# Sell-offs, Reversals and Business Risk

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## Lessons from 2008

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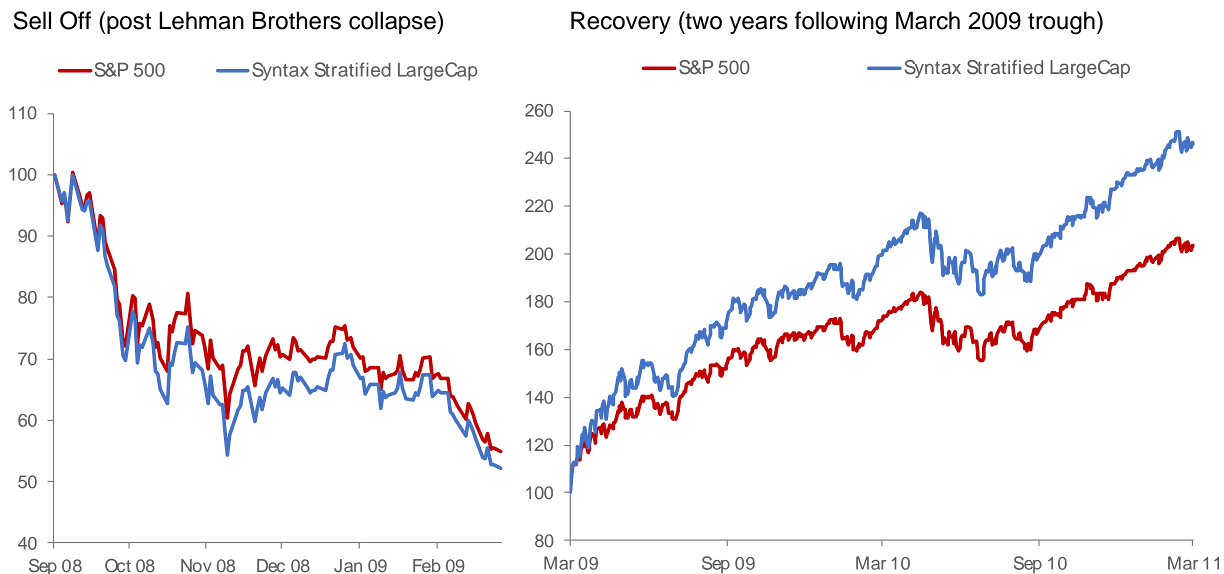
The root cause of the current market crisis is markedly different from anything we've seen before. However, the broad risk aversion, chaotic markets and divergence of sector performance has many of the hallmarks of the 2008 Global Financial Crisis. The Global Financial Crisis caused strong headwinds for cap-weighted indices during the subsequent recovery and saw them underperform many alternative weight strategies, such as Stratified Weight, significantly over the entire sell-off and recovery episode.

In this report, we examine the trajectory of the 2008 sell-off and subsequent recovery using our unique business risk lens and give actionable insights. If the 2008/9 hindsight is indeed 20:20, there are two ways to add value to our core portfolios: (i) rebalancing after the broad-based sell-off and (ii) reducing business risk concentrations during periods of high uncertainty. We will explore these two strategies in more detail and take stock of the market today.

Exhibit 1: Global Financial Crisis: Sell Off and Subsequent Recovery




Cumulative total return, 9.12.2008-3.9.2009 and 3.9.2009-3.9.2011. Performance does not reflect fees or implementation costs as an investor cannot directly invest in an index. Please see important disclaimers regarding backtested data prior to inception. Source: S&P Dow Jones Indices, Syntax.

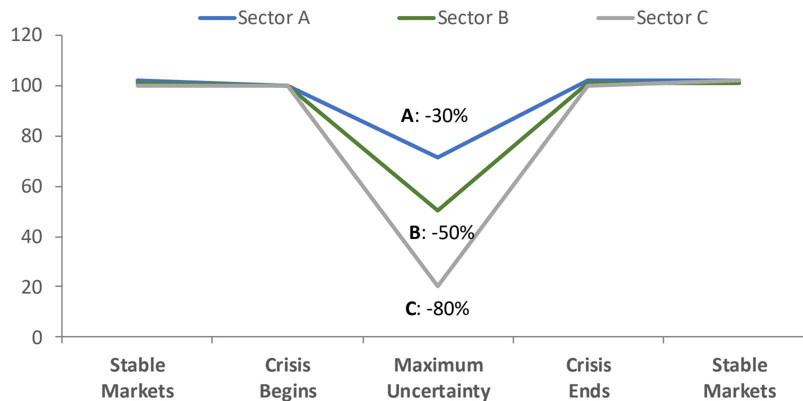
## Risk 1. Failing to Rebalance in a Reversal

There were two regimes in 2008 and 2009: (i) a sharp sell-off, which picked up steam when Lehman Brothers collapsed on September 15th, 2008 until almost six months later on March 9th, 2009 when the market bottomed and (ii) a sharp recovery when the dust settled around the extent of the crisis and confidence returned.

