BANK OF CANADA
BANQUE DU CANADA

What COVID-19 revealed about the resilience of bond funds

Staff Analytical Note 2020-18 (English)
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August 2020

Introduction

Open-ended fixed-income mutual funds with large holdings of corporate bonds (bond funds) play a growing role in financing the Canadian corporate sector. They now hold around 23 percent of Canadian corporate bonds denominated in Canadian dollars compared with 12 percent in 2007. Bond funds offer daily redemptions to investors, but they hold assets that may be difficult to sell on short notice. If many investors were to redeem simultaneously, the funds might be forced to quickly sell corporate bonds, potentially decreasing liquidity in the bond market (Arora et al. 2019b; Bank of Canada 2019).

COVID-19 represents a real-life test for bond funds (Falato, Goldstein and Hortaçsu 2020). Concerns about the economic impact of the pandemic created a shock wave in financial markets in March 2020. Spreads of Canadian corporate bonds widened significantly, causing the value of bond fund assets to fall. A large share of investors reacted by exiting these funds to raise cash. Net redemptions reached $14 billion in March, amounting to around 4.5 percent of assets under management (Bank of Canada 2020).

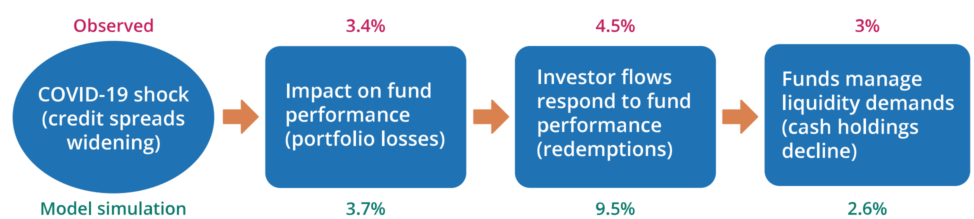
While large, these redemptions were still substantially less than those predicted by a model simulation based on the credit spreads in March (see **Figure 1** for a summary of the model simulation compared with what happened in March).

The difference between the predicted and observed redemptions in March can be explained—at least partly. We believe that the Bank of Canada's liquidity and asset purchase facilities helped calm markets and limit investor redemptions. Fund managers also played a role in preventing large redemptions by intensifying their relationship efforts with investors (i.e., they had regular conversations about investment decisions). Some fund managers also charged higher fees to investors who exited the fund. The higher fees were deemed necessary because the cost of providing liquidity in this market rose significantly in March.

Evidence suggests that most fund managers met the demand for redemptions with cash and other liquid assets. Securities regulators also gave fund managers additional flexibility to use borrowing to manage demand for redemptions. Available data indicate that, on average, cash holdings of bond funds declined from 4.2 to 3 percent of assets under management in the quarter ending in March.

Overall, the combined actions of fund managers and authorities helped prevent funds from selling bonds in a market undergoing severe liquidity strains, which would have amplified the adverse conditions of market liquidity (see Gravelle 2020 for an explanation of market liquidity and how conditions evolved during the crisis). If bond funds face another wave of large redemptions, they may be more vulnerable because they have already used part of their cash buffers. By rapidly rebuilding those buffers, bond funds can help avoid future forced sales of assets that are less liquid. The Bank will continue to monitor these funds and how they can affect fixed-income market liquidity.

Figure 1: Transmission of the COVID-19 shock on bond funds in March—observed vs. model simulation



A COVID-19 stress simulation

We quantify how the rapid increase in Canadian credit spreads observed in March can affect redemptions of bond funds and their liquidity positions using **Ceto**, our mutual fund stress test model (Arora et al. 2019a).

Table 1 describes the features of the COVID-19 scenario considered in our simulation. The shock consists of movements observed in March 2020 of credit spreads across categories of credit quality. This credit spread shock is combined with the Bank of Canada's 150-basis-point cut to the policy rate in March. The resulting overall interest rate shock is applied on a one-month horizon.

