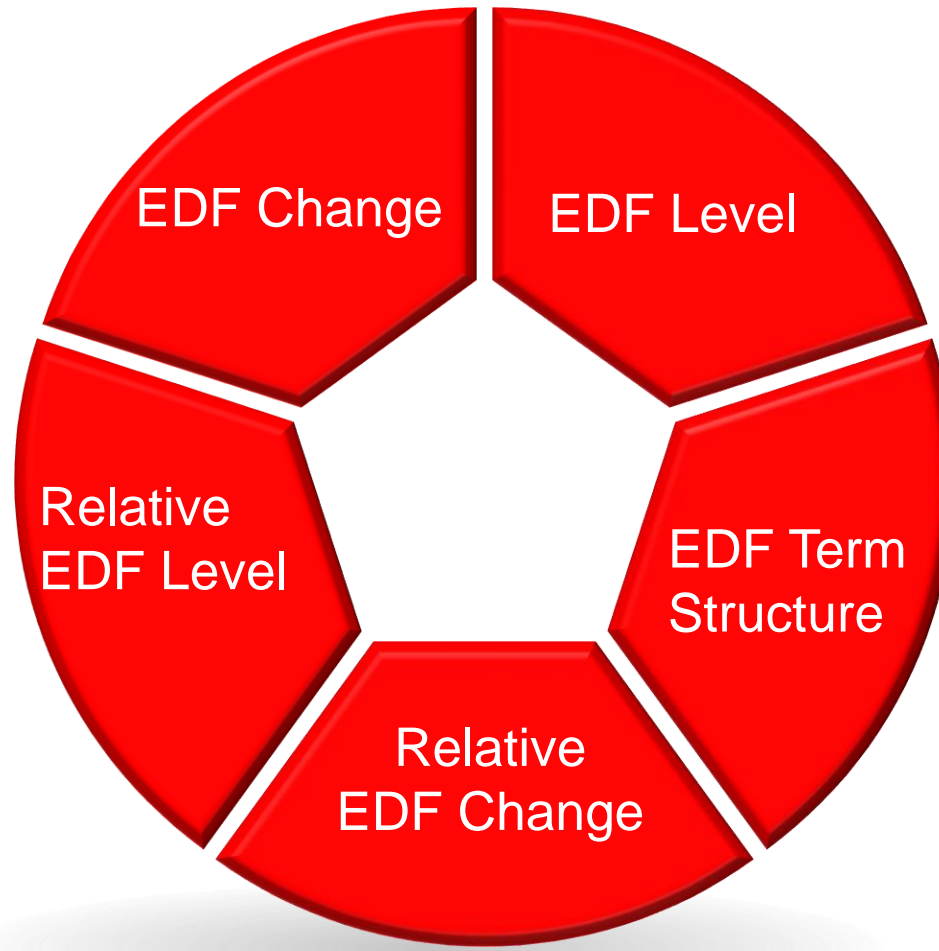
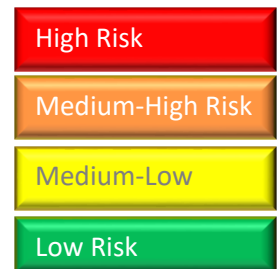