The momentum reversal effects seen during the recovery in 2009 are a compelling reason to stay invested today. The bottom is notoriously difficult to time and the reversal in 2009 happened quickly. That said, a cap weighted strategy is an inefficient methodology to capture a reversal. The logic is easy to understand with a simple example.

Consider three sectors: 'A'; 'B' & 'C'. In the sell-off phase, 'A' goes down the least (-30%); 'B' halves, and 'C' goes down the most (-80%). In the recovery phase, all sectors completely recover back to the prices they were at the start of the crisis (returns of +43%, +100%, and +400%, respectively).

Exhibit 2: Cap Weight Drag During Recovery: Three-Sector Example




Hypothetical performance of three sectors during a sell-off and recovery.

Assume that the three sectors are weighted the same at the start of the study (though they need not be). The market cap weighted approach does not rebalance, but rather lets the sector weights move with the markets, so the worst performing sector ('C') ends up with one third of the weight of the best performing sector ('A') immediately before the recovery period (Exhibit 2).

This weighting decision creates a drag on performance, since the strategy is underweight the sector with the greatest reversal, and overweight the sector with the least. Alternative weight strategies, such as Stratified Weight, rebalance their weights frequently and are therefore less subject to this drag during industry reversals.

Exhibit 3: Cap Weight Drag During Recovery Phase: Simple Math*

Market Cap Weight Methodology

| | Start weight | Sell-off perf. | Trough weight | Recovery perf. |
|---|---|---|---|---|
| A | 33% | -30% | 50% | 43% |
| B | 33% | -50% | 36% | 100% |
| C | 33% | -80% | 14% | 400% |
| | 100% | **-53%** | 100% | **114%** |
| **Market Cap Weight Performance** | | | | **0%** |

Stratified Weight Methodology

| | Start weight | Sell-off perf. | Trough weight | Recovery perf. |
|---|---|---|---|---|
| A | 33% | -30% | 33% | 43% |
| B | 33% | -50% | 33% | 100% |
| C | 33% | -80% | 33% | 400% |
| | 100% | **-53%** | 100% | **181%** |
| **Stratified Weight Performance** | | | | **31%** |

* Hypothetical Example. Source: Syntax

In our hypothetical example, the market cap weighted strategy is flat over the entire sell-off and recovery. However, due to its rebalancing approach, the Stratified Weight index of the same sectors is up 31% (Exhibit 3).

Exhibit 4 shows the performance of the three sectors on a scatterplot with the performance during the sell-off on the x-axis and the performance during the recovery on the y-axis. Note the inverse correlation (since the x-axis was reversed). The chart highlights that the highest performer in the sell-off was the lowest performer in the recovery.

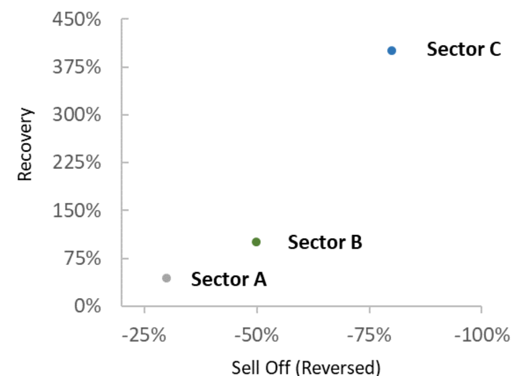
## Rebalancing Math in 2008

We start our focus period immediately before Lehman Brothers collapsed, at the close of September 12, 2008. The sell-off regime persisted almost six months until March 9th, 2009, when the market bottomed. We define the recovery period from the market bottom through the following year, March 9th, 2010, by which time the dust settled around the extent of the crisis and confidence returned.

Exhibit 5 on the following page shows the same scatterplot as in Exhibit 4, with the actual performance for business risk groups during the Financial Crisis. With very few exceptions, this reversal effect was universal across all business groups. There was a negative 0.8 rank correlation between the sell off and recovery performance of the industry groupings.

