

EDF™ CASE STUDY

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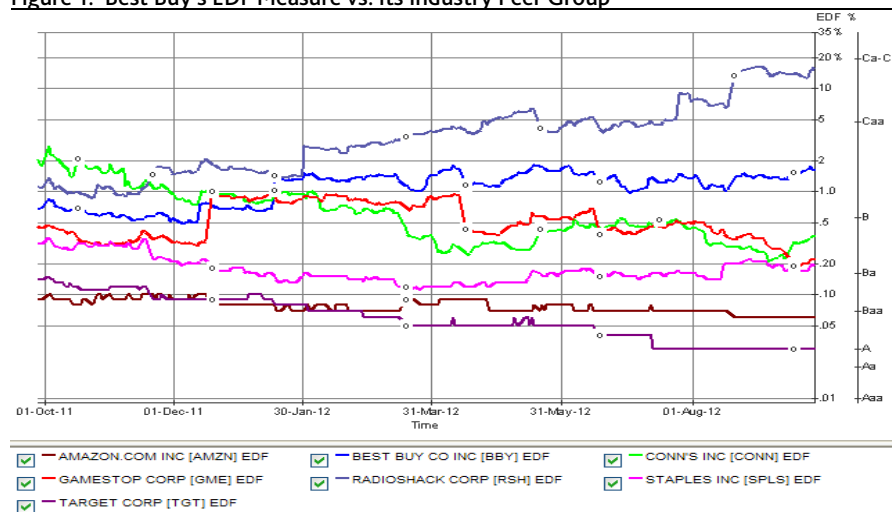
Best Buy Co., Inc.

Rise of E-Commerce Takes Toll on Retailer's Credit Risk as Store Sales Falter

Summary

- Best Buy Corporation Inc. is a specialty retailer of consumer electronics globally. Through much of its history, Best Buy was considered one of the most successful retail stores in the US. However, in the past two years Best Buy's sales have declined significantly. One of the key reasons for Best Buy's flagging performance is the ascent of internet retailers and the general decline of brick-and-mortar store sales.
- In February 2011, the company reported quarterly earnings of USD 651 million, which was 20% lower than the USD 779 million during the same time in 2010. Since that time, Best Buy's one-year probability of default has increased by 93%, from 0.9% on February 28, 2011 to 1.74% as of October 1, 2012. The negative momentum in Best Buy's EDF™ measure and its underperformance relative to its peers, indicates that Best Buy is a relatively risky firm among its industry competitors.
- The increase in Best Buy's EDF metric is attributable to a deterioration in its two primary drivers, market leverage (financial risk) and asset volatility (business risk). A 25% rise in the firm's asset volatility during the financial crisis contributed to a significant increase in its EDF measure. More recently, Best Buy's high and rising market leverage has been the principal driver of the recent rise in its risk of default. The company's 62% market leverage puts it in the 90th percentile of its industry sector, making it one of the riskiest firms in its sector on that metric.

