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COVID-19 Impact on North America Large Firm Credit Risk

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Abstract

COVID-19 has become, and will likely continue to be, a major driver of credit risk. In this paper, we continue to monitor the impact of the coronavirus and the concurrent shock in oil prices on large firms in North America to identify which sectors have the greatest credit deterioration.

Using Moody's Analytics probability of default models, we see credit deterioration across firms of all sizes and industries from their through-the-cycle levels. Agriculture and Consumer Products sectors see the largest increase in default risk from through-the-cycle levels. Average size-weighted expected losses across industries more than double from pre-COVID-19 levels.

The as-of date for this analysis is April 7, 2020. In addition, this study considers only the aggregate impact of government aid as it is reflected in the equity market movements. This study does not consider the idiosyncratic effect of government assistance on individual companies. Moody's Analytics may make more updates as the situation develops.

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Executive summary

The purpose of this exercise is to identify which sectors can expect to sustain the greatest impact from COVID-19–related credit stressors. We performed this analysis by running firms' financial statements through default risk models and comparing the following risk measures:

1. **COVID-19 point-in-time (PIT) probability of default (PD).** This point-in-time probability of default risk measure includes the economic stress caused by the coronavirus pandemic and oil price shocks per the as-of date for this analysis.
2. **Through-the-cycle (TTC) PD.** This measure captures the risk level associated with firms' financial ratios without any consideration of prevailing credit cycle conditions.

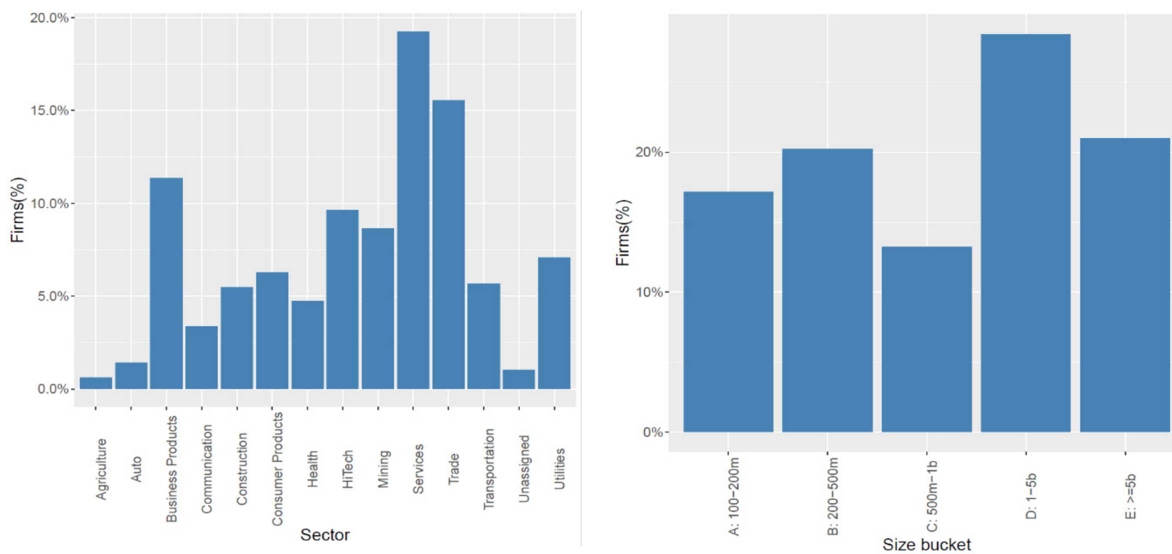
We compare these measures to evaluate how COVID-19 point-in-time probability of default measures exceed through-the-cycle probability of default measures (TTC PD vs COVID-19 PD). We perform this analysis at an industry level and at the risk-band level within industries to identify which industries COVID-19 affects most and with what magnitude. We do not stress financials for individual firms because we expect that market reactions captured by the PIT PD reflect potential future changes in financials.

Data

The large firm sample includes 10,000 private and public firms. Over 90% of the firms are in the United States, and the rest of the firms are in Canada.

