

Communications

**We See Good Odds of the CRTC Decision Being Revised/
Overturned****Executive Summary**

The main purpose of this lengthy report is to outline why we believe there are good odds that the recent CRTC decision on wholesale Internet access rules (Telecom Order 2019-288 - [LINK](#)) will be overturned, or at a minimum revised in favour of the facilities-based telecom and cable players. The first step will likely be **appeals to the Federal Court, which must occur within 30 days of the August 15 decision (so likely September 13), and then appeals to either Federal Cabinet or the CRTC itself must be lodged within 90 days (so about November 13)**. We note with interest that this will be after the Federal election on October 21, so hopefully government officials will be able to review this file without worrying about knee-jerk media headlines and any associated voter impact. Below, we outline the four key sections of this report, which give us confidence that wholesale rates will not stick at the arguably low levels established by the CRTC. We acknowledge that handicapping outcomes of regulatory/political process is a very challenging exercise. In Appendix A, we show an example of one of the historic decisions (in this case also relating to wholesale Internet access back in December, 2009) that was referred back to the CRTC for reconsideration by Cabinet, just in case investors are wondering if this sort of thing ever happens.

We also present in this report a detailed sensitivity analysis on how much our forecasts and target prices would be negatively impacted in the future if the industry fails in getting relief from this regulatory regime. The details of this analysis starts on page 23, but a quick summary of estimated target price, revenue and capex reductions is shown in Exhibit 1 below (downside scenarios for consolidated profit estimates are in Exhibit 15 on page 29). **Total investments per annum in wireline/cable infrastructure in 2021 and beyond would be estimated to decline by about \$1.68 billion in aggregate for the six publicly-traded telecom and cable companies** (so even more if we had data on non-public operators like Eastlink and SaskTel). The estimated 22% reduction in wireline investment might seem like a staggering number to some observers, but we note that: a) the figure is in line with claims by Eastlink that it will cut 25% (equates to ~\$50 million) out of its capex budget if these rules stay in effect; and b) the economic reality, as we see it, is that the loss of over \$2.3 billion in high gross margin broadband revenue will force management teams in the industry to mitigate the impact on cash flow with much higher hurdle rates for new capital investment. We believe the implications will go far beyond network extension into rural areas, and even projects geared towards increased broadband capacity, quality and innovation in urban areas will be reduced. In fact, we believe the wholesale rates are so low relative to the true costs of building and maintaining these next generation networks, that even incumbent telcos and cablecos in some cases will start leasing access from each other within their home territories as opposed to proceeding with planned FTTH and DOCSIS 3.1 plus node segmentation initiatives.

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Exhibit 1. Summary of Downside Sensitivity (C\$, millions, except target prices)

	Wireline Revenue Downside			Wireline Capex Downside			Target Price	
	2021E	Scenario	Delta	2021E	Scenario	Delta	Current Published	Downside Scenario
BCE	12,762	11,962	800	3,068	2,517	551	\$65.00	\$61.00
RCI	3,956	3,469	487	989	694	295	\$89.00	\$82.00
TELUS	7,078	6,690	388	1,909	1,538	372	\$62.00	\$57.00
SJR*	4,429	4,067	362	842	610	231	\$31.00	\$27.00
QBR	2,765	2,581	183	608	465	144	\$36.00	\$30.00
CCA*	1,313	1,187	126	230	148	81	\$110.00	\$96.00
Total	32,303	29,956	2,347	7,646	5,971	1,675		

*Based on fiscal years, and Canadian cable only for CCA.

Source: Company reports, TD Securities Inc.

To be clear, none of our official estimates are changing today because we see good odds that the CRTC decision will not survive appeal. We already factored in the immediate impact of lower go forward and retroactive rates for existing wholesale-based customers in our estimate and target price changes on August 20 ([link to report](#)), but: a) after the appeals process, we would hope to be able to reverse some of those estimate/target changes; and b) we are not willing, at this time (beyond a sensitivity analysis), to take the next step in assuming both lower estimates and lower target multiples owing to a sustained increase in competitive intensity from Internet resellers. It should be noted that the first wave of expected impact (already in our models) is skewed to Ontario/Quebec owing to the historic geographic focus of resellers, but wave two that is examined in this report would be expected to impact carriers in all regions (including AB/BC) as **we believe wholesale-based competitors will ramp up efforts in all areas if access to fast, next generation broadband networks remains at low price points with minimal capex obligations.**

Lastly, before we outline the sections of the report below (four sections on why we believe the decision will not stand, and then a fifth section on the sensitivity analysis), we must make it clear that we do not profess to have access to nearly as much information as the operators themselves when it comes to regulatory precedents, costing methodologies, and any potential estimated consequences for capex and employment levels. We expect submissions from the industry (starting in mid-September) to be far more detailed and comprehensive than the arguments we have laid out in this report. Normally, we would wait to read those submissions and then simply inform investors about the arguments made, and perhaps also our assessment of the risks/probabilities. But this situation is too important, in our view, and we felt that we needed to inform investors in advance about both the material risks if these wholesale rates stick, and just as importantly our view that the evidence seems very strong in support of overturning this decision, which supports no estimate/target price changes today and it keeps us bullish on investments in the sector for now, albeit with elevated risk.

- 1. These low wholesale access rates do not seem necessary (page 7):** In this section, we explore, using data from the CRTC and the Competition Bureau, how Internet resellers in Canada have already been achieving big market share gains in recent years, and especially since the interim wholesale rates were announced in October, 2016. Our own analysis (unchanged from October, 2016) also concludes that resellers can earn attractive financial returns via the system of interim access rates, while they also provide lower advertised prices than incumbents, which benefits consumers. "An important form of dynamic competition" (to quote the Competition Bureau) already exists between cable and telco competitors who own and invest in their own networks, and the historic wholesale access rates (while still too low according to arguments from incumbent carriers) have not caused any noticeable harm to infrastructure investment. In other words, **the system seems to be working well for consumers, resellers, and facilities-based carriers, so we wonder if there is a problem that the CRTC is trying to solve with material incremental reductions to the wholesale rates.** We also wonder if this policy is potentially backward-looking, given that many observers expect new forms of facilities-based broadband competition in the future from LEO (low Earth orbit) satellites and 5G-based FWA (fixed wireless access).
- 2. These low wholesale access rates do not seem fair (page 12):** The regulatory policy in the past, and numerous CRTC decisions, have promised a system that leans primarily on facilities-based competition, so it can be argued that it is not fair to alter the rules midway through the game (with material retroactive payments for the past three years) when a lot of capital has already been invested in next generation networks (NGN) by the cable and telecom industry. We will show evidence (in sections two and four of the report), that Canada already had a more onerous wholesale access regime than most G7 nations (including no clear mechanisms to migrate wholesale new entrants up the investment ladder to become more facilities-based over time), so an extreme downward revision in the access rates was neither expected nor reasonable, in our view. It can also be argued that there is somewhat of a regulatory bargain between telcos/cablecos and the government, with the industry accepting foreign ownership restrictions as well as meaningful taxes and subsidies that go to support cultural and societal goals (like Canadian TV content, 911 services, and law enforcement support), so, in return, **the telcos and cablecos do not expect to have their network assets made available to others on what we consider unreasonable terms after they have already sunk investments into the infrastructure.** We are not aware of many industries in Canada that do so much in terms of private investment in infrastructure, while also facing such unpredictable and arguably intrusive regulations. We also question if it is fair and reasonable to have rules that could allow large foreign players (or even tech giants like Google or Amazon) to take advantage of cheap wholesale access rates with no obligations either to have Canadian ownership, or to invest in any networks (rural or urban), or to support culture/employment in this country.

