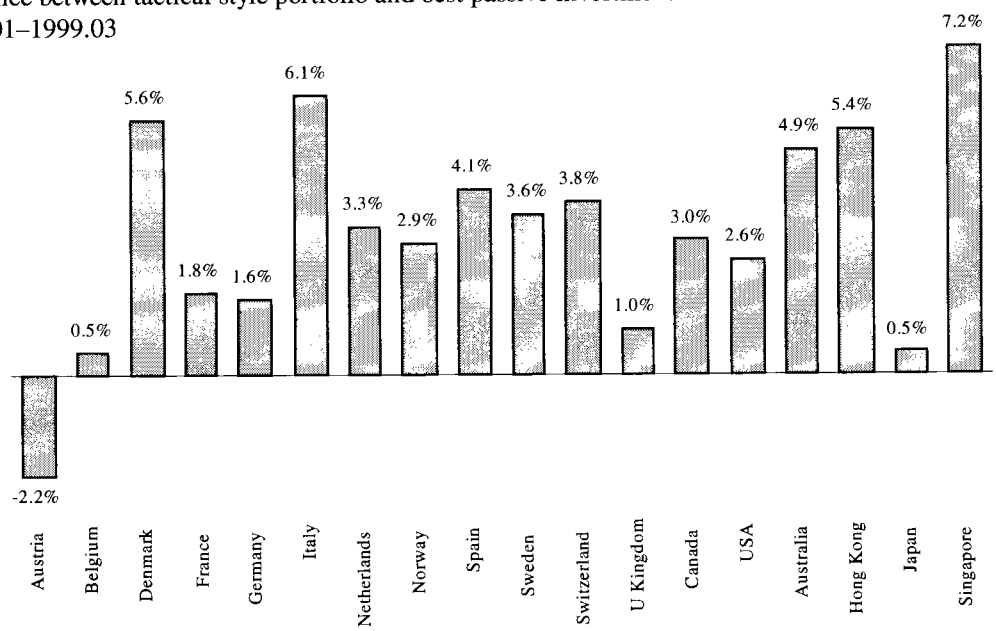
Evidence presented in this study indicates that the return difference between value and growth stocks is to some extent predictable on the basis of lagged information about the economic outlook and the market climate. Finally, we test whether this predictability can be exploited by active style rotation strategies. In other words, we examine the significance of our findings about the dynamics of value premiums from the viewpoint of an investor.

Active style rotation strategies are compared with passive value as well as growth strategies on a country-by-country basis. The signals for style switching within a country are determined on the basis of the fitted values of the instrument regression models. In the case the value-growth spread predicted at the beginning of a month is positive, funds are allocated to the segment of value stocks for the following month, otherwise growth stocks enter the portfolio. The asset allocation is revised on a monthly basis. Such an active style rotation procedure as well as the two passive allocations represent investable strategies. This is because the MSCI indices, which are the basis for our simulations, include the most liquid stocks in each country.

