

Equities

18 March 2011 | 11 pages

Eastern Japan earthquake/Market correction

Strategies for investors: A quant perspective

- Quantitative Analysis
- The Japan Earthquake

- **Sympathies** – We would like to express our deepest sympathies to all affected by the earthquake in Japan and our wishes for a speedy recovery.
- **Turbulent markets, but natural disasters do not cause recessions** — The past week has witnessed the sharpest correction in the Japanese market since the late 1980s and massive intraday volatility (see Figure 3). This was triggered by the earthquake in eastern Japan and its ongoing consequences. Nonetheless, it is worth remembering that natural disasters typically do not cause recessions.
- **Negative sentiment could be getting overdone** — In spite of this, sentiment is moving strongly into risk-averse territory, which could support a further, ultimately unjustified, correction. As in most market sell-offs, investors abandon stocks en masse, selling what they can of what they own—such that fundamentally sound names get oversold.
- **Market troughs and shocks** — Late last year, we looked at the historical behavior of various common investment factors in Japan around peaks and troughs of the economic cycle. For more details, see our November 26, 2010, memo, [Factor performance around inflection points](#). While nothing works very well as we approach the trough, valuation factors and quality factors prove helpful as we emerge out of the trough.
- **Screening for success** — Once the sell off is over, market participants risk perception does not immediately snap back to previous level – the memory of the sell-off and the events that triggered it continue to resonate. This impacts what people look to buy – thus, we screen for fundamentally sound companies with compelling valuations that look beaten down. This report is designed to help investors develop a strategy that we believe should outperform into a bounce or recovery.

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See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

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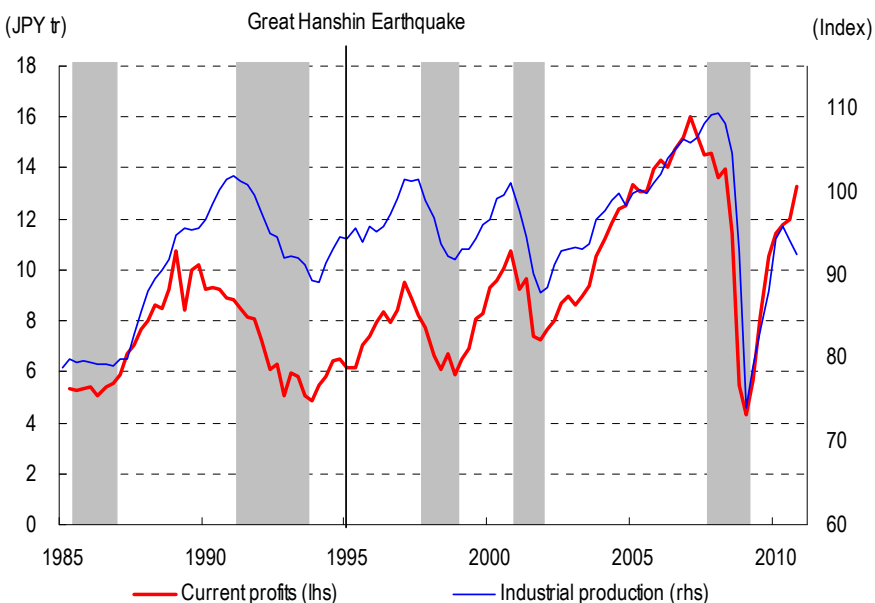
Strategies for investors

We are in unprecedented times. Volatility and correlation spiked alarmingly as risk aversion struck and markets plunged: only to start recovering as policy makers acted and investors began to factor in the distress in the system. While it's still too early to know if this is the "beginning of the end, or the end of the beginning", we show a strategy here that tries to identify names that are potential outperformers once the dust settles and market starts trading on fundamentals. We screen for stocks that look likely to be the first beneficiaries of this.

Please contact the authors or your Citi Salesperson for more details.