3. **These low wholesale access rates do not seem accurate (page 17):** The CRTC uses an incremental run rate cost estimate for each network operator, and then they add a 30% profit mark-up to determine the wholesale rates for each tier of service. We will have to defer to the carriers for details on Phase II costing methodologies (they have access to a lot of data that we do not see) and we look forward to the arguments made by the industry in upcoming legal/Cabinet appeals. In this section of our report, we will highlight how the initial CRTC model that was created many years ago (which is still used by regulators in a lot of other countries) used a retail minus approach (typically a 30% discount) as opposed to cost plus, and **based on this methodology, the wholesale access rate for a typical amount of reseller speed/capacity would be about \$45/sub/month instead of the newly mandated rate of about \$16.** Interestingly, one carrier (privately-held cable company Eastlink) has complained publicly that their true all-in costs are three times higher than the new wholesale rates established by the CRTC, which is pretty close to our ~\$45 estimate versus ~\$16 CRTC observation. If all historic capex to build networks, plus maintenance and capacity expansion capex, is counted, we do not believe that the full cost can be 30% lower than the approximate \$16 CRTC wholesale access rates. If this was the case, then FCF generation and ROIC would be much higher for wireline telecom and cable operators based on \$70+ broadband ARPU levels and only \$12-\$13 in total costs (the average FCF margin across our six wireline companies was only 15% in 2018). We also question how access rates for the cablecos can be the same for all speeds, which just does not make sense to us given the need to provision capacity on a network for peak loading, which means more fibre deployment and/or node splitting if customers are downloading faster and using more data.
4. **These low wholesale access rates could render Canadian telecoms, and the Canadian digital economy as a whole, uncompetitive versus most other developed economies in the world (page 19):** Canadian carriers already suffer versus global peers on wireline wholesale access regulations, including mandated access to both cable and telecom networks (Belgium appears to be the only other developed nation that does this), and the lack of a ladder system in order to encourage resellers to gradually invest in their own infrastructure. Resellers need to invest very little capital in order to set up shop, including a stunning fact that interconnection with Rogers Cable needs to occur at only one head-end facility in Ontario (York Mills Road in Toronto) in order to gain full bitstream access to 1 Gbps service in households from London to Ottawa. If these lower wholesale access rates (and ~\$350 million in free funding to resellers) are maintained, then we believe Canada will fall behind other nations over the next few years on broadband network investment. We believe that **the cost of capital for Canadian telecoms will increase because equity and debt investors will perceive better returns with lower risks in other countries, and then with higher hurdle rates and less attractive investment opportunities, the cable and telecom companies will be forced to reduce capex.** Our estimates in section five point to annual wireline infrastructure spending declining by \$1.68 billion by 2021 if this regulatory regime is upheld. Both the CRTC and the Canadian

government have cited facilities-based competition as the better sustainable long-term regulatory approach in the past, and this has rightfully been chosen for wireless in Canada (to be clear we do not believe that this CRTC decision signals that low-cost MVNO access to wireless networks will be mandated in the future). As a result, we are perplexed by the CRTC's decision to lean so heavily on discounted wholesale access in wireline (although we cannot help but think back to our earlier comment on the appeal timeframe for this decision coming just after the Federal election). When regulators and policy makers review the arguments submitted by facilities-based carriers, and when they consider the future health and competitiveness of Canada's digital economy, we believe this decision will be overturned or, at least, materially altered.

5. **Downside scenario analysis (page 23):** We have already presented some key highlights from this section in Exhibit 1. Unfortunately, we would expect material erosion in high-margin broadband ARPU if this wholesale access regime remains in place. Less money per subscriber will be received from resellers, and retail pricing could drop meaningfully owing to increased competition from current and prospective resellers, who can arbitrage the access rates with minimal upfront investment. As we know, revenue growth in voice and video is challenged, so with broadband growth also being impaired we would likely be looking at several years of negative overall revenue growth for wireline telecom and cable assets (in some cases, but not all, offset by wireless growth at the consolidated level). This, in turn, would likely cause us to lower our EV/EBITDA-based target multiples. The only savior for investors is that material capex reductions (which are not good for Canadian infrastructure and long-term broadband quality) should soften the negative impact on FCF (2021E FCF declines only 2-3% in most of our downside models), so if dividends and FCF yield remain as important to investors as they seem to be today (as opposed to revenue/EBITDA growth), then maybe the target price declines that we predict in our sensitivity analysis will prove to be too pessimistic. We should also point out that an upside scenario from telcos migrating up to infrastructure-type valuations over the next 2-3 years would likely be totally eradicated (to be clear this was never in our target prices).

Mandated Internet Wholesale History

Below we provide verbatim excerpts from historical CRTC filings to help set the stage in understanding why wholesale internet rates have been implemented in the first place.

Regulation for mandated wholesale internet access was initially issued in 1998, where the CRTC concluded the following:

*“The Commission considers that incumbent telephone companies and incumbent cable companies have substantial market power with respect to higher speed access services, and **that this market is not yet sufficiently competitive** to justify forbearance with respect to the rates and terms on which these carriers provide higher speed access services.” (Telecom Decision 98-9)*

Fast forward to 2015, the CRTC ruled that the incumbents must open access to fiber-based services on the basis that:

*“The Commission’s general approach towards wholesale service regulation has been to promote facilities-based competition wherever possible. **Facilities-based competition**, in which competitors primarily use their own telecommunications facilities and networks to compete instead of leasing from other carriers, **is typically regarded as the ideal and most sustainable form of competition**. The desired outcome is that once competitors are given access to certain facilities (for example, access facilities), they are incented to enter the market and invest in other parts of the network, eventually leading to lower prices, innovative service offerings, and greater choice for consumers.” (Telecom Regulatory Policy 2015-326)*

Interim wholesale rates were set on October, 2016 (see our previous note [here](#)), and final rates were set on August 15, 2019 (see our previous note [here](#)).

1. These low wholesale access rates do not seem necessary

The current system seems to be working, with significant share gains (and geographic expansion) for resellers; network investment continuing by facilities-based carriers; and equity values and access to capital remaining vibrant for the publicly-traded incumbents. Borrowing words from the Competition Bureau (from their recent report - [LINK](#)) below, we believe that the current system already promotes sufficient competition:

*"Most Canadians are well-served by world class broadband networks... While some consumers may only think about their telephone or cable company when it comes to buying internet services, the Bureau's research has found that more than 1,000,000 Canadian households rely on smaller competitive providers to obtain internet services, and that the **competitive impact of this class of providers continues to grow...***

*However, the market performance of wholesale-based competitors takes nothing away from the important marketplace role played by their facilities-based counterparts. These providers, which are typically telephone and cable companies, serve the significant majority of Canadians, while at the same time making the substantial investments necessary to deploy, maintain, and upgrade the physical networks that connect Canadian homes to the internet. **These competitors engage in an important form of dynamic competition, working to outdo each other in order to offer the highest speeds and most reliable networks.** Of importance, the Bureau notes the potential negative effects that a wholesale access regime can have on the incentive for facilities-based competitors to make the necessary investments to ensure that Canadians are served by world class networks. In this regard, the Bureau underscores the importance of setting wholesale access rates at the correct level to ensure that investment incentives are maintained, while at the same time ensuring sufficient scope for wholesale-based competitors to continue to offer competitive discipline in the marketplace."*

The CRTC stats from 2017 break down these small providers to about 8% national share for resellers, plus another five points for non-cable/telco facilities-based players like satellite, fixed wireless, and fibre builders (like Beanfield), so total entrant share gets to 13%. We estimate (with help from the Competition Bureau's study) that this had risen to 10% by the end of 2018 (Exhibit 2). A move from ~8% to ~10% market share (up 25%) in just one year is material, in our view.

Exhibit 2. End of 2018 Estimated Internet Market Share for Resellers

	Subscribers		
	Held by Resellers	Market Share***	Available Households*
Greater Toronto Area	397,138	16.1%	2,466,698
Southern Ontario	111,094	18.4%	603,773
Montreal	277,322	18.6%	1,490,978
Ottawa region	194,576	16.6%	1,172,147
QC (ex-Montreal/Ottawa)	52,358	5.0%	1,047,162
AB	78,007	5.0%	1,560,137
BC	90,367	5.0%	1,807,339
Total Reseller Subscribers	1,200,863		
Reseller Market Share	10.0%		
Total Market**	12,064,858		

*Households calculated using a 2.5:1 ratio for homes to population using 2016 Census data, and assumes broadband penetration of 90%.

**Total market assumed to be the total Internet subscribers reported by BCE/Rogers/TELUS/Shaw/Quebecor/Cogeco as of the end of 2018, which includes business and consumer Internet subs lumped together for most operators, and it would include some subs in the Prairies and Atlantic Canada, where we have no data on resellers.

*** Excluding QC (ex-Montreal/Ottawa), these market share figures come from the Competition Bureau Report found at: <https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04470.html>. QC (ex-Montreal/Ottawa) are TD estimates.

Source: Competition Bureau, Statistics Canada, and TD Securities Inc.

We also question the need for the lower final wholesale rates when our former DCF (unchanged from October, 2016) showed attractive ROI potential for resellers under interim rates (Exhibit 4). With only \$50 million in upfront start-up and interconnection capex estimated as the requirement to reach 10 million homes with high-speed Internet, and then peak funding of \$156 million over three years (inclusive of initial subscriber acquisition costs until scale is attained), we concluded that a new player entering as a reseller could earn a 40% IRR. Even when we flexed the assumptions to include only five million homes covered for the same \$50 million upfront capex, the IRR remained attractive at 29%. We are deliberately not updating this DCF model to reflect the new, lower wholesale access rates because our base case view is that the rates will not remain this low (and/or the capex requirements for resellers will increase if the CRTC modifies the degree of access that they get to incumbent networks), but it is obvious that much higher IRR's could be possible, even if we were to lower the ARPU assumptions. Recall that the point we are making in this section is that the old system of interim rates was already sufficient to stimulate competition from resellers, so we believe that these players already have good economics.

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The interim rates also seemed acceptable enough to the facilities-based players to sustain network investment. Exhibit 3 shows that capex for the overall industry has not declined in the three-year period following the interim rates (2016-2018) versus the prior seven-year period.