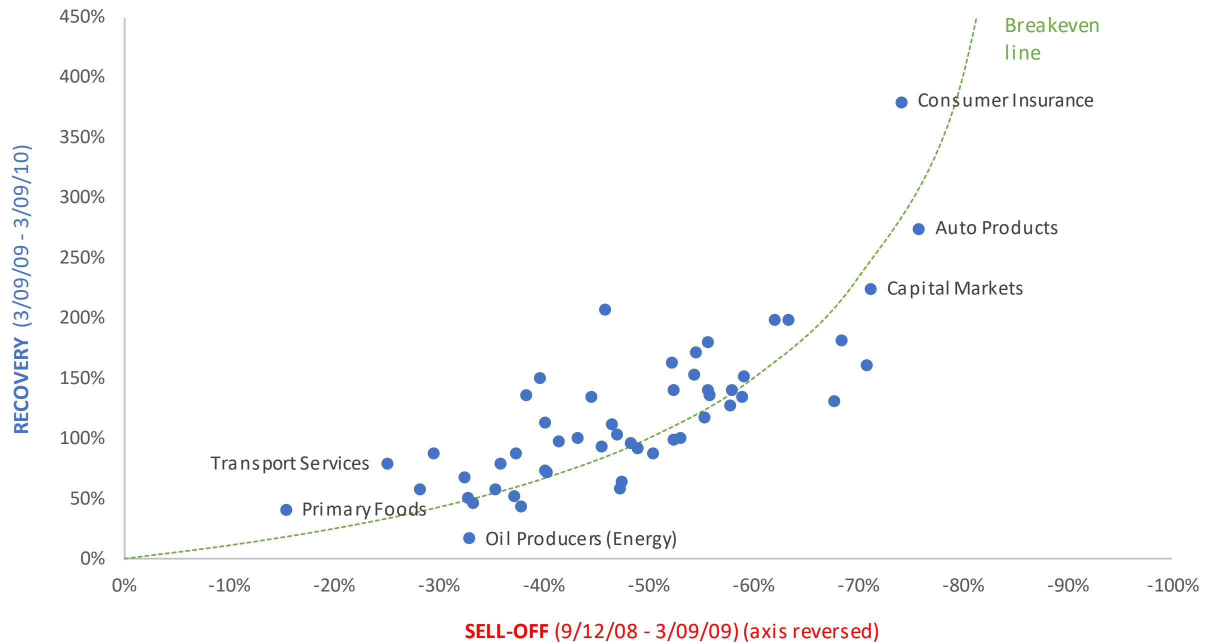
In other words, one of the strongest forces during the 2009 recovery was that the industries that went down the most during the sell-off went up the most during the recovery.

Exhibit 4. Sell Off / Recovery Scatterplot. Three sector example




* Hypothetical Example. Source: Syntax

Exhibit 5: Sell-off / Recovery Scatterplot for the Financial Crisis.
The worst performing groups during the sell-off were the best performing during the recovery.




Total return of the average S&P 500 company in each Industry during the sell-off (9.12.2008 – 3.9.2009) and recovery (3.9.2009 – 3.10.2010). Industry groups defined using Syntax's Functional Information System. Performance does not reflect fees or implementation costs as an investor cannot directly invest in an index. Please see important disclaimers regarding backtested data prior to inception. Source: S&P Dow Jones Indices, Syntax.

Exhibit 6: Best and Worst Performers during the 2008 Financial Crisis Sell Off and Recovery Periods

| Worst Performers | Sell-off | Recovery |
|---|---|---|
| Auto Products | -75.8 | 275.1 |
| Consumer Insurance | -74.0 | 381.1 |
| Capital Markets | -71.2 | 225.3 |
| Non-Mortgage Banking | -70.8 | 161.0 |
| Branded Apparel | -68.3 | 182.7 |
| Rental | -67.8 | 130.4 |
| Real Estate Developers | -63.2 | 200.2 |
| Home Office Equipment | -62.0 | 199.8 |

| Best Performers | Sell-off | Recovery |
|---|---|---|
| Alcohol and Tobacco | -28.1 | 58.6 |
| Restaurants | -29.5 | 88.0 |
| Processed Foods | -32.4 | 68.4 |
| Analog Circuits | -32.7 | 52.0 |
| Downstream | -32.9 | 17.0 |
| Electric Regulated | -33.2 | 47.8 |
| Food Distributors | -35.4 | 58.9 |
| Healthcare Products | -35.9 | 80.5 |

For a complete list of business groups and their performance in 2008 and 2020, please see the Appendix.

