



COVID-19 and bond market liquidity: alert, isolation and recovery

Staff Analytical Note 2020-14 (English)

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July 2020

Introduction

The COVID-19 pandemic kickstarted a series of unprecedented events. The measures necessary to contain the spread of the virus disrupted entire industries. Anticipating the impact on their jobs and incomes, Canadian households and businesses started to change how much they borrowed and how they invested their savings. The widespread desire to hold more liquid assets and more cash threw many markets off balance. The repercussions spread like a contagion throughout the financial system.

We are interested in how financial markets worked for investors holding bonds issued by the Government of Canada. These bonds offer Canadian investors and institutions safe and liquid vehicles to invest savings. They can also serve as collateral for trades in other markets and as a reference to price other, less liquid bonds. Therefore, the markets for Government of Canada bonds are among the largest and most important components of our financial system. Yet, as the pandemic unfolded, trading these bonds became difficult.

To illustrate what happened in bond markets overall, we examine a two-year Government of Canada bond that had benchmark status during this period. Benchmark bonds play a special role because they attract by far the largest trading volume and offer lower costs for trading (Bulusu and Gungor 2017). A given Government of Canada bond is designated as a benchmark after a series of staggered issuances, at which point:

- its outstanding stock is typically close to that of the current benchmark, and
- market participants shift their trading activity toward the new benchmark.

The evidence suggests that what happened for benchmark Government of Canada bonds also describes the broad pattern experienced in other bond markets, including the markets for Canada Mortgage Bonds, provincial bonds and US Treasury bonds.

Three phases

We find that the market for this Government of Canada bond went through three phases as the pandemic unfolded. First, dealers met the rising demand for liquidity as investors went on alert. Then, in the second phase, trading conditions worsened significantly, probably because dealers eventually reduced their supply of liquidity. Finally, a period of relative calm followed several interventions by the Bank of Canada to support the financial system. We also find evidence that the same three phases happened across the bond markets.

Phase 1—alert

The first phase covers the weeks of:

- February 24 to 28
- March 2 to 6

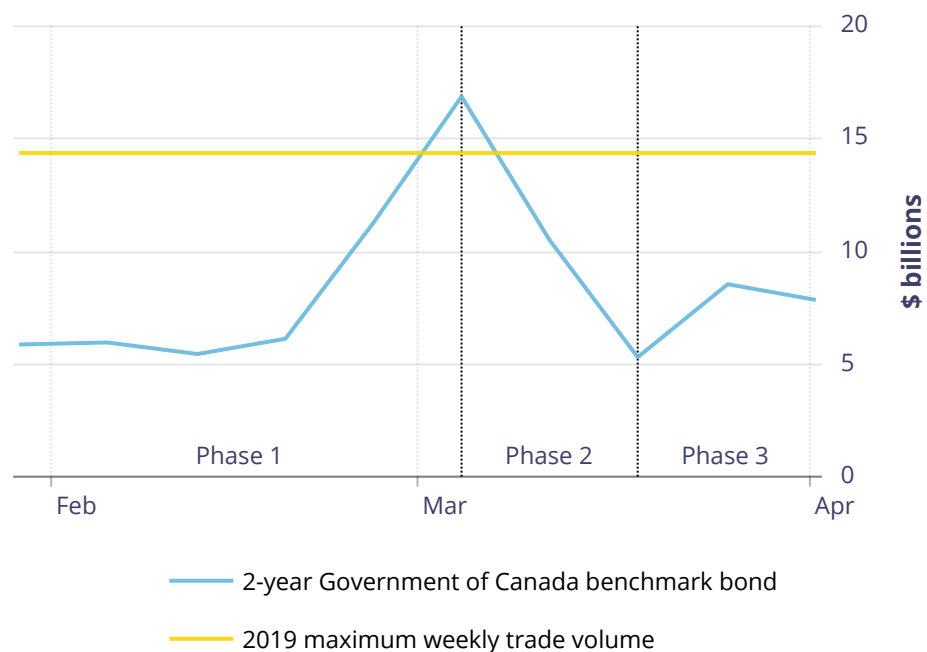
During this period, the market for benchmark Government of Canada bonds was stretched but responded reasonably well.