Figure 1: Best Buy's EDF Measure vs. its Industry Peer Group



Fierce Industry Competition Leads to High and Rising Risk of Credit Event

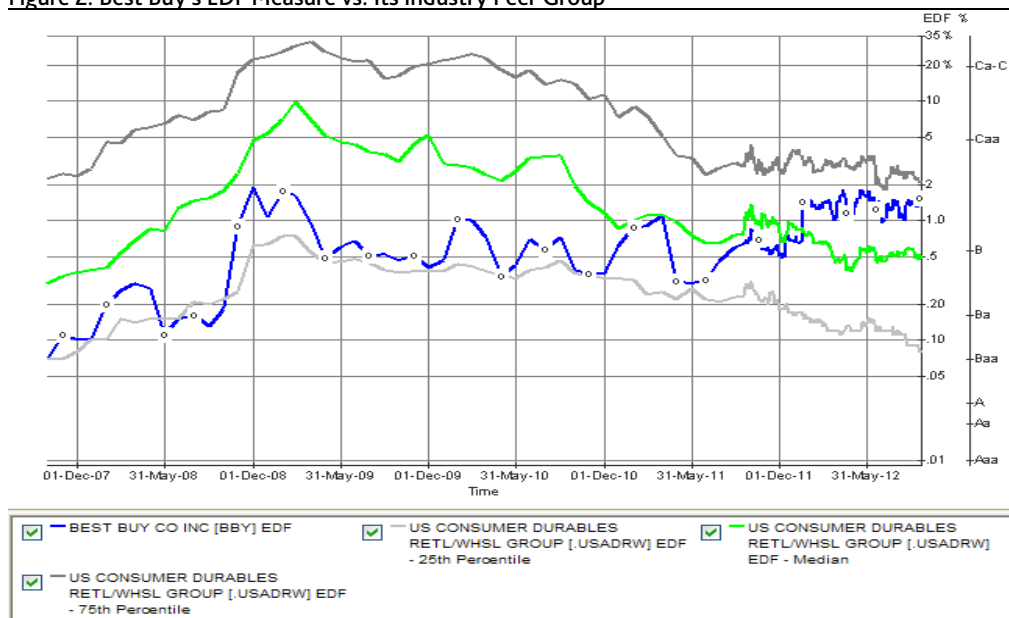
Best Buy's Expected Default Frequency (EDF) measure has been rising steadily over the past year and is currently back to the level of risk at which it was shortly after the onset of the 2008 financial crisis and recession. The firm's one-year probability of default increased from 0.9% on February 28, 2011 to 1.74% as of October 1, 2012. As Figure 1 on the cover of this report shows, Best Buy's one-year EDF measure has increased by 93% since it announced a 20 percent year-over-year decline in earnings in February 2011. In the past month alone, Best Buy's EDF metric jumped by nearly 23%. An EDF level of 1.74% is roughly equivalent to a B3 rating on Moody's rating scale.

Also shown in Figure 1 are some of Best Buy's industry competitors, such as Amazon.com, RadioShack Corp., Staples Inc., and GameStop Corp. Best Buy's EDF measure suggests that it is currently one of the riskiest firms in this group after RadioShack. On March 29, 2012, Best Buy reported weaker-than-expected results for the prior holiday quarter and announced that it would close fifty large US stores and lay off 400 employees. The end of the fiscal second quarter of 2012 brought more negative results. Net income fell to USD 12 million from USD 150 million a year earlier. The company also reported that sales dropped by 3.2% in the second quarter, the eighth decline in the last nine quarters.

One of the key reasons for Best Buy's flagging performance is the ascent of internet retailers and the general decline of brick-and-mortar store sales. For many years, Best Buy benefited from its sales of music CDs and DVDs, cellular phones, video games, and other consumer electronics. With the widespread shift toward digital music downloadable from the internet (such as Apple's iTunes Store) and cut-rate e-tailers (such as Amazon.com), the popularity of Best Buy has diminished. Although customers often use Best Buy to view various products, a practice known as "showrooming", they tend to not make their purchases at Best Buy stores, instead placing their actual sales at online retailers that offer cut-rate prices.

Best Buy has underperformed peers in its industry sector since the beginning of 2012. Figure 2 shows the one-year EDF metric for Best Buy over the last five years, as well as the median, 25th, and 75th percentiles of the EDF measure for Best Buy's industry peer group, the US consumer durables retail/wholesale sector. It is notable that although the level of Best Buy's current EDF measure is similar to that during the 2008 financial crisis, on a relative basis it is *more* risky than it was in 2008. In 2008, Best Buy's 2% EDF measure was lower than the median for its industry sector. Between 2009 and 2010, Best Buy followed the improvement of its industry sector and tracked near the 25th percentile. Best Buy began to underperform its sector in 2010, and since the summer of 2011, its EDF measure has deteriorated while its sector median continued to improve. The deterioration in its EDF measure now places it closer to the 75th percentile of its industry sector.

