China Market Report

Analyzing the June Liquidity Squeeze

Oleg Ruban, Kevin Zhang and Zoltán Nagy

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Introduction

Chinese equities lost more than 14 percent during June 2013 when interbank rates rose rapidly. In this report, we analyze June's losses through the lens of the Barra China Equity Model (CNE5). Factor models provide an effective tool for portfolio and risk managers to assess how different types of companies react to such market events; these models can help decision support during environments of rising market risk.

We find the monthly equity market loss in June 2013 was substantial: in terms of risk adjusted returns this was the worst month for Chinese equities since July 2001. Our analysis of factor returns and volatilities highlights how different market segments reacted as the People's Bank of China (PBOC) stated that the burden should be on the lenders to better manage their balance sheets. Finally, we examine two specific portfolios: minimum volatility and diversified financials, highlighting the drivers of their returns during June 2013. We find that exposures to CNE5 style factors have been a significant driver of performance for both portfolios.

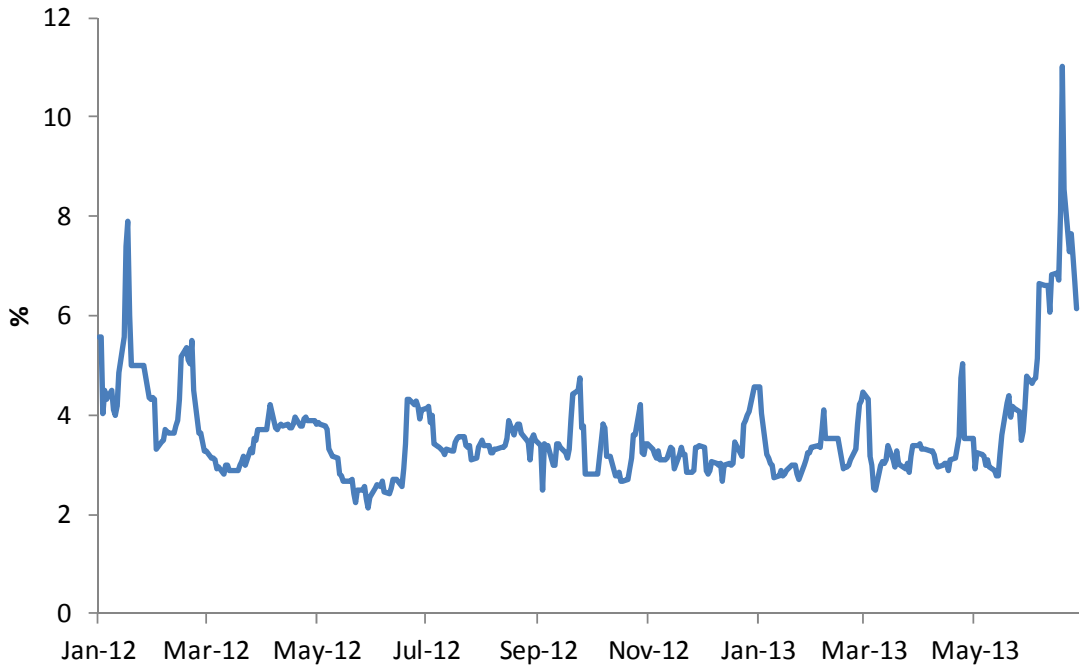
What Drove June's Losses?

The China equity market losses came as China's domestic short term interbank rates rose sharply, and while there were comments from the US Federal Reserve signaling a possibility of an earlier end to Quantitative Easing. At the same time, China's latest PMI (Purchasing Manager's Index) reading disappointed analysts. The seven-day Shibor (Shanghai Interbank Offered Rate) rate closed on June 20 at 11 percent, up from 2.8 percent on May 13 (see Figure 1). The overnight Shibor shot up to 30 percent intraday and ended at 13 percent on June 20. With short term money market rates soaring (partly caused by a large number of wealth management products maturing on similar dates in June 2013), observers reported that the interbank lending market had effectively frozen; there were reports that one of the country's biggest banks defaulted and rumors spread that the central bank had provided cash injections to another major bank.[1]

On June 24, the PBOC took a harder line on the country's cash crunch. The central bank was reluctant to answer bank industry pleas for cash, saying that liquidity was at a "reasonable level" and that lenders should better manage their own balance sheets. This was perceived as a shift in central banking policy and the equity market lost 6 percent during the day.

