

# Axioma Insight

## Quarterly Risk Review

### US Edition

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October 31, 2011

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Quarter-end predicted risk for many benchmarks around the world was higher, in most cases substantially higher, than it was at the end of the prior quarter (Table 1). The one exception was Japan, which was likely still suffering the effects of the earthquake and tsunami at the end of July. Japan has now moved from above-average risk relative to other major markets last quarter to below-average risk. Not surprisingly the Euro block forecast risk is currently the highest of the major markets.

Highlights from this quarter:

- The spread between short horizon and medium horizon models has grown, reflecting an environment of increasing risk. Forecasts from the statistical models remain below those of fundamental models, suggesting the increase in risk is driven by fundamental factors. (See Figure 3, page 8.)
- Six out of ten style factors have experienced returns in excess of one standard deviation in at least one month during the last quarter (Table 2, page 10).
- Medium term momentum, size and exchange rate sensitivity have been rewarded. Leverage, market sensitivity and especially volatility have had negative returns (Figure 7, page 11).
- Factor volatilities have increased across the board, with styles increasing on average by 1.2%, and industries increasing by an average of 12% (Table 3, page 12.)
- Active risk of a 50 stock tracking portfolio against Russell 1000 has increased by about 50 basis points over the last three months (Figure 8, page 14).
- Asset level correlations among Russell 1000 stocks are at a 10 year high, reflecting the common drivers of risk in the current environment. Virtually no stock pairs have a negative correlation (Figures 9 and 10, pages 16 and 17).

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**Table 1. Comparison of Benchmark Predicted Volatilities**

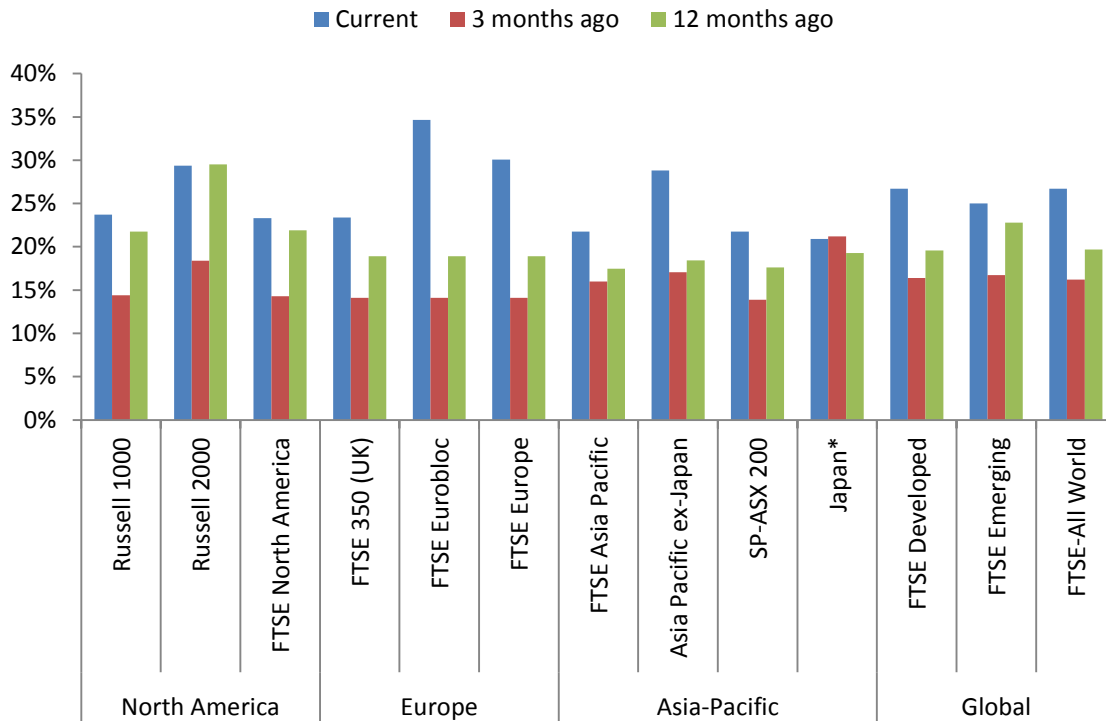
	Benchmark Predicted Volatility			Change Vs.	
	Most Recent (31 Oct 2011)	1 Quarter Ago (29 July 2011)	1 Year Ago (29 Oct 2010)	1 Quarter Ago	1 Year Ago
North America					
Russell 1000	25.6%	15.0%	20.3%	10.5%	5.3%
Russell 2000	31.0%	19.0%	27.2%	12.0%	3.8%
FTSE North America	24.5%	14.8%	20.3%	9.7%	4.1%
Europe					
FTSE 350 (UK)	24.6%	14.1%	18.9%	10.4%	5.7%
FTSE Eurobloc	34.6%	22.6%	29.9%	12.1%	4.7%
FTSE Europe	31.4%	21.0%	24.1%	10.4%	7.4%
Asia-Pacific					
FTSE Asia Pacific	24.4%	15.9%	15.8%	8.6%	8.7%
Asia Pacific ex-Japan	28.8%	17.0%	18.4%	11.8%	10.4%
SP-ASX 200	21.8%	13.9%	17.6%	7.9%	4.1%
Japan*	20.9%	21.2%	19.3%	-0.3%	1.6%
FTSE Developed	26.7%	16.4%	19.6%	10.3%	7.1%
FTSE Emerging	27.6%	16.8%	20.5%	10.8%	7.1%
FTSE-All World	26.5%	16.2%	19.7%	10.3%	6.8%
Average	26.8%	17.2%	20.9%	9.6%	5.9%

\* Russell Developed minus Russell Developed ex-Japan.

Based on medium-horizon fundamental model for each region.

Source: Axioma, Inc. FTSE, Frank Russell, Standard and Poor's.