Table 1: Shock to credit spreads across the credit curve

Credit quality	COVID-19 simulation (basis points)	2007–09 global financial crisis (basis points)
AAA	-100	-100
AA	+20	0
A	+50	+50
BBB	+150	+100
BB	+225	+600
B	+450	+1,000
Below B	+650	+2,000

While the widening of credit spreads was less acute for riskier bonds in March 2020 than during the 2007–09 global financial crisis, it was more pronounced for bonds in the AA and BBB rating segments. This partly reflects the sharp and broad-based repricing of assets caused by COVID-19. This observation is important because, on average, around 50 percent of Canadian bond fund portfolios are securities rated AA or BBB (see **Table A-1** in the Appendix).

Bond fund sample

We consider open-ended mutual funds with large holdings of Canadian corporate bonds that experienced at least 1 percent of net redemptions in March.

Our sample consists of 188 bond funds with total holdings of $323 billion in assets under management.[1] Arora et al. (2019a) present information about the underlying data and explain in further detail how we identify bond funds. On average across bond funds, holdings of Canadian corporate bonds represented 44 percent of the funds' portfolio in February 2020 (**Table 2**). **Table A-1** in the Appendix provides the composition of bond holdings by credit ratings.

Table 2: Asset allocation of bond funds before the COVID-19 shock

	Asset allocation (%)
Cash and equivalents	4.3
Equity	12.2
Government bonds	32.4
Corporate bonds	44.3
Other	6.7

More investor redemptions after poor performance

Staff Discussion Paper/Document d'analyse du personnel — 2021-2

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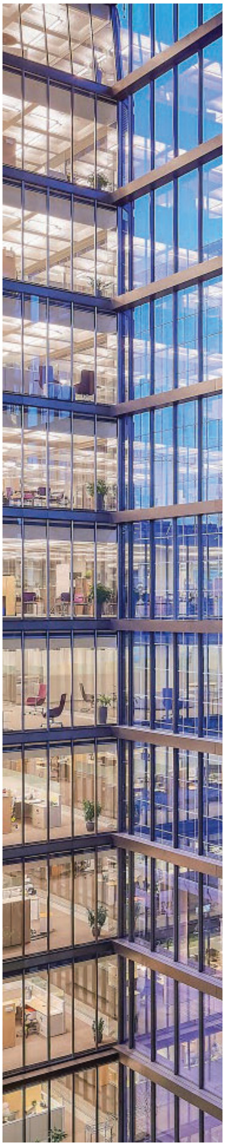

COVID-19 Crisis: Lessons Learned for Future Policy Research

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Overview

In March 2020, the COVID-19 pandemic and physical distancing rules halted work in a range of industries. Many businesses and households worried that they could lose their income for months and would need to take out loans, sell assets or apply for government support to make their payments on rent, wages, materials and debt. Anticipating or facing large demands for money from their investors or counterparties, asset managers needed to sell securities to raise the funds. The widespread nature of the disruption meant that demand for new loans and for asset sales would soar (Bank of Canada 2020a).

Banks are the natural institutions to meet such demands. They lend to businesses and households, and they deal in asset markets—buying and selling securities for investors. However, bank dealers became more prudent and less willing to lend against or buy securities as uncertainty and market volatility rose. Furthermore, in recent decades, the asset management industry had grown relative to the stock of liquid assets held by Canadian banks, and their demand for money during the COVID-19 crisis was considerable. At the height of the crisis, it became costly and difficult for investors and asset managers to sell the securities they were holding to meet the demand for money. This could prevent savings from being channelled into investments. The Bank of Canada stepped in and injected into the financial system the largest amount of money that it ever has in its history.

Over the past two centuries, central banks have evolved to regulate the supply of money in response to changes in demand. The Bank's actions are therefore built into the design of the financial system, like those of other central banks around the world. Nevertheless, many observers—the authors included—were surprised by the speed, scope and size of central bank interventions that were needed in the early months of the COVID-19 crisis. In this document, we examine the events that took place in financial markets around these interventions and ask how the need for intervention could be reduced in future crises.

Specifically, we review the disruptions observed in Canadian fixed-income markets during March and April 2020 because these markets play a key role in the financial system (Fontaine, Selody and Wilkins 2009). First, we examine the impact of the COVID-19 pandemic on investors' need for money. Then, we look at the signs of stress coming from fixed-income markets. Finally, we examine some of the constraints bank dealers face when intermediating fixed-income markets. We summarize our findings in a conceptual framework of the demand for and supply of money. In short, we find that demand from investors and asset managers to sell fixed-income securities outpaced the ability or willingness of bank dealers to grow their balance sheet and supply the money to buy them.

