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Ontario Energy Board Cost of Capital – Review of recent macroeconomic developments

prepared for the Ontario Energy Board by London Economics International LLC

April 24, 2020

London Economics International LLC ("LEI") was retained by the Ontario Energy Board ("OEB") to monitor macroeconomic conditions to ensure the cost of capital parameters for 2020 rates (issued by the OEB on October 31st, 2019) reflect current outlooks. As part of this quarterly review, for illustrative purposes, LEI conducted updated calculations of the return on equity ("ROE"), the deemed long-term debt rate ("DLTDR"), and the deemed short-term debt rate ("DSTDR") using data as of March 31st, 2020. This resulted in an ROE of 8.53%, with deemed long-term and short-term debt rates of 3.23% and 2.18% respectively.

Macroeconomic conditions have deteriorated rapidly since the last update as a result of the global COVID-19 pandemic that has seen the Canadian economy (along with other global economies) likely enter into recession. In the month of March, aggressive actions have been taken by the Bank of Canada and the Federal and provincial governments to support the economy, including interest rates that are now close to zero. In this briefing note, we provide additional special analysis to describe the extraordinary differences that have characterized the first quarter of 2020.

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1 Executive summary

This quarterly report will update the Ontario Energy Board ("OEB") on recent macroeconomic trends on a global, North American, and provincial scale since its publication of the 2020 cost of capital parameters (published on October 31st, 2019). Specifically, this report outlines:

- the short-term global outlooks for GDP growth and interest rates, in light of the Great Lockdown economic crisis caused by the global COVID-19 pandemic;

- the outlook for the Canadian economy, which has undergone significant disruption as a result of the pandemic, whereby growth is expected to decline sharply by 3.9%[1] In addition, the oil price shock that preceded and has sustained into the economic crisis resulting from the pandemic is likely to disproportionately affect Canada, relative to other developed countries.; and

- the short-term forecast for Ontario GDP growth, which is similarly expected to decline to -2.77%, erasing the gains made from the 1.77% GDP growth rate achieved in 2019.[2]

In addition to the review of macroeconomic developments, LEI has cross-checked the cost of capital parameters with data as of March 31st, 2020. The results of this exercise are summarized in Figure 1 below.

The cost of capital parameters remained relatively steady, with the return on equity ("ROE") increasing to 8.53% and deemed long-term debt rate ("DLTDR") to 3.23%, relative to September 2019 rates. While the 10-year Government of Canada bond yields have declined from 1.70% (in September 2019) to 0.85% (in March 2020), these cost of capital parameters have remained steady primarily because: (i) the spreads between the 10-year and 30-year bond yields have widened significantly (from 0.2% in September 2019 to 0.4% in March 2020); and (ii) the A-rated Utility Bond Yield Spread has widened (from 1.5% in September 2019 to 2.0% in March 2020).

The deemed short-term debt rate ("DSTDR") declined to 2.18%, driven by the falling banker's acceptance ("BA") rates. Both the ROE and DLTDR have increased very slightly relative to the September 2019 update, while the DSTDR has decreased by nearly 60 basis points relative to the update. Given the movements in all three cost of capital parameters since the OEB's 2020 update, the changes to the short-term rate can be considered to be material.

However, it remains to be seen whether the low rates seen in response to the pandemic are actionable, and if lenders are willing to extend significant credit at any interest under the current climate. Preliminary data from the fourth quarter of 2019 in Canada suggest that flows of

[1] International Monetary Fund. *World Economic Outlook, April 2020: Chapter 1: The Great Lockdown.* April 2020

[2] Note values are taken as an average of estimates compiled from various economic outlooks, including those published by RBC, TD and National Bank. (Sources: RBC Economics. *Provincial Outlook.* April 2020; TD Economics. *Provincial Economic Forecast.* March 17, 2019; National Bank of Canada. *Monthly Economic Monitor.* April 2020).