## Risk 2. Weighting Bias Compounds Performance Drag

The rebalancing drag (Risk 1) was compounded by the S&P 500's starting sector allocations on September 12th, 2008. Energy had the largest allocation prior to the crash, having grown to 17% as oil prices reached all-time highs during the summer. Though Energy had the lowest loss during the sell-off, it also the lowest gain in the recovery, and combined it had the worst performance over the period. That is, the sector with the highest weight had the lowest recovery return and second lowest full cycle return.

Financials and Healthcare also saw their weights grow in relative terms since the bursting of the tech bubble and had relatively large weightings within the cap weight benchmark. These large positions in Energy, Financials and Industrials caused a drag on performance as these sectors were among the worst performing through the crisis (combined sell-off and recovery period). This heavy

Exhibit 7a: Market Cap Sector Weights on 9.12.2008

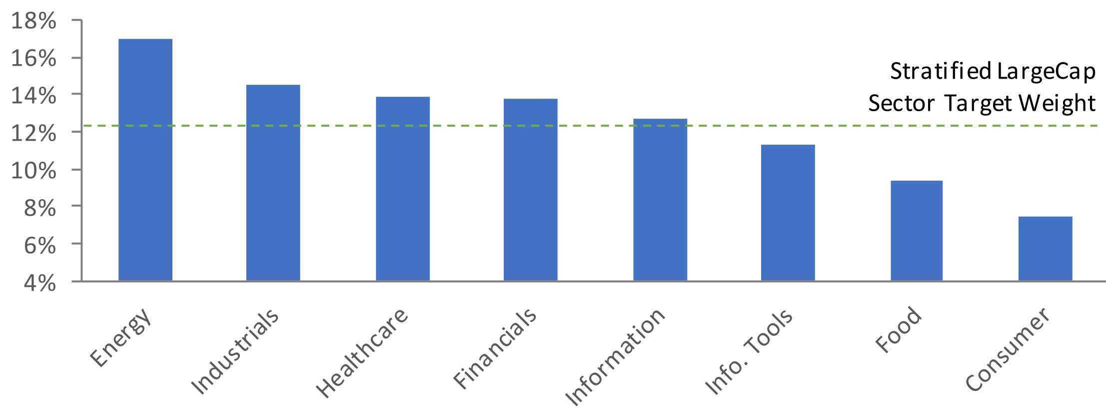
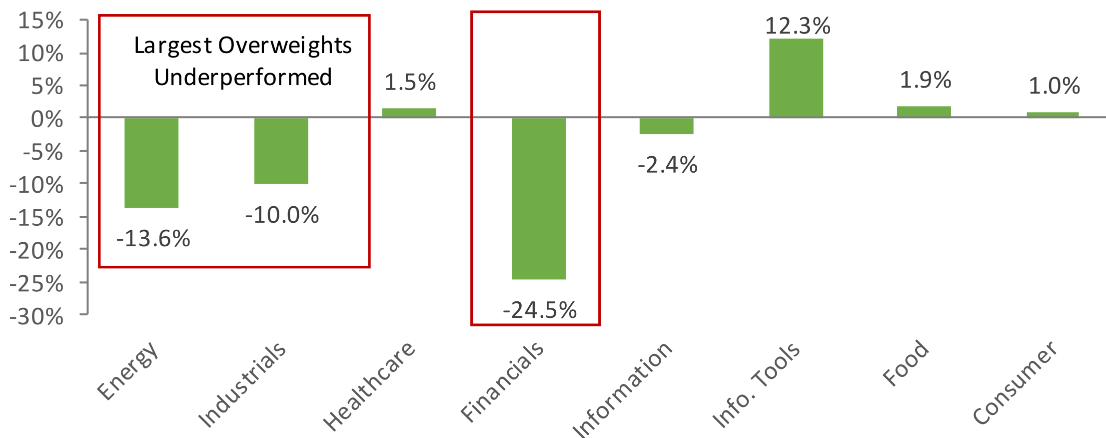



Exhibit 7b: Full Cycle S&P 500 Sector Performance 9.12.2008 – 3.10.2010.