Exhibit 3. Industry Capex History for Wireline Operations Only (C\$, millions)

	2009A	2010A	2011A	2012A	2013A	2014A	2015A	2016A	2017A	2018A	Total
RCI	642	611	748	832	1,105	1,055	1,030	1,085	1,334	1,429	9,871
BCE	1,717	2,019	1,973	2,193	2,247	2,893	2,809	2,936	3,174	3,193	25,154
TELUS	1,333	1,258	1,339	1,270	1,398	1,527	1,684	1,986	2,116	2,018	15,929
SJR	677	774	748	708	819	743	822	906	990	1,001	8,189
QBR	472	569	575	644	502	540	570	654	613	619	5,756
CCA	199	228	272	301	200	215	278	180	230	241	2,345
Total	5,040	5,459	5,655	5,948	6,271	6,972	7,193	7,747	8,457	8,501	67,244

Source: Company Reports, and TD Securities Inc.

Exhibit 4. Reseller DCF Based on Prior Interim Rates

	2016	2017	2018	2019	2020	2021
ASSUMPTIONS						
Urban Households Covered	10,000	10,100	10,201	10,303	10,406	10,510
Growth		1.0%	1.0%	1.0%	1.0%	1.0%
Gross Adds for New Reseller as % of Households						
Gross Additions		2%	3%	4%	4%	3%
		202	306	412	416	315
New Entity Churn		2.00%	2.00%	2.00%	2.00%	2.00%
New Entity Net Adds		178	227	266	205	67
New Entity End of Period Subscribers	-	178	404	670	876	943
Newco Market Share of Total Households in Covered Territory		1.8%	4.0%	6.5%	8.4%	9.0%
Internet ARPU						
% growth		\$52.00	\$54.08	\$56.24	\$57.37	\$57.37
		n.a	4.0%	4.0%	2.0%	0.0%
COA and Activation Fees (~\$100) per gross addition		\$300	\$306	\$312	\$318	\$325
- % change		n.a	2.0%	2.0%	2.0%	2.0%
Wholesale Costs						
Estimated Subs sharing 100 Mbps of Capacity		125	110	100	100	100
Average Capacity Rate per 100 Mbps		\$200	\$200	\$200	\$200	\$200
Capacity cost/month per subscriber		\$1.600	\$1.818	\$2.000	\$2.000	\$2.000
Average Access Rate per sub/month		\$25.00	\$26.00	\$27.00	\$28.00	\$28.00
Total Wholesale Costs per sub/month		\$26.60	\$27.82	\$29.00	\$30.00	\$30.00
Other Opex/sub/month (fibre backhaul, customer service, billing, admin)		\$10.00	\$10.10	\$10.20	\$10.30	\$10.41
- % change		n.a	1%	1%	1%	1%
Total Opex per Sub per Month		\$36.60	\$37.92	\$39.20	\$40.30	\$40.41
Capex as a % of Revenues (not including initial interconnection)		1.0%	1.0%	1.0%	1.0%	1.0%
FREE CASH FLOW ANALYSIS (\$mm)						
New Entity Network Revenues		55	189	363	532	626
New Entity Operating Expenses		39	132	253	374	441
EBITDAM		16	56	110	158	185
- EBITDAM margin %		29.6%	29.9%	30.3%	29.7%	29.6%
COA Expense		61	94	129	133	102
EBITDA		(44)	(37)	(19)	26	83
- margin %		-79.7%	-19.7%	-5.2%	4.8%	13.2%
Initial Build Capex		50	0	0	0	0
Ongoing Capital Expenditures		0.6	2	4	5	6
Total Capex		51	2	4	5	6
Free Cash Flow (unlevered and untaxed)		(95)	(39)	(22)	20	76
Cumulative Funding Required (pre-finance costs)		(95)	(134)	(156)	(136)	(59)
Discount Rate						15.0%
Terminal EBITDA Multiple						5.0x
Terminal Enterprise Value						413
PV of Terminal Enterprise Value						236
PV of FCF						(89)
Total PV of Enterprise Value in mid-2017						148
IRR						40%

Source: Company reports, and TD Securities Inc.

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Furthermore, looking at Internet pricing during the period when former interim wholesale rates were in effect (Exhibit 5), we can see that resellers already offered meaningful pricing discounts versus the incumbents. In Exhibit 23 (towards the end of the report) we show average internet rates in Canada, versus Global peers. We also believe that the policy could be potentially backwards looking if one takes into account new forms of facilities-based competition that are already on the horizon with LEO satellites and 5G-based FWA.

Exhibit 5. Internet Pricing: Regular Advertised Rates

		Price	Download	Upload	Cap
Ontario	Teksavvy ⁽¹⁾	\$68.95	150 Mbps	15 Mbps	Unlimited
	Bell	\$89.95	150 Mbps	150 Mbps	Unlimited
	Rogers	\$89.99	150 Mbps	15 Mbps	Unlimited
	Cogeco ⁽²⁾	\$100.00	120 Mbps	10 Mbps	Unlimited
Alberta	Teksavvy	\$69.95	150 Mbps	15 Mbps	Unlimited
	TELUS ⁽³⁾	\$95.00	150 Mbps	150 Mbps	Unlimited
	Shaw ⁽⁴⁾	\$92.00	100 Mbps	10 Mbps	500 GB
Quebec	Teksavvy	\$63.96	400 Mbps	50 Mbps	Unlimited
	Bell ⁽⁵⁾	\$85.95	500 Mbps	500 Mbps	Unlimited
	Videotron ⁽⁶⁾	\$85.00	400 Mbps	50 Mbps	Unlimited

(1) Current promo pricing is \$33.95 (6 months), but figures presented above are regular rack rate.

(2) Current promo pricing is \$72.00 (12 months), but figures presented above are regular rack rate.

(3) Current promo pricing is \$60.00 (24 months), but figures presented above are regular rack rate.

(4) Current promo pricing is \$50.00 (24 months), but figures presented above are regular rack rate.

(5) Current promo pricing is \$69.95 (12 months), but figures presented above are regular rack rate.

(6) Current promo pricing is \$75.00 (12 months), but figures presented above are regular rack rate.

*Data as of August 18, 2019

Source: Company websites, and TD Securities Inc.

2. These low wholesale access rates do not seem fair:

The quote from the CRTC in 2015 on page 6 (echoed in this recent opinion piece by a former CRTC commissioner – [LINK](#)) is indicative of the representation that has been made to the industry in the past with regards to favouring facilities-based competition.

In addition, this excerpt from the telecom act should guide the process of determining fair rates:

"Every rate charged by a Canadian carrier for a telecommunications service shall be just and reasonable... in determining whether a rate is just and reasonable, the Commission may adopt any method or technique that it considers appropriate, whether based on a carrier's return on its rate base or otherwise."

The six cable/telco firms we cover have invested about \$67 billion in their wireline networks over the past 10 years as a result of the CRTC commitments (Exhibit 3), so we believe arguments can be made to the Federal Court that it is not fair to change the rules and significantly lower mandated wholesale access rates after this money has already been spent. Exhibit 6 (unchanged from our August 20 report) shows our estimate of the material decline in access rates for each carrier based on a typical speed and usage pattern, and, of course, these ~40% declines are on top of interim rates that were already set well below what existed prior to October, 2016. For added perspective, Exhibit 7 and Exhibit 8 show some additional examples, including a wider range of speed/usage tiers for three operators, and in these calculations, we note that the base access rate is the exact same for all tiers shown, so only the capacity/usage assumptions change (for example 10 Mbps service and 1 Gbps service from Rogers both have a base access rate of \$13.44). To be clear, the carriers did not accept or submit costs at these low levels. These are simply the cost-based rates that the CRTC came up with after almost three years of their own internal analysis. In some cases that we are aware of, the carriers proposed monthly capacity rates per 100 Mbps service of over \$500, versus the decided range of only about \$100-\$250 shown in Exhibit 6.