Figure 2: Best Buy's EDF Measure vs. Its Industry Peer Group



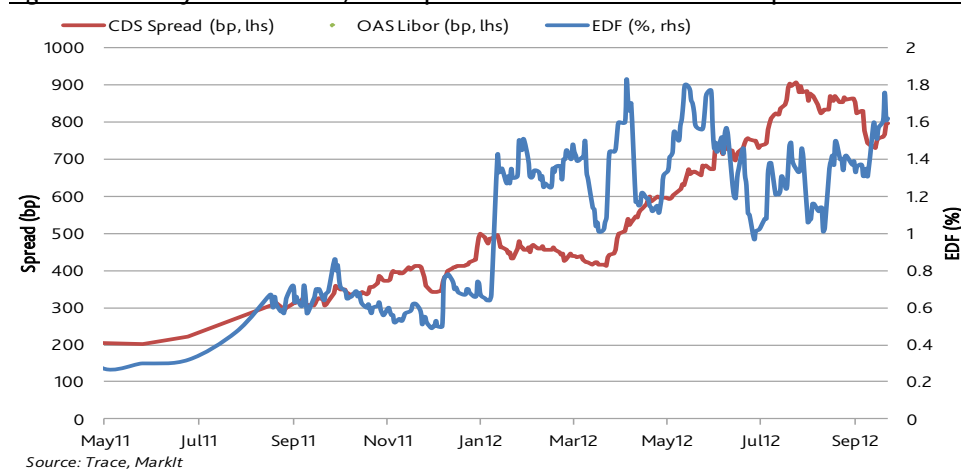
The 93% increase in Best Buy's EDF measure over the past year was in sharp contrast to the changes in the median EDF level for its peer industry group, whose EDF metric declined by 55% over the same period. Moody's Analytics' research has shown that firms that underperform their industry sectors, regardless of the level of their EDF measure, tend to experience higher default rates. Based on data from 1992 to 2011, we calculated one-year default rates conditioned on a firm's EDF level and on the relative EDF change versus its sector. Relative performance is measured by the difference in the change in a firm's EDF measure and the change in its industry median EDF measure. Figure 3 shows the results. For ease of presentation, we bucketed EDF levels and change versus sector into ten equally sized categories (deciles). Firms whose EDF measures underperform their industry sectors (categories 6 through 10) experience higher default rates, regardless of EDF level. In Figure 3, this is shown by the fact that default rates increase from right to left. Taken with the data from Figure 2, the table suggests that the trend of Best Buy's EDF metric versus its industry group shows relatively heightened risk of default in both absolute and relative terms.

Figure 3: Average Realized Default Rates by EDF Level and Relative Performance vs. Industry Sector

Firm EDF Level	EDF Change Relative to Industry Peer Group Change										ALL
	1	2	3	4	5	6	7	8	9	10	
1	0.05%	0.03%	0.02%	0.00%	0.00%	0.01%	0.03%	0.00%	0.00%	0.00%	0.02%
2	0.10%	0.05%	0.06%	0.06%	0.00%	0.00%	0.02%	0.07%	0.11%	0.27%	0.05%
3	0.10%	0.06%	0.01%	0.03%	0.01%	0.03%	0.07%	0.06%	0.03%	0.18%	0.05%
4	0.28%	0.12%	0.17%	0.15%	0.09%	0.10%	0.08%	0.09%	0.17%	0.30%	0.15%
5	0.32%	0.23%	0.24%	0.32%	0.22%	0.24%	0.21%	0.27%	0.22%	0.46%	0.27%
6	0.62%	0.44%	0.45%	0.34%	0.44%	0.56%	0.44%	0.72%	0.51%	0.97%	0.55%
7	0.71%	0.56%	0.66%	0.80%	0.64%	0.72%	0.73%	1.06%	1.18%	1.63%	0.89%
8	1.01%	1.01%	1.19%	1.25%	1.27%	1.44%	1.58%	1.65%	2.05%	3.10%	1.68%
9	3.14%	2.22%	4.83%	5.16%	5.25%	4.34%	4.87%	5.75%	6.37%	8.39%	5.60%
10	6.43%	4.68%	5.76%	7.70%	7.70%	6.96%	7.67%	9.31%	9.99%	13.70%	8.94%
All	0.66%	0.63%	1.08%	1.73%	1.73%	1.83%	2.24%	2.92%	3.13%	5.96%	2.16%