Chart 1 shows that trading volume increased dramatically during the first week when the contagion began. In the second week, trading volume reached a level above the highest value observed in 2019. In fact, the peak in early March is the highest trading volume ever for two-year benchmark Government of Canada bonds.

One reason for this peak is that demand for trading Government of Canada bonds intensified during the pandemic. It's possible that buyers were increasing their holdings of safe bonds and sellers were increasing their holdings of cash. Both types of investors were increasing the liquidity of their portfolios.

Chart 1: Spot market trading volume reaches a historical peak during phase 1

Weekly average of daily data

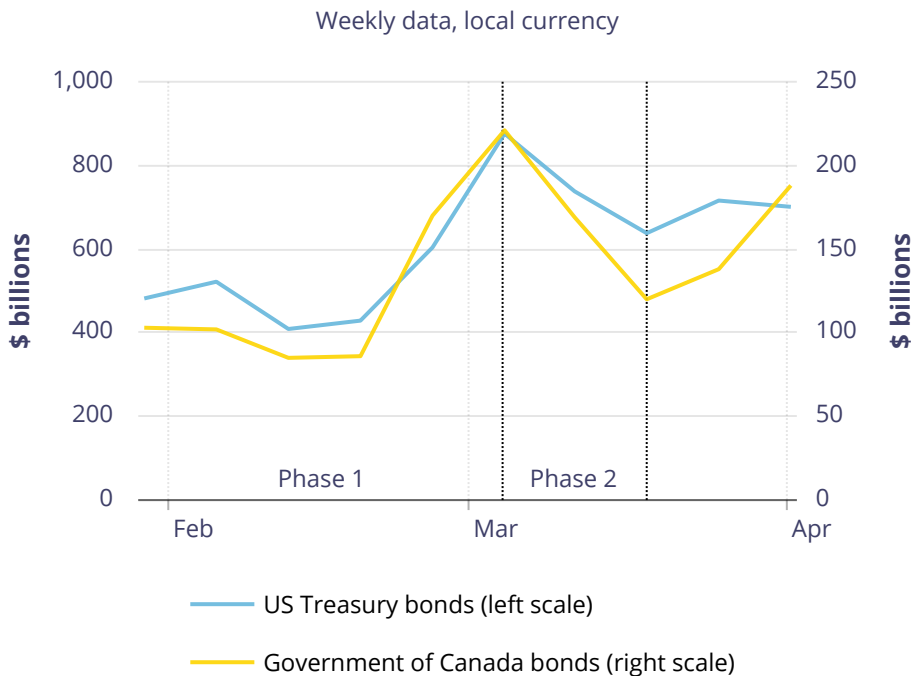


Sources: Canadian Depository for Securities and Bank of Canada calculations

Last observation: April 1, 2020

The trading volume followed a similar pattern for the Government of Canada bond market overall and, remarkably, for the US Treasury bond market (**Chart 2**). In addition, Fleming and Ruela (2020) observe high trading volume amid high illiquidity in the US Treasury bond market. They show that the same three phases occurred over time in the United States; and the timing of these phases essentially overlaps with our findings in Canada. Their results increase our confidence that these three phases offer a useful description of events.