5.2 Performance of Active Value-Growth Strategies

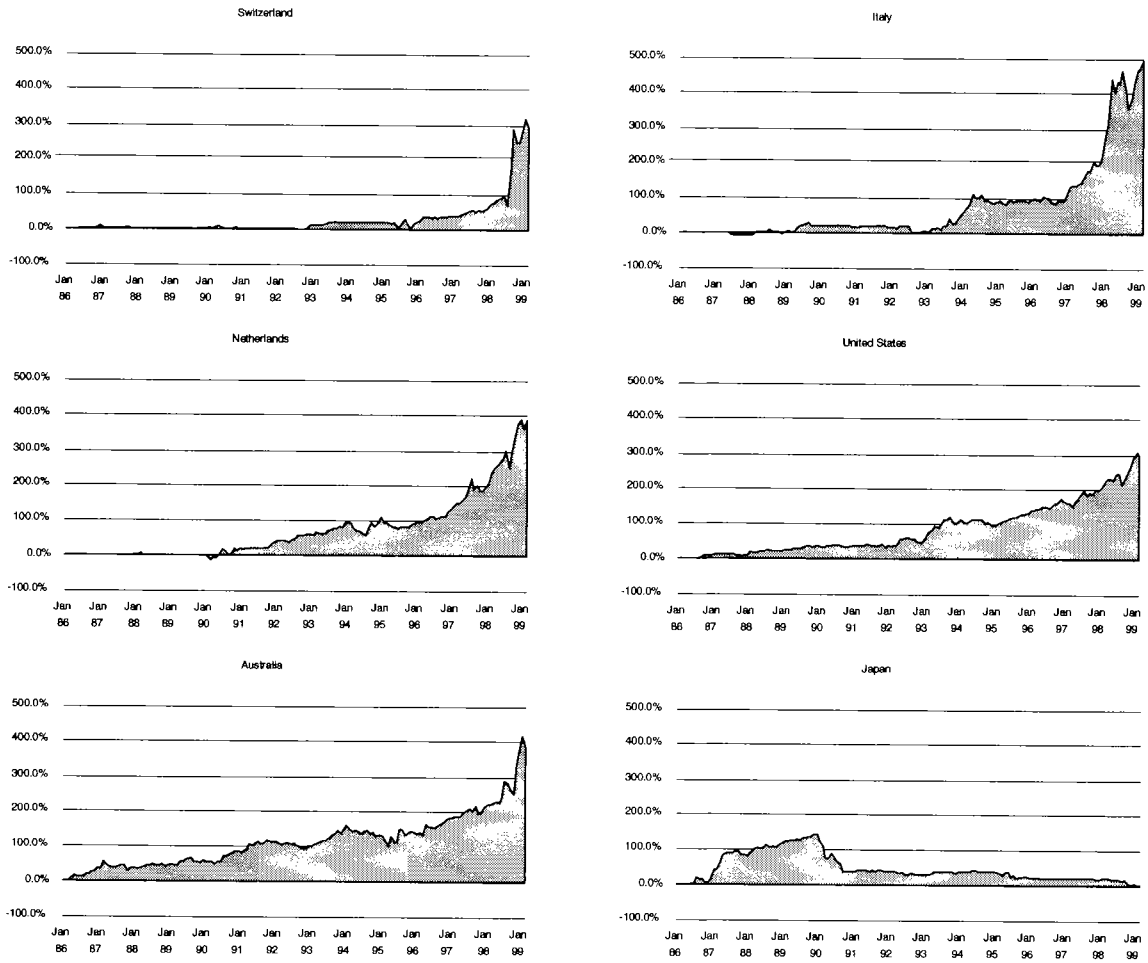
Risk and return figures for the tactical style rotation strategy and the two alternative passive investments measured over the period from January 1986 to March 1999 are documented in Table 3. Figure 8 displays the return difference between the tactical style portfolio and the respective passive

Figure 8: Tactical Style Rotation Strategies
Return difference between tactical style portfolio and best passive investment
Period: 1986.01–1999.03



Return difference between the actively managed style rotation portfolio and the passive investment with the highest return in each country, respectively. Return differences are denominated in local currencies. The signals for style switching within a country are determined on the basis of the fitted values of the instrument regression model.

Figure 9: Tactical Style Rotation Strategies
Cumulated return difference relative to best passive investment
Period: 1986.01–1999.03



Cumulated return difference between the actively managed style rotation portfolio and the best per-forming passive investment, relative to the initial investment. In Switzerland the best performing passive investment and, therefore, the benchmark for the active investment is the value portfolio; Italy: growth; Netherlands: value; United States: growth; Japan: value; Australia: value.

investment with the highest return, in the different countries. It shows that active style rotation beats passive value or growth investments in terms of return in all countries, with the exception of Austria. Return differences produced are in between 0.47% (Japan) and 7.21% (Singapore) per year. In 16 of the 18 countries also the return-to-risk ratio, which is average return over volatility, is superior for the active portfolio.

Figure 9 shows the cumulated return difference relative to the passive bench-marks, on the basis of the initially invested funds, for a typical sample of countries. Let's have a closer look at the performance of the style rotation strategies in Swit-

zerland and the United States. In Switzerland the best performing passive investment and, therefore, the benchmark for the active investment is the value portfolio, in the US it is the growth portfolio. In Switzerland the additional return of active style rotation over 159 months sums to 293.7%, in the US it cumulates to 294.9%, when round-trip transaction cost of 0.4% are included. In Switzerland 25 transactions had to be executed to implement the style rotation strategy; in other words, the investments style is altered after 6 months on average. In the US the number of transactions is just 14, implying a change of market segments after 10 month on average.

Our simulations show that active style management on the basis of a quantitative model significantly adds value to a portfolio. Tactical switching between value and growth stocks seems to clearly outperform passive value and growth strategies in terms of risk and return in most countries. At the same time, the number of transactions required is not prohibitive. Yet, the results presented here provide only an indication respecting the performance potential of style rotation. This is because the sets of instruments in the regression models we apply are not individually fitted to the specific value-growth cycles in the different countries; we simply apply the same eight instruments for each stock market. Moreover, a more frequent re-estimation of the regression model parameters would have a positive impact on the performance of the strategy.