Exhibit 1 shows the distribution of firms by industry on the left and by total asset size on the right. Services, Trade, and Business Products are the most-represented industries in the sample though borrowers in the data span all the industry sectors in the model. The Unassigned sector is for firms that either do not have an industry identifier or are in an industry that does not map to the RiskCalc™ model's sectors. Total asset size for this sample has a lower boundary of $100 million.

Exhibit 1 Industry and size distribution for firms in the COVID-19 exercise sample



Source: Moody's Analytics Data Alliance

Analysis and results

Methodology

The analysis measures the impact of COVID-19 and the oil price shocks on default risk for borrowers. Our model uses financial statement data and associated default observations on historical data samples with defining characteristics similar to those of the data samples used in this exercise. We evaluate firms by their PD measure. The model produces through-the-cycle default risk measures using only firms' financial statements without any consideration of the prevailing credit cycle conditions. It also produces point-in-time default risk measures that account for the credit cycle by translating public equity market signals. The model also translates PD into a PD-implied rating.[1]

We compare these measures to evaluate how COVID-19 has changed point-in-time probability of default measures from through-the-cycle levels. We perform this analysis at an industry level and at the risk-band level within industries.

Results

Agriculture and Consumer Products see the greatest increase in risk

To measure the impact of recent events by rating grade, in Exhibit 2 we take a firm whose financial ratios imply a TTC PD rating of Baa2 (~0.35% PD) and apply the COVID-19 credit cycle adjustment of each industry to see how recent developments affect default probability at different starting risk levels. The unadjusted PIT PD shows how the credit cycle at the end of February affects ratings. By the end of February, many sectors already began to reflect credit negative pressure while some sectors remained more resilient, such as Utilities. We now see all industries are punitively affected by the current pandemic. Agriculture supplants Consumer Products from our previous study[2] as the sector with the highest average COVID-19 PIT PD. Utilities and Mining remain near the bottom of the list in terms of magnitude.

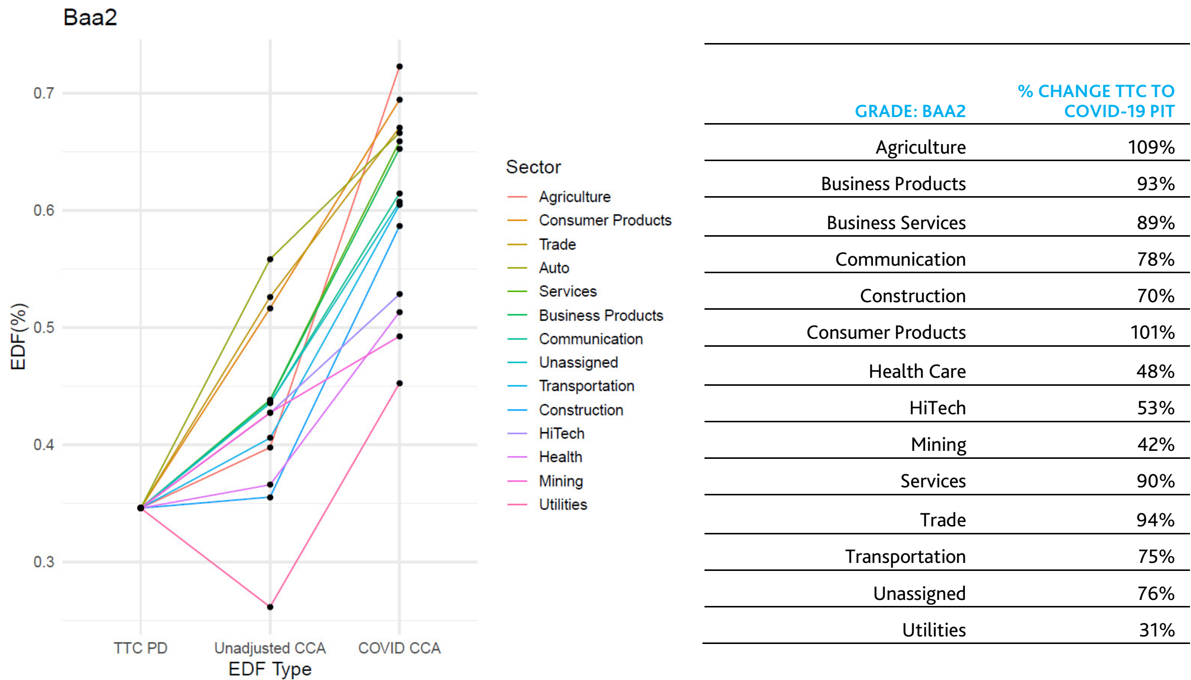
The table on the right in Exhibit 2 measures the PD movement for each sector from the TTC to the COVID-19 PIT PD. Users can apply this percentage change to their TTC PD to approximate the impact of the coronavirus on their portfolio. For example, if you have an agriculture firm that has a risk profile similar to a Baa2 risk rating with a TTC PD of 0.35%, you can multiply that 0.35% TTC PD by (1 + 109%) to get a point-in-time default risk measure of 0.73% that incorporates the coronavirus credit cycle stressors.