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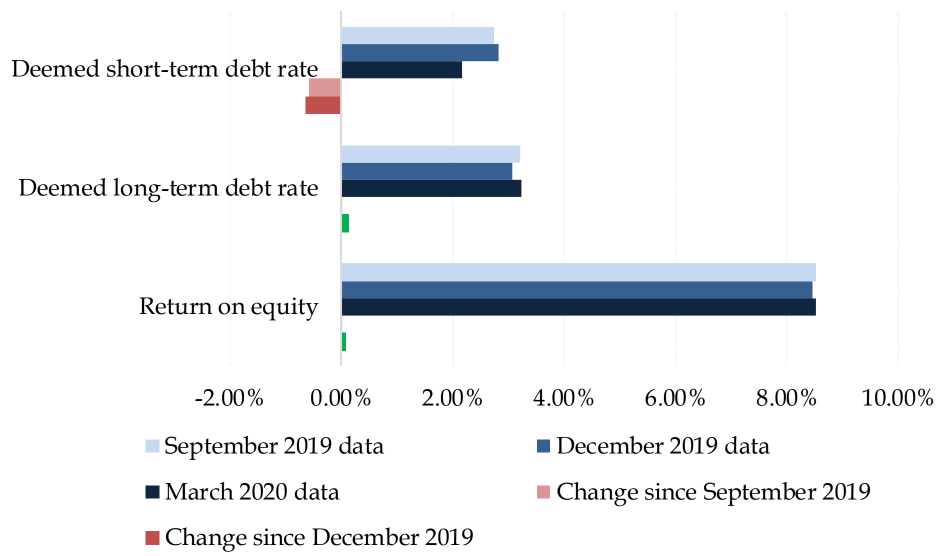
consumer credit had been trending downwards,[3] and LEI anticipates this trend to persist through Q2 of 2020, as the world grapples with the impact of the pandemic across the global economy. It is expected that these values may change further as governments and central banks take action to combat the economic fallout from the pandemic.

Figure 1. 2020 cost of capital parameters using data from January 2020 to March 2020



Cost of capital parameter	Value based on September 2019 data	Value based on December 2019 data	Value based on March 2020 data	Difference (since December 2019)	Difference (since September 2019)
Return on equity	8.52%	8.46%	8.53%	0.07%	0.01%
Deemed long-term debt rate	3.21%	3.08%	3.23%	0.15%	0.02%
Deemed short-term debt rate	2.75%	2.82%	2.18%	-0.64%	-0.57%

While there is limited room to maneuver with respect to rate cuts from central banks, LEI anticipates that economic conditions will further deteriorate in the second quarter.

[3] Statistics Canada. "The Daily: National Balance Sheet and Financial Flow Accounts, Fourth Quarter 2019." March 13, 2020. < https://www150.statcan.gc.ca/n1/daily-quotidien/200313/dq200313a-eng.htm>

2 Recap and recent macroeconomic developments

In this section, LEI briefly summarizes its previous briefing note, and describes recent macroeconomic developments since the publication of the Letter from the Board outlining the 2020 cost of capital parameters, released on October 31st, 2019.

2.1 Cost of capital – Q4 2019 recap

In LEI's second briefing note to the OEB, submitted on January 15th, 2020, the general short-term outlook for both global economic growth and interest rates for 2020 had solidified the declining trend, driven by ongoing trade tensions between major global economies (notably the US and China), and the resultant decline in manufacturing activity.[4] As for Canada, the outlook for 2020 was relatively more stable, as moderate consumer spending and housing activity offsetting contracting exports of mainly non-energy commodities.[5] Looking at the Province of Ontario's short-term outlook, the declining GDP growth trend had stabilized, as a result of a strengthening housing and labor markets.[6]

Combined, these market forces resulted in a small but observed relative declines in two of the calculated 2020 cost of capital parameters relative to the annual update. Specifically, the calculated ROE declined by 6 basis points to 8.46%, while the DLTDR declined by 13 basis points to 3.08%. In contrast, the DSTDR increased by 7 basis points to 2.82%. The decline in two of the three parameters was in line with expectations given the prevailing macroeconomic conditions and was primarily driven by declines in the actual and forecasted long-term bond yields (for 10- and 30-year Government of Canada bonds).

2.2 Recent macroeconomic developments

Since LEI's second briefing note to the OEB, the world has seen a dramatic and precipitous decline in output, and virtually all economies have since likely gone into technical recession. In general, the macroeconomy of the first quarter of 2020 can be distinguished into two main segments, the trade tensions and declining crude oil prices that characterized January and February, and the rapid and steep declines in output as economies shuttered across the globe to curb the spread of the coronavirus that characterized the month of March. A summary of these forces is summarized in Figure 2 below.

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[4] International Monetary Fund. *World Economic Outlook: Global Manufacturing Downturn, Rising Trade Barriers.* October 2019.

[5] TD Economics. *Quarterly Economic Forecast.* December 17, 2019.

[6] BMO Capital Markets Economic Research. *Provincial Monitor.* December 2, 2019.

