The Cross-section of Conditional Mutual Fund Performance in European Stock Markets

Supplemental Web Appendix: Not for Publication

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Appendix A: Data Source Details and Variable Definitions

Appendix A1: Description of Lipper Mutual Fund Data

We obtained, from Lipper (a subsidiary of Thomson Reuters), several datasets on developed European-domiciled (including the UK) mutual funds having a focus on equities (either Pan-European or country/region/sector specific) in developed Europe (including the UK) during the March 1988 to February 2008 period. We do not have information on the exact location of the portfolio manager or the manager's buy-side analysts, so we use the fund's country of investment objective as a proxy for the location of these key fund employees. For a subset of the funds that exist in 2011, we have obtained the domicile of the fund advisor, which is where we would expect the portfolio manager and buy-side analysts to reside. Information about the advisor's location is available for 60% of our universe, and covers mainly regional and country funds. Overall, more than 80% of the country funds with location information have an investment objective that coincides with the advisor's location. The sample includes funds that were alive at the end of the sample, as well as non-surviving funds; about 15% of the funds dropped out of our sample prior to the end of the sample period. We include actively managed funds, index funds, and both active and passive sector funds, although European index funds are less prevalent in Europe than in the U.S. These data include monthly net returns, total expense ratios, and load fees. Summary statistics for these data are provided in Table 1. In this appendix, we describe, in more detail, the characteristics and limitations of the data.

A1.1 Inclusion of Funds

Lipper actively examines registration lists for mutual funds from regulatory authorities across Europe in an attempt to create a complete database, and contacts management companies to follow up on funds for which the companies have not proactively supplied data. Although all mutual fund datasets contain an "incubation bias," as per Evans (2010), this bias should be minimal in our paper as we require a minimum of 36 months of return history to be available for a fund to be included in the strategies at the end of a particular calendar quarter.

A1.2 Net Returns

Our returns dataset contains monthly net returns (with fund distributions reinvested at the end of the day that they are paid) on each shareclass of all European equity mutual funds with a European investment focus. Returns are net of fees and fund-level trading costs, i.e., these are returns actually experienced by investors in the funds (ignoring load charges or investor-level broker commissions).

Since we do not have complete information on total net assets (TNA) of the individual shareclasses of the funds, we select the earliest-existing shareclass to represent that fund's returns. When a monthly return is missing for that shareclass, we check the other shareclasses to see if they have a return during that month to proxy for the missing return. Generally, shareclasses have very close returns, so this should not be a problem. We continue this process until we reach the last available return for that shareclass, then we continue to search for any further returns from any shareclass. In general, the shareclass with the first available return exists as long as all of the other shareclasses, so we continue using returns from that shareclass to represent the fund.

A1.3 Expense Ratios

Lipper provided historical total annual expense ratios (TERs), including fund management, administration, and distribution fees for a subset of the funds that existed in 2008. No TER data is available for funds that did not exist in 2008.

Table A1 shows the number of funds, existing during each given month, with TER information. Note that, in the early years of our sample, Lipper did not have TER data for all but a few funds.

Table A1: Fund Universe TER Coverage

Date	Number TERs	Total Number Funds	% with TER
December 2007	1,377	4,206	32.7
December 2002	952	3,186	29.9
December 1997	191	1,377	13.9
December 1992	10	700	1.4
March 1988	4	228	1.8

To handle missing TER data at the end of a given calendar quarter, we use, for a given fund, the cross-sectional average TER of all funds with available annual expense ratio data at the end of that quarter.

A1.4 Load Fees

We retrieved front-end and redemption load fees from Morningstar Direct, though these were only available for funds existing at the time of data extraction. Due to a lack of historical data availability, this information is only available as of the date of data extraction, 2011, and not for earlier years. Therefore, over all prior years, for a given fund that exists at 2011, we use its 2011 load fee level. For funds not surviving until 2011, we use, at the end of each calendar quarter, the cross-sectional average front-end (or redemption) load during 2011 as a proxy.

Appendix A2: Data Sources and Definitions

Market Benchmark: MSCI Total Return Indices for Europe, Nordic Countries, UK, France, Spain, Portugal, Italy, Austria, Switzerland, Belgium, Netherlands and Germany.
The MSCI Europe Index is market capitalization weighted and measures the performance of 16 developed market country equity indices: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. In constructing each country index, every listed security in the market is identified, free float adjusted, and screened by size, liquidity and minimum free float. The MSCI Total Return Indices assume daily reinvestment of dividends at the close of trading on the day the security is quoted ex-dividend (the ex-date). Additional details are available at: http://www.msci.com/products/indices/tools/.

Small-Minus-Big Factor: Difference between Europe STOXX Small Cap Return Index and Europe STOXX Large Cap Return Index.
The STOXX Europe 600 Size indices provide a broad but liquid representation of large, mid and small capitalization companies in Europe. The indices cover Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. Components are reviewed quarterly and weighted according to free float market capitalization subject to a 20% weighting cap. Details are available at http://www.stoxx.com.

High-Minus-Low Factor: Difference between Europe Value and Growth Portfolios.
Through 2007Q4, these are computed using Ken French's International Research Returns Data, "Index Portfolios formed on B/M, E/P, CE/P, and D/P". For each country, French forms value-weighted portfolios of stocks sorted on B/M, taking the top 30% as the value stocks and the bottom 30% as the growth stocks. The Europe value (growth) factor value weights the Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Ireland, Italy, Netherlands, Spain, and Switzerland value (growth) stock portfolios. Our value factor equals the difference between Europe high B/M index and low B/M index returns. We compute the Jan-Feb 2008 index values using the difference between S&P Citigroup Europe BMI Value and Growth Indices, which follow a similar methodology to Ken French from S&P Citigroup Global Equity Indices website. Additional details are available on Ken French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/int_index_port_formed.html.

Momentum Factor: Difference between top and bottom six sectors from Dow Jones STOXX 600 Supersector Indices.
This factor is derived from the STOXX Europe 600 Index, which comprises 600 of the largest European stocks by free float market capitalisation. In the STOXX Europe 600 Supersector Indices, component weights are proportional to free float market capitalization, subject to 30% capping for the largest companies and 15% capping for the second largest companies. Using the Industry Classification Benchmark, companies are categorised according to their primary source of revenue. Portfolios are rebalanced on a monthly basis. We select the top and bottom six sectors based on total return for the one year period from thirteen months before rebalancing to one month before rebalancing. The momentum factor is defined as the return on an equal-weighted portfolio of the top six supersectors minus the return on an equal-weighted portfolio of the bottom six supersectors. The data was retrieved from http://www.stoxx.com.

Term Structure: Difference between "10-year Euro area Government Benchmark Bond Yield" and Euribor 1 month rate.
Both series are taken from the European Central Bank Statistical Data Warehouse. The 10-year Euro area

Government Benchmark Bond Yield corresponds to Series Key FM.M.U2.EUR.4F.BB.U2_10Y.YLD and is reported in the Statistics Pocket Book. The Euribor is the euro interbank offer rate for one month deposits. Additional information is available at http://www.ecb.int/stats/money/indices/html/index.en.html.

Dividend Yield: Europe Dividend Yield.
This series is taken from the Global Financial Database series SYEURYM which is based on large cap stocks representing approximately 75% of the capitalization in each country. Dividend data use a trailing twelve month window and dividends only get included once reported by the firms.

Default Spread: Difference between Yields on German Corporate bonds and Yields on German Public debt securities.
Both series are taken from the Bundesbank website. Yields on German Corporate bonds correspond to the series "Time series WU0022: Yields on debt securities outstanding issued by residents / Corporate bonds (non-MFIs)/ Monthly average." Yields on German Public debt securities correspond to the series "WU0004: Yields on debt securities outstanding issued by residents / Public debt securities / Monthly average." Details on the calculation of these rates are available at http://www.bundesbank.de/statistik/statistik_zinsen.en.php.

Risk-Free Rate: One month Euribor.
Data are taken from the European Central Bank and Backfilled with "GFD Euribor 1 month," an interbank rate for the ECU recovered from Global Financial Database for the period 02/1988-12/1993.

Table A2: Descriptive Statistics for Benchmark and Macroeconomic Factors

This table shows descriptive statistics for the european risk factors as well as for the predictor variables used to track time-variations in the conditional alpha. All statistics are based on monthly observations for the factors and state variables. The market factor is represented by the MSCI Europe index.

Panel A. Risk Factors

	Market	Size	Book-to-market	Sector Momentum
Mean	0.95	-0.41	0.39	0.34
Median	1.55	-0.33	0.37	0.43
Maximum	12.97	7.07	11.15	13.14
Minimum	-16.41	-9.03	-12.08	-14.72
Standard Deviation	4.61	2.52	2.65	3.32
Skewness	-0.78	-0.10	-0.07	-0.30
Kurtosis	4.59	3.33	5.95	5.84
Autocorrelation	0.07	0.23	0.20	0.23

Panel B. Macroeconomic Variables

	Dividend Yield	Default Spread	Short Rate	Term Spread
Mean	3.05	0.58	5.51	1.09
Median	3.00	0.50	4.51	1.19
Maximum	4.80	2.80	13.69	3.28
Minimum	1.70	-0.20	2.04	-3.67
Standard Deviation	0.72	0.46	2.86	1.00
Skewness	0.09	1.40	0.64	-0.64
Kurtosis	2.40	5.86	2.19	4.29
Autocorrelation	0.97	0.90	0.99	0.90

Appendix A3: Description of Datastream European Stock Data

We obtained, from Thomson Datastream, end-of-month prices and monthly returns on European stocks during the March 1988 to February 2008 time period, where cash dividends are reinvested at the ex-dividend date. Also, all stock returns and prices are U.S. dollar denominated. The universe of stocks comprises both listed and delisted stocks, and covers 15 European equity markets. In particular, our sample includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Switzerland, and the UK. Table A4 presents a snapshot of the evolution of our universe of stocks over time.

To identify stock delisting events, we use price data for individual stocks. In Datastream, when a company is delisted, the stock price remains constant until the end of the sample, while there is no evidence of the delisting date on the return index data. We match both datasets, identifying the delisting date in the return series as that of the second observation of constant prices.

To eliminate illiquid stocks from consideration for the strategies, we exclude the bottom 70% of stocks, ranked by equity market capitalization, each month. The smallest stock in the top 30% is still fairly small, as shown by the table below:

Table A3: Stock Universe Capitalization Filter Thresholds

Date	Market Capitalization of Smallest Stock ($ Millions)
December 1, 2007	438.1
December 1, 2002	222.1
December 1, 1997	190.2
December 1, 1993	182.6

To eliminate stocks with potentially erroneous return data, we also exclude stock returns at the 0.1% level (we keep returns ranked between 0.1 and 99.9% during each month). A count of the remaining stocks is shown below.

Table A4: Stock Universe Asset Count

	1988	1993	1998	2003	2008
Universe	3,932	4,656	5,663	5,637	6,331
Austria	70	120	112	116	105
Belgium	190	187	185	203	217
Denmark	204	276	265	197	201
Finland	35	68	148	157	145
France	180	567	891	944	955
Germany	296	379	524	826	1,149
Greece	97	182	278	346	296
Ireland	67	63	64	52	58
Italy	250	295	313	308	328
Netherlands	164	179	223	165	138
Norway	57	108	232	168	253
Portugal	77	133	139	79	62
Spain	50	115	158	158	146
Switzerland	351	344	298	282	273
UK	1,844	1,640	1,833	1,636	2,005

Appendix B: Tables Reporting Additional Robustness Results

Table B1: Out-of-Sample Performance of Short and Long Portfolios

This table presents performance statistics for portfolios chosen by investors with beliefs that allow short-selling of mutual funds. Panel A shows results when the investors attempt to identify underperformers by studying a portfolio with short-only positions. Panel B reports the performance of a 2:1 leveraged portfolio that takes a 200% long position in mutual funds financed by using a 100% short position in benchmark and country indices. Panel C reports the performance of a self-financing portfolio that takes a long position in mutual funds financed by using a short position in benchmark and country indices with the objective of maintaining zero exposure to the market risk factor. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

Panel A: Short Portfolio Performance

	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	5.84%	3.04%	-1.30%	-2.47%	-7.66%	-6.83%	-7.18%	-6.75%	-6.80%	-7.47%
Arithmetic mean	7.82%	4.58%	0.02%	-0.89%	-5.09%	-4.39%	-4.69%	-4.31%	-4.62%	-5.48%
Volatility	19.80%	17.39%	16.09%	17.55%	22.14%	21.58%	21.81%	21.61%	20.39%	19.49%
Sharpe ratio	0.188	0.028	(0.254)	(0.284)	(0.415)	(0.394)	(0.403)	(0.389)	(0.428)	(0.492)
(p-Val for Fund SR $\leq$ Bmk SR)	98%	97%	92%	90%	83%	84%	84%	84%	83%	80%
Average Realized Utility	-13.67%	-9.06%	-3.83%	-3.64%	-2.16%	-2.48%	-2.34%	-2.59%	-1.52%	-0.15%
(p-Val for Fund ARU $\leq$ Bmk ARU)	99%	98%	92%	91%	85%	86%	86%	86%	84%	81%
Outperformance Frequency	44%	40%	29%	34%	33%	33%	34%	32%	29%	27%
Single-Factor Alpha	-4.80%	-6.34%	-12.18%	-12.44%	-16.21%	-15.44%	-15.85%	-15.41%	-15.43%	-16.35%
Single-Factor Alpha t-Stat	(1.755)	(2.444)	(5.949)	(5.769)	(4.911)	(4.782)	(4.883)	(4.742)	(5.285)	(5.682)
Single-Factor Beta	1.055	0.859	0.923	0.974	1.094	1.072	1.084	1.073	1.039	0.986
Four-Factor Alpha	-1.47%	-3.17%	-10.28%	-10.73%	-12.32%	-12.67%	-11.74%	-12.62%	-12.94%	-15.55%
Four-Factor Alpha t-Stat	(0.551)	(1.290)	(5.095)	(5.390)	(4.043)	(4.448)	(3.947)	(4.425)	(4.697)	(5.783)
Beta - Market	1.008	0.820	0.893	0.932	1.001	0.982	0.994	0.981	0.970	0.911
Beta - SMB	0.372	0.369	0.279	0.309	0.502	0.565	0.521	0.577	0.420	0.346
Beta - HML	(0.165)	(0.130)	(0.104)	(0.163)	(0.177)	(0.247)	(0.186)	(0.248)	(0.170)	(0.155)
Beta - Momentum	0.159	0.007	(0.008)	(0.064)	(0.211)	(0.219)	(0.209)	(0.220)	(0.214)	(0.228)
Panel B: 2:1 Leverage Portfolio Performance										
Geometric mean	1.40%	0.04%	11.90%	14.10%	18.59%	18.56%	18.79%	17.76%	18.83%	18.11%
Arithmetic mean	2.74%	1.37%	15.13%	17.06%	22.27%	22.07%	22.62%	21.37%	22.65%	21.16%
Volatility	16.35%	16.27%	25.84%	24.76%	27.98%	27.22%	28.66%	27.61%	28.63%	25.08%
Sharpe ratio	(0.083)	(0.168)	0.427	0.524	0.649	0.660	0.646	0.626	0.648	0.680
(p-Val for Fund SR $\leq$ Bmk SR)	99%	100%	70%	53%	36%	34%	37%	39%	37%	29%
Average Realized Utility	-1.20%	-2.53%	5.02%	7.69%	10.14%	10.57%	9.91%	9.59%	9.95%	11.35%
(p-Val for Fund ARU $\leq$ Bmk ARU)	99%	100%	68%	46%	29%	25%	30%	32%	30%	20%
Outperformance Frequency	38%	39%	53%	53%	54%	57%	53%	55%	56%	56%
Single-Factor Alpha	-4.92%	-5.44%	5.68%	6.65%	10.92%	11.81%	11.40%	11.02%	9.89%	8.41%
Single-Factor Alpha t-Stat	(1.468)	(1.757)	1.020	1.223	1.772	1.984	1.807	1.835	1.530	1.528
Single-Factor Beta	0.580	0.570	0.813	0.815	1.000	0.918	1.013	0.938	1.037	0.982
Four-Factor Alpha	-9.25%	-10.22%	9.50%	9.69%	14.43%	17.18%	15.13%	16.39%	17.96%	16.05%
Four-Factor Alpha t-Stat	(2.987)	(3.557)	2.218	2.303	2.659	3.338	2.764	3.177	3.198	3.366
Beta - Market	0.597	0.572	0.763	0.821	0.942	0.846	0.953	0.869	0.949	0.892
Beta - SMB	(0.632)	(0.648)	0.531	0.555	0.302	0.512	0.309	0.478	0.466	0.541
Beta - HML	0.392	0.340	(0.238)	(0.336)	(0.101)	(0.231)	(0.118)	(0.231)	(0.051)	(0.156)
Beta - Momentum	(0.177)	(0.175)	0.070	0.044	0.343	0.285	0.355	0.290	0.604	0.474