Exhibit 6. Mandated Wholesale Rates

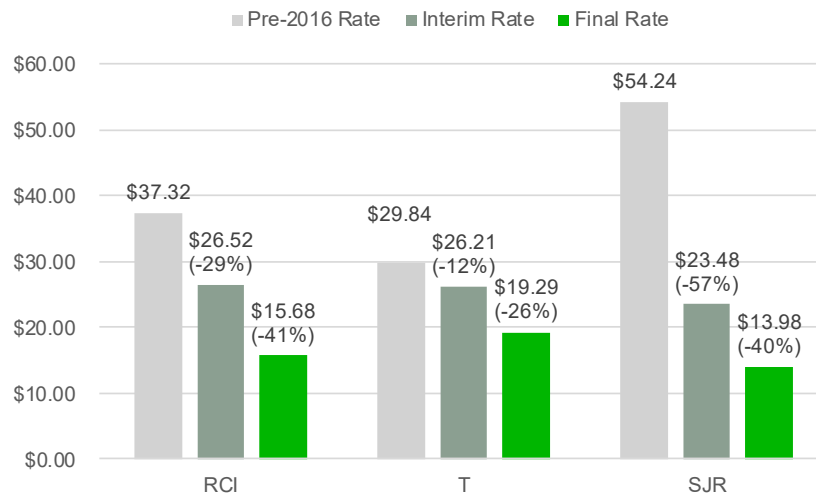
	Pre-2016 Pricing			Oct 2016 Pricing			Pricing Under New Rates			Change Versus Oct 2016 pricing (%)
	Monthly Capacity Rate per 100 Mbps Service	Access Rate Per End User	Pre-2016 Rate	Monthly Capacity Rate per 100 Mbps Service	Access Rate Per End User	Interim Rate	Monthly Capacity Rate per 100 Mbps Service	Access Rate Per End User	Final Rate	
BCE	\$1,036.49	\$25.62	\$35.98	\$149.08	\$25.62	\$27.11	\$102.48	\$14.78	\$15.80	-42%
RCI	\$1,400.00	\$23.32	\$37.32	\$319.68	\$23.32	\$26.52	\$224.32	\$13.44	\$15.68	-41%
T	N/A	\$29.84	\$29.84	N/A	\$26.21	\$26.21	N/A	\$19.29	\$19.29	-26%
SJR	N/A	\$54.24	\$54.24	\$296.10	\$20.52	\$23.48	\$251.14	\$11.47	\$13.98	-40%
QBR.B	\$2,031.00	\$26.89	\$47.20	\$395.36	\$26.89	\$30.84	\$227.05	\$14.30	\$16.57	-46%
CCA	\$1,411.17	\$24.98	\$39.09	\$323.73	\$24.98	\$28.22	\$233.49	\$13.37	\$15.70	-44%

*We assume 100 customers share one unit of 100Mbps capacity in the calculation for all-in cost per sub above. Due to the bursty nature of Internet traffic, resellers can always have many customers sharing one unit of capacity. Even if a reseller buys 1 Gbps speeds and offers 1 Gbps service to consumers, it can still have many customers sharing the capacity. We do not believe that resellers need to use an over-subscription ratio as low as 10.

(1) TELUS uses a flat billing model while Shaw used a flat billing model before Aug 2017.

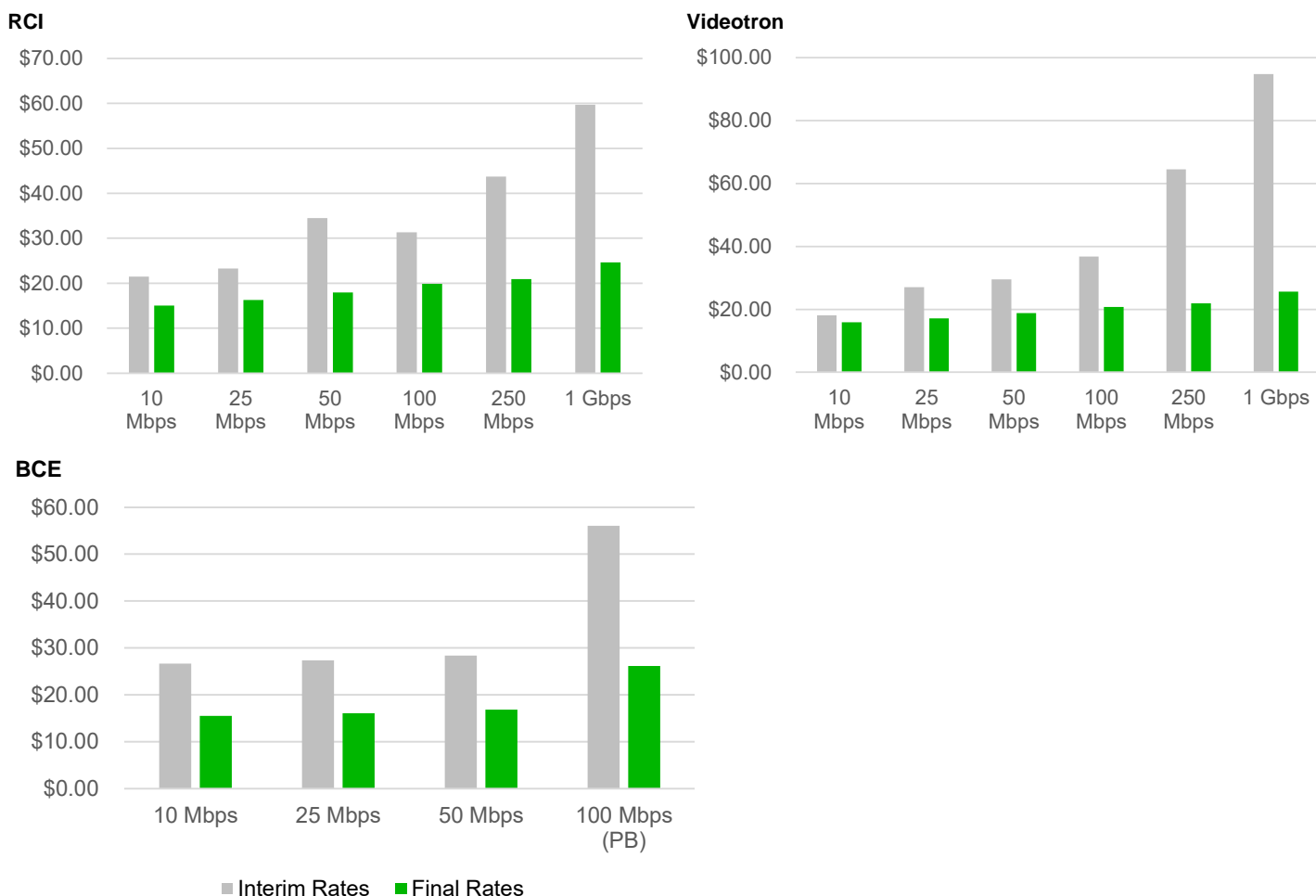
Source: CRTC, TD Securities

Exhibit 7. Progression of Mandated Wholesale Rates



Source: CRTC, and TD Securities Inc.

Exhibit 8. Range of Wholesale Access Rates



*Bell has been allowed a much bigger access rate for its 100 Mbps service (57% increase over its 50 Mbps rate) because pair-bonding (PB) is required to deliver 100 Mbps over non-FTTH infrastructure. So the CRTC determined that the historic capex and current cost to run two copper lines into a home is worthy of a big step-up in the access rate. However, cablecos splitting nodes and adding new DOCSIS technology to move up to well above 100 Mbps does not appear to justify any difference in the access rate between 10 Mbps service and 1 Gbps service.

Source: CRTC, and TD Securities Inc.

Going a step further, we wanted to see if these dramatic regulatory changes were perhaps a function of the starting point for Canadian wholesale regulation being far more relaxed than what we see in other developed countries. We have concluded that it is quite the opposite. In Exhibit 12 (included in section four), we show a snapshot of Canadian regulation versus key G7 nations plus a few other developed economies. **Even before this CRTC decision, Canada had an arguably onerous regulatory environment, with both mandated access to high speed Internet networks from cablecos and telcos (most nations regulate access only to telco networks, and the U.S. does not mandate NGN access to either), and a system that seemingly has no checks and balances in place to force wholesale-**

based new entrants to move up the investment ladder over time. The ladder theory (shown in Exhibit 9) suggests that sustainable competition in telecom markets can be optimized by phasing out reseller network access over time at the lower rungs (such as 100% resale with no interconnection required at all, or full bitstream access from a small number of access points, which is what we have in Canada at present), while breaking down barriers to network access at higher rungs (such as telephone poles or ducts that facilitate new fibre or other network elements to be deployed). As new entrants gain scale and financial resources from the benefits of low rung access, they can (and must if the regulations dictate it) gradually invest in their own infrastructure and move traffic off of the incumbent network(s) and onto their own.