[1] 'China Pulls Banking System back from Brink after Squeeze,' *Financial Times* (June 22/23).

Figure 1: Seven-Day Shibor Rate.



The Impact on the Equity Market

Figure 2 plots the recent performance of the equity market in China, highlighting June 2013. June's monthly loss is substantial by historical standards. Looking at raw returns, it was the seventh worst month for the market since January 1999. However, once we adjust the returns for risk, using the beginning-of-month forecast volatility of the China Market factor from the short version Barra China Equity Model (CNE5S), it becomes the second worst loss after July 2001 (see Table 1). This highlights how June's loss was unusual, given the prevailing environment of volatility in Chinese equities.

Figure 2: Recent Performance of the MSCI China A Index (June 2013 is highlighted).

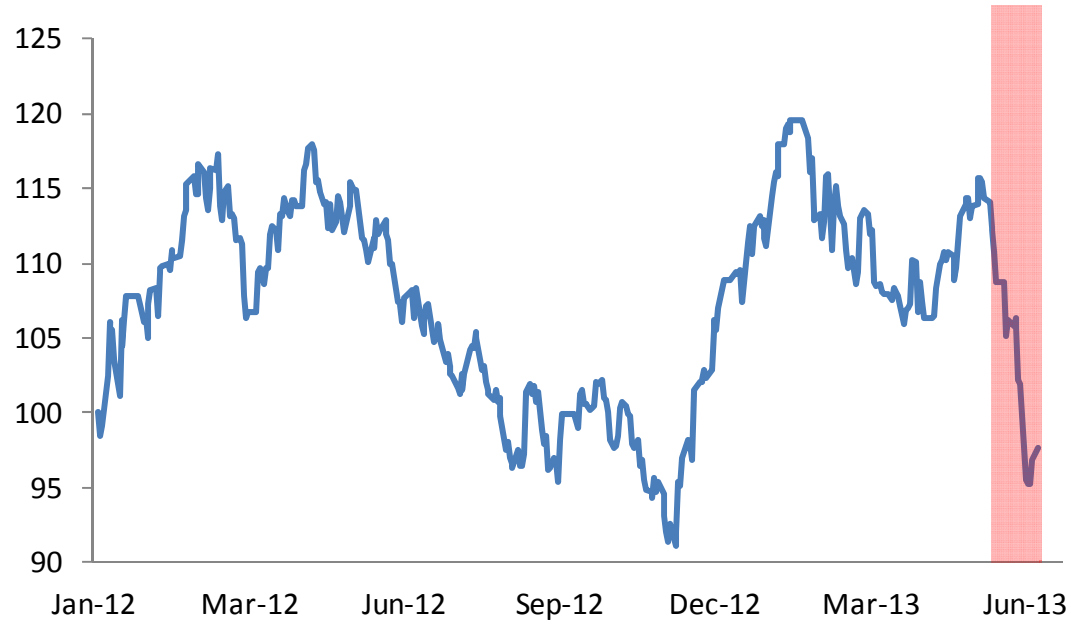


Table 1: Worst Raw and Risk-Adjusted Monthly Returns for Chinese Equities since January 1999.

