

August 09, 2007

North America

U.S. Equity Quantitative Strategies

Investment Strategy & Macro
U.S. Equity Quantitative Strategies

Market Commentary/Strategy

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Turbulent Times in Quant Land

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Investment Conclusion

- As market conditions have calmed, the performance of equity market neutral managers has become more challenged. We believe performance of most factors, particularly value factors, have turned perverse in a dramatic fashion. It is unclear how long current situation will persist, but stability will be facilitated by understanding that underperformance is systematic, not due to individual model misspecification, in our view.

Summary

- July 2007 saw returns to quant factors increase dramatically, with volatility at 2 to 3 times normal levels. In July, the misperformance of the factors was driven primarily on the long side.
- Factor returns for the first 5 trading days in August have been roughly of the same magnitude for what we experienced for all of July, however, now model misbehavior has primarily been the results of shorts outperforming.
- Factor performance does not appear to have notable sector biases so we discount the possibility of sector rotation being responsible for observed dynamics.

Over the past few days, most quantitative fund managers have experienced significant abnormal performance in their returns. It is not just that most factors are not working but rather they are working in a perverse manner, in our view. The names that are short are outperforming, often notably, while the names that are long are underperforming, although less severely. Moreover, there appears to be very little news coming out surrounding these names and all of this is occurring against the backdrop of the general markets appearing to calm down. This has led to our fielding a large number of calls from our quantitative asset management clients, trying to understand what is occurring in our market.

It is impossible to know for sure what was the catalyst for this situation. In our opinion, the most reasonable scenario is that a few large multi-strategy quantitative managers may have experienced significant losses in their credit or fixed income portfolios. In an attempt to lower the risks in their portfolios and being afraid to “mark to market” their illiquid credit portfolios, these managers probably sought to raise cash and de-lever in the most liquid market — the U.S. equity market.

As these managers unwound significant factor based portfolios, these factors started to behave in unexpected and potentially troubling ways. Short names started to rally and long names started to fall as these trades started to hit the market. As most quantitative managers use similar quantitative factors, this abnormal factor phenomenon was not confined to a few funds. Rather, a large number of quantitative managers have seen their models begin to behave in unexpected ways. Again, it is no longer only the multi-strategy managers, but now pure quantitative equity managers who have started to see their portfolios “misbehave”, both U.S. domestic and global fund managers.

To be absolutely clear, when we are discussing misbehavior, it is not simply that model returns are flat (or not working) but specifically that the models (ours included) are behaving in the opposite way we would predict and have seen and tested for over very long time periods (45+ years). Additionally, the magnitude (or volatility) of the returns in July increased substantially with the factor returns being on the order of 1 to 4 times what we have traditionally seen. Those returns look placid relative to what we have seen in the first six trading days of August. As for what has been transpiring in August, we have been able to document daily returns of this magnitude occurring before only at the height of the bursting of the Internet Bubble and in the late 1960s. This appears to be an event with little precedent.

This breakdown in traditional factor returns is, of course, not limited to the return (or alpha) side but also is now extending to traditional risk models – that is, managers are finding their risk models are now miscalibrated for the current market environment. Again, this is not limited to any one model but overall to all factor based (or structural) risk models. This has led to further concerns within a number of asset management organizations we have been speaking to, with risk-managers facilitating further de-leveraging as they seek to better understand the situation.

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Detailing the Situation

To help illustrate the full scope of the situation, Figure 1, Figure 2 and Figure 3 show the monthly returns to the factors we use in our own models, grouped according to theme as specified in our model. In the month of July, a significant number of the valuation theme factors were of a significantly different order of magnitude compared to what we have seen either this past year, or really most any other year.

Figure 1: Monthly Returns of Valuation Theme Factors, in Russell 1000 Stock Universe

	EBITDA to EV	Trailing Earnings to Price	Book to Price	Sales to Price	Total Yield	Net FCF to Price	Net Income to Operating Cash Flow	Gross FCF to Price	Sharpened Fcst E / P
December, 2006	1.3%	2.3%	1.9%	1.7%	0.5%	1.9%	0.3%	1.3%	1.8%
January, 2007	0.7%	-1.5%	-0.5%	0.8%	-0.6%	-0.2%	-1.0%	0.8%	-1.2%
February, 2007	0.7%	-0.7%	0.6%	1.3%	-1.0%	0.1%	0.3%	-1.0%	1.3%
March, 2007	0.0%	-1.1%	-1.6%	-1.1%	-1.1%	-0.2%	0.3%	0.1%	0.3%
April, 2007	0.1%	1.4%	0.1%	0.1%	-0.9%	0.3%	-0.1%	1.5%	1.6%
May, 2007	0.2%	-0.5%	0.0%	0.4%	-0.9%	0.2%	-0.2%	0.9%	0.9%
June, 2007	0.1%	-0.2%	-0.7%	-0.4%	-0.8%	-0.6%	-0.5%	-0.5%	1.6%
July, 2007	-4.3%	-3.1%	-3.2%	-3.6%	-1.3%	-1.9%	1.7%	-1.8%	-1.9%
Absolute Value of Returns 1973 to Present	1.9%	1.8%	2.0%	2.1%	1.5%	1.6%	1.3%	1.7%	2.1%
Standard Deviation of Returns 1973 to Present	2.7%	2.6%	2.9%	3.1%	2.0%	2.3%	1.7%	2.5%	2.9%

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
Past results are no guarantee of future performance.

