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What Explains the Recent Increase in Canadian Corporate Bond Spreads

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Abstract

The spread between the yield of a corporate bond and the yield of a similar Government of Canada bond reflects compensation for possible default by the issuing firm and compensation for additional risks beyond default. Using the approach proposed by Gilchrist and Zakrajšek (2012), we find that roughly two-thirds of the total 1.2-percentage-point increase in corporate bond spreads from July 2014 to September 2016—a period when oil prices were low—is due to higher compensation for possible default. Default risk explains most of the increase of spreads for energy and high-yield firms but explains almost none of the increase for financial and investment-grade firms. This suggests that liquidity risk and other factors beyond possible default affected spreads of financial and other investment-grade firms.

Bank topic: Financial markets
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Résumé

L'écart entre le rendement d'une obligation de société et celui d'une obligation du gouvernement du Canada comparable correspond à la rémunération exigée en compensation de la possibilité de défaut de la société émettrice et en compensation d'autres risques que le défaut. En appliquant la méthode proposée par Gilchrist et Zakrajšek (2012), nous montrons qu'environ les deux tiers de l'accroissement total de 1,2 point de pourcentage des écarts de rendement sur obligations de sociétés entre juillet 2014 et septembre 2016 – soit une période de faibles prix pétroliers – sont attribuables à un surcroît de rémunération lié à la possibilité de défaut. Si le risque de défaut rend compte de la majeure partie de l'élargissement des écarts de rendement dans le cas des titres du secteur de l'énergie et des obligations à haut rendement, il est par contre loin d'expliquer l'augmentation quand il s'agit des sociétés financières et des entreprises émettrices de titres de bonne qualité. Ce constat donne à penser que le risque de liquidité et d'autres facteurs que la possibilité de défaut sont à l'origine de l'élargissement des écarts relatifs aux titres des sociétés financières et autres émetteurs de titres de bonne qualité.

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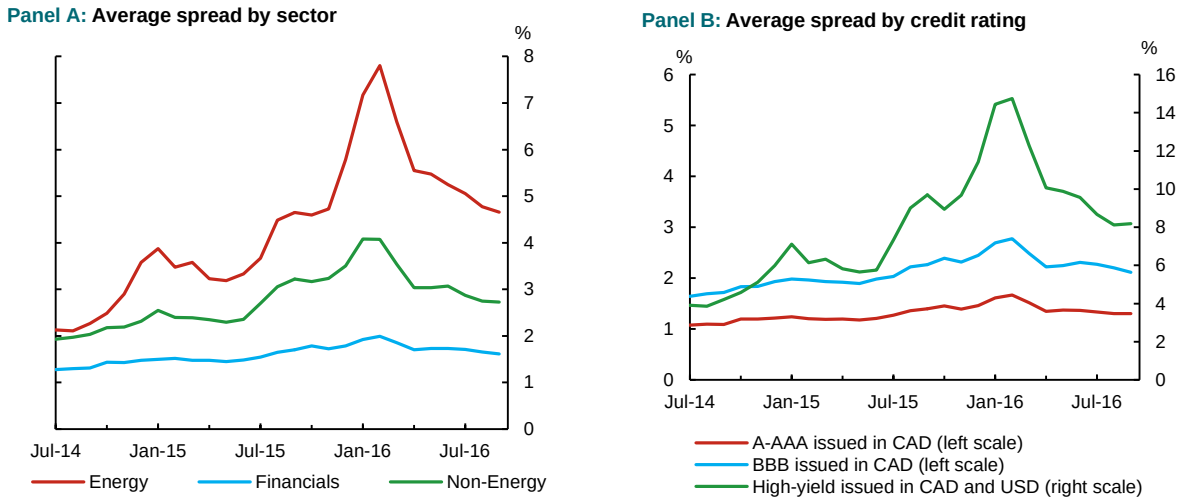
What Explains the Recent Increase in Canadian Corporate Bond Spreads?

