

Axioma Insight

Quarterly Risk Review

European Edition

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For this issue we are tracking a few additional benchmarks and benchmark derivatives. In addition, for many regional benchmarks we are calculating risk in both the local currency and US dollars. Due to currency effects, these estimates can be quite different, as Table 1 illustrates. Most benchmarks saw their risk increase since the end of the third quarter, and risk estimates were substantially higher across the board than they were a year ago. For many of the benchmarks we track, however, risk peaked in October or November, and declined by the end of the year.

PIIGS, FTSE Europe, FTSE Eurobloc and the SP-ASX 200 denominated in USD showed the highest risk, joined by the Russell 2000. Among the European indexes, PIIGS and FTSE Eurobloc also appeared quite risky even in their home currency, whereas the non-Eurobloc indexes exhibited some of the lowest risk when denominated in EUR. Risk estimates in USD for many of these developed markets are also substantially higher than predicted risk in the same currency for the FTSE Emerging index, indicating the ongoing fragility of the markets. The SP-ASX 200 denominated in AUD, with one of the lowest risk estimates, stood in sharp contrast to the high risk of the same stocks in USD.

The death of Kim Jong Il in December, although big news in Asia and globally, did not seem to have any meaningful impact on risk forecasts for the Asia Pacific region, Japan or in emerging markets.

Fourth Quarter Highlights:

- Stock correlations eased at year end and agreement among Axioma's four risk model variants increased, perhaps pointing to better times ahead for managers focused on individual stock selection.
- Benchmark risk continued to rise at the end of 2011. Eurobloc markets, especially PIIGS, led the pack in predicted risk, in both local and USD terms. Japan and Australia (in local currencies) had the lowest risk, joined by non-Eurobloc euro-denominated benchmarks (Table 1).
- Risk forecasts from Axioma's four model variants moved closer to each other at the end of 2011 (Figure 4) and short-horizon forecasts fell below their medium-horizon counterparts.
- A low volatility strategy would have been the best single-factor strategy for 2011 (Figure 8).
- We have added a new report to help investors determine what is driving the change in risk from one period to the next. This allows you to understand the impact of changes in portfolio composition, volatility and correlation. See Figure 7 for more detail.
- A decomposition of our statistical model showed that interest-rate and volatility-related variables were among those most highly correlated with our statistical factors (Table 2).
- Asset-asset correlations neared their 2010 peak in 2011, although they declined somewhat by the end of the year. Currency correlations were at or near record highs (Figures 10 and 14).

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Table 1. Comparison of Benchmark Predicted Volatilities¹

	Benchmark Predicted Volatility (%)			Change Vs.	
	Most Recent (30 Dec 2011)	Quarter Ago (30 Sep 2011)	Year Ago++ (31 Dec 2010)	Quarter Ago	Year Ago
North America					
Russell 1000	24.4	23.7	16.8	0.7	7.6
Russell 2000	31.2	29.4	21.6	1.8	9.5
FTSE North America	24.6	23.3	15.9	1.3	8.6
Europe					
FTSE 350					
GBP	23.8	23.4	16.6	0.4	7.2
USD	28.0	27.2	14.4	0.8	13.6
FTSE Eurobloc					
EUR	29.8	27.9	17.0	1.9	12.9
USD	36.5	34.6	23.1	1.8	13.4
FTSE Europe					
EUR	25.3	24.5	15.9	0.8	9.4
USD	31.1	30.1	21.1	1.0	10.0
FTSE Developed Europe					
EUR	25.1	24.4	15.8	0.6	9.2
USD	30.9	30.1	21.1	0.8	9.7
Non-Eurobloc*					
EUR	23.0	23.0	16.0	0.1	7.1
USD	27.8	27.3	20.1	0.5	7.7
Non-Eurobloc Developed**					
EUR	22.4	22.7	15.8	-0.3	6.7
USD	27.1	27.0	20.0	0.1	7.2
PIIGS***					
EUR	30.9	29.0	20.5	1.9	10.3
USD	37.9	36.2	26.8	1.6	11.1
Asia-Pacific					
FTSE Asia Pacific	24.2	21.7	13.9	2.5	10.3
Asia Pacific ex-Japan****	28.6	25.2	16.3	3.3	12.2
SP-ASX 200					
AUD	21.5	19.5	14.2	1.9	7.3
USD	34.5	32.3	22.6		
Japan+					
JPY	20.3	21.2	16.4	-0.9	3.9
USD	23.6	21.1	13.8	2.5	9.9
FTSE Developed	26.6	25.3	16.2	1.4	10.4
FTSE Emerging	28.1	25.0	17.8	3.1	10.3
FTSE-All World	26.6	25.0	16.4	1.5	10.2

All figures based on Medium-Horizon Fundamental risk model

* FTSE Europe minus FTSE Eurobloc

**FTSE Developed Europe minus FTSE Eurobloc

***Portugal, Italy, Ireland, Greece and Spain from FTSE Eurobloc

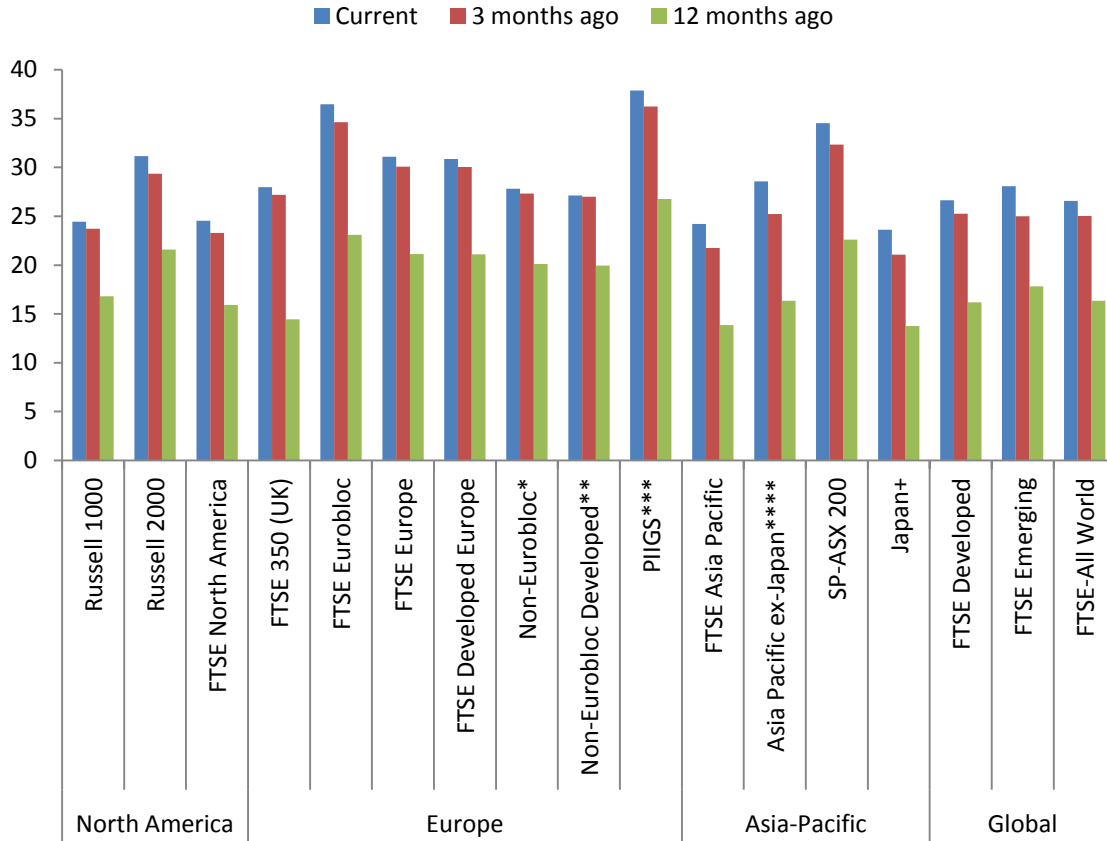
****FTSE Asia Pacific using Asia Pacific Ex-Japan Risk Model

+Russell Developed minus Russell Developed ex-Japan.

++ 30 December for Japan

Source: FTSE, Frank Russell, Standard & Poor's, Axioma Inc. All figures in USD unless otherwise noted.

Figure 1. Risk Forecasts (in USD) for Eurobloc and PIIGS Were By Far The Highest



All figures based on Medium-Horizon Fundamental risk model

* FTSE Europe minus FTSE Eurobloc

**FTSE Developed Europe minus FTSE Eurobloc

***Portugal, Italy, Ireland, Greece and Spain from FTSE Eurobloc

****FTSE Asia Pacific using Asia Pacific Ex-Japan Risk Model

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Source: FTSE, Frank Russell, Standard & Poor's, Axioma Inc. All figures in USD unless otherwise noted.