Month	Return
Oct-08	-24.8%
Aug-09	-22.0%
Jun-08	-20.6%
Mar-08	-20.4%
Nov-07	-16.2%
Aug-08	-15.9%
Jun-13	-14.2%
Jul-01	-13.5%
Jan-08	-13.2%
Jun-04	-10.7%

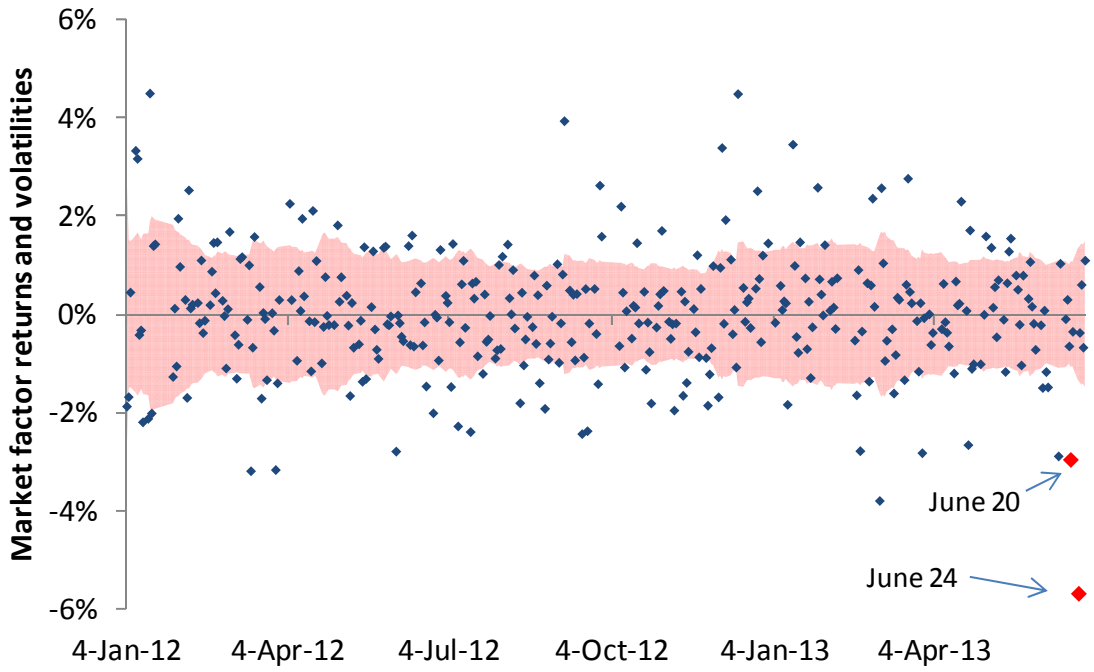
Month	Return	Volatilty f-cast (monthly)	Z-score
Jul-01	-13.5%	3.2%	-4.16
Jun-13	-14.2%	5.5%	-2.57
Aug-09	-22.0%	8.8%	-2.51
Mar-08	-20.4%	10.1%	-2.01
Sep-11	-9.3%	4.7%	-1.97
Jun-04	-10.7%	5.6%	-1.91
Oct-08	-24.8%	13.3%	-1.87
Dec-11	-8.8%	5.2%	-1.71
Jan-02	-10.4%	6.1%	-1.71
Jun-08	-20.6%	12.0%	-1.71

Figure 3 shows a different perspective on the events of June 2013 by looking at daily market returns and the volatility forecasts from the daily version of the Barra China Equity Model (CNE5D). Two days clearly stand out on in recent weeks: June 20 and June 24. The China Market factor[2] lost 3 percent on June 20 and 6 percent on June 24.[3]

[2] The China Market factor can be thought of as a representing the return of a broadly diversified portfolio of Chinese equities.

[3] These were 2.8 and 4.2 sigma events, respectively.

Figure 3: Daily Returns and Volatilities in the China Equity Market.



Understanding the China Equity Market's Reaction

Factor models provide an effective tool to analyze how various segments of the equity market differ in their responses to market or macroeconomic shocks, distilling the drivers of the cross-section of asset returns to a relatively small number of common market themes, or factors. By monitoring the returns to factors, we can examine how different company characteristics, such as industry membership, past share price performance, and company fundamentals, all influence the way a company's share price responds to a market event. A substantially positive or negative factor return suggests that companies sharing a certain characteristics responded differently from the rest of the market to an event.