The spread between the yield of a corporate bond and the yield of a similar Government of Canada bond reflects compensation for possible default by the issuing firm and compensation for additional risks beyond default. Since the fall in oil prices around the middle of 2014, yield spreads on Canadian corporate bonds have increased substantially, as shown in **Chart 1**. Using the approach proposed by Gilchrist and Zakrajšek (2012), we find that roughly two-thirds of the total 1.2-percentage-point increase in corporate bond spreads from July 2014 to September 2016 is due to higher compensation for possible default. Default risk explains most of the increase of spreads for energy and high-yield firms but explains almost none of the increase for financial and investment-grade firms. This suggests that liquidity risk and other factors beyond potential default affected spreads of financial and other investment-grade firms.

Chart 1: The total rise in spreads since the middle of 2014 was the largest for energy and high-yield firms

Average option-adjusted spread across corporate bonds issued by Canadian firms*
Monthly data



Sources: Bank of America Merrill Lynch, Bloomberg and Bank of Canada calculations Last observation: September 2016

*Note: Investment-grade bonds include only Canadian-dollar issuances. High-yield bonds include both Canadian-dollar and US-dollar issuances.

Decomposing Corporate Bond Spreads

We follow Gilchrist and Zakrajšek (2012) to decompose corporate bond spreads into **compensation for expected default** and **compensation for risk beyond expected default**. The compensation for expected default reflects the additional yield that investors require to bear the risk that the issuing firm may default on its bond obligations. In Gilchrist and Zakrajšek (2012), this component varies with the estimated default probability of firms. The compensation for risk beyond expected default captures variation in investors' risk preferences and attitudes towards corporate credit. It also reflects changes in liquidity premiums: the perceived ability to quickly buy and sell a corporate bond in the secondary market without affecting prices.

We collect a sample of historical data on Canadian bond spreads, bond characteristics and external estimates of firms' default probabilities. For each month in our sample, we predict each bond's individual spread using the estimated historical relationship between spreads, default probabilities and bond characteristics. This predicted value is the compensation for expected default of an individual bond, and the compensation for risk beyond expected default is given by the difference between the observed spread and the predicted spread.

We construct aggregate measures of compensation for expected default and compensation for risk beyond expected default. For example, we create an index of expected default compensation for the entire energy sector by taking the average of the predicted spread for all bonds issued by Canadian firms in the energy sector. We then repeat this aggregation for other sectors and for different credit ratings. We provide further details on the data and methodology in the appendix.

What Explains the Increase in Spreads Since July 2014?

We first apply our decomposition to the market-wide increase in spreads since July 2014. For each month, we calculate the relative contribution of each spread component to the cumulative increase of spreads since July 2014 (**Chart 2**). We note two important developments. First, roughly two-thirds of thetotal 1.2-percentage-point increase in spreads from July 2014 to September 2016 is due to higher compensation for expected default, with the remainder due to risks beyond expected default. Second, the temporary spike in spreads in early 2016 was driven entirely by risk beyond expected default.

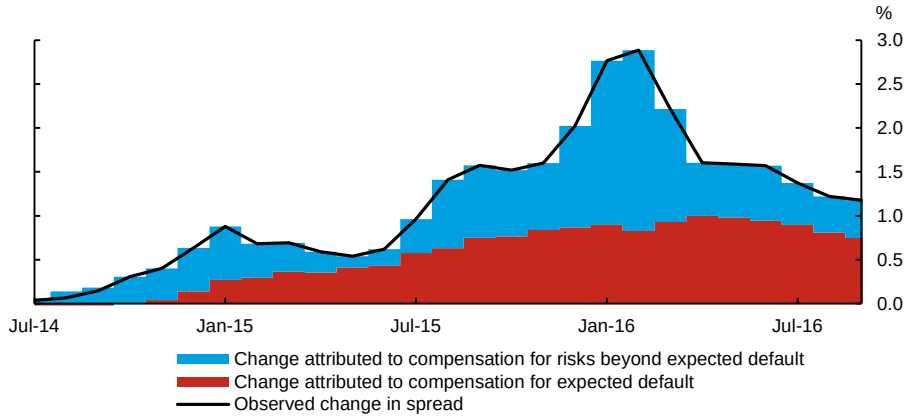
This aggregate picture hides considerable divergence across industries. **Chart 3** shows that bonds issued by firms in the energy sector experienced the largest increase in spreads, increasing by 2.6 percentage points since July 2014. Of this, the model attributes the majority, 1.8 percentage points, to higher compensation for expected default. In contrast, financial spreads increased by only 0.3 percentage points, none of which is attributed to compensation for expected default.

