

Axioma Insight

Quarterly Risk Review

China 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:

- The four risk model variants (Medium-Term Fundamental, Medium-Term Statistical, Short-Term Fundamental and Short-Term Statistical) were largely in agreement about the predicted risk for China at the end of the year (Figures 1 – 6). We believe this agreement reduces the likelihood of a big “risk shock.” Overall, predicted risk rose slightly between the third and fourth quarters of 2011.
- Elsewhere, 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).
- A low volatility strategy would have worked well in 2011. Illiquid stocks also fared well, mainly in the last nine months of the year. Negative short-term momentum turned in good returns in the first half of the year, but that performance stalled in the last six months (Figure 8). This suggests that strategies based on return reversal would have fared well for the first half of 2011.
- The correlation of Liquidity with a number of other style factors fell during the fourth quarter, whereas Value became more correlated with many of the style factors (Table 5).
- 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.

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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	2.2	11.9
China Top 300+					
USD	19.7	18.8	27.8	0.9	-8.1
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

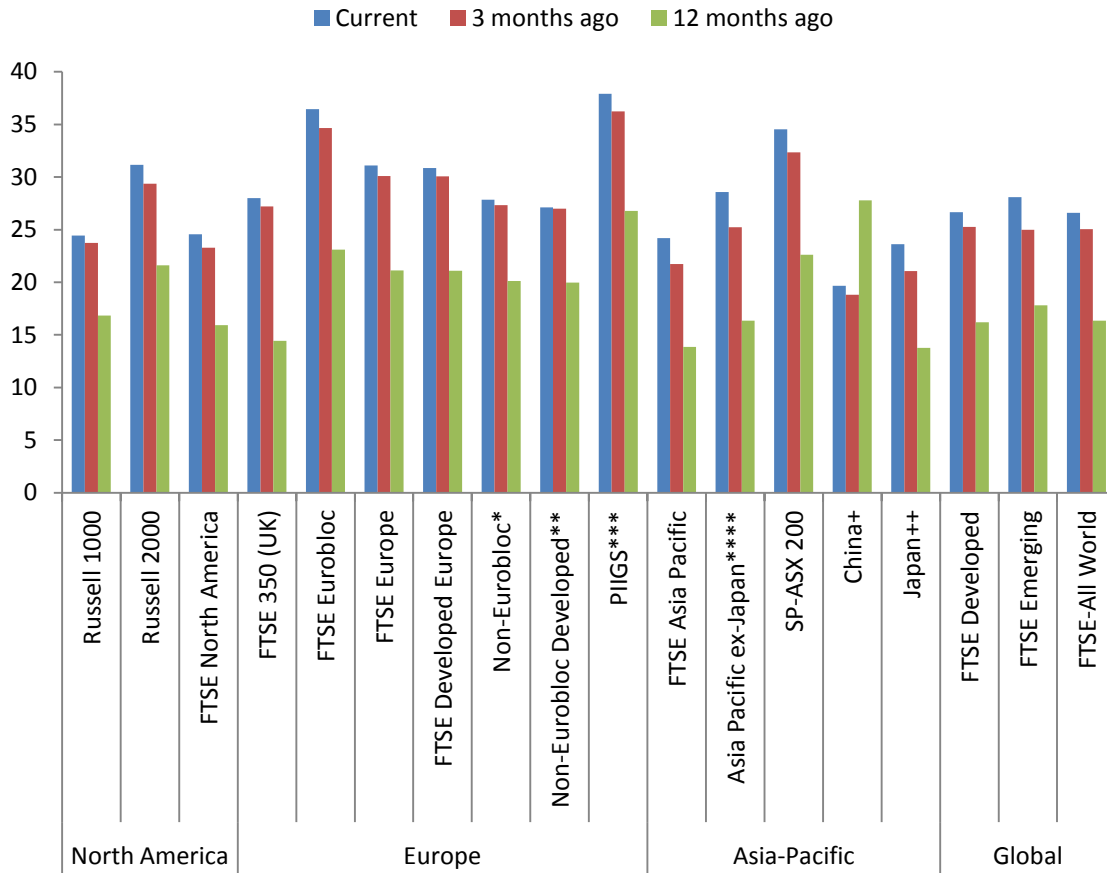
+300 largest comps by market cap in the China A-share universe also in our risk model estimation universe

++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 Are 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

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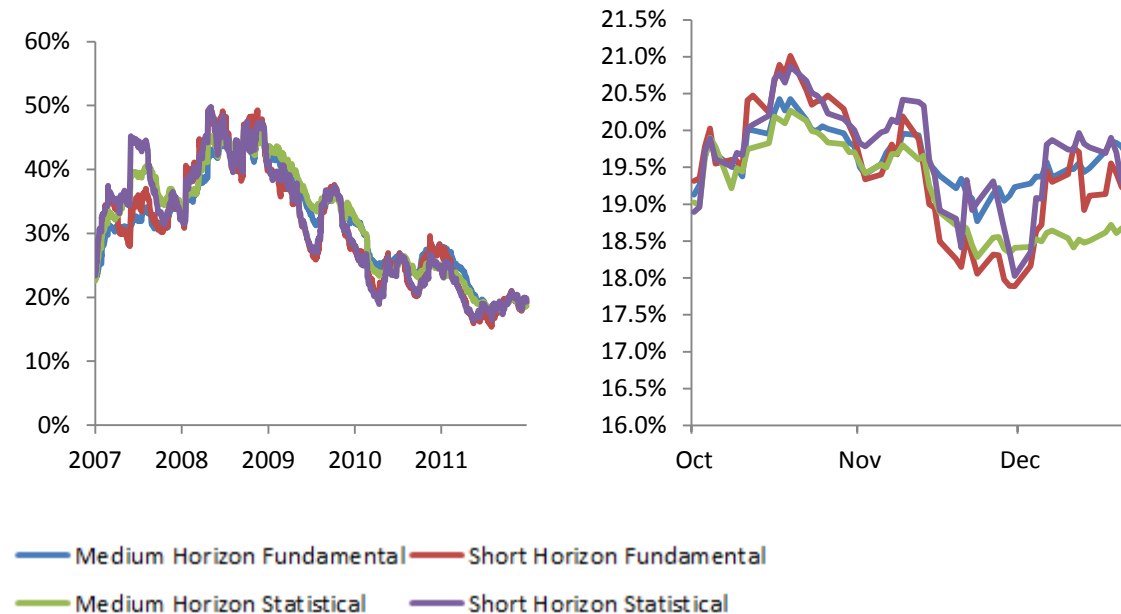
Source: FTSE, Frank Russell, Standard & Poor's, Axioma Inc. All figures in USD unless otherwise noted.