The Early Warning Toolkit in Practice: Carillion PLC

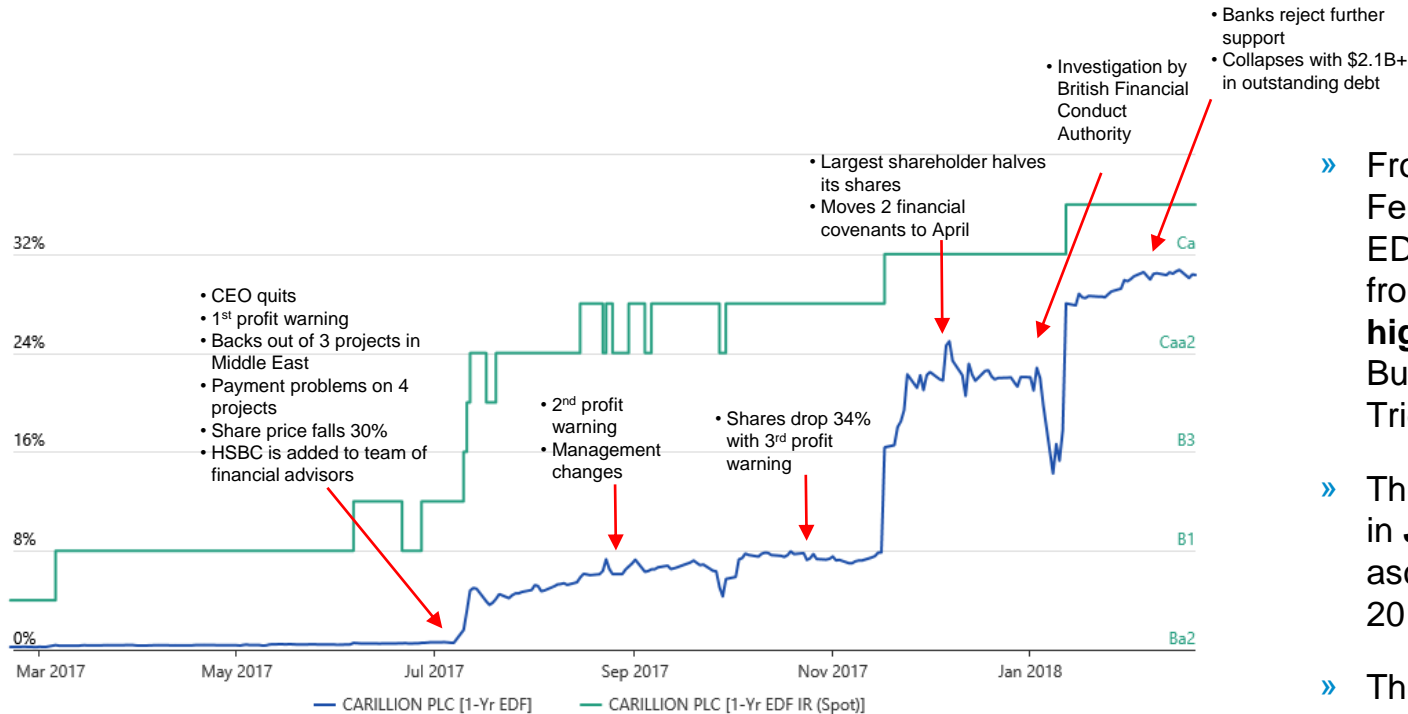
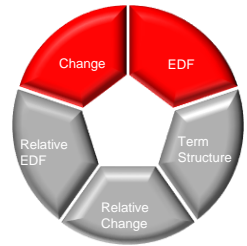
Carillion demonstrated High Risk for all 5 Early Warning factors



Based in the UK, **Carillion** was a multinational construction company and facilities management provider. It had 43,000 employees globally and held roughly 450 governmental contracts across the UK ministries of education, justice, defense and transportation. In 2016, it had \$7.3B in sales and a market capitalization of nearly \$1.4B. In January 2018, the firm collapsed with more than \$2.1B in outstanding debt, leaving UK taxpayers, subcontractors and suppliers to bear the burden.