Source: S&P Dow Jones Indices, Syntax. * Using Functional Information System (FIS) sector definitions.

sector imbalance stands in contrast to the Stratified LargeCap, which allocates equally to each sector at rebalance.

In contrast, the S&P 500 Consumer and IT sectors, which had the smallest sector weights in the S&P 500 in September 2008, outperformed through the turmoil (see Exhibit 7b).

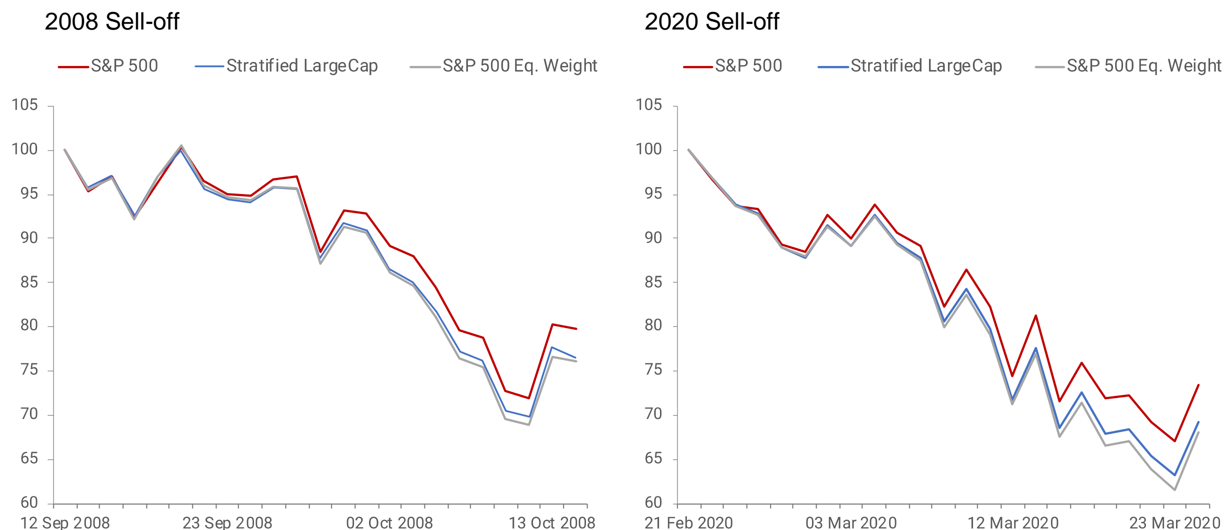
The large-scale shock seen in the financial crisis impacted the sectors in one of two ways. Sectors that were not directly exposed to the underlying related business risk sold off and then recovered all of their losses within a year. The sell-off was likely due to widespread panic and they were the collateral damage. The more directly related sectors, such as Financials and Industrials experienced tail returns and took much longer to recover their losses.

We believe that many core investment products that claim to provide full exposure to all the investment opportunities within a market or economy in fact contain concentrated business risks. They are therefore exposing investors to more tail risk, and potential performance drag, than that of more diversified products.

## Comparison of the current sell-off with the 2008 crisis

Notably, drawdowns this year have been steeper than in 2008. From the first serious market reaction to the Coronavirus on February 24th, 2020, it took 14 trading days for the S&P 500 to fall 25%, while in 2008, it took 19 trading days