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Figure 2. Summary of macroeconomic outlooks for 2020

Region	Growth trend relative to previous briefing note	Interest rates trends relative to previous briefing note	Key factors
Global	Declining	Declining	• Widespread economic decline resulting from the measures in place to curb the spread of the coronavirus causing COVID-19 • Increased uncertainty over global supply chains as economies slow down sharply
Canada	Declining	Declining	• Economic shutdown across the country to curb the spread of COVID-19 • Heavy increased government spending to cushion impact of the resulting economic shock • Aggressive monetary policy to bring down interest rates
Ontario	Declining	N/A	• Province-wide state of emergency declared limiting open businesses to essential services only • Reduced economic activity from key growth drivers such as housing and consumer spending to further drag economy

Sources: International Monetary Fund; BMO; RBC; TD; Bank of Canada.

2.2.1 Special analysis: assessing the initial economic impact of COVID-19

As of April 19th, 2020, there are over 2.3 million confirmed recorded cases and tragically, over 150,000 deaths that have resulted from COVID-19, a disease caused by the novel coronavirus SARS-CoV-2.[7] What began as a pneumonia-like influenza towards the end of 2019 has since grown into a global pandemic larger than any previous health crisis since the 1918 Influenza Pandemic.[8] Given the nature of the coronavirus – i.e. there are no known cures or vaccines – the best tools to limit the human cost of the disease caused by the virus involve quarantine and isolation measures.[9] This has been widely employed to varying extents across virtually all countries around the world, and aggressively in all advanced economies and jurisdictions.

In its initial release of the World Economic Outlook in April 2020, the International Monetary Fund ("IMF") has termed the resultant economic crisis from the pandemic the Great Lockdown, after the aggressive shutdown measures many governments have placed on their citizens to curb the spread of the disease.[10] IMF has revised down its growth forecast for the world economy from its January 2020 update which had forecast ***growth of 3.3% to a decline of 3%***.[11] For advanced

[7] World Health Organization website. *Novel Coronavirus 2019*. Accessed on April 20, 2020. Accessed at: < https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

[8] World Health Organization. *WHO Director-General's opening remarks at the media briefing on COVID-19*. March 11th, 2020

[9] World Health Organization website. *Novel Coronavirus 2019*. Accessed on April 20, 2020. Accessed at: < https://www.who.int/emergencies/diseases/novel-coronavirus-2019>.

[10] International Monetary Fund. *World Economic Outlook, April 2020: Chapter 1: The Great Lockdown*. April 2020.

[11] Ibid.

economies, the declines are even larger, with output expected to decline 6.1% in 2020, relative to prior forecasted growth of 1.6%.

In Canada, the first confirmed case of COVID-19 was recorded on February 20th, 2020, and as of April 19th, 2020, just under 37,000 cases had been recorded with around 1,700 deaths.[12] A large proportion of the confirmed cases of the outbreak in Canada have been recorded in Ontario, with just over 11,000 as of writing, and around 580 deaths, representing 30% and 35% of the national total, respectively.[13] Similar to the measures taken globally, the Canadian government has taken steps to curb the spread of the disease by placing limitations on commerce, movement and public gatherings.

In subsequent sections, we discuss the macroeconomic implications of the crisis and the measures taken by global, North American and Canadian governments in response to the economic crisis.

2.2.2 Global and North American outlook update for 2020

Prior to the impact of the global pandemic, economic activity had been slowing across the world economy as a result of the continued trade tensions between the two largest global economies i.e. the US and China. In its January update to its global outlook, the IMF noted that there were reasons to believe that sluggish manufacturing and trade activity had "bottomed out" as a result of tentative agreements in trade negotiations and decreasing uncertainty of the United Kingdom leaving the European Union ("EU") without a trade deal.[14]

However in the months of February and March, crude oil benchmarks saw precipitous historic declines in prices. These declines were driven by reduced demand from East Asian markets grappling with outbreaks of COVID-19, and a supply glut from major oil-producing countries. Over this period, the global benchmark for crude oil, Brent crude, declined 43% over previous month, and 52% over previous year.[15]

The result of the global pandemic has been a strong decline in forecasts for global and regional growth for the year 2020. Specifically, in addition to IMF predicting a decline of 3% for global GDP growth for 2020, and the Consensus Forecasts shows that among economic forecasters,

[12] Government of Canada website. *Coronavirus disease (COVID-19): Outbreak update.* Accessed on April 20, 2020. Accessed at: < https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html>