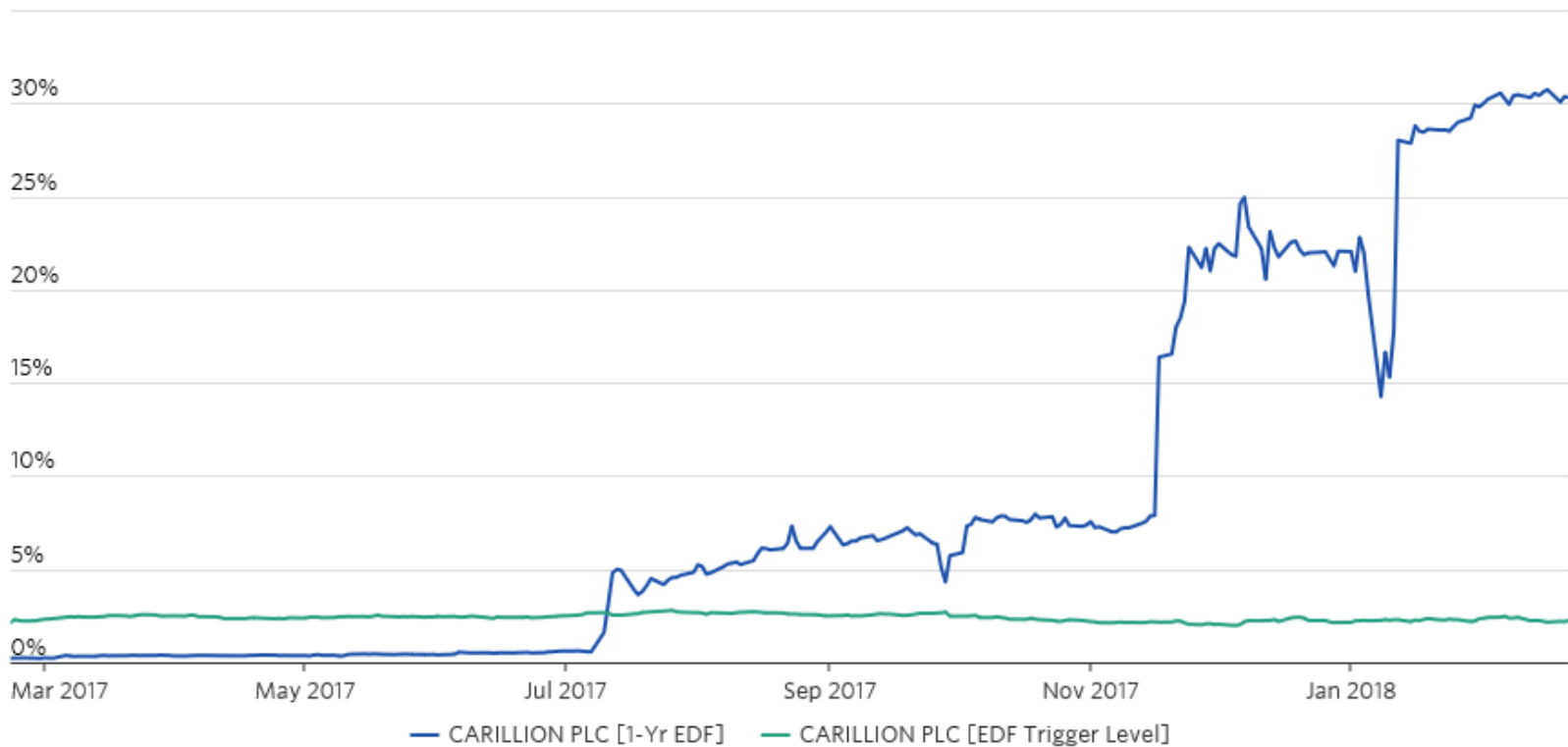
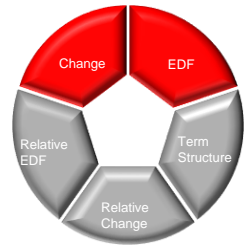


Carillion's EDF first signaled heightened credit risk in July 2017



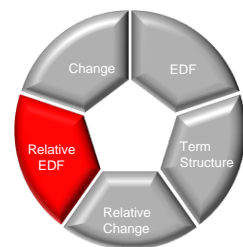
- » From February 2017 to February 2018, Carillion's EDF measure worsened from 0.22% to 30.31% (**10x higher** than the Global Business Services Group Trigger Level of 3.05%)
- » The EDF first rose sharply in **July 2017** and began its ascent again in November 2017.
- » The rating implied by its EDF measure also deteriorated steadily from Ba3 to C, when it ultimately defaulted.