The decomposition shows similar disparities across credit ratings. **Chart 4** shows that the model attributes the entire increase of spreads for investment-grade bonds (AAA to BBB rating) to compensation for risk beyond expected default. On the other hand, almost all of the 4.5-percentage-point increase of spreads for high-yield bonds is attributed to higher compensation for expected default.

Our finding that the increase in the spreads of both energy firms and high-yield firms was driven primarily by higher default risk is consistent with the weakness in energy and non-energy commodity prices in recent years. As Canadian energy firms are directly exposed to lower oil prices, the decline in the value of their assets may hamper their ability to service their debt, increasing their default risk. Similarly, the Canadian high-yield market is composed in large part of firms in the energy sector and other commodity-sensitive sectors. As high-yield issuers are generally more exposed to lower commodity prices than are investment-grade issuers, default risk played a larger role in explaining the rise in their bonds' spreads. On the other hand, financial firms and other non-energy firms have fewer direct exposures to commodity prices.

Chart 2: Roughly two-thirds of the increase in aggregate corporate spreads is due to higher expected default

Decomposition of cumulative variation in average option-adjusted spreads across bonds issued by Canadian firms
Cumulative change since July 2014
Monthly data

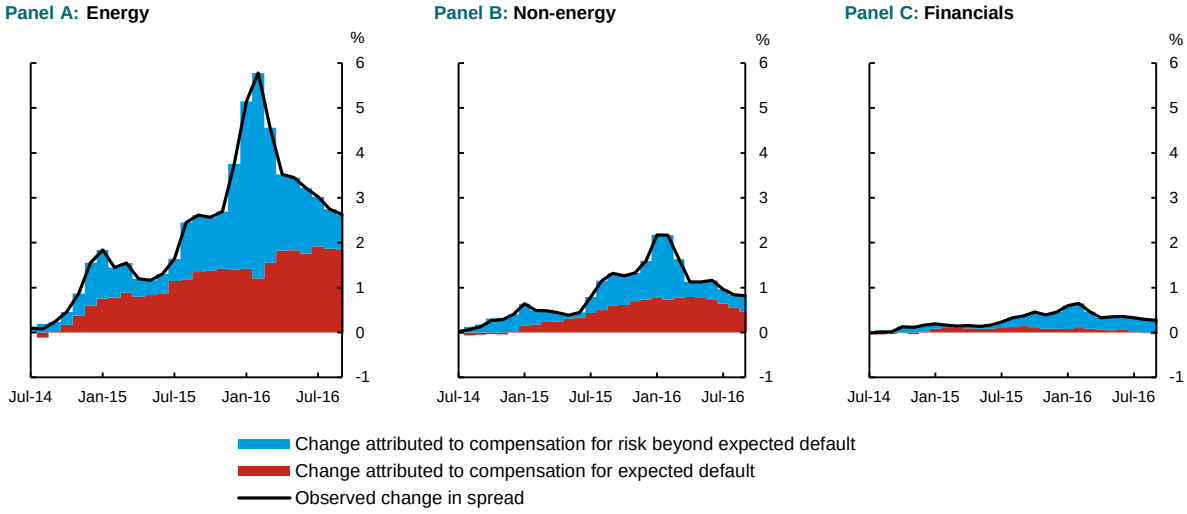


Sources: Bank of America Merrill Lynch, Bloomberg and Bank of Canada calculations

Last observation: September 2016

Chart 3: The drivers of the increase in bond spreads vary across sectors

Decomposition of cumulative variation in average option-adjusted spreads across bonds issued by Canadian firms
Cumulative change since July 2014
By sector, monthly data