Table B1: Out-of-Sample Performance of Short and Long Portfolios, Continued

This table presents performance statistics for portfolios chosen by investors with beliefs that allow short-selling of mutual funds. Panel A shows results when the investors attempt to identify underperformers by studying a portfolio with short-only positions. Panel B reports the performance of a 2:1 leveraged portfolio that takes a 200% long position in mutual funds financed by using a 100% short position in benchmark and country indices. Panel C reports the performance of a self-financing portfolio that takes a long position in mutual funds financed by using a short position in benchmark and country indices with the objective of maintaining zero exposure to the market risk factor. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

Panel C: Self-Financing Portfolio Performance - Market Factor Neutral

	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	4.00%	1.63%	10.25%	8.48%	12.21%	14.50%	12.26%	14.89%	11.64%	13.13%
Arithmetic mean	4.00%	1.85%	10.75%	8.85%	13.13%	15.14%	13.19%	15.53%	12.52%	13.73%
Volatility	0.63%	6.60%	9.97%	8.53%	13.82%	11.58%	13.87%	11.60%	13.52%	11.07%
Sharpe ratio	(0.163)	(0.342)	0.666	0.557	0.654	0.953	0.655	0.986	0.622	0.870
(p-Val for Fund SR $\leq$ Bmk SR)	0%	84%	17%	19%	26%	5%	26%	5%	28%	8%
Average Realized Utility	3.97%	1.20%	9.14%	7.69%	10.11%	12.88%	10.15%	13.25%	9.63%	11.69%
(p-Val for Fund ARU $\leq$ Bmk ARU)	78%	89%	36%	47%	30%	14%	30%	12%	34%	20%
Outperformance Frequency	37%	38%	46%	44%	45%	47%	46%	47%	45%	46%
Single-Factor Alpha	-0.10%	-2.00%	6.10%	3.71%	7.23%	10.19%	7.46%	10.39%	7.43%	7.74%
Single-Factor Alpha t-Stat	(1.024)	(1.144)	2.299	1.716	1.907	3.195	1.956	3.259	2.005	2.580
Single-Factor Beta	(0.000)	(0.088)	0.012	0.033	0.093	0.022	0.085	0.041	0.025	0.048
Four-Factor Alpha	-0.20%	-3.45%	8.22%	4.47%	7.88%	12.62%	8.42%	12.91%	9.71%	10.93%
Four-Factor Alpha t-Stat	(2.170)	(2.029)	3.141	2.035	2.153	4.082	2.296	4.197	2.865	3.639
Beta - Market	0.001	(0.043)	0.018	0.058	0.073	(0.040)	0.064	(0.021)	0.020	0.053
Beta - SMB	(0.017)	(0.200)	0.084	0.066	0.127	0.172	0.121	0.186	0.190	0.197
Beta - HML	0.008	0.106	(0.010)	(0.022)	(0.041)	(0.004)	(0.032)	(0.020)	(0.107)	(0.145)
Beta - Momentum	(0.003)	0.047	0.111	0.051	0.153	0.257	0.191	0.242	0.206	0.203

Table B2: Sorted Portfolio Performance

This table presents summary annualized arithmetic mean returns (Panel A) and their conditional four-factor alpha (Panel B) for equal-weighted portfolios of funds formed each quarter by sorting individual funds into deciles based on their conditional four factor Alpha t-statistic as estimated by investors with beliefs summarized in Table 2. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. We construct the High minus Low (H-L) as the spread in average returns and 4-factor alphas between top and bottom deciles of funds. The Patton-Timmermann monotonicity test rejects, i.e. yields a low p-value, if the mean returns or alpha-estimates are monotonically declining from the top-ranked through the bottom-ranked decile of funds. The momentum strategy sorts funds based on their trailing 12-month historical returns.

	BCAPM	BCAPM-A	BAMA	BAMA-A	BSMA	BSMA-A	BAMAP	BAMAP-A	Momentum
					Annualized Average Return				
1	13.37%	13.08%	13.38%	12.81%	13.37%	12.79%	13.15%	12.64%	14.90%
2	12.52%	12.40%	11.74%	11.89%	11.77%	11.93%	12.27%	11.89%	12.80%
3	11.62%	11.44%	11.40%	11.35%	11.42%	11.34%	11.63%	11.85%	11.30%
4	10.61%	10.67%	11.26%	11.44%	11.14%	11.46%	11.68%	11.18%	10.50%
5	9.64%	11.01%	10.01%	10.72%	10.11%	10.63%	10.12%	11.27%	9.50%
6	10.51%	10.17%	9.99%	10.25%	9.94%	10.40%	9.74%	10.12%	9.80%
7	9.69%	9.95%	9.65%	9.92%	9.67%	9.92%	9.71%	9.88%	9.50%
8	9.57%	9.91%	9.45%	10.04%	9.51%	9.90%	9.32%	9.52%	10.00%
9	9.58%	9.05%	9.83%	9.14%	9.67%	9.23%	9.39%	9.33%	9.80%
10	9.38%	8.79%	9.83%	8.97%	9.94%	8.93%	9.55%	8.84%	8.60%
H-L	3.99%	4.29%	3.55%	3.83%	3.43%	3.86%	3.60%	3.79%	6.40%
					Patton-Timmermann Test p-Values				
H vs L	8%	3%	7%	0%	7%	0%	4%	0%	28%
All	85%	15%	35%	2%	10%	0%	3%	0%	23%
					Annualized 4-Factor Alpha				
1	5.32%	5.25%	5.21%	4.12%	5.19%	4.09%	4.93%	4.02%	6.60%
2	3.95%	4.00%	1.68%	2.09%	1.71%	2.13%	2.94%	2.41%	3.90%
3	2.63%	2.18%	0.97%	0.84%	0.98%	0.84%	1.30%	2.26%	2.00%
4	1.41%	1.13%	1.04%	1.88%	0.94%	1.91%	1.96%	1.18%	0.50%
5	-0.15%	1.13%	-0.16%	0.41%	-0.04%	0.37%	0.13%	1.32%	-0.70%
6	0.82%	0.13%	0.19%	0.25%	0.08%	0.31%	-0.22%	-0.39%	-0.40%
7	-1.25%	-0.35%	-0.55%	-0.31%	-0.53%	-0.28%	-0.74%	-0.23%	-0.70%
8	-1.27%	-1.09%	-0.38%	0.17%	-0.30%	-0.01%	-0.89%	-0.65%	0.30%
9	-1.11%	-1.94%	0.11%	-0.99%	-0.03%	-0.88%	-0.71%	-1.04%	0.30%
10	-2.24%	-2.34%	-0.02%	-0.35%	0.09%	-0.37%	-0.60%	-0.79%	0.00%
H-L	7.56%	7.58%	5.22%	4.47%	5.10%	4.46%	5.53%	4.80%	6.60%
					Patton-Timmermann 4-Factor Residual Test p-Values				
H vs L	1%	0%	4%	0%	5%	0%	2%	0%	48%
All	70%	1%	70%	1%	26%	1%	8%	0%	36%

Table B3: Predictability Generated by Individual and Local Macro Variables

This table presents key out of sample performance statistics when the three investor types from Table 2 and identified in the corresponding panel header, that allow for macroeconomic predictability in returns, based on augmented pricing models, use a single state variable to track time-variations in the conditional alphas and factor loadings. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Results are reported for the sample period 06/1993-02/2008 and assume the setup from the baseline investment exercise, i.e. no short-selling, individual fund holdings capped at 10% of the total holdings, quarterly rebalancing, and $\sigma_\alpha = 10\%$ per month. The data source and construction for each of the macrovariables are described in detail in Appendix A2 and Supplemental Appendix B2.

Panel A - Skeptic Macro Alpha (Local Market Augmented Benchmark)

	Geometric mean	Arithmetic mean	Volatility	Sharpe ratio	p-Value for Fund SR $\leq$ Bmk SR	Realized Utility	p-Value for Fund ARU $\leq$ Bmk ARU	Single-Factor Pricing Model Alpha	t-Statistic	Beta
Local Macro Variables	15.51%	17.51%	20.57%	0.652	18%	10.90%	11%	6.48%	1.730	0.982
1 - Short Rate Yield	15.38%	17.43%	20.60%	0.647	61%	6.84%	56%	6.68%	1.877	0.945
2 - Term Spread	14.54%	16.13%	18.04%	0.667	58%	7.04%	55%	5.37%	1.929	0.910
3 - Dividend Yield	13.65%	15.40%	18.96%	0.596	71%	5.83%	69%	4.91%	1.492	0.877
4 - Default Spread	14.81%	16.56%	19.03%	0.654	59%	6.91%	56%	5.74%	1.854	0.918
5 - Volatility	14.60%	16.37%	18.93%	0.648	62%	6.78%	58%	5.06%	1.786	0.963
6 - Inflation	15.56%	17.20%	18.25%	0.717	45%	7.96%	41%	6.76%	2.222	0.877
7 - Industrial Production	15.89%	17.75%	19.79%	0.690	51%	7.63%	45%	7.17%	2.041	0.900
8 - Economic Sentiment	15.75%	17.66%	20.01%	0.678	54%	7.42%	48%	6.79%	1.884	0.904
9 - Currency Factor	12.05%	13.61%	17.94%	0.530	81%	4.64%	83%	3.02%	0.966	0.856

Panel B - Agnostic Macro Alpha (Local Market Augmented Benchmark)

	Geometric mean	Arithmetic mean	Volatility	Sharpe ratio	p-Value for Fund SR $\leq$ Bmk SR	Realized Utility	p-Value for Fund ARU $\leq$ Bmk ARU	Single-Factor Pricing Model Alpha	t-Statistic	Beta
Local Macro Variables	14.98%	16.96%	20.50%	0.627	22%	10.42%	15%	2.65%	0.789	0.987
1 - Short Rate Yield	15.15%	17.15%	20.35%	0.641	62%	6.72%	58%	6.43%	1.804	0.929
2 - Term Spread	14.54%	16.13%	18.06%	0.666	58%	7.04%	55%	5.36%	1.926	0.911
3 - Dividend Yield	13.49%	15.21%	18.79%	0.591	71%	5.74%	70%	4.76%	1.461	0.870
4 - Default Spread	14.85%	16.61%	19.06%	0.656	59%	6.94%	55%	5.78%	1.860	0.918
5 - Volatility	14.59%	16.36%	18.94%	0.648	62%	6.78%	58%	5.05%	1.783	0.963
6 - Inflation	15.41%	17.04%	18.28%	0.708	47%	7.80%	44%	6.65%	2.176	0.877
7 - Industrial Production	15.88%	17.75%	19.81%	0.689	51%	7.61%	46%	7.17%	2.036	0.901
8 - Economic Sentiment	15.79%	17.70%	20.06%	0.678	53%	7.42%	48%	6.84%	1.886	0.903
9 - Currency Factor	12.07%	13.63%	17.88%	0.533	81%	4.68%	82%	3.04%	0.982	0.856

Panel C - Agnostic Macro Alpha with Predictability (Local Market Augmented Benchmark)

	Geometric mean	Arithmetic mean	Volatility	Sharpe ratio	p-Value for Fund SR $\leq$ Bmk SR	Realized Utility	p-Value for Fund ARU $\leq$ Bmk ARU	Single-Factor Pricing Model Alpha	t-Statistic	Beta
1 - Short Rate Yield	16.13%	18.20%	20.78%	0.679	54%	7.48%	48%	7.46%	2.085	0.956
2 - Term Spread	14.23%	15.84%	18.21%	0.645	62%	6.67%	60%	4.51%	1.509	0.914
3 - Dividend Yield	13.26%	15.23%	20.13%	0.553	78%	4.99%	78%	4.15%	1.206	0.943
4 - Default Spread	14.92%	16.69%	19.21%	0.655	59%	6.94%	55%	5.64%	1.769	0.919
5 - Volatility	13.33%	15.19%	19.46%	0.570	77%	5.34%	76%	3.90%	1.270	0.965
6 - Inflation	15.52%	17.44%	19.93%	0.669	56%	7.26%	51%	6.48%	1.880	0.934
7 - Industrial Production	15.67%	17.50%	19.58%	0.685	52%	7.51%	47%	6.82%	2.035	0.914
8 - Economic Sentiment	14.00%	15.68%	18.53%	0.625	66%	6.34%	64%	4.91%	1.609	0.894
9 - Currency Factor	10.06%	11.27%	15.60%	0.459	90%	3.49%	92%	1.67%	0.647	0.773
Panel D - Reference Portfolios										
Benchmark	10.06%	11.40%	16.28%	0.449						
CAPM	6.08%	7.01%	13.60%	0.214	98%	4.23%	98%	-2.67%	(2.237)	0.782
BCAPM-A	11.84%	13.71%	19.51%	0.493	48%	7.88%	43%	3.67%	1.108	0.875

Table B4: Robustness to Fund Universe Size

This table shows the effect of imposing different constraints on the universe of funds available for forming the investor's portfolios. All results are based on performance during the out-of-sample period from 06/1993 - 02/2008. The baseline scenario selected the 50 funds with the highest conditional alpha and assumed no restrictions on the changes in the weights, but capped holdings in individual funds to a maximum of 10% of the portfolio. Panels A & B test the portfolio performance when the initial sort selects the 25 funds and 250 funds, respectively, with the highest conditional alphas. Panel C tests the portfolio performance when there is no initial sort based on a fund's conditional alpha. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Each column shows portfolio results based on the individual Bayesian updating models, summarized in Table 2, identified in the corresponding column header.