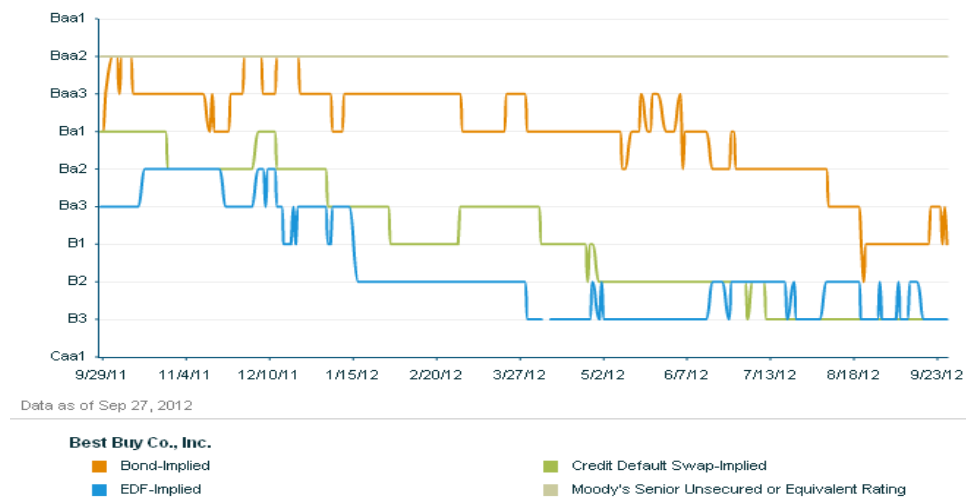
Market signals from the bond and CDS markets agree with the view that the company is experiencing high and rising credit risk, as shown in Figure 4. Bond and CDS spreads are often used as proxies for early warning of a credit event. Although imprecise measures of default risk, spreads often provide useful directional indications of changes in credit risk. Best Buy's 5-year CDS spread and the option-adjusted spread on its 3.75% bond maturing 2016 have increased by about 50% since the start of the year. In the past month, Best Buy's EDF measure continued to increase, even as the company's bond spread narrowed by 13% to its current level of 471bp. Likewise, Best Buy's CDS spread decreased by 7% during the same period to its current level of 792bp. Given the business challenges and rising financial risks facing Best Buy, which are reflected in its EDF measure, the rally in its spreads may be short lived. As market clearing prices, spreads reflect many other risks besides default risk, some of which reflect investor risk aversion and are sensitive to short run news. Regardless of the recent improvement, both bond and CDS spreads remain at relatively elevated levels. Taken together with the rising EDF measure, they suggest that financial markets agree that credit risk for Best Buy has risen substantially.

Figure 4: Best Buy's EDF Measure, Bond Spread Over Libor and 5-Year CDS Spread



EDF credit measures, as well as credit spreads, are granular measures of the level of a firm's default risk. However, for some purposes, investors prefer to analyze credit risk in the language of agency credit ratings. Figure 5 shows EDF measure and credit spreads converted to their Moody's ratings equivalents, as well as the senior unsecured ratings from Moody's Investors Service for comparison. By viewing default probabilities and spreads in terms of implied ratings, we transform them from statements about the *level* of risk to comparisons of *relative* default risk.¹ In rating terms Best Buy's EDF-implied rating has declined by four to five notches over the past year to its current implied rating of B3. Its CDS-implied rating has fallen by a similar amount from Ba1 to B3. Best Buy's bond-implied rating declined from a level around Baa3 to its current Ba2/Ba3 level. All of Best Buy's market-implied credit risk measures are about five to seven notches lower than Moody's Investors Service's Baa2 rating.² Moody's Investors Service's rating outlook for Best Buy is categorized as "developing".

Figure 5: Best Buy's EDF- implied rating, Bond-Implied Rating, CDS-Implied Rating, and Moody's Rating



Analyzing the Drivers of Best Buy's EDF Measure

In this section we will look into the drivers of Best Buy's EDF measure in more detail. Moody's Analytics' public firm EDF model belongs to a class of credit risk models referred to as structural or asset value models.³ The basic assumption of asset value models is that there is a causal, economically motivated reason that default occurs. Default is highly likely to occur when the market value of the firm is insufficient to cover its liabilities due at some future date – i.e. firms tend to default when they are insolvent. This follows from the fact that equity holders are residual claimants on the value of the firm. If the market value of the firm is negative, equity holders can and often will "put" the residual value of the firm to creditors.