The EDF remained above its industry EDF trigger level* since July 2017

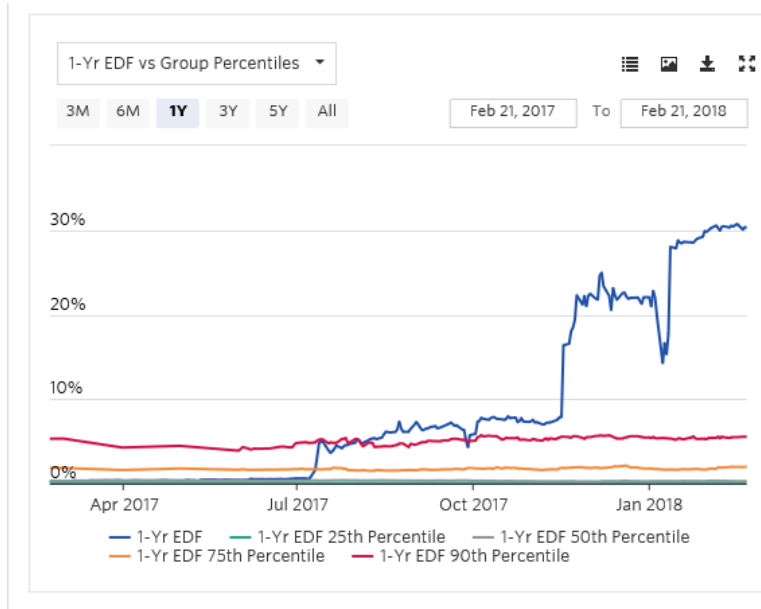


**Level above which firms have historically been at highest risk of default*

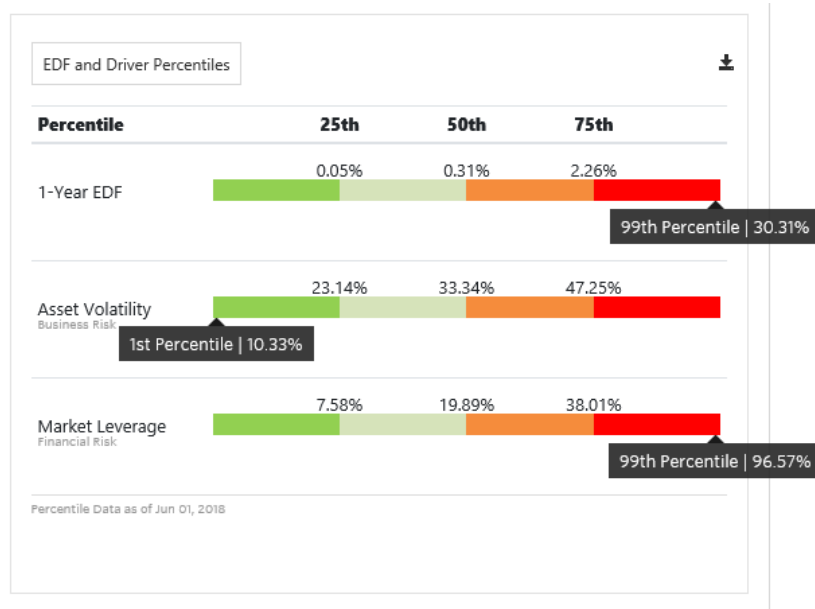
Carillion's EDF measure was amongst the riskiest names in its industry peer group over the last year



EDF Level vs Peers

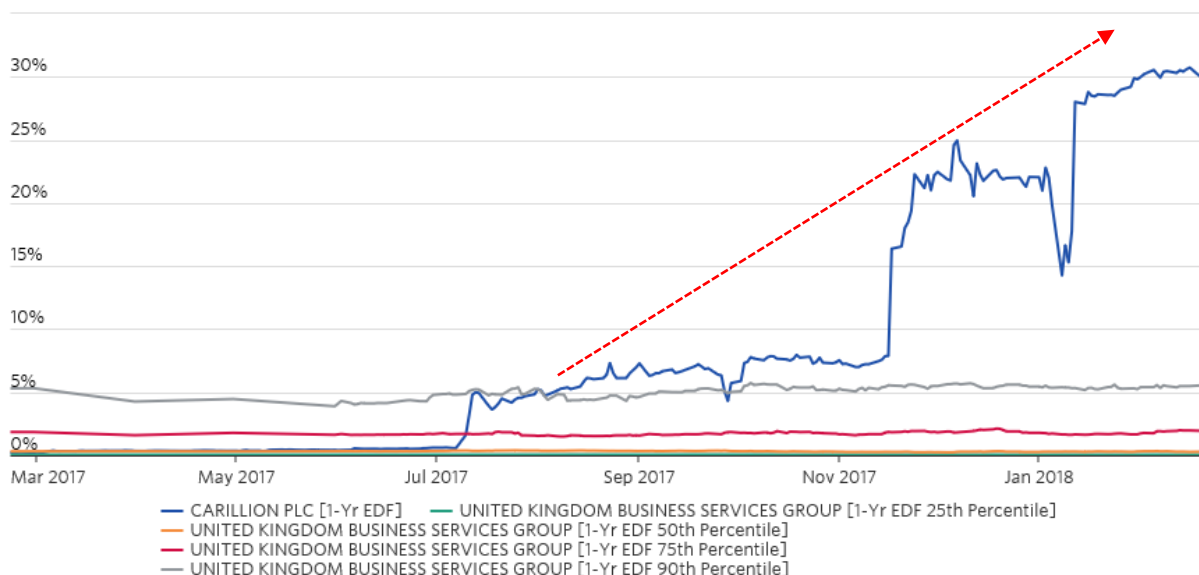
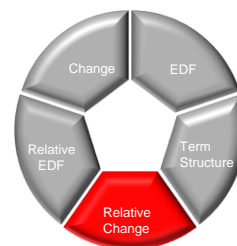