Let us first zoom in on what happened on June 20 and June 24. Table 2 shows the returns, volatilities and risk-adjusted returns of the style factors in CNE5, ranked from lowest to highest risk-adjusted return. It is interesting to compare the returns of the Leverage factor on June 20 and June 24. This factor, composed of market leverage, debt-to-assets and book leverage,[4] captures the return differences between high leverage and low leverage stocks. It was the second best performing factor on June 20, but the second worse performing factor on June 24. The statement from the central bank is one likely reason for this—highly leveraged companies were penalized when it became clear that the central bank was unlikely to inject extra liquidity into the system.

Looking at the other styles, growth was the best performing style factor on both days and Momentum also had positive returns. On the other hand Beta, Residual Volatility and Liquidity were among the

[4] See The Barra China Equity Model (CNE5) Empirical Notes for a detailed description of the style factors.

worst performing style factors on both days. This suggests that companies with high predicted and trailing earnings growth did relatively better during the days the market declined the most, while companies with high historical beta, high volatility of specific returns or high turnover did relatively worse.[5]

Table 2: Daily Returns of CNE5 Style Factors.

June 20, 2013

	Factor return	Factor vol (daily)	Z-score
RESVOL	-0.53%	0.16%	-3.39
BETA	-0.46%	0.21%	-2.17
SIZENL	-0.15%	0.08%	-1.87
BTOP	-0.18%	0.10%	-1.84
LIQUIDTY	-0.12%	0.12%	-1.00
SIZE	-0.06%	0.17%	-0.36
MOMENTUM	0.01%	0.19%	0.07
EARNYILD	0.03%	0.10%	0.30
LEVERAGE	0.06%	0.10%	0.61
GROWTH	0.08%	0.07%	1.13

June 24, 2013

	Factor return	Factor vol (daily)	Z-score
BETA	-0.97%	0.22%	-4.38
LEVERAGE	-0.19%	0.10%	-1.85
LIQUIDTY	-0.16%	0.12%	-1.31
RESVOL	-0.16%	0.17%	-0.94
SIZENL	0.00%	0.08%	-0.04
EARNYILD	0.00%	0.10%	-0.03
BTOP	0.02%	0.10%	0.16
MOMENTUM	0.14%	0.19%	0.70
SIZE	0.15%	0.17%	0.85
GROWTH	0.10%	0.08%	1.20

Table 3 shows the returns, volatilities and risk-adjusted returns of the top and bottom performing five industry factors in CNE5.[6] In general, we observe a typical defensive pattern, however the positive performance of the Diversified Financial industry factor is interesting in the context of the market decline and we will address it further in the next section.

Table 3: Daily Returns of Top and Bottom Five CNE5 Industry Factors.

June 20, 2013

Bottom five

	Factor return	Factor vol (daily)	Z-score
Metals	-0.63%	0.43%	-1.46
Trading Companies	-0.56%	0.40%	-1.40
Ind. Conglomerates	-0.84%	0.62%	-1.37
Airlines	-0.57%	0.67%	-0.85
Hotels/Rest/Leisure	-0.39%	0.49%	-0.81

Top five

	Factor return	Factor vol (daily)	Z-score
Media	2.65%	1.02%	2.60
Div. Financials	1.17%	0.86%	1.35
Construction	0.46%	0.40%	1.16
Chemicals	0.34%	0.29%	1.15
Real Estate	0.80%	0.74%	1.09

June 24, 2013

	Factor return	Factor vol (daily)	Z-score
Ind. Conglomerates	-1.57%	0.65%	-2.42
Road, Rail, Transport	-0.45%	0.30%	-1.50
Metals	-0.55%	0.44%	-1.27
Energy	-0.51%	0.48%	-1.06
Aerospace, Defence	-1.19%	1.25%	-0.95