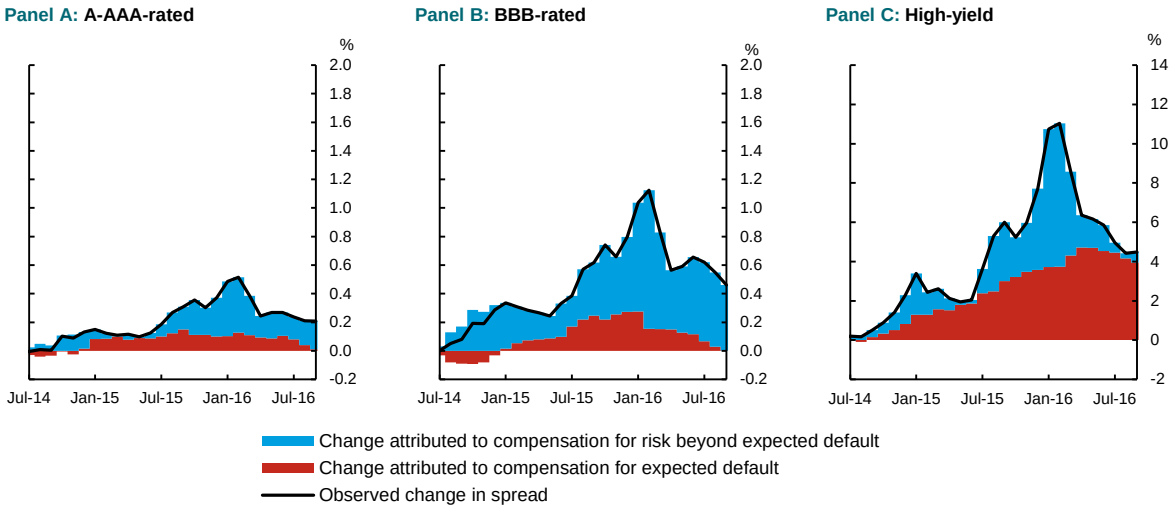


Sources: Bank of America Merrill Lynch, Bloomberg and Bank of Canada calculations

Last observation: September 2016

Chart 4: Higher compensation for expected default explains the entire increase in high-yield spreads

Decomposition of variation in average option-adjusted spreads across bonds issued by Canadian firms
Cumulative change since July 2014
By credit rating, monthly data



Sources: Bank of America Merrill Lynch, Bloomberg and Bank of Canada calculations

Last observation: September 2016

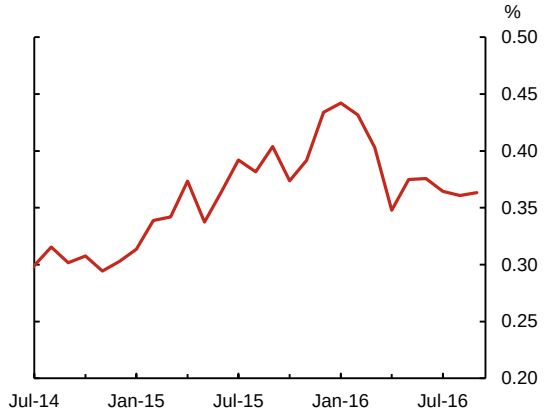
Did Liquidity Play a Role in the Recent Increase in Corporate Spreads?

We use spreads on Canada Mortgage Bonds (CMBs) to gauge the extent to which movement in compensation for risk beyond expected default of A-AAA bonds was driven by higher liquidity premiums. CMB spreads can be used to proxy variation in liquidity premiums as they are government-guaranteed and have no prepayment risk (as in Fontaine, Selody and Wilkins 2009). **Chart 5** plots the average spread to Government of Canada bonds across all outstanding CMBs. Since July 2014, average CMB spreads have increased by around 0.1 percentage points, suggesting that the compensation that investors require for bearing liquidity risk has increased.

In **Chart 6,** we compare the cumulative increase in CMB spreads since July 2014 with the cumulative increase in the compensation for risk beyond expected default for A-AAA Canadian corporate bonds. From July 2014 to July 2015, higher compensation for liquidity risk explains the entire increase in compensation for risk beyond expected default, whereas it did not contribute to the subsequent increase from August 2015 to September 2016. Over the whole period, a comparison with CMB spreads suggests that roughly half of the total 0.2-percentage-point increase in compensation for risk beyond expected default could be due to higher compensation for liquidity risk.