[1] The PD-implied or EDF-implied rating is generally consistent with the default rates of bond ratings as measured by Moody's Investors Service Default Studies.

[2] https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_1222395

Appendix II: Expected Movements in PIT PD Due to COVID-19 presents tables with percentage change adjustments for each industry and implied-rating grade combination.

Exhibit 2 Change from the TTC PD to the COVID-19 PIT PD by industry for Baa2 firms

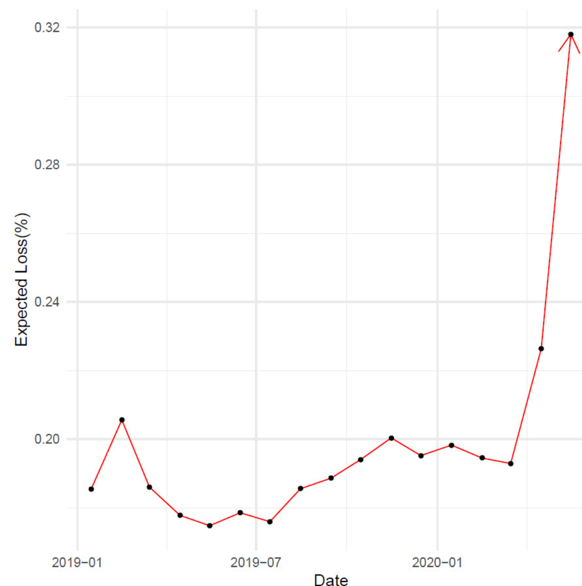


GRADE: BAA2	% CHANGE TTC TO COVID-19 PIT
Agriculture	109%
Business Products	93%
Business Services	89%
Communication	78%
Construction	70%
Consumer Products	101%
Health Care	48%
HiTech	53%
Mining	42%
Services	90%
Trade	94%
Transportation	75%
Unassigned	76%
Utilities	31%

Impact on expected losses

To assess potential impacts on expected losses, we assume a constant loss given default (LGD) of 50% and multiply it by our monthly weighted average PIT PDs. Exhibit 3 charts the weighted average expected loss rates beginning in January 2019 through April 7, 2020. The final datapoint shows the COVID-19 PIT PD based on the latest credit cycle information. We see expected loss rates increase by roughly 68% since the onset of COVID-19. This is down from nearly 80% in our prior study.

