What Just Happened?

8 November 2016

Global equity market risk is back where it was just before the 2008 crash.

It doesn't matter who wins the U.S. election. For more than two years, downside risk in global markets has been at the same level it reached just before the demise of Lehman Brothers in 2008.

Don't confuse low volatility with low risk. What matters is how fat the downside tails are and that information is simply invisible to the standard deviation of returns.

Tails in the U.S. Equity Market are *Very* Fat

The worst single day in the U.S. equity market was 19 October 1987 when the S&P 500 Index crashed by over 20%.

By applying our tail model to the data in the year up to the end of September 1987, we can see how likely we would have thought such a catastrophic loss was, a few days before it happened.

The answer, not surprisingly, is that it was something that should be expected one day in 80 years. Since nothing like that had occurred in over 100 years, while it was an unlikely event, it could have been regarded as 'overdue'. But that would hardly have been a persuasive reason for expecting it to happen in less than a month.

If we had asked that question again in September 2014, the answer would have been much more worrying. Again, using the data in the year ended 30 September 2014, the tail model estimated the frequency of the October 1987 event as 1 day in 30 years.

Repeating that calculation using the data in the year ended September 2016 produces a more pessimistic estimate. The frequency of the catastrophic October 1987 loss now appears to be 1 day in 25 years–29 years after the first one.

Such a loss is still an unlikely event, but the tail of the S&P 500 Index is fatter than it was in September 2008, before Lehman Brothers went down.

It's so fat that the moves of 2% up or down that are being projected as a result of the US election are, in fact, commonplace events that we should expect every two months.

Global Equity Market Downside Risk is also at 2008 Levels (And it has nothing to do with the U.S. Presidential Election)

The Stoxx® Global 1800 Index began after the 1987 crash, so we have no way of knowing what the tail of its returns distribution would have looked like in September 1987.

We can however, look back to its worst ever return, which occurred in October 2008–a loss of 6.93%. The second worst loss ever (6.8%) was on 26 September 2008. Using the data for the year prior to 25 September 2008 we use the Omega Metrics® tail model to ask how likely a 6.93% loss appeared to be.

The answer is that it appeared to be a 1 day in 4 year event. The average excess loss was 10% and the frequency of that loss was 1 day in 13 years.

By September 2014 risk appears to have receded significantly. The tail fit puts the likelihood of a repeat of the 6.93% loss as a 1 day in 31 year event. (Not at all odd given that the index goes back 23 years and only one such loss has ever happened.)

But fast forward one year to September 2015 and the picture has changed completely. The tail of the Stoxx® Global 1800 Index returns has become so fat that the risk looks almost exactly as it did in 2008. The frequency of a loss as large as 6.93% is now 1 day in 3.9 years. The expected excess loss is 11.2% and the frequency of such a loss is 1 day in 13.8 years.

These figures clearly had nothing to do with the U.S. Presidential election. A year later on 30 September 2016 they are identical.

It doesn't matter who wins the U.S. election. Equity market risk has grown alarmingly. Tails are as fat now as they were before the crash of 2008. Low volatility doesn't mean low risk.

Low Volatility Doesn't Mean Low Risk

Figure 1 shows the NAV of a fictitious company, named after the great French mathematician Augustin-Louis Cauchy.[1]

His name is also attached to a probability distribution that is so fat tailed that none of its moments are finite.

To generate the NAV of the A-L Cauchy Corporation we started with a random sample from a standard Cauchy distribution. Although the Cauchy distribution has no finite moments, this property can't be passed on to the sample.

Because the sample is finite, it has a finite mean and a finite standard deviation. By translating and rescaling the sample 'returns' we can match the mean and standard deviation of the Dow Jones Industrial Average over the past year.

So just like the DJI, the simulated returns of the A-L Cauchy Corporation have low variance.

But that doesn't mean that the returns distribution has low risk. Our tail model sees that the data has a very fat tail.

Draws from a Cauchy distribution will, sooner or later, produce very large losses or very large gains. In fact, the next draw in our sample corresponded to a 28% loss for the A-L Cauchy Corporation.

The potential for such a loss is entirely invisible to the standard deviation. The only way to discover it is by using a good tail model.

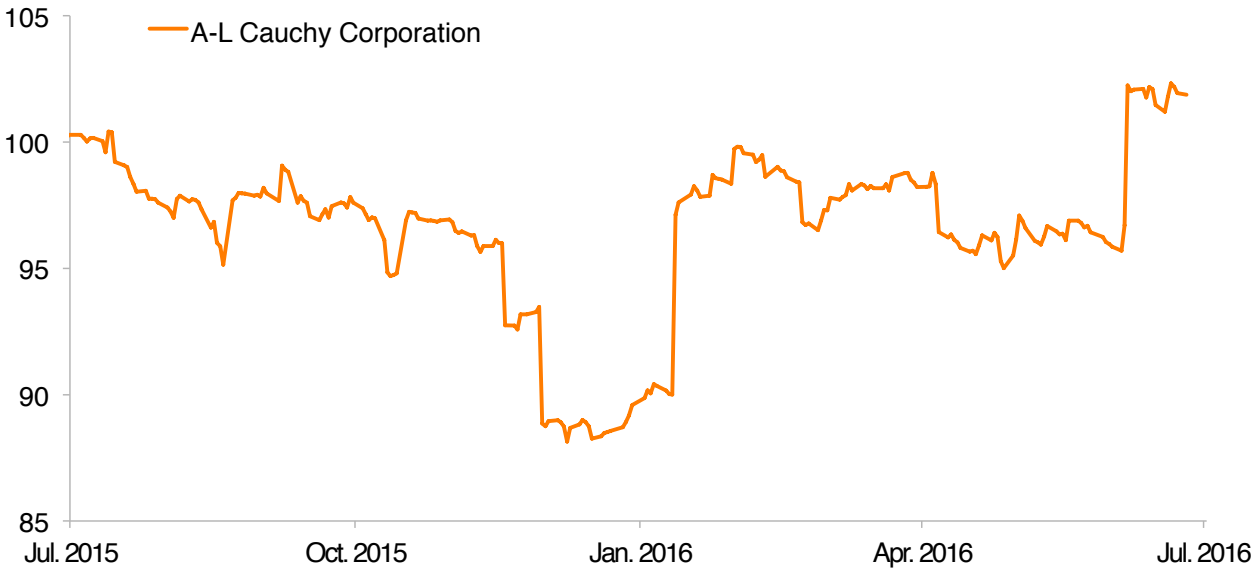

Figure 1. The returns that produced the NAV of the A-L Cauchy Corporation come from a Cauchy distribution. Although they have low variance, they contain the potential for very large losses.

[1] If you think that the Cauchy Corporation price history looks artificial, compare it with LinkedIn.

Omega Analysis

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