Even Great Hanshin Earthquake could
not derail the economic recovery in 1995

Figure 1. Current profits and industrial production

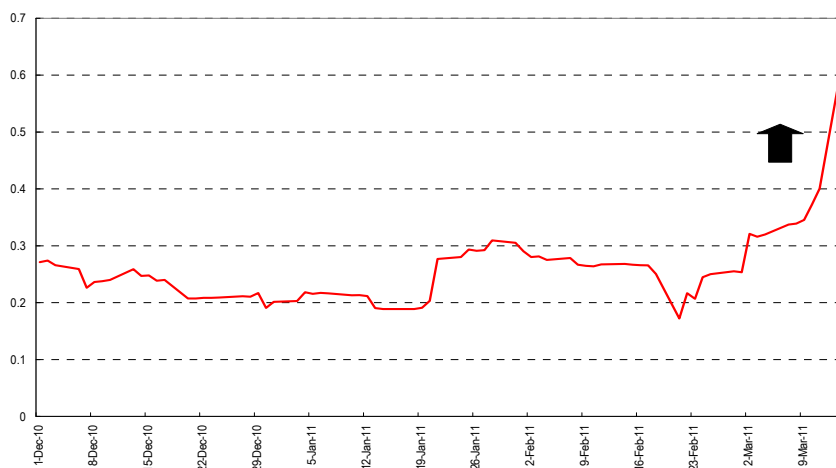


Source: Citi Investment Research and Analysis.

State of the market

Figure 2. Average Cross Sectional Correlation

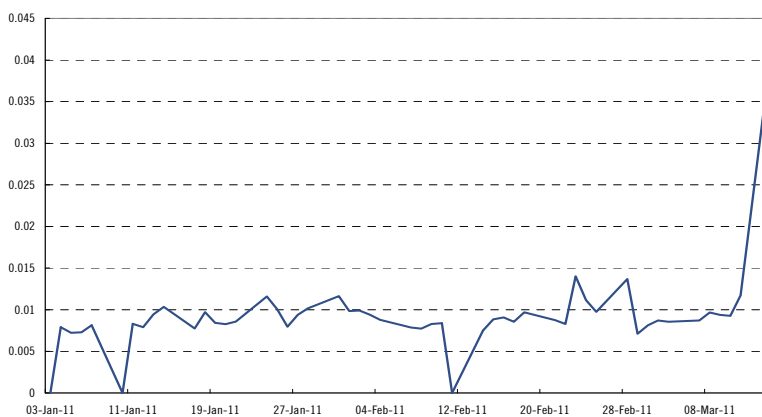
Cross correlation is the mean pairwise correlation between rolling one month returns of all the possible pairs of index constituents – this measure has shot up since the earthquake



Source: Citi Investment Research and Analysis.

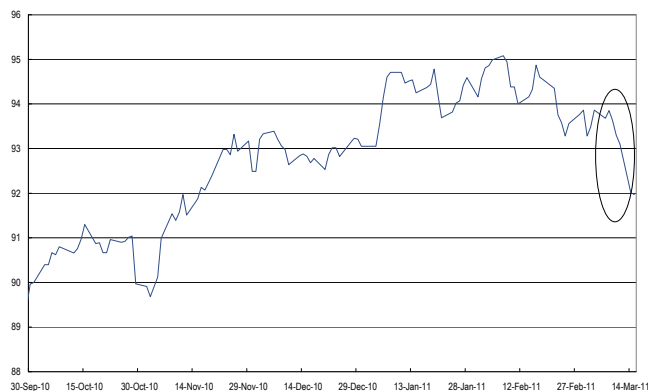
The abnormal volatility metric (Citi Abnormal Vol is Citi's proprietary volatility indicator) has also jumped following the event

Figure 3. Citi Abnormal Vol index



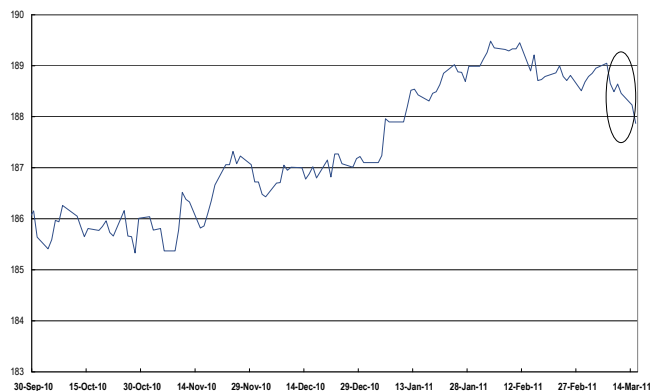
Source: Citi Investment Research and Analysis.

Figure 4. Citi Risk Index (CITQJPRI)



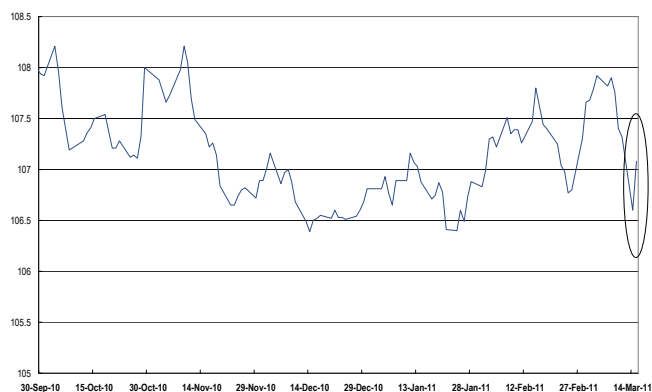
Source: Citi Investment Research and Analysis.