The above economic intuition can be translated into three quantifiable variables: the expected value of a firm's assets (A), the volatility of its assets (denoted by σ), and its default point, X . The default point represents the amount of a firm's liabilities due in the future that would trigger a default if not paid on time. The interaction of the three variables is encapsulated by the firm's distance-to-default (DD) which, under some largely innocuous assumptions, can be expressed as:

$$DD \approx (\ln(A) - \ln(X)) / \sigma$$

This simple equation essentially states that a firm's relative credit risk (measured by DD) is a function of its financial risk and its business risk, two factors that are core concepts of fundamental credit analysis. The numerator of the above equation measures a firm's financial leverage (X/A) based on market values – i.e. the firm's financial risk. All else equal, higher leverage decreases DD and hence increases the probability of default. The denominator of the DD equation represents the firm's business risk. Firms in industries with

¹ The methodology of the market-implied ratings is described in the document "Moody's Market-Implied Ratings: Description, Methodology, and Analytical Applications," available on www.moodyanalytics.com Footnote about MIR methodology.

² Moody's Investors Service's full credit opinion and rating rationale on Best Buy can be read on Moodys.com.

³ The methodology of the public firm EDF model is described in the document "Public Firm Expected Default Frequency (EDF) Credit Measures Methodology, Performance, and Model Extensions," available on www.moodyanalytics.com.

high asset volatility tend to exhibit higher risk of default, all else equal. Once we have calculated a firm's *DD*, we can derive its probability of default (its EDF measure) by looking at the historical average default rate consistent with each *DD* level.

The analysis of the contribution of financial risk and business risk to changes in Best Buy's EDF measure over the past five years shows that the primary reason for the rise of Best Buy's EDF metric is high and rising market leverage (i.e. financial risk). Figure 6 shows the time series of its market value of assets, its default point, and its market leverage.⁴ The graph shows that Best Buy's market leverage has increased sharply since the end of 2011. Over the past year, Best Buy's market leverage has increased by 18%, from 51% to 62% as of 1 October. The primary driver of the increase in Best Buy's financial risk has been a marked decline in the market value of assets. After Best Buy's year-over-year decline in FY2011 revenues, from USD 1.32 billion to USD 1.28 billion, along with a 1.8% reduction in its comparable-store sales, the company's market value of assets dropped from USD 27.8 billion in February 2011 to USD 17.4 billion today – a 38% decline. Its default point has remained stable (as well as exhibiting apparent seasonality/cyclicality) at around USD 11 billion. Interpreting these results from a fundamental credit analyst's perspective, Best Buy's ability to generate cash flow to cover its liabilities (which remain steady) is has been deteriorating for at least the past year, raising its probability of default.