Figure 2: Monthly Returns of Quality Theme Factors, in Russell 1000 Stock Universe

	ROE	ROIC	Change in Shares Outstanding	Change in Employees	Sales Growth	Change in Managerial Discretion Accruals	Incremental Net Margins	Asset Turnover	Intangibles to Assets
December, 2006	-0.3%	-1.0%	2.0%	1.0%	-1.4%	-0.3%	-0.5%	-0.5%	-1.1%
January, 2007	-0.1%	0.8%	-0.5%	-1.5%	0.7%	0.6%	-1.1%	1.3%	1.9%
February, 2007	-0.9%	-0.1%	0.2%	0.6%	0.0%	-0.3%	0.8%	0.8%	-1.0%
March, 2007	-0.3%	0.9%	0.5%	0.0%	0.5%	0.2%	-2.0%	0.5%	-1.1%
April, 2007	1.1%	0.4%	1.3%	-0.2%	-0.5%	-0.5%	-0.9%	-0.5%	0.8%
May, 2007	0.3%	-0.3%	0.0%	0.8%	-0.1%	0.4%	-0.2%	0.6%	-0.3%
June, 2007	0.4%	0.0%	0.2%	0.0%	0.7%	0.5%	1.3%	-0.4%	-1.9%
July, 2007	0.9%	1.6%	-3.0%	-3.7%	5.2%	-0.4%	-0.8%	-0.1%	0.0%
Absolute Value of Returns 1973 to Present	1.5%	1.2%	1.3%	1.5%	1.7%	1.0%	1.1%	1.5%	1.3%
Standard Deviation of Returns 1973 to Present	2.1%	1.7%	1.9%	2.0%	2.4%	1.2%	1.5%	2.3%	1.8%

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
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Figure 3: Monthly Returns of Market Sentiment Theme Factors, in Russell 1000 Stock Universe

	Price Momentum	Sharpened Analyst Recommendations	Sharpened Earnings Revisions Model	Earnings Revisions Ratio	Stock Liquidity	Market Estimated Earnings Surprise
December, 2006	2.6%	-0.6%	-0.2%	0.3%	1.4%	-0.5%
January, 2007	-0.7%	-1.6%	-0.7%	-0.1%	-1.5%	-0.2%
February, 2007	0.4%	0.2%	0.2%	-0.5%	0.9%	0.4%
March, 2007	1.8%	1.0%	-0.5%	3.4%	0.5%	2.8%
April, 2007	-1.8%	-0.2%	0.3%	-0.3%	0.3%	-0.9%
May, 2007	-2.5%	-0.3%	0.0%	0.3%	-0.1%	-0.1%
June, 2007	-0.1%	-0.1%	-0.8%	0.9%	1.5%	1.0%
July, 2007	2.1%	1.6%	-1.9%	1.0%	3.1%	1.0%
Absolute Value of Return 1973 to Present	3.3%	1.3%	1.1%	1.6%	1.3%	1.2%
Standard Deviation of Returns 1973 to Present	5.05%	1.62%	2.14%	2.10%	1.70%	1.5%

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
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For example, where as the general monthly return to the Book-to-Price based factor is 188 bps (on an absolute value of returns basis calculated back to January 1973), in July it was -319 bps , or 1.8 times the normal (standardized) level. Similarly, Sales-to-Price was -356 bps or 1.8 times its normal levels; Ebitda-to-EV was -432 bps or 2.3 times its normal level; and Free-Cash-Flow to price was -189 bps or 1.5 times its normal level. These events are rare.

As one can observe, though, it is not just valuation theme factors that have increased in magnitude of returns — it is a broad spectrum of factors. Notably, Changes in Shares Outstanding (2.3 times normal level), Sales Growth (3.0 times normal level), Change in Employees (2.5 times normal level), and Stock Liquidity (2.4 times normal levels) all experienced significant increase in the magnitude of their returns. On the other hand, interestingly, Price Momentum, Analyst Recommendations, and Earnings Revisions return magnitudes were well within in normal limits or below normal limits. Price Momentum, (0.6 times normal levels), Earnings Revisions (0.6 times normal), Accruals (0.40 times normal), and other factors are notably last volatile in their return streams this past July.

Daily Returns Provide Additional Insight into the Situation

Given our relatively unique and flexible technology set-up, we are able to explore far back in time what is occurring on the factor return level at a daily basis, through close of day on Tuesday, August 7, 2007. The returns to a set of highlighted factors are shown below in a number of figures.

Specifically, among a number of valuation based factors, we have seen significant underperformance in a very short time period (see Figure 4 below). For example, in some of the traditional quantitative signals used in our own models and probably most of our clients models, we have seen factors stop working and the magnitude of the returns become quite large over the past 2 weeks. While at the end of July, the perverse performance was coming from the long side of the factors not doing well (e.g. earning negative returns), in the past few days we have seen the short end of the factors take the lead in misbehaving (e.g. earning positive returns).