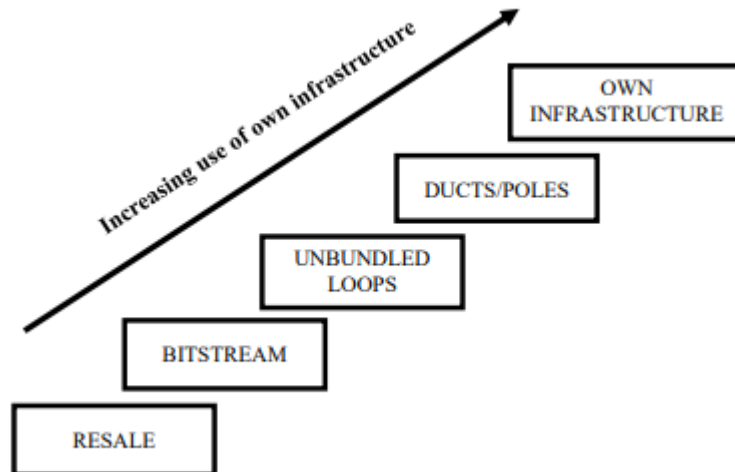
Given that Internet resellers in Canada seem to have no obligations to invest in their own networks (these low rung wholesale access rates from the CRTC do not have a sunset date attached to them), we believe the facilities-based carriers had legitimate reason to believe that the access rates would be set at levels that: a) were close to the cost estimates that they put forward; and b) were not dramatically lower than what existed in the past. These expectations for fairness could only have been increased, in our view, by the social bargain that the industry feels it has lived up to in the past, such as:

- Helping Canada's cultural objectives by providing substantial subsidies for the creation and display of Canadian content. Albeit this occurs through video distribution revenues and regulations (BDU, or broadcast distribution undertaking, to be precise), but they are the same companies and these are the same shared wireline networks that carry Internet services.
- Using private investment to support law enforcement and emergency services via 911 functionality and the monitoring of criminal activity.
- Also using private investment to extend network access to both low income households and people in smaller towns and rural areas (granted that this investment is sometimes packaged with government subsidies for more rural and remote communities).
- Unlike some industries that drained government coffers for bail-outs and subsidies in the past (such as the auto industry after the financial crisis), the telecom industry has helped reduce the federal deficit via material payments for wireless spectrum via auctions, plus of course material recurring tax payments.
- Keeping head offices and jobs in Canada, in part, owing to stringent foreign ownership restrictions that these large carriers have always abided by.

These lower wholesale access rates could create a situation where not only small Canadian companies (like Teksavvy) compete for Internet revenues, but we could see large foreign players come in to piggyback on the networks that have been built with Canadian investment. **There are no foreign ownership restrictions on start-up, wholesale-based competitors, so there is nothing stopping telecom/cable carriers from other countries, or even global technology giants like Google or Amazon, from siphoning broadband revenues away from Canadian carriers with virtually no offsetting obligations to invest in infrastructure, employment, or social/cultural programs.** Not only do

we believe that this is not good public policy (addressed more in section four), but we do not believe it is a fair or reasonable situation for the regulators to have imposed upon the facilities-based carriers.

Exhibit 9. Ladder of Investment Theory



The Ladder of Investment theory was popularized in the early 2000s and is a concept where entrants are initially granted mandated wholesale access to incumbents' facilities to provide resale services (lowest rung of the ladder), and regulators gradually incentivise entrants to invest in their own facilities to progressively increase infrastructure ownership, ultimately upgrading to fully facilities-based operators (highest rung of the ladder).

Source: Giganomics and TD Securities Inc.

3. These low wholesale access rates do not seem accurate

Prior to the current system of cost-based rates, the CRTC used a discount to retail pricing in order to establish the rates at which resellers could access low rungs of the network with minimal capex requirements. A typical discount (in both Canada as well as other countries that still use a retail minus approach) was 30%.

- In Exhibit 5, we showed rack rate pricing for various Internet tiers in ON/AB/QC for Teksavvy versus incumbents. One could argue and we would agree that rack rate pricing, such as ~\$90/month for 150 Mbps service in ON, is not indicative of either what average customers pay, or what the true costs are for the incumbent carriers. At almost all times, there is some form of promotional discounting that occurs by the incumbents, so we need to look at these promo rates as a guide for both the underlying costs and the ARPU being generated. We can also see broadband ARPU from the disclosure from RCI/QBR (which we show in Exhibit 10 and note that we estimated Shaw's Internet ARPU at \$71 in our June 28 report – [LINK](#)).

Exhibit 10. Internet ARPU

	2017A	2018A
Rogers	\$72.32	\$74.19
QBR	\$52.26	\$53.29

Note: Rogers ARPU is based on consumer and business internet revenues.

Source: Company Reports, and TD Securities Inc.

- Thankfully, we are in a seasonal period (back-to-school) when carriers are putting their best foot forward with well-publicized promotions (as opposed to more secretive in-store and call centre deals at other times during the year), and we have recently observed 150 Mbps offers from Bell/Rogers at around \$65 as opposed to the regular \$85-\$90 rates. If the regulators were to set the wholesale rates at a 30% discount to this \$65 promotional pricing, then resellers would be paying about \$45 per month.
- Our analysis here is obviously simplistic and we would fully expect the CRTC to analyze more thoroughly both the proper retail rate(s) and the appropriate discount that should be offered to resellers, but directionally, we think this math draws attention to the massive gap between theoretical retail minus rates, and the cost plus rates shown in Exhibit 6 (in the range of \$16/sub/month as opposed to ~\$45).
- It is also interesting to note that one carrier has complained publicly that their true all-in costs (which we assume includes all historic capex to build networks, plus maintenance and capacity expansion capex) are three times higher than the new wholesale rates established by the CRTC, which is pretty close to our ~\$45 estimate versus ~\$16 observation.

Before we discuss our opinion on what an "accurate price" might be, we provide a quote from the Competition Bureau's study as a reference point:

"The Bureau underscores the importance of setting wholesale access rates at the correct level to ensure that investment incentives are maintained, while at the same time ensuring sufficient scope for wholesale-based competitors to continue to offer competitive discipline in the marketplace."

Is ~\$45 (retail minus) fair for the resellers? Perhaps not, and we would need access to a lot more time/resources and non-public information in order to draw firm conclusions.

Is ~\$16 (cost plus) remotely fair for the facilities-based carriers who have invested billions in risk capital to make these networks a reality? From where we sit, we believe that the answer is clearly no. We show wireline simple FCF (wireline EBITDA less wireline capex) and FCF margins (as a percentage of revenue) in Exhibit 11 for each of the incumbents. With FCF margins averaging 15%, the facilities-based carriers do not seem to be printing money with exorbitant pricing relative to their all-in costs. We fail to understand how full cost can be 30% lower than the ~\$16 CRTC wholesale access rates. If they were truly getting +\$70 in ARPU for broadband service with an all-in cost of \$12-\$13 (the wholesale rates we have calculated, less the 30% mark-up allowed by the CRTC), then we would likely see much better FCF generation and ROIC metrics coming out of the segmented wireline results.

We are confident that either the courts, Cabinet, or the CRTC will conclude that there is some middle ground between ~\$16 and ~\$45 that is more equitable for all involved.

Exhibit 11. 2018A Simple Wireline FCF (C\$, millions)

2018A	BCE	Rogers	TELUS	QBR	SJR*	CCA*	Total
Wireline EBITDA	5,321	1,874	1,789	1,446	1,966	664	13,060
Wireline Capex	3,193	1,429	2,018	619	1,001	241	8,501
Wireline Simple FCF	2,128	445	-229	827	965	423	4,559
Wireline EBITDA margin (% of wireline revenue)	43%	48%	29%	51%	46%	51%	42%
Wireline Simple FCF margin (% of wireline revenue)	17%	11%	-4%	29%	22%	33%	15%

*Shown on calendar basis. CCA figures only include Canadian Cable and excludes previously owned data center business.

Source: Company Reports, and TD Securities Inc.

4. These low wholesale access rates could render Canadian telecoms and cablecos, and the Canadian digital economy as a whole, uncompetitive versus most other developed economies in the world.

Approaching the topic from a different angle, we tackle whether the proposed system makes sense versus other countries. What we see in most developed nations (Exhibit 12 and Exhibit 13 shows G7 plus a few other countries with similar characteristics to Canada) is that broadband competition is primarily driven by either:

- a) having a well-developed cable industry to compete with ILECs, such as in the U.S., Belgium, and Netherlands; or
- b) having a wholesale access regime in place to allow non-cable new entrants to provide competition to ILECs (although access in most cases graduates from low rungs to high rungs in the investment ladder over time, so that these new entrants morph into more facilities-based players versus resellers), such as in France, Italy, Japan, and the U.K.

Canada seems to be one of the only countries heading in the direction of having both robust competition from wholesale access entrants, plus a well-developed cable industry. The issue specific to Canada is that the wholesale system provides entrants with active access at low rungs (resale of services requiring minimum investment) with no mechanism to migrate over time to more passive access at higher rungs (such as network infrastructure and fibre assets). As a result, the total market share for resellers in Canada seems to have grown rapidly since the announcement of lower interim access rates in October, 2016 (as we estimated in section 1), while investments in network facilities remain minimal (we are only aware of one case where TekSavvy planned to invest \$26 million over 18 months in a fibre network in Chatham, ON, although we have no way of confirming their progress). We believe that the current regulatory system is not a sustainable model as it fails to incentivize network investments.

With the final access rates being about 40% below the interim rates, and with resellers getting a meaningful injection of free capital from the retroactive fees, we believe that it is only logical to expect wholesale-based broadband competitors to gain market share at an even faster pace in future years, so the global comparison chart in Exhibit 13 could start to show Canada as a significant outlier versus peers in terms of aggregate share for entrants in a country where well built-out cable and telecom networks both exist. Canada could also fall out of the top third in the OECD on experienced download speed.