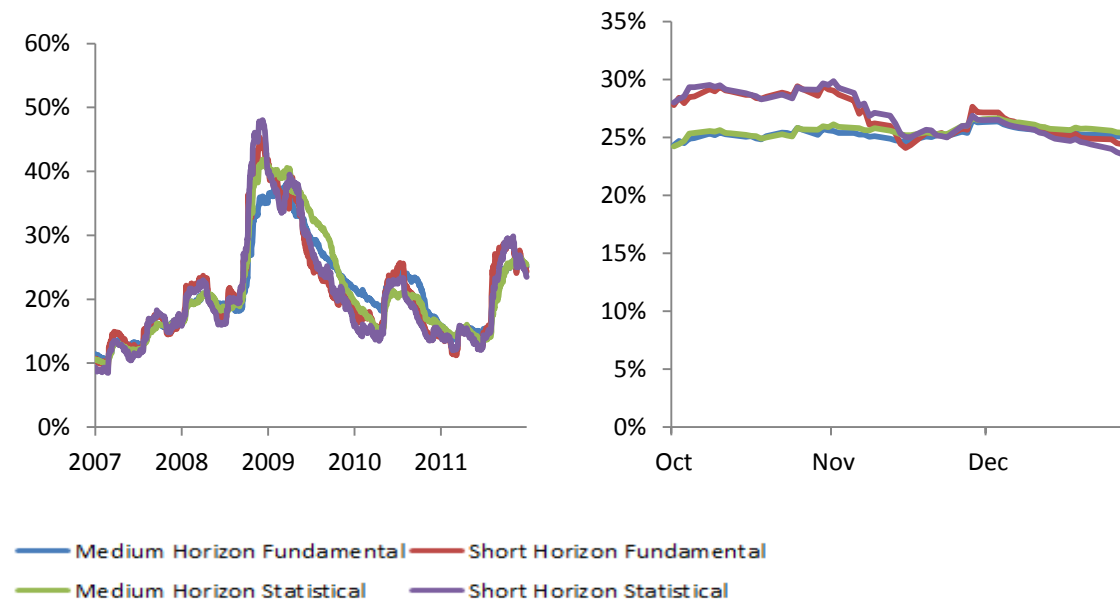
See Endnotes for a description of how the non-standard benchmarks are constructed.

Focus on Europe

Europe continues to be front and center in discussions of global equity markets. From a risk perspective, however, Axioma’s model forecasts (in EUR) for the FTSE Developed Europe index have fallen from their peak late in third quarter 2011 (Figure 2). These estimates do remain well above their lows at the beginning of 2011, however. In addition, whereas the short-horizon model variants showed significantly higher forecasts than their medium-horizon counterparts at the beginning of the fourth quarter, those estimates have converged, and in fact the short-horizon forecasts fell slightly below those of the medium-horizon models at the end of the quarter.

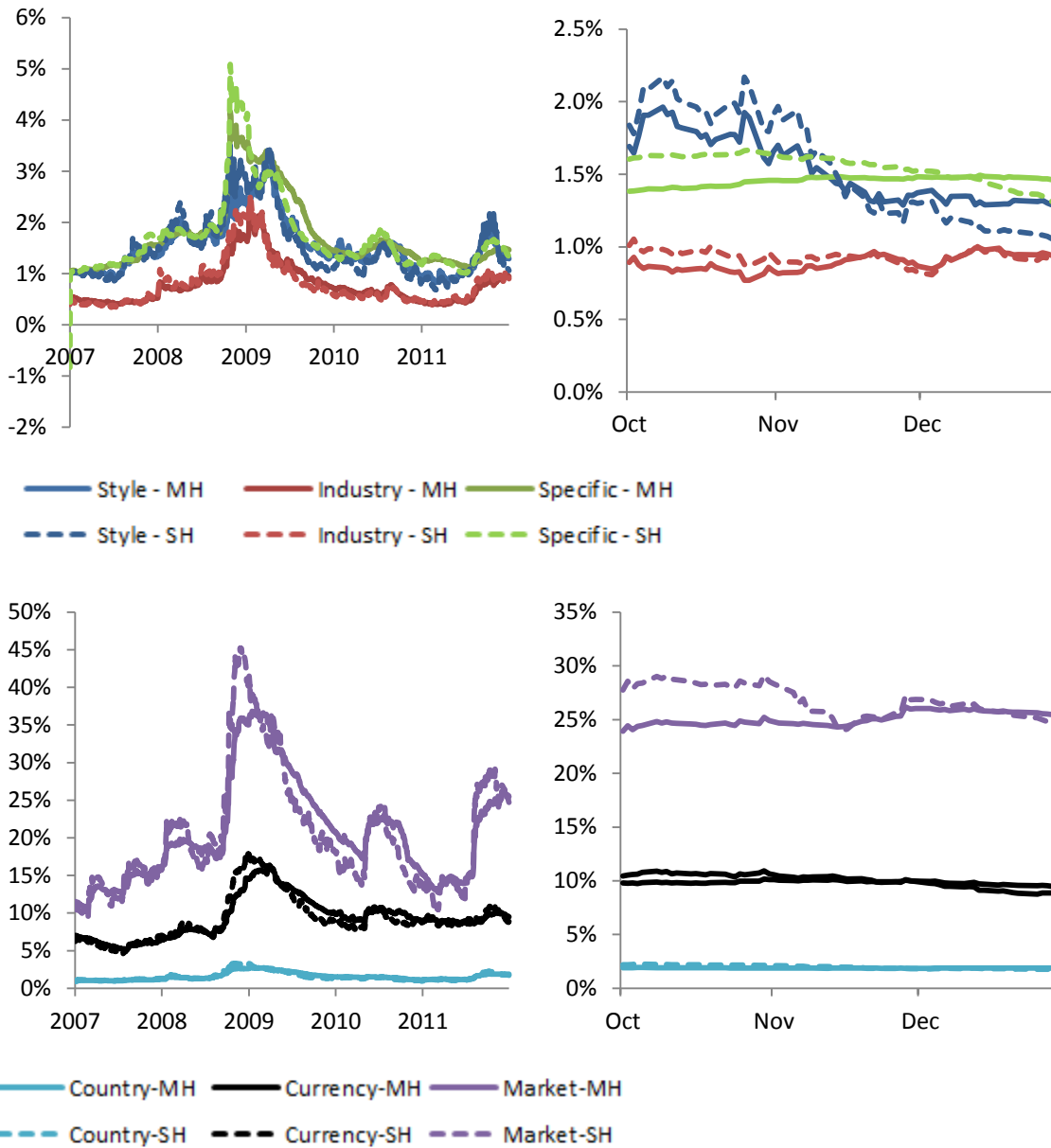
Both market and currency risks ended 2011 well off their peaks during the fourth quarter, especially at the short horizon, where year-end figures were 4.4 and 2.0 percentage points lower, respectively (Figure 3). Market risk has been the highest contributor to risk of the benchmark for at least the past five years, and has seen larger swings than the still-significant currency risk.

Figure 2. FTSE Developed Europe Risk Characteristics, Last Five Years and Most Recent Three Months



Source: FTSE, Axioma, Inc.

Figure 3. FTSE Developed Europe Components of Risk



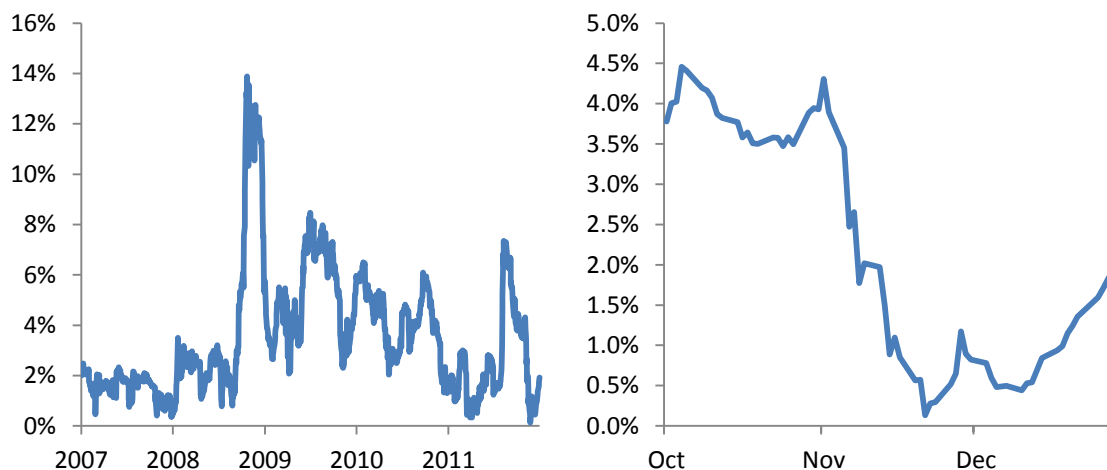
Source: FTSE, Axioma, Inc.

Differences in risk estimates are described further by risk *spreads*. The predicted risk spread measures the difference between the largest and smallest risk estimates from the four risk models (medium-term fundamental, medium-term statistical, short-term fundamental and short-term statistical). The higher the number, the larger the disagreement among models. Short-horizon models may lead their medium-horizon counterparts as risk changes, and statistical models may pick up new or different factors that are not detected by their fundamental counterparts.

The disagreement among the models hit its recent peak in August 2011, and has declined fairly steadily since then, although it bounced a bit at the end of December 2011 (Figure 4). This year-end bounce was largely the result of the short-horizon models predicting lower risk than their medium-horizon counterparts, especially for the statistical model (Figure 6).