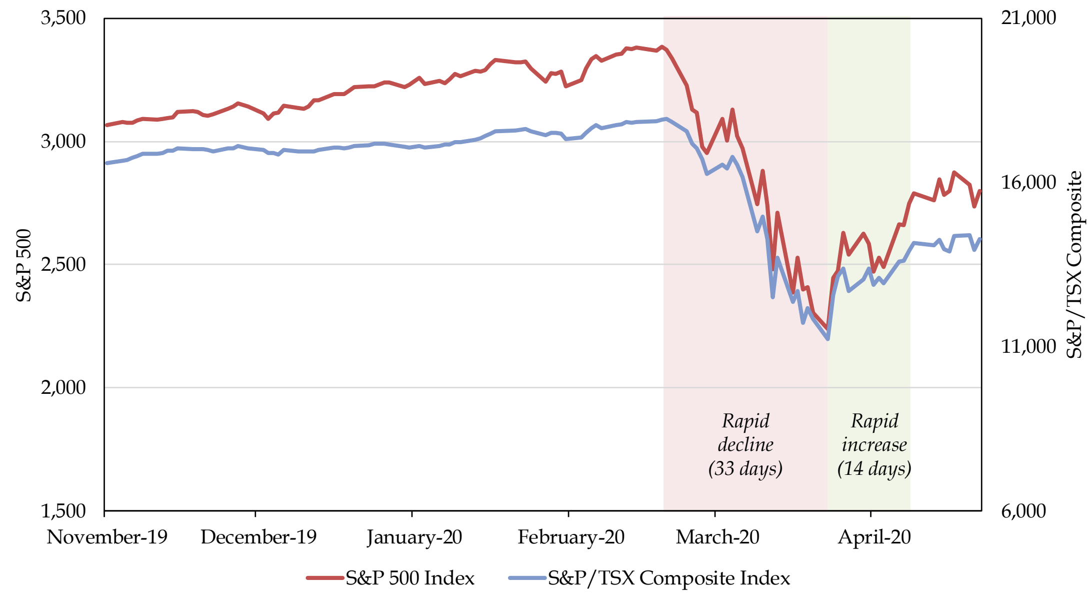
[13] Ibid.

[14] International Monetary Fund. *World Economic Outlook: Update. Tentative Stabilization, Sluggish Recovery?* January 20, 2020.

[15] Thomson Reuters. *Europe Brent Spot Price.* Accessed on April 20, 2020.

growth for North America has been downgraded to negative 4%.[16,17] Declines and volatility have also characterized the financial markets, where between February 19 and March 23, the S&P 500 Index declined by 33%, before increasing by 24% in the following 14 days. These sharp swings are illustrated in Figure 3 below, and demonstrate both the uncertainty and impact of the aggressive measures that have been taken over the past month.

Figure 3. S&P 500 Index and TSX/S&P Composite Index, November 2019 to April 2020



Source: Commercial third-party database.

With economic activity expected to be depressed until the middle of the year, we anticipate that the full extent of the economic crisis remains to be seen.

2.2.3 Canadian outlook update for 2020

With regard to the Canadian outlook, the gains from previous quarters are anticipated to be erased with growth expected to decline by 3.9% in 2020 resulting from the impact of declining crude oil prices, economic disruptions from rail blockades and the economic impact from measures taken to curb the spread of COVID-19.[18] That decline understates the impact of COVID-19, as Statistics Canada data showed that month-on-month, economic activity declined by 9% in March in an unprecedented early release of economic data.[19] As a result of these multiple shocks

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[16] International Monetary Fund. *World Economic Outlook: Update. Tentative Stabilization, Sluggish Recovery?* January 20, 2020

[17] Consensus Forecasts. *Surveys of International Forecasts*. April 6, 2020.

[18] Ibid. P.16

[19] Statistics Canada. *Gross domestic product by industry: Nowcast, March 2020*. April 15, 2020