**Figure 1. Risk Has Increased Across the Board; Japan is the Lone Exception**



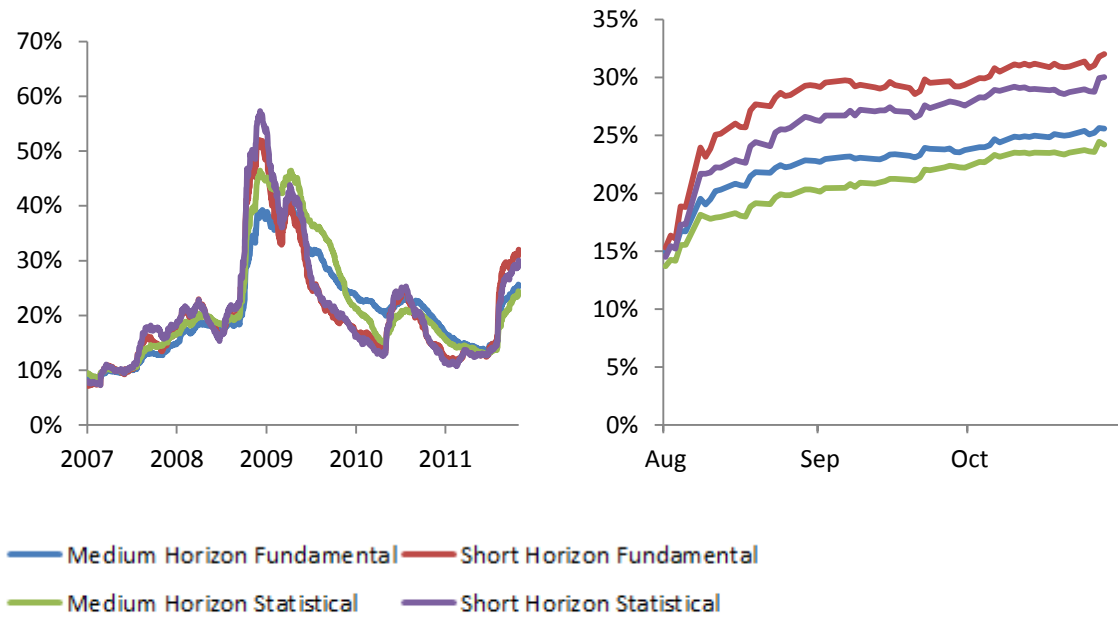
\*Russell Developed minus Russell Developed ex-Japan

Based on medium-horizon fundamental model for each region. Data as of October 31, 2011. Source: Axioma, Inc. FTSE, Frank Russell, Standard and Poor's.

## Focus on the US market

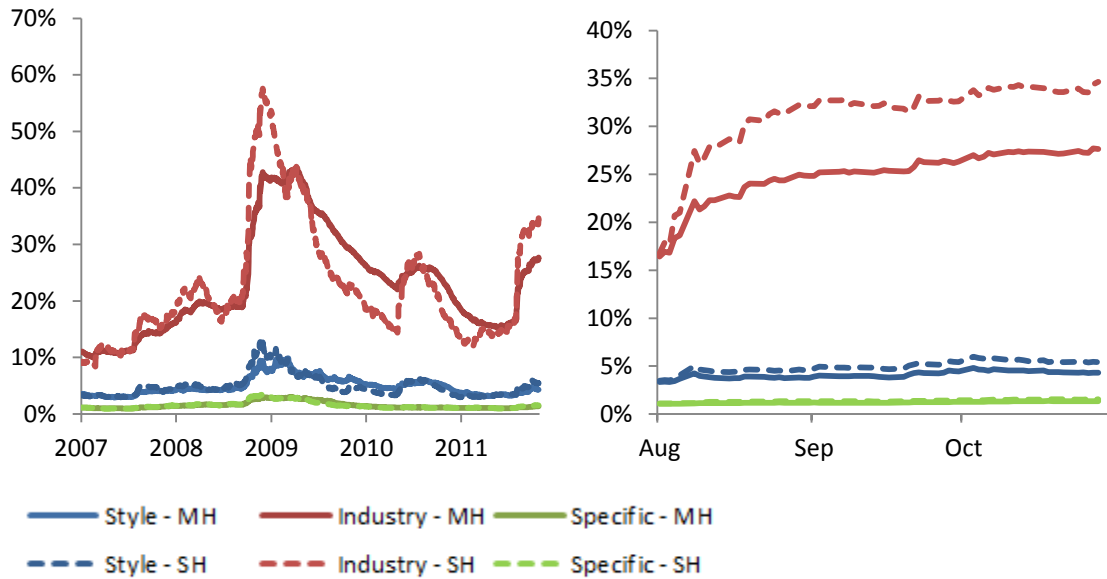
The third quarter saw a substantial increase in risk for US stocks relative to the prior quarter. European stocks registered a similar rise, and both regions' increase was clearly higher than that of the Asia-Pacific region, and even more than that of emerging markets. Risk forecasts from all four models were similar at the beginning of August, but then started to diverge and the models remain far apart, with risk from the short-horizon models quite a bit higher than that of the medium-horizon models (Figure 2). The short-horizon fundamental model, driven largely by a rise in industry risk, saw the biggest increase

**Figure 2. Russell 1000 Risk Characteristics, Last 5 Years and Most Recent Quarter, Ending 31 October 2011**



Source: Frank Russell, Axioma, Inc.