	Factor return	Factor vol (daily)	Z-score
Software	2.25%	0.82%	2.73
HH Durables	1.06%	0.46%	2.31
Hardware	1.12%	0.58%	1.93
Building Products	0.68%	0.43%	1.59
Food Staples	0.68%	0.43%	1.57

Finally, Table 4 shows the top and bottom performing factors for the month of June 2013 as a whole. Companies whose share price outperformed (Momentum), growth companies and large-cap stocks

[5] Note that the cross-sectional correlation in exposures between the liquidity factor and the residual volatility factor is relatively high at 0.57. This suggests that stocks with high turnover also tend to have high residual volatility.

[6] The Barra China Equity Model (CNE5) has 32 industry factors. We highlight the performance of top and bottom 5, ranked on the basis of risk-adjusted returns (Z-scores).

tended to perform relatively better during June 2013, while mid-cap stocks (Non-linear size), high beta stocks and high turnover stocks (Liquidity) did relatively worse. Looking at the industry factors, we see Media and Software companies showing relative outperformance, while Diversified Metals and Energy stocks underperformed.

Table 4: Best and Worst Performing Factors in June 2013.

Style Factor Name	Monthly Return (%)	Volatility Forecast (monthly, %)	Z-Score	Industry Factor Name	Monthly Return (%)	Volatility Forecast (monthly, %)	Z-Score
Top 5 Factors				**Top 5 Factors**			
Momentum	2.36	1.21	1.96	Media	13.44	4.79	2.81
Growth	0.85	0.49	1.72	Software	10.41	4.06	2.57
Size	0.50	1.21	0.41	Household Durables (non-Homebuilding)	3.77	2.54	1.49
Book-to-Price	0.15	0.61	0.25	Hardware and Semiconductors	4.31	3.07	1.41
Residual Volatility	-0.02	0.98	-0.02	Banks	2.65	4.03	0.66
Bottom 5 Factors				**Bottom 5 Factors**			
Non-linear Size	-0.87	0.56	-1.55	Diversified Metals	-4.70	2.32	-2.03
Beta	-1.72	1.11	-1.54	Energy	-4.34	2.65	-1.64
Liquidity	-0.95	0.64	-1.49	Airlines	-4.85	3.82	-1.27
Earnings Yield	-0.63	0.63	-1.01	Chemicals	-2.06	1.77	-1.16
Leverage	-0.25	0.58	-0.43	Marine	-3.54	3.38	-1.05

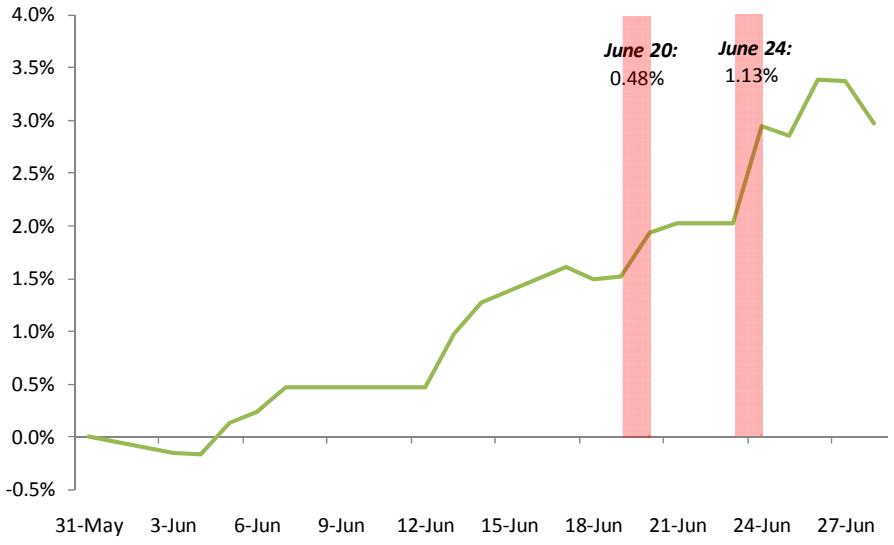
Date range: May 31, 2013 - June 30, 2013.