Based on our analysis, we identify two main questions about potentially reducing the scope and size of central bank interventions in a crisis and the associated moral hazard. These questions may form the basis of themes of future policy research:

- Can central banks' policies and crisis interventions in financial markets better reflect the growing role that asset managers play in the financial system?
- Can the structure of financial markets be made less reliant on the capacity of banks to supply money?

The pandemic led to a dash for cash

Businesses and households needed loans to weather loss of income

Containment measures such as stay-at-home orders disrupted economic activity. For the week of March 15 to 21, 2020, the Statistics Canada Labour Force Survey found that the employment level had already declined by one million jobs. In the first quarter of 2020, the Canadian Survey on Business Conditions found that nearly one-third of businesses reported revenue declines of 40 percent or more compared with the same quarter a year earlier. Businesses and households worried that the closures would create a gap between their income and expenses, which they would need to reconcile by selling their assets or by borrowing. The disruption led to the sharpest fall on record in consumer and business confidence (Bank of Canada 2020b), and many households and businesses sought money to weather the storm for both immediate payment needs and precautionary savings.

The financial sector prepared to make short-term loans but faced a great deal of uncertainty. Since the duration and extent of the lockdown was unknown, it was unclear who would need to borrow and what amount would be required. Because the long-term impacts on the economy were unknown, it was difficult for lenders to judge which businesses would survive the pandemic to repay the loans.

Chart 1 illustrates the growing sense of uncertainty at the beginning of the pandemic. It shows the tail risk for stock prices based on Fontaine, Ouellet Leblanc and Shotlander (2020). The tail risk is the probability of a 10 percent price change of the S&P/TSX 60 Index, based on the prices of options on the index. This measure is a sort of fear index that captures the market's perceived probability of large negative returns.

Introduction

FP Bonds – Corporate 2021, the sixth edition to be published by Grey House Publishing Canada, lists outstanding publicly and privately held debt securities – together with their features and provisions – issued by Canadian incorporated companies, as well as brand new introductory material related to the corporate bond market. Separate tables list convertible, exchangeable, retractable and extendible debt issues. An additional table lists outstanding asset-backed securities.

Corporate debt issues outstanding as at ***May 5, 2021*** have been included.

An important part of investing in the debt market is determining the quality of a debt issue. Credit ratings are forward looking measures which assess an entity's ability to make timely payments of interest and principal. As such, a credit rating combines both quantitative and qualitative analysis.

FP Bonds – Corporate 2021 includes ratings supplied by **Dominion Bond Rating Service** (DBRS). The DBRS ratings, dated ***May 5, 2021***, are presented in two tables, in addition to being shown with each issue. The first table lists issues by rating, from lowest to highest. Generally, a DBRS rating of BBB is considered to be investment grade and anything below that could be considered as non-investment grade or high-yield debt. As well, unrated securities are also considered to be high-yield if its spread to a comparable Government of Canada issue is substantially higher than the spread between investment-grade corporate bonds and Government of Canada issues. A second table lists all rated issues by company.

Abbreviations

A............annually
A$............Australian dollars
B............bi-monthly
bd............bond
CCAA............Companies' Creditors Arrangement Act
Ch¥............Chinese yuan (offshore)
Cn¥............Chinese yuan (onshore)
cl. ....class
com. ....common
convert. ....convertible
deb. ....debentures
divd(s). ....dividend(s)
exchange. ....exchangeable
F.R. ....floating rate
HK$............Hong Kong dollars
ln. ....loan
Jp¥............Japanese yen
M............monthly
M.R. ....multiple rate
max. ....maximum
min. ....minimum
mtg(e). ....mortgage
NKr............Norwegian krone
NZ$............New Zealand dollars
nt............note
o/s............outstanding
P............private placement
Q............quarterly
redeem. ....redeemable
reset. ....resettable
retract. ....retractable
S............semi-annually
S$............Singapore dollar
S.F. ....sinking fund
SKr............Swedish Krona
SFr............Swiss francs
ser. ....series
sh(s). ....share(s)
T............Toronto Stock Exchange
TSX............Toronto Stock Exchange
TSX-VEN............TSX Venture Exchange
US$............U.S. dollars
V............TSX Venture Exchange
V.R. ....variable rate
Z.R. ....zero coupon rate
€............Euros
£............British pound

Coverage of debt issues is presented in the following format:

Note: Features and details appear only when applicable.