6. What Did we Learn?

The main purpose of this study is to explore the dynamics as well as the economics of value-growth spreads on international equity markets. Our sample covers 3 global regions, and 18 countries over 1980s and 1990s. We document the following major results:

- Over the last 20 years, value stocks outperformed growth stocks on most international equity markets.
- Across the globe, year-to-year value-growth return spreads considerably vary with respect to both signs and magnitudes.
- The performance of value stocks relative to growth stocks reveals characteristic cycles in all regions and countries.
- Correlations of value-growth return spreads across the globe are typically low, yet, there is some co-movement of the value-growth spreads across countries which are economically linked.
- Value-growth return spreads are driven by expected business conditions and the market climate: Value stocks tend to outperform growth stocks when the outlook improves and premiums for systematic risk decrease.
- Reasonable portions of the value-growth return spreads on international markets are ex-ante predictable by indicators of expected global economic conditions; this predictable variation of value-growth return spreads is economically significant and can be exploited by active style rotation strategies.
- There is notable common variation of expected value-growth spreads across international countries and regions; correlations of expected value-growth return spreads are substantially higher than correlations of spreads measured ex-post.

Our findings overall contribute to the notion that value-growth return spreads on equity markets reflect a compensation for systematic risk. Most importantly, we document evidence that value-growth spreads are driven by global economic conditions, which is a characteristic feature of risk premiums on capital markets. Our analyses of the correlations of expected value-growth spreads indicate that the underlying risk factor seems to be priced consistently across markets. The patterns in our predicted value-growth spreads are compatible with the prevalent view that the risk factor priced in value stock returns is financial distress.

Appendix

Table A1: Year-to-Year Value-Growth Spreads (in %)

Countries	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Europe																				
Austria	8.2	–16.1	10.6	1.0	–1.8	–165.8	7.9	25.8	–13.3	–28.7	8.9	1.2	–29.3	36.4	14.7	–1.9	21.4	15.5	5.6	4.5
Belgium	–4.3	11.4	12.8	10.0	1.5	18.9	–11.9	5.6	19.1	2.8	10.4	0.0	16.3	9.9	6.2	19.2	0.9	9.3	20.2	11.5
Denmark	–34.7	–45.9	–22.3	50.8	24.2	21.7	2.9	–4.8	–27.2	–32.5	4.3	–15.5	–13.6	–10.8	6.0	8.0	–6.6	–33.2	46.5	–12.3
France	–9.9	14.9	–0.8	23.1	0.8	3.6	26.0	5.2	0.9	–3.0	–2.4	2.3	–2.1	9.2	1.2	–12.2	–27.9	28.2	–19.8	19.4
Germany	–12.1	–5.5	–4.2	–10.5	–2.7	–3.1	–13.0	20.5	–0.3	1.2	–8.8	8.7	0.2	10.8	1.1	–13.3	11.2	11.2	–12.2	28.5
Italy	–47.6	–7.1	10.7	–1.0	5.4	3.2	–56.7	–9.7	10.6	11.6	–8.5	–6.7	–1.4	25.8	6.3	–15.4	6.1	16.1	12.7	–1.5
Netherlands	–45.4	31.1	17.5	31.2	10.7	–35.3	3.1	14.5	4.3	5.0	–11.6	3.1	–9.3	22.6	–2.9	21.4	–6.7	9.4	18.1	40.8
Norway	24.3	44.6	13.9	–9.6	17.7	21.2	15.3	10.3	32.9	28.1	17.2	–31.7	31.7	67.6	–25.9	–12.2	19.2	15.4	–8.0	15.8
Spain	7.2	–12.9	14.3	–2.5	70.2	6.4	–95.6	–22.6	–6.5	16.2	14.3	15.4	–10.0	–7.7	3.1	–6.6	24.0	2.7	3.5	5.2
Sweden	13.9	3.5	9.1	34.8	17.5	12.9	–20.5	–5.0	16.2	–9.9	–5.5	16.1	–50.0	28.3	0.1	–20.3	–10.5	4.2	–39.5	–14.3
Switzerland	–10.0	5.0	12.1	22.4	–0.3	2.1	–24.4	15.5	21.3	–4.3	–2.4	8.9	–15.7	24.9	–5.6	–7.9	–1.4	15.7	1.7	12.5
U Kingdom	–19.4	12.7	–25.3	24.5	–0.5	7.0	23.1	7.7	7.5	4.6	–1.9	–23.3	–0.6	26.4	6.7	–4.9	2.0	3.7	–14.0	11.3
North Amer.																				
Canada	18.2	0.3	23.3	23.0	1.9	1.1	4.8	3.8	6.1	1.8	0.5	5.5	–8.0	9.4	2.3	0.9	11.6	–11.3	–12.5	–16.2
USA	–1.3	10.3	–3.4	10.9	5.9	–4.3	4.4	–5.0	11.3	–13.9	–7.4	–18.6	5.6	16.7	–2.8	0.6	–4.7	–0.8	–32.4	4.0
Pacific Rim																				
Australia	–3.8	22.0	4.9	38.0	–4.5	15.3	–35.3	6.5	12.8	–4.3	–15.0	12.9	9.8	15.2	–8.0	10.2	7.7	17.9	–9.7	12.7
Hong Kong	–33.1	18.7	4.3	–16.3	6.4	–7.9	1.2	–0.9	–8.8	20.9	–23.2	16.0	23.0	55.8	–4.5	7.8	20.2	–23.6	–5.3	–13.0
Japan	8.3	30.8	15.4	–8.0	–23.2	16.5	–1.7	5.4	3.7	12.4	7.5	–2.3	5.2	7.1	15.4	6.3	13.3	–10.3	5.2	–0.7
Singapore	–28.0	15.7	5.0	–1.2	–8.5	–9.5	41.3	7.4	–1.9	16.3	1.5	5.6	–3.7	–18.2	–2.2	–6.4	0.2	3.9	–2.3	54.6
Regions																				
World	–2.3	13.1	0.0	9.1	–0.3	2.3	1.3	3.7	7.0	2.3	–0.6	–8.1	3.2	16.0	2.8	0.3	1.9	–0.5	–17.4	6.8
North Amer.	0.4	9.3	–1.7	11.7	5.5	–4.1	4.3	–4.4	11.0	–12.6	–6.7	–16.3	4.7	16.3	–2.6	0.6	–3.9	–1.3	–31.3	3.3
Europe	–15.2	8.5	–8.0	16.0	3.7	1.7	–1.8	9.7	7.0	2.0	–2.7	19.9	–3.3	19.9	2.3	–5.7	–0.7	9.3	–7.9	14.1
Pacific Rim	4.5	27.9	13.1	–4.4	–20.0	14.9	–2.0	6.0	3.6	12.2	6.3	10.7	5.8	10.7	9.5	5.5	12.8	–8.0	3.6	1.6