Chart 5: CMB spreads have increased since July 2014

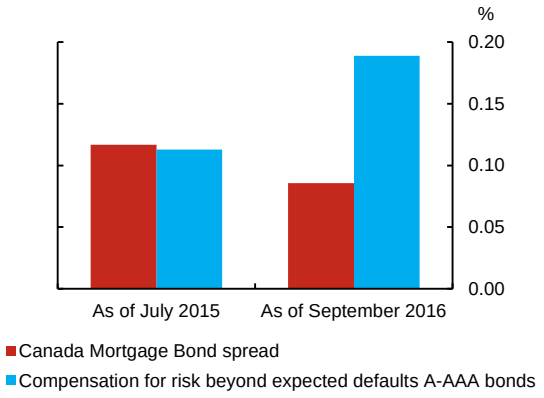
Average option-adjusted spread across Canada Mortgage Bonds
Monthly data



Sources: Bank of America Merrill Lynch and Bank of Canada calculations
Last observation: September 2016

Chart 6: The increase in Canadian corporate spreads can be partially explained by higher compensation for liquidity risks

Cumulative change in percentage points since July 2014



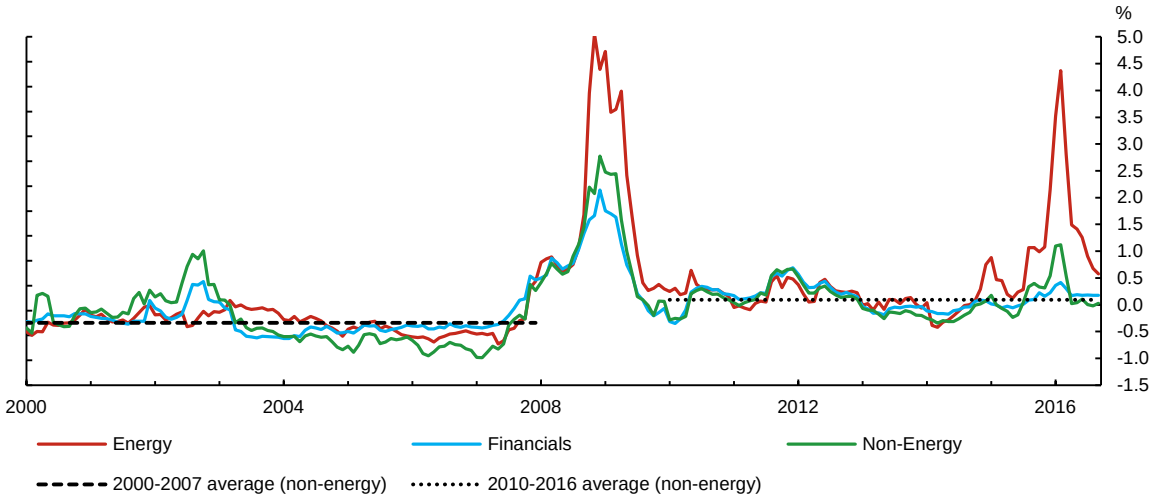
Sources: Bank of America Merrill Lynch, Bloomberg and Bank of Canada calculations
Last observation: September 2016

How High (or Low) Are Current Risk and Liquidity Premiums?

Outside the energy sector, compensation for risk beyond expected default stands near post-crisis lows. This follows a brief period in early 2016 when it surged to post-crisis highs (**Chart 7**). Overall, this suggests that risk aversion, uncertainty or liquidity premiums are low across the entire Canadian corporate bond market. A longer historical perspective provides a different answer, however. Compensation for risk beyond expected default appears to have increased in the post-crisis period relative to the pre-crisis period. We leave identification of the factors behind this shift and its permanence to future research.

Chart 7: Compensation for risk beyond default is near post-crisis lows and appears to have shifted upward in the post crisis-period

Average estimated compensation for risk beyond default across corporate bonds issued by Canadian firms*
Monthly data



Sources: Bank of America Merrill Lynch, Bloomberg and Bank of Canada calculations
Last observation: September 2016

*Note: Investment-grade bonds include only Canadian-dollar issuances. High-yield bonds include both Canadian dollar and US-dollar issuances.