1.	**<u>8% Bonds, due Sept. 30, 2013</u>**			
2.	**DBRS Rating:**	AAA	Apr 24, 2012	
3.	Issued:	US$300,000,000	Dec. 31, 2003	Euro
4.	O/S:	US$300,000,000	Dec 31, 2011	
5.	Interest:	8.00% (S)	Mar 31/Sep 30	

6. **Interest Details:**
7. **Private Placement**
8. **Redemption:** Redeem. on and after the following dates on min. 30 days' notice as follows:
Oct 1, 2013.............US$101.000 Oct 1, 2014..........................US$100.00
9. **Retraction:** Retract. on the following dates as follows:
Sep 30, 2015...........US$100.000 On or before Aug 31, 2015
Sep 30, 2016...........US$100.000 On or before Aug 31, 2016
10. **Sinking Fund:** Sufficient to retire the following principal amount of debt:
Sep 30, 2013......US$10,000,000 Sep 30, 2014................US$10,000,000
11. **Purchase Fund:**
12. **Convertible:** Convert. (by company) into com sh as follows:
Oct 1, 2012 - Sep 30, 2013.....$10.000.......100.000 From Oct 1, 2014.........$14.000.........71.428
13. **Exchange:** (same as conversion)
14. **Extendible:** Extendible to Sep 30, 2015, exercisable from May 31, 2010 to Aug 31, 2010, at a rate of 10%.
15. **Secured:**
16. **Guarantor:**
17. **Change of Control:**
18. **Note:**
19. **Lead Underwriters:**
20. **Trustee:**
21. **Paying Agent:**
22. **Exchange(s):**
23. **Symbol:**
24. **CUSIP:**

Description:

1. Security Name
2. DBRS Rating and date rating was last updated
3. **a** Amount issued **b** Date issued **c** Euro issuer indicator.
4. **a** Amount outstanding **b** Date outstanding
5. **a** Interest rate **b** Interest payment frequency **c** Interest payment cycle
6. Notes on non-fixed coupon rates or other interest details
7. Private placement indicator
8. **a** Redemption date **b** Redemption price
9. **a** Retraction date **b** Retraction price **c** Retraction exercise period
10. **a** Sinking Fund date **b** Sinking fund amount/percentage.
11. Purchase fund details
12. **a** Conversion period **b** Conversion price per share **c** Conversion basis per pref. share
13. **a** Exchange period **b** Exchange price per share **c** Exchange basis per pref. share
14. Extendible details
15. Secured details
16. Guarantor of issue
17. Change of control
18. Additional notes
19. Lead Underwriter(s)
20. Trustee
21. Paying Agent
22. Exchanges on which security is listed
23. Trading Symbol
24. CUSIP Number