Annual returns of value stocks relative to annual returns of growth stocks. Value and growth stocks are represented by the style-specific total return indices provided by MSCI for countries and regions.

Table A2: Statistics on Year-to-Year Value-Growth Spreads
Period: 1980.01–1999.06

Countries	Mean	SD	t-statistic	Min	Max	# pos years	# neg years
Europe							
Austria	–4.8%	41.3%	–0.50	–165.8%	36.4%	13	7
Belgium	8.5%	8.5%	4.34	–11.9%	20.2%	17	3
Denmark	–4.7%	26.1%	–0.79	–45.9%	50.8%	8	12
France	2.8%	14.5%	0.85	–27.9%	28.2%	12	8
Germany	0.4%	11.6%	0.14	–13.3%	28.5%	9	11
Italy	–2.3%	19.8%	–0.52	–56.7%	25.8%	10	10
Netherlands	6.1%	21.2%	1.25	–45.4%	40.8%	14	6
Norway	14.4%	23.3%	2.69	–31.7%	67.6%	15	5
Spain	0.9%	29.6%	0.13	–95.6%	70.2%	12	8
Sweden	–0.9%	21.3%	–0.19	–50.0%	34.8%	11	9
Switzerland	3.5%	13.2%	1.16	–24.4%	24.9%	11	9
U Kingdom	2.4%	14.6%	0.71	–25.3%	26.4%	12	8
North America							
Canada	3.3%	10.6%	1.36	–16.2%	23.3%	16	4
USA	–1.2%	11.3%	–0.48	–32.4%	16.7%	9	11
Pacific Rim							
Australia	5.3%	15.7%	1.46	–35.3%	38.0%	13	7
Hong Kong	1.9%	20.5%	0.40	–33.1%	55.8%	10	10
Japan	5.3%	11.4%	2.03	–23.2%	30.8%	14	6
Singapore	3.5%	18.4%	0.82	–28.0%	54.6%	10	10
Regions							
World	2.0%	7.0%	1.26	–17.4%	16.0%	13	7
North Amer.	–0.9%	10.8%	–0.37	–31.3%	16.3%	10	10
Europe	2.1%	9.0%	1.03	–15.2%	19.9%	11	9
Pacific Rim	5.1%	9.9%	2.26	–20.0%	27.9%	15	5