Panel A: Portfolios of 25 Funds with the Highest Conditional Alpha

	Benchmark	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	10.06%	7.32%	6.95%	12.81%	13.24%	16.32%	17.03%	16.01%	17.18%	15.33%	15.87%
Arithmetic mean	11.40%	8.06%	7.80%	14.82%	15.04%	18.45%	19.07%	18.17%	19.21%	17.38%	17.67%
Volatility	16.28%	12.14%	12.98%	20.26%	19.11%	21.33%	20.82%	21.45%	20.74%	20.73%	19.30%
Sharpe ratio	0.449	0.326	0.285	0.529	0.573	0.673	0.719	0.656	0.728	0.640	0.703
p-Val for Fund SR $\leq$ Bmk SR		64%	81%	42%	30%	15%	9%	18%	8%	18%	9%
Realized Utility		5.81%	5.24%	8.50%	9.39%	11.34%	12.24%	10.99%	12.42%	10.68%	11.80%
p-Val for Fund ARU $\leq$ Bmk ARU		81%	89%	36%	25%	9%	5%	11%	4%	11%	5%
Outperformance Frequency		41%	37%	54%	53%	52%	54%	51%	55%	48%	51%
Single-Factor Alpha		-0.28%	-0.29%	4.79%	4.71%	8.38%	9.59%	8.13%	9.67%	6.93%	6.99%
Single-Factor Alpha t-Stat		(0.275)	(0.294)	1.316	1.405	2.135	2.487	2.067	2.530	2.017	2.193
Single-Factor Beta		0.669	0.679	0.872	0.867	0.934	0.884	0.939	0.886	0.969	0.925
Four-Factor Alpha		-0.30%	-0.57%	9.40%	8.93%	12.92%	13.90%	12.58%	13.94%	12.22%	11.90%
Four-Factor Alpha t-Stat		(0.296)	(0.600)	3.606	3.918	4.284	5.088	4.181	5.227	4.515	4.930
Beta - Market		0.641	0.652	0.814	0.820	0.858	0.813	0.869	0.819	0.900	0.859
Beta - SMB		0.015	0.009	0.577	0.553	0.489	0.560	0.476	0.545	0.474	0.518
Beta - HML		0.077	0.031	(0.249)	(0.238)	(0.206)	(0.288)	(0.214)	(0.288)	(0.178)	(0.241)
Beta - Momentum		(0.007)	(0.041)	0.091	0.039	0.228	0.179	0.219	0.179	0.318	0.293

Panel B: Portfolios of 250 Funds with the Highest Conditional Alpha

	Benchmark	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	10.06%	7.90%	8.09%	12.51%	13.19%	13.69%	14.44%	13.80%	14.52%	13.48%	14.24%
Arithmetic mean	11.40%	8.94%	9.24%	13.99%	14.54%	15.15%	15.83%	15.28%	15.91%	14.98%	15.60%
Volatility	16.28%	14.41%	15.13%	17.25%	16.47%	17.31%	16.83%	17.44%	16.90%	17.50%	16.58%
Sharpe ratio	0.449	0.336	0.340	0.573	0.634	0.638	0.697	0.641	0.699	0.621	0.693
p-Val for Fund SR $\leq$ Bmk SR		78%	90%	19%	8%	8%	3%	8%	3%	9%	2%
Realized Utility		5.79%	5.77%	9.37%	10.29%	10.45%	11.35%	10.52%	11.40%	10.19%	11.25%
p-Val for Fund ARU $\leq$ Bmk ARU		85%	94%	17%	7%	7%	3%	7%	3%	8%	2%
Outperformance Frequency		37%	38%	52%	54%	50%	56%	51%	55%	51%	55%
Single-Factor Alpha		-1.51%	-1.57%	3.38%	4.01%	4.42%	5.15%	4.44%	5.15%	4.04%	4.56%
Single-Factor Alpha t-Stat		(1.079)	(1.676)	1.463	1.890	1.828	2.238	1.820	2.214	1.742	2.192
Single-Factor Beta		0.834	0.902	0.898	0.878	0.904	0.888	0.912	0.892	0.932	0.907
Four-Factor Alpha		-1.59%	-1.65%	6.10%	6.71%	7.32%	8.71%	7.38%	8.73%	7.68%	8.35%
Four-Factor Alpha t-Stat		(1.220)	(1.753)	3.793	4.461	4.061	5.450	4.103	5.467	4.381	5.662
Beta - Market		0.805	0.871	0.865	0.851	0.855	0.847	0.864	0.853	0.887	0.858
Beta - SMB		(0.021)	(0.013)	0.375	0.372	0.400	0.428	0.408	0.431	0.386	0.378
Beta - HML		0.120	0.087	(0.155)	(0.147)	(0.181)	(0.185)	(0.191)	(0.193)	(0.146)	(0.126)
Beta - Momentum		(0.011)	(0.024)	0.052	0.037	0.132	0.131	0.130	0.134	0.190	0.203

Table B4: Robustness to Fund Universe Size, Continued

This table shows the effect of imposing different constraints on the universe of funds available for forming the investor's portfolios. All results are based on performance during the out-of-sample period from 06/1993 - 02/2008. The baseline scenario selected the 50 funds with the highest conditional alpha and assumed no restrictions on the changes in the weights, but capped holdings in individual funds to a maximum of 10% of the portfolio. Panels A & B test the portfolio performance when the initial sort selects the 25 funds and 250 funds, respectively, with the highest conditional alphas. Panel C tests the portfolio performance when there is no initial sort based on a fund's conditional alpha. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

Panel C: Portfolios of All Funds

	Benchmark	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	10.06%	8.24%	8.92%	9.99%	10.13%	10.10%	10.05%	10.10%	10.05%	9.93%	10.04%
Arithmetic mean	11.40%	9.39%	10.13%	11.25%	11.39%	11.33%	11.27%	11.33%	11.28%	11.15%	11.27%
Volatility	16.28%	15.12%	15.48%	15.76%	15.78%	15.62%	15.61%	15.62%	15.62%	15.59%	15.59%
Sharpe ratio	0.449	0.350	0.390	0.454	0.462	0.463	0.459	0.463	0.460	0.452	0.460
p-Val for Fund SR $\leq$ Bmk SR		91%	78%	42%	37%	35%	37%	35%	37%	40%	37%
Realized Utility		5.92%	6.48%	7.44%	7.57%	7.58%	7.53%	7.58%	7.53%	7.42%	7.53%
p-Val for Fund ARU $\leq$ Bmk ARU		95%	84%	46%	41%	41%	43%	41%	43%	47%	43%
Outperformance Frequency		45%	46%	52%	51%	50%	50%	50%	50%	50%	50%
Single-Factor Alpha		-1.50%	-0.82%	0.23%	0.37%	0.06%	0.22%	0.06%	0.22%	-0.12%	0.19%
Single-Factor Alpha t-Stat		(1.884)	(0.967)	0.219	0.353	0.052	0.203	0.052	0.206	(0.107)	0.173
Single-Factor Beta		0.911	0.930	0.938	0.940	0.939	0.932	0.940	0.932	0.938	0.933
Four-Factor Alpha		-1.10%	0.00%	1.54%	1.65%	1.39%	1.65%	1.39%	1.65%	1.34%	1.66%
Four-Factor Alpha t-Stat		(1.407)	(0.003)	1.741	1.871	1.502	1.818	1.505	1.821	1.443	1.833
Beta - Market		0.892	0.909	0.913	0.916	0.914	0.909	0.914	0.909	0.913	0.910
Beta - SMB		0.053	0.100	0.163	0.167	0.163	0.174	0.164	0.175	0.163	0.172
Beta - HML		0.025	(0.009)	(0.040)	(0.043)	(0.049)	(0.052)	(0.049)	(0.052)	(0.046)	(0.049)
Beta - Momentum		(0.017)	(0.018)	0.022	0.006	0.042	0.027	0.042	0.026	0.042	0.030

Table B5: Robustness to Investor Trading Strategy Restrictions

This table shows the effect of imposing different constraints on the portfolio weights. All results are based on performance during the out-of-sample period from 06/1993 - 02/2008. The baseline scenario selected the 50 funds with the highest conditional alpha and assumed no restrictions on the changes in the weights, but capped holdings in individual funds to a maximum of 10% of the portfolio. Panel A lifts the constraints on the portfolio weights which are no longer capped at 10%, although short sales are still ruled out. Panel B limits the maximum position in individual funds to 5% of the portfolio. Panel C restricts changes in the portfolio weights so the fund cannot divest more than 5% per quarter, which has the effect of reducing turnover. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

Panel A: No Maximum Weight Restrictions

	Benchmark	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	10.06%	7.23%	5.73%	16.14%	15.76%	22.55%	22.12%	22.71%	22.05%	19.43%	19.83%
Arithmetic mean	11.40%	8.36%	7.12%	18.09%	17.66%	25.87%	25.43%	26.05%	25.35%	22.08%	22.84%
Volatility	16.28%	14.91%	16.45%	20.05%	19.80%	27.09%	27.08%	27.18%	27.01%	23.82%	25.47%
Sharpe ratio	0.449	0.286	0.183	0.697	0.685	0.803	0.788	0.807	0.787	0.755	0.736
p-Val for Fund SR $\leq$ Bmk SR		90%	99%	15%	16%	11%	13%	10%	13%	11%	17%
Realized Utility		5.00%	3.07%	11.76%	11.50%	14.24%	13.85%	14.34%	13.82%	13.13%	12.65%
p-Val for Fund ARU $\leq$ Bmk ARU		92%	100%	10%	11%	5%	7%	4%	7%	6%	10%
Outperformance Frequency		44%	40%	56%	59%	58%	60%	58%	60%	53%	53%
Single-Factor Alpha		-2.09%	-3.22%	6.06%	5.92%	15.18%	16.18%	15.54%	16.13%	11.03%	11.39%
Single-Factor Alpha t-Stat		(1.310)	(1.950)	1.544	1.515	2.655	2.796	2.721	2.793	2.381	2.197
Single-Factor Beta		0.858	0.920	0.889	0.875	1.003	0.915	1.007	0.910	0.969	0.987
Four-Factor Alpha		-2.86%	-2.90%	9.22%	9.08%	22.78%	23.19%	22.85%	23.10%	18.19%	20.42%
Four-Factor Alpha t-Stat		(1.831)	(1.658)	3.095	3.023	4.735	4.900	4.763	4.910	4.756	4.968
Beta - Market		0.822	0.900	0.842	0.840	0.819	0.755	0.827	0.762	0.851	0.853
Beta - SMB		(0.155)	(0.085)	0.502	0.496	0.749	0.625	0.719	0.608	0.616	0.644
Beta - HML		0.186	0.096	(0.190)	(0.197)	(0.170)	(0.188)	(0.169)	(0.195)	(0.170)	(0.160)
Beta - Momentum		(0.041)	0.065	0.039	0.053	0.338	0.299	0.300	0.301	0.371	0.556

Panel B: 5% Maximum Weight

	Benchmark	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	10.06%	7.05%	6.28%	11.94%	12.59%	14.72%	14.65%	14.60%	14.51%	14.48%	13.59%
Arithmetic mean	11.40%	7.90%	7.17%	13.75%	14.16%	16.48%	16.32%	16.42%	16.18%	16.31%	15.18%
Volatility	16.28%	12.95%	13.31%	19.18%	17.78%	19.20%	18.58%	19.46%	18.55%	19.52%	17.96%
Sharpe ratio	0.449	0.294	0.231	0.503	0.566	0.645	0.658	0.633	0.651	0.626	0.617
p-Val for Fund SR $\leq$ Bmk SR		86%	96%	45%	27%	13%	11%	15%	12%	17%	15%
Realized Utility		5.36%	4.50%	8.11%	9.26%	10.72%	10.92%	10.51%	10.79%	10.38%	10.15%
p-Val for Fund ARU $\leq$ Bmk ARU		92%	97%	39%	23%	9%	8%	11%	9%	11%	12%
Outperformance Frequency		38%	37%	54%	53%	51%	53%	52%	55%	49%	53%
Single-Factor Alpha		-1.26%	-1.63%	3.87%	4.09%	6.34%	6.60%	6.28%	6.33%	5.76%	4.28%
Single-Factor Alpha t-Stat		(1.354)	(1.850)	1.246	1.432	2.041	2.197	2.003	2.091	1.875	1.618
Single-Factor Beta		0.739	0.727	0.885	0.845	0.917	0.878	0.928	0.878	0.955	0.925
Four-Factor Alpha		-1.29%	-2.03%	7.79%	7.51%	9.87%	10.81%	9.81%	10.49%	10.57%	8.67%
Four-Factor Alpha t-Stat		(1.410)	(2.201)	3.628	3.869	4.276	5.110	4.242	4.986	4.426	4.542
Beta - Market		0.708	0.702	0.832	0.819	0.858	0.825	0.871	0.829	0.900	0.871
Beta - SMB		(0.013)	(0.015)	0.476	0.495	0.414	0.518	0.420	0.512	0.427	0.447
Beta - HML		0.101	0.057	(0.189)	(0.232)	(0.204)	(0.259)	(0.213)	(0.265)	(0.165)	(0.200)
Beta - Momentum		0.002	(0.032)	0.080	0.043	0.183	0.136	0.164	0.136	0.259	0.224