**Figure 3. Russell 1000: Predicted Risk of Major Fundamental Model Components**

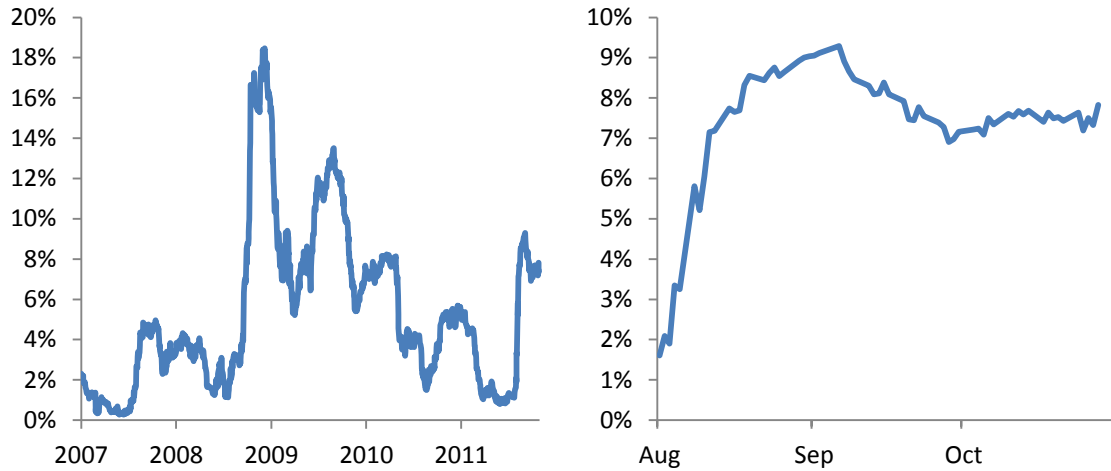


Source: Frank Russell, Axioma, Inc.

Differences in risk estimates are described further by risk *spreads*. The predicted risk spread measures the difference in the largest risk estimate from the four risk models (medium-term fundamental, medium-term statistical, short-term fundamental and short-term statistical) from the smallest (Figure 4). The higher the number, the larger the disagreement among models. The five-year peak came in early December 2008, when the short-term statistical model’s forecast exceeded that of the medium-term fundamental model by almost 17 percentage points. Over the last quarter, the spread climbed substantially, but stabilized after August and remained well below the 5-year high.

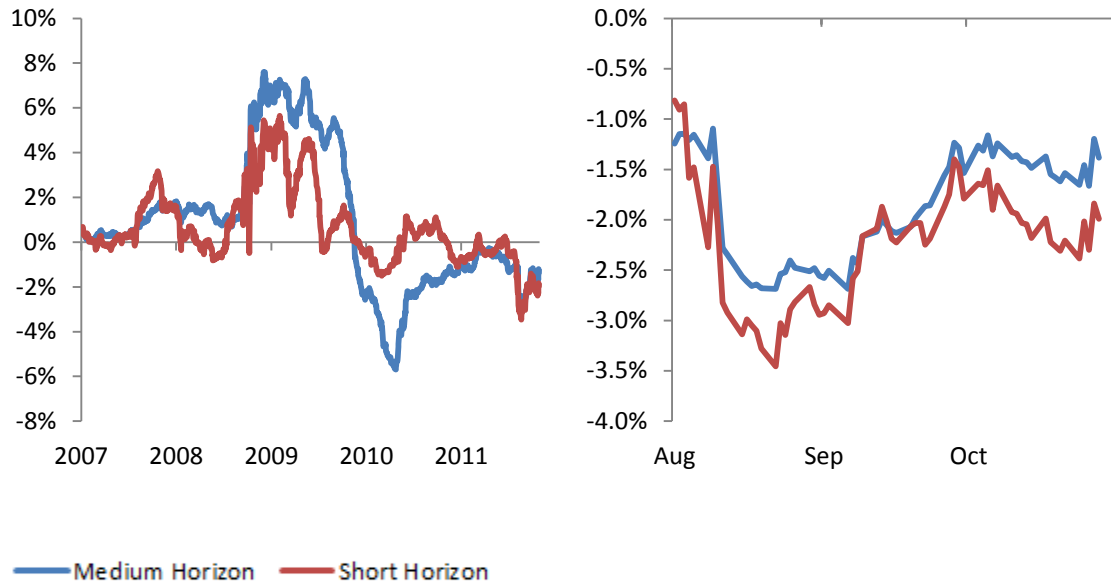
In 2008-2009, all spreads were positive – statistical common factor risk was higher than fundamental at both horizons, and the short horizon risk was higher than the medium horizon, for both the statistical and fundamental models (Figure 5 and Figure 6). It is relatively rare to have the stat-fund spreads at both horizons and the short-medium spreads for both types of model all be negative at the same time. In the most recent period, whereas the short-term models had higher risk forecasts than their medium-term counterparts, the statistical models actually had lower risk forecasts than the fundamental, driven largely by the lower common factor risk predicted by the statistical models. Since we are looking at benchmark risk, stock-specific risk plays a relatively small role in these spreads. *We conclude that the risk environment in the US this time is indeed different from three years ago.*

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

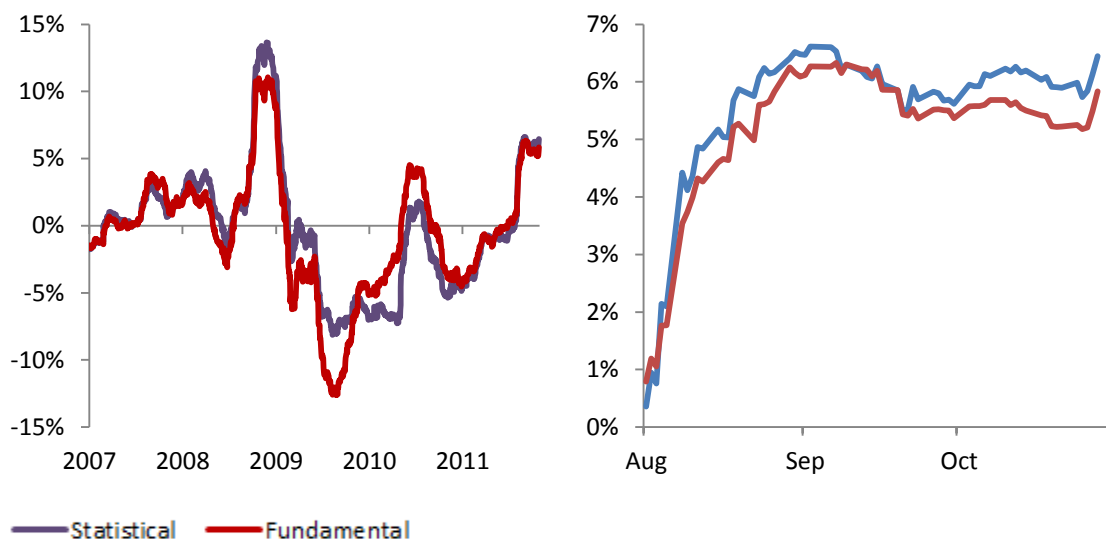


Source: Frank Russell, Axioma, Inc.