Mean and SD are based on the return differences between value stock and growth stocks calculated over the calendar years. t-statistic measures the statistical significance of the yearly mean. 'Min' denotes the smallest yearly value-growth spread, 'Max' the largest. '# pos years' stands for the number of years with positive value-growth spreads, '# neg years' for the number of negative ones. Value and growth stocks are represented by the style-specific total return indices provided by MSCI for countries and regions. Returns are denominated in local currencies.

Table A3: International Correlations of Year-to-Year Value-Growth Spreads
Period: 1980.01–1999.06

Countries	Bel	Den	Fran	Ger	Ita	Net	Nor	Spa	Swe	Swi	Uki	Can	USA	Aus	HKg	Jap	Sin
Austria	–0.35	–0.14	0.00	0.19	–0.04	0.43	–0.08	–0.07	–0.01	0.15	–0.02	0.13	0.07	–0.17	0.09	–0.25	0.09
Belgium		0.19	–0.16	–0.03	0.58	0.23	0.05	0.20	–0.16	0.37	–0.06	–0.31	–0.01	0.48	0.00	0.23	–0.20
Denmark			–0.11	–0.31	0.07	0.10	–0.46	0.08	–0.04	–0.02	0.15	0.00	–0.21	–0.06	–0.15	–0.37	–0.13
France				0.19	–0.11	0.37	0.12	–0.43	0.32	0.29	0.57	–0.10	0.50	0.21	–0.15	–0.30	0.48
Germany					0.39	0.28	0.13	0.15	0.05	0.47	0.18	–0.32	0.08	0.30	0.21	–0.10	0.36
Italy						0.34	0.14	0.54	0.16	0.62	0.05	–0.18	–0.05	0.47	0.36	0.02	–0.20
Netherlands							–0.04	–0.08	0.01	0.48	0.33	–0.18	0.20	0.33	0.29	–0.16	0.49
Norway								–0.08	0.10	0.14	0.39	0.01	0.54	0.09	0.38	0.24	–0.07
Spain									0.28	0.25	–0.44	0.02	–0.19	0.27	–0.02	–0.19	–0.41
Sweden										0.62	0.17	0.61	0.40	0.44	–0.06	–0.15	–0.32
Switzerland											0.19	0.16	0.23	0.70	0.05	–0.13	–0.09
U Kingdom												–0.08	0.63	0.16	0.22	–0.06	0.29
Canada													0.25	0.14	0.04	0.12	–0.39
USA														0.36	0.18	–0.08	0.00
Australia															0.11	0.03	–0.20
Hong Kong																0.23	–0.04
Japan																	–0.03
Singapore																	

Regions	Nam	Eur	Pac
World	0.87	0.74	0.32
North America		0.56	–0.01
Europe			–0.04

Correlation coefficients are calculated on the basis of yearly differences between the returns on value stocks and the returns on growth stocks across countries. Correlation coefficients larger than 0.3 are underlined. Value and growth stocks are represented by the style-specific total return indices provided by MSCI for countries and regions.

Table A4: Correlations of Instrumental Variables
Period: 1986.01–1999.06

	GLDIVY	TERMSP	TEDSPR	CREDSP	GLREAL	INRELW	GLVOLA	BUSCLI
GLDIVY	1.000	–0.304	0.333	–0.005	0.567	0.398	–0.059	–0.082
TERMSP		1.000	–0.391	–0.214	0.171	–0.050	–0.041	0.478
TEDSPR			1.000	0.197	0.324	0.103	0.193	0.207
CREDSP				1.000	–0.073	0.077	0.235	–0.103
GLREAL					1.000	0.211	–0.098	0.353
INRELW						1.000	0.482	–0.089
GLVOLA							1.000	0.044
BUSCLI								1.000

Correlation coefficients for the levels of instrumental variables. BUSCLI stands for the US purchasing manager index, GLVOLA for the global stock market volatility, INRELW for inverse relative wealth, GLREAL for the global real interest rate, CREDSP for the US credit spread (Moody's), TEDSPR for the Treasury-Eurodollar spread, TERMSP for the global term spread, and GLDIVY for the global dividend yield.

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