Portfolio Performance

Having explored the performance of individual factors, let us now look at how exposures to factors influenced the performance of investment strategies. We consider the performance of two portfolios, benchmarked against the MSCI China A Index. A minimum variance strategy, represented by the MSCI China A Minimum Volatility Index (MV) outperformed the benchmark by almost 3 percent in June 2013, while a portfolio of Diversified Financial stocks underperformed the benchmark by just over 8 percent. Style factor exposures were key to explaining the performance of both portfolios.

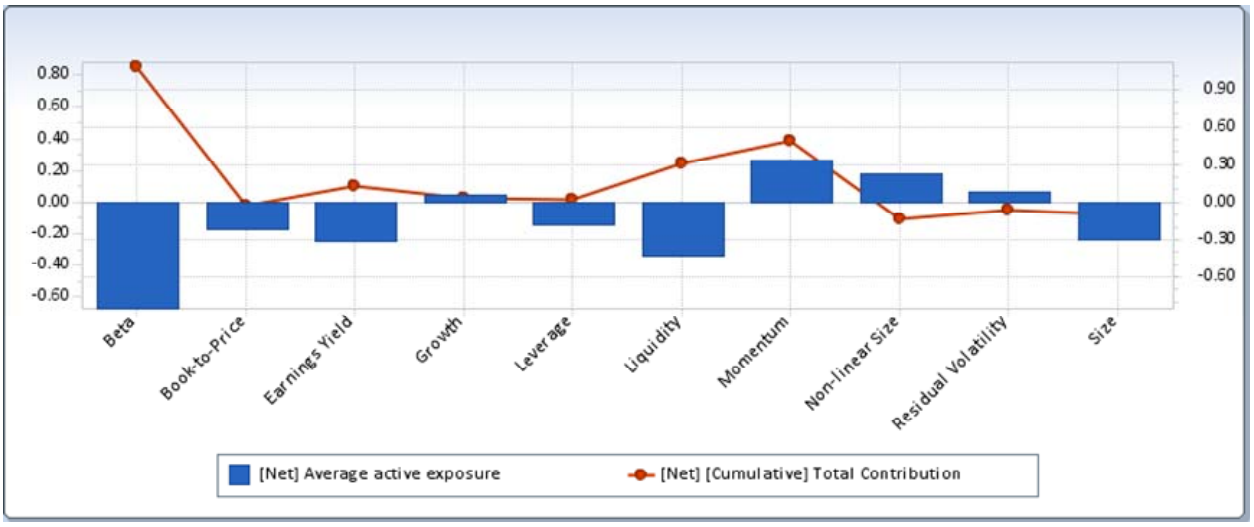
Figure 4 shows the relative performance of the MV strategy during the month of June. A significant part of the outperformance happened on June 20 (+0.48 percent) and June 24 (+1.13 percent).

Figure 4: Relative Performance of the MSCI China A Minimum Volatility Index.



Over the month, style factors contributed 1.75 percent to the strategy's performance. As Figure 5 shows, most of the return contribution from style factors came from the tilt of the MV Index to low-beta (+1.07 percent), low-liquidity (+0.31 percent) and high-momentum (+0.49 percent) stocks.