Focus on the Chinese Market

We construct a China Top 300 benchmark by taking the 300 largest companies by market cap in the China A-share universe that are also in our risk model estimation universe. Our risk model estimation universe applies filters to exclude companies based on liquidity and other metrics. The benchmark is market cap weighted, with a maximum weight of 5% for any individual stock. As at 31 December 2011, the five largest weights in the benchmark are Agricultural Bank of China, Industrial & Commercial Bank of China, Petrochina, Bank of China and China Petroleum.

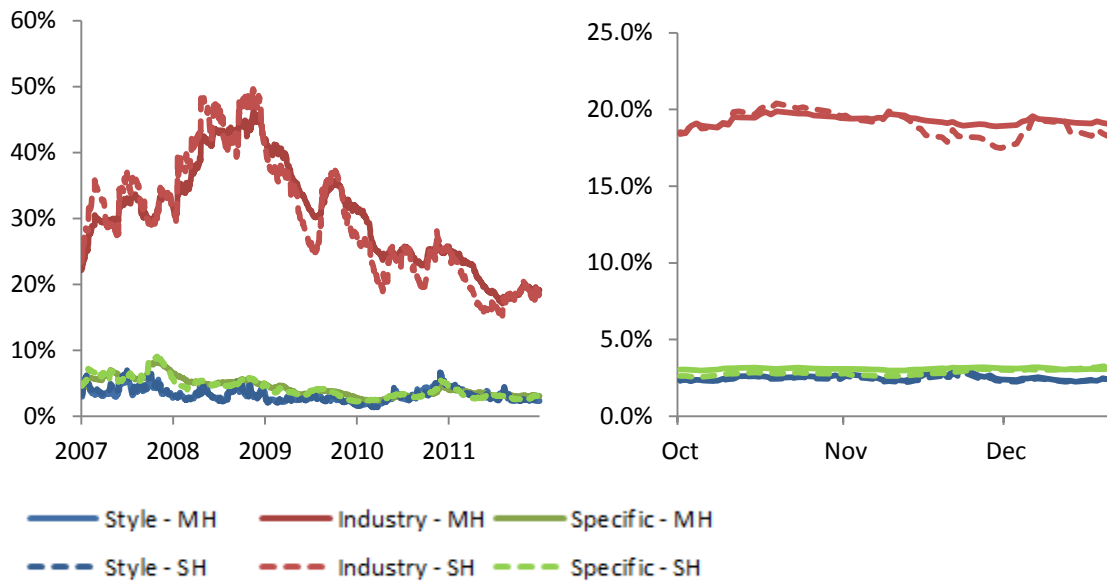
As we observed for the other countries and regions we cover, risk in China ended the fourth quarter of 2011 below its peak during the quarter (Figure 2). However, while forecasts from the medium-horizon fundamental and short-horizon statistical models ended the year slightly higher than they were at the end of the third quarter, forecasts from the medium-horizon statistical and short-horizon fundamental models were down, if only slightly, over the same period. An increase in medium-horizon industry risk and a slight decrease in short-horizon industry risk drove the results (Figure 3).

Figure 2. China Top 300 Risk Characteristics, Last Five Years and Most Recent Quarter, Ending 30 December 2011



Source: Axioma, Inc.

Figure 3. China Top 300: Predicted Risk of Major Fundamental Model Components

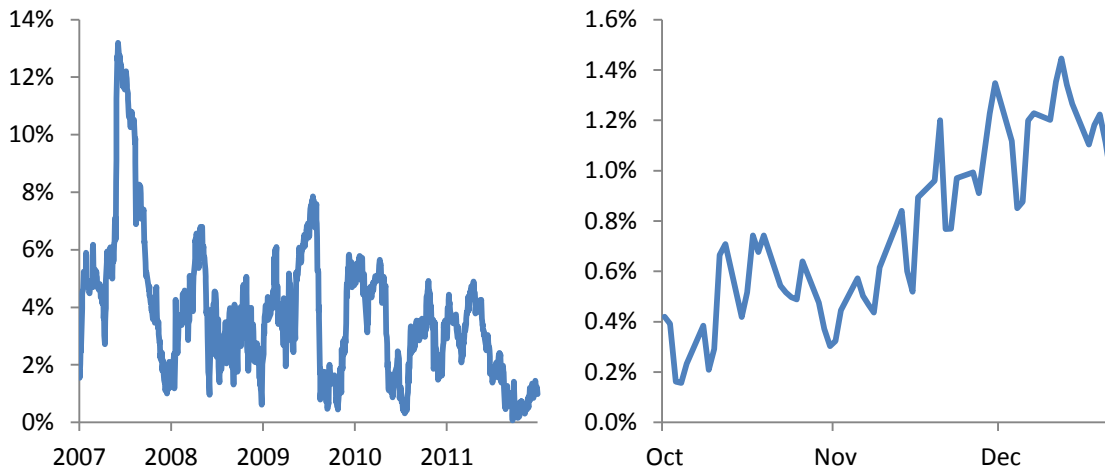


Source: Axioma, Inc.

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, Figure 4). The higher the number, the larger the disagreement among the 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.

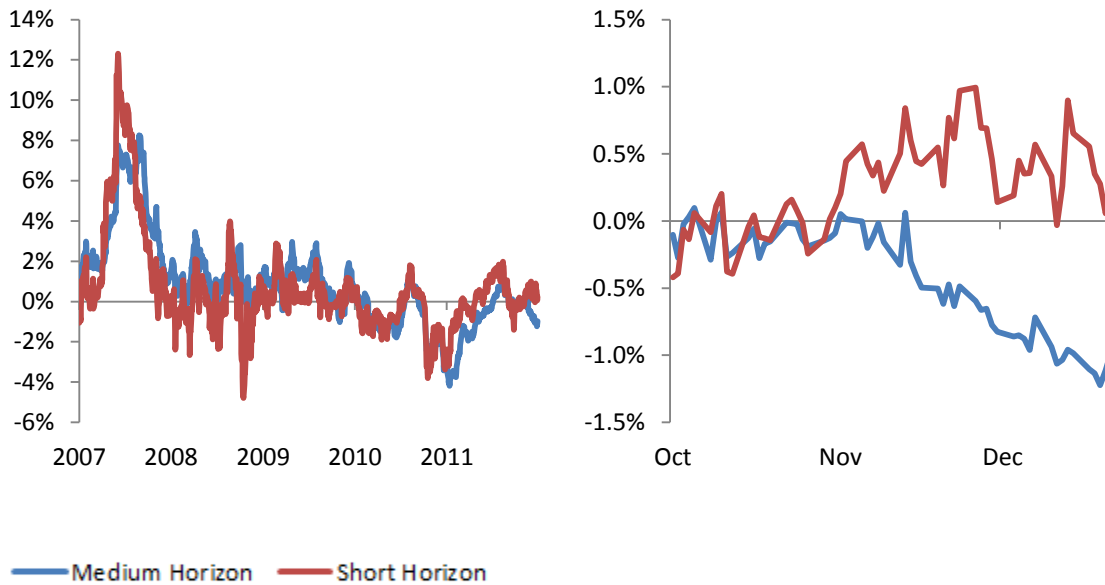
In China, the risk spread increased during the quarter, but the magnitude of the increase was low and the spread remains near its five-year low (Figure 4). The increase in spread was the result of the medium-horizon statistical forecast falling below the medium-horizon fundamental forecast (Figure 5). For both the statistical and fundamental model variants, the difference between short-horizon and medium-horizon forecasts is close to zero (Figure 6).