**Figure 5. Statistical – Fundamental Spread**



Source: Frank Russell, Axioma, Inc.

**Figure 6. Short – Medium Spread**

Source: Frank Russell, Axioma, Inc.

## Volatilities and Returns

The increased volatility is reflected in the magnitude of factor returns. In September, six of the 10 style factors had returns at least one standard deviation above or below average (Table 2). In addition, September returns for short-term momentum and exchange-rate sensitivity were in the top 5% relative to their history since 1982, whereas Growth, Market Sensitivity and Value had one of their worst months since 1982. Reversal of fortune in October was dramatic for Exchange Rate Sensitivity and Volatility. Volatility, which has produced highly negative returns for much of the last year, continued its downward path during the first two months of this quarterly period, and despite an uptick in October posted by far the most negative return for the last 12 months (Figure 7).

In addition, all style factors have seen volatility from both the medium-horizon and short-horizon models tick up during the last quarter, although to varying degrees (Table 3). For example, while the risk of the Volatility factor is substantially higher than it was at the end of July, the risk of the Growth factor is only marginally higher.

Industry risk is up across the board as compared with last quarter (Table 4 highlights the 10 industries with the biggest increase according to the medium-horizon model). On average, medium-horizon industry risk is about 12% higher than it was at the end of July 2011, and no industry saw a decrease in risk since then. Short-horizon forecasts have risen even more – they are up an average of 19% over the past three months. The range

of increases was about 10% - 14% for the medium horizon model, and 15% - 24% for the short-horizon variant, so no industries appear as big outliers.

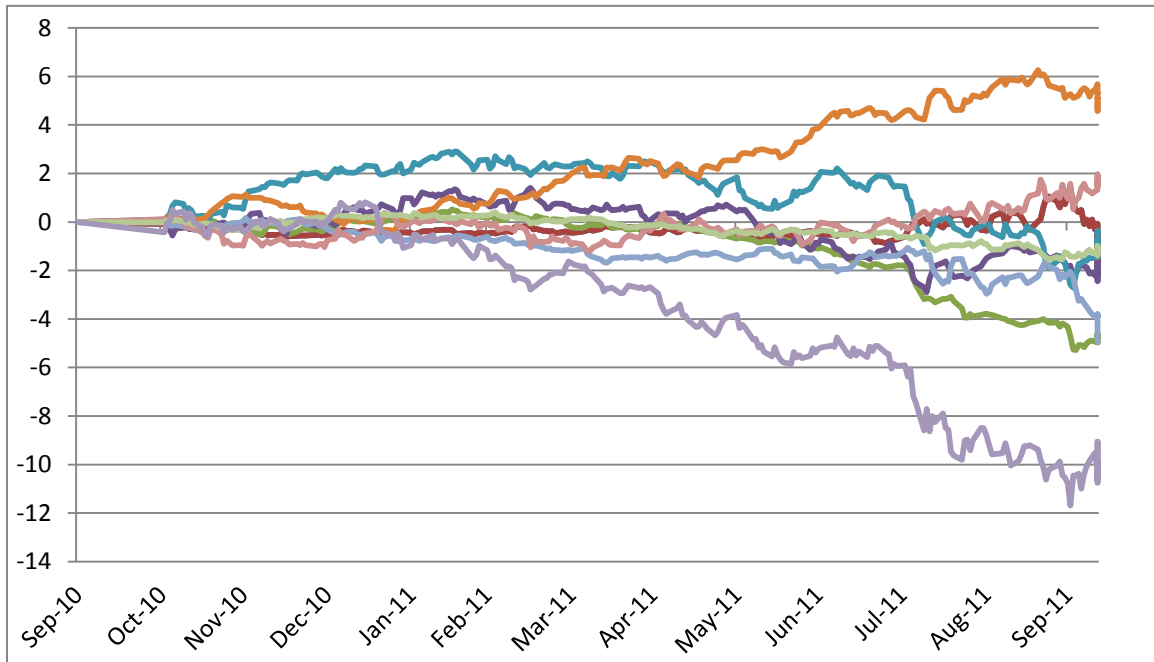
**Table 2. US Realized Style Factor Returns**

Axioma Risk Factor	2011 Returns			Average Monthly Return				
	Oct	Sep	Aug	3Q 2011	2Q 2011	1Q 2011	4Q 2010	Long Term*
Exchange Rate Sensitivity	-1.17	1.47	0.36	0.53	-0.02	0.04	-0.39	0.01
Growth	0.33	-0.51	0.50	0.11	0.16	0.28	0.15	0.44
Leverage	-0.47	-0.57	-2.03	-1.10	-0.29	0.01	-0.07	-0.19
Liquidity	0.02	-0.44	-0.21	-0.35	-0.47	0.16	-0.16	0.45
Market Sensitivity	0.76	-2.09	-1.51	-1.33	-0.14	0.16	0.71	-0.02
Medium Term Momentum	0.44	0.01	0.86	0.43	0.61	0.62	0.28	0.45
Short-Term Momentum	-1.83	0.84	-1.59	-0.12	-0.19	-0.30	-0.36	-2.02
Size	0.37	0.62	0.44	0.38	0.26	-0.07	-0.14	-0.18
Value	-0.09	-0.40	-0.27	-0.30	-0.17	-0.02	0.10	0.22
Volatility	0.54	-2.16	-3.05	-1.98	-1.22	-0.58	-0.02	-1.13

\* Axioma Medium Horizon Model, January 1982 - present





























































Highlighted cells are 1 standard deviation above or below average

**Figure 7. US Medium-Horizon Model Cumulative Style Factor Returns, 12 Months Ended October 2011 (%)**






























































Source: Axioma, Inc.