Convertible Debt

Issuer	Description	Conversion Basis (per $1,000)	Conversion Price (per Share)	Exchanges	Symbol
Accord Financial Corp	deb 7% 2023/12/31	74.074 com. sh(s). to Dec 30, 2023	$13.50	T	ACD.DB
Aecon Group Inc	deb 5% 2023/12/31	41.667 com. sh(s). to Dec 31, 2023	$24.00	T	ARE.DB.C
Ag Growth Intl Inc	deb 4.85% 2022/06/30	11.983 com. sh(s). to Jun 29, 2022	$83.45	T	AFN.DB.D
Ag Growth Intl Inc	deb 4.5% 2022/12/31	11.344 com. sh(s). to Dec 30, 2022	$88.15	T	AFN.DB.E
Air Canada	nt 4% 2025/07/01	65.114 vtg & var vtg to Jun 30, 2025	US$15.35		
Alaris Eqty Ptnrs Incm Tr	deb 5.50% 2024/06/30	41.237 tr. unit to Jun 29, 2024	$24.25	T	AD.DB
Alcanna Inc	deb 4.7% 2022/01/31	68.493 com. sh(s). to Jan 30, 2022	$14.60	T	CLIQ.DB
Aleafia Health Inc	deb 8.5% 2022/06/27	680.000 com. sh(s). to Jun 27, 2022	$1.47	T	AH.DB
Algoma Central Corp	deb 5.25% 2024/06/30	61.270 com. sh(s). to Jun 30, 2024	$16.32	T	ALC.DB.A
American Hotel Incm Pptys	deb 5% 2022/06/30	108.108 unit to Jun 29, 2022	US$9.25	T	HOT.DB.U
Aphria Inc	nt 5.25% 2024/06/01	89.312 Tilray Inc cl 2 to May 31, 2024	US$11.20		
Argonaut Gold Inc	deb 4.625% 2025/11/30	350.116 com. sh(s). to Nov 29, 2025	US$2.86	T	AR.DB.U
Atlantic Power Corp	deb 6% 2025/01/31	238.095 com. sh(s). to Jan 30, 2025	$4.20	T	ATP.DB.E
Atrium Mortgage Invt Corp	deb 5.5% 2021/09/30	68.259 com. sh(s). to Sep 29, 2021	$14.65	T	AI.DB.B
Atrium Mortgage Invt Corp	deb 5.3% 2024/06/30	66.934 com. sh(s). to Jun 29, 2024	$14.94	T	AI.DB.C
Atrium Mortgage Invt Corp	deb 5.6% 2025/03/31	67.797 com. sh(s). to Mar 30, 2025	$14.75	T	AI.DB.E
Atrium Mortgage Invt Corp	deb 5.5% 2025/12/31	64.103 com. sh(s). to Dec 30, 2025	$15.60	T	AI.DB.D
Aurora Cannabis Inc	nt 5.5% 2024/02/28	138.370 com. sh(s). to Feb 27, 2024	US$7.23		
Axis Auto Finance Inc	deb 7.5% 2023/03/31	1052.632 com. sh(s). to Mar 30, 2023	$0.95		
BSR Real Estate Invt Tr	deb 5% 2025/09/30	69.444 unit to Sep 29, 2025	US$14.40	T	HOM.DB.U
BTB REIT	deb 6% 2024/10/31	184.502 tr. unit to Oct 31, 2024	$5.42	T	BTB.DB.G
BTB REIT	deb 7% 2025/10/31	274.725 tr. unit to Oct 31, 2025	$3.64	T	BTB.DB.H
Baylin Technologies Inc	deb 6.5% 2023/07/10	260.000 com. sh(s). to Jul 09, 2023	$3.85	T	BYL.DB
BlackBerry Ltd	deb 1.75% 2023/11/23	166.667 com. sh(s). to Nov 23, 2023	US$6.00	T	BB.DB.U
Canadian Solar Inc	nt 2.5% 2025/10/01	27.271 com. sh(s). to Sep 29, 2025	US$36.67		
Canopy Growth Corp	nt 4.25% 2023/07/15	20.758 com. sh(s). to Jul 15, 2023	$48.17		