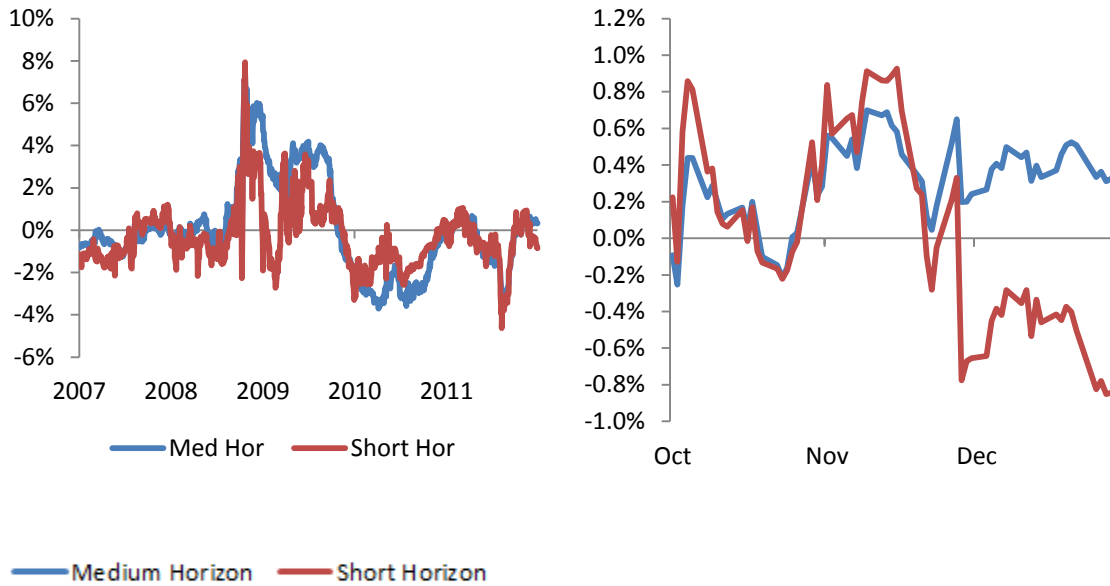
If risk is changing rapidly, it may be picked up sooner by our short-horizon models. If this trend continues, we may see lower risk in developed Europe this year than we have seen in a while. As we see in Table 1, however, the countries making up developed Europe had widely different risk profiles, and this average risk number may mask some very volatile markets.

Figure 4. Predicted Risk Spread: The Difference Between the Highest and Lowest Risk Estimates Based on the Four Model Variants, FTSE Developed Europe



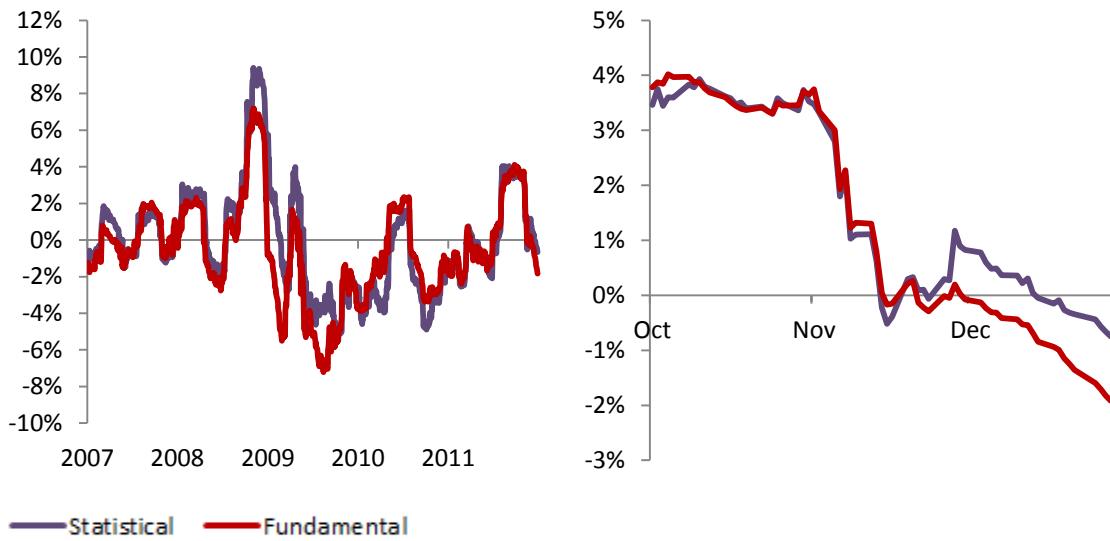
Source: FTSE, Axioma, Inc.

Figure 5. Statistical – Fundamental Spread



Source: FTSE, Axioma, Inc.

Figure 6. Short – Medium Spread



Source: FTSE, Axioma, Inc.

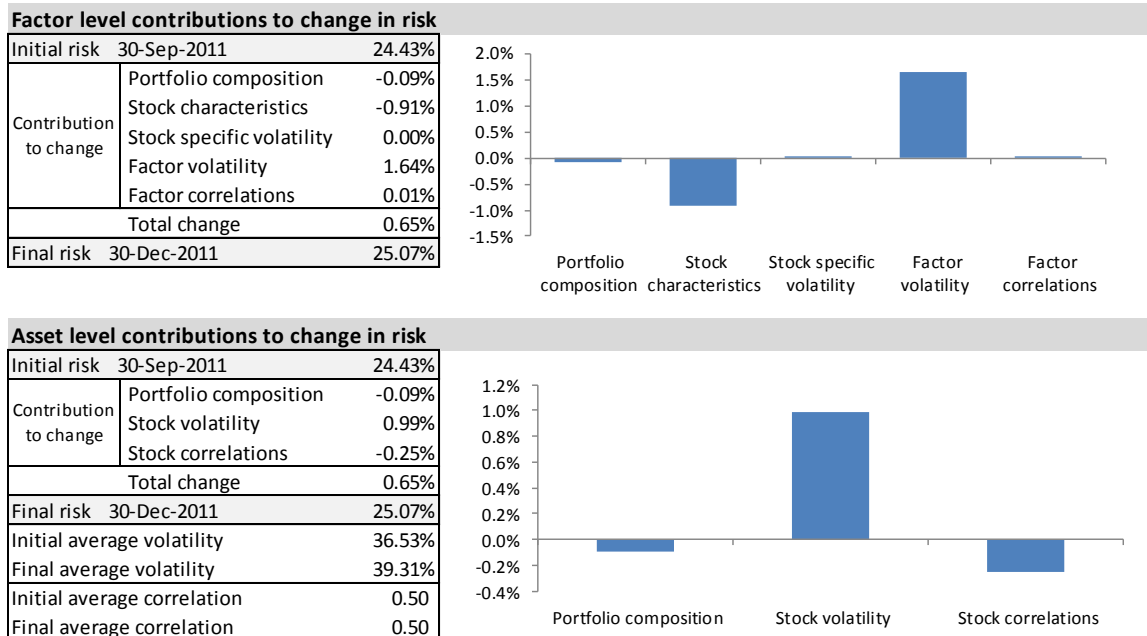
Decomposition of the Change in Risk

The issue of high stock-stock correlations has been front and center in the financial media and in Axioma’s own reporting for quite a while now. High correlation clearly has an impact on market risk, and below we aim to quantify that effect relative to other components of risk estimates.

To understand what is driving the change in risk for each benchmark we look at the contribution to change from each of the underlying components: portfolio composition/weights, portfolio stock characteristics, stock-specific volatility, factor volatility and factor correlationsⁱⁱ. The overall impact of asset level correlations is not seen until we combine these components, so to see the impact of changes in stock correlations we also do decomposition of the full asset covariance matrix.

Figure 7 describes these changes in risk for the FTSE Developed Europe index from the end of the third quarter to the end of the fourth. Increased factor- and asset-level volatility was the only positive contributor to the change in risk during the fourth quarter. Correlations had little-to-no impact.

Figure 7. Change in Risk Decomposition, FTSE Developed Europe Index



Macro Influences

One of the advantages of using a statistical factor model is that the structure of the model is not fixed, which allows for the possibility of significant transient factors that come and go over time. We monitor the correlation of the statistical factors with a number of macro variables to better understand the macro effects that are currently influencing the markets. Table 2 shows the absolute value of correlations between the statistical factors and macro variables, where the correlations are greater than 0.2 and above the 90% confidence level. Only the first five statistical factors are shown in this list. A complete list is available on request.

The first statistical factor, that which has the biggest influence on volatility, is essentially a market factor. Those factors correlated with the market – such as interest rates and credit spreads – have been consistent drivers of the statistical factors. For Europe, not only European yields and spread have been important. US and Japanese yields, and US credit spreads, have also had high correlations with the first statistical factor. Many of the local style factors were correlated with the stat factors, and were consistently throughout the year.

Table 2. Macro Influences on the European Market

Macro Variables		Current Stat Factors					Last Quarter Stat Factors					Last Year Stat Factors				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Yield	US 1y yield						0.22									
	US 5y yield	0.41					0.35					0.32				
	US 10y yield	0.56					0.47					0.38				
	JP 1y yield															
	JP 5y yield	0.22														
	JP 10y yield	0.27										0.20				
	EU 1y yield	0.30					0.55		0.21			0.28				
	EU 5y yield	0.46					0.54	0.30				0.45				
	EU 10y yield	0.51					0.53	0.26				0.45				
	US yield spread	0.56					0.45					0.37				
	JP yield spread	0.27														
	EU yield spread	0.24	0.28					0.26				0.28				
Credit	US TR CDI SPREAD	0.74		0.21			0.70					0.72	0.21			
	Itraxx Europe 3Y Spread	0.71		0.30			0.67		0.26			0.83		0.25		
	Itraxx Asia Ex Japan 5Y Spread		0.20		0.24		0.24					0.48		0.37		
Volatility	VIX	0.63					0.66					0.60				
	VSTOXX	0.48					0.32									
Commodity	GOLD (USD)															
	SILVER (USD)	0.29						0.23				0.30		0.22		
	OIL (WTI)(USD)											0.25				
	HSBC JC BASE METAL INDEX		0.22					0.20				0.24				
	CREDIT SUISSE S&P GSCI SOFTs															
Economic	JAPAN CPI															
	UK CPI															
	US CPI															
	EURO CPI	0.56														
	US PMI											0.62				0.58
	China PMI											0.53				
	AU PMI															
	GB PMI	0.56	0.73													
	EURO PMI															
	US ISM INVENTORY				0.57											
OECD + Major Six NME						0.57						0.54			0.60	
Local Style	Exchange Rate Sensitivity	0.32	0.22	0.46			0.29	0.25	0.35			0.63	0.22			
	Growth		0.28	0.31			0.20	0.34	0.23			0.38				0.21
	Leverage			0.30					0.32							0.33
	Liquidity	0.69	0.45				0.66	0.44	0.29			0.73		0.31		
	Medium-Term Momentum		0.43	0.38			0.22	0.47	0.34	0.21		0.49	0.40			
	Short-Term Momentum	0.65					0.65					0.47	0.31	0.20		
	Size	0.62	0.43		0.29		0.59	0.45		0.32		0.73	0.22	0.36		
	Value	0.25	0.40	0.56		0.24		0.50	0.50		0.23	0.32	0.24	0.22		
	Volatility	0.92					0.90					0.92				

Volatilities and Returns

While returns to several of Axioma's risk factors fell far from their average values in the third quarter and October, they settled down to within one standard deviation in November and December (Table 3). A large-cap tilt would have paid off nicely from September to December of 2011, but for most of the year the best global strategy among Axioma's risk factors would have been to invest in a low-volatility portfolio (Figure 8).