**Table 3. US Style Factor Predicted Volatility**

	Month End (%)			Change from		Trends		
	Current (31 Oct 2011)	Quarter Ago (29 Jul 2011)	Year Ago (29 Oct 2010)	Quarter Ago	Year Ago	5 year	1 Year	3 Month
<b>Exchange Rate Sensitivity</b>								
Medium Horizon	2.6	1.0	1.4	1.6	1.1			
Short Horizon	3.6	1.0	1.0	2.6	2.6			
<b>Growth</b>								
Medium Horizon	0.9	0.7	0.9	0.2	0.0			
Short Horizon	1.0	0.7	0.8	0.3	0.2			
<b>Leverage</b>								
Medium Horizon	2.2	1.2	1.8	1.0	0.4			
Short Horizon	2.7	1.3	1.2	1.4	1.6			
<b>Liquidity</b>								
Medium Horizon	3.2	2.6	3.2	0.6	0.0			
Short Horizon	3.4	2.7	3.1	0.7	0.3			
<b>Market Sensitivity</b>								
Medium Horizon	4.1	3.0	4.1	1.1	-0.1			
Short Horizon	4.7	3.0	3.4	1.6	1.2			
<b>Medium-Term Momentum</b>								
Medium Horizon	2.8	2.4	2.3	0.4	0.5			
Short Horizon	3.2	2.6	1.5	0.6	1.7			
<b>Short-Term Momentum</b>								
Medium Horizon	3.0	1.4	2.5	1.6	0.5			
Short Horizon	3.9	1.6	1.6	2.2	2.3			
<b>Size</b>								
Medium Horizon	3.2	2.6	3.5	0.7	-0.3			
Short Horizon	3.9	2.6	2.7	1.3	1.2			
<b>Value</b>								
Medium Horizon	1.3	1.0	1.4	0.4	0.0			
Short Horizon	1.7	1.0	0.9	0.7	0.7			
<b>Volatility</b>								
Medium Horizon	5.9	3.9	6.0	2.0	0.0			
Short Horizon	7.5	4.3	4.8	3.2	2.7			

Source: Axioma, Inc.

**Table 4. 10 Largest Industry Increases in Medium Horizon Predicted Volatility, Versus Last Quarter**

	Month End (%)			Change from		Trends		
	Current (31 Oct 2011)	Quarter Ago (29 Jul 2011)	Year Ago (29 Oct 2010)	Quarter Ago	Year Ago	5 year	1 Year	3 Month
Metals & Mining								
Medium Horizon	34.3	20.2	29.6	14.2	4.7			
Short Horizon	44.8	19.7	22.3	25.1	22.5			
Marine								
Medium Horizon	33.5	19.9	27.5	13.7	6.0			
Short Horizon	42.2	20.5	16.5	21.7	25.8			
Road & Rail								
Medium Horizon	32.9	19.3	28.1	13.6	4.8			
Short Horizon	42.0	20.0	21.0	22.0	21.0			
Commercial Banks								
Medium Horizon	31.0	17.5	27.1	13.5	4.0			
Short Horizon	38.4	18.2	19.6	20.2	18.8			
Energy Equipment & Services								
Medium Horizon	35.9	22.4	27.5	13.5	8.4			
Short Horizon	46.2	22.4	20.3	23.8	25.9			
Automobiles								
Medium Horizon	37.5	24.0	33.7	13.5	3.8			
Short Horizon	46.4	24.3	24.5	22.1	21.9			
Building Products								
Medium Horizon	33.3	19.8	28.7	13.5	4.6			
Short Horizon	42.0	19.8	20.1	22.3	21.9			
Construction & Engineering								
Medium Horizon	32.8	19.5	26.7	13.4	6.2			
Short Horizon	41.4	18.8	17.0	22.7	24.5			
Leisure Equipment & Products								
Medium Horizon	31.4	18.2	27.6	13.2	3.8			
Short Horizon	38.8	18.9	20.9	20.0	17.9			
Trading Companies & Distributors								
Medium Horizon	32.9	19.9	27.8	13.0	5.1			
Short Horizon	41.0	20.7	21.2	20.3	19.8			

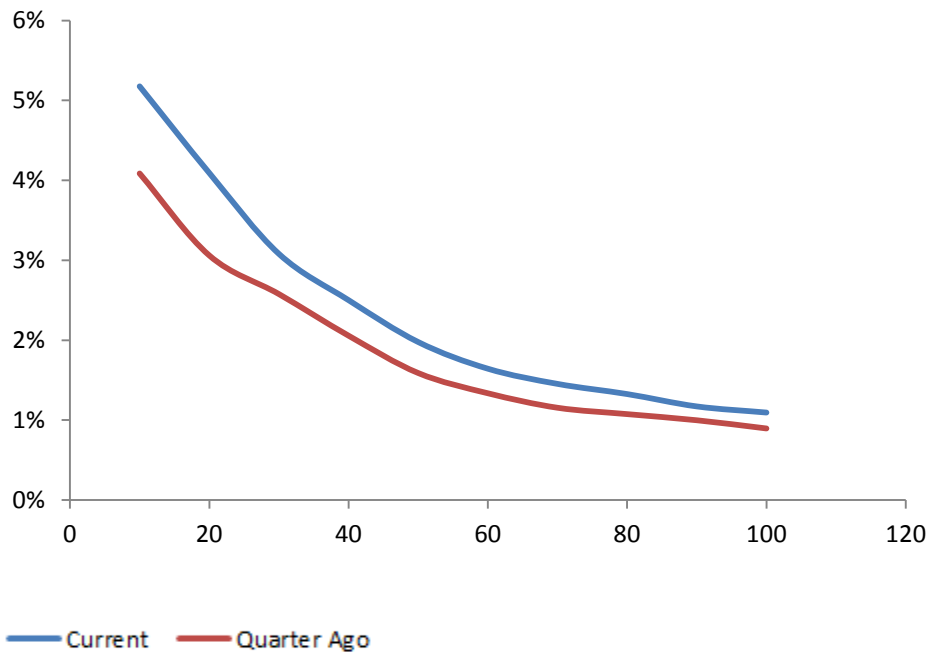
Source: Axioma, Inc.