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



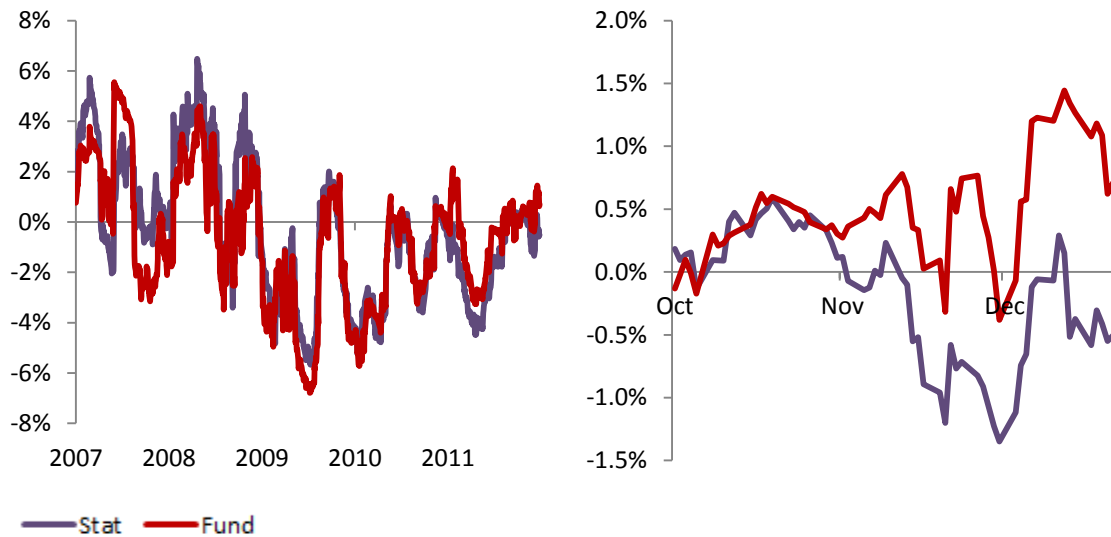
Source: Frank Russell, Axioma, Inc.

Figure 5. China Top 300 Statistical – Fundamental Spread



Source: Axioma, Inc.

Figure 6. China Top 300 Short – Medium Spread



Source: Axioma, Inc.

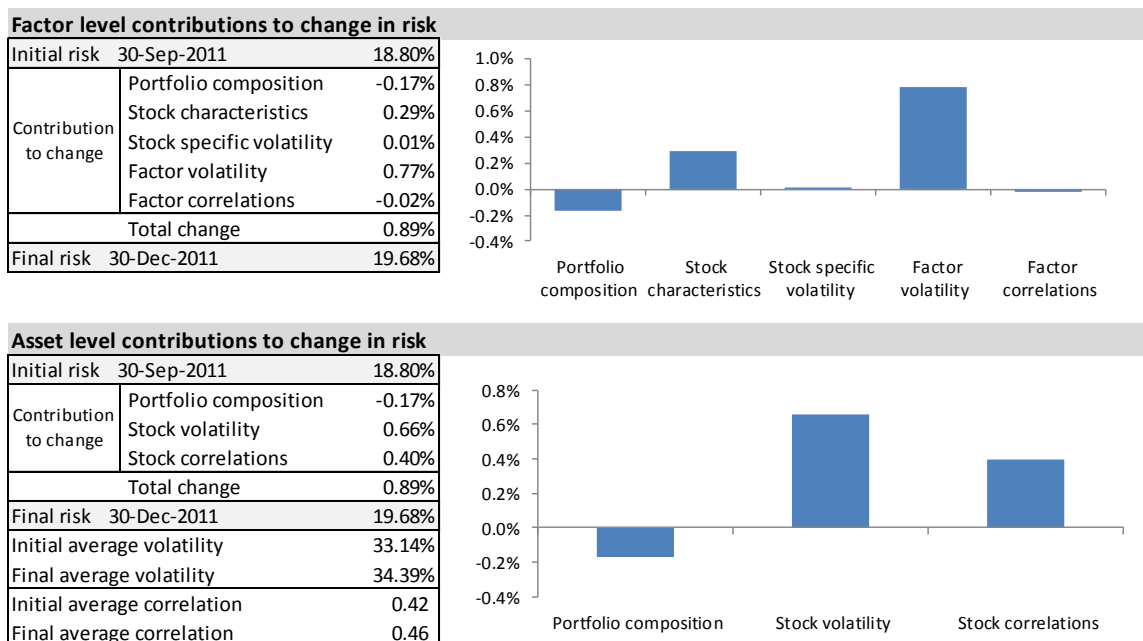
Decomposition of the Change in Risk – China Top 300

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 can 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 China Top 300 from the end of the third quarter to the end of the fourth. Increased factor- and asset-level volatility was the major source of the change in risk. From the factor-level standpoint, changes in stock characteristics also contributed positively to the increase, offset by changes in portfolio composition. When we drill down to the asset level, asset-asset correlations also had a positive impact on the change in risk over the quarter.

Figure 7. Change in Risk Decomposition, China Top 300



Volatilities and Returns

December was a volatile month for the Chinese market. Six of the nine style factors experienced returns at least one standard deviation above or below their long-term average during December. October and November saw factor returns much more in line with their long-term averages (Table 2).