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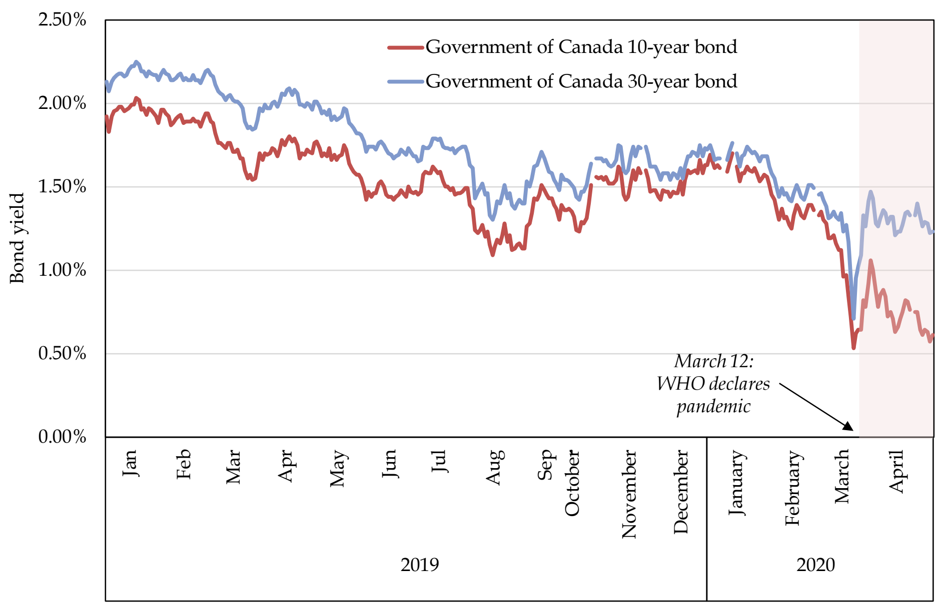
to the economy over a short period of time, the Bank of Canada and the Canadian Federal government have taken aggressive and unprecedented measures to attempt to cushion their impact.

In the span of three weeks in March, the Bank of Canada lowered the overnight target rate from 1.75% to 1.25% on March 4th, then 0.75% on March 16th and finally to 0.25% on March 27th, 2020.[20] As part of the announcement for the third unscheduled rate cure, the Bank noted that it is intending to ease the cost of borrowing and increasing the availability of credit.[21] In addition, the central bank indicated that on top of other measures to increase short-term liquidity, it would step up its program of bond buying and Provincial money market instruments. These monetary changes have resulted in widening spreads between the yields on the 10-year and 30-year bonds as investors seek safety in longer term assets. Specifically, the spread between the two treasuries has grown from 0.08% at the beginning of 2020 to 0.68% by April 15, 2020. This is illustrated below in Figure 4.

Figure 4. Government of Canada 10 and 30-year bond yields, September 2019 – April 2020



Source: Bank of Canada.

To provide further context to macroeconomic outlook in Canada, LEI has also tracked movements in consumer credit levels and business confidence, as reported by Statistics Canada and the Bank of Canada, respectively.

[20] The Bank of Canada. *Bank of Canada lowers overnight rate target to ¼ percent.* March 27, 2020.

[21] Ibid.

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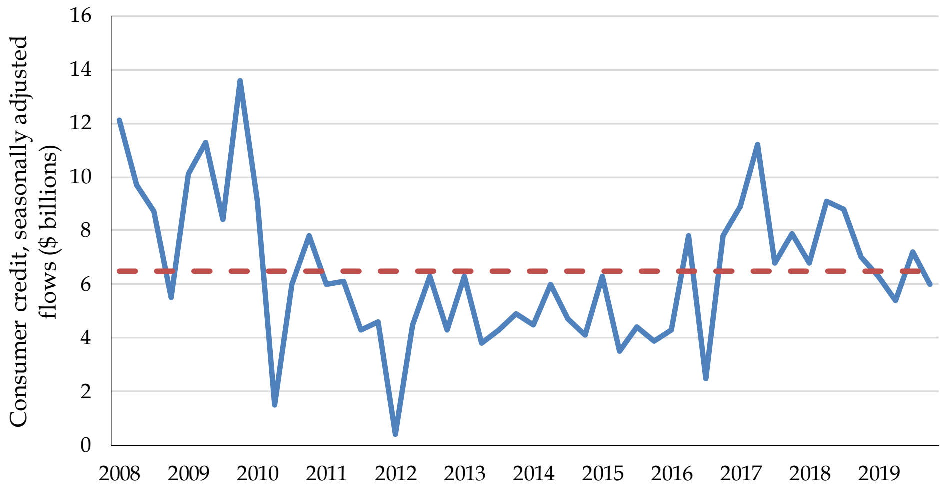
According to Statistics Canada's quarterly release of the 'national balance sheet and financial flow accounts', consumer credit declined to $6 billion in the fourth quarter of 2019, down $1.2 billion from the previous quarter and 7% below the average consumer credit levels seen over the 2008-2019 period.[22] These movements are shown in Figure 5 below. These indicators will likely continue to deteriorate in Q1 and Q2 of 2020 once the data showing the impact of economic shocks becomes more apparent. In particular, LEI notes that it remains to be seen whether the low rates are actionable, and if lenders are willing to extend credit under the current climate.