## Implications for Tracking Error

Another sign of increased market risk is illustrated in Figure 8, which highlights the tracking error to the Russell 1000 versus the number of stocks. As we iterate across the number of stocks, in all cases the tracking error is higher currently than at the end of the July.

Changes in market level risk almost inevitably imply changes in active risk for managers who are tracking a benchmark. In the following chart we show the minimum active risk for index tracking portfolios of varying number of stocks. The recent increase in market risk has led to a fairly large corresponding increase in tracking error for portfolios with a small number of stocks, but even a portfolio with 100 stocks would have higher tracking error now relative to last quarter.

**Figure 8. Tracking Error as Number of Stocks Increases, Russell 1000**



As of 10/31/2011

Source: Frank Russell, Axioma Inc.

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## Correlations and Cross-Sectional Dispersion

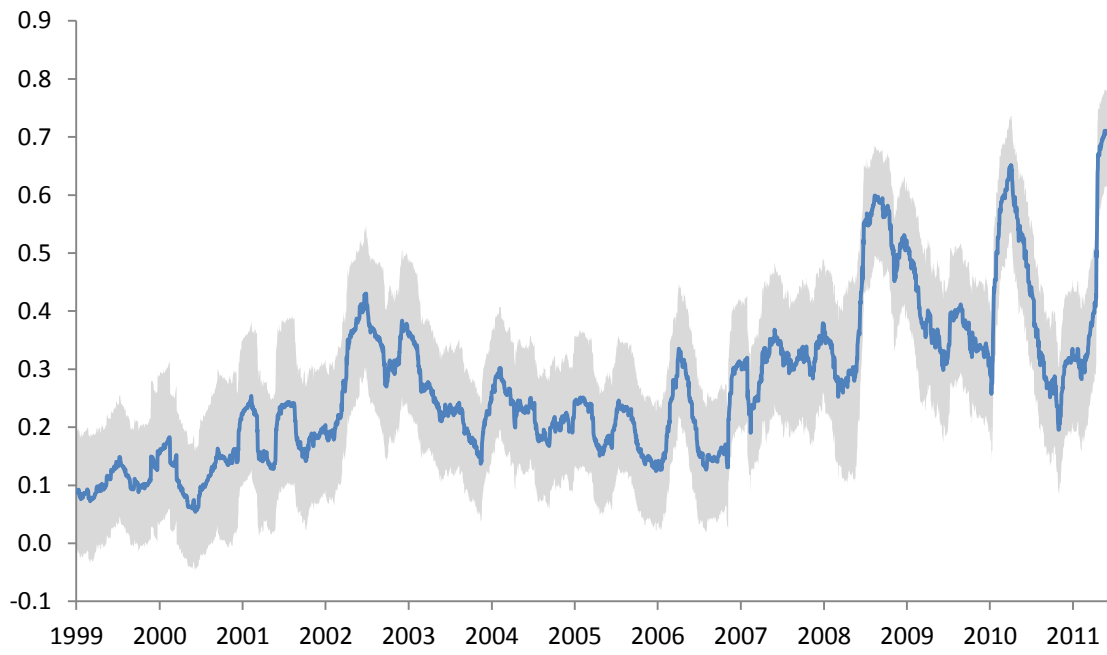
2011 has witnessed a large increase in correlations, especially between stocks. The median correlation exceeded its prior peak (since at least 1999) at the end of October (Figure 9). The interquartile range for correlations has also fallen to a new low, and the percent of stock pairs that actually have a negative correlation is just about zero.

Cross-sectional dispersion (also called cross-sectional volatility) of monthly returns had fallen dramatically in early 2011, although it has ticked up substantially since May.

Similarly, industry dispersion has ticked up only slightly after dropping to a new low (since 1999) in June of this year. So, as stocks seem to be moving in lock-step with each other, so do industries (Figure 12). Style factor dispersion (and inversely, correlation) is typically lower than that of industries. Whereas style dispersion had fallen as well, the drop was less steep than that of industry dispersion. Correspondingly, the very recent increase is more muted than industry dispersion. In addition, correlations over the last quarter have not changed substantially (Table 5), with the exception of Exchange Rate Sensitivity, which is now much more negatively correlated with almost all the other style factors. Its average correlation with industries has also fallen quite substantially.