Figure 4: Daily Returns to Valuation Theme Factors, in Russell 1000 Universe

Date	EBITDA to EV			Book to price			Gross Free Cash Flow to Price		
	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread
July-2-2007	1.0%	1.1%	-0.1%	1.1%	1.3%	-0.2%	1.1%	1.0%	0.2%
July-3-2007	0.5%	0.2%	0.2%	0.3%	0.2%	0.1%	0.4%	0.3%	0.1%
July-5-2007	0.1%	0.4%	-0.3%	0.0%	0.5%	-0.5%	0.3%	0.4%	-0.1%
July-6-2007	0.7%	0.6%	0.1%	0.5%	0.6%	-0.1%	0.7%	0.6%	0.1%
July-9-2007	0.0%	0.4%	-0.4%	0.0%	0.3%	-0.3%	0.0%	0.3%	-0.3%
July-10-2007	-1.5%	-1.1%	-0.4%	-1.5%	-1.2%	-0.3%	-1.3%	-1.2%	-0.2%
July-11-2007	0.3%	0.3%	0.0%	0.4%	0.5%	-0.1%	0.5%	0.3%	0.2%
July-12-2007	1.5%	1.4%	0.0%	1.4%	1.4%	-0.1%	1.3%	1.4%	-0.1%
July-13-2007	0.2%	0.6%	-0.5%	0.4%	0.4%	0.0%	0.3%	0.7%	-0.4%
July-16-2007	-0.4%	-0.5%	0.1%	-0.5%	-0.6%	0.2%	-0.6%	-0.7%	0.1%
July-17-2007	0.0%	-0.1%	0.1%	0.0%	-0.3%	0.3%	0.1%	0.0%	0.1%
July-18-2007	-0.1%	-0.1%	0.0%	-0.2%	-0.1%	-0.1%	0.0%	0.0%	-0.1%
July-19-2007	0.2%	1.1%	-0.9%	0.5%	0.4%	0.0%	0.4%	0.9%	-0.5%
July-20-2007	-1.1%	-1.1%	0.0%	-1.3%	-1.0%	-0.4%	-1.1%	-1.0%	-0.1%
July-23-2007	-0.2%	0.1%	-0.3%	-0.3%	0.1%	-0.5%	0.2%	-0.1%	0.3%
July-24-2007	-2.1%	-2.4%	0.4%	-2.2%	-2.2%	0.0%	-1.9%	-2.1%	0.2%
July-25-2007	-0.4%	0.1%	-0.4%	0.0%	-0.2%	0.1%	-0.4%	-0.1%	-0.3%
July-26-2007	-2.5%	-2.1%	-0.4%	-2.4%	-2.1%	-0.2%	-2.6%	-2.3%	-0.2%
July-27-2007	-1.8%	-1.0%	-0.7%	-1.6%	-1.2%	-0.3%	-1.7%	-1.3%	-0.4%
July-30-2007	0.7%	1.4%	-0.7%	0.7%	1.2%	-0.5%	0.7%	1.3%	-0.6%
July-31-2007	-1.2%	-1.0%	-0.2%	-1.3%	-1.0%	-0.2%	-1.0%	-1.1%	0.1%
August-1-2007	0.2%	0.2%	0.0%	-0.1%	0.2%	-0.3%	0.1%	0.3%	-0.2%
August-2-2007	0.2%	1.1%	-0.9%	0.3%	0.7%	-0.4%	0.7%	1.0%	-0.3%
August-3-2007	-3.2%	-2.6%	-0.6%	-3.2%	-2.8%	-0.4%	-2.9%	-2.4%	-0.5%
August-6-2007	1.1%	1.4%	-0.3%	1.0%	1.6%	-0.6%	1.1%	1.0%	0.1%
August-7-2007	0.1%	1.4%	-1.4%	0.1%	0.9%	-0.8%	0.0%	1.1%	-1.1%
August to Date Returns	-1.6%	1.5%	-3.1%	-1.9%	0.6%	-2.5%	-1.0%	0.9%	-1.9%
Last Week in July Returns	-5.2%	-2.7%	-2.4%	-4.5%	-3.2%	-1.2%	-4.9%	-3.5%	-1.3%

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
Past results are no guarantee of future performance.

While not shown in a figure, the same results hold for Forward Earnings to Price, Sales to Price, and Trailing Earnings to Price measures as well. These tables are available from us upon request.

With regard to Quality Theme based factors, the story is quite different but similar to what we saw at the monthly level. As shown in Figure 5 below, a number of these factors have continued to perform admirably in the face of adversity. Specifically, ROIC, Sales Growth, and Accruals are tending to hold up.