Is this situation optimal in terms of stimulating sustainable long-term competition, including ongoing infrastructure investments that are necessary to drive competition and innovation? We do not think so. We do not believe it is sustainable or desirable for Canadian telcos/cablecos to have both a higher cost of capital and less incentive to invest in networks, versus all other G7 nations and most other developed economies, which will ultimately be detrimental to the infrastructure for the digital economy and make Canada less competitive in the long run.

The minimal historic capex spending by resellers versus facilities-based carriers (Exhibit 14) gives us little hope that wholesale-based players will fill any voids on infrastructure spending. Furthermore, if we look at the regulations in the U.S., between 2003 and 2005, the FCC lifted wholesale restrictions for the incumbent ILECs which led to an uptick in fiber investments increasing fibre lines deployed to 6,299,000 in 2012 from a mere 111,386 lines in 2003.

Exhibit 12. Global Comparison of Regulation

	Telco Regulation			Cableco regulation	Other
	Legacy unbundled loops	Fibre rich loops	Support structures		
Canada	- Mandated cost-based regulated rates	- Mandated cost-based regulated rates	- Mandated cost-based regulated rates	- Mandated cost-based regulated rates	- The only country that regulates both telcos and cablecos.
Australia	- Mandated cost-based rates, but to be deregulated by 2022	- Mandated cost-based rates, but to be deregulated by 2022	- Not regulated	- Not regulated	- Australian government is deploying fibre across the country through NBN Co., and which, when complete, will be a national monopoly which provide wholesale access to retailers.
European Union	- Mandated cost-based regulated rates	- Regulated rates are only mandated in UK and Netherlands, but are flexible	- Mandated - Cost-based regulated rates in UK and Portugal	- Belgium only, but regulated rates are still under consultation with final rates expected in late 2019 to early 2020.	- France: There is no mandated access to fibre-based facilities, but are made available only on terms that require entrants to co-invest. - Portugal: Focuses regulation on access to support structures.
Japan	- Mandated	- Mandated	- Mandated with regulated rates specified by a formula	- Not regulated	- Although wholesale access is mandated, in practice, facilities-based competition is the norm. - Beginning in 2010, regulatory emphasis was placed on negotiated terms, resulting in the incumbent telco negotiating wholesale access rates on a voluntary basis for fiber services.
Switzerland	- Mandated	- Not regulated	- Mandated cost-based regulated rates	- Not regulated	- Entrants may access fiber services through negotiating terms or co-investments.
U.S.	- Not regulated	- Not regulated	- Not regulated	- Not regulated	- Wholesale access regulations were removed in 2005.

Source: Gigamonics, and TD Securities Inc.

Industry Insights

Equity Research

September 4, 2019

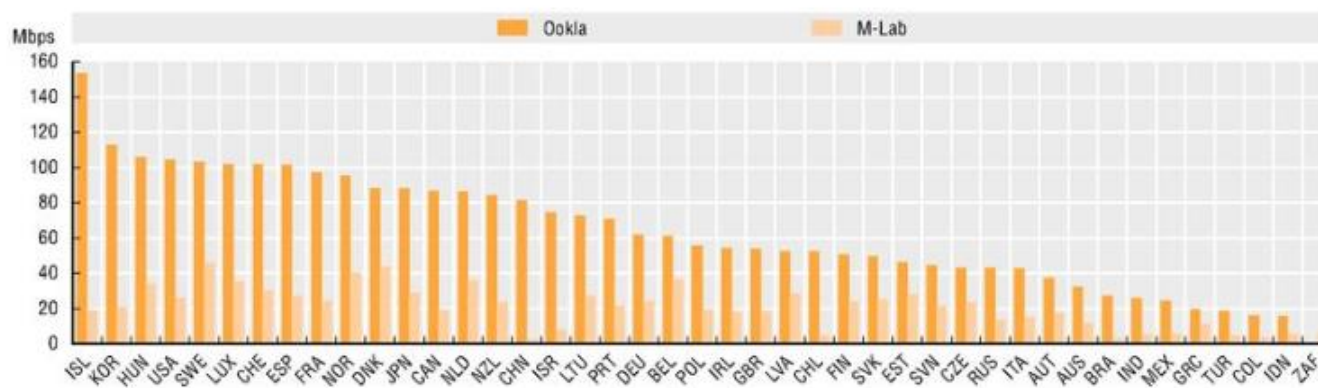
Exhibit 13. Global Comparison of Market Share and Download Speeds

	Incumbent Telecom Operator	Incumbent Cable Operator	Entrant
CANADA	38%	49%	13%
Australia	51%	17%	32%
Belgium	46%	52%	2%
France	40%	8%	52%
Germany	40%	23%	37%
Italy	45%	0%	55%
Japan	54%	6%	40%
Netherlands	41%	45%	14%
Portugal	40%	41%	19%
Switzerland	50%	31%	19%
United Kingdom	37%	20%	43%
United States	32%	55%	14%

*Data as of year-end 2016, except Japan as of year-end 2015, European Commission’s “Digital Progress Report 2017” data as of June 2017, ANACOM (Portugal) data for September 2017 and ComCom (Switzerland) data for year end 2017. Sources: CRTC, ACCC, European Commission, Japan Ministry of Communications, ANACOM, ComCom, and FCC.

Average experienced download speed of fixed broadband connections, 2018

Ookla and M-lab measurements



Source: OECD, based on Ookla, October 2018 and M-Lab (Worldwide broadband speed league) as measured between June 2017 and May 2018.

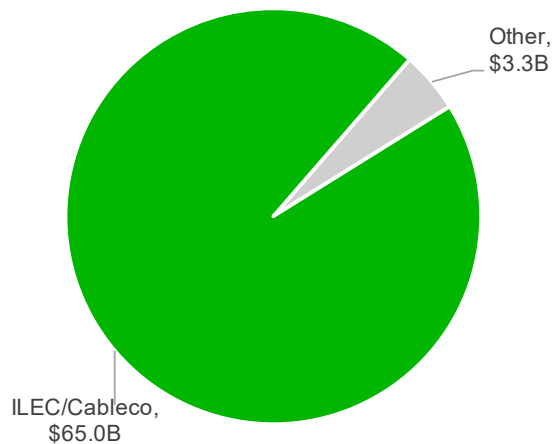
Source: Giganomics and OECD

Industry Insights

Equity Research

September 4, 2019

Exhibit 14. Wireline Capex 2006-2017 (as per the CRTC)



Sector	Category	Subcategory	2012	2013	2014	2015	2016	Growth (%) 2015-2016	CAGR (%) 2012-2016
Wireline	Incumbent TSPs	All	4.7	4.9	4.8	5.2	5.5	7.4	4.1
	Alternative service providers	Other facilities-based service providers (including cable-based carriers)	2.3	1.9	2.3	3.1	3.7	19.8	12.1
		Resellers	0.04	0.04	0.03	0.02	0.03	24.2	-8.5
		Subtotal	2.4	2.0	2.3	3.1	3.7	19.9	11.8
	Total	All	7.1	6.9	7.1	8.2	9.2	12.0	6.8
Wireless	Total	All	2.3	2.0	2.3	2.1	2.3	8.7	0.3
Total	Total	All	9.4	8.9	9.4	10.4	11.6	11.3	5.3

Note: CRTC figures include capex from private companies such as Sasktel and Eastlink and are expressed in billions.

Source: CRTC, TD Securities Inc.

5. Downside scenario analysis

In this section, we will present our current best estimates as to how our forecasts and valuations would change if our thesis from this report is wrong, such that the current CRTC decision on wholesale access rates does not get revised or overturned. To be clear, we already lowered our estimates (and most target prices) on August 20 in order to reflect the immediate known/estimated impact of lower wholesale fees being received from existing reseller subscribers (including the retroactive amounts to be booked against revenue in the next quarter). At that time, and still today, we did not factor in the following two items into our base case outlook because we hold out hope that the decision will be revised in favour of the facilities-based carriers:

1. Estimates of incremental market share gains for resellers, and less pricing power for incumbents, as a result of the lower input costs (and likely greater access to funding) for wholesale-based competitors; and
2. Lower target multiples for wireline assets (cable and telco) owing to both lower expected revenue/EBITDA growth rates, as well as fears among the global investment community that Canada has a unfavourable regulatory environment.

So, the sensitivity analysis in this section now bakes in the two assumptions above. For starters, we have extended our base case forecast models out to 2021 (versus 2020 published previously for most companies and business segments). Key annual forecasts for each company can be found in Exhibits 16-21, and, again to be clear, we have not changed any official estimates (just introducing new base case 2021 estimates). Given likely appeal timeframes and a transition period, we do not believe that results in 2020 would show the full negative impact of this proposed wholesale rate regime, so we felt compelled to look out to 2021, and we cannot show investors how much 2021 estimates would be expected to decline unless we first provided base case estimates for that year (which we would expect to remain largely unchanged if this CRTC decision gets adjusted).