EDF Level vs Driver Percentiles



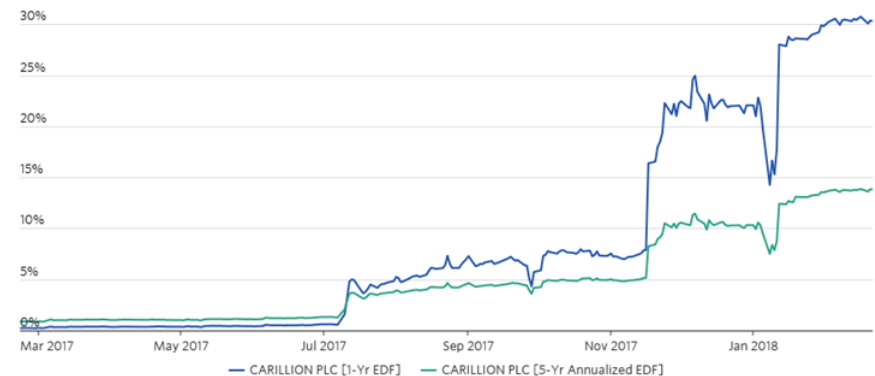
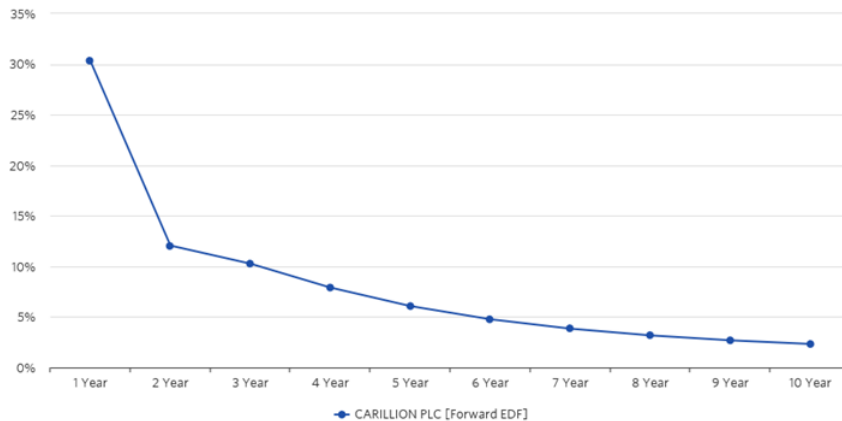
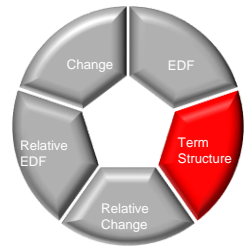
- » Moody's Analytics research shows that a company is 10x more likely to default if its EDF is greater than the median of its peer industry group.
- » Carillion's EDF was trending above the 90th percentile of its peer group since August 2017, where it remained until January 2018 when it defaulted.
- » Asset volatility was in line with the 1st percentile, while market leverage was in the riskiest 99th percentile compared to its peer group.