Exhibit 3 Progression of expected loss rates

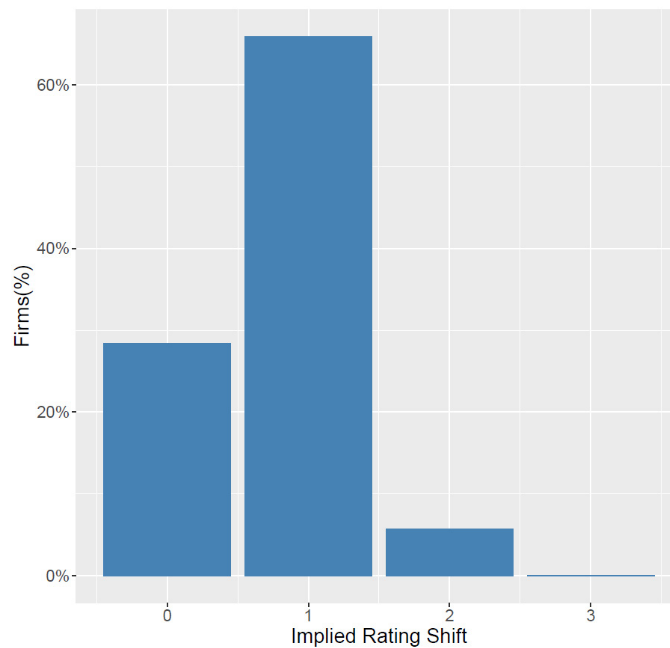


Conclusion

The global coronavirus contagion and the drop in oil prices has shocked firms across all sectors and sizes. Month-over-month, we typically do not expect many PIT risk rating grade changes—and if there are changes, they are usually not more than a one-rating grade upgrade or downgrade. Exhibit 4 illustrates that COVID-19 and oil price shocks have, in general, downgraded borrowers by one or two rating grades across sectors and firm sizes. Roughly 30% of borrowers see no rating grade impact, up from 10% in our prior study. More than 65% see a one-grade downgrade and roughly 5% see a two or more grade downgrade versus roughly 30% from our prior study.[3]

Although all industries are negatively affected, Agriculture and Consumer Products see the greatest increase in risk from TTC PD. The previously hardest-hit industries are showing some recovery in the COVID-19 PIT PD while the previously more resilient industries are maintaining their credit negative levels in the COVID-19 PIT PD. We continue to watch for the latest public market data that may influence the PIT PD.

Exhibit 4 Change in implied ratings due to the COVID-19 PIT PD (all downgrades)



[3] https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_1222395

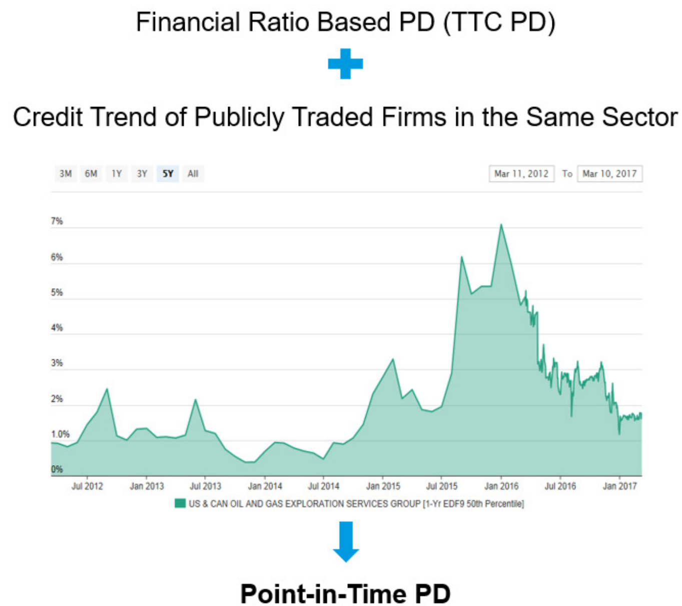
Appendixes

Appendix I: Credit Cycle Adjustment Overview

The credit cycle adjustment (CCA) model produces our PIT risk measures. It accounts for the credit cycle by combining the distance-to-default (DD). DD factors for a given month are obtained in the beginning of the next month. Data goes through quality checks and additional transformations to be released in the CCA for the following month.

Exhibit 5 illustrates the progression of the through-the-cycle default risk measure through our financial statement only (FSO) model (TTC PD model) before applying the adjustment to produce the point-in-time CCA default risk measure. The CCA model demonstrates how the current market signals compare to historical market signals. If the current credit environment is better than the historical average, we adjust the FSO EDF™ (Expected Default Frequency) down to arrive at a less risky CCA EDF. If the current credit environment is worse than the historical average, we adjust the FSO EDF up to arrive at a riskier CCA EDF. EDF is Moody's Analytics nomenclature for probability of default.

Exhibit 5 Illustrative progression of the CCA model



Appendix II: Expected Movements in PIT PD Due to COVID-19

Change in EDF from the FSO to the COVID-19 CCA EDF

Exhibit 6 identifies the expected change in CCA EDF (PIT PD) relative to the FSO EDF (TTC PD) when using the latest credit market signals per this study's as-of date.