For each of the six major telecom and cable companies that we cover in Canada, we made the following four key adjustments to our 2021 estimates in this sensitivity analysis. Only wireline segment figures were adjusted, as we see no direct impacts on wireless or media segments from this CRTC decision (to be clear we do not believe that these CRTC rules hint that they could be leaning towards a similar low wholesale cost regime in wireless via the MVNO proceeding – both the competitive dynamics and the historic regulatory approach in the two markets are very different). After highlighting the adjustments, we will walk through the specifics of how these assumptions impact key results for one of the main players, Rogers, and then Exhibit 15 summarizes the impact for all of the operators.

1. **We lowered our consumer broadband/Internet ARPU estimates by about 17%-20%:** This would include a combination of more subs shifting from retail to wholesale (at lower rates than wholesale in the past, and note that wholesale customers still get treated as subscribers for every carrier except BCE, so it is mostly ARPU and not sub adds that should get impacted as resellers increase market share), plus retail price

reductions in order to combat the increased disruption caused by competition from resellers. We acknowledge that some observers might view ARPU reductions of this magnitude in 2021 as extreme, so let us expand on our thought process:

- a) Given contracts, bundles, and just general consumer inertia, we would never expect a structural change in regulatory and competitive conditions to have an impact that somehow leads to a step function change in ARPU or market share in just one calendar year. The adjustments we are making to 2021 forecasts would, in reality, occur more gradually over 3-4 years. Some of the downside pressure could actually show up as early as 2019, but then most of the pain would be spread over 2020, 2021, and 2022 as customers gradually become aware of, and then take advantage of, new competitive options from resellers and/or lower pricing in response from incumbents. We could have added the complexity of multi-year DCF models for both our base case forecasts and these downside scenario estimates, but the conclusions would have been very similar, in our view, and we decided that focusing on just the annual impact in 2021 was a far easier way to present and explain our findings. Could we have picked 2022 instead of 2021? Sure, but that would have required even more estimation because we would first have had to extend our base case forecast models out to that year. So feel free to think of our downside scenario estimates as directional instead of absolute, but our conclusion on broadband ARPU declines would not change from this 17-20% range even if we got more detailed and spread out the declines over 3-4 years.
- b) The 17-20% decline in ARPU comes from a combination of more wholesale subs in the mix, at much lower ARPU levels than retail customers (it is critical to reiterate that the cablecos and telcos lump retail and wholesale customers in the total Internet subscriber figures that they disclose, except for BCE), and also declines in retail pricing owing to increased competition from resellers.
- c) The math on a typical carrier today would likely be blended ARPU of ~\$70, which is comprised of ~10% of subs being wholesale at ~\$26, and ~90% of subs being retail at ~\$75 (we acknowledge that there are meaningful regional differences today, especially in Quebec, in both blended ARPU, and reseller market share, so this typical math example is more of a weighted average as opposed to the specifics for any one company).
- d) If the average wholesale ARPU drops to ~\$16, and if market share for resellers increases to 20% from 10%, then the direct wholesale impact on ARPU would be just about 10% (blended ARPU in this example drops to \$63.20 from \$70). Given that the resellers seemed to have gained at least two points of market share in just one year in 2018 (refer back to section 1 and Exhibit 2)

under the interim wholesale rates, we think another 10% share gain is quite plausible over the next 2-3 years with the benefit of much lower access rates and more access to funding (plus recall that we would expect new resellers, including large foreign companies, to consider market entry).

- e) The remaining indirect impact on ARPU from increased retail price competition would thus have to account for a 7%-10% reduction in total broadband ARPU (out of our total decline estimates of 17%-20%). The math here points to retail ARPU in this example needing to decline from ~\$75 to approximately \$66-\$69 (or down 8%-12%). **From a public policy perspective, an interesting twist here is that we believe someone who supports the new CRTC wholesale rates could have a very difficult time disagreeing with our assertion that retail prices will decline and thus hurt total ARPU and profitability for the facilities-based carriers. If one wants to argue that the retail pricing for incumbents in this example will stay at ~\$75, and thus our estimate of 17-20% declines in broadband ARPU is too extreme, then what is the purpose of this regulatory regime in the first place if consumers are not expected to benefit from lower pricing?**
- f) To be fair, the reprice from ~\$26 to ~\$16 for the existing wholesale subs (so 10% of total in this example) is already in our base case 2021 estimates because of the estimate reductions that we put in our models to be conservative after the CRTC decision was announced (as detailed in our August 20 report). So for our downside sensitivity analysis, one could argue that the incremental direct wholesale impact is just the mix shift to 20% share from 10% share in this example, which is an 8.5% reduction in blended ARPU (thus leaving a bit more to be explained by increased retail price competition). But that is just semantics, in our view, because the full negative impact of the CRTC decision really includes both our prior estimate revisions and the new assumptions in this downside sensitivity analysis.
2. **We assumed 80%-90% margins on lost Internet revenue, so that most of the revenue loss flows through to EBITDA:** Most of the cost related to provisioning broadband services is capex and not opex (which could be at the heart of the problem of the estimated all-in costs that have been determined by the CRTC), so gross margins on these revenues today are estimated at 95% or higher. If a facilities-based player loses a retail customer to a wholesaler, then costs such as customer service, billing, and bad debts would shift to the reseller, so we have assumed that at least some of the revenue loss can be offset by cost reduction. However, the incumbents will still need to power and maintain the network, and they will need to fight hard with investments in marketing and customer support in order to compete with more aggressive wholesale-based competitors, so we do not think it is realistic to assume

more than 10-20 cents in opex reduction for every \$1.00 in reduced broadband ARPU.

3. **We lowered our wireline segment capital intensity estimates by 300-500bps:** As has already been announced by certain players (BCE cutting its fixed wireless Internet expansion by 200k homes, and Eastlink lowering its capex budget by \$50 million, or 25%), we believe reducing capital investment will be the main way that management teams in the industry attempt to offset the negative impact of lower Internet revenue. In regions with less population density (where the economics of network investments were already less attractive than the biggest urban centres), there could be less incentive to invest, plus we believe that even in the big cities, we could see telcos piggyback on cable infrastructure in some cases, and vice-versa. Why spend about \$1,000 per home in capex for FTTH if you can simply load your customers onto a pre-existing competitor's super-fast broadband network for only about \$16/sub/month with virtually no incremental capex? **There would also be the simple economic reality that some desirable capex projects will have to get delayed (or even cancelled forever) if these public companies want to be able to sustain their commitments to the capital markets in terms of dividend payments to equity holders and credit ratings for bondholders and banks.** It should be noted that much of the capex related to extending network coverage and increasing broadband capacity is capitalized labour, so these estimated capex reductions would surely lead to layoffs and a permanent reduction in employment levels across the facilities-based landscape (both directly, and indirectly via equipment vendors and outsourced contractors).
4. **We lowered our target multiples on wireline segment EBITDA by 50bps, so from about 7-8x previously (base multiples plus interest rate adjustments), to about 6.5-7.5x:** One could argue that 50bps is a modest adjustment relative to the magnitude of the revenue hit that we predict, and/or that 6.5-7.5x would still be somewhat generous for low growth (or even negative growth) wireline assets in an environment with a negative and uncertain regulatory environment. We do not dispute that our assumption here is subject to debate, but we believe the following three factors justify only modest multiple contraction:
 - a. Interest rates remain extremely low by historic standards, so these stocks should still get supported by investors looking for FCF and dividend yield, even with minimal revenue growth.
 - b. The anticipated capex reductions cited above should mitigate declines in FCF (and future EPS via gradual D&A expense changes that coincide with the capex) relative to the more meaningful revenue and EBITDA impacts. Note that we are not making predictions today on which companies might do a better job than others of being proactive with capex reductions to offset the CRTC rate burden, so surely, we could be facing a

situation by 2021 where some stocks get hurt a bit more than others.

- c. There would still be initiatives and sub-segments within wireline/cable divisions that are enhancing shareholder value in the future, despite the less attractive growth and returns from the broadband sub-segment. On the revenue side, some key examples would be Healthcare and International assets at TELUS, and business telecom market share gains by the cable companies. On the cost reduction side, we could point to the scale benefits of the Comcast X1 platform for most cablecos, and the maturing FTTH footprints for BCE and TELUS, which we believe should lead to meaningful savings in a few years. In all cases we should also remind investors of the benefits in a 5G world of being able to leverage both fixed line and wireless assets for small cell deployment and network capacity/speed/latency, so Canadian carriers, in general, should still look good on that front versus many international peers.

Rogers Walkthrough

To help readers understand the impact of these sensitivity assumptions, let us walk through one of our models in more detail. We chose to highlight Rogers here because it is one of the largest operators, and also because it is one of the few companies that provides segmented disclosure on Internet revenue (and therefore ARPU) separate from other wireline services (Quebecor being the only other one with this disclosure, and recall that we showed the broadband ARPU figures for these two companies in Exhibit 10).