For the full year of 2011 returns for a few factors stand out. Liquidity’s performance showed a steady downward progression from April through the end of the year (in other words, illiquid stocks fared much better than their more-liquid counterparts), and the factor’s return – both the absolute value and a risk-adjusted return – was the highest magnitude of all nine risk factors. Stocks with negative short-term momentum had a good run in the first half of the year, favoring strategies based on return reversal, but that run hit the brakes for the second half. Finally, across the globe an exposure to low volatility produced the best return among Axioma’s style factors for 2011. In China, the return was more choppy than in the other market’s we have examined, but low volatility produced strong returns for the year in China as well as in other markets.

Axioma’s style factors show a wide range of predicted risk forecasts (Table 3). Volatility, Size, Short-Term Momentum and Liquidity are the highest risk style factors as of the end of 2011 (Table 3.)

Predicted risk for most industries has decreased from a year ago, with some industries experiencing a substantial decline (Table 4). Predicted risk for most industries increased from the end of the third quarter to the end of the fourth quarter, however, most notably for media companies.

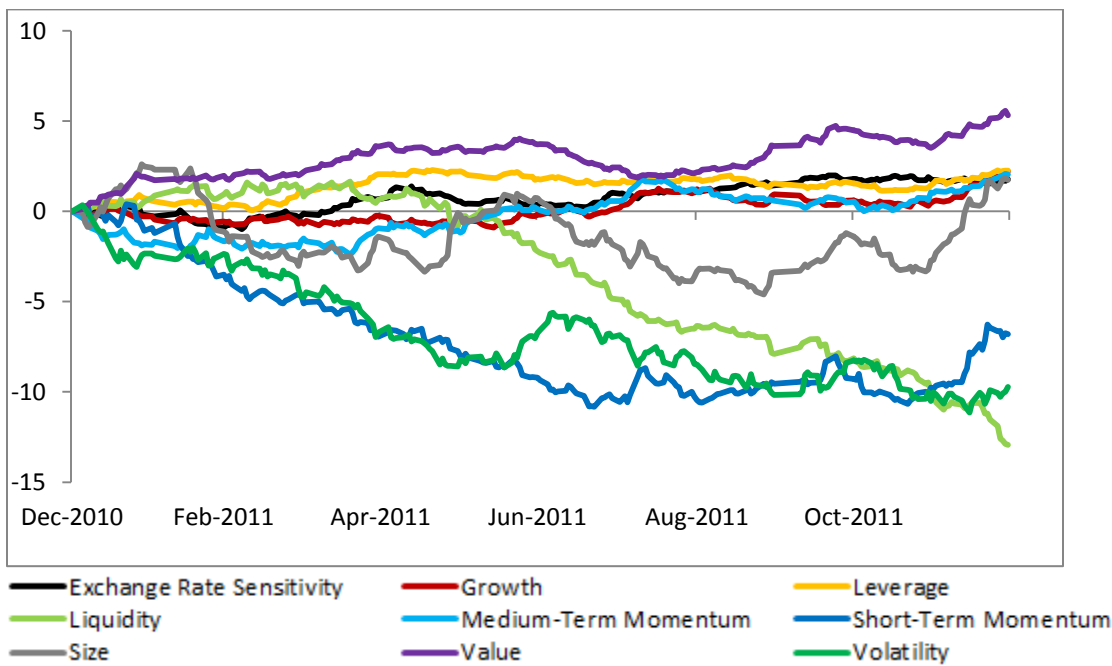
Table 2. China Realized Style Factor Returns

Axioma Risk Factor	2011 Returns			Average Monthly Return				
	Dec	Nov	Oct	3Q 2011	2Q 2011	1Q 2011	4Q 2010	Long Term*
Exchange Rate Sensitivity	-0.01	-0.01	0.35	0.36	0.16	-0.04	-0.53	-0.05
Growth	1.75	-0.14	-0.34	0.38	0.17	-0.23	0.47	0.29
Leverage	0.79	-0.09	0.00	-0.08	0.28	0.32	0.10	0.09
Liquidity	-3.31	-1.96	-0.26	-1.98	-1.01	0.27	-0.96	-0.87
Medium-Term Momentum	0.97	0.52	-0.05	0.15	0.55	-0.50	-0.73	0.10
Short-Term Momentum	3.28	-0.52	0.29	-0.12	-1.47	-1.73	-1.75	-1.10
Size	4.59	-1.34	2.06	-1.37	1.00	-0.72	-0.29	-0.78
Value	1.75	-0.93	0.83	-0.02	0.50	0.72	-0.26	0.35
Volatility	0.88	-2.45	2.13	-1.24	-0.68	-1.61	0.45	-0.47

* January 1999 - present























































Highlighted cells are at least 1 standard deviation above or below average

Figure 8. China Medium-Horizon Model Cumulative Style Factor Returns, 12 Months Ended December 2011 (%)





























































































Source: Axioma, Inc.

Table 3. China Style Factor Predicted Volatility

	Month-End Predicted Volatility			Current Vs.		MH Minus SH	Trends		
	Dec 2011	Sep 2011	Dec 2010	Quarter Ago	Year Ago		5 Year	1 Year	1 Quarter
Exchange Rate Sensitivity									
Medium Horizon	1.4	1.7	2.5	-0.2	-1.1	0.1			
Short Horizon	1.3	1.3	2.3	-0.1	-1.1				
Growth									
Medium Horizon	1.9	1.9	1.8	0.0	0.1	-0.2			
Short Horizon	2.1	2.0	1.9	0.1	0.2				
Leverage									
Medium Horizon	1.4	1.4	1.7	0.0	-0.3	0.0			
Short Horizon	1.4	1.3	1.7	0.1	-0.3				
Liquidity									
Medium Horizon	4.3	3.7	4.7	0.6	-0.4	-0.5			
Short Horizon	4.8	3.5	4.3	1.3	0.5				
Medium-Term Momentum									
Medium Horizon	2.4	2.7	4.3	-0.3	-1.9	0.3			
Short Horizon	2.1	2.3	4.7	-0.2	-2.6				
Short-Term Momentum									
Medium Horizon	5.3	4.5	5.7	0.8	-0.4	-0.6			
Short Horizon	5.8	4.7	5.9	1.1	-0.1				
Size									
Medium Horizon	6.2	6.0	8.4	0.2	-2.3	0.1			
Short Horizon	6.1	5.5	9.0	0.6	-3.0				
Value									
Medium Horizon	2.4	2.0	2.4	0.3	-0.1	-0.2			
Short Horizon	2.6	2.2	2.4	0.4	0.2				
Volatility									
Medium Horizon	5.5	5.2	6.7	0.2	-1.2	0.0			
Short Horizon	5.5	5.2	6.4	0.3	-0.9				




























































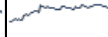










































Source: Axioma, Inc.