Table B5: Robustness to Investor Trading Strategy Restrictions, Continued

This table shows the effect of imposing different constraints on the portfolio weights. All results are based on performance during the out-of-sample period from 06/1993 - 02/2008. The baseline scenario selected the 50 funds with the highest conditional alpha and assumed no restrictions on the changes in the weights, but capped holdings in individual funds to a maximum of 10% of the portfolio. Panel A lifts the constraints on the portfolio weights which are no longer capped at 10%, although short sales are still ruled out. Panel B limits the maximum position in individual funds to 5% of the portfolio. Panel C restricts changes in the portfolio weights so the fund cannot divest more than 5% per quarter, which has the effect of reducing turnover. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

Panel C: Limit Buy/Sell to 5% per Quarter

	Benchmark	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	10.06%	7.00%	5.96%	11.39%	12.91%	14.74%	14.43%	14.64%	14.03%	14.50%	13.46%
Arithmetic mean	11.40%	7.84%	6.79%	13.17%	14.50%	16.49%	16.07%	16.44%	15.70%	16.33%	15.07%
Volatility	16.28%	12.92%	12.75%	18.98%	17.89%	19.11%	18.44%	19.34%	18.57%	19.51%	18.07%
Sharpe ratio	0.449	0.290	0.211	0.478	0.581	0.648	0.649	0.638	0.625	0.627	0.607
p-Val for Fund SR $\leq$ Bmk SR		87%	95%	51%	25%	13%	12%	14%	16%	17%	18%
Realized Utility		5.31%	4.34%	7.66%	9.53%	10.78%	10.75%	10.60%	10.32%	10.40%	9.99%
p-Val for Fund ARU $\leq$ Bmk ARU		92%	97%	45%	20%	9%	9%	10%	12%	11%	14%
Outperformance Frequency		42%	41%	53%	54%	50%	54%	52%	53%	50%	49%
Single-Factor Alpha		-1.36%	-1.46%	3.44%	4.29%	6.32%	6.25%	6.27%	5.79%	5.65%	4.23%
Single-Factor Alpha t-Stat		(1.334)	(1.684)	1.124	1.484	2.059	2.083	2.024	1.921	1.844	1.575
Single-Factor Beta		0.740	0.683	0.872	0.853	0.918	0.870	0.926	0.878	0.958	0.925
Four-Factor Alpha		-1.47%	-1.74%	7.35%	7.74%	9.84%	10.45%	9.80%	9.97%	10.30%	8.70%
Four-Factor Alpha t-Stat		(1.530)	(1.946)	3.450	4.003	4.316	4.978	4.254	4.761	4.312	4.375
Beta - Market		0.713	0.652	0.823	0.826	0.861	0.815	0.868	0.826	0.903	0.877
Beta - SMB		(0.011)	(0.026)	0.468	0.484	0.416	0.504	0.413	0.504	0.412	0.460
Beta - HML		0.104	0.083	(0.184)	(0.221)	(0.203)	(0.253)	(0.205)	(0.269)	(0.152)	(0.213)
Beta - Momentum		0.010	(0.008)	0.080	0.057	0.172	0.144	0.156	0.145	0.253	0.225

Table B6: Portfolio Performance with Unrestricted Covariance Matrix

This table shows the ou tof sample portfolio performance for the different strategies with an unrestricted covariance matrix for return residuals. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Results are based on the benchmark out-of-sample portfolio selection exercise that reviews portfolio weights every quarter, limits the maximum holdings in any one fund to 10%, rules out short-selling and uses the short-term Euribor, the default spread, the term spread and the dividend yield to capture time-variations in the conditional alpha and factor loadings with beliefs specified so that $\sigma_\alpha = 10\%/\text{Month}$. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP
Panel A: Full Sample Results						
Geometric mean	10.06%	8.51%	13.08%	13.19%	13.32%	13.89%
Arithmetic mean	11.40%	9.65%	14.56%	14.72%	14.90%	15.40%
Volatility	16.28%	14.99%	17.22%	17.74%	18.02%	17.59%
Sharpe ratio	0.449	0.370	0.607	0.599	0.599	0.642
p-Value for Fund SR $\leq$ Bmk SR		77%	17%	18%	18%	9%
Realized Utility	7.48%	6.23%	9.93%	9.83%	9.85%	10.55%
p-Val for Fund ARU $\leq$ Bmk ARU		84%	14%	15%	15%	8%
Outperformance Frequency		42%	56%	50%	51%	49%
Single-Factor Alpha		-1.28%	4.54%	4.71%	4.89%	5.13%
Single-Factor Alpha t-Stat		(1.183)	1.743	1.749	1.775	2.000
Single-Factor Beta		0.896	0.841	0.868	0.877	0.887
Four-Factor Alpha		-1.47%	8.50%	8.84%	9.07%	9.34%
Four-Factor Alpha t-Stat		(1.388)	4.845	4.610	4.728	5.081
Beta - Market		0.877	0.797	0.821	0.828	0.845
Beta - SMB		0.013	0.464	0.472	0.467	0.460
Beta - HML		0.069	(0.171)	(0.227)	(0.224)	(0.209)
Beta - Momentum		0.013	0.088	0.177	0.177	0.210
Panel B: Sub-Sample Results - 1993-2000						
Geometric mean	18.33%	16.65%	18.40%	19.38%	19.63%	20.60%
Arithmetic mean	19.49%	17.64%	19.97%	21.01%	21.32%	22.18%
Volatility	15.31%	14.15%	18.03%	18.58%	18.92%	18.20%
Sharpe ratio	0.941	0.888	0.826	0.858	0.859	0.940
p-Value for Fund SR $\leq$ Bmk SR		70%	70%	62%	62%	55%
Realized Utility	16.02%	15.61%	17.04%	18.39%	18.61%	19.19%
p-Val for Fund ARU $\leq$ Bmk ARU		88%	54%	40%	38%	32%
Outperformance Frequency		47%	47%	43%	43%	43%
Single-Factor Alpha		0.39%	5.77%	5.96%	6.31%	7.26%
Single-Factor Alpha t-Stat		0.230	1.300	1.269	1.303	1.665
Single-Factor Beta		0.886	0.847	0.882	0.888	0.893
Four-Factor Alpha		-2.52%	10.08%	13.19%	13.68%	14.20%
Four-Factor Alpha t-Stat		(1.475)	3.924	5.456	5.617	5.725
Beta - Market		0.874	0.731	0.762	0.763	0.800
Beta - SMB		(0.094)	0.375	0.379	0.379	0.394
Beta - HML		0.172	0.009	(0.086)	(0.089)	(0.092)
Beta - Momentum		(0.070)	0.241	0.302	0.303	0.319
Panel C: Sub-Sample Results - 2001-2008						
Geometric mean	1.17%	-0.23%	7.36%	6.52%	6.53%	6.66%
Arithmetic mean	2.65%	0.99%	8.70%	7.92%	7.96%	8.06%
Volatility	16.99%	15.54%	16.24%	16.67%	16.87%	16.76%
Sharpe ratio	(0.023)	(0.132)	0.348	0.292	0.291	0.299
p-Value for Fund SR $\leq$ Bmk SR		71%	3%	6%	6%	3%
Realized Utility	-1.62%	-2.44%	3.37%	1.92%	1.76%	2.57%
p-Val for Fund ARU $\leq$ Bmk ARU		58%	2%	7%	7%	3%
Outperformance Frequency		38%	66%	56%	59%	55%
Single-Factor Alpha		-3.90%	4.46%	2.49%	2.85%	1.76%
Single-Factor Alpha t-Stat		(3.048)	2.039	1.062	1.231	0.732
Single-Factor Beta		0.948	0.904	0.949	0.961	0.991
Four-Factor Alpha		-3.40%	6.61%	4.92%	5.69%	3.71%
Four-Factor Alpha t-Stat		(3.223)	3.982	2.587	3.106	1.893
Beta - Market		0.961	0.854	0.833	0.845	0.892
Beta - SMB		0.118	0.485	0.434	0.404	0.404
Beta - HML		(0.044)	(0.218)	(0.134)	(0.111)	(0.131)
Beta - Momentum		(0.016)	0.020	0.204	0.217	0.197

Table B7: Robustness to Investor Beliefs

This table shows how the tightness of investor priors affects the out of sample portfolio performance. All results are based on performance during the out-of-sample period from 06/1993 - 02/2008. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Assumptions are identical to those from the baseline scenario, i.e., portfolio weights are set every quarter, maximum holdings in individual funds is capped at 10%, short-selling is ruled out and the state variables used to capture time-variations in the conditional alpha and factor loadings are the term spread, the dividend yield, the default spread, and the short-term interest rate. Each panel shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding panel header.

	Sigma Alpha						Sigma Alpha					
	0.10%	1.00%	5.00%	10.00%	50.00%	100.00%	0.10%	1.00%	5.00%	10.00%	50.00%	100.00%
	Panel A: BCAPM-A						Panel B: BSMA-A					
Geometric mean	9.56%	13.77%	13.61%	13.61%	13.62%	13.62%	7.37%	15.35%	17.31%	16.96%	16.78%	16.77%
Arithmetic mean	10.18%	15.32%	15.28%	15.29%	15.30%	15.30%	8.45%	16.97%	19.34%	18.98%	18.80%	18.80%
Volatility	11.16%	17.64%	18.40%	18.44%	18.46%	18.46%	14.65%	18.34%	20.76%	20.72%	20.76%	20.76%
Sharpe ratio	0.544	0.636	0.608	0.607	0.607	0.607	0.297	0.702	0.734	0.718	0.708	0.708
p-Val for Fund SR $\leq$ Bmk SR	14%	15%	21%	22%	22%	22%	87%	7%	8%	9%	11%	11%
Realized Utility	8.22%	10.45%	10.01%	9.99%	10.00%	10.00%	5.21%	11.67%	12.54%	12.22%	12.03%	12.02%
p-Val for Fund ARU $\leq$ Bmk ARU	37%	12%	17%	17%	17%	17%	90%	5%	4%	5%	6%	6%
Outperformance Frequency	44%	55%	54%	54%	54%	54%	42%	55%	57%	54%	54%	54%
Single-Factor Alpha	1.18%	4.61%	4.89%	4.90%	4.92%	4.92%	-1.45%	7.21%	9.84%	9.51%	9.38%	9.38%
Single-Factor Alpha t-Stat	0.709	1.635	1.589	1.586	1.591	1.591	(1.109)	2.332	2.577	2.477	2.432	2.432
Single-Factor Beta	0.558	0.863	0.864	0.864	0.864	0.864	0.803	0.857	0.887	0.880	0.878	0.878
Four-Factor Alpha	2.38%	8.37%	8.49%	8.51%	8.50%	8.50%	-0.90%	11.73%	14.00%	13.76%	13.63%	13.63%
Four-Factor Alpha t-Stat	1.759	4.184	3.921	3.915	3.908	3.907	(0.669)	5.207	5.177	5.079	4.994	4.994
Beta - Market	0.507	0.829	0.824	0.824	0.824	0.824	0.778	0.799	0.818	0.807	0.803	0.803
Beta - SMB	0.135	0.495	0.489	0.489	0.488	0.488	0.045	0.515	0.553	0.560	0.565	0.565
Beta - HML	(0.007)	(0.203)	(0.222)	(0.222)	(0.222)	(0.222)	0.003	(0.219)	(0.287)	(0.287)	(0.285)	(0.285)
Beta - Momentum	0.132	0.059	0.045	0.044	0.042	0.042	0.039	0.201	0.172	0.168	0.160	0.160

Table B7: Robustness to Investor Beliefs, Continued

This table shows how the tightness of investor priors affects the out of sample portfolio performance. All results are based on performance during the out-of-sample period from 06/1993 - 02/2008. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Assumptions are identical to those from the baseline scenario, i.e., portfolio weights are set every quarter, maximum holdings in individual funds is capped at 10%, short-selling is ruled out and the state variables used to capture time-variations in the conditional alpha and factor loadings are the term spread, the dividend yield, the default spread, and the short-term interest rate. Each panel shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding panel header.

	Sigma Alpha						Sigma Alpha					
	0.10%	1.00%	5.00%	10.00%	50.00%	100.00%	0.10%	1.00%	5.00%	10.00%	50.00%	100.00%
	Panel C: BAMA-A						Panel D: BAMAP-A					
Geometric mean	15.57%	15.50%	16.42%	17.00%	16.96%	16.81%	13.73%	15.27%	15.88%	15.94%	15.76%	15.75%
Arithmetic mean	17.64%	17.56%	18.44%	19.02%	18.98%	18.83%	15.57%	17.14%	17.71%	17.77%	17.58%	17.56%
Volatility	20.99%	20.92%	20.68%	20.67%	20.74%	20.76%	19.41%	19.64%	19.44%	19.47%	19.38%	19.37%
Sharpe ratio	0.645	0.643	0.693	0.721	0.717	0.710	0.591	0.664	0.700	0.702	0.696	0.695
p-Val for Fund SR $\leq$ Bmk SR	19%	19%	11%	9%	9%	10%	25%	14%	10%	9%	10%	10%
Realized Utility	10.78%	10.74%	11.72%	12.28%	12.21%	12.05%	9.73%	11.10%	11.76%	11.80%	11.67%	11.66%
p-Val for Fund ARU $\leq$ Bmk ARU	12%	12%	7%	5%	5%	6%	19%	9%	6%	6%	6%	6%
Outperformance Frequency	55%	53%	55%	56%	55%	54%	49%	51%	51%	51%	51%	51%
Single-Factor Alpha	7.84%	7.81%	8.87%	9.49%	9.50%	9.39%	4.87%	6.61%	6.98%	6.98%	6.96%	6.95%
Single-Factor Alpha t-Stat	2.044	2.061	2.344	2.492	2.469	2.436	1.542	2.007	2.135	2.132	2.141	2.140
Single-Factor Beta	0.918	0.912	0.890	0.883	0.880	0.879	0.939	0.926	0.923	0.926	0.918	0.918
Four-Factor Alpha	11.76%	12.12%	13.10%	13.74%	13.82%	13.64%	10.08%	11.95%	12.30%	12.30%	12.24%	12.23%
Four-Factor Alpha t-Stat	4.673	4.864	4.991	5.185	5.098	5.004	4.340	4.810	4.918	4.912	4.926	4.925
Beta - Market	0.869	0.862	0.834	0.816	0.807	0.805	0.878	0.848	0.849	0.853	0.842	0.841
Beta - SMB	0.534	0.564	0.540	0.545	0.566	0.565	0.509	0.510	0.507	0.509	0.498	0.497
Beta - HML	(0.327)	(0.345)	(0.311)	(0.288)	(0.290)	(0.287)	(0.242)	(0.211)	(0.212)	(0.215)	(0.200)	(0.199)
Beta - Momentum	0.149	0.161	0.184	0.176	0.166	0.160	0.323	0.341	0.352	0.350	0.347	0.346

Table B8: Robustness to using Country Momentum Factor

This table shows the sensitivity of our results with regard to changing how the momentum factor in the four-factor alpha model is constructed. The baseline analysis assumes that the sector momentum factor is constructed based on the prior 12-month return performance of the 18 super sectors tracked by the STOXX indices. It then constructs the realized momentum factor as the difference between the equal-weighted return on the top-six and the bottom-six sectors. This exercise is then repeated every month to get a time-series of momentum realizations. The country momentum factor uses the same methodology, but now applied to the 16 MSCI Europe country indices. For this case we consider the equal-weighted return on the top-three countries relative to the equal-weighted return on the bottom-three countries. All other assumptions from the baseline scenario remain valid, i.e., portfolio weights are set every quarter, maximum holdings in individual funds is capped at 10%, short-selling is ruled out and the state variables used to capture time-variations in the conditional alpha and factor loadings are the term spread, the dividend yield, the default spread, and the short-term interest rate. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header. All results are based on performance during the out-of-sample period from 06/1993 - 02/2008. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas.