Both short- and medium-horizon predicted risk for most style factors were roughly the same at the end of the fourth quarter than they were at the end of the third; Volatility was an exception, with a fairly large change over the quarter at the medium horizon, and a big jump for the year for both model variants (Table 4).

Country and currency predicted volatilities appear in the Appendix.

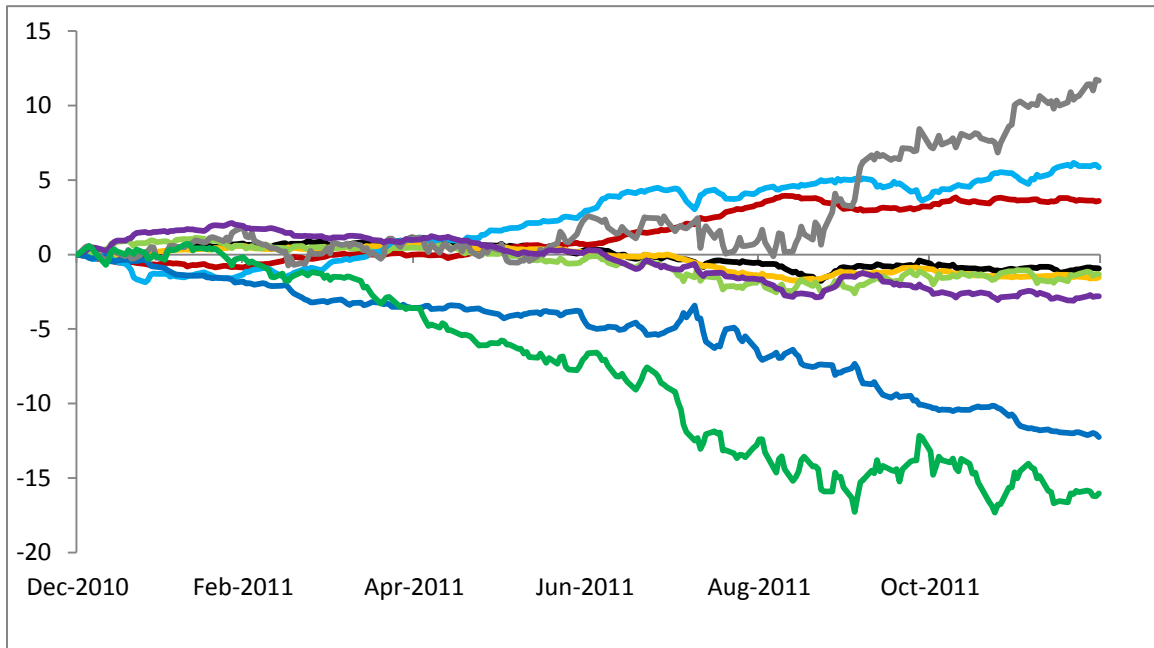
Table 3. Europe Medium-Horizon Fundamental Model Realized Factor Returns

Axioma Risk Factor	2011 Returns			Average Monthly Return				
	Dec	Nov	Oct	3Q 2011	2Q 2011	1Q 2011	4Q 2010	Long Term*
European Market	-0.04	-2.10	7.22	-6.33	-0.05	0.86	1.93	0.36
Exchange Rate Sensitivity	0.06	-0.38	0.24	-0.39	-0.11	0.21	0.08	0.05
Growth	-0.08	0.46	0.16	0.79	0.22	0.00	0.02	0.16
Leverage	-0.03	-0.53	0.21	-0.44	-0.11	0.16	0.03	-0.19
Liquidity	-0.19	0.46	0.59	-0.62	-0.21	0.11	0.09	0.28
Medium-Term Momentum	0.52	1.37	-1.09	0.67	1.17	-0.19	0.68	0.44
Short-Term Momentum	-1.45	-0.80	-2.62	-1.13	-0.51	-1.05	-0.04	-1.42
Size	1.49	2.62	3.78	0.29	0.79	0.04	-0.98	-0.17
Value	-0.03	-0.40	-0.93	-0.56	-0.28	0.36	-0.33	0.21
Volatility	-1.66	-1.62	2.87	-3.23	-1.79	-0.57	-0.11	-0.61

* January 1999 - present

Highlighted cells are 1 standard deviation above or below average.





























































Figure 8. Europe Medium-Horizon Model Cumulative Style Factor Returns, Last 12 Months (%)



- Exchange Rate Sensitivity — Growth — Leverage
- Liquidity — Medium-Term Momentum — Short-Term Momentum
- Size — Value — Volatility

Source: Axioma, Inc.

Table 4. Europe Fundamental Models, Style Factor Predicted Volatility (%)

	Month-End Predicted			Current Vs.		MH Minus SH	Trends		
	Dec 2011	Sep 2011	Dec 2010	Quarter	Year		5 Year	1 Year	1 Quarter
				Ago	Ago				
European Market									
Medium Horizon	25.5	23.8	15.1	1.7	10.3	0.8			
Short Horizon	24.7	27.6	13.7	-2.9	11.0				
Exchange Rate Sensitivity									
Medium Horizon	1.6	1.8	1.1	-0.2	0.5	0.1			
Short Horizon	1.5	2.1	1.1	-0.6	0.4				
Growth									
Medium Horizon	1.5	1.6	1.1	-0.1	0.4	0.1			
Short Horizon	1.4	1.8	1.0	-0.5	0.4				
Leverage									
Medium Horizon	1.1	1.2	0.8	0.0	0.3	0.1			
Short Horizon	1.0	1.4	0.8	-0.4	0.2				
Liquidity									
Medium Horizon	2.8	2.6	1.8	0.2	0.9	0.1			
Short Horizon	2.7	2.9	1.7	-0.2	1.0				
Medium-Term Momentum									
Medium Horizon	3.0	2.8	2.8	0.1	0.2	0.0			
Short Horizon	3.0	2.9	2.6	0.1	0.4				
Short-Term Momentum									
Medium Horizon	4.3	4.4	2.5	0.0	1.9	0.5			
Short Horizon	3.8	5.2	2.3	-1.4	1.5				
Size									
Medium Horizon	6.7	6.2	5.1	0.6	1.6	0.3			
Short Horizon	6.4	6.7	4.8	-0.3	1.6				
Value									
Medium Horizon	2.3	2.4	1.5	-0.1	0.8	0.1			
Short Horizon	2.2	2.9	1.4	-0.7	0.8				
Volatility									
Medium Horizon	9.1	7.5	5.2	1.6	3.9	-0.2			
Short Horizon	9.3	8.7	4.7	0.6	4.6				

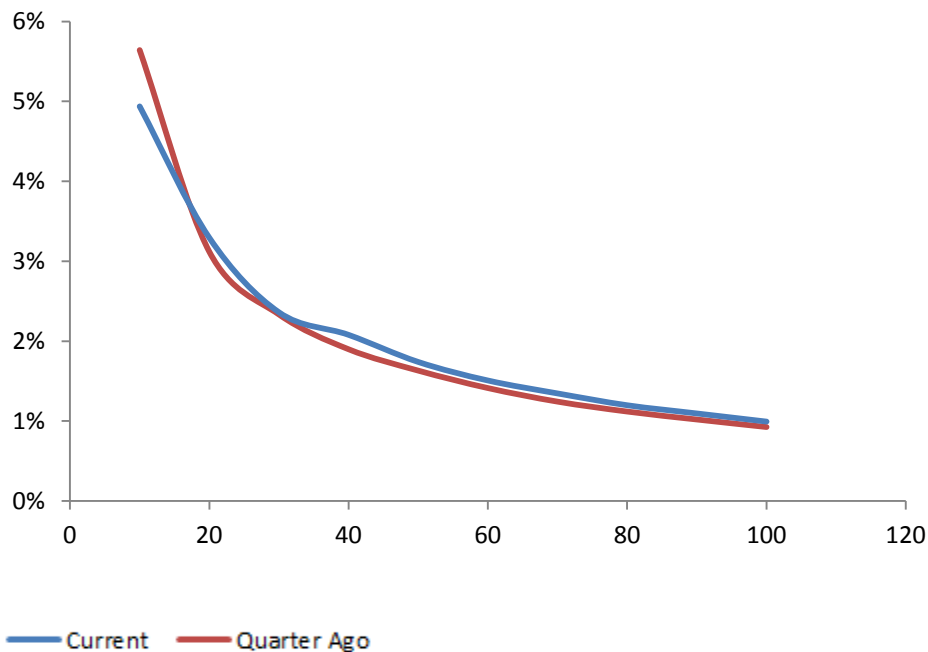
Source: Axioma, Inc.