Figure 5. Citi Value Index (CITQJPVA)



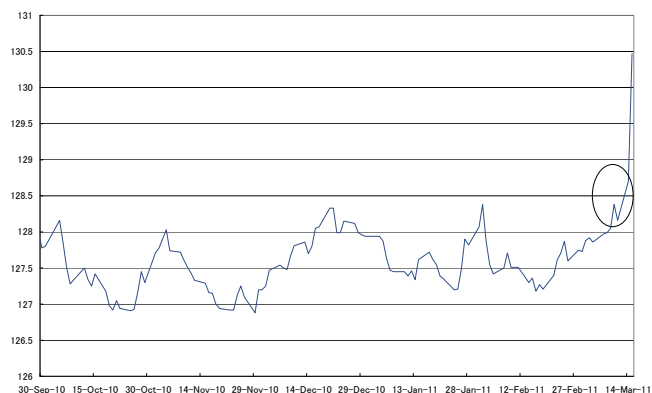
Source: Citi Investment Research and Analysis.

Figure 6. Citi Momentum Index (CITQJPMO)



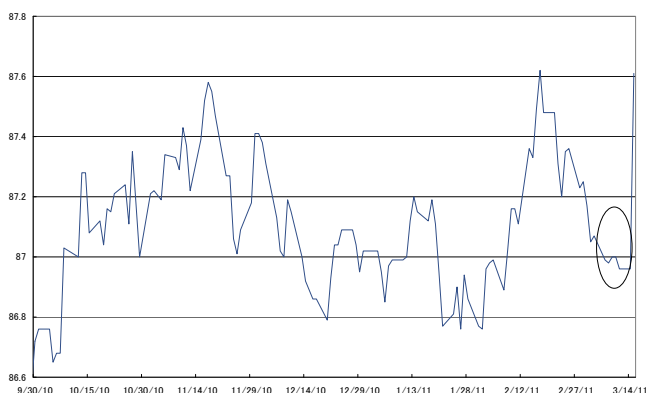
Source: Citi Investment Research and Analysis.

Figure 7. Citi Quality Index (CITQJPQU)



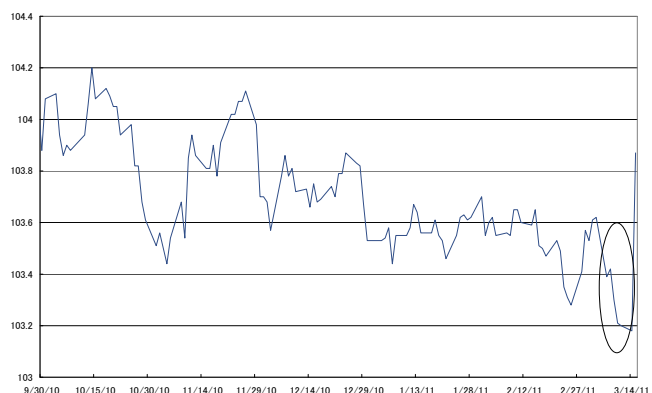
Source: Citi Investment Research and Analysis.

Figure 8. Citi Size Index (CITQJPSZ)



Source: Citi Investment Research and Analysis.

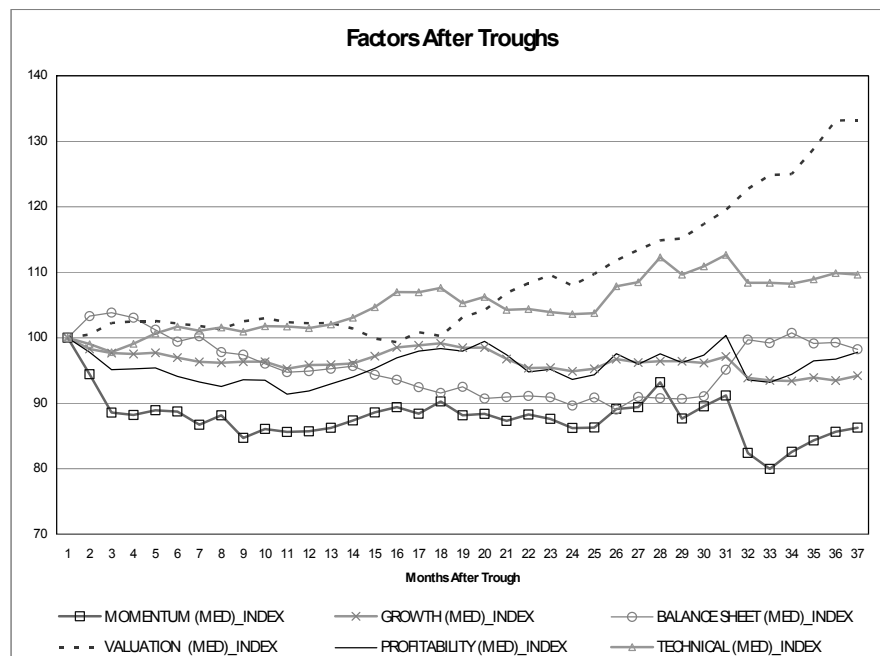
Figure 9. Citi Growth Index (CITQJPGR)