DBRS Corporate Debt Ratings, by Issuer

Issuer	Description	DBRS Rating	Last Update
AIMCo Realty Investors LP	Senior Unsecured Debt	AA low	May 27, 2019
ARC Resources Ltd	Senior Unsecured Notes	BBB	Apr 6, 2021
ATCO Ltd	Fixed-to-Floating Rate Subordinated Notes	BBB	Aug 28, 2020
Acces Recherche Montreal	Senior Bonds	A	Oct 15, 2019
Aeroports de Montreal	Revenue Bonds	A	Mar 1, 2021
Agnico Eagle Mines Ltd	Senior Unsecured Notes	BBB	Apr 7, 2021
Alberta Powerline LP	Senior Bonds	A low	Oct 14, 2020
Alectra Inc	Senior Unsecured Debentures	A	Jun 29, 2020
Algonquin Power Co	Senior Debentures	BBB	Feb 11, 2021
Allied Properties REIT	Senior Unsecured Debentures	BBB	Dec 4, 2019
AltaGas Ltd	Medium Term Notes	BBB low	Dec 8, 2020
AltaLink Investments LP	Senior Bonds	BBB high	Jul 11, 2019
AltaLink LP	Senior Secured Bonds and Medium Term Notes	A	Jul 16, 2020
Arrow Lakes Power Corp	Project Bonds	A high	Apr 30, 2021
Artis REIT	Senior Unsecured Debentures	BBB low	Nov 29, 2019
BCI QuadReal Realty	Senior Debentures	AA low	May 3, 2021
BMW Canada Inc	Senior Notes	A high	Sep 29, 2020
Bank of Montreal	Covered Bonds	AAA	Jun 4, 2020
Bank of Montreal	Deposits & Senior Debt	AA	Jun 4, 2020
Bank of Montreal	Bail-inable Senior Debt	AA low	Jun 4, 2020
Bank of Montreal	Subordinated Debt	A high	Jun 4, 2020
Bank of Montreal	NVCC Subordinated Debt	A low	Jun 4, 2020
Bank of Montreal	NVCC Additional Tier 1 (AT1) Limited Recourse Capital Notes	BBB high	Jun 4, 2020
Bank of Nova Scotia	Covered Bonds	AAA	Apr 22, 2021
Bank of Nova Scotia	Deposits & Senior Debt	AA	Apr 22, 2021
Bank of Nova Scotia	Bail-inable Senior Debt	AA low	Apr 22, 2021
Bank of Nova Scotia	Subordinated Debt	A high	Apr 22, 2021
Bank of Nova Scotia	NVCC Subordinated Debt	A low	Apr 22, 2021

AAG FH LP

9.75% Senior Notes, due July 15, 2024

Issued:	US$243,500,000	Jul 17, 2019
O/S:	US$243,500,000	Dec 31, 2020
Interest:	9.75 % (S)	Jan 17/Jul 17

Redemption: Redeem. on and after Apr 15, 2024 at par. Redeem. at any time prior to April 24, 2024 at the greater of U.S. Treasury Yield + 0.50% and par.

Change of Control: In the event of a Change of Control, the company will be required to offer to purchase the notes at 101% of the principal amount of the notes, plus accrued and unpaid interest.

Guarantor: Guaranteed by certain subsidiaries.

Lead Underwriter(s): J.P. Morgan Securities plc

Trustee: Wilmington Trust, National Association

ABC Schools Partnership

4.246% Bonds, Series A, due Dec. 31, 2043

Issued:	$87,203,000	Sep 18, 2012
O/S:	$75,921,170	Dec 31, 2020
Interest:	4.246 % (S)	Jun 30/Dec 31

Private Placement

Redemption: Redeem. at any time at the greater of Canada Yield Price (Canada Yield + 0.46%) and par.

Sinking Fund: Mandatory principal repayments are as follows:

Jun 30, 2021	$989,870.00	Dec 31, 2021	$1,010,880.00
Jun 30, 2022	$1,032,350.00	Dec 31, 2022	$1,054,260.00
Jun 30, 2023	$1,076,640.00	Dec 31, 2023	$1,099,500.00
Jun 30, 2024	$1,122,840.00	Dec 31, 2024	$1,146,680.00
Jun 30, 2025	$1,171,030.00	Dec 31, 2025	$1,195,890.00
Jun 30, 2026	$1,221,280.00	Dec 31, 2026	$1,247,200.00
Jun 30, 2027	$1,273,680.00	Dec 31, 2027	$1,300,720.00
Jun 30, 2028	$1,328,340.00	Dec 31, 2028	$1,356,530.00
Jun 30, 2029	$1,385,340.00	Dec 31, 2029	$1,414,740.00
Jun 30, 2030	$1,444,780.00	Dec 31, 2030	$1,475,450.00
Jun 30, 2031	$1,506,780.00	Dec 31, 2031	$1,538,770.00
Jun 30, 2032	$1,571,440.00	Dec 31, 2032	$1,604,790.00
Jun 30, 2033	$1,638,870.00	Dec 31, 2033	$1,673,660.00
Jun 30, 2034	$1,709,190.00	Dec 31, 2034	$1,745,470.00
Jun 30, 2035	$1,782,530.00	Dec 31, 2035	$1,820,380.00
Jun 30, 2036	$1,859,030.00	Dec 31, 2036	$1,898,490.00
Jun 30, 2037	$1,938,790.00	Dec 31, 2037	$1,979,960.00
Jun 30, 2038	$2,021,990.00	Dec 31, 2038	$2,064,910.00
Jun 30, 2039	$2,108,760.00	Dec 31, 2039	$2,153,520.00
Jun 30, 2040	$2,199,250.00	Dec 31, 2040	$2,245,930.00
Jun 30, 2041	$2,293,610.00	Dec 31, 2041	$2,342,310.00
Jun 30, 2042	$2,392,040.00	Dec 31, 2042	$2,442,820.00
Jun 30, 2043	$2,494,670.00	Dec 31, 2043	$2,545,210.00