Implications for Tracking Error

Changes in market-level risk can mean changes in active risk for managers who are tracking a benchmark. Figure 9 highlights the tracking error to the FTSE Europe benchmark versus the number of stocks for an optimized portfolio with a limit on the number of names.

Unlike most other regions of the world, where current risk of a 10 stock portfolio was higher at the end of the fourth quarter than at the end of the third, in developed Europe this concentrated portfolio would have had lower risk. Differences in tracking error for the other number-of-name data points were minimal but all higher at the end of the year than at the end of September.

Figure 9. Tracking Error as Number of Stocks Increases, FTSE Europe



As of 31 Dec 2011

Source: FTSE, Axioma Inc.

Correlations and Cross-Sectional Dispersion

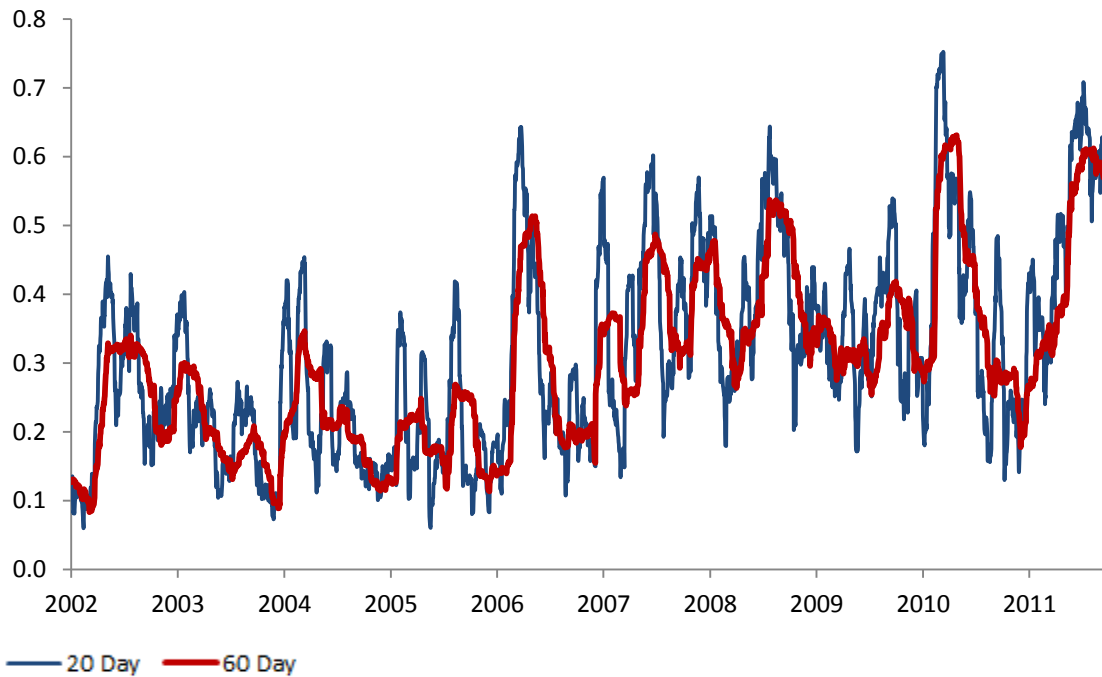
Stock correlations rose substantially in 2011. Although both 20- and 60-day correlations of stocks within the FTSE Developed Europe index ended the year below their end-of-September peak, 20-day correlations were just about at their prior peak, which came in mid-2010 (Figure 10). 60-day correlations were also well above their average throughout the fourth quarter, although they never quite reached their 2010 high point. At the end of 2011, virtually no pairs of stocks had a negative prior 60-day correlation (Figure 11).

When the holding period is extended to monthly, and we calculate the dispersion (cross-sectional standard deviation) of returns the conclusion was similar (Figure 12). Stocks' returns were more similar to each other. This is not necessarily a bad thing – current levels of dispersion are similar to what we've observed in the long stretch from 2003 through 2007, which was a time of generally good markets *and* active returns.

The standard deviation of predicted volatility across Europe's developed market countries suggest bigger differences in country returns going forward relative to what we have observed recently– the level at the end of the year was last seen in 2002 (Figure 13). Currency dispersion is similar: although it ended 2011 below its peak in early 2009, the level is higher than it was for much of the 2000's.

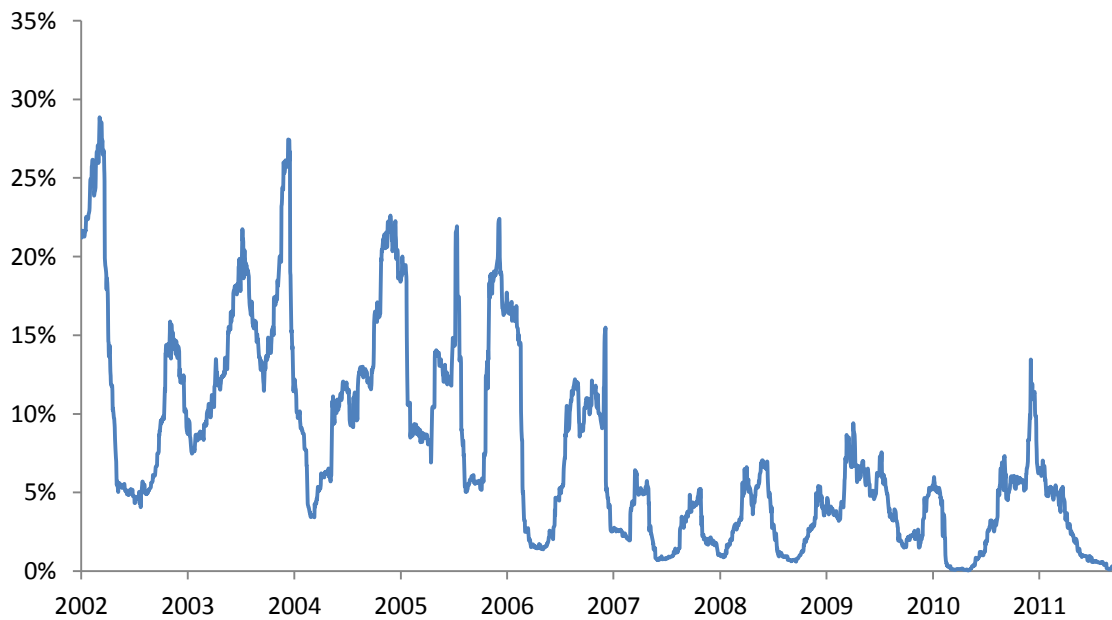
As stock returns have been more similar to each other recently, so have *realized* currency returns (Figure 14). Currencies started the decade of the 2000s with fairly low correlations, but those correlations climbed throughout the decade, especially for developed currencies, likely due to the increasing significance of the euro. Since 2005 correlations have stayed in a (wide) range, with emerging currencies trending a bit higher. At the end of 2011 correlations for developed currencies were above the prior high of their range, and emerging market currencies were just below their high in 2010.

Figure 10. Europe Median Realized 20- and 60-day pairwise asset correlations



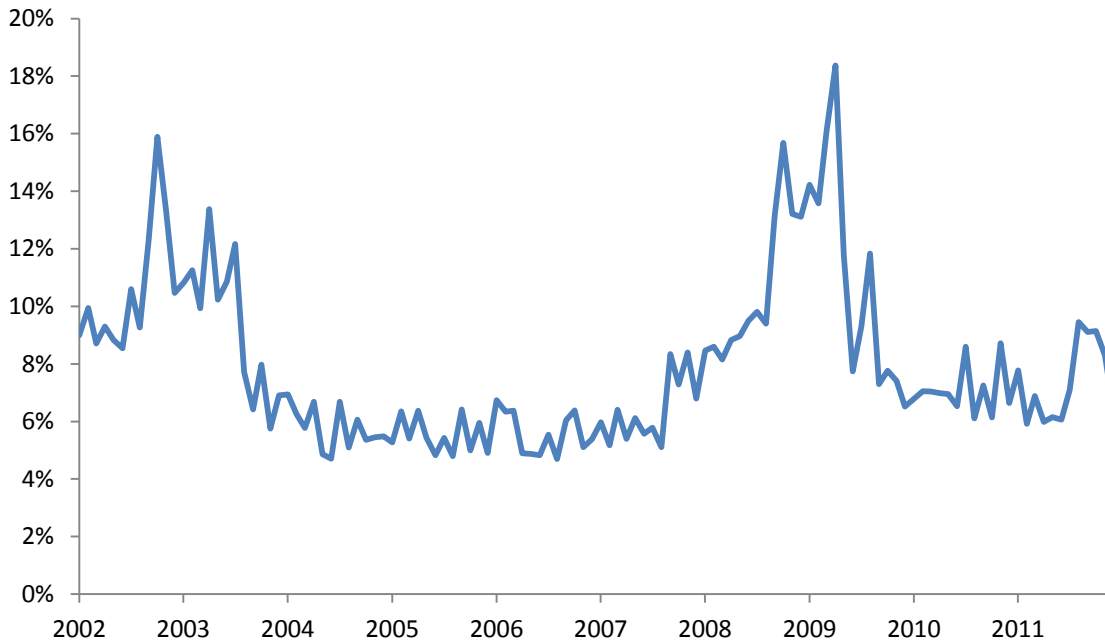
Source: FTSE, Axioma, Inc.