Chart 2: Government of Canada and US Treasury bonds reach the same peak trading volumes during phase 1



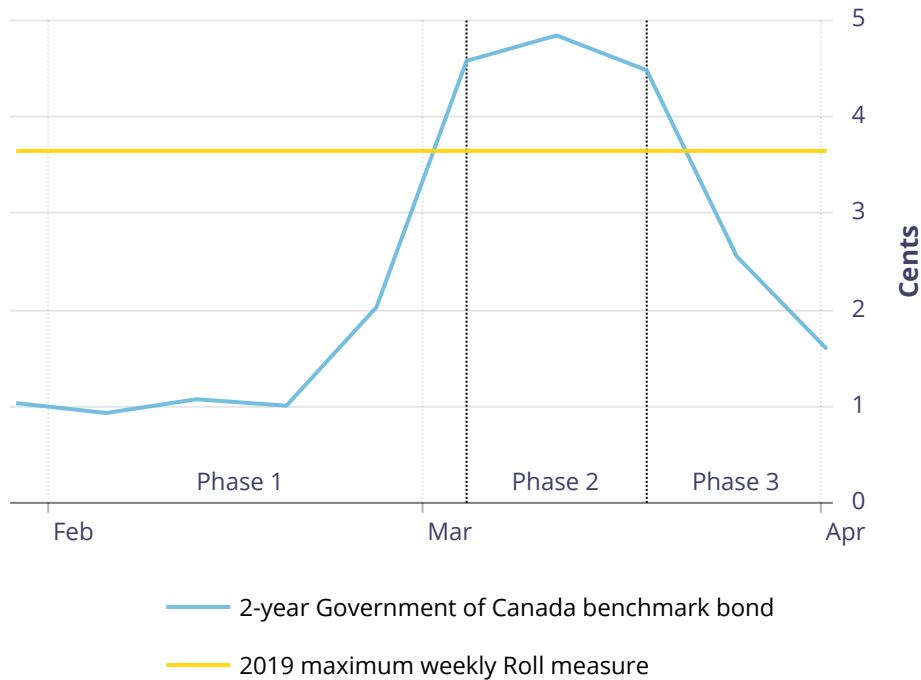
Sources: Bank of Canada and Federal Reserve Bank of New York

Last observation: April 22, 2020

Chart 3 shows that the price of liquidity was rising to compensate the market makers during phase 1. Like trading volume, the price of liquidity peaked beyond the highest level observed in 2019. But, in contrast with the trading volume, it stayed well below the historical maximum. This suggests that the market functioned reasonably well and met the rising demand for liquidity.

Chart 3: Illiquidity peaks during phase 1 and phase 2

Roll liquidity metric, weekly average of daily data

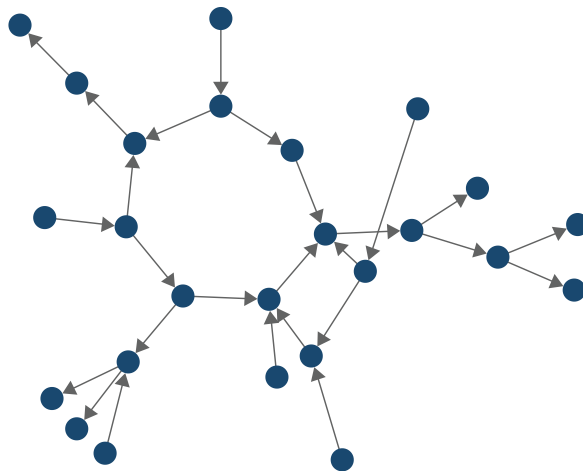


Sources: Canadian Depository for Securities and Bank of Canada calculations

Last observation: April 1, 2020

Using daily trading data, **Figure 1** shows the network that connects dealers and their clients for one of the benchmark bonds on March 1, 2016 (Fontaine and Walton 2020). Each connection in this network corresponds to a movement of this benchmark bond from a buyer to a seller. A network with one buyer and one seller has one link; this is the simplest network. A network becomes more complex as more buyers and sellers carry out transactions and create more links. The network for the two-year benchmark bond changes every day with changing market conditions.