Table 4. Predicted Volatility, Industries

	Dec 2011	Sep 2011	Dec 2010	Quarter Ago	Year Ago	Minus SH	Trends		
							5 Year	1 Year	1 Quarter
Auto Components									
Medium Horizon	22.6	20.7	28.3	2.0	-5.6	0.6			
Short Horizon	22.0	22.2	29.0	-0.1	-7.0				
Automobiles									
Medium Horizon	23.9	22.1	33.1	1.9	-9.2	0.4			
Short Horizon	23.5	22.5	31.8	1.0	-8.3				
Beverages & Tobacco									
Medium Horizon	18.5	18.0	24.6	0.4	-6.2	0.4			
Short Horizon	18.1	18.2	24.1	-0.1	-6.0				
Chemicals									
Medium Horizon	22.6	22.2	28.4	0.4	-5.8	0.5			
Short Horizon	22.0	22.4	28.9	-0.4	-6.9				
Coal & Consumable Fuels									
Medium Horizon	28.4	25.2	42.0	3.2	-13.6	1.7			
Short Horizon	26.7	24.5	39.6	2.3	-12.9				
Comm & Prof Services									
Medium Horizon	21.8	20.4	25.0	1.4	-3.1	-2.0			
Short Horizon	23.8	21.2	24.3	2.6	-0.5				
Communications Equip									
Medium Horizon	23.9	22.4	27.8	1.5	-3.9	0.5			
Short Horizon	23.4	23.5	27.4	-0.2	-4.1				
Computers & Peripherals									
Medium Horizon	24.2	22.2	28.2	2.0	-4.0	-0.2			
Short Horizon	24.4	23.7	29.0	0.7	-4.7				
Constr & Engineering									
Medium Horizon	22.3	20.6	25.6	1.7	-3.3	-0.2			
Short Horizon	22.5	21.8	25.6	0.7	-3.1				
Construction Materials									
Medium Horizon	29.1	30.7	30.6	-1.6	-1.6	0.7			
Short Horizon	28.4	31.0	31.1	-2.6	-2.7				
Consumer Services									
Medium Horizon	22.7	20.1	24.4	2.6	-1.7	0.9			
Short Horizon	21.8	22.6	24.5	-0.8	-2.7				
Electrical Equipment									
Medium Horizon	21.6	20.0	24.8	1.7	-3.2	-0.1			
Short Horizon	21.8	21.7	24.4	0.1	-2.6				
Energy ex Coal									
Medium Horizon	21.3	20.7	27.7	0.6	-6.4	0.4			
Short Horizon	20.9	21.7	28.7	-0.8	-7.7				
Financials									
Medium Horizon	21.8	21.5	29.0	0.2	-7.2	2.1			
Short Horizon	19.7	21.5	30.4	-1.8	-10.7				
Food Products									
Medium Horizon	20.6	19.2	26.6	1.4	-6.0	-0.3			
Short Horizon	20.9	20.2	28.5	0.7	-7.6				

Source: Axioma, Inc.

Table 5. Continued

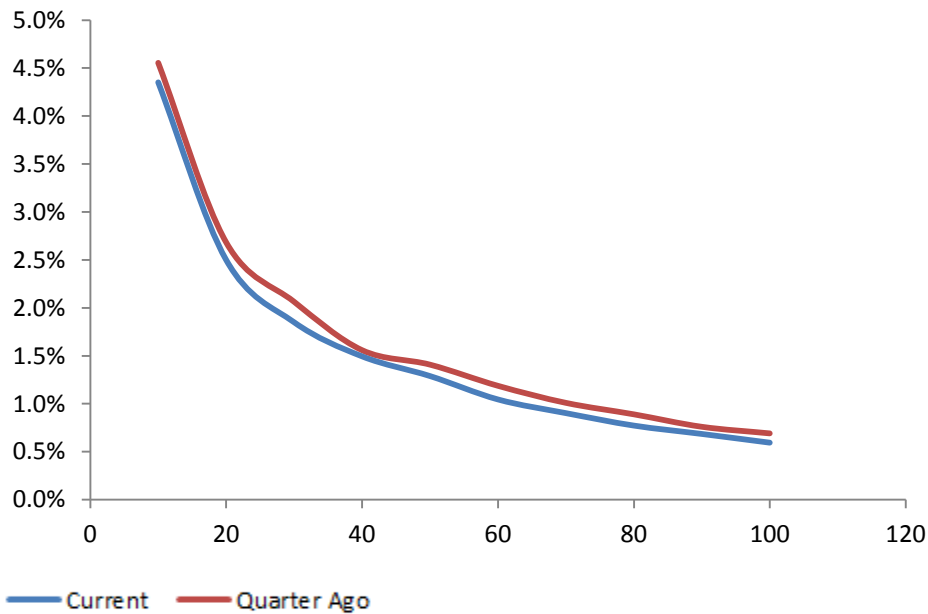
	Month-End Predicted Volatility			Current Vs.		MH Minus SH	Trends		
	Dec 2011	Sep 2011	Dec 2010	Quarter Ago	Year Ago		5 Year	1 Year	1 Quarter
	Health Care								
Medium Horizon	20.7	20.5	25.2	0.2	-4.5	-0.2			
Short Horizon	20.9	21.3	23.4	-0.4	-2.5				
Household Durables									
Medium Horizon	21.6	19.8	25.7	1.8	-4.2	0.9			
Short Horizon	20.7	20.9	24.3	-0.2	-3.6				
Machinery									
Medium Horizon	23.0	22.0	27.9	1.1	-4.9	0.9			
Short Horizon	22.1	23.0	28.8	-0.8	-6.7				
Media									
Medium Horizon	26.4	19.9	26.1	6.4	0.2	-1.4			
Short Horizon	27.8	19.9	25.1	7.9	2.6				
Metals & Mining ex Steel									
Medium Horizon	26.0	23.1	36.3	2.9	-10.2	-0.1			
Short Horizon	26.1	23.2	34.0	2.9	-7.9				
Paper & Forest Products									
Medium Horizon	21.9	22.2	28.4	-0.2	-6.5	-0.3			
Short Horizon	22.2	23.1	28.1	-0.9	-5.9				
Real Estate									
Medium Horizon	22.6	20.6	27.5	2.1	-4.9	0.2			
Short Horizon	22.4	22.0	28.4	0.5	-6.0				
Retailing									
Medium Horizon	19.9	17.5	25.0	2.5	-5.1	1.6			
Short Horizon	18.3	18.7	25.2	-0.3	-6.8				
Semicond & Electronics									
Medium Horizon	22.3	20.9	25.5	1.4	-3.2	-0.9			
Short Horizon	23.2	22.8	25.5	0.5	-2.3				
Software & Services									
Medium Horizon	22.0	19.0	28.8	3.0	-6.8	-1.2			
Short Horizon	23.2	19.4	28.1	3.9	-4.9				
Steel									
Medium Horizon	23.2	23.3	30.0	-0.1	-6.8	1.3			
Short Horizon	21.9	22.7	29.6	-0.8	-7.7				
Telecomm Services									
Medium Horizon	19.9	18.9	25.3	1.0	-5.4	1.0			
Short Horizon	19.0	19.7	25.4	-0.7	-6.4				
Textiles, App & Lux Gds									
Medium Horizon	21.5	20.0	26.1	1.5	-4.6	-1.3			
Short Horizon	22.8	20.3	27.0	2.4	-4.3				
Trdg Comps, Dist & Congl									
Medium Horizon	22.1	21.0	26.3	1.1	-4.2	0.9			
Short Horizon	21.2	21.8	26.3	-0.6	-5.1				
Trans Infrastructure									
Medium Horizon	20.0	19.7	26.0	0.3	-6.1	1.8			
Short Horizon	18.2	20.7	27.0	-2.5	-8.8				
Trans Non-Infrastructure									
Medium Horizon	26.3	25.4	31.4	0.9	-5.1	0.5			
Short Horizon	25.8	26.5	32.9	-0.7	-7.1				
Utilities									
Medium Horizon	20.8	20.3	25.5	0.6	-4.6	0.7			
Short Horizon	20.2	20.8	26.2	-0.7	-6.0				