Figure 11. Percent of Realized European Stock-Stock Correlations That Are Negative



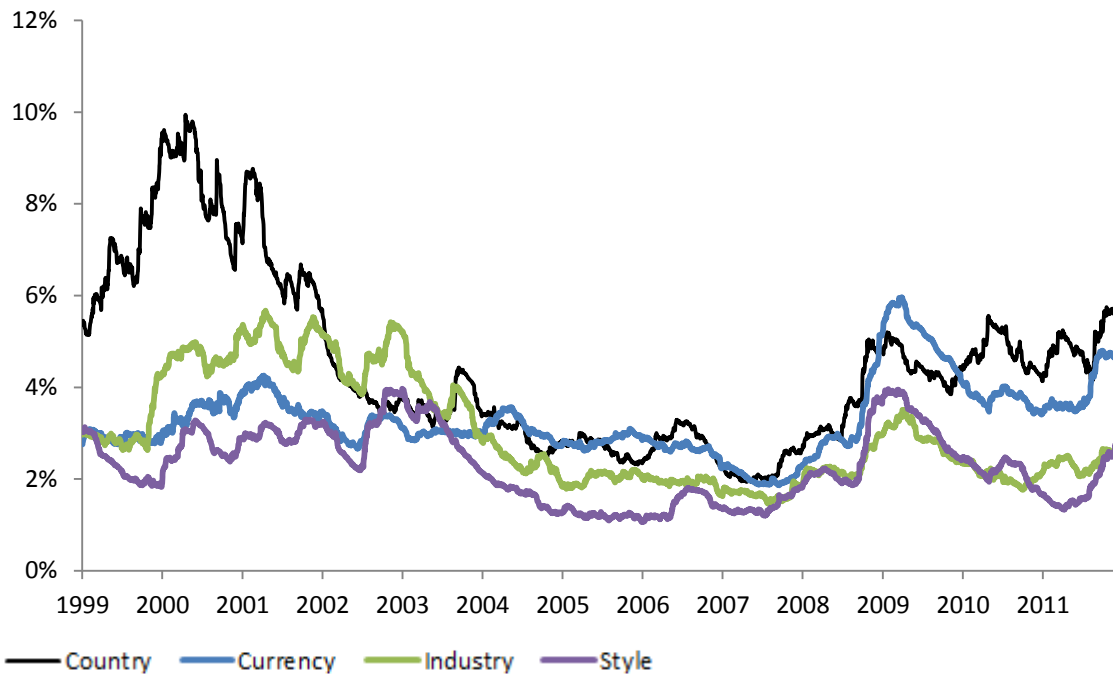
Source: FTSE, Axioma, Inc.

Figure 12. Europe Cross-Sectional Dispersion of Monthly Returns

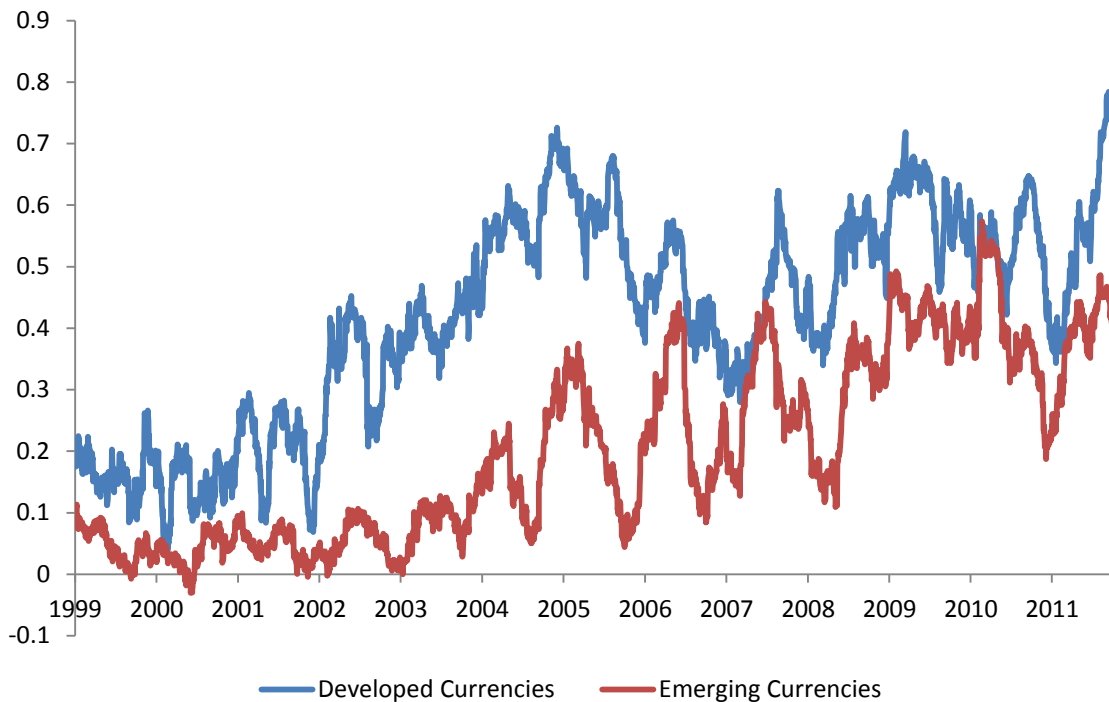


Source: FTSE, Axioma, Inc.

Figure 13. Europe Medium Horizon Fundamental Model, Cross-Sectional Standard Deviation of Common Factor Predicted Volatility



Source: Axioma, Inc.

Figure 14. Median Global Currency Correlations

As mentioned earlier, changes in factor correlations had relatively little impact on changes in market risk forecasts during the fourth quarter. Although these changes have been relatively modest, we do observe that between the end of the third and fourth quarters the correlation between the European Market factor and Medium-Term Momentum moved from slightly positive to slightly negative, and the relationship between Momentum and Volatility became more negative as well. At the end of 2011, the correlations between the average currency and the European Market factor and Volatility were quite high, although that did not change much versus the end of the third quarter.

Of course, not everything is correlated. A number of countries actually have negative correlations when the market factor is removed, most notably Spain and Italy versus the United Kingdom (Table 6). Greece had quite a negative correlation with the European Market at the end of the year whereas France had the most positive correlation with the market factor of all the developed European countries.

Table 5. Style, Currency and Country Correlations

As of 30 Dec 2011												Average		
	European Market	Value	Leverage	Growth	Size	Short-Term Mom	Medium-Term Mom	Volatility	Liquidity	Exch Rate Sens	Country	Currency	Industry	
European Market	1	0.34	0.19	-0.24	0.59	-0.53	-0.08	0.89	0.67	0.43	0.03	0.35	-0.06	
Value	0.34	1	0.32	-0.55	0.24	-0.11	-0.38	0.37	0.26	0.39	0.07	0.15	-0.01	
Leverage	0.19	0.32	1	-0.38	0.13	0.01	-0.06	0.18	0.06	0.23	0.03	0.11	0.01	
Growth	-0.24	-0.55	-0.38	1	-0.26	-0.06	0.10	-0.25	-0.19	-0.26	-0.05	-0.04	-0.01	
Size	0.59	0.24	0.13	-0.26	1	-0.27	0.07	0.49	0.43	0.31	0.04	0.22	-0.02	
Short-Term Momentum	-0.53	-0.11	0.01	-0.06	-0.27	1	0.06	-0.41	-0.34	-0.19	-0.05	-0.15	0.03	
Medium-Term Momentum	-0.08	-0.38	-0.06	0.10	0.07	0.06	1	-0.19	-0.15	-0.17	-0.02	-0.11	0.01	
Volatility	0.89	0.37	0.18	-0.25	0.49	-0.41	-0.19	1	0.67	0.46	0.04	0.40	-0.08	
Liquidity	0.67	0.26	0.06	-0.19	0.43	-0.34	-0.15	0.67	1	0.29	0.03	0.26	-0.04	
Exchange Rate Sensitivity	0.43	0.39	0.23	-0.26	0.31	-0.19	-0.17	0.46	0.29	1	0.05	0.32	-0.05	

As of 30 Sep 2011												Average		
	European Market	Value	Leverage	Growth	Size	Short-Term Mom	Medium-Term Mom	Volatility	Liquidity	Exch Rate Sens	Country	Currency	Industry	
European Market	1	0.33	0.21	-0.27	0.55	-0.52	0.07	0.88	0.66	0.43	-0.10	0.38	-0.03	
Value	0.33	1	0.37	-0.57	0.24	-0.14	-0.36	0.37	0.29	0.41	-0.01	0.18	0.01	
Leverage	0.21	0.37	1	-0.41	0.17	0.01	-0.02	0.23	0.07	0.25	0.00	0.09	0.01	
Growth	-0.27	-0.57	-0.41	1	-0.26	-0.04	0.09	-0.32	-0.24	-0.26	0.02	-0.05	-0.03	
Size	0.55	0.24	0.17	-0.26	1	-0.20	0.13	0.45	0.44	0.30	-0.06	0.23	0.00	
Short-Term Momentum	-0.52	-0.14	0.01	-0.04	-0.20	1	-0.02	-0.40	-0.35	-0.19	0.07	-0.16	0.02	
Medium-Term Momentum	0.07	-0.36	-0.02	0.09	0.13	-0.02	1	-0.04	-0.10	-0.12	-0.03	-0.05	0.00	
Volatility	0.88	0.37	0.23	-0.32	0.45	-0.40	-0.04	1	0.66	0.47	-0.09	0.41	-0.05	
Liquidity	0.66	0.29	0.07	-0.24	0.44	-0.35	-0.10	0.66	1	0.30	-0.09	0.27	-0.01	
Exchange Rate Sensitivity	0.43	0.41	0.25	-0.26	0.30	-0.19	-0.12	0.47	0.30	1	-0.02	0.35	-0.03	