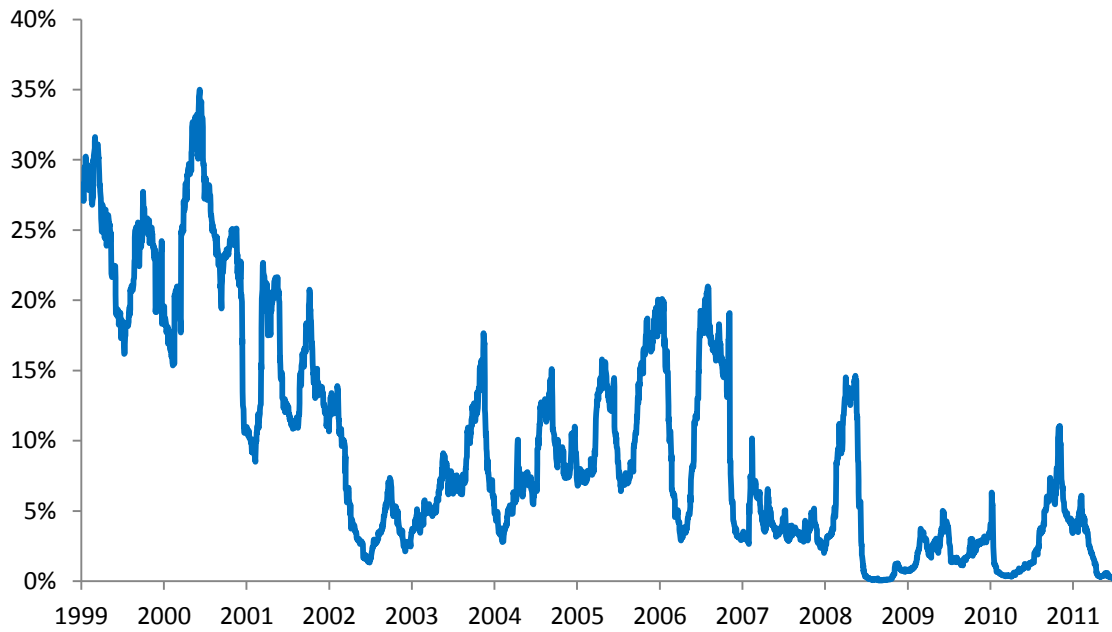
Overall, although October saw a recovery in market returns, it did not see any improvement in the correlation/dispersion environment, and distinguishing the thorns from the roses remained extremely difficult, whether an investor was trying to choose among stocks, industries or risk factors.

**Figure 9. Russell 1000 Median Realized 60-day Pairwise Asset Correlation**



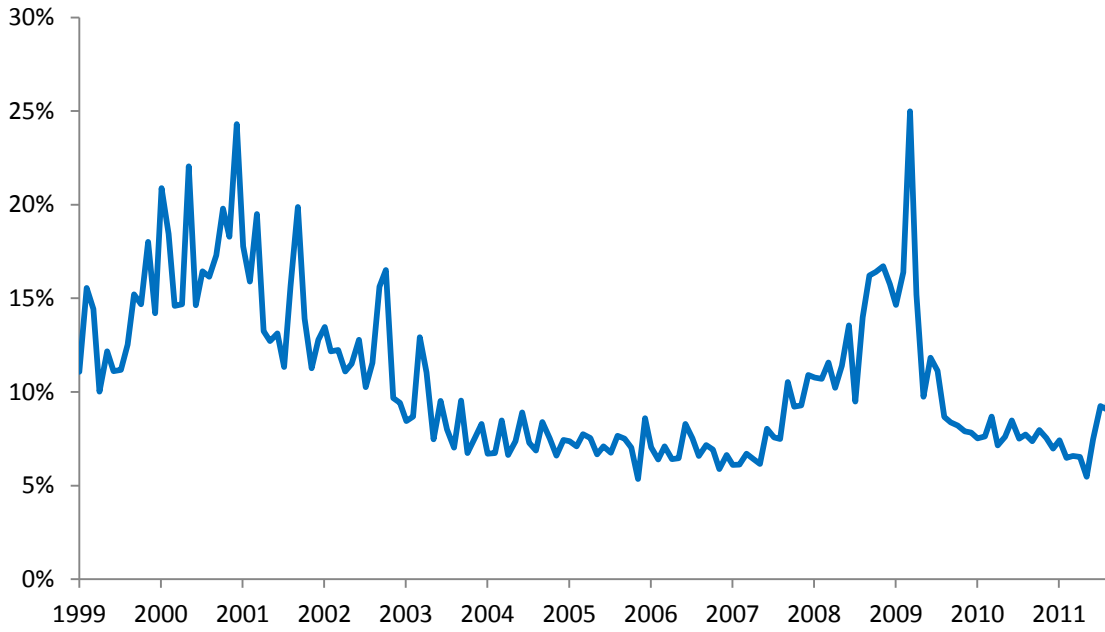
Source: Frank Russell, Axioma, Inc.

**Figure 10. Percent of Russell 1000 60-day Stock-Stock Correlations That Are Negative**



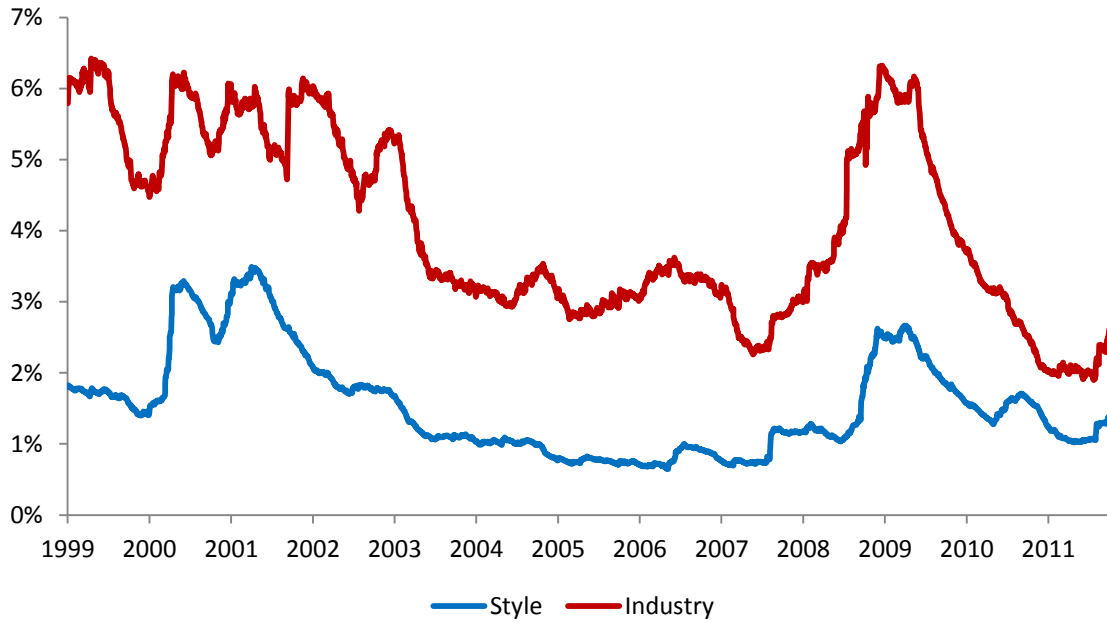
Source: Frank Russell, Axioma, Inc.