Carillion's EDF measure was trending substantially higher than the 90th percentile



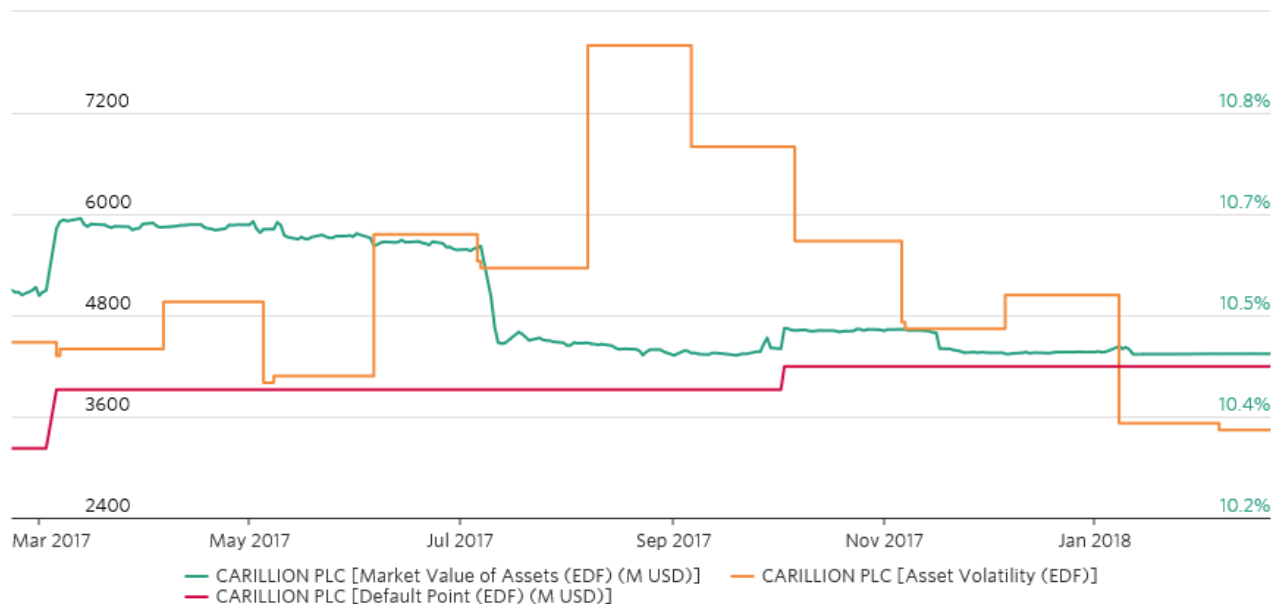
- » Carillion's EDF was trending above the 50th percentile as of May 2017, and crossed the 75th percentile by July 2017.
- » As of August 2017, the EDF slightly crossed the 90th percentile, and began its rapid ascent in November 2017.
- » The EDF improved slightly in December 2018 – potentially due to speculation of bank support – and spiked again in January 2018 when the firm ultimately defaulted.

Carillion's term structure demonstrated a downward sloping shape



- » A company's term structure tends to be upward-sloping during an economic expansion, unless it is in distress. Our research shows that firm's that experience inverted term structures (1yr EDF > 5yr EDF) are 13x more likely to default than firms that experience a normal upwards sloping term structure.
- » Carillion's 1yr EDF surpassed its 5yr EDF in July 2017, where it remained for the six months prior to its default.

Carillion's high default risk was reflected by its debt levels outpacing its cash flow...



- » Over the last year, B&W's market leverage worsened by 53%.
- » The main reason for this was added short term and long term liabilities to its books, coupled with a market value of assets lessened by 15%.
- » Over the last year, Carillion lost money on large contracts and accumulated substantial amounts of debt to offset its losses – due primarily to taking on too many high risk projects.

...while its slight improvement in business risk was not enough to improve the EDF



- » A company's business risk can be measured by the volatility of its assets. Higher volatility reflects greater uncertainty about a firm's future cash flows.
- » Over the last year, Carillion's asset volatility improved by nearly 2%, and was trending downward since its high point in September 2017.

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