References

Fontaine, J.-S., J. Selody and C. Wilkins. 2009. "Improving the Resilience of Core Funding Markets." Bank of Canada *Financial System Review* (December): 41–46.

Gilchrist, S. and E. Zakrajšek. 2012. "Credit Spreads and Business Cycle Fluctuations." *American Economic Review* 102 (4): 1692–1720.

Appendix—Data and Methodology

We obtain monthly option-adjusted spreads for Canadian corporate bonds from Bank of America Merrill Lynch. Bank of America Merrill Lynch calculates option-adjusted spreads to filter out variation due to the option component of callable debt. We obtain monthly five-year default probabilities from the Bloomberg credit-risk model, which augments a Merton distance-to-default model with other relevant factors, including accounting information. Finally, we obtain bond reference data such as issue date and maturity type from Bloomberg. Matching by International Securities Identification Number, we use these three data sources to obtain an unbalanced panel of monthly bond observations from January 1999 to September 2016.

We use bonds issued by Canadian companies only. For investment-grade bonds, we restrict our sample to Canadian-dollar issuances only. However, for high-yield firms, we include both Canadian-dollar and US-dollar issuances. This is done to account for the importance of the US-dollar corporate bond market for Canadian high-yield firms. We define the financial sector as including bonds issued by firms involved in banking, financial services and asset-backed securities. The energy sector includes bonds issued by firms that are involved in energy exploration and production, gas distribution, oil field equipment and services, and oil refining and marketing. **Table A1** shows the composition of our sample and some descriptive statistics. The overall mean is noticeably higher than the median, which reflects the fact that high-yield bonds are in small numbers and have much higher spreads. The results presented in this paper use the mean, although we obtained similar results using the median.

Table A1: Sample composition

	Full sample	By sector			By rating		
		Energy	Financials	Other	A-AAA	BBB	HY
No. of bonds	1,241	321	464	465	672	449	298
No. of (bond, month) observations	61,340	13,888	22,667	24,785	31,202	20,712	9,426
Median spread (%)	1.33	1.95	0.85	1.58	0.77	1.72	4.31
Mean spread (%)	2.01	3.23	1.20	2.08	0.98	1.95	5.57
Median default probability (%)	1.76	1.64	2.10	1.28	1.92	1.26	2.71
Mean default probability (%)	2.02	2.31	2.27	1.64	1.95	1.52	3.37

We follow Gilchrist and Zakrajšek (2012) to decompose spreads into compensation for expected default and compensation for risk beyond expected default. We first estimate **equation 1**, where the log of the option-adjusted spread of bond *k* issued by firm *i* at month *t*—$\log(S_{it}[k])$—is regressed on firm *i*'s five-year default probability ($DFT_{it}[k]$) and a vector of bond characteristics ($\boldsymbol{Z}_{it}[k]$), both at month *t*. The bond characteristics include duration, amount outstanding, coupon rate, credit rating dummies and a currency dummy. **Equation 2** gives the predicted level of each bond spread associated with a given probability of default and bond characteristics. Compensation for expected default ($\hat{S}_t$) in each period is defined as the average predicted spread across all bonds (**equation 3**). Finally, compensation for risk beyond expected default (RBD_t) is simply the average residual (**equation 4**).

Equation 1 is estimated from January 1999 to June 2014. Using the estimated coefficients, we obtain predicted spreads over the full sample, from 1999 to September 2016. In addition, when computing the averages across bonds over the June 2014 to September 2016 period, we restrict the sample to bonds that are outstanding over the full period (i.e., 28 observations for each bond). This is done to remove any movement in the average spread from new issuances or maturities.

Equation 1: $log(S_{it}[k]) = \beta ln(DFT_{it}[k]) + \gamma' \boldsymbol{Z}_{it}[k] + \varepsilon_{it}[k]$

Equation 2: $\hat{S}_{it}[k] = \exp(\hat{\beta} ln(DFT_{it}[k]) + \hat{\gamma}' \boldsymbol{Z}_{it}[k] + \frac{\widehat{\sigma^2}}{2})$

Equation 3: $\hat{S}_t = \frac{1}{N_t} \sum_i \sum_k \hat{S}_{it}[k]$

Equation 4: $RBD_t = S_t - \hat{S}_t$