Source: Citi Investment Research and Analysis.

Looking at the Styles that have been performing, only the Quality style has registered a positive return – momentum, value, growth, size and risk styles have all registered sharp declines.

Figure 10. Factor performance after troughs



Source: Citi Investment Research and Analysis.

Based on our Event study of past market troughs¹, we know that once a sell off is over, people's risk perception does not immediately revert to its previous level. The relatively strong performance of quality factors over the first few months of these rallies tends to support this hypothesis. But after this initial period, it is maybe not surprising to find that in recoveries, valuation strategies do very well – as investors initially look to buy sound businesses on very appealing valuations. This impacts what people look to buy: investments that require generally more extreme growth or optimistic outcomes continue to look more challenging.

Based on this approach we have designed a strategy that we believe should outperform into a bounce or recovery. The strategy also makes intuitive sense – we are simply looking to take advantage of the “irrational”, herd behavior based sell-off which we know occurs from time to time. The first leg of our model (Attractive on Radar model+ Quality filter) ensures that the stocks we pick are fundamentally sound. The second leg, i.e. short term reversal, ensures that we pick up (of the fundamentally sound names) those which have been beaten down. The output of the screen is detailed in the table on following page.

We have incorporated explicit liquidity filters (average trading value > 10 million USD per day). In addition, we also provide an overseas sales ratio metric which is based on company disclosure and provides a gauge of the proportion of the company's sales from non-Japanese sources. The idea being since domestic demand is likely to be weak in the near term, we screen for companies with exposure to foreign demand. We select stocks for whom this ratio is > 30%.

¹ Factor performance around inflection points, Paul Chanin and Nachiket Garde, CFA