Exhibit 8: Comparison between 2008 and 2020 market sell offs

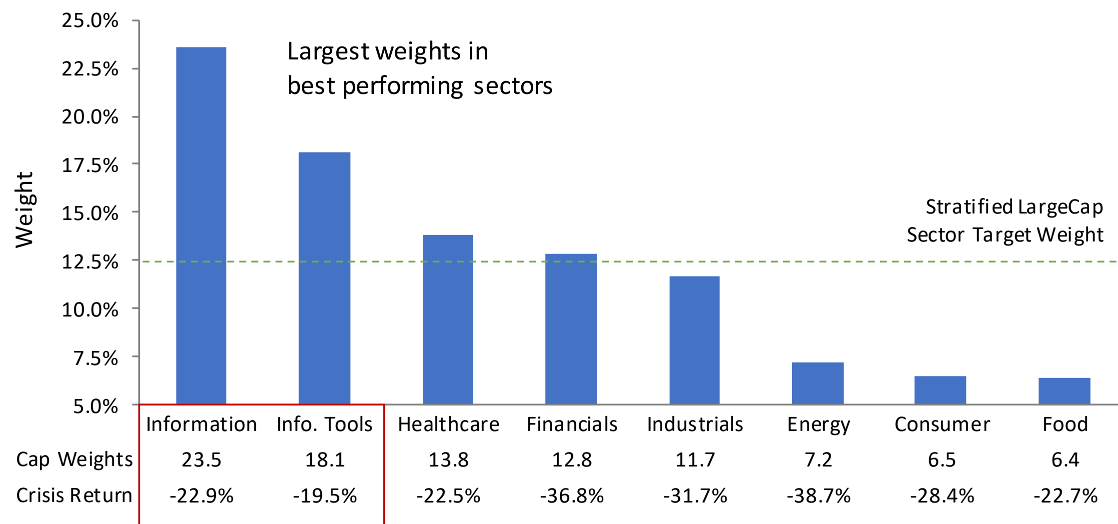



Cumulative total return, 9.12.2008 – 10.13.2009 and 2.21.2020 – 3.24.2020. Performance does not reflect fees or implementation costs as an investor cannot directly invest in an index. Please see important disclaimers regarding backtested data prior to inception. Source: S&P Dow Jones Indices, Syntax.

to realize the same level of drawdown. The relative performance of the Stratified LargeCap and the S&P 500 is similar in 2020 to that seen in 2008 (Exhibit 8).

As with 2008, the root cause of the performance difference between Stratified Weight and cap weight is driven by sector and industry weighting choices. Just as the S&P 500's heavy Energy allocation helped reduce drawdowns in 2008, the heavy allocation to Technology stocks is supporting the market today. On February 21st, 2020, the S&P 500's combined weight in the Info. Tools and Information Sectors was 41.6%.

Exhibit 9: S&P 500 has significant exposure to tech, which could underperform in a reversal




| | Information | Info. Tools | Healthcare | Financials | Industrials | Energy | Consumer | Food |
|---|---|---|---|---|---|---|---|---|
| Cap Weights | 23.5 | 18.1 | 13.8 | 12.8 | 11.7 | 7.2 | 6.5 | 6.4 |
| Crisis Return | -22.9% | -19.5% | -22.5% | -36.8% | -31.7% | -38.7% | -28.4% | -22.7% |

Using Functional Information System (FIS) sector definitions. Source: Syntax

Using Syntax's Related Business Risk tool to analyze the market, we find that the best performing business risk groupings have been those associated with food, healthcare and technology. The worst have been those associated with energy, leisure, retail and banking (see Appendix for a full list).

## Conclusion

The current global health, economic, and market situation is unprecedented. While predictions are foolish in this environment, we believe certain things remain true.

First, cap-weighted strategies systematically reduce weight to those assets that have underperformed their peers during a sell off. This is in contrast to the Syntax Stratified LargeCap index (a reweighted version of the S&P 500) which captures a rebalancing premium by bringing its relative weights back to neutral during a recovery period. This premium was highlighted by the relative performance after the market trough in 2009. Cap-weighted strategies have an increased risk of drag, since before the current crisis, many were already overweight of the technology sectors, which have outperformed during the sell-off. If the market recovery follows the 2008/9 roadmap, the best performing sectors in the sell-off will underperform in the recovery.

Second, over time, proper diversification mitigates Related Business Risk. Market shocks almost always expose investors' active positions and leave investors wondering why they were overweight or underweight a particular sector. When an over-weighted sector is afflicted more than others, or an under-weighted sector rises more than others during a recovery, investors may regret their relative choices. When investors over-weight a sector (or their ostensibly passive investment does that for them), and that position subsequently experiences a tail risk event, that is when, as we say at Syntax: Diversification Matters.