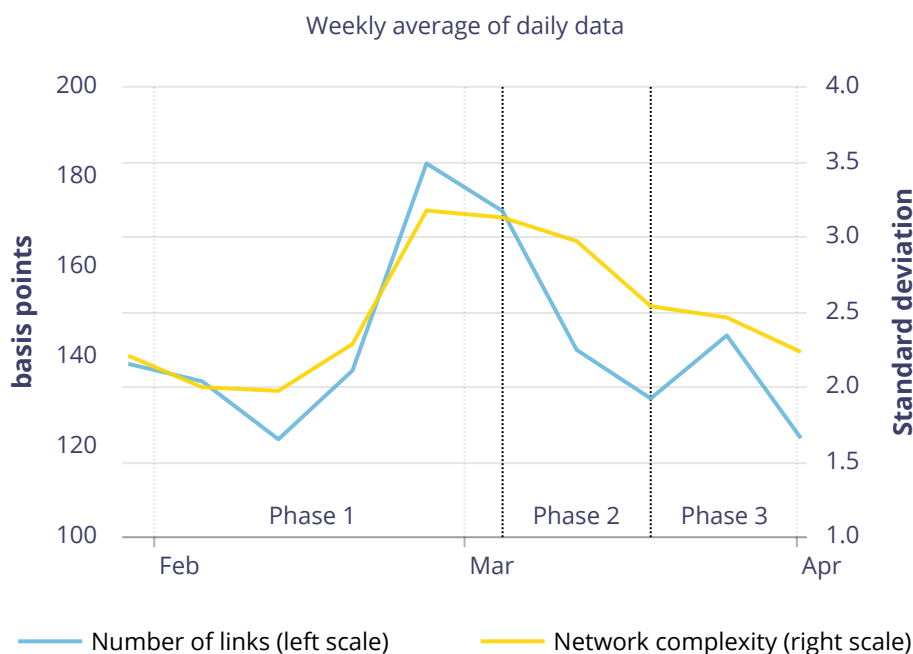
Figure 1: Example of a transaction network



We want to understand how the network for our benchmark bond changed. **Chart 4** shows that the number of links between dealers and clients increased by 50 percent for this bond during phase 1. The chart shows that the complexity of the network of trades also increased dramatically during phase 1.

The larger and more complex network explains how dealers meet the rising demand for trading. As the situation unfolds, each dealer trades with more clients and more dealers. The dealers also begin using a complex mix of repurchase (repo) and spot trades to circulate the bonds between the final buyers and sellers at the end of the trading day. The trading network becomes more complex as the price of liquidity increases. This suggests that the greater degree of complexity reflects the dealers' response to the investors' higher demand for trading.

Chart 4: The complexity of transaction networks peaks in phase 1



Sources: Canadian Depository for Securities and Bank of Canada calculations

Last observation: April 1, 2020

Phase 2—the market malfunctions

The second phase covers the weeks of:

- March 9 to 13
- March 16 to 20

Early during this phase, trading volume fell (**Chart 1** and **Chart 2**), but the price of liquidity remained elevated (**Chart 3**). This suggests that dealers reduced the supply of liquidity and clients started to face challenges in trading bonds.

Fleming and Ruela (2020) find that the worst period of illiquidity for US Treasury bonds occurred in the same time frame, with notable improvements thereafter. Consistent with this, **Chart 4** shows a sharp reduction in the complexity and the number of links in dealer networks, reversing the rise observed in the first phase of the crisis. In unreported results, the data show that this reduction was common across dealers and not due to one or a few dealers substantially reducing their activities while others maintained theirs.