Figure 5. Consumer credit, 2008 Q1 – 2019 Q4



Source: Statistics Canada. *CANSIM Table 38-10-0238-01.* Accessed April 19, 2020
Note: The latest consumer credit data is most recently published in March 2020 for Q4 2019. Q1 2020 data is not yet available.

As for business confidence, LEI analyzed the results of the Bank of Canada's Business Outlook Survey ("BOS") for the Spring 2020 period, along with historical movements in the survey's main indicator, the BOS indicator, as depicted in Figure 6.[23] Despite modest improvements in business confidence registered in the Winter 2019-20 survey, the Spring survey showed that even before the full impact of COVID-19 became apparent, the indicator had declined from 0.75 to -0.68 by

[22] Statistics Canada. "The Daily: National Balance Sheet and Financial Flow Accounts, Fourth Quarter 2019." March 13, 2020. < https://www150.statcan.gc.ca/n1/daily-quotidien/200313/dq200313a-eng.htm>

[23] The BOS is a quarterly survey summarizing the interviews conducted by the Bank's regional offices with the senior management of about 100 firms selected in accordance with the composition of the gross domestic product of Canada's business sector. The Spring 2020 survey was conducted from February 11th to March 6th, 2020. The BOS indicator is a summary measure that captures common movements from the main BOS questions and is above zero when business confidence is above its historical average. (Source: Bank of Canada)

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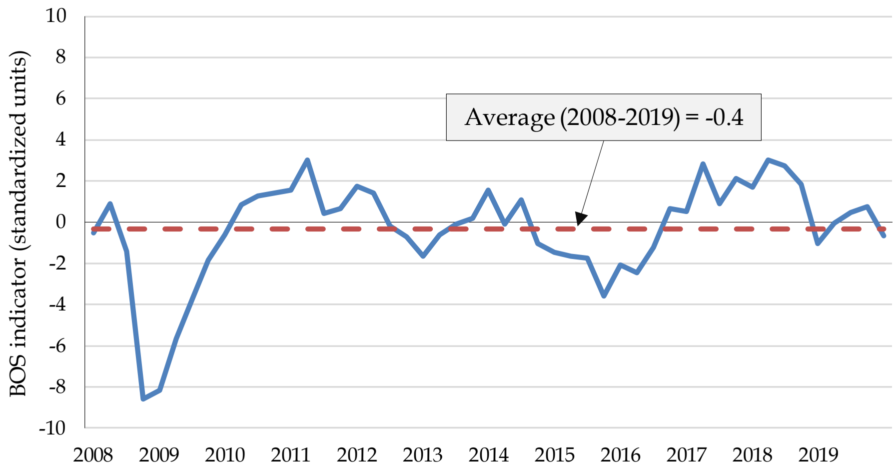
the end of the survey period, illustrating the impact of shocks to the hydrocarbon extraction industry and transportation segments.[24]

Figure 6. Business confidence, 2008 Q1 – 2020 Q1



Source: Bank of Canada. Business Outlook Survey – Spring 2020." April 6, 2020. < https://www.bankofcanada.ca/2020/04/business-outlook-survey-spring-2020/>

Note: The BOS indicator is above zero when business confidence is above its historical average.

2.2.4 Ontario outlook update for 2020

Ontario's GDP growth is expected on average to decline to -2.77% in 2020 (down from previous forecasts of 1.73%),[25] and down from 1.77% in 2019. In addition to the global economic shocks described in previous sections, Ontario's economy will be affected by declining levels of consumer spending and limits to the growth in housing markets as a result of the global pandemic.[26] The impact of economic disruptions experienced in January and February from trade tensions, declining manufacturing output following plant closures, and railway blockades is also likely to impact quarterly GDP growth in Ontario, resulting in the sharp reversal of growth from previous forecasts.[27]

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[24] Bank of Canada. *"Business Outlook Survey – Spring 2020."* April 6, 2020. Accessed at: < https://www.bankofcanada.ca/2020/04/business-outlook-survey-spring-2020/>

[25] 2020 forecasts taken as an average of estimates published by BMO, RBC, and TD. (Sources: RBC Economics. *Provincial Outlook.* April 2020; TD Economics. *Provincial Economic Forecast.* March 17, 2019; National Bank of Canada. *Monthly Economic Monitor.* April 2020).

[26] RBC Economics. *Provincial Outlook.* April 2020.