Figure 6: Best Buy's Market Leverage and Market Value of Assets

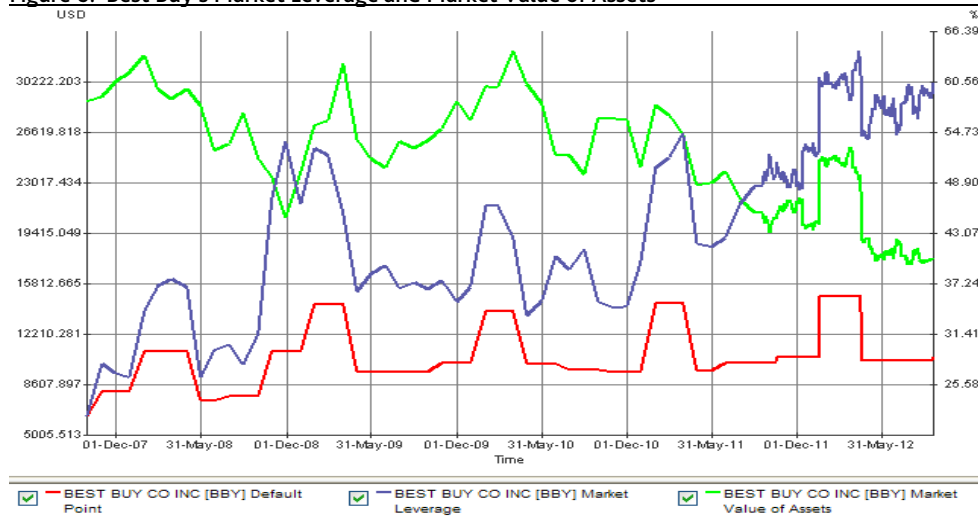
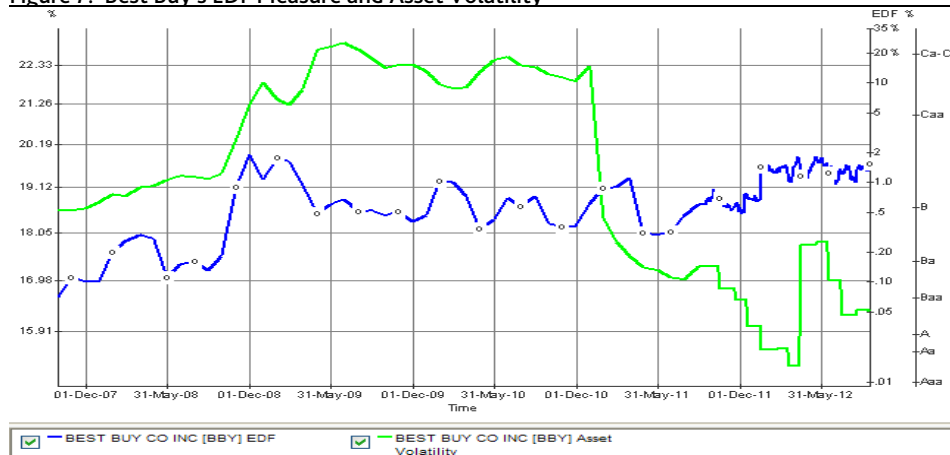


Figure 7: Best Buy's EDF Measure and Asset Volatility



Best Buy's business risk, as measured by its asset volatility, also helps explain the changes in its EDF measure over time. Figure 7 shows the time series for the firm's EDF metric and its asset volatility over the past five years. The rise in the asset volatility of the firm at the end of 2008 was the primary reason for the increase in

⁴ Calculated as a percentage of asset value.

the EDF metric at the time. Although its market leverage also jumped in 2008, it came back down, while its asset volatility did not. This contrasts with the recent increase in Best Buy's EDF, which, as we discussed above is largely due to a sharp run-up in its market leverage. Indeed, Best Buy's asset volatility declined from 22% in September 2010 to 16% as of 1 October, 2012. Since the end of 2010, the company has taken steps to increase profitability by cutting costs, closing some of its stores, and laying off employees. Although its asset volatility has fallen since 2010, the decrease in Best Buy's asset volatility has not been sufficient to suppress the rise in the company's EDF metric, due to the company's rising level of market leverage.

Summary

Through much of its history Best Buy was considered one of the most successful retail stores in the US. However, since 2010 the electronics retailer has faced business and financial challenges that are placing increasing pressure on its credit quality. With the widespread use of digital media directly downloadable from the internet (e.g. iTunes) and online retailers offering the same products at reduced prices (e.g. Amazon.com) the popularity of Best Buy has diminished. Customers increasingly use Best Buy to view various products, a practice known as "showrooming", while placing their actual sales online at retailers.

Best Buy's one-year EDF measure has increased by 93% since it announced a 20% year-over-year decline in earnings in February 2011, from 0.9% to its current level of 1.74%. Furthermore, the increase in Best Buy's EDF measure over the past year was in sharp contrast to the changes in the median EDF level for its peer industry group, whose EDF metric declined by 55% over the same period. The recent increase in Best Buy's EDF measure has been driven primarily by an increase in its market leverage (financial risk). The firm's market leverage rose by 18%, while the market value of Best Buy's assets dropped by 38%. Although Best Buy's asset volatility has fallen since 2010, the decrease in its asset volatility has not been sufficient to bring down the company's EDF metric. The assessment of financial market signals suggest that given Best Buy's weakened competitive position it remains vulnerable.

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