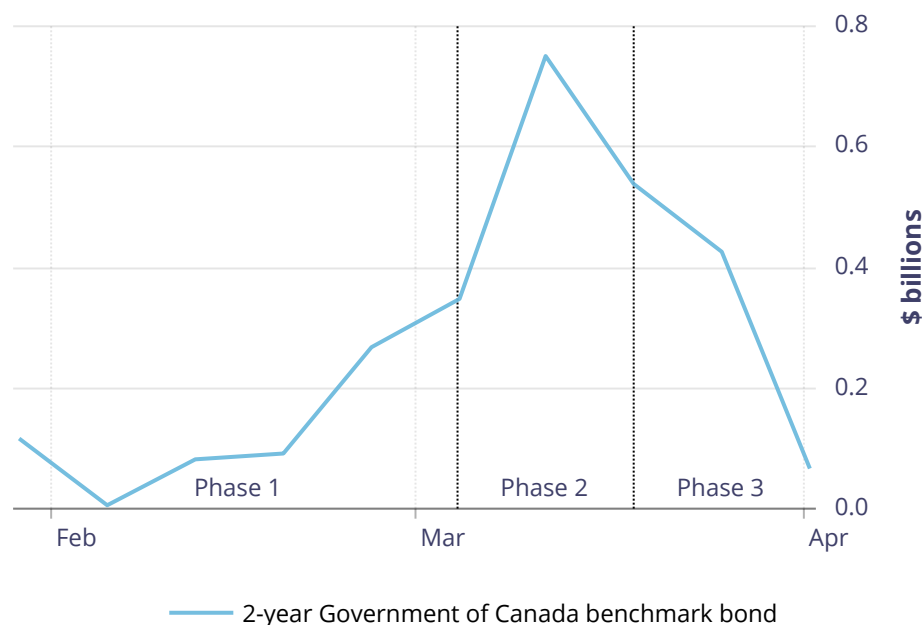
A potentially important reason for dealers to sharply reduce their supply of liquidity is that they were facing challenging funding conditions. Indeed, during that period, the Bank announced several policy actions to support the financial system (details about these can be found on the [Bank's website](#)):

- March 12: expanded the bond buyback program and term repo operations
- March 13: announced the Bankers' Acceptance Purchase Facility
- March 16: announced purchases of Canada Mortgage Bonds and the expansion of term repo collateral
- March 18: expanded the list of eligible securities for term repo and the collateral policy for the Standing Term Liquidity Facility
- March 20: announced more frequent term repo operations
- March 23: launched the Bankers' Acceptance Purchase Facility
- March 24: announced the Provincial Money Market Purchase Program

Interestingly, liquidity conditions did not worsen further during phases 2 and 3. This is possibly a sign that these and later Bank announcements stabilized conditions in the Government of Canada bond market. Nonetheless, the rapid reduction in the size and complexity of dealer networks introduced another difficulty. Cascades of settlement failures became widespread ([Chart 5](#)). Settlement fails are unanticipated delays that occur when a trader fails to deliver securities. These fails sometimes cascade over a transaction network when counterparties that fail to receive bonds then also fail to deliver them. Fontaine and Walton (2020) show that large and complex dealer networks are exposed to widespread settlement failures when market conditions change rapidly or big news hits the market. Adapting to these changes was made more difficult as dealers moved their operations to backup locations and many staff started working from home.

Chart 5: Settlement fails peak in phase 2

Weekly average of daily data



Sources: Canadian Depository for Securities and Bank of Canada calculations

Last observation: April 1, 2020

Phase 3—the relative calm

The final phase covers the weeks of:

- March 23 to 27
- March 30 to April 3 (and continues at the time of writing)

During this period, the trading volume has recovered to a level slightly above what was normal earlier in 2020 (**Chart 1** and **Chart 2**). More important, the price of liquidity has reversed most of the increases observed in the first week and settled at a level slightly higher than normal (**Chart 3**). This suggests that dealers are now accommodating the demand for liquidity at moderately higher costs than before the start of the crisis. Indeed, the complexity and the number of links in dealer networks have returned to normal levels, and the number of settlement fails has fallen to almost zero.