Source: Axioma, Inc.

Implications for Tracking Error

Changes in market-level risk almost inevitably imply changes in active risk for managers who are tracking a benchmark. In China, despite the increase in predicted volatility from the end of the third quarter to the end of the fourth, tracking error has actually declined slightly across the number of names spectrum.

Figure 9. Tracking Error as Number of Stocks Increases, China Top 300



As of 30 Dec 2011
 Source: Axioma Inc.

Correlations and Cross-Sectional Dispersion

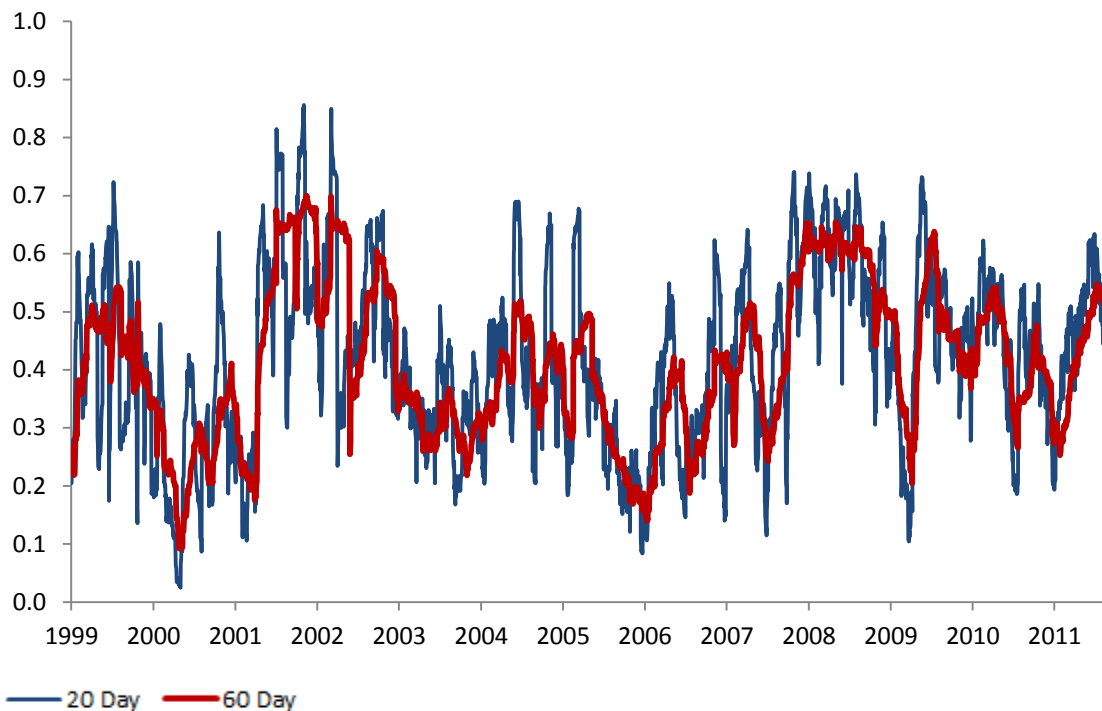
Unlike most other regions we have examined, stock-stock correlations in China were not clearly higher for most of 2011 than they were in prior years (Figure 10). In fact there have been several periods since 1999 when correlations were similar or higher. In addition, the 60-day median correlation ended the year well below average. The percentage of stocks with negative correlations was just about zero at the end of the year, similar to most other regions of the world. Correlation among stocks is of interest as it has an impact on the diversification benefit that is available by holding additional stocks.

When the holding period is extended to monthly, we observe that dispersion (cross-sectional standard deviation) of returns remained fairly low during 2011, although it ticked up at the end of the year. This dispersion was well below the levels it reached during 2007 – 2010. Dispersion is of interest as it determines the opportunity set available to active investors – the higher the dispersion the more benefit to be gained from stock selection.

Expected dispersion across industries and style factors fell throughout 2011; expected dispersion for the style factors has been declining since early 2008. And whereas in most other regions expected style dispersion is generally well below industry dispersion, that is not the case in China, where they are generally similar.