Figure 5: Daily Returns to Quality Theme Factors, in Russell 1000 Universe

Date	ROIC			Sales Growth			Change in Managerial Discretion		
	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread
July-2-2007	1.1%	1.1%	0.0%	1.4%	1.0%	0.4%	1.0%	1.2%	-0.2%
July-3-2007	0.2%	0.3%	-0.1%	0.3%	0.4%	-0.1%	0.2%	0.3%	-0.1%
July-5-2007	0.4%	0.4%	0.0%	0.5%	0.2%	0.3%	0.3%	0.3%	0.0%
July-6-2007	0.8%	0.4%	0.3%	0.7%	0.4%	0.3%	0.7%	0.5%	0.2%
July-9-2007	0.1%	0.3%	-0.2%	0.4%	0.1%	0.4%	0.0%	0.3%	-0.3%
July-10-2007	-1.2%	-1.1%	-0.1%	-1.1%	-1.4%	0.3%	-1.2%	-1.1%	-0.1%
July-11-2007	0.5%	0.3%	0.3%	0.4%	0.3%	0.1%	0.5%	0.4%	0.1%
July-12-2007	1.7%	1.3%	0.3%	1.7%	1.3%	0.4%	1.4%	1.5%	-0.1%
July-13-2007	0.3%	0.6%	-0.3%	0.3%	0.5%	-0.2%	0.5%	0.3%	0.2%
July-16-2007	-0.5%	-0.6%	0.1%	-0.4%	-0.7%	0.3%	-0.5%	-0.4%	-0.1%
July-17-2007	-0.2%	0.0%	-0.2%	0.1%	0.0%	0.1%	-0.1%	0.2%	-0.3%
July-18-2007	-0.1%	0.1%	-0.2%	0.2%	-0.2%	0.4%	0.1%	-0.1%	0.2%
July-19-2007	0.7%	0.8%	-0.1%	1.0%	0.7%	0.4%	0.6%	0.7%	-0.1%
July-20-2007	-0.8%	-1.1%	0.3%	-0.8%	-1.3%	0.5%	-1.2%	-1.0%	-0.2%
July-23-2007	0.4%	-0.1%	0.5%	0.3%	-0.1%	0.4%	0.1%	0.2%	-0.1%
July-24-2007	-1.9%	-2.3%	0.4%	-2.2%	-2.2%	-0.1%	-1.9%	-2.2%	0.3%
July-25-2007	-0.5%	-0.2%	-0.3%	0.1%	-0.2%	0.2%	0.1%	-0.5%	0.6%
July-26-2007	-2.1%	-2.6%	0.5%	-2.2%	-2.7%	0.4%	-2.2%	-2.3%	0.1%
July-27-2007	-1.4%	-1.5%	0.1%	-1.4%	-1.6%	0.1%	-1.5%	-1.3%	-0.2%
July-30-2007	1.4%	1.0%	0.4%	1.3%	1.0%	0.4%	0.9%	1.1%	-0.2%
July-31-2007	-1.0%	-0.8%	-0.2%	-1.1%	-1.0%	-0.1%	-1.0%	-0.7%	-0.3%
August-1-2007	0.2%	0.0%	0.1%	0.1%	0.2%	-0.2%	0.4%	0.1%	0.3%
August-2-2007	0.8%	0.6%	0.1%	1.0%	0.7%	0.3%	1.0%	0.6%	0.4%
August-3-2007	-3.0%	-2.5%	-0.5%	-3.0%	-2.8%	-0.2%	-2.5%	-2.7%	0.2%
August-6-2007	1.4%	0.6%	0.8%	0.8%	0.9%	-0.1%	1.0%	0.8%	0.2%
August-7-2007	0.8%	0.7%	0.1%	1.1%	0.3%	0.8%	0.7%	0.6%	0.1%
August to Date Returns	0.1%	-0.5%	0.6%	0.0%	-0.6%	0.6%	0.6%	-0.6%	1.1%
Last Week in July Returns	-3.5%	-4.1%	0.5%	-3.3%	-4.5%	1.0%	-3.6%	-3.7%	0.1%

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
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On the other hand, Change in Shares Outstanding, Change in Employees, Incremental Net Margins, and Asset Turnover, among others, are acting much like the valuation factors described above (see Figure 6 below).

Figure 6: Daily Returns for Additional Quality Theme Factors, in Russell 1000 Universe

Date	Change in Shares Outstanding			Change in Employees			Incremental Net Margins			Asset Turnover		
	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread
	July-2-2007	1.2%	1.4%	-0.2%	1.2%	1.3%	-0.2%	1.1%	1.2%	-0.1%	1.2%	1.1%
July-3-2007	0.2%	0.3%	-0.2%	0.2%	0.3%	-0.1%	0.3%	0.3%	0.0%	0.4%	0.2%	0.1%
July-5-2007	0.0%	0.6%	-0.6%	0.2%	0.5%	-0.3%	0.4%	0.2%	0.1%	0.3%	0.4%	-0.1%
July-6-2007	0.7%	0.6%	0.1%	0.6%	0.7%	-0.1%	0.4%	0.6%	-0.2%	0.8%	0.3%	0.4%
July-9-2007	-0.1%	0.3%	-0.5%	-0.1%	0.1%	-0.2%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%
July-10-2007	-1.4%	-1.5%	0.0%	-1.5%	-1.2%	-0.3%	-1.4%	-1.2%	-0.1%	-1.4%	-1.2%	-0.3%
July-11-2007	0.5%	0.4%	0.1%	0.3%	0.4%	-0.1%	0.4%	0.5%	-0.1%	0.6%	0.5%	0.1%
July-12-2007	1.4%	1.4%	0.0%	1.5%	1.5%	-0.1%	1.3%	1.4%	-0.1%	1.8%	1.2%	0.6%
July-13-2007	0.2%	0.5%	-0.3%	0.4%	0.3%	0.1%	0.6%	0.3%	0.3%	0.4%	0.5%	-0.1%
July-16-2007	-0.4%	-0.3%	0.0%	-0.5%	-0.3%	-0.2%	-0.6%	-0.6%	-0.1%	-0.4%	-0.5%	0.1%
July-17-2007	0.0%	0.0%	0.0%	-0.3%	0.0%	-0.3%	0.1%	-0.1%	0.3%	-0.1%	0.1%	-0.1%
July-18-2007	-0.2%	0.0%	-0.2%	-0.3%	-0.1%	-0.2%	0.0%	-0.1%	0.2%	-0.1%	0.1%	-0.1%
July-19-2007	0.2%	0.5%	-0.3%	0.3%	0.7%	-0.4%	0.8%	0.6%	0.2%	0.5%	0.8%	-0.3%
July-20-2007	-1.4%	-0.9%	-0.5%	-1.3%	-1.0%	-0.3%	-1.2%	-1.2%	0.0%	-0.9%	-1.2%	0.3%
July-23-2007	0.0%	0.1%	-0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	-0.1%	0.0%	0.2%	-0.2%
July-24-2007	-2.2%	-2.1%	0.0%	-2.3%	-2.2%	0.0%	-2.0%	-2.0%	0.0%	-2.0%	-2.2%	0.1%
July-25-2007	0.1%	-0.2%	0.3%	-0.2%	-0.1%	-0.2%	-0.2%	-0.4%	0.3%	-0.6%	0.0%	-0.6%
July-26-2007	-2.5%	-2.6%	0.2%	-2.7%	-2.4%	-0.2%	-3.0%	-2.2%	-0.8%	-2.4%	-2.5%	0.0%
July-27-2007	-1.5%	-1.2%	-0.3%	-1.7%	-1.4%	-0.2%	-1.8%	-1.4%	-0.4%	-1.4%	-1.2%	-0.3%
July-30-2007	1.0%	1.2%	-0.2%	0.7%	1.2%	-0.4%	1.1%	1.0%	0.1%	1.3%	1.0%	0.2%
July-31-2007	-1.2%	-0.8%	-0.3%	-1.1%	-1.0%	0.0%	-1.3%	-1.0%	-0.3%	-1.1%	-1.0%	-0.1%
August-1-2007	0.2%	0.1%	0.1%	-0.1%	0.1%	-0.2%	0.3%	0.2%	0.0%	0.2%	0.1%	0.1%
August-2-2007	0.6%	1.1%	-0.4%	0.9%	1.0%	-0.1%	0.5%	0.9%	-0.4%	0.7%	0.7%	0.0%
August-3-2007	-3.0%	-2.6%	-0.4%	-2.9%	-2.8%	-0.1%	-3.0%	-2.6%	-0.1%	-2.9%	-2.2%	-0.7%
August-6-2007	1.8%	0.8%	1.0%	1.3%	1.2%	0.1%	1.0%	1.0%	-0.1%	1.2%	1.0%	0.1%
August-7-2007	0.4%	0.8%	-0.4%	0.3%	1.2%	-0.8%	0.3%	0.6%	-0.3%	0.4%	0.9%	-0.5%
August to Date Returns	0.1%	0.1%	-0.1%	-0.4%	0.7%	-1.1%	-0.8%	0.2%	-0.9%	-0.5%	0.5%	-1.1%
Last Week in July Returns	-4.1%	-3.7%	-0.3%	-4.9%	-3.7%	-1.0%	-5.1%	-4.1%	-1.0%	-4.3%	-3.6%	-0.7%