Panel A: Pan-European Benchmark Models

	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP
Geometric mean	10.06%	7.43%	12.65%	15.94%	14.47%	14.06%
Arithmetic mean	11.40%	8.60%	14.45%	18.06%	16.59%	16.14%
Volatility	16.28%	15.20%	19.09%	21.19%	21.21%	20.88%
Sharpe ratio	0.449	0.296	0.542	0.659	0.589	0.576
p-Val for Fund SR $\leq$ Bmk SR		94%	37%	17%	30%	30%
Realized Utility		5.10%	8.82%	11.06%	9.63%	9.40%
p-Val for Fund ARU $\leq$ Bmk ARU		97%	31%	10%	21%	22%
Outperformance Frequency		36%	57%	49%	50%	51%
Single-Factor Alpha		-2.16%	4.02%	8.08%	6.76%	5.24%
Single-Factor Alpha t-Stat		(1.781)	1.202	2.122	1.760	1.541
Single-Factor Beta		0.894	0.848	0.948	0.937	1.001
Four-Factor Alpha		-2.12%	7.65%	11.99%	10.48%	9.83%
Four-Factor Alpha t-Stat		(1.765)	2.854	3.611	3.153	3.367
Beta - Market		0.859	0.834	0.965	0.956	1.012
Beta - SMB		(0.021)	0.473	0.426	0.384	0.419
Beta - HML		0.084	(0.223)	(0.238)	(0.207)	(0.213)
Beta - Momentum		0.045	0.105	0.031	0.015	0.036

Panel B: Local Market Augmented Benchmark Models

	Benchmark	CAPM-A	BCAPM-A	BSMA-A	BAMA-A	BAMAP-A
Geometric mean	10.06%	7.49%	14.19%	16.24%	15.41%	14.75%
Arithmetic mean	11.40%	8.86%	15.86%	18.28%	17.38%	16.63%
Volatility	16.28%	16.41%	18.41%	20.77%	20.41%	19.70%
Sharpe ratio	0.449	0.290	0.639	0.683	0.651	0.636
p-Val for Fund SR $\leq$ Bmk SR		98%	18%	14%	17%	17%
Realized Utility		4.80%	10.56%	11.52%	10.88%	10.58%
p-Val for Fund ARU $\leq$ Bmk ARU		99%	14%	8%	11%	11%
Outperformance Frequency		40%	55%	52%	51%	51%
Single-Factor Alpha		-2.32%	5.23%	9.09%	8.44%	6.33%
Single-Factor Alpha t-Stat		(2.064)	1.627	2.383	2.266	1.997
Single-Factor Beta		0.965	0.845	0.888	0.871	0.943
Four-Factor Alpha		-2.59%	9.15%	13.43%	12.56%	10.94%
Four-Factor Alpha t-Stat		(2.197)	3.566	4.237	4.111	3.936
Beta - Market		0.944	0.853	0.905	0.889	0.953
Beta - SMB		0.003	0.500	0.548	0.497	0.474
Beta - HML		0.033	(0.286)	(0.345)	(0.315)	(0.285)
Beta - Momentum		0.022	0.083	0.037	0.031	0.076

Table B9: Out-of-Sample Performance of Short and Long Stock Portfolios

This table presents performance statistics for portfolios that allow short-selling of Individual Stocks. Panel A considers the ability of the stock selection methodology to identify underperformers by studying a portfolio with short-only positions. Panel B reports the performance of a 2:1 leveraged portfolio that takes a 200% long position in stocks financed by using a 100% short position in benchmark and country indices. Panel C reports the performance of a self-financing portfolio that takes a long position in stocks financed by using a short position in benchmark and country indices with the objective of maintaining zero exposure to the market risk factor. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Results are reported for the out-of-sample period 06/1993 - 02/2008 and assume quarterly rebalancing. The short-term Euribor, the default spread, the term spread and the dividend yield are used as predictive variables, and beliefs are specified so that $\sigma_\alpha = 10\%$/Month. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Panel A: Short Portfolio Performance										
Geometric mean	-6.97%	-9.60%	-9.64%	-9.78%	-5.85%	-8.29%	-15.87%	-13.75%	-13.69%	-16.60%
Arithmetic mean	-4.40%	-7.28%	-6.76%	-6.93%	-3.17%	-5.86%	-11.97%	-10.04%	-9.79%	-12.88%
Volatility	22.88%	21.55%	24.52%	24.33%	23.40%	22.17%	28.19%	27.52%	28.44%	27.48%
Sharpe ratio	(0.372)	(0.528)	(0.443)	(0.454)	(0.311)	(0.449)	(0.570)	(0.514)	(0.488)	(0.618)
p-Value for Stock SR $\leq$ Bmk SR	85%	77%	81%	81%	87%	81%	72%	76%	77%	69%
Realized Utility	-3.33%	0.39%	-2.15%	-1.84%	-4.90%	-1.42%	0.09%	-1.23%	-2.23%	1.56%
p-Val for Stock ARU $\leq$ Bmk ARU	88%	79%	84%	83%	91%	84%	76%	80%	82%	72%
Outperformance Frequency	36%	33%	36%	37%	34%	34%	33%	34%	32%	34%
Single-Factor Alpha	-12.27%	-13.79%	-15.56%	-16.23%	-11.14%	-13.83%	-23.10%	-21.51%	-20.39%	-23.04%
Single-Factor Alpha t-Stat	(2.568)	(3.093)	(2.643)	(2.830)	(2.107)	(2.811)	(3.439)	(3.364)	(2.986)	(3.490)
Single-Factor Beta	0.779	0.690	0.710	0.731	0.726	0.707	0.824	0.870	0.802	0.774
Four-Factor Alpha	-9.11%	-9.12%	-11.47%	-11.48%	-6.53%	-10.31%	-19.51%	-19.34%	-15.18%	-19.24%
Four-Factor Alpha t-Stat	(1.910)	(1.993)	(1.896)	(1.957)	(1.225)	(2.093)	(3.012)	(3.115)	(2.260)	(2.951)
Beta - Market	0.731	0.619	0.504	0.516	0.625	0.647	0.656	0.727	0.575	0.592
Beta - SMB	0.365	0.390	0.596	0.618	0.704	0.697	1.116	1.024	0.976	0.928
Beta - HML	(0.123)	(0.029)	(0.037)	(0.021)	(0.224)	(0.278)	(0.531)	(0.520)	(0.348)	(0.382)
Beta - Momentum	0.055	0.037	0.033	(0.046)	(0.125)	(0.207)	(0.422)	(0.458)	(0.257)	(0.376)
Panel B: 2:1 Leverage Portfolio Performance										
Geometric mean	12.19%	19.54%	18.73%	20.04%	23.79%	22.24%	23.05%	23.13%	22.45%	33.56%
Arithmetic mean	18.15%	23.87%	26.41%	29.03%	30.42%	28.16%	32.30%	30.94%	30.79%	43.51%
Volatility	33.09%	28.53%	37.77%	39.05%	36.11%	34.09%	43.54%	40.01%	41.38%	45.88%
Sharpe ratio	0.425	0.693	0.591	0.639	0.729	0.706	0.648	0.671	0.645	0.859
p-Value for Stock SR $\leq$ Bmk SR	69%	35%	51%	47%	33%	35%	43%	39%	43%	18%
Realized Utility	1.63%	11.19%	4.55%	5.56%	10.09%	10.08%	3.11%	6.21%	4.43%	10.20%
p-Val for Stock ARU $\leq$ Bmk ARU	75%	32%	64%	60%	40%	40%	69%	56%	64%	38%
Outperformance Frequency	53%	60%	59%	62%	60%	61%	56%	54%	55%	57%
Single-Factor Alpha	9.83%	16.69%	14.08%	16.89%	23.92%	20.10%	21.96%	20.22%	21.34%	32.79%
Single-Factor Alpha t-Stat	1.168	2.569	1.610	1.814	2.732	2.527	2.217	2.097	2.124	3.084
Single-Factor Beta	0.735	0.802	1.187	1.165	0.852	0.930	1.259	1.076	1.057	1.256
Four-Factor Alpha	7.62%	14.53%	9.89%	13.19%	24.19%	19.22%	22.64%	22.64%	20.26%	30.85%
Four-Factor Alpha t-Stat	0.874	2.155	1.054	1.350	2.668	2.457	2.289	2.294	1.980	2.939
Beta - Market	0.653	0.693	1.253	1.207	0.686	0.769	1.173	1.080	0.971	1.186
Beta - SMB	(0.454)	(0.169)	(0.051)	(0.250)	(0.052)	(0.080)	0.217	0.289	0.029	0.016
Beta - HML	0.354	0.038	(0.309)	(0.156)	0.106	0.075	(0.210)	(0.287)	(0.011)	(0.198)
Beta - Momentum	0.146	0.040	(0.334)	(0.033)	0.304	0.305	(0.174)	0.156	(0.119)	0.219

Table B9: Out-of-Sample Performance of Short and Long Stock Portfolios, Continued

This table presents performance statistics for portfolios that allow short-selling of Individual Stocks. Panel A considers the ability of the stock selection methodology to identify underperformers by studying a portfolio with short-only positions. Panel B reports the performance of a 2:1 leveraged portfolio that takes a 200% long position in stocks financed by using a 100% short position in benchmark and country indices. Panel C reports the performance of a self-financing portfolio that takes a long position in stocks financed by using a short position in benchmark and country indices with the objective of maintaining zero exposure to the market risk factor. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Results are reported for the out-of-sample period 06/1993 - 02/2008 and assume quarterly rebalancing. The short-term Euribor, the default spread, the term spread and the dividend yield are used as predictive variables, and beliefs are specified so that $\sigma_\alpha = 10\%/\text{Month}$. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

Panel C: Self-Financing Portfolio Performance - Market Factor Neutral

	CAPM	CAPM-A	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Geometric mean	5.29%	7.14%	12.47%	17.95%	23.64%	19.66%	17.41%	16.69%	23.83%	16.52%
Arithmetic mean	5.32%	8.11%	18.56%	23.75%	26.31%	22.50%	26.15%	23.12%	31.37%	24.64%
Volatility	2.50%	13.95%	31.42%	31.66%	23.68%	24.24%	42.76%	35.75%	38.53%	39.65%
Sharpe ratio	0.488	0.288	0.460	0.621	0.938	0.759	0.516	0.532	0.708	0.518
p-Value for Stock SR $\leq$ Bmk SR	15%	62%	63%	47%	13%	27%	58%	55%	38%	58%
Realized Utility	5.20%	5.17%	3.61%	8.30%	17.20%	13.23%	-1.60%	3.64%	8.31%	0.75%
p-Val for Stock ARU $\leq$ Bmk ARU	69%	66%	66%	49%	7%	20%	81%	66%	48%	73%
Outperformance Frequency	37%	46%	58%	64%	56%	58%	49%	59%	59%	55%
Single-Factor Alpha	1.23%	4.18%	14.47%	19.78%	22.80%	20.92%	24.90%	19.40%	26.04%	18.23%
Single-Factor Alpha t-Stat	1.843	1.112	1.709	2.328	3.688	3.283	2.252	2.049	2.615	1.739
Single-Factor Beta	0.017	0.067	0.246	0.308	0.164	0.090	0.195	0.152	0.274	0.370
Four-Factor Alpha	1.11%	2.41%	7.91%	15.68%	22.37%	22.30%	19.93%	17.42%	19.87%	13.44%
Four-Factor Alpha t-Stat	1.525	0.606	0.918	1.759	3.646	3.377	1.781	1.781	1.954	1.227
Beta - Market	0.015	0.083	0.471	0.503	0.231	0.158	0.221	0.169	0.329	0.380
Beta - SMB	(0.004)	(0.155)	(0.207)	(0.048)	0.111	0.101	(0.368)	(0.267)	(0.461)	(0.524)
Beta - HML	0.002	(0.017)	(0.554)	(0.507)	(0.346)	(0.223)	(0.052)	(0.113)	0.031	0.129
Beta - Momentum	0.011	(0.025)	(0.453)	(0.447)	(0.008)	0.135	(0.141)	0.137	0.038	(0.038)

Table B10: Sub-Sample Performance of Portfolios Investing in Individual Stocks

This table shows the out of sample portfolio performance for the different strategies investing in individual stocks during the out-of-sample period 06/1993-12/2000 (Panel A) and 01/2001-02/2008 (Panel B). The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Results are based on the benchmark out-of-sample portfolio selection exercise that reviews portfolio weights every quarter, limits the maximum holdings in any one stock to 5%, rules out short-selling and uses the short-term Euribor, the default spread, the term spread and the dividend yield to capture time-variations in the conditional alpha and factor loadings with beliefs specified so that $\sigma_\alpha = 10\%/\text{Month}$. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