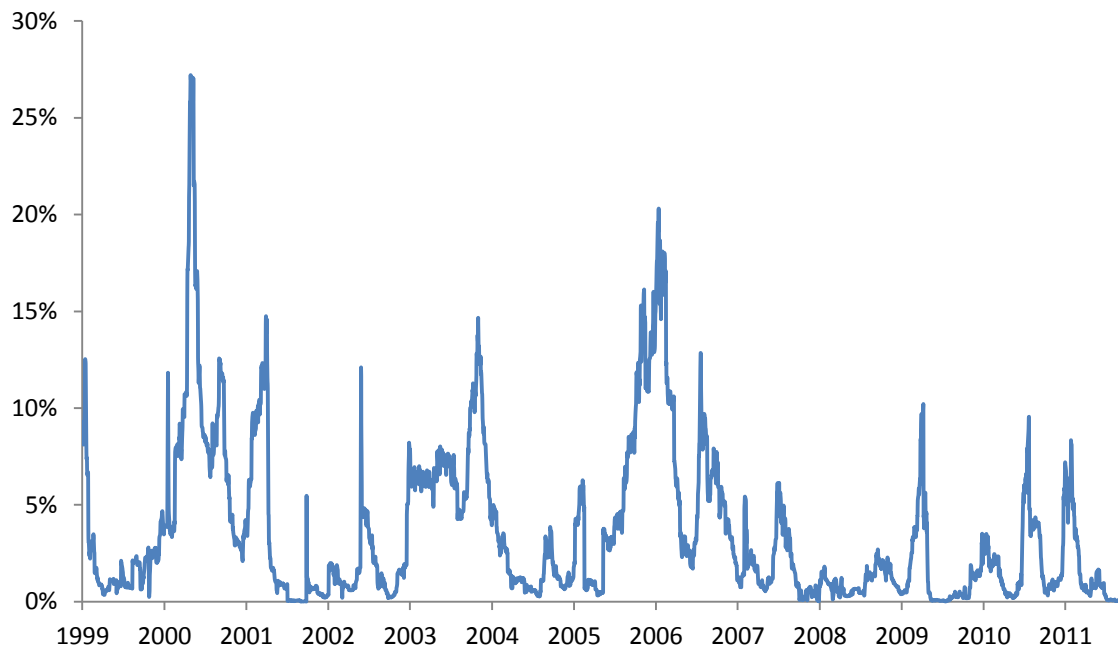
The impact of changes in correlation on changes in benchmark risk was mentioned earlier. Table 5 shows predicted correlations and changes over the quarter for the 9 style factors in the China model, plus correlations of the B-share market with these factors. The biggest downward changes from the third quarter to the fourth quarter came from the liquidity factor, especially its correlations with leverage and size. The Value factor experienced a number of upward revisions, most notably with Short-Term Momentum and the B-share market.

Figure 10. China Top 300 Median Realized Pairwise Asset Correlations



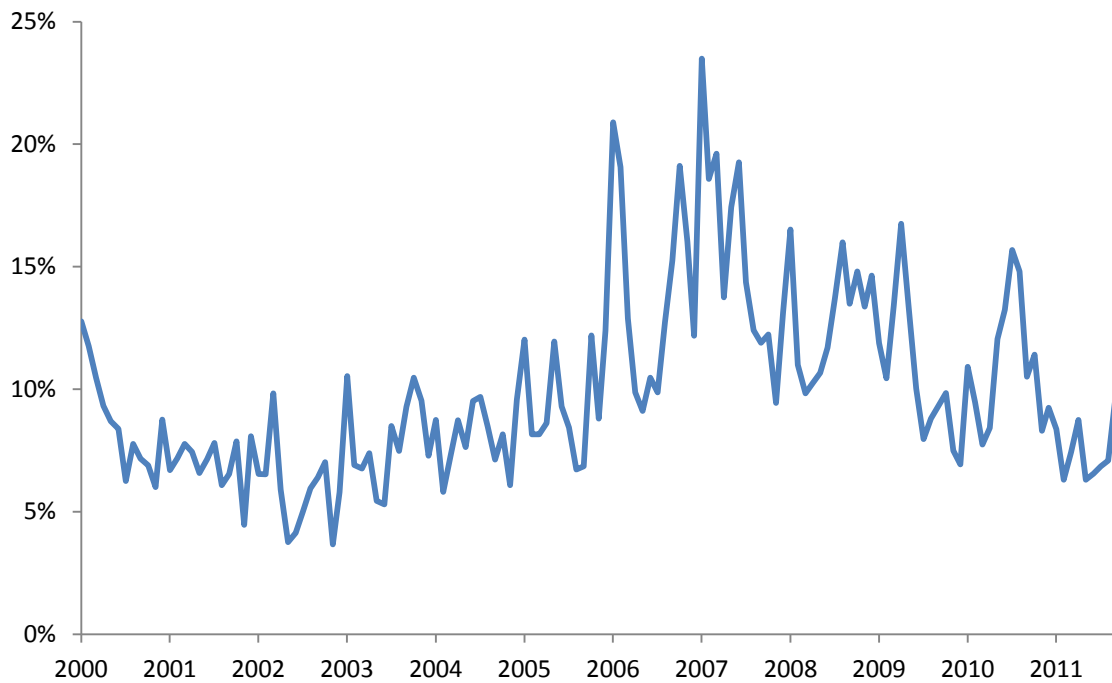
Source: Axioma, Inc.

Figure 11. Percent of 60-day Stock-Stock Correlations That Are Negative



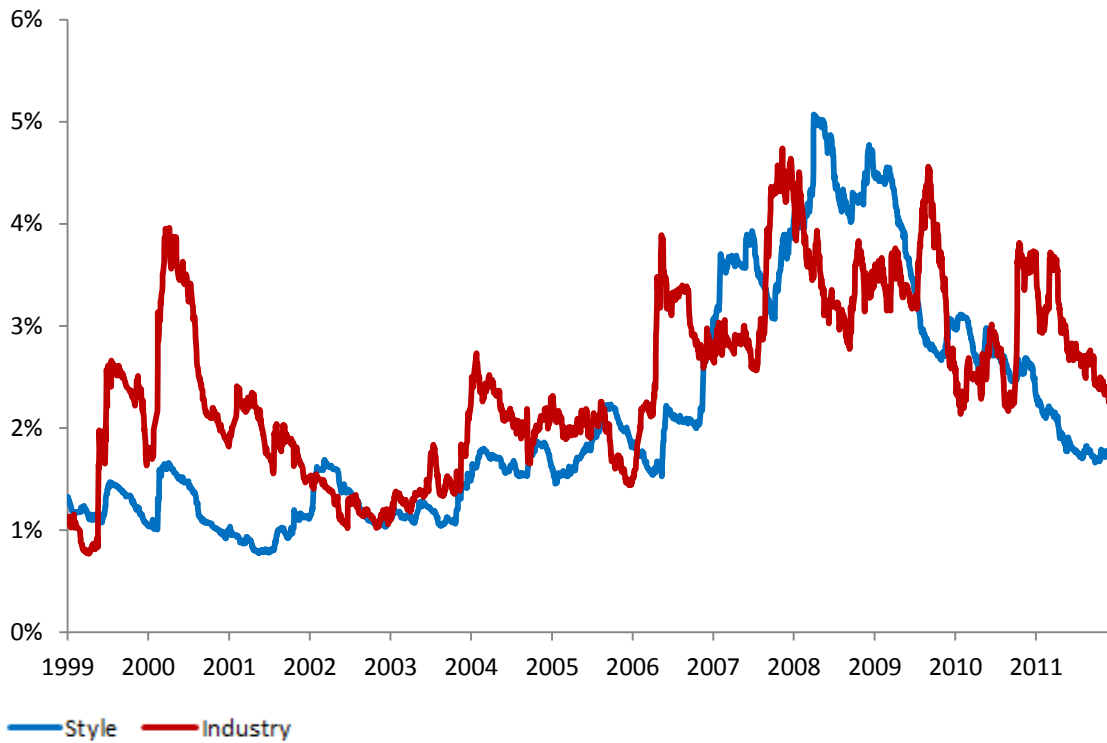
Source: Axioma, Inc.