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
Past results are no guarantee of future performance.

Finally, in terms of the daily returns, as shown in Figure 7, market temperament factors have held up markedly well, all considering. That said, price momentum based measures have begun to experience some stress in the past few days and it will be worth following this signal closely to see if this trend continues or reverses.

Figure 7: Daily Returns for Market Temperament Theme Factors, in Russell 1000 Universe

Date	Earnings Revisions Ratio			Price Momentum			Stock Liquidity		
	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread	Most Attractive	Least Attractive	Long / Short Spread
	July-2-2007	1.1%	1.0%	0.2%	1.4%	0.8%	0.6%	1.3%	1.1%
July-3-2007	0.2%	0.5%	-0.2%	0.2%	0.2%	0.0%	0.3%	0.3%	0.0%
July-5-2007	0.2%	0.3%	-0.1%	0.1%	0.2%	-0.1%	0.2%	0.2%	0.0%
July-6-2007	0.5%	0.7%	-0.2%	0.5%	0.5%	0.0%	0.6%	0.9%	-0.3%
July-9-2007	0.2%	-0.2%	0.5%	0.1%	-0.3%	0.4%	-0.1%	0.0%	-0.1%
July-10-2007	-1.4%	-1.5%	0.1%	-1.6%	-1.3%	-0.3%	-1.4%	-1.4%	0.1%
July-11-2007	0.6%	0.3%	0.3%	0.6%	0.3%	0.2%	0.5%	0.1%	0.3%
July-12-2007	1.7%	1.5%	0.2%	1.6%	1.4%	0.3%	1.4%	1.4%	0.0%
July-13-2007	0.2%	0.5%	-0.2%	0.4%	0.3%	0.1%	0.2%	0.4%	-0.2%
July-16-2007	-0.4%	-0.6%	0.2%	-0.4%	-0.4%	0.1%	-0.5%	-0.6%	0.2%
July-17-2007	-0.2%	0.0%	-0.2%	0.0%	-0.1%	0.1%	0.1%	-0.1%	0.3%
July-18-2007	-0.2%	-0.3%	0.0%	-0.2%	-0.3%	0.2%	-0.2%	-0.2%	0.1%
July-19-2007	0.2%	0.6%	-0.5%	0.2%	0.4%	-0.1%	0.5%	0.5%	0.0%
July-20-2007	-1.3%	-1.0%	-0.2%	-1.3%	-1.1%	-0.3%	-0.7%	-1.2%	0.5%
July-23-2007	0.2%	0.0%	0.2%	0.3%	-0.4%	0.7%	0.0%	-0.1%	0.1%
July-24-2007	-2.3%	-2.3%	0.1%	-2.0%	-1.8%	-0.2%	-2.0%	-2.3%	0.3%
July-25-2007	0.0%	0.0%	-0.1%	-0.4%	0.2%	-0.5%	0.1%	-0.2%	0.3%
July-26-2007	-2.3%	-2.6%	0.3%	-2.5%	-2.2%	-0.3%	-2.1%	-2.7%	0.6%
July-27-2007	-1.6%	-1.4%	-0.2%	-1.4%	-1.7%	0.2%	-1.4%	-1.6%	0.2%
July-30-2007	1.2%	0.7%	0.5%	1.2%	0.6%	0.6%	1.0%	0.8%	0.2%
July-31-2007	-1.0%	-1.3%	0.3%	-0.8%	-1.3%	0.4%	-1.0%	-1.3%	0.2%
August-1-2007	0.2%	0.1%	0.1%	0.1%	0.1%	0.0%	0.3%	-0.6%	0.9%
August-2-2007	0.8%	0.3%	0.5%	0.7%	0.5%	0.2%	0.9%	0.7%	0.2%
August-3-2007	-2.7%	-3.0%	0.3%	-2.9%	-3.1%	0.2%	-2.3%	-3.4%	1.1%
August-6-2007	1.6%	1.6%	0.0%	1.0%	2.0%	-0.9%	1.3%	0.8%	0.4%
August-7-2007	0.6%	0.7%	-0.1%	0.5%	0.5%	0.0%	0.4%	0.7%	-0.3%
August to Date Returns	0.6%	-0.3%	0.8%	-0.6%	0.0%	-0.6%	0.6%	-1.7%	2.3%
Last Week in July Returns	-3.8%	-4.6%	0.8%	-4.0%	-4.5%	0.4%	-3.4%	-5.0%	1.5%

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
Past results are no guarantee of future performance.