## Appendix: Crisis performance by Business Group

As of 3/23/2020

| 2008 Financial Crisis | Sell-off | Recovery |
|---|---|---|
| Auto Products | -75.8 | 275.1 |
| Consumer Insurance | -74.0 | 381.1 |
| Capital Markets | -71.2 | 225.3 |
| Non-Mortgage Banking | -70.8 | 161.0 |
| Branded Apparel | -68.3 | 182.7 |
| Rental | -67.8 | 130.4 |
| Operators and Developers | -63.2 | 200.2 |
| Home Office Equipment | -62.0 | 199.8 |
| Commercial Insurance | -59.0 | 152.0 |
| Production Equipment | -58.8 | 135.6 |
| End User Hardware | -57.9 | 140.5 |
| Investment Services | -57.7 | 127.9 |
| Other Natural Resources | -55.7 | 136.9 |
| Aerospace and Defense | -55.6 | 140.9 |
| Semiconductor Services | -55.6 | 181.6 |
| Healthcare Insurance | -55.3 | 118.5 |
| Metals | -54.4 | 171.8 |
| Content Providers | -54.3 | 154.6 |
| Midstream and Gas | -53.0 | 101.3 |
| Upstream Energy | -52.3 | 99.3 |
| Apparel Retailers | -52.3 | 141.5 |
| Industrial Conglomerates | -50.3 | 89.0 |
| Distribution Services | -48.9 | 92.7 |
| Electrical Components | -48.1 | 96.7 |
| Electric Competitive | -47.5 | 63.3 |
| Medical Devices | -47.4 | 58.1 |
| Transaction Services | -47.0 | 103.8 |
| Commercial Hardware | -46.5 | 112.1 |
| Home Office | -45.8 | 208.4 |
| Mechanical Components | -44.4 | 135.2 |
| Medical Research Services | -43.1 | 101.8 |
| Management and IT Services | -41.4 | 98.9 |
| Hospital Equipment | -40.2 | 73.4 |
| Chemicals | -40.0 | 73.5 |
| Internet Services and Websites | -40.0 | 114.2 |
| Healthcare Providers | -39.5 | 150.6 |
| Semis | -38.3 | 137.0 |
| Specialty Services | -37.7 | 44.5 |
| Business Software | -37.2 | 87.9 |
| Telecom Networks | -37.0 | 53.1 |
| Healthcare Products | -35.9 | 80.5 |
| Food Distributors | -35.4 | 58.9 |
| Electric Regulated | -33.2 | 47.8 |
| Downstream | -32.9 | 17.0 |
| Analog Circuits | -32.7 | 52.0 |
| Processed Foods | -32.4 | 68.4 |
| Restaurants | -29.5 | 88.0 |
| Alcohol and Tobacco | -28.1 | 58.6 |

| 2020 COVID-19 Pandemic | Sell-off |
|---|---|
| Upstream Energy | -59.7 |
| Leisure Operators | -58.6 |
| Downstream Energy | -56.6 |
| Non Real Estate Banking | -56.4 |
| Apparel Retailers | -54.0 |
| Branded Apparel | -52.5 |
| Consumer Insurance | -47.6 |
| Healthcare Providers | -47.1 |
| Capital Markets | -45.4 |
| Restaurants | -45.1 |
| Semis | -43.8 |
| Analog Circuits | -43.8 |
| Chemicals | -43.2 |
| Commercial Insurance | -43.1 |
| Auto Products | -43.0 |
| Transportation Services | -43.0 |
| Midstream and Gas | -42.7 |
| Home Office | -41.8 |
| Electrical Components | -41.6 |
| Mechanical Components | -40.9 |
| Medical Devices | -40.0 |
| Aerospace and Defense | -39.6 |
| Investment Services | -39.3 |
| Home Office Equipment | -38.9 |
| Management and IT Services | -37.6 |
| End User Hardware | -37.4 |
| Distribution Services | -37.2 |
| Electric Competitive | -37.0 |
| Industrial Conglomerates | -36.8 |
| Other Natural Resources | -36.4 |
| Production Equipment | -35.4 |
| Electric Regulated | -35.0 |
| Semiconductor Services | -34.9 |
| Commercial Hardware | -34.4 |
| Transaction Services | -34.3 |
| Content Providers | -34.2 |
| Internet Services and Websites | -33.4 |
| Medical Research Services | -33.3 |
| Rental | -33.0 |
| Alcohol and Tobacco | -33.0 |
| Business Software | -31.8 |
| Food Distributors | -31.7 |
| Telecom Networks | -31.6 |
| Hospital Equipment | -29.2 |
| Specialty Services | -28.3 |
| Healthcare Products | -27.0 |
| Healthcare Insurance | -25.7 |
| Processed Foods | -20.1 |

Total return of the average S&P 500 company in each Industry during the 2008 sell-off (9.12.2008 – 3.9.2009) and recovery (3.10.2009 – 3.10.2010) and during the 2020 sell-off (2.21.2020 – 3.23.2020). Industry groups defined using Syntax's Functional Information System. Performance does not reflect fees or implementation costs as an investor cannot directly invest in an index. Please see important disclaimers regarding backtested data prior to inception. Source: S&P Dow Jones Indices, Syntax.

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