Figure 12. Cross-Sectional Dispersion of Monthly Returns



Source: Axioma, Inc.

Figure 13. China Medium-Horizon Fundamental Model, Cross-Sectional Dispersion of Predicted Volatility, Common Factors



Source: Axioma, Inc.

Table 6. Style Factor Predicted Correlations

As of 30 Dec 2011	Value	Lev- erage	Growth	Size	Liq- uidity	Short- Term Mom	Medium- Term Mom	Vol- atility	Exch Rate Sens	B-Share Market	Avg Industry
Value	1	0.26	0.15	0.34	-0.12	0.04	-0.23	0.01	0.06	0.01	-0.07
Leverage	0.26	1	0.19	0.35	-0.14	0.05	-0.01	-0.11	-0.08	0.14	-0.09
Growth	0.15	0.19	1	0.29	-0.25	0.13	0.18	0.07	-0.10	0.12	-0.05
Size	0.34	0.35	0.29	1	0.02	0.20	0.09	-0.05	-0.07	0.24	-0.10
Liquidity	-0.12	-0.14	-0.25	0.02	1	-0.03	-0.23	0.19	-0.02	-0.02	-0.04
Short-Term Momentum	0.04	0.05	0.13	0.20	-0.03	1	0.38	-0.23	0.07	-0.02	0.30
Medium-Term Momentum	-0.23	-0.01	0.18	0.09	-0.23	0.38	1	-0.31	0.21	-0.10	-0.33
Volatility	0.01	-0.11	0.07	-0.05	0.19	-0.23	-0.31	1	-0.20	0.04	-0.35
Exchange Rate Sensitivity	0.06	-0.08	-0.10	-0.07	-0.02	0.07	0.21	-0.20	1	-0.08	-0.27
B-Share Market	0.01	0.14	0.12	0.24	-0.02	-0.02	-0.10	0.04	-0.08	1	0.73

As of 30 Sep 2011	Value	Lev- erage	Growth	Size	Liq- uidity	Short- Term Mom	Medium- Term Mom	Vol- atility	Exch Rate Sens	B-Share Market	Avg Industry
Value	1	0.25	0.09	0.23	-0.05	-0.10	-0.32	-0.03	0.04	-0.09	-0.03
Leverage	0.25	1	0.13	0.30	-0.04	-0.05	-0.12	-0.13	-0.06	0.13	-0.06
Growth	0.09	0.13	1	0.23	-0.21	0.05	0.15	0.07	-0.07	0.09	-0.03
Size	0.23	0.30	0.23	1	0.14	0.12	0.06	-0.09	-0.07	0.20	-0.08
Liquidity	-0.05	-0.04	-0.21	0.14	1	0.03	-0.15	0.23	-0.05	0.03	-0.04
Short-Term Momentum	-0.10	-0.05	0.05	0.12	0.03	1	0.36	-0.27	0.09	-0.08	0.31
Medium-Term Momentum	-0.32	-0.12	0.15	0.06	-0.15	0.36	1	-0.29	0.25	-0.12	-0.31
Volatility	-0.03	-0.13	0.07	-0.09	0.23	-0.27	-0.29	1	-0.23	-0.02	-0.31
Exchange Rate Sensitivity	0.04	-0.06	-0.07	-0.07	-0.05	0.09	0.25	-0.23	1	-0.12	-0.29
B-Share Market	-0.09	0.13	0.09	0.20	0.03	-0.08	-0.12	-0.02	-0.12	1	0.74

Change	Value	Lev- erage	Growth	Size	Liq- uidity	Short- Term Mom	Medium- Term Mom	Vol- atility	Exch Rate Sens	B-Share Market	Avg Industry
Value	0	0.01	0.06	0.10	-0.07	0.14	0.10	0.04	0.02	0.11	-0.05
Leverage	0.01	0	0.06	0.05	-0.11	0.09	0.11	0.02	-0.02	0.02	-0.04
Growth	0.06	0.06	0	0.06	-0.04	0.08	0.03	0.00	-0.03	0.04	-0.03
Size	0.10	0.05	0.06	0	-0.12	0.08	0.03	0.04	0.00	0.04	-0.03
Liquidity	-0.07	-0.11	-0.04	-0.12	0	-0.06	-0.08	-0.04	0.02	-0.05	0.00
Short-Term Momentum	0.14	0.09	0.08	0.08	-0.06	0	0.02	0.04	-0.03	0.07	-0.01
Medium-Term Momentum	0.10	0.11	0.03	0.03	-0.08	0.02	0	-0.01	-0.04	0.01	-0.03
Volatility	0.04	0.02	0.00	0.04	-0.04	0.04	-0.01	0	0.03	0.05	-0.04
Exchange Rate Sensitivity	0.02	-0.02	-0.03	0.00	0.02	-0.03	-0.04	0.03	0	0.04	0.02
B-Share Market	0.11	0.02	0.04	0.04	-0.05	0.07	0.01	0.05	0.04	0	-0.01

Source: Axioma, Inc.

Conclusion

Risk in the Chinese market rose slightly throughout 2011, but at the end of the year was still below the recent peak near the end of 2010. Risk spreads remain small, with the medium-horizon fundamental model predicting the highest risk and the medium-horizon statistical model forecasting the lowest risk at year end. Correlations of stocks in China are somewhat lower than in other single countries or regions we've studied, and the median correlation has not exhibited the same upward trend we have seen elsewhere. Like the rest of the world, however, almost no stock pairs in China actually had negative correlations in the second half of 2011. In general the risk profile of China is somewhat different from what we observe in the rest of the world, but the opportunities to use risk models as a key tool for managing portfolios is very similar.

Endnotes

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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