[27] TD Economics. *Provincial Economic Forecast.* March 17, 2019

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3 Cost of capital parameters – Q1 2020 update

The OEB conducts its annual cost of capital parameter update using data as of September 30th of that year, with rates becoming effective on January 1st of the following year. As part of this quarterly review, LEI has conducted an internal update of the cost of capital parameters using data as of March 31st, 2020, where possible.

Overall, as the impact of the macroeconomic shocks becomes more apparent, the actions taken by governments and central banks have seen a decline in the short-term rates, with the ROE and long-term rates somewhat unchanged by the vast macroeconomic changes seen in the first quarter, driven by the widening spreads between the 10-year and 30-year government bonds. This follows the macroeconomic trends discussed in Section 2.2, both short and long-term forecasts have declined and gone into negative territory. Further declines can be expected as the extent of the global pandemic becomes more apparent.

3.1 Return on equity

The ROE is the allowed return on shareholders' invested capital that is comparable to the return that investors would expect to earn from other investments with similar levels of business risk. Using data as of March 31st, 2020 from the Bank of Canada, Consensus Economics, and Bloomberg, LEI calculated the ROE as **8.53%**, up one (1) basis point from the published 2020 cost of capital parameter update. See Appendix A for a detailed illustration of this calculation.

3.2 Deemed long-term debt rate

The DLTDR reflects the interest rate that would be charged to an A-rated commercial business customer for a long-term (30-year) commercial loan. Following LEI's internal update of the OEB's cost of capital parameter calculations, the deemed long-term debt rate was determined to be **3.23%,** up two (2) basis points compared to the 2020 cost of capital parameters. See Appendix A for a detailed illustration of this calculation.

3.3 Deemed short-term debt rate

Finally, the DSTDR reflects the interest rate that would be charged to an A-rated commercial business customer for a short-term (3-month) loan by a commercial bank. Note that the DSTDR calculation incorporates the results of a confidential survey of prime Canadian banks, conducted by OEB Staff, whereby estimates for the spread of short-term debt issuances over Bankers' Acceptance ("BA") rates are provided. As this confidential survey is conducted once annually, LEI utilized the data from the September 2019 survey for its internal update.

The calculated deemed short-term debt rate is **2.18%**, down from 2.82% in the previous update. See Appendix A for a detailed illustration of this calculation.

4 Appendix A: Cost of capital parameter calculations

Consistent with the OEB methodology detailed in the annual update to parameters, LEI has calculated the values for ROE, DLTDR and DSTDR as illustrated in Figure 7 and Figure 8 below, using data as of March 31st, 2020.

Figure 7. ROE and DLTDR calculation

Cost of Capital Parameter Calculations (For rate changes effective in 2020)

Step 1: Analysis of Business Day Information in the Month

Month: **March 2020**

	Day	Bond Yields % Govt. of Canada 10-yr	Bond Yields % Govt. of Canada 30-yr	Bond Yields % A-rated Utility 30-yr	Bond Yield Spreads % 30-yr. Govt. over 10-yr Govt.	Bond Yield Spreads % 30-yr. Util. over 30-yr Govt.
1	1-Mar-20					
2	2-Mar-20	1.12	1.34	2.88	0.22	1.54
3	3-Mar-20	0.96	1.23	2.77	0.27	1.54
4	4-Mar-20	0.97	1.27	2.83	0.30	1.56
5	5-Mar-20	0.84	1.17	2.73	0.33	1.56
6	6-Mar-20	0.72	0.96	2.62	0.24	1.66
7	7-Mar-20					
8	8-Mar-20					
9	9-Mar-20	0.53	0.71	2.56	0.18	1.85
10	10-Mar-20	0.62	0.95	2.70	0.33	1.75
11	11-Mar-20	0.64	1.02	2.88	0.38	1.86
12	12-Mar-20	0.64	1.09	3.13	0.45	2.04
13	13-Mar-20	0.82	1.33	3.29	0.51	1.96
14	14-Mar-20					
15	15-Mar-20					
16	16-Mar-20	0.78	1.26	3.29	0.48	2.03
17	17-Mar-20	0.92	1.41	3.42	0.49	2.01
18	18-Mar-20	1.06	1.47	3.59	0.41	2.12
19	19-Mar-20	1	1.43	3.62	0.43	2.19
20	20-Mar-20	0.87	1.28	3.56	0.41	2.28
21	21-Mar-20					
22	22-Mar-20					
23	23-Mar-20	0.78	1.26	3.52	0.48	2.26
24	24-Mar-20	0.85	1.31	3.57	0.46	2.26
25	25-Mar-20	0.88	1.36	3.59	0.48	2.23
26	26-Mar-20	0.84	1.34	3.57	0.50	2.23
27	27-Mar-20	0.72	1.28	3.45	0.56	2.17
28	28-Mar-20					
29	29-Mar-20					
30	30-Mar-20	0.75	1.32	3.47	0.57	2.15
31	31-Mar-20	0.71	1.32	3.43	0.61	2.11
		0.82	**1.23**	**3.20**	**0.41**	**1.97**
	Sources:	Bank of Canada		Bloomberg		