Exhibit 6 Change in PD from the TTC to the COVID-19 PIT PD

SECTOR	A1	A2	A3	BAA1	BAA2	BAA3	BA1	BA2	BA3	B1	B2	B3	CAA/C
Business Products	48%	113%	114%	66%	54%	51%	71%	89%	95%	73%	73%	90%	143%
HiTech	25%	67%	60%	39%	35%	35%	35%	53%	67%	36%	41%	42%	79%
Construction	34%	94%	81%	52%	45%	40%	50%	70%	75%	51%	51%	60%	102%
Communication	40%	109%	98%	62%	49%	43%	59%	78%	80%	61%	60%	72%	119%
Trade	54%	117%	120%	68%	58%	60%	73%	94%	106%	79%	82%	102%	161%
Services	50%	114%	118%	67%	56%	54%	72%	90%	99%	75%	76%	94%	149%
Mining	20%	58%	54%	37%	27%	31%	26%	42%	52%	34%	36%	31%	67%
Unassigned	38%	107%	94%	61%	48%	42%	57%	76%	78%	59%	57%	69%	114%
Consumer Products	62%	135%	124%	71%	63%	72%	76%	101%	112%	88%	83%	118%	183%
Auto	53%	115%	120%	68%	57%	57%	72%	93%	103%	78%	79%	99%	156%
Health	23%	63%	58%	38%	32%	34%	31%	48%	61%	35%	39%	38%	74%
Agriculture	63%	142%	125%	72%	66%	77%	81%	109%	113%	91%	84%	124%	192%
Transportation	37%	105%	92%	60%	48%	42%	56%	75%	78%	58%	57%	68%	113%
Utilities	16%	48%	41%	35%	20%	26%	17%	31%	32%	32%	29%	24%	53%

Exhibit 7 presents the change in five-year EDF (PD) that represents the longer-run impact of COVID-19 relative to the FSO EDF (TTC PD) when using the latest credit market signals per this study's as-of date.

Exhibit 7 Change in PD from the TTC to the COVID-19 PIT PD

SECTOR	A1	A2	A3	BAA1	BAA2	BAA3	BA1	BA2	BA3	B1	B2	B3	CAA/C
Business Products	22%	36%	43%	37%	54%	86%	89%	91%	70%	50%	39%	47%	49%
HiTech	17%	21%	29%	24%	31%	58%	54%	49%	48%	38%	24%	29%	31%
Construction	19%	24%	37%	27%	43%	75%	75%	70%	58%	43%	29%	36%	38%
Communication	20%	28%	41%	30%	46%	80%	85%	81%	64%	45%	33%	40%	42%
Trade	23%	42%	44%	43%	62%	98%	95%	96%	74%	53%	43%	51%	55%
Services	22%	38%	43%	39%	57%	90%	91%	93%	71%	51%	40%	48%	51%
Mining	14%	19%	24%	22%	23%	47%	48%	41%	42%	31%	21%	25%	27%
Unassigned	20%	26%	40%	29%	45%	79%	84%	79%	62%	45%	32%	39%	41%
Consumer Products	25%	47%	51%	51%	74%	110%	104%	101%	83%	58%	47%	57%	62%
Auto	23%	40%	43%	42%	60%	95%	93%	95%	73%	53%	42%	50%	53%
Health	16%	20%	27%	23%	27%	54%	51%	46%	46%	35%	23%	28%	29%
Agriculture	25%	49%	54%	55%	80%	114%	109%	103%	87%	59%	49%	59%	65%
Transportation	20%	26%	40%	28%	45%	79%	84%	78%	61%	44%	32%	39%	40%
Utilities	12%	16%	19%	17%	16%	34%	37%	33%	36%	23%	17%	19%	21%

Appendix III: Average Probability of Default by Rating Grade

Exhibit 8 presents the average EDF (or PD) by rating grade.

Exhibit 8 Average PD by rating grade

RATING	AVERAGE PD
Aaa	0.01%
Aa1	0.02%
Aa2	0.04%
Aa3	0.07%
A1	0.11%
A2	0.16%
A3	0.20%
Baa1	0.25%
Baa2	0.35%
Baa3	0.53%
Ba1	0.85%
Ba2	1.35%
Ba3	2.02%
B1	3.03%
B2	4.55%
B3	6.82%
Caa/C	17.10%

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