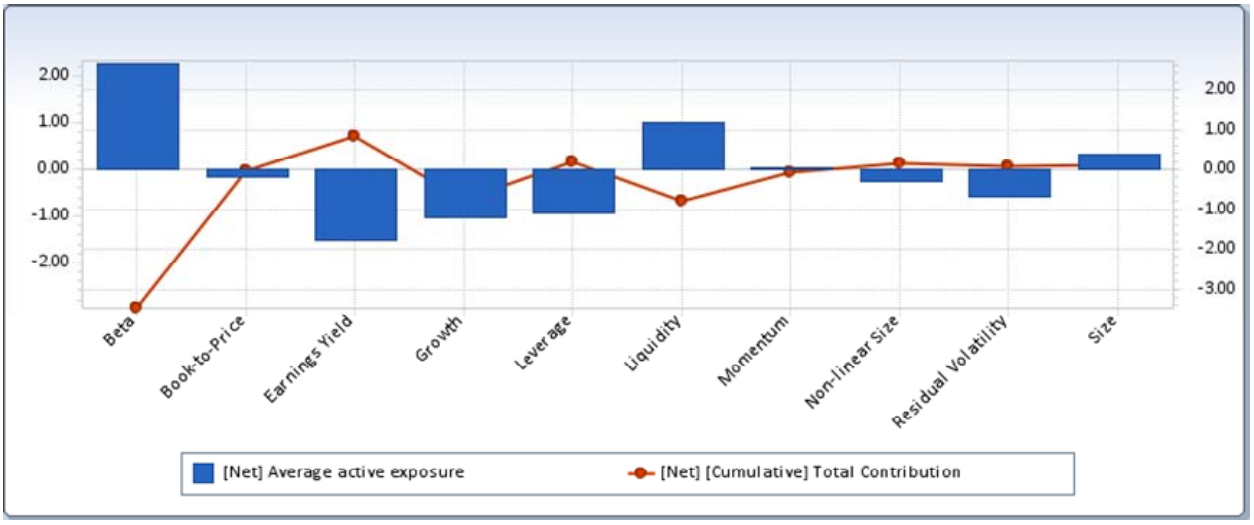
Figure 5: Average Style Exposures and Return Contributions of the Minimum Volatility Strategy.



We also consider the performance of a sub-portfolio of all stocks from the China A Index that belong to the Diversified Financials industry. Interestingly, even though the portfolio was constructed on the basis of industry membership, its underperformance was due in larger share to style factors (-3.72 percent) than the industry factors (-2.44 percent).[7]

Figure 6 shows that diversified Financial stocks can be characterized as high beta, low growth, low leverage, liquid (high turnover) and expensive in terms of earning yield. During the month of June, the greatest contribution to return was due to a high exposure to Beta, causing a loss of 3.46 percent.

Figure 6: Average Style Exposures and Return Contributions of the Diversified Financials Portfolio.



[7] See the Appendix for a return attribution summary.

Conclusion

Chinese equities lost more than 14 percent during the month of June 2013 as interbank rates rose rapidly. As we illustrated in this Market Report, this was the worst monthly risk-adjusted return for more than a decade. We examined this event through the Barra China Equity Model (CNE5) to see how different market segments reacted as June unfolded. Factor models provide an effective tool to assess how different types of companies react to such market events. Analysis of these reactions can help portfolio and risk managers make informed decisions when considering the positioning of their portfolios in an environment of rising market risk.

Two days clearly stood out during the month: June 20 and June 24, when the equity market lost 3 and 6 percent, respectively. Interestingly, the Leverage factor, which captures the return differences between high leverage and low leverage stocks, went from having a positive return on June 20 to having a negative return on June 24, as highly leveraged companies became penalized when it became clear on June 24 that the central bank was unlikely to inject extra liquidity into the system.