Change												Average		
	European Market	Value	Leverage	Growth	Size	Short-Term Mom	Medium-Term Mom	Volatility	Liquidity	Exch Rate Sens	Country	Currency	Industry	
European Market	0	0.01	-0.02	0.02	0.03	-0.01	-0.15	0.01	0.01	0.00	0.13	-0.03	-0.03	
Value	0.01	0	-0.06	0.02	0.00	0.03	-0.01	0.00	-0.03	-0.02	0.08	-0.03	-0.02	
Leverage	-0.02	-0.06	0	0.03	-0.04	0.00	-0.03	-0.04	-0.01	-0.02	0.03	0.02	-0.01	
Growth	0.02	0.02	0.03	0	0.00	-0.02	0.01	0.07	0.05	0.00	-0.07	0.01	0.01	
Size	0.03	0.00	-0.04	0.00	0	-0.07	-0.06	0.04	0.00	0.01	0.10	-0.01	-0.02	
Short-Term Momentum	-0.01	0.03	0.00	-0.02	-0.07	0	0.08	-0.01	0.01	0.00	-0.11	0.01	0.01	
Medium-Term Momentum	-0.15	-0.01	-0.03	0.01	-0.06	0.08	0	-0.15	-0.05	-0.05	0.01	-0.07	0.01	
Volatility	0.01	0.00	-0.04	0.07	0.04	-0.01	-0.15	0	0.01	0.00	0.13	-0.01	-0.03	
Liquidity	0.01	-0.03	-0.01	0.05	0.00	0.01	-0.05	0.01	0	-0.01	0.12	-0.01	-0.03	
Exchange Rate Sensitivity	0.00	-0.02	-0.02	0.00	0.01	0.00	-0.05	0.00	-0.01	0	0.07	-0.03	-0.02	

Source: Axioma, Inc.

Table 6. Developed Europe Country Correlations

As of 30 Dec 2011	European Market	United Kingdom	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland
European Market	1	-0.01	0.15	0.20	-0.17	0.13	0.39	-0.07	-0.23	-0.13	-0.01	0.19	0.05	-0.10	0.02	0.02	-0.03
United Kingdom	-0.01	1	-0.25	-0.02	-0.13	0.05	-0.19	-0.21	-0.17	0.05	-0.32	-0.19	-0.04	-0.20	-0.31	0.05	-0.19
Austria	0.15	-0.25	1	0.14	-0.04	0.02	0.24	-0.01	-0.09	-0.07	0.04	0.18	0.09	0.10	0.08	-0.05	0.09
Belgium	0.20	-0.02	0.14	1	-0.07	0.23	0.32	0.06	-0.09	-0.03	0.22	0.28	-0.07	0.23	0.15	0.05	0.03
Denmark	-0.17	-0.13	-0.04	-0.07	1	0.11	-0.16	0.04	0.08	0.02	-0.05	0.02	0.15	-0.09	-0.09	0.11	0.08
Finland	0.13	0.05	0.02	0.23	0.11	1	0.14	-0.05	-0.07	-0.04	-0.01	0.12	0.07	-0.04	0.02	0.40	0.00
France	0.39	-0.19	0.24	0.32	-0.16	0.14	1	0.04	-0.11	-0.05	0.20	0.24	-0.21	0.16	0.21	-0.13	-0.03
Germany	-0.07	-0.21	-0.01	0.06	0.04	-0.05	0.04	1	-0.08	0.02	0.01	0.13	-0.02	-0.09	-0.11	-0.04	0.06
Greece	-0.23	-0.17	-0.09	-0.09	0.08	-0.07	-0.11	-0.08	1	-0.02	-0.03	-0.16	-0.03	0.24	0.08	-0.21	0.01
Ireland	-0.13	0.05	-0.07	-0.03	0.02	-0.04	-0.05	0.02	-0.02	1	-0.09	0.06	-0.07	-0.05	-0.02	-0.03	0.03
Italy	-0.01	-0.32	0.04	0.22	0.05	-0.01	0.20	0.01	-0.03	-0.09	1	0.17	-0.10	0.31	0.55	-0.16	0.03
Netherlands	0.19	-0.19	0.18	0.28	0.02	0.12	0.24	0.13	-0.16	0.06	0.17	1	0.04	0.06	0.16	0.04	0.07
Norway	0.05	-0.04	0.09	-0.07	0.15	0.07	-0.21	-0.02	-0.03	-0.07	-0.10	0.04	1	-0.16	-0.13	0.19	-0.02
Portugal	-0.10	-0.20	0.10	0.23	-0.09	-0.04	0.16	-0.09	0.24	-0.05	0.31	0.06	-0.16	1	0.43	-0.20	-0.08
Spain	0.02	-0.31	0.08	0.15	-0.09	0.02	0.21	-0.11	0.08	-0.02	0.55	0.16	-0.13	0.43	1	-0.15	0.02
Sweden	0.02	0.05	-0.05	0.05	0.11	0.40	-0.13	-0.04	-0.21	-0.03	-0.16	0.04	0.19	-0.20	-0.15	1	-0.01
Switzerland	-0.03	-0.19	0.09	0.03	0.08	0.00	-0.03	0.06	0.01	0.03	0.03	0.07	-0.02	-0.08	0.02	-0.01	1

































































































As of 30 Sep 2011	European Market	United Kingdom	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland
European Market	1	-0.07	0.17	0.21	-0.19	0.11	0.38	-0.06	-0.18	-0.19	-0.02	0.16	0.04	-0.10	-0.01	0.02	0.07
United Kingdom	-0.07	1	-0.30	0.00	-0.15	0.05	-0.27	-0.23	-0.17	0.10	-0.32	-0.20	-0.06	-0.20	-0.30	0.06	-0.20
Austria	0.17	-0.30	1	0.02	-0.04	0.01	0.22	0.04	-0.11	-0.06	0.07	0.14	0.10	0.04	0.06	-0.06	0.10
Belgium	0.21	0.00	0.02	1	-0.06	0.32	0.30	0.12	-0.10	0.02	0.24	0.29	-0.03	0.21	0.17	0.11	0.03
Denmark	-0.19	-0.15	-0.04	-0.06	1	0.08	-0.14	0.06	0.06	0.04	-0.04	0.12	0.18	-0.06	-0.09	0.10	0.05
Finland	0.11	0.05	0.01	0.32	0.08	1	0.11	-0.09	-0.07	-0.01	0.07	0.18	0.10	0.04	0.06	0.44	0.07
France	0.38	-0.27	0.22	0.30	-0.14	0.11	1	0.11	-0.07	-0.08	0.28	0.23	-0.17	0.15	0.23	-0.11	0.02
Germany	-0.06	-0.23	0.04	0.12	0.06	-0.09	0.11	1	-0.09	-0.01	0.05	0.17	-0.06	-0.05	-0.09	-0.09	0.09
Greece	-0.18	-0.17	-0.11	-0.10	0.06	-0.07	-0.07	-0.09	1	-0.03	0.04	-0.11	-0.02	0.27	0.16	-0.24	-0.03
Ireland	-0.19	0.10	-0.06	0.02	0.04	-0.01	-0.08	-0.01	-0.03	1	-0.04	0.01	-0.12	0.02	-0.03	-0.06	0.02
Italy	-0.02	-0.32	0.07	0.24	-0.04	0.07	0.28	0.05	0.04	-0.04	1	0.17	-0.10	0.33	0.57	-0.16	0.00
Netherlands	0.16	-0.20	0.14	0.29	0.12	0.18	0.23	0.17	-0.11	0.01	0.17	1	0.01	0.01	0.11	0.04	0.06
Norway	0.04	-0.06	0.10	-0.03	0.18	0.10	-0.17	-0.06	-0.02	-0.12	-0.10	0.01	1	-0.14	-0.14	0.19	-0.01
Portugal	-0.10	-0.20	0.04	0.21	-0.06	0.04	0.15	-0.05	0.27	0.02	0.33	0.01	-0.14	1	0.47	-0.15	-0.13
Spain	-0.01	-0.30	0.06	0.17	-0.09	0.06	0.23	-0.09	0.16	-0.03	0.57	0.11	-0.14	0.47	1	-0.17	0.00
Sweden	0.02	0.06	-0.06	0.11	0.10	0.44	-0.11	-0.09	-0.24	-0.06	-0.16	0.04	0.19	-0.15	-0.17	1	-0.02
Switzerland	0.07	-0.20	0.10	0.03	0.05	0.07	0.02	0.09	-0.03	0.02	0.00	0.06	-0.01	-0.13	0.00	-0.02	1