Step 2: 10-Year Government of Canada Bond Yield Forecast

Source: Consensus Forecasts Survey Date: April 6, 2020

	3-month	12-month	Average	
March 2020	0.700	1.000	**0.850**	%

Step 3: Long Canada Bond Forecast

10-yr Govt. of Canada Bond Forecast (from Step 2)	0.850	%
Actual Spread of 30-year over 10-year Government of Canada Bond Yield (from Step 1)	0.413	%
Long Canada Bond Forecast (LCBF)	**1.263**	%

Step 4: Return on Equity (ROE) Forecast

Initial ROE			9.75	%
Change in Long Canada Bond Yield Forecast from September 2009				
LCBF (March 2020) (from Step 3)	1.263	%		
Base LCBF	4.250	%		
Difference	-2.987	%		
0.5 x Difference			-1.493	%
Change in A-rated Utility Bond Yield Spread from September 2009				
A-rated Utility Bond Yield Spread (March 2020) (from Step 1)	1.971	%		
Base A-rates Utility Bond Spread	1.415	%		
Difference	0.556	%		
0.5 x Difference			0.278	%
Return on Equity based on March 2020 data			**8.53**	%

Step 5: Deemed Long Term Debt Rate Forecast

Long Canada Bond Forecast for March 2020 (from Step 3)	1.263	%
A-rated Utility Bond Yield Spread March 2020 (from Step 1)	1.971	%
Deemed Long-term Debt Rate based on March 2020 data	**3.23**	%

Source: OEB. "Cost of Capital Parameter Updates." <https://www.oeb.ca/industry/rules-codes-and-requirements/cost-capital-parameter-updates>

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Figure 8. DSTDR calculation

Cost of Capital Parameter Calculations (For rate changes effective in 2020)

Step 1: Average annual spread over Banker's Acceptance

A.		Average Spread over 90-day Bankers Acceptance		Date of input
	Bank 1	80	bps	Sept., 2019
	Bank 2	100	bps	Sept., 2019
	Bank 3	82.5	bps	Sept., 2019
	Bank 4	100	bps	Sept., 2019
	Bank 5		bps	
	Bank 6		bps	

B. Discard high and low estimates
If less than 4 estimates, take average without discarding high and low.

Number of estimates	4	
High estimate	100	bps
Low estimate	80	bps

C.

Average annual spread	91.25	bps

Step 3: Deemed Short-Term Debt Rate Calculation

Average annual spread	0.91%
Average Banker's Acceptance Rate	1.27%
Deemed Short Term Debt Rate	**2.18%**

Step 2: Average 3-month Banker's Acceptance Rate

Month: March 2020

	Day	Bankers' Acceptance Rate (%) 3-month
1	1-Mar-20	
2	2-Mar-20	1.46%
3	3-Mar-20	1.47%
4	4-Mar-20	1.32%
5	5-Mar-20	1.29%
6	6-Mar-20	1.25%
7	7-Mar-20	
8	8-Mar-20	
9	9-Mar-20	1.14%
10	10-Mar-20	1.14%
11	11-Mar-20	1.15%
12	12-Mar-20	1.20%
13	13-Mar-20	1.24%
14	14-Mar-20	
15	15-Mar-20	
16	16-Mar-20	1.24%
17	17-Mar-20	1.24%
18	18-Mar-20	1.24%
19	19-Mar-20	1.24%
20	20-Mar-20	1.24%
21	21-Mar-20	
22	22-Mar-20	
23	23-Mar-20	1.24%
24	24-Mar-20	1.24%
25	25-Mar-20	1.49%
26	26-Mar-20	1.44%
27	27-Mar-20	1.44%
28	28-Mar-20	
29	29-Mar-20	
30	30-Mar-20	1.08%
31	31-Mar-20	1.08%
		1.27%

Source: OEB. "Cost of Capital Parameter Updates." <https://www.oeb.ca/industry/rules-codes-and-requirements/cost-capital-parameter-updates>

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5 Appendix B: Works cited

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