Panel A: Sub-Sample Results - 1993-2000

		Pan-European Benchmark Models					Local Market Augmented Benchmark Models				
	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP	CAPM-A	BCAPM-A	BSMA-A	BAMA-A	BAMAP-A
Geometric mean	18.33%	19.49%	16.66%	13.40%	12.60%	12.21%	20.94%	16.14%	14.55%	13.46%	11.58%
Arithmetic mean	19.49%	20.87%	18.42%	15.23%	14.62%	14.06%	22.44%	17.89%	16.26%	15.21%	13.60%
Volatility	15.31%	16.73%	19.07%	19.49%	20.43%	19.51%	17.33%	19.04%	18.70%	18.89%	20.30%
Sharpe ratio	0.941	0.944	0.700	0.521	0.467	0.461	1.002	0.673	0.598	0.537	0.420
p-Value for Stock SR $\leq$ Bmk SR		69%	64%	86%	84%	85%	54%	71%	68%	70%	88%
Realized Utility	16.02%	17.33%	18.01%	14.34%	14.81%	14.20%	18.89%	17.18%	17.03%	16.58%	13.90%
p-Val for Stock ARU $\leq$ Bmk ARU		53%	46%	75%	71%	75%	33%	53%	56%	59%	77%
Outperformance Frequency		47%	50%	40%	45%	42%	52%	50%	45%	42%	41%
Single-Factor Alpha		2.53%	3.28%	1.36%	1.83%	0.39%	4.41%	2.47%	2.61%	2.34%	0.04%
Single-Factor Alpha t-Stat		0.787	0.668	0.236	0.299	0.066	1.369	0.509	0.485	0.416	0.007
Single-Factor Beta		0.922	0.820	0.693	0.689	0.646	0.913	0.827	0.680	0.632	0.634
Four-Factor Alpha		2.10%	6.81%	4.42%	6.05%	4.57%	4.62%	6.50%	5.77%	5.35%	4.29%
Four-Factor Alpha t-Stat		0.600	1.675	0.925	1.242	0.881	1.347	1.563	1.299	1.167	0.797
Beta - Market		0.822	0.749	0.688	0.661	0.580	0.846	0.780	0.664	0.618	0.577
Beta - SMB		(0.109)	0.314	0.412	0.403	0.389	(0.033)	0.359	0.352	0.394	0.406
Beta - HML		0.326	(0.232)	(0.343)	(0.319)	(0.216)	0.185	(0.264)	(0.317)	(0.347)	(0.185)
Beta - Momentum		0.083	0.420	0.206	0.230	0.213	0.183	0.426	0.166	0.129	0.170

Panel B: Sub-Sample Results - 2001-2008

		Pan-European Benchmark Models					Local Market Augmented Benchmark Models				
	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP	CAPM-A	BCAPM-A	BSMA-A	BAMA-A	BAMAP-A
Geometric mean	1.17%	-9.03%	-6.73%	1.97%	-0.30%	1.53%	-7.22%	-4.95%	2.43%	0.48%	2.14%
Arithmetic mean	2.65%	-5.94%	-2.35%	5.99%	3.35%	5.10%	-4.45%	-0.81%	6.29%	4.12%	5.72%
Volatility	16.99%	24.53%	29.14%	28.43%	27.10%	26.84%	23.29%	28.45%	27.87%	27.08%	26.75%
Sharpe ratio	(0.023)	(0.366)	(0.185)	0.103	0.011	0.077	(0.322)	(0.136)	0.116	0.040	0.100
p-Value for Stock SR $\leq$ Bmk SR		92%	91%	57%	73%	64%	92%	88%	59%	70%	64%
Realized Utility	-1.62%	-13.43%	-17.62%	-9.30%	-12.28%	-9.92%	-11.49%	-15.38%	-9.66%	-11.74%	-9.93%
p-Val for Stock ARU $\leq$ Bmk ARU		98%	99%	84%	92%	86%	98%	98%	85%	91%	86%
Outperformance Frequency		45%	47%	47%	47%	46%	45%	48%	52%	46%	48%
Single-Factor Alpha		-6.99%	-3.89%	4.20%	2.70%	4.90%	-5.89%	-3.08%	4.03%	4.13%	6.92%
Single-Factor Alpha t-Stat		(1.238)	(0.625)	0.522	0.349	0.597	(1.197)	(0.518)	0.509	0.532	0.877
Single-Factor Beta		0.974	1.223	1.059	0.872	0.837	0.988	1.261	1.042	0.868	0.884
Four-Factor Alpha		-7.25%	-4.18%	6.91%	7.42%	9.65%	-5.99%	-3.69%	7.89%	9.67%	12.68%
Four-Factor Alpha t-Stat		(1.344)	(0.811)	0.924	1.053	1.309	(1.276)	(0.719)	1.066	1.419	1.808
Beta - Market		0.729	0.956	0.908	0.699	0.716	0.801	1.098	0.960	0.774	0.772
Beta - SMB		0.470	0.465	0.371	0.412	0.404	0.351	0.453	0.312	0.355	0.444
Beta - HML		(0.120)	(0.309)	(0.190)	(0.230)	(0.161)	(0.064)	(0.480)	(0.207)	(0.299)	(0.149)
Beta - Momentum		(0.037)	(0.117)	0.130	0.121	0.090	(0.123)	(0.204)	0.144	0.146	0.174

Table B11: Sub-Sample Performance of Portfolios Investing in Individual Stocks and Mutual Funds

This table shows the out of sample portfolio performance for the different strategies investing in a combined asset universe of individual stocks and mutual funds during the out-of-sample period 06/1993-12/2000 (Panel A) and 01/2001-02/2008 (Panel B). The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Results are based on the benchmark out-of-sample portfolio selection exercise that reviews portfolio weights every quarter, limits the maximum holdings in any one stock to 5% or in any one mutual fund to 10%, rules out short-selling and uses the short-term Euribor, the default spread, the term spread and the dividend yield to capture time-variations in the conditional alpha and factor loadings with beliefs specified so that $\sigma_\alpha = 10\%/\text{Month}$. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

Panel A: Sub-Sample Results - 1993-2000

		Pan-European Benchmark Models					Local Market Augmented Benchmark Models				
	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP	CAPM-A	BCAPM-A	BSMA-A	BAMA-A	BAMAP-A
Geometric mean	18.33%	20.86%	18.19%	20.66%	20.52%	18.96%	21.96%	18.26%	21.36%	21.17%	19.25%
Arithmetic mean	19.49%	21.81%	19.54%	22.54%	22.41%	20.77%	23.35%	19.46%	22.97%	22.80%	20.98%
Volatility	15.31%	13.81%	16.69%	19.97%	20.02%	19.44%	16.73%	15.74%	18.40%	18.53%	18.98%
Sharpe ratio	0.941	1.211	0.867	0.875	0.866	0.807	1.092	0.914	0.972	0.956	0.838
p-Value for Stock SR $\leq$ Bmk SR		8%	49%	60%	61%	67%	44%	40%	43%	43%	60%
Realized Utility	16.02%	19.67%	18.26%	19.36%	19.24%	17.94%	19.55%	18.40%	20.53%	20.49%	18.66%
p-Val for Stock ARU $\leq$ Bmk ARU		17%	42%	33%	34%	46%	23%	40%	24%	24%	39%
Outperformance Frequency		57%	51%	52%	50%	49%	63%	51%	50%	50%	47%
Single-Factor Alpha		6.14%	4.93%	7.80%	7.64%	4.98%	4.80%	4.65%	8.65%	8.61%	5.42%
Single-Factor Alpha t-Stat		2.872	1.277	1.381	1.354	0.933	1.765	1.314	1.703	1.680	1.031
Single-Factor Beta		0.783	0.803	0.818	0.825	0.832	0.957	0.789	0.788	0.788	0.811
Four-Factor Alpha		5.30%	8.59%	13.43%	13.52%	10.99%	8.43%	8.42%	14.64%	14.60%	11.65%
Four-Factor Alpha t-Stat		2.401	3.163	3.709	3.785	3.213	2.950	3.181	4.310	4.335	3.492
Beta - Market		0.705	0.726	0.746	0.750	0.739	0.893	0.742	0.714	0.712	0.708
Beta - SMB		(0.031)	0.315	0.379	0.405	0.411	0.137	0.342	0.376	0.390	0.404
Beta - HML		0.198	(0.122)	(0.188)	(0.211)	(0.132)	0.043	(0.198)	(0.195)	(0.205)	(0.109)
Beta - Momentum		0.021	0.264	0.336	0.333	0.339	0.221	0.281	0.346	0.335	0.373

Panel B: Sub-Sample Results - 2001-2008

		Pan-European Benchmark Models					Local Market Augmented Benchmark Models				
	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP	CAPM-A	BCAPM-A	BSMA-A	BAMA-A	BAMAP-A
Geometric mean	1.17%	-1.41%	0.13%	3.45%	4.54%	4.45%	0.97%	1.14%	4.35%	5.56%	4.52%
Arithmetic mean	2.65%	0.06%	2.86%	6.13%	7.03%	7.16%	2.68%	3.72%	6.85%	7.93%	7.22%
Volatility	16.99%	16.99%	23.17%	23.34%	22.39%	23.50%	18.29%	22.53%	22.48%	21.81%	23.34%
Sharpe ratio	(0.023)	(0.176)	(0.008)	0.132	0.178	0.175	(0.020)	0.030	0.169	0.224	0.179
p-Value for Stock SR $\leq$ Bmk SR		76%	63%	38%	32%	34%	30%	53%	32%	26%	34%
Realized Utility	-1.62%	-3.60%	-6.50%	-3.55%	-2.19%	-2.77%	-1.54%	-5.07%	-2.16%	-0.97%	-2.83%
p-Val for Stock ARU $\leq$ Bmk ARU		77%	86%	60%	51%	55%	38%	78%	50%	41%	55%
Outperformance Frequency		45%	52%	48%	53%	51%	49%	53%	51%	58%	51%
Single-Factor Alpha		-2.47%	-0.13%	2.03%	4.74%	6.17%	0.60%	0.32%	3.24%	5.81%	4.84%
Single-Factor Alpha t-Stat		(1.224)	(0.034)	0.320	0.816	0.893	0.316	0.089	0.542	1.040	0.733
Single-Factor Beta		0.902	1.165	1.014	0.929	0.824	0.982	1.154	0.997	0.926	0.949
Four-Factor Alpha		-2.76%	1.39%	5.11%	8.27%	8.65%	0.22%	1.63%	6.83%	9.94%	7.66%
Four-Factor Alpha t-Stat		(1.410)	0.438	0.850	1.531	1.311	0.123	0.512	1.191	1.900	1.213
Beta - Market		0.876	0.974	0.835	0.764	0.675	0.942	1.013	0.841	0.793	0.769
Beta - SMB		0.104	0.464	0.292	0.312	0.288	0.074	0.441	0.268	0.246	0.238
Beta - HML		0.027	(0.249)	0.007	(0.053)	(0.115)	0.004	(0.307)	0.008	(0.032)	(0.025)
Beta - Momentum		(0.096)	0.013	0.298	0.237	0.209	(0.132)	(0.001)	0.258	0.237	0.248

Table B12: Optimal Portfolio Weights (February, 2008)

This table presents the portfolio holdings at the end of the sample (02/2008) for the different strategies. Results are based on the benchmark out-of-sample portfolio selection exercise that reviews portfolio weights every quarter, limits the maximum holdings in any one fund to 10%, rules out short-selling and uses the short-term Euribor, the default spread, the term spread and the dividend yield to capture time-variations in the conditional alpha and factor loadings with beliefs specified so that $\sigma_\alpha = 10\%/\text{Month}$. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

	CAPM	BCAPM	BCAPM-A	BSMA	BSMA-A	BAMA	BAMA-A	BAMAP	BAMAP-A
Etoile Alimentation Europe	0%	0%	0%	10%	10%	10%	10%	10%	10%
SKARBIEC-RYNKU NIERUCHOMOSCI FIZ	0%	0%	0%	10%	10%	10%	10%	10%	10%
StreetTRACKS MSCI Europe Telecom Services ETF	0%	0%	0%	10%	10%	10%	10%	0%	10%
iShares DJ EURO STOXX Telecommunications (DE)	0%	0%	0%	10%	10%	10%	10%	0%	10%
iShares TecDAX (DE)	0%	0%	0%	10%	0%	10%	0%	10%	10%
Etoile Collectivites Europe	0%	0%	0%	0%	10%	0%	10%	10%	10%
Fideuram Fund Europe Listed Cons Staples Eq	0%	0%	0%	0%	10%	0%	10%	10%	10%
Holly	0%	0%	10%	0%	10%	0%	10%	0%	9%
Postbank Megatrend	0%	0%	0%	10%	2%	10%	2%	10%	2%
StreetTRACKS MSCI Europe Information TechnologyETF	0%	0%	0%	10%	0%	10%	0%	10%	0%
Fideuram Fund Europe Listed TT Equity	0%	0%	0%	0%	10%	0%	10%	0%	10%
Santander Aggressive Spain, FI	0%	0%	0%	10%	0%	10%	0%	10%	0%
CSIMF Universe F	0%	6%	5%	0%	8%	0%	9%	0%	0%
iShares DJ EURO STOXX Technology (DE)	0%	0%	0%	9%	0%	9%	0%	8%	0%
KBC Multi Track Euro Telecom Acc	0%	0%	0%	10%	0%	10%	0%	4%	0%
Odin Eiendom	0%	10%	10%	0%	0%	0%	0%	0%	0%
FIM Fenno	0%	10%	10%	0%	0%	0%	0%	0%	0%
Holberg Norge	0%	10%	10%	0%	0%	0%	0%	0%	0%
DnB NOR SMB	0%	10%	10%	0%	0%	0%	0%	0%	0%
Pareto Aksje Norge	0%	10%	10%	0%	0%	0%	0%	0%	0%
WarrenWicklund Norge	0%	10%	10%	0%	0%	0%	0%	0%	0%
Fortis L Equity Telecom Europe Cap	0%	0%	0%	1%	9%	1%	8%	0%	0%
Sparinvest Europaeiske Finansielle Aktier	0%	6%	10%	0%	0%	0%	0%	0%	0%
Kaupthing Investment Fund - Icelandic Equity	0%	6%	6%	0%	0%	0%	0%	0%	0%
Anima European Equity B	10%	0%	0%	0%	0%	0%	0%	0%	0%
European Equity Index Pool	10%	0%	0%	0%	0%	0%	0%	0%	0%
SGAM Index Euro	10%	0%	0%	0%	0%	0%	0%	0%	0%
Lyxor France Index 1	10%	0%	0%	0%	0%	0%	0%	0%	0%
Andorfons Europa	10%	0%	0%	0%	0%	0%	0%	0%	0%
Andorfons Franca	10%	0%	0%	0%	0%	0%	0%	0%	0%
AXA WF Euro Value Equities A Cap	10%	0%	0%	0%	0%	0%	0%	0%	0%
Barclays EF Euro Blue Chip A	10%	0%	0%	0%	0%	0%	0%	0%	0%
Eurovalor Bolsa Espaola, FI	0%	10%	0%	0%	0%	0%	0%	0%	0%
iShares DJ STOXX 600 Basic Resources (DE)	0%	10%	0%	0%	0%	0%	0%	0%	0%
Odin Finland	0%	0%	0%	0%	0%	0%	0%	0%	9%
SEBinvest Danske Aktier	0%	0%	9%	0%	0%	0%	0%	0%	0%
SGAM Index Tech Euro	0%	0%	0%	0%	0%	0%	0%	7%	0%
Andorfons Anglaterra	6%	0%	0%	0%	0%	0%	0%	0%	0%
iShares DJ STOXX 600 Auto (DE)	0%	0%	0%	0%	1%	0%	1%	0%	0%
Storebrand Optima Norge A	0%	1%	0%	0%	0%	0%	0%	0%	0%

Table B13: Out of Sample Portfolio Performance With Recursively Optimized Asset Count

This table shows the portfolio performance for the different investment strategies during the out-of-sample period 06/1993-02/2008 when the number of securities included in the portfolio is recursively selected from a coarse grid of $\{20,\ 50,\ 100,\ 250,\ 500,\ 1,000\}$ securities based on historical out of sample realized utility. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Results are based on the baseline out-of-sample portfolio selection exercise that reviews portfolio weights every quarter, rules out short-selling and uses the short-term Euribor, the default spread, the term spread and the dividend yield to capture time-variations in the conditional alpha and factor loadings with beliefs specified so that $\sigma_\alpha = 10\%$/Month. Panel A reports the performance when the investor is investing in the universe of mutual funds, Panel B presents the contrasting results when the investor is investing in the universe of individual stocks. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header.