Change	European Market	United Kingdom	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland
European Market	0	0.06	-0.02	-0.01	0.02	0.03	0.01	-0.02	-0.05	0.06	0.01	0.03	0.02	0.01	0.03	0.00	-0.11
United Kingdom	0.06	0	0.05	-0.02	0.02	0.00	0.08	0.02	0.00	-0.05	0.00	0.02	0.02	0.00	0.00	-0.01	0.01
Austria	-0.02	0.05	0	0.12	0.00	0.01	0.02	-0.06	0.02	-0.01	-0.03	0.04	-0.02	0.06	0.01	0.00	-0.01
Belgium	-0.01	-0.02	0.12	0	-0.01	-0.10	0.02	-0.05	0.01	-0.06	-0.03	-0.01	-0.03	0.03	-0.02	-0.06	0.00
Denmark	0.02	0.02	0.00	-0.01	0	0.03	-0.02	-0.02	0.03	-0.03	-0.01	-0.10	-0.02	-0.03	0.01	0.01	0.03
Finland	0.03	0.00	0.01	-0.10	0.03	0	0.03	0.03	0.00	-0.03	-0.08	-0.07	-0.03	-0.08	-0.05	-0.04	-0.06
France	0.01	0.08	0.02	0.02	-0.02	0.03	0	-0.07	-0.04	0.03	-0.08	0.02	-0.04	0.01	-0.02	-0.02	-0.04
Germany	-0.02	0.02	-0.06	-0.05	-0.02	0.03	-0.07	0	0.01	0.03	-0.04	-0.05	0.04	-0.04	-0.02	0.04	-0.04
Greece	-0.05	0.00	0.02	0.01	0.03	0.00	-0.04	0.01	0	0.01	-0.07	-0.05	-0.01	-0.03	-0.08	0.03	0.04
Ireland	0.06	-0.05	-0.01	-0.06	-0.03	-0.03	0.03	0.03	0.01	0	-0.05	0.05	0.05	-0.07	0.01	0.03	0.01
Italy	0.01	0.00	-0.03	-0.03	-0.01	-0.08	-0.08	-0.04	-0.07	-0.05	0	0.00	0.00	-0.02	-0.02	0.00	0.03
Netherlands	0.03	0.02	0.04	-0.01	-0.10	-0.07	0.02	-0.05	-0.05	0.05	0.00	0	0.03	0.05	0.05	0.01	0.00
Norway	0.02	0.02	-0.02	-0.03	-0.02	-0.03	-0.04	0.04	-0.01	0.05	0.00	0.03	0	-0.02	0.01	0.00	0.00
Portugal	0.01	0.00	0.06	0.03	-0.03	-0.08	0.01	-0.04	-0.03	-0.07	-0.02	0.05	-0.02	0	-0.04	-0.05	0.05
Spain	0.03	0.00	0.01	-0.02	0.01	-0.05	-0.02	-0.02	-0.08	0.01	-0.02	0.05	0.01	-0.04	0	0.02	0.02
Sweden	0.00	-0.01	0.00	-0.06	0.01	-0.04	-0.02	0.04	0.03	0.03	0.00	0.01	0.00	-0.05	0.02	0	0.01
Switzerland	-0.11	0.01	-0.01	0.00	0.03	-0.06	-0.04	-0.04	0.04	0.01	0.03	0.00	0.00	0.05	0.02	0.01	0

Conclusion

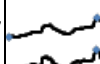





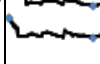











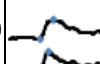

















Risk of European benchmarks and benchmark derivatives was substantially higher for most of 2011 than it had been since mid-2009, although it ticked down toward the end of the year. For much of 2011, the four Axioma risk model variants had quite a bit of disagreement about risk, but by December they converged, led by declines in risk forecasts from the short-horizon models. While stock-stock correlations rose substantially throughout 2011 and neared record highs since at least 1999, they eased downward by the end of the year. We hope and expect this will improve prospects for active managers, particularly those focused on individual stock selection.

Appendix 1. Predicted Volatility, Developed European Countries

	Month-End Predicted			Current Vs.		MH Minus SH	Trends		
	Dec 2011	Sep 2011	Dec 2010	Quarter Ago	Year Ago		5 Year	1 Year	1 Quarter
Austria									
Medium Horizon	10.1	8.3	6.8	1.8	3.3	-0.2			
Short Horizon	10.3	9.2	7.0	1.1	3.2				
Belgium									
Medium Horizon	7.1	7.0	4.3	0.1	2.9	-0.1			
Short Horizon	7.2	8.3	4.4	-1.1	2.8				
Denmark									
Medium Horizon	8.9	8.7	6.6	0.2	2.3	0.6			
Short Horizon	8.3	9.9	6.2	-1.5	2.1				
Finland									
Medium Horizon	9.8	9.4	6.2	0.4	3.5	-0.4			
Short Horizon	10.2	9.6	5.9	0.6	4.3				
France									
Medium Horizon	5.7	5.3	3.1	0.4	2.7	-0.1			
Short Horizon	5.8	6.4	2.8	-0.6	3.1				
Germany									
Medium Horizon	5.2	5.6	3.6	-0.4	1.6	0.6			
Short Horizon	4.6	6.6	3.7	-2.0	0.9				
Greece									
Medium Horizon	28.5	27.4	18.8	1.1	9.6	2.6			
Short Horizon	25.9	30.1	17.8	-4.2	8.0				
Ireland									
Medium Horizon	13.8	11.3	11.6	2.4	2.2	-0.8			
Short Horizon	14.6	12.4	10.6	2.2	3.9				
Italy									
Medium Horizon	9.1	8.4	5.4	0.7	3.7	-0.8			
Short Horizon	9.8	9.6	5.4	0.2	4.4				
Netherlands									
Medium Horizon	6.3	5.4	3.6	0.9	2.7	-0.7			
Short Horizon	7.0	6.6	3.6	0.4	3.4				
Norway									
Medium Horizon	8.9	8.3	8.4	0.6	0.4	0.5			
Short Horizon	8.4	8.9	8.6	-0.5	-0.2				
Portugal									
Medium Horizon	12.4	11.8	11.4	0.6	1.0	0.5			
Short Horizon	11.9	10.7	12.7	1.3	-0.8				
Spain									
Medium Horizon	8.3	8.5	8.5	-0.2	-0.2	0.5			
Short Horizon	7.8	8.3	8.7	-0.5	-0.9				
Sweden									
Medium Horizon	8.6	8.7	6.6	-0.1	2.0	1.1			
Short Horizon	7.5	8.4	5.9	-1.0	1.5				
Switzerland									
Medium Horizon	6.9	7.3	3.9	-0.4	3.0	0.9			
Short Horizon	6.0	8.8	3.9	-2.8	2.1				
United Kingdom									
Medium Horizon	5.1	5.4	3.3	-0.3	1.8	0.7			
Short Horizon	4.4	6.3	3.0	-1.9	1.4				

Source: Axioma, Inc.

Appendix 2. Predicted Volatility, Developed European Currencies

	Month-End Predicted			Current Vs.		MH Minus SH	Trends		
	Dec 2011	Sep 2011	Dec 2010	Quarter Ago	Year Ago		5 Year	1 Year	1 Quarter
CHF									
Medium Horizon	12.6	14.2	7.6	-1.6	5.0	1.7			
Short Horizon	10.8	16.6	8.8	-5.7	2.0				
DKK									
Medium Horizon	0.2	0.2	0.2	0.0	0.0	0.0			
Short Horizon	0.3	0.2	0.2	0.1	0.0				
GBP									
Medium Horizon	8.1	9.0	8.5	-0.9	-0.4	0.6			
Short Horizon	7.5	9.5	8.7	-2.0	-1.2				
NOK									
Medium Horizon	7.4	7.9	7.5	-0.5	-0.1	0.2			
Short Horizon	7.2	8.8	7.0	-1.6	0.2				
SEK									
Medium Horizon	7.3	7.9	6.8	-0.6	0.5	0.0			
Short Horizon	7.3	8.5	6.6	-1.2	0.7				
USD									
Medium Horizon	11.2	12.0	10.2	-0.7	1.0	1.0			
Short Horizon	10.2	12.7	10.8	-2.5	-0.6				

Source: Axioma, Inc.

Appendix 3. Developed Currency Correlations

As of 30 Dec 2011	CHF	NOK	GBP	SEK	DKK	EUR
CHF	1	0.41	0.35	0.38	0.50	0.50
NOK	0.41	1	0.68	0.81	0.85	0.85
GBP	0.35	0.68	1	0.71	0.70	0.70
SEK	0.38	0.81	0.71	1	0.87	0.87
DKK	0.50	0.85	0.70	0.87	1	1.00
EUR	0.50	0.85	0.70	0.87	1.00	1

As of 30 Sep 2011	CHF	NOK	GBP	SEK	DKK	EUR
CHF	1	0.32	0.25	0.29	0.41	0.41
NOK	0.32	1	0.65	0.81	0.83	0.83
GBP	0.25	0.65	1	0.65	0.67	0.67
SEK	0.29	0.81	0.65	1	0.85	0.85
DKK	0.41	0.83	0.67	0.85	1	1.00
EUR	0.41	0.83	0.67	0.85	1.00	1

Change	CHF	NOK	GBP	SEK	DKK	EUR
CHF	0	0.09	0.10	0.09	0.08	0.08
NOK	0.09	0	0.03	0.00	0.02	0.02
GBP	0.10	0.03	0	0.07	0.04	0.04
SEK	0.09	0.00	0.07	0	0.02	0.02
DKK	0.08	0.02	0.04	0.02	0	0.00
EUR	0.08	0.02	0.04	0.02	0.00	0

Source: Axioma, Inc.

ⁱ Some of the markets we cover do not have official benchmarks, but we are able to back into the risk estimates. For example, FTSE does not have a PIIGS index, but we are able to create a derivative by starting with the FTSE Developed Europe index and removing all countries except Portugal, Italy, Ireland, Greece and Spain. The remaining stocks are then reweighted in proportion to their original weights. In this report we will refer to these derivations as benchmarks, although we will only use the provider's name (e.g. FTSE) for their official indexes.

ⁱⁱ The components of a risk forecast are the portfolio holdings, its factor exposures, the covariance matrix, and stock-specific risk. In order to decompose the change in risk of a benchmark or portfolio, we employ the following methodology: We first look at the impact of the change in holdings, so we use last period's risk model with the current portfolio to calculate a risk forecast, and the difference is attributable solely to the change in holdings. Next, to evaluate the change in stocks' characteristics, we update the factor exposures, and again use last period's risk model, but current holdings and exposures. Third, we look at the impact of specific risk changes by using current specific risk estimates but the prior period's covariance matrix. We calculate the impact of changes in correlation by using last period's correlations

with all the other data as of the current period. Finally, the residual is the impact of the change in factor volatility. While the ordering described above will affect the results, we find that the results do not change substantially when we change the order. Intuitively we believe that the biggest impact will come from change in factor volatility, and our results bear out our intuition.

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