Lack of Historical Precedent for These Daily Returns

We have searched our daily factor returns series back from the present into the 1960s to see if we could find a precedent for return swings of this magnitude. In truth, we were hard pressed to find a five day trading period that corresponds to the events we have witnessed to date. As shown in Figure 8 below, the only corresponding periods were the bursting of the Internet Bubble and a series of events in the 1960s. The events of 1987, 1997 and 1998 were not of this scale or magnitude.

<u>Book to Price</u>		<u>Gross Free Cash Flow to Price</u>		<u>Sales to Price</u>		<u>EBITDA to EV</u>	
<u>DATE</u>	<u>Long / Short Spread</u>	<u>DATE</u>	<u>Long / Short Spread</u>	<u>DATE</u>	<u>Long / Short Spread</u>	<u>DATE</u>	<u>Long / Short Spread</u>
September-22-1966	-3.0%	November-16-1962	-3.9%	November-16-1962	-3.5%	June-30-2000	-3.2%
October-24-1966	-3.3%	November-26-1962	-1.9%	June-2-2000	-2.8%	December-5-2000	-3.8%
October-26-1966	-3.9%	November-21-1988	-2.1%	June-30-2000	-4.1%		
November-4-1966	-3.6%	October-6-1999	-2.1%	July-12-2000	-2.7%	August to Date Returns	-3.09%
November-11-1966	-3.0%	January-10-2000	-2.1%	July-20-2000	-2.8%		
December-19-1966	-3.5%	February-23-2000	-2.8%	December-5-2000	-8.5%		
January-18-1967	-2.7%	June-2-2000	-2.8%	December-8-2000	-6.9%		
March-8-1967	-3.4%	June-30-2000	-2.8%	December-22-2000	-3.8%		
June-1-1967	-2.6%	November-1-2000	-2.0%	January-3-2001	-4.1%		
August-21-1967	-3.7%	December-5-2000	-2.9%	April-5-2001	-3.7%		
August-25-1967	-5.4%	December-8-2000	-2.8%	April-10-2001	-4.2%		
October-18-1967	-3.6%	December-11-2000	-2.8%	April-18-2001	-4.2%		
November-10-1967	-3.5%	January-10-2001	-2.6%	April-19-2001	-3.2%		
December-27-1967	-3.0%	January-11-2001	-2.7%				
January-4-1968	-2.6%	January-12-2001	-2.7%	August to Date Returns	-2.7%		
February-23-1968	-2.8%	January-16-2001	-4.4%				
March-15-1968	-2.7%	April-5-2001	-1.9%				
March-18-1968	-2.7%	May-2-2001	-3.3%				
April-1-1968	-3.8%	October-10-2001	-2.1%				
June-6-1968	-3.1%	October-11-2001	-2.7%				
June-27-1968	-2.6%	October-16-2001	-1.9%				
October-3-1968	-3.4%	November-13-2001	-2.0%				
June-30-2000	-2.9%						
December-5-2000	-4.6%	August to Date Returns	-1.9%				
December-8-2000	-3.3%						
August to Date Returns	-2.49%						

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
 Past results are no guarantee of future performance.

Factor Returns in Sectors

In general, the performance of factors returns have not been driven by anyone sector or any particular set of sectors. As shown in Figure 8 below, for the factors with the most notable performance issues, they have tended to perform similarly across all sectors. Accordingly, we discount notions that what we are observing in the market is a "sector based rotation" phenomena and again attribute it to more of a liquidity based de-leveraging phenomena.

Figure 8: Monthly Returns in Valuation and Quality Theme Factors at Sector Level, in Russell 1000 Universe