Secured: No details available.

Lead Underwriter(s): CIBC World Markets Inc.

Trustee: Computershare Trust Company of Canada Inc.

CUSIP: 00287XAA9

AGT Food and Ingredients Inc.

5.875% Senior Notes, due Dec. 21, 2021

Issued:	$200,000,000	Dec 21, 2016
O/S:	$24,364,280	Dec 31, 2020
Interest:	5.875 % (S)	Jun 21/Dec 21

Private Placement

Redemption: Redeem. on and after the following dates on min. 30 and max. 60 days' notice as follows:
Dec 21, 2018..$104.406 Dec 21, 2019..$102.203
Dec 21, 2020..$100.00
Was redeem. at any time prior to Dec. 21, 2018 on min. 30 and max. 60 days' notice at the greater of Canada Yield Price (Canada Yield + 050%) and par. Was redeem. (maximum 35%) to Dec. 21, 2018 at 105.875% with proceeds of an equity offering.

Change of Control: In the event of a Change of Control, the company will be required to offer to purchase the notes at 101% of the principal amount of the notes, plus accrued and unpaid interest.

Guarantor: Guaranteed by each existing and any future restricted subsidiaries.

Lead Underwriter(s): Scotia Capital Inc., CIBC World Markets Inc., National Bank Financial Inc.

Trustee: TSX Trust Company

CUSIP: 001264AA8

AIMCo Realty Investors LP

2.266% Senior Notes, Series 1, due June 26, 2024

DBRS Rating:	AA low	May 27, 2019
Issued:	$400,000,000	Jun 26, 2017
O/S:	$400,000,000	Dec 31, 2020
Interest:	2.266 % (S)	Jun 26/Dec 26

Private Placement

Redemption: Redeem. on and after Apr 26, 2024 at par. Redeem. at any time prior to April 26, 2024, at the greater of Canada Yield Price (Canada Yield + 0.24%) and par.

Lead Underwriter(s): TD Securities Inc., RBC Capital Markets

Trustee: Computershare Trust Company of Canada Inc.

CUSIP: 00889YAA9

3.367% Senior Notes, Series 3, due June 1, 2027

DBRS Rating:	AA low	May 27, 2019
Issued:	$325,000,000	Dec 7, 2018
O/S:	$325,000,000	Dec 31, 2020
Interest:	3.367 % (S)	Jun 1/Dec 1

Private Placement

Redemption: Redeem. on and after Apr 1, 2027 at par. Redeem. at any time prior to April 1, 2027, at the greater of Canada Yield Price (Canada Yield + 0.30%) and par.

Lead Underwriter(s): TD Securities Inc., RBC Capital Markets

Trustee: Computershare Trust Company of Canada Inc.

CUSIP: 00889YAC5

3.043% Senior Notes, Series 2, due June 1, 2028

DBRS Rating:	AA low	May 27, 2019
Issued:	$400,000,000	Nov 23, 2017
O/S:	$400,000,000	Dec 31, 2020
Interest:	3.043 % (S)	Jun 1/Dec 1

Private Placement

Redemption: Redeem. on and after Mar 1, 2028 at par. Redeem. at any time prior to March 1, 2028 at the greater of Canada Yield Price (Canada Yield + 0.27%) and par.

Lead Underwriter(s): TD Securities Inc., RBC Capital Markets

Trustee: Computershare Trust Company of Canada Inc.