	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP
Panel A: Recursively Optimized Portfolio Asset Count for Mutual Funds						
Geometric mean	10.06%	6.24%	8.93%	15.23%	14.49%	14.35%
Arithmetic mean	11.40%	7.22%	10.55%	17.32%	16.59%	16.40%
Volatility	16.28%	13.91%	17.88%	21.08%	21.12%	20.69%
Sharpe ratio	0.449	0.224	0.361	0.627	0.591	0.594
p-Value for Fund SR $\leq$ Bmk SR		97%	75%	23%	29%	27%
Realized Utility	7.48%	4.30%	5.71%	10.41%	9.68%	9.77%
p-Val for Fund ARU $\leq$ Bmk ARU		98%	73%	16%	22%	20%
Outperformance Frequency		40%	53%	50%	50%	47%
Single-Factor Alpha		-3.19%	0.68%	7.16%	6.44%	6.15%
Single-Factor Alpha		(2.675)	0.261	1.851	1.685	1.769
Single-Factor Beta		0.819	0.865	0.926	0.931	0.954
Four-Factor Alpha		-3.65%	4.36%	10.66%	9.15%	9.75%
Four-Factor Alpha t-Stat		(3.136)	1.881	3.651	3.240	3.570
Beta - Market		0.832	0.857	0.882	0.894	0.933
Beta - SMB		0.037	0.413	0.511	0.457	0.461
Beta - HML		(0.010)	(0.219)	(0.327)	(0.309)	(0.285)
Beta - Momentum		0.000	0.030	0.220	0.191	0.296
Selected Asset Count Frequency						
20 Securities		5%	61%	11%	20%	81%
50 Securities		2%	3%	64%	54%	16%
100 Securities		0%	2%	3%	3%	0%
250 Securities		14%	24%	20%	22%	2%
500 Securities		72%	0%	0%	0%	0%
1000 Securities		7%	10%	0%	0%	0%
Panel B: Recursively Optimized Portfolio Asset Count for Stocks						
Geometric mean	10.06%	9.04%	10.66%	10.79%	12.04%	9.53%
Arithmetic mean	11.40%	10.91%	12.48%	12.78%	13.81%	11.53%
Volatility	16.28%	19.22%	19.07%	20.04%	18.84%	20.03%
Sharpe ratio	0.449	0.354	0.439	0.433	0.515	0.371
p-Value for Stock SR $\leq$ Bmk SR		85%	63%	65%	43%	75%
Realized Utility	7.48%	5.32%	6.94%	6.67%	8.35%	5.46%
p-Val for Stock ARU $\leq$ Bmk ARU		82%	56%	59%	36%	71%
Outperformance Frequency		47%	53%	50%	50%	49%
Single-Factor Alpha		-0.82%	0.98%	2.25%	3.06%	1.23%
Single-Factor Alpha t-Stat		(0.340)	0.370	0.631	1.012	0.333
Single-Factor Beta		1.042	0.973	0.919	0.920	0.893
Four-Factor Alpha		-1.86%	1.31%	4.08%	4.68%	3.18%
Four-Factor Alpha t-Stat		(0.790)	0.589	1.266	1.767	0.931
Beta - Market		0.932	0.953	0.818	0.887	0.774
Beta - SMB		0.109	0.349	0.361	0.421	0.334
Beta - HML		0.046	(0.280)	(0.167)	(0.293)	(0.085)
Beta - Momentum		0.059	0.081	0.273	0.133	0.245
Selected Asset Count Frequency						
20 Securities		13%	0%	0%	0%	0%
50 Securities		2%	2%	2%	3%	2%
100 Securities		0%	8%	0%	0%	0%
250 Securities		39%	20%	27%	14%	41%
500 Securities		15%	55%	66%	78%	50%
1000 Securities		31%	14%	5%	5%	7%

Table B14: Out of Sample Portfolio Performance With Recursively Optimized Weight Restrictions

This table shows the portfolio performance for the different investment strategies during the out-of-sample period 06/1993-02/2008 when imposing a recursively optimized constraint on the portfolio weights selected from a coarse grid of {2.5%, 5%, 10%, 25%, 50%, 100%} based on historical out of sample realized utility. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Results are based on the baseline out-of-sample portfolio selection exercise that reviews portfolio weights every quarter, rules out short-selling and uses the short-term Euribor, the default spread, the term spread and the dividend yield to capture time-variations in the conditional alpha and factor loadings with beliefs specified so that $\sigma_\alpha = 10\%$/Month. Panel A reports the performance when the investor is investing in the universe of mutual funds, Panel B presents the contrasting results when the investor is investing in the universe of individual stocks. Each column shows portfolio results based on the individual Bayesian updating models, summarized in Table 2, identified in the corresponding column header.

	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP
Panel A: Recursively Optimized Weight Threshold for Mutual Funds						
Geometric mean	10.06%	6.27%	14.68%	21.10%	21.25%	18.20%
Arithmetic mean	11.40%	7.27%	16.62%	24.35%	24.52%	20.85%
Volatility	16.28%	14.08%	20.09%	26.81%	26.90%	23.80%
Sharpe ratio	0.449	0.225	0.623	0.755	0.759	0.704
p-Value for Fund SR $\leq$ Bmk SR		94%	27%	18%	18%	21%
Realized Utility	7.48%	4.29%	10.34%	13.04%	13.13%	11.97%
p-Val for Fund ARU $\leq$ Bmk ARU		94%	18%	8%	8%	11%
Outperformance Frequency		40%	56%	57%	58%	53%
Single-Factor Alpha		-2.39%	5.28%	13.86%	14.21%	10.12%
Single-Factor Alpha		(1.402)	1.393	2.459	2.523	2.186
Single-Factor Beta		0.785	0.892	0.969	0.973	0.954
Four-Factor Alpha		-3.30%	8.93%	20.29%	20.36%	16.52%
Four-Factor Alpha t-Stat		(1.957)	3.211	4.256	4.278	4.315
Beta - Market		0.776	0.872	0.829	0.838	0.871
Beta - SMB		(0.093)	0.524	0.753	0.724	0.642
Beta - HML		0.116	(0.295)	(0.282)	(0.281)	(0.269)
Beta - Momentum		(0.008)	0.139	0.318	0.280	0.362
Weight Threshold Frequency						
2.5% Max Weight		0%	0%	0%	0%	0%
5% Max Weight		20%	3%	2%	2%	2%
10% Max Weight		0%	1%	0%	0%	0%
25% Max Weight		0%	46%	0%	0%	1%
50% Max Weight		20%	0%	0%	0%	8%
100% Max Weight		59%	49%	98%	98%	88%
Panel B: Recursively Optimized Weight Threshold for Stocks						
Geometric mean	10.06%	5.82%	6.97%	8.05%	7.35%	8.15%
Arithmetic mean	11.40%	8.16%	10.39%	10.42%	9.66%	10.39%
Volatility	16.28%	21.40%	25.83%	21.90%	21.52%	21.29%
Sharpe ratio	0.449	0.189	0.244	0.289	0.258	0.295
p-Value for Stock SR $\leq$ Bmk SR		95%	91%	88%	90%	86%
Realized Utility	7.48%	1.34%	0.44%	3.23%	2.73%	3.58%
p-Val for Stock ARU $\leq$ Bmk ARU		94%	91%	86%	89%	85%
Outperformance Frequency		47%	53%	48%	47%	49%
Single-Factor Alpha		-2.35%	1.51%	0.11%	-1.07%	0.23%
Single-Factor Alpha t-Stat		(0.587)	0.304	0.028	(0.266)	0.058
Single-Factor Beta		0.943	0.941	0.943	0.938	0.901
Four-Factor Alpha		-4.36%	-1.51%	0.23%	-1.30%	1.33%
Four-Factor Alpha t-Stat		(1.042)	(0.309)	0.058	(0.352)	0.355
Beta - Market		0.871	0.858	0.841	0.843	0.804
Beta - SMB		0.141	0.123	0.312	0.379	0.438
Beta - HML		(0.027)	(0.184)	(0.220)	(0.315)	(0.304)
Beta - Momentum		(0.082)	(0.192)	0.053	(0.033)	0.057
Weight Threshold Frequency						
2.5% Max Weight		10%	66%	90%	76%	98%
5% Max Weight		8%	2%	10%	23%	2%
10% Max Weight		0%	0%	0%	0%	0%
25% Max Weight		3%	0%	0%	0%	0%
50% Max Weight		0%	2%	0%	0%	0%
100% Max Weight		78%	31%	0%	0%	0%

Table B15: Out of Sample Performance of Portfolios Investing in Individual Stocks Including Micro-Caps

This table shows the portfolio performance for the different strategies investing in individual stocks during the out-of-sample period 06/1993-02/2008 (Panel A) and for strategies investing in a universe combining individual stocks and mutual funds (Panel B). Instead of filtering out stocks with capitalizations below the 70th percentile in each rebalancing period, as in the baseline analysis, we here consider a broader stock universe that only filters out those stocks with capitalizations below the 10th percentile in each rebalancing period. The arithmetic and geometric mean returns, the volatility, the Sharpe ratio, and average realized utility are all annualized. Bootstrapped one-sided p-Values test the null hypothesis that portfolio strategy and benchmark Sharpe Ratio and Average Realized Utility are equal against the alternative that the mutual fund portfolio dominates the benchmark. The outperformance frequency shows the percentage of months during which the strategies generated returns higher than the benchmark return. The annualized measures of alpha control for macrovariables and time-varying risk factor loadings but not local benchmarks. Specifically, when computing the single-factor alphas, we allow the market factor loading of the portfolio return to depend on the (time-varying) macroeconomic variables; similarly all risk loadings are allowed to depend on all macroeconomic variables when calculating the four-factor alphas. Each column shows portfolio results based on the individual Bayesian updating models, which are summarized in Table 2, identified in the corresponding column header. Results are based on the benchmark out-of-sample portfolio selection exercise that reviews portfolio weights every quarter, limits the maximum holdings in any one stock to 5% or in any one mutual fund to 10%, rules out short-selling and uses the short-term Euribor, the default spread, the term spread and the dividend yield to capture time-variations in the conditional alpha and factor loadings with beliefs specified so that $\sigma_\alpha = 10\%/\text{Month}$.

Panel A: Stock Only Investment Universe

	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP	CAPM-A	BCAPM-A	BSMA-A	BAMA-A	BAMAP-A
Geometric mean	10.06%	9.30%	8.82%	9.01%	10.15%	6.68%	7.74%	7.11%	9.84%	9.42%	6.28%
Arithmetic mean	11.40%	10.94%	11.92%	12.51%	13.56%	9.51%	9.59%	10.06%	13.24%	12.73%	9.01%
Volatility	16.28%	17.95%	24.82%	26.44%	26.34%	23.80%	19.07%	24.18%	26.05%	25.85%	23.30%
Sharpe ratio	0.449	0.381	0.315	0.318	0.359	0.227	0.288	0.246	0.351	0.334	0.211
(p-Value for Stock SR $\leq$ Bmk SR)		68%	86%	81%	78%	90%	87%	92%	77%	80%	90%
Realized Utility	7.48%	6.06%	2.68%	2.02%	3.12%	1.06%	4.13%	1.33%	3.04%	2.70%	0.92%
(p-Val for Stock ARU $\leq$ Bmk ARU)		66%	85%	82%	78%	90%	86%	92%	78%	80%	91%
Outperformance Frequency		49%	50%	51%	50%	53%	46%	50%	51%	49%	48%
Single-Factor Alpha		0.09%	0.46%	3.40%	5.50%	-0.04%	-0.31%	-1.42%	4.46%	4.82%	-0.92%
Single-Factor Alpha t-Stat		0.030	0.098	0.566	0.922	(0.007)	(0.098)	(0.312)	0.745	0.816	(0.181)
Single-Factor Beta		0.890	1.042	0.844	0.811	0.832	0.918	1.022	0.801	0.772	0.838
Four-Factor Alpha		0.64%	0.88%	9.34%	11.43%	5.82%	0.48%	-0.40%	11.07%	10.94%	5.55%
Four-Factor Alpha t-Stat		0.207	0.199	1.779	2.183	1.140	0.153	(0.093)	2.084	2.098	1.129
Beta - Market		0.744	0.932	0.684	0.705	0.741	0.784	0.920	0.642	0.687	0.751
Beta - SMB		0.155	0.362	0.799	0.852	0.647	0.252	0.422	0.779	0.753	0.638
Beta - HML		0.189	(0.210)	(0.396)	(0.511)	(0.326)	0.043	(0.256)	(0.333)	(0.443)	(0.321)
Beta - Momentum		(0.106)	(0.365)	0.132	0.010	0.077	(0.136)	(0.291)	0.203	0.044	0.174