**Figure 11. Russell 1000 Cross-Sectional Dispersion of Monthly Returns**



Source: Frank Russell, Axioma, Inc.

**Figure 12. US Medium Horizon Fundamental Model, Cross-Sectional Dispersion of Predicted Volatility, Common Factors**



Source: Axioma, Inc.

**Table 5. Style Factor Predicted Correlations**

<b>As of 10/31/2011</b>	Value	Lev- erage	Growth	Size	Mkt Sens	Liq- uidity	Short- Term Mom	Medium- Term Mom	Exch Rate Sens	Vol- atility	Avg Industry
Value	1	0.31	0.00	0.11	0.28	-0.13	-0.22	-0.37	-0.07	0.24	0.27
Leverage	0.31	1	-0.25	0.02	0.25	0.17	-0.10	-0.24	0.07	0.10	0.16
Growth	0.00	-0.25	1	0.04	-0.07	-0.11	-0.13	0.05	-0.24	-0.08	-0.04
Size	0.11	0.02	0.04	1	0.07	0.04	0.01	0.00	-0.10	-0.02	0.05
Market Sensitivity	0.28	0.25	-0.07	0.07	1	0.21	-0.32	0.07	-0.28	0.63	0.77
Liquidity	-0.13	0.17	-0.11	0.04	0.21	1	-0.12	0.03	-0.13	0.10	0.16
Short-Term Momentum	-0.22	-0.10	-0.13	0.01	-0.32	-0.12	1	0.16	0.22	-0.27	-0.39
Medium-Term Momentum	-0.37	-0.24	0.05	0.00	0.07	0.03	0.16	1	-0.05	0.04	0.06
Exchange Rate Sensitivity	-0.07	0.07	-0.24	-0.10	-0.28	-0.13	0.22	-0.05	1	-0.33	-0.39
Volatility	0.24	0.10	-0.08	-0.02	0.63	0.10	-0.27	0.04	-0.33	1	0.78

<b>As of 7/29/2011</b>	Value	Lev- erage	Growth	Size	Mkt Sens	Liq- uidity	Short- Term Mom	Medium- Term Mom	Exch Rate Sens	Vol- atility	Avg Industry
Value	1	0.41	-0.08	0.14	0.30	-0.07	-0.26	-0.35	0.12	0.20	0.26
Leverage	0.41	1	-0.22	0.00	0.16	0.07	-0.23	-0.34	0.12	0.08	0.15
Growth	-0.08	-0.22	1	0.05	-0.13	-0.05	0.01	0.09	-0.17	-0.19	-0.13
Size	0.14	0.00	0.05	1	0.07	0.05	0.06	-0.01	-0.11	0.06	0.07
Market Sensitivity	0.30	0.16	-0.13	0.07	1	0.11	-0.25	0.02	0.02	0.61	0.75
Liquidity	-0.07	0.07	-0.05	0.05	0.11	1	-0.10	-0.12	-0.13	0.14	0.10
Short-Term Momentum	-0.26	-0.23	0.01	0.06	-0.25	-0.10	1	0.25	-0.07	-0.23	-0.32
Medium-Term Momentum	-0.35	-0.34	0.09	-0.01	0.02	-0.12	0.25	1	-0.15	0.01	0.01
Exchange Rate Sensitivity	0.12	0.12	-0.17	-0.11	0.02	-0.13	-0.07	-0.15	1	-0.09	-0.06
Volatility	0.20	0.08	-0.19	0.06	0.61	0.14	-0.23	0.01	-0.09	1	0.75

<b>Change in correlation</b>	Value	Lev- erage	Growth	Size	Mkt Sens	Liq- uidity	Short- Term Mom	Medium- Term Mom	Exch Rate Sens	Vol- atility	Avg Industry
Value	0	-0.10	0.08	-0.02	-0.02	-0.07	0.04	-0.03	-0.19	0.04	0.01
Leverage	-0.10	0	-0.03	0.02	0.10	0.10	0.13	0.11	-0.05	0.02	0.02
Growth	0.08	-0.03	0	-0.01	0.06	-0.06	-0.14	-0.04	-0.07	0.11	0.09
Size	-0.02	0.02	-0.01	0	0.00	0.00	-0.05	0.01	0.01	-0.07	-0.02
Market Sensitivity	-0.02	0.10	0.06	0.00	0	0.10	-0.07	0.06	-0.30	0.02	0.02
Liquidity	-0.07	0.10	-0.06	0.00	0.10	0	-0.02	0.15	0.00	-0.04	0.05
Short-Term Momentum	0.04	0.13	-0.14	-0.05	-0.07	-0.02	0	-0.10	0.29	-0.04	-0.07
Medium-Term Momentum	-0.03	0.11	-0.04	0.01	0.06	0.15	-0.10	0	0.10	0.02	0.05
Exchange Rate Sensitivity	-0.19	-0.05	-0.07	0.01	-0.30	0.00	0.29	0.10	0	-0.24	-0.34
Volatility	0.04	0.02	0.11	-0.07	0.02	-0.04	-0.04	0.02	-0.24	0	0.03

Source: Axioma, Inc.

## Conclusion

The last three months have been characterized by increasing volatility, especially for industries, high correlations and low dispersion among stocks, volatile factor returns, little risk distinction between industries or styles – overall, a difficult environment for investors to produce high active returns (not that it is ever very easy!)

We hope you, our readers, find this information helpful in your investment process. We will continue to refine and enhance this publication, and we look forward to suggestions about how we can improve this report to ensure it is a useful tool for managing portfolio risk.



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