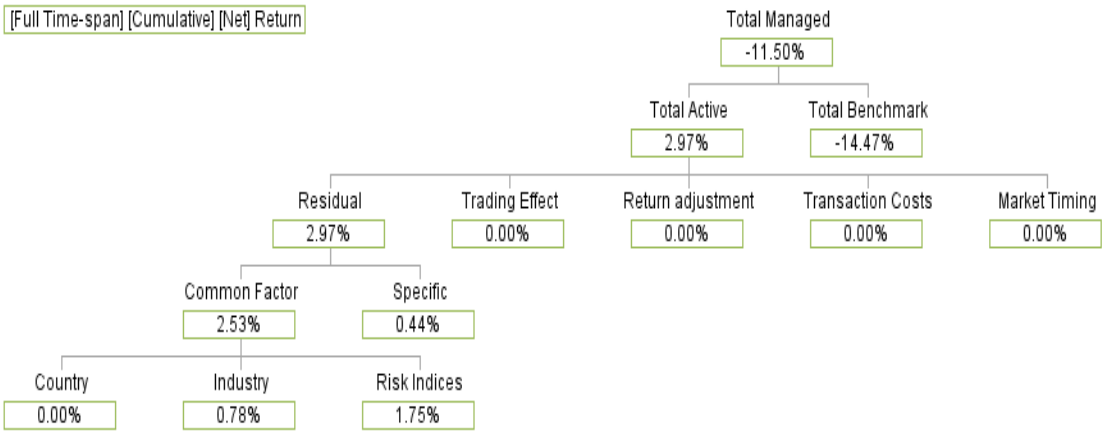
Finally, our analysis of portfolio performance highlighted the importance of monitoring style exposures during turbulent markets. The MSCI China A Minimum Volatility Index saw most of its outperformance relative to the parent index come from a tilt to low beta, low liquidity and high momentum stocks. A portfolio of diversified financial companies underperformed the market, but this was also largely due to its style factor exposures. The greatest contribution to its return came from a high exposure to Beta and negative exposure to Growth.

Appendix: Performance Attribution of Investment Strategies

MSCI China A Minimum Volatility Index

Figure A1 provides an insight into the drivers of the relative outperformance of the MSCI China A Minimum Volatility Index relative to the MSCI China A Index during June. Style factors contributed the most to the active performance of the index (+1.75 percent), followed by Industry factors (+0.78 percent) and asset selection (+0.44 percent).

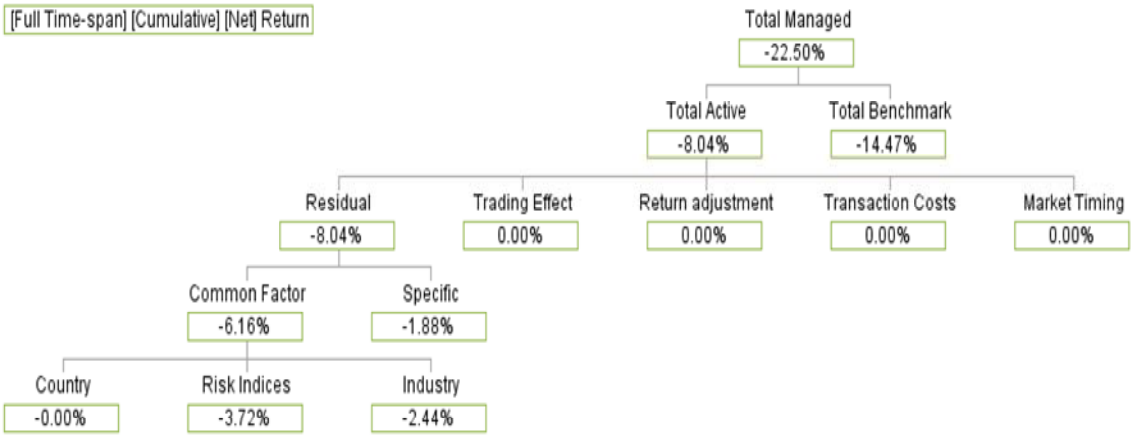
Figure A1: Performance Attribution of MSCI China A Minimum Volatility Index in June 2013.



Diversified Financials Portfolio

This portfolio lost 22.5 percent in June, substantially underperforming the China A Index. Surprisingly, as we see in Figure A2, the underperformance (-8.04 percent) of the Diversified Financials portfolio was due in larger share to Style factors (-3.72 percent) than the Industry factors (-2.44 percent).

Figure A2: Performance Attribution of Diversified Financials in June 2013.



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[1] *As of September 30, 2012, as published by eVestment, Lipper and Bloomberg on January 31, 2013*

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