CUSIP: 00889YAB7

2.712% Senior Notes, Series 4, due June 1, 2029

DBRS Rating:	AA low	May 27, 2019
Issued:	$600,000,000	Jun 14, 2019
O/S:	$600,000,000	Dec 31, 2020
Interest:	2.712 % (S)	Jun 1/Dec 1

Private Placement

Redemption: Redeem. on and after Mar 1, 2029 on min. 30 and max. 60 days' notice at par. Redeem. at any time prior to March 1, 2029 on min. 30 and max. 60 days' notice at the greater of Canada Yield Price (Canada Yield + 0.31%) and par.

Lead Underwriter(s): TD Securities Inc., RBC Capital Markets
Trustee: Computershare Trust Company of Canada Inc.
CUSIP: 00889YAD3

ALSTEF YUL LP

6.65% Amortizing Bonds, Series A, due Sept. 15, 2029

Issued:	$46,000,000	Sep 15, 2009
O/S:	$26,886,000	Mar 15, 2021
Interest:	6.65 % (S)	Mar 15/Sep 15

Private Placement

Redemption: Redeem. at any time at the greater of Canada Yield Price (Canada Yield + 0.5%) and par.

Sinking Fund: Mandatory principal repayments are as follows:

Sep 15, 2021	$1,202,000.00	Mar 15, 2022	$1,242,000.00
Sep 15, 2022	$1,283,000.00	Mar 15, 2023	$1,326,000.00
Sep 15, 2023	$1,370,000.00	Mar 15, 2024	$1,416,000.00
Sep 15, 2024	$1,463,000.00	Mar 15, 2025	$1,511,000.00
Sep 15, 2025	$1,561,000.00	Mar 15, 2026	$1,613,000.00
Sep 15, 2026	$1,667,000.00	Mar 15, 2027	$1,722,000.00
Sep 15, 2027	$1,780,000.00	Mar 15, 2028	$1,839,000.00
Sep 15, 2028	$1,900,000.00	Mar 15, 2029	$1,963,000.00
Sep 15, 2029	$2,028,000.00		

Lead Underwriter(s): RBC Capital Markets
CUSIP: 021237AA0

ARC Resources Ltd.

5.36% Senior Notes, due May 27, 2022

Issued:	US$150,000,000	May 27, 2010
O/S:	US$60,000,000	Dec 31, 2020
Interest:	5.36 % (S)	May 27/Nov 27

Private Placement

Sinking Fund: Mandatory principal repayments are as follows:

May 27, 2021	US$30,000,000.00	May 27, 2022	US$30,000,000.00

2.354% Senior Notes, Series 1, due Mar. 10, 2026

DBRS Rating:	BBB	Apr 6, 2021
Issued:	$450,000,000	Mar 10, 2021
O/S:	$450,000,000	Mar 10, 2021
Interest:	2.354 % (S)	Mar 10/Sep 10

Private Placement

Redemption: Redeem. on and after Feb 10, 2026 at par. Redeem. at any time prior to Feb. 10, 2026 at the greater of Canada Yield Price (Canada Yield + 0.335%) and par.

Change of Control: In the event of a Change of Control, the company will be required to offer to purchase the notes at 101% of the principal amount of the notes, plus accrued and unpaid interest.

Lead Underwriter(s): RBC Capital Markets, CIBC World Markets Inc.
CUSIP: 00208DAA9

3.465% Senior Notes, Series 2, due Mar. 10, 2031

DBRS Rating:	BBB	Apr 6, 2021
Issued:	$550,000,000	Mar 10, 2021
O/S:	$550,000,000	Mar 10, 2021
Interest:	3.465 % (S)	Mar 10/Sep 10

Private Placement

Redemption: Redeem. on and after Dec 10, 2030 at par. Redeem. at any time prior to Dec. 10, 2030 at the greater of Canada Yield Price (Canada Yield + 0.485%) and par.

Change of Control: In the event of a Change of Control, the company will be required to offer to purchase the notes at 101% of the principal amount of the notes, plus accrued and unpaid interest.

Lead Underwriter(s): RBC Capital Markets, CIBC World Markets Inc.
CUSIP: 00208DAB7