Panel B: Stock and Mutual Fund Investment Universe

	Benchmark	CAPM	BCAPM	BSMA	BAMA	BAMAP	CAPM-A	BCAPM-A	BSMA-A	BAMA-A	BAMAP-A
Geometric mean	10.06%	10.06%	9.41%	11.95%	12.59%	11.23%	10.01%	9.61%	12.47%	12.51%	11.06%
Arithmetic mean	11.40%	11.14%	11.97%	14.58%	15.17%	13.69%	11.23%	12.02%	14.95%	14.91%	13.46%
Volatility	16.28%	14.67%	22.42%	23.02%	22.85%	22.32%	15.58%	21.82%	22.31%	21.94%	21.94%
Sharpe ratio	0.449	0.480	0.351	0.455	0.485	0.430	0.458	0.363	0.486	0.493	0.426
(p-Value for Stock SR $\leq$ Bmk SR)		98%	51%	16%	18%	19%	99%	23%	12%	11%	12%
Realized Utility	7.48%	4.23%	7.88%	11.69%	11.48%	10.91%	4.02%	9.99%	12.22%	12.28%	11.80%
(p-Val for Stock ARU $\leq$ Bmk ARU)		98%	43%	7%	8%	10%	99%	17%	4%	4%	6%
Outperformance Frequency		47%	53%	55%	52%	53%	44%	51%	53%	54%	53%
Single-Factor Alpha		1.20%	0.49%	5.16%	6.25%	4.49%	0.95%	0.56%	6.06%	6.44%	4.00%
Single-Factor Alpha t-Stat		0.648	0.130	1.050	1.287	0.973	0.671	0.153	1.258	1.372	0.881
Single-Factor Beta		0.812	1.037	0.844	0.829	0.859	0.895	1.019	0.793	0.780	0.855
Four-Factor Alpha		3.45%	1.87%	10.90%	11.93%	11.04%	3.20%	2.14%	12.31%	12.59%	10.96%
Four-Factor Alpha t-Stat		2.068	0.554	2.532	2.809	2.608	2.377	0.652	2.911	3.076	2.655
Beta - Market		0.777	0.947	0.705	0.708	0.763	0.845	0.937	0.665	0.672	0.755
Beta - SMB		0.182	0.434	0.725	0.746	0.712	0.170	0.438	0.739	0.725	0.683
Beta - HML		0.052	(0.231)	(0.364)	(0.398)	(0.361)	0.030	(0.243)	(0.347)	(0.361)	(0.313)
Beta - Momentum		0.038	(0.238)	0.131	0.056	0.124	0.020	(0.209)	0.184	0.110	0.205

Appendix B2: Data Sources and Definitions for Additional Variables used in Tables Reporting Robustness Results

B2.1: Additional Pan-European Macroeconomic Variables

Volatility

Squared 1-month Change in the German VDAX Index

The VDAX Index expresses the implied volatility of the value-weighted German blue-chip stock index DAX over the next 30 days by the DAX option contracts. While this series is widely available, the data used here was taken from the Global Financial Database.

Consumer Price Index

Twelve-Month Rate of Change in the European Consumer Price Index

The data used here was taken from the European Central Bank Statistical Data Warehouse Euro-Area "HICP - Overall index, European Central Bank" Series Key ICP.M.U2.N.000000.3.ANR. Data prior to 1996 is estimated on the basis of non-harmonised national consumer price indices. Data prior to 1991 exclude East Germany; country weights are calculated on the basis of PPP conversion rates before 1990. Data and additional information are available at:
http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=122.ICP.M.U2.N.000000.3.ANR

Industrial Production

Annual Rate of Change in the European Industrial Production Index (Excluding Construction)

The data used here was taken from the European Central Bank Statistical Data Warehouse Euro-Area "Working day adjusted, not seasonally adjusted, Total Industry (excluding construction) - NACE Rev2, European Central Bank, unspecified" Series Key STS.M.I6.W.PROD.NS0020.3.000. The series represents an internal ECB calculation. Data and additional information are available at:
http://sdw.ecb.europa.eu/quickview.do?SERIES_KEY=132.STS.M.I6.W.PROD.NS0020.3.000

Economic Sentiment

One-Month Change in the Economic Sentiment Indicator

The Economic Sentiment Indicator is taken from the European Commission Directorate General for Economic and Financial Affairs Business and Consumer Surveys. The relevant series is the EU.ESI series in the ESI_NACE2 data file. Additional details on the construction of the ESI, including a methodological guide that reports survey questions, are available at:
http://ec.europa.eu/economy_finance/db_indicators/surveys/index_en.htm

Currency Factor

Local Currency Exchange Rate Variations

Weighted average (using country market capitalizations) of the squared monthly change in exchange rates (adjusted for the interest rate spread) measured against the Ecu or the Euro. The exchange rates were taken from the U.S. Federal Reserve System H.10 weekly release, which contains daily exchange rates of major currencies against the U.S. dollar. The data are noon buying rates in New York for cable transfers payable in the listed currencies. More information is available at: http://www.federalreserve.gov/releases/h10/hist/

B2.2: Local Market Macroeconomic Variables

Austria

Term Structure

Austria's term structure is measured as the difference between "Austria 10-year Government Bond Yield" and a proxy for Austria's short term interest rate. The "Austria 10-year Government Bond Yield" is taken from the Global Financial Database, series IGAUT10D. The short term interest rate was computed using "Austria 3-month Treasury Bill Yield" from Global Financial Database, series ITAUT3M, through May 1989. From June 1989 to February 2008 we built the series using the "3-month Vienna Interbank Offered Rate" series from OECD.Stat Extracts website.

Dividend Yield

We used the "Vienna SE Dividend Yield" series. This data series is taken from Global Financial Database, series SYAUTYM.

Default Spread

Austria's default spread is measured as the difference between "Austria Nonfinancial Corporate Bond Yield" and "Austria 10-Year Government Bond Yield". Both series are from the Global Financial Database. Yields on nonfinancial corporate bonds correspond to the series INAUTD. Yields on 10-year government bonds correspond to the series IGAUT10D.

Short Rate

Austria's short rate is measured using "Austria 3-month Treasury Bill Yield" from Global Financial Database, series ITAUT3M, through May 1989. From June 1989 to February 2008 we built the series using the "3-month Vienna Interbank Offered Rate" series from OECD.StatExtracts website.

Belgium

Term Structure

The Belgium term structure is measured as the difference between "Belgium 10-year Government Bond Yield" and "Belgium 3-month Treasury Bill Yield". Both series are taken from the Global Financial Database. Yields on 10-year government bonds correspond to the series IGBEL10D, while yields on 3-month treasury bills correspond to the series ITBEL3D.

Dividend Yield

We used the "Belgium SE Dividend Yield" series. This data series is taken from the Global Financial Database, series SYBELYM.

Default Spread

The Belgium default spread is measured as the difference between "Belgium Non-Financial Company Bond Yields" and "Belgium 10-year Government Bond Yield". Both series are taken from the Global Financial Database. Yields on nonfinancial corporate bonds correspond to the series INBELW, while yields on 10-year government bonds correspond to the series IGBEL10D.

Short Rate

The Belgium short rate is measured by the "Belgium 3-month Treasury Bill Yield" . The data are taken from the Global Financial Database, series ITBEL3D.

France

Term Structure

France's term structure is measured as the difference between "France 10-year Government Bond Yield" and "France 3-month Treasury Bill Yield". Both series are from the Global Financial Database, series IGFRA10D and ITFRA3D, respectively.

Dividend Yield

France's dividend yield is measured by the "France Dividend Yield" series (SYFRAYM) from the Global Financial Database.

Default Spread

France's default spread is computed as the difference between "France First Class Private Bonds Average Yield" and "France 10-year Government Bond Yield". Both series are from the Global Financial Database. Average yields on first-class private bonds correspond to the series INFRAM. Yields on 10-year government bonds correspond to the series IGFRA10D.

Short Rate

France's short rate is measured using the"France 3-month Treasury Bill Yield" series. The data is taken from the Global Financial Database, series ITFRA3D.

Germany

Term Structure

Germany's term structure is measured as the difference between "Germany 10-year Benchmark Bond" and "Germany 3-month Treasury Bill Yield". Both series are taken from the Global Financial Database. Yields on the 10-year benchmark bond correspond to the series IGDEU10D, while yields on 3-month Treasury bills correspond to the series ITDEU3D.

Dividend Yield

We used the "Germany Dividend Yield" series. These data are taken from Global Financial Database, series SYDEUYM.

Default Spread

Germany's default spread is measured as the difference between "Germany Corporate Bond Yield" and "Germany 10-year Benchmark Bond". Both series are taken from the Global Financial Database. Yields on corporate bonds correspond to the series INDEUD, while yields on the 10-year benchmark bond correspond to the series IGDEU10D.

Short Rate

Germany's short rate is measured using the "Germany 3-month Treasury Bill Yield" series. Data are taken from the Global Financial Database, series ITDEU3D.

Italy

Term Structure

Italy's term structure is measured as the difference between "Italy 10-year Government Bond Yield" and "Italy 3-month Treasury Bill Yield". Both series are taken from the Global Financial Database. Yields on 10-year government bonds correspond to the series IGITA10D, while yields on 3-month Treasury bills correspond to the series ITITA3M.

Dividend Yield

We used the "Italy Dividend Yield" series. These data are taken from the Global Financial Database, series SYITAYM.

Default Spread

Italy's default spread is measured as the difference between "Italy Average Corporate Bond Yield" and"Italy 10-year Government Bond Yield". Both series are from the Global Financial Database. Yields on average corporate bonds correspond to the series INITAM, while yields on 10-year government bonds correspond to the series IGITA10D.

Short Rate

Italy's short rate is measured using the "Italy 3-Month Treasury Bill Yield" series. Data are taken from the Global Financial Database, series ITITA3M.

Netherlands

Term Structure

Netherlands' term structure is measured as the difference between "Netherlands 10-year Government Bond Yield" and "Netherlands 3-month Treasury Bill Yield ". Both series are taken from the Global Financial Database. Yields on 10-year government bonds correspond to the series IGNLD10D, while yields on 3-month treasury bills correspond to the series ITNLD3D.

Dividend Yield

We used the "Netherlands CBS All X/Royal Dutch Dividend Yield" series as a proxy for Netherlands' dividend yield. These data are taken from Global Financial Database, series SYNLDYAM.

Default Spread

Netherlands' default spread is measured as the difference between "Netherlands Corporate Bond Yield" and "Netherlands 10-year Government Bond Yield". Both series are from the Global Financial Database. Yields on corporate bonds correspond to the series INNLDEW, while yields on 10-year government bonds correspond to the series IGNLD10D.

Short Rate

Netherlands' short rate is measured using the "Netherlands 3-month Treasury Bill Yield" series. Data are taken from the Global Financial Database, series ITNLD3D.

Scandinavia

Term Structure

The Scandinavian term structure is measured as the difference between "Sweden 10-year Government Bond Yield" and "Sweden 3-month Treasury Bill Yield". Both series are taken from the Global Financial Database. Yields on 10-year government bonds correspond to the series IGSWE10D, while yields on 3-month Treasury bills correspond to the series ITSWE3D.

Dividend Yield

We used the "Stockholm SE Dividend Yield" series as a proxy for the Scandinavian dividend yield. These data are taken from Global Financial Database, series SYSWEYM.

Default Spread

The Scandinavian default spread is measured as the difference between "Sweden Corporate Bond Yield" and"Sweden 10-year Government Bond Yield ". These series are from the Global Financial Database. Yields on corporate bonds correspond to the series INSWEW, while yields on 10-year government bonds correspond to the series IGSWE10D.

Short Rate

The Scandinavian short rate is measured using the "Sweden 3-month Treasury Bill Yield" series. Data are taken from the Global Financial Database, series ITSWE3D.

Spain/Portugal

Term Structure

The Spain/Portugal term structure is measured as the difference between "Spain 10-year Government Bond Yield " and "Spain 3-month T-Bill Yield". Both series are taken from the Global Financial Database. Yields on 10-year government bonds correspond to the series IGESP10D, while yields on 3-month treasury bills correspond to the series ITESP3M.

Dividend Yield

We used the "Madrid SE Dividend Yield" series as a proxy for the Spain/Portugal dividend yield. These data are taken from the Global Financial Database, series SYESPYM.

Default Spread

The Spain/Portugal default spread is measured as the difference between "Spain Electric Utility Bond Yield" and "Spain 10-year Government Bond Yield". These series are from the Global Financial Database. Yields on the proxy for corporate bonds correspond to the series INESPM, while yields on 10-year government bonds correspond to the series IGESP10D.

Short Rate

The Spain/Portugal short rate is measured using the "Spain 3-month T-Bill Yield" series. Data are taken from the Global Financial Database, series ITESP3M.

Switzerland

Term Structure

Switzerland's term structure is computed as the difference between "Switzerland 10-year Government Bond" and "Switzerland 3-month Secondary Market T-Bill Yield". Both series are taken from the Global Financial Database. Yields on government bonds correspond to the series IGCHE10D starting in January 1991. Prior to this date, we used the "Switzerland 20-Year Government Bond Yield" series, also from the Global Financial Database. Yields on the proxy for 3-month Treasury bills correspond to the series ITCHE3D.

Dividend Yield

Switzerland's dividend yield is measured by the "Switzerland Dividend Yield" series, SYCHEYM, from the Global Financial Database.

Default Spread

Switzerland's default spread is measured as the difference between "Switzerland 7-10 year AAA Corporate Bond Yield" and "Switzerland 10-year Government Bond". These series are from the Global Financial Database. Yields on corporate bonds correspond to the series ZD3A7YD, while yields on 10-year government bonds correspond to the series IGCHE10D.

Short Rate

Switzerland's short rate is measured using the "Switzerland 3-month Secondary Market T-Bill Yield" series. Data are taken from the Global Financial Database, series ITCHE3D.

UK

Term Structure

The UK term structure is measured as the difference between "United Kingdom 10-year Government Bond Yield" and "UK 3-month Treasury Bill Yield". Both series are taken from the Global Financial Database. Yields on 10-year government bonds correspond to the series IGGBR10D, while yields on 3-month treasury bills correspond to the series ITGBR3D.

Dividend Yield

We used the "UK FT-Actuaries Dividend Yield (w/GFD Extension)" series as a proxy for the UK dividend yield. This data are taken from Global Financial Database, series DFTASD.

Default Spread

The UK default spread is measured as the difference between "Great Britain Corporate Bond Yield" and "United Kingdom 10-year Government Bond Yield". These series are from the Global Financial Database. Yields on corporate bonds correspond to the series INGBRW, while yields on 10-year government bonds correspond to the series IGGBR10D.

Short Rate

The UK short rate is measured using the "UK 3-month Treasury Bill Yield" series. Data are taken from the Global Financial Database, series ITGBR3D.