	<u>Energy</u>	<u>Materials</u>	<u>Industrials</u>	<u>Consumer Discretionary</u>	<u>Consumer Staples</u>	<u>Health Care</u>	<u>Financials</u>	<u>Technology</u>	<u>Telecom</u>	<u>Utilities</u>
EBITDA to EV										
December, 2006	2.4%	-2.3%	-0.8%	0.8%	-0.6%	2.1%	2.4%	1.1%	5.5%	-1.3%
January, 2007	1.6%	7.4%	2.2%	3.8%	-1.1%	4.1%	-2.0%	-3.4%	-4.5%	1.7%
February, 2007	-2.2%	-5.1%	0.9%	-1.8%	-0.3%	5.4%	2.0%	1.6%	8.8%	2.0%
March, 2007	-1.3%	4.2%	-1.4%	-3.8%	1.2%	1.2%	2.9%	-1.1%	2.4%	-0.7%
April, 2007	0.6%	-0.1%	-0.8%	2.5%	-0.9%	-4.1%	1.1%	4.3%	-1.1%	0.9%
May, 2007	-0.5%	1.7%	-1.8%	-2.5%	3.4%	1.6%	1.1%	2.8%	0.7%	-0.9%
June, 2007	-1.1%	-2.6%	-1.5%	-0.6%	1.5%	1.7%	2.4%	0.5%	4.9%	-0.6%
July, 2007	-4.0%	0.1%	-3.3%	-5.3%	-0.2%	-5.9%	-4.0%	-2.7%	-2.9%	-2.0%
Trailing Earnings to Price										
December, 2006	0.6%	-1.8%	0.0%	-0.4%	-0.4%	2.1%	5.4%	1.7%	2.6%	0.1%
January, 2007	2.8%	3.6%	0.4%	1.3%	3.0%	1.3%	-7.8%	-2.8%	-2.5%	2.9%
February, 2007	-1.4%	-3.8%	0.4%	-2.4%	-0.5%	5.1%	-1.3%	1.0%	3.1%	-1.9%
March, 2007	-1.0%	5.8%	1.0%	-6.9%	0.8%	3.1%	-2.2%	0.3%	3.4%	-2.7%
April, 2007	3.9%	-0.9%	3.8%	0.3%	-0.7%	-7.1%	5.4%	5.1%	2.1%	1.0%
May, 2007	1.7%	-2.2%	-3.6%	1.8%	-0.4%	-0.4%	1.2%	-1.1%	0.7%	-1.7%
June, 2007	0.8%	-2.5%	-2.6%	-5.5%	1.4%	-0.3%	4.2%	-1.0%	-1.2%	-2.0%
July, 2007	-3.1%	-3.2%	-1.8%	-2.6%	2.3%	-8.4%	-6.6%	-0.2%	-3.7%	-2.7%
Book to Price										
December, 2006	3.8%	1.8%	2.8%	1.5%	-0.3%	1.4%	1.7%	0.8%	-3.3%	3.7%
January, 2007	3.5%	2.8%	0.9%	1.8%	-3.4%	2.5%	-5.1%	-4.1%	-4.3%	-0.4%
February, 2007	-2.6%	-1.5%	1.5%	-1.8%	-0.5%	2.7%	1.0%	6.1%	-2.4%	-1.4%
March, 2007	-3.1%	-7.7%	3.8%	-5.0%	1.7%	-1.5%	-1.6%	-1.0%	3.7%	0.2%
April, 2007	-0.1%	0.0%	0.9%	-1.3%	1.7%	-5.9%	1.0%	4.3%	1.1%	-2.2%
May, 2007	-2.2%	-1.1%	2.0%	-0.1%	3.5%	4.8%	-0.4%	-2.9%	1.6%	-4.1%
June, 2007	0.4%	1.0%	1.5%	-6.6%	3.8%	2.6%	-0.2%	-0.5%	3.9%	-1.5%
July, 2007	0.5%	-4.7%	-1.9%	-6.0%	2.1%	-6.8%	-4.3%	0.4%	7.0%	-0.4%
Sales to Price										
December, 2006	2.9%	3.2%	-0.8%	0.4%	0.7%	3.9%	N/A	1.7%	9.2%	1.4%
January, 2007	-1.1%	3.4%	3.4%	3.3%	0.3%	3.1%	N/A	-3.2%	-3.4%	-0.4%
February, 2007	3.0%	-2.2%	2.3%	-1.4%	3.1%	8.1%	N/A	1.0%	12.0%	-2.1%
March, 2007	1.5%	2.1%	-0.6%	-2.2%	0.4%	-0.2%	N/A	-1.6%	0.8%	1.3%
April, 2007	3.1%	3.7%	0.0%	1.1%	0.8%	-6.1%	N/A	0.9%	-3.7%	-2.6%
May, 2007	0.6%	-1.1%	0.6%	0.8%	1.4%	2.2%	N/A	-0.5%	1.3%	-0.4%
June, 2007	0.5%	-0.1%	-0.4%	-5.5%	0.9%	1.5%	N/A	0.4%	3.1%	-0.6%
July, 2007	-3.3%	0.2%	-1.3%	-8.9%	-1.6%	-9.0%	N/A	-2.6%	-2.4%	-0.2%
Change in Shares Outstanding										
December, 2006	-0.1%	4.3%	0.8%	1.8%	-2.8%	1.2%	3.0%	1.7%	-0.5%	-1.6%
January, 2007	1.1%	-3.4%	1.0%	-0.6%	1.7%	3.2%	-2.8%	-0.9%	-1.3%	-0.4%
February, 2007	-1.8%	0.6%	0.6%	-1.7%	1.3%	2.0%	-1.0%	2.5%	-2.4%	2.1%
March, 2007	-0.2%	-3.6%	0.8%	-0.5%	-4.1%	1.5%	0.7%	0.6%	4.1%	1.0%
April, 2007	2.0%	-2.5%	-0.2%	1.7%	-3.9%	2.1%	2.4%	3.4%	0.5%	3.1%
May, 2007	0.8%	-3.9%	0.0%	1.1%	-0.9%	0.2%	1.9%	0.2%	4.1%	-1.0%
June, 2007	-2.3%	-2.9%	1.2%	-0.5%	1.7%	2.4%	3.6%	-2.3%	-2.4%	-2.3%
July, 2007	-2.6%	-8.1%	-0.7%	-3.7%	1.5%	-4.6%	-3.0%	-2.5%	-2.7%	0.1%
Sales Growth										
December, 2006	-0.7%	-3.7%	-1.0%	-1.1%	3.0%	-1.8%	N/A	-3.1%	-4.5%	-1.0%
January, 2007	3.6%	7.6%	1.6%	-0.2%	1.7%	-3.0%	N/A	-0.3%	2.3%	2.2%
February, 2007	2.1%	-1.8%	-1.9%	-0.9%	-4.8%	1.4%	N/A	0.5%	0.5%	2.5%
March, 2007	3.2%	3.7%	-0.4%	1.5%	-1.1%	0.1%	N/A	-0.5%	0.9%	3.6%
April, 2007	0.2%	-0.3%	-1.6%	1.5%	2.4%	-3.3%	N/A	-0.5%	-3.0%	2.8%
May, 2007	-3.7%	4.5%	0.2%	-0.2%	1.4%	-2.0%	N/A	-2.3%	0.1%	4.0%
June, 2007	5.0%	-2.9%	0.9%	4.0%	-5.2%	-3.4%	N/A	-0.4%	2.3%	-1.6%
July, 2007	3.5%	9.4%	5.6%	9.0%	4.6%	7.4%	N/A	6.5%	9.7%	-0.1%

Source: Lehman Brothers Quantitative Equity Strategies; CRSP; Compustat; Russell; Thomson Financial Services
 Past results are no guarantee of future performance.