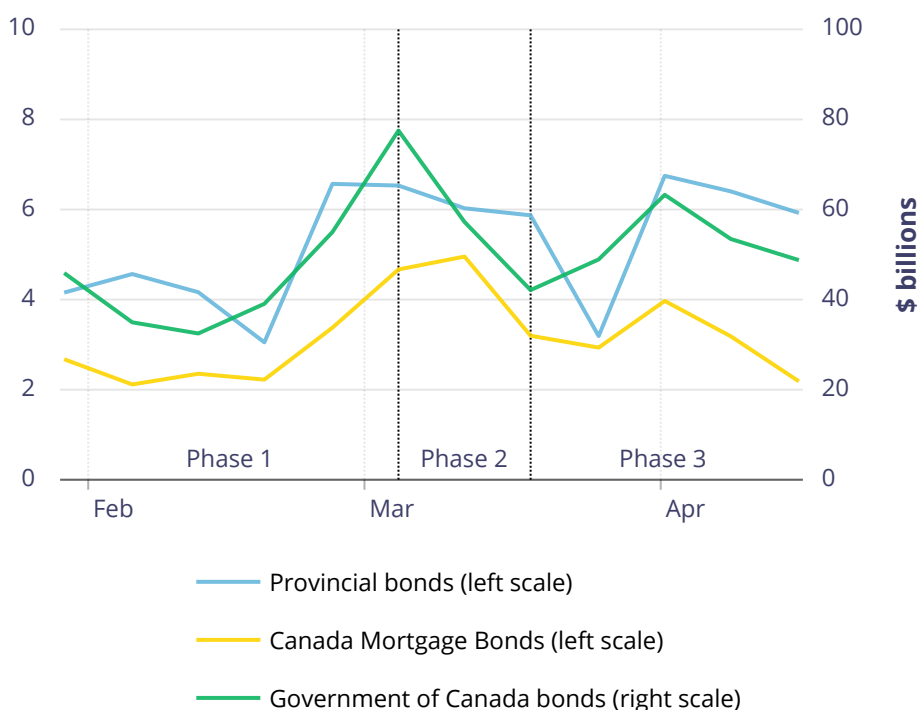
Broader patterns

Following the path of a single bond has the benefit of simplicity. Yet the same pattern can be observed for most active bonds in Canada. The pattern of total trading volume for all Government of Canada bonds is similar across the three phases (**Chart 6**). The peak of trading volume for these bonds at the end of the first phase was almost 50 percent greater than the highest value in 2019 (\$53 billion). This reinforces the idea that markets initially responded well.

The same broad pattern emerges for the total trading volume of all Canada Mortgage Bonds and all provincial bonds. Provincial bonds exhibit peak trading volume in phase 1—\$5.8 billion compared with a high of \$4.2 billion in 2019—and a decline in phase 2. One small difference is that the recovery for provincial bonds seems to start later than the recovery for Government of Canada bonds, which may be due to the timing of the Bank’s liquidity interventions to support the provincial bond markets. Nevertheless, the trading volume for provincial bonds eventually recovers during the third phase as well.

Chart 6: Other large Canadian bond markets share a similar pattern

Weekly average of daily data



Sources: Canadian Depository for Securities and Bank of Canada calculations

Last observation: April 15, 2020

Conclusion

We use the two-year benchmark bond to provide a high-level perspective on how the markets for bonds issued by the Government of Canada evolved as the COVID-19 crisis unfolded. The results of this exercise suggest that the situation progressed in three phases.

The first phase saw a dramatic increase in the demand for liquidity, which dealers largely accommodated but at a higher price for liquidity. The second phase saw a rapid reduction in dealers' supply of liquidity, and the supply was insufficient to absorb the demand. Finally, in the third phase, dealer networks, trading activity and the price for liquidity have stabilized following interventions by the Bank of Canada to support the financial system.

This pattern of a relative recovery is also evident in the broader bond markets in Canada and the United States.

References

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Content Type(s): **Staff research, Staff analytical notes**

Topic(s): **Coronavirus disease (COVID-19), Financial markets, Monetary policy**

JEL Code(s): **E, E4**

DOI: <https://doi.org/10.34989/san-2020-14>