Figure 11. Screening Results

Bloomberg Ticker	Name	Sector	Mcap (US\$m)	Share Price (3/17)	60D Avg Trading Value (US\$m)	Rating	Target price	Return Since Earth Quake (Mar10- Mar17)	Earnings Revision Ratio	65d Risk Adjusted price Momentum Rank	12m Reversal	FY09 Overseas sales
5803 JT	Fujikura	Industrials	1,570.22	318	13.43	1H	650	-22.00%	72.36%	30.70%	90.52%	47.38
5706 JT	Mitsui Mining & Smelting	Materials	2,121.97	246	16.10	2H	340	-20.38%	88.66%	92.66%	22.32%	33.69
4631 JT	DIC	Materials	1,760.16	170	19.87	2H	240	-20.28%	97.05%	86.09%	31.40%	58.25
7013 JT	IHI	Industrials	3,261.87	166	26.12	NR	NA	-19.81%	97.05%	93.83%	13.39%	42.22
4004 JT	Showa Denko	Materials	2,666.48	142	19.32	1M	220	-18.86%	65.84%	9.06%	81.28%	36.22
4203 JT	Sumitomo Bakelite	Materials	1,176.81	481	12.77	1M	650	-16.76%	15.37%	91.09%	42.60%	47.94
6501 JT	Hitachi	Info Technology	27,280.67	404	282.72	2H	540	-16.60%	92.08%	97.27%	4.93%	40.75
4042 JT	Tosoh	Materials	1,687.09	235	12.92	2H	310	-16.55%	86.80%	84.61%	14.88%	37.68
4114 JT	Nippon Shokubai	Materials	1,575.07	808	13.96	1M	1,250	-16.49%	73.45%	95.94%	19.03%	46.91
6665 JT	Elpida Memory	Info Technology	2,779.94	910	92.74	1H	1,400	-15.36%	24.07%	80.00%	98.83%	82.27
5713 JT	Sumitomo Metal Mining	Materials	9,282.14	1,254	70.10	2H	1,650	-14.78%	93.32%	65.94%	30.54%	45.20
6472 JT	NTN	Industrials	2,266.17	377	18.19	NR	NA	-13.93%	64.91%	37.11%	32.34%	65.46
6474 JT	Nachi-Fujikoshi	Industrials	1,098.65	416	14.45	NR	NA	-13.88%	97.05%	100.00%	3.05%	37.56
4183 JT	Mitsui Chemicals	Materials	3,097.33	251	45.70	2H	320	-12.98%	71.27%	48.75%	40.64%	39.47
5991 JT	NHK Spring	Consumer Disc	2,224.16	770	14.43	NR	NA	-12.89%	99.07%	58.28%	33.67%	36.33
5802 JT	Sumitomo Electric	Industrials	10,525.88	1,055	52.72	1M	1,400	-12.67%	25.78%	77.50%	27.09%	38.41
4217 JT	Hitachi Chemical	Materials	2,021.64	1,590	15.55	1M	2,400	-11.72%	56.21%	72.73%	69.69%	42.91
5214 JT	Nippon Electric Glass	Info Technology	7,346.21	1,102	60.81	1M	1,650	-11.61%	68.48%	81.72%	40.56%	70.20
6753 JT	Sharp	Consumer Disc	8,216.74	741	77.72	2H	910	-11.60%	55.75%	36.95%	95.30%	48.15
4062 JT	Ibiden	Info Technology	4,117.84	2,457	50.68	1H	2,800	-11.56%	60.25%	62.89%	78.00%	71.22
4568 JT	Daiichi Sankyo	Health Care	13,334.52	1,526	45.49	1M	2,000	-11.40%	86.18%	26.17%	43.30%	50.66
4005 JT	Sumitomo Chemical	Materials	7,392.12	366	57.72	1M	520	-11.35%	90.84%	67.19%	59.28%	44.97
6902 JT	Denso	Consumer Disc	17,108.63	2,582	63.64	1M	3,600	-11.20%	71.27%	65.16%	30.62%	49.00
2802 JT	Ajinomoto	Consumer Staples	6,480.89	840	28.04	2M	1,000	-10.99%	59.47%	92.27%	38.45%	32.65
6201 JT	Toyota Industries	Consumer Disc	5,466.50	2,366	19.10	2M	2,800	-10.55%	88.66%	81.48%	37.35%	33.46
7201 JT	Nissan Motor	Consumer Disc	21,059.18	733	154.91	1M	1,270	-9.19%	90.53%	54.30%	37.27%	76.01
7267 JT	Honda Motor	Consumer Disc	63,113.19	3,055	226.53	1M	4,480	-9.12%	63.66%	72.03%	36.18%	81.61
4502 JT	Takeda Pharma	Health Care	35,240.64	3,725	102.49	2M	4,300	-8.82%	70.03%	64.69%	41.50%	53.01
1662 JT	Japan Petroleum	Energy	1,350.83	3,560	15.03	2H	3,600	-8.20%	90.68%	98.75%	85.67%	30.83
5406 JT	Kobe Steel	Materials	6,102.91	192	39.56	1M	280	-7.25%	56.52%	54.14%	34.77%	33.44
6988 JT	Nitto Denko	Materials	8,541.72	4,085	104.31	1M	5,500	-7.18%	86.65%	89.84%	11.35%	67.58
6963 JO	Rohm	Info Technology	6,118.26	5,040	24.13	2H	5,600	-7.17%	25.62%	55.63%	88.41%	62.36
4523 JT	Eisai	Health Care	9,455.19	2,992	75.83	1M	4,300	-6.08%	80.59%	59.61%	52.55%	57.96
5201 JT	Asahi Glass	Industrials	12,429.76	1,001	66.72	2M	1,150	-3.28%	92.86%	91.33%	36.26%	63.42
2914 JT	Japan Tobacco	Consumer Staples	18,269.68	320,500	80.79	1M	410,000	-2.37%	72.36%	89.06%	49.02%	43.28
1605 JT	Inpex	Energy	14,040.04	543,000	126.51	2H	500,000	-1.99%	85.25%	96.64%	85.51%	38.63

Note: NR: Not Rated.

Source: Citi Investment Research and Analysis.

Appendix A-1

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Citi Investment Research & Analysis Quantitative World Radar Screen Model Coverage	30%	40%	30%			
% of companies in each rating category that are investment banking clients	24%	23%	19%			
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% of companies in each rating category that are investment banking clients	55%	0%	50%			
Citi Investment Research & Analysis Asia Quantitative Radar Screen Model Coverage	20%	60%	20%			
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