Where Do We Think it Goes from Here?

The situation developing among quantitative fund managers has all the hallmarks of a classic “run on a bank” situation, such as the one depicted in the movie, “It’s A Wonderful Life”. Self-fulfilling prophesies of losses can come true if investors stampede and head for the door in unison. We certainly hope this situation does not materialize and stress the need for investor calm. We continue to see the situation for the facts we know are occurring rather than the speculation others are engaging in: there has been a systematic unwinding of factors bets as a few large investors need to reduce risk in highly liquid markets.

We believe there are reasons for optimism here.

We believe that as more and more investors understand that what is occurring is not an idiosyncratic blow-up of their own quantitative models that a sense of calm and order can be restored. Clearly, pension funds, plan sponsors and consultants will look back upon this period not as a case of specific managers experiencing problems but as the asset class experiencing problems. There is no learning that is happening here about the talent and quality of individual quant managers — we do not believe anyone will emerge from this as the “smart guys” or the “fools”. We as quants must remain rational --- and rationality is after all what we all pride ourselves on – and understand that this is what is occurring. We believe that is easiest for mutually ensured survival and our best bet to stave off he stampede at this capital market’s version of the Who concert in Cincinnati.

However, if one is predisposed to see all glasses as half-empty, of course, then one could make a case of despair here. Each individual manager has the incentive to try and sit this one out, to race to the sidelines and let others take the pain. Hedge fund managers realize that given their own incentive contracts, weathering additional down days may mean they work for free effectively for a while as they claw back to their high-watermarks. Risk managers may begin to step in and take the decision making process away from portfolio managers as firms’ appetite for risk dries up. Redemptions may occur sooner rather than later forcing further spirals. Collateral requirements on the part of broker dealers may start to rise. But this is all speculation, and, we must strongly emphasize that we have not seen evidence to date that these events are in fact happening.

We like to believe in the rationality of human beings (and particularly quants) and place our faith in the strong forces and mutual incentives we all have for orderly functioning of the capital markets. As drivers of cars down dark roads at night, we learn to have faith that the driver approaching on the other side of the road, will not swerve into our lane to hit us. In fact, he is just as afraid of our swerving to hit him as we are of his swerving to hit us. We both exhale as we pass by each other headed into the night in our respective opposite directions, successfully avoiding both of our destructions.

We believe, and earnestly hope, that is how things are headed here, that is how events will play out – that stability will win, and that calm will soon prevail. The stakes are too high for all of us for anything else to be a realistic final resolution.

Analyst Certification:

I, Matthew S. Rothman, Ph.D., hereby certify (1) that the views expressed in this research Industry Note accurately reflect my personal views about any or all of the subject securities or issuers referred to in this Industry Note and (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this Industry Note.

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The analysts responsible for preparing this report have received compensation based upon various factors including the firm's total revenues, a portion of which is generated by investment banking activities

Guide to Lehman Brothers Equity Research Rating System:

Our coverage analysts use a relative rating system in which they rate stocks as 1-Overweight, 2-Equal weight or 3-Underweight (see definitions below) relative to other companies covered by the analyst or a team of analysts that are deemed to be in the same industry sector (the "sector coverage universe"). Not applicable.

In addition to the stock rating, we provide sector views which rate the outlook for the sector coverage universe as 1-Positive, 2-Neutral or 3-Negative (see definitions below). A rating system using terms such as buy, hold and sell is not the equivalent of our rating system. Investors should carefully read the entire research report including the definitions of all ratings and not infer its contents from ratings alone.

Stock Rating

1-Overweight - The stock is expected to outperform the unweighted expected total return of the sector coverage universe over a 12-month investment horizon.

2-Equal weight - The stock is expected to perform in line with the unweighted expected total return of the sector coverage universe over a 12-month investment horizon.

3-Underweight - The stock is expected to underperform the unweighted expected total return of the sector coverage universe over a 12-month investment horizon.

RS-Rating Suspended - The rating and target price have been suspended temporarily to comply with applicable regulations and/or firm policies in certain circumstances including when Lehman Brothers is acting in an advisory capacity in a merger or strategic transaction involving the company.

Sector View

1-Positive - sector coverage universe fundamentals/valuations are improving.

2-Neutral - sector coverage universe fundamentals/valuations are steady, neither improving nor deteriorating.

3-Negative - sector coverage universe fundamentals/valuations are deteriorating.

Distribution of Ratings:

Lehman Brothers Equity Research has 2064 companies under coverage.

41% have been assigned a 1-Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as Buy rating, 29% of companies with this rating are investment banking clients of the Firm.

43% have been assigned a 2-Equal weight rating which, for purposes of mandatory regulatory disclosures, is classified as Hold rating, 39% of companies with this rating are investment banking clients of the Firm.

12% have been assigned a 3-Underweight rating which, for purposes of mandatory regulatory disclosures, is classified as Sell rating, 25% of companies with this rating are investment banking clients of the Firm.

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