1. A 20% reduction in broadband ARPU lowered our growth estimate in 2021 to -18% from +2%. **Total cable segment revenue declined \$487 million**, to -12% growth versus +0.4% in our base case. Broadband ARPU in 2021E declined \$15, from \$78 in our base case model to \$63 in our downside scenario. Note that our model does not break out wholesale versus retail subs and ARPU (there would be too many estimates involved as these figures are not disclosed).
2. The 90% flow through of revenue to EBITDA caused our cable segment EBITDA in 2021E to decline by \$439 million. Cable segment EBITDA growth gapped down to -21%, versus +1.5% in our base case model. **On a consolidated basis, EBITDA growth in 2021 fell from +4.8% to -1.7%**. Our EPS estimate in 2021 dropped to \$4.68 from \$5.25.
3. Our base case capex forecast for Rogers Cable in 2021 is 25% intensity (so 25% of revenue), which we assume will be down from 27% in 2020 and 30% in 2019 (recall that management's long-term goal is 20-22% intensity, but this is not expected to be fully achieved by 2021). In our sensitivity analysis, we assumed this will be cut by 500bps in 2021, to 20%, which means that cable/wireline segment capex drops to \$694 million in our downside scenario versus \$989 million in our base case outlook. **This is clearly a meaningful (30%) reduction in infrastructure spending, and from Exhibit 15, you can add up that the aggregate expected decline in 2021E capex for all six publicly-traded cable/telecom firms would be an arguably staggering \$1.68 billion** (note that this does not even include names we do not cover like Eastlink and SaskTel). Owing to the less attractive returns on network investment, the lower capex at Rogers would be expected to buffer declines in FCF, with our 2021 estimate declining only 3%, from \$2,919 million (TD definition, post IFRS 16 lease costs and IFRS 15 contract asset changes), to \$2,823 million in our downside scenario (FCF/share from \$5.67 down to \$5.48).
4. Our base case multiple for cable assets at Rogers got trimmed to 6.0x from 6.5x, so that our target multiple post interest rate adjustments (still using 1.95% as a GoC 10-year yield forecast, versus the long-term average of 3.10%) declined to 6.8x from 7.3x. Our base case (and still officially published) target price of \$89.00 is actually based on our 2020 and not 2021 estimates, but our newly published base case forecasts for 2021 also point to a 12-month target price of \$89.00 if we apply a 10% time value discount to the 2021 target value using our base case multiples. **When we apply the lower wireline target multiple**

to our downside scenario estimates for 2021, and then also discount back by 10%, we derive a 12-month target price of \$82, or 8% lower than our base case target. Interestingly, the \$7 difference between these two target prices compares to only a \$1.98 reduction in RCI.B shares since August 15 (the day of the surprise CRTC decision on wholesale access rates), so it seems like the market shares our view that there is a good chance that this regulatory burden will be eased via the appeal process over the next few months.

Exhibit 15. Downside Sensitivity (C\$, millions, except per share figures)

	Wireline Revenue Downside			Wireline Capex Downside		
	2021E	Scenario	Delta	2021E	Scenario	Delta
BCE	12,762	11,962	800	3,068	2,517	551
RCI	3,956	3,469	487	989	694	295
TELUS	7,078	6,690	388	1,909	1,538	372
SJR*	4,429	4,067	362	842	610	231
QBR	2,765	2,581	183	608	465	144
CCA*	1,313	1,187	126	230	148	81
Total	32,303	29,956	2,347	7,646	5,971	1,675

	Cosolidated EBITDA Downside			Cosolidated EPS Downside			Cosolidated FCF Downside		
	2021E	Scenario	Delta	2021E	Scenario	Delta	2021E	Scenario	Delta
BCE	10,755	10,106	-6%	\$3.85	\$3.44	-11%	4,220	4,122	-2%
RCI	7,018	6,579	-6%	\$5.25	\$4.68	-11%	2,919	2,823	-3%
TELUS	6,488	6,179	-5%	\$3.43	\$3.14	-8%	2,036	2,030	0%
SJR*	2,429	2,139	-12%	\$1.53	\$1.30	-15%	806	784	-3%
QBR	1,999	1,834	-8%	\$2.53	\$2.18	-14%	612	599	-2%
CCA*	1,197	1,085	-9%	\$8.17	\$6.85	-16%	431	411	-5%

	Target Price	
	Current Published	Downside Scenario
BCE	\$65.00	\$61.00
RCI	\$89.00	\$82.00
TELUS	\$62.00	\$57.00
SJR*	\$31.00	\$27.00
QBR	\$36.00	\$30.00
CCA*	\$110.00	\$96.00

*Based on fiscal years

Source: Company reports, and TD Securities Inc.

Industry Insights

Equity Research

September 4, 2019

Exhibit 16. BCE Annual Forecasts

	2017	2018	2019	2020	2021
	Actual	Actual	Guidance	TDSI Est.	TDSI Est.
Revenue (\$mm)					
Bell Canada					
Bell Wireline (incl. BA)	12,400	12,267	n.a	12,295	12,571
Bell Wireless	7,926	8,818	n.a	8,949	9,426
Bell Media	3,104	3,121	n.a	3,232	3,329
Intersegment/other	(673)	(738)	n.a	(749)	(755)
Consolidated Revenue	22,757	23,468	23,703- 24,172	23,727	24,592
EBITDA (\$mm)					
Bell Canada					
Bell Wireline (incl. BA)	5,190	5,321	n.a	5,284	5,477
Bell Wireless	3,376	3,521	n.a	3,863	4,057
Bell Media	716	693	n.a	848	865
Consolidated EBITDA¹	9,282	9,535	10,012- 10,202	9,995	10,399
EPS from Continuing Ops²	\$3.42	\$3.51	\$3.48 – \$3.58	\$3.43	\$3.66
Consolidated Discretionary Free Cash Flow³	3,418	3,567	3,800- 4,000	3,689	3,954
Discretionary FCF/share	\$3.82	\$3.97	n.a	\$4.10	\$4.39
Wireline Capex (incl. BA)	3,174	3,193	n.a	3,077	3,053
Wireless Capex	731	664	n.a	668	873
Bell Media Capex	129	114	n.a	115	100
BCE Capex (\$mm)	4,034	3,971	n.a	3,859	4,026
As a % of Revenue	17.7%	16.9%	~16.5%	16.3%	16.4%
Operating Statistics					
NAS Lines (k)	6,320	5,942	n.a	5,586	5,296
Wireless Subscribers (k)	9,167	9,610	n.a	9,920	10,339
Internet Subscribers (k)	3,790	3,410	n.a	3,551	3,640
Video Subscribers (k) (satellite, IPTV and wholesale)	2,832	2,766	n.a	2,787	2,817

1. EBITDA growth guidance excluding IFRS 16 adjustments is +2-4%, with IFRS 16 adding ~\$275 million.

2. EPS guidance excluding IFRS 16 adjustments is \$3.53-\$3.63.

3. FCF growth guidance excluding IFRS 16 adjustments is +3-7%, with IFRS 16 adding ~\$175 million.

Source: Company reports and TD Securities Inc.

Industry Insights

Equity Research

September 4, 2019

Exhibit 17. TELUS Annual Forecasts

(\$mm), except per share amounts	2017A	2018A	2019E	2020E	2021E	
Revenue	Actual	Actual	Guidance	TDSI	TDSI	TDSI
TELUS wireline	5,737	6,233	not provided	6,492	6,777	7,078
TELUS wireless	7,671	8,135	not provided	8,313	8,584	8,950
Total Revenue¹	13,408	14,368	\$14,623 to \$14,907	14,805	15,362	16,028
EBITDA				31.8%	32.9%	
TELUS wireline	1,719	1,789	not provided	1,970	2,157	2,327
TELUS wireless	3,286	3,461	not provided	3,757	3,949	4,161
Total Adjusted EBITDA²	5,005	5,250	\$5,670 to 5,775	5,728	6,107	6,488
Restructuring and Other	(95)	(146)	(100)	(100)	(60)	(60)
Total EBITDA	4,910	5,104	not provided	5,628	6,047	6,428
Adj. EPS³	\$2.77	\$2.85	up to +10%	\$2.98	\$3.25	\$3.43
Discretionary FCF	966	1,197	\$1.05 to \$1.15 billion	1,046	1,713	2,036
FCF/Share	\$1.63	\$2.01	not provided	\$1.74	\$2.85	\$3.39
Net Debt to EBITDA⁴	2.70x	2.69x	not provided	2.92x	2.72x	2.49x
CAPEX						
Wireline Capex	2,116	2,018	not provided	1,990	1,913	1,909
Wireless Capex	978	896	not provided	844	952	992
Total Capex	3,094	2,914	Approx. \$2.85 billion	2,834	2,865	2,902
<i>As a % of Revenue</i>	23.1%	20.3%	not provided	19.1%	18.7%	18.1%
Operating Stats						
Wireless Subs Net Adds (k)	296	457	not provided	534	534	577
HS Internet Net Adds (k)	81	115	not provided	86	98	103
Resi NAS Line Net Adds (k)	(76)	(51)	not provided	(56)	(54)	(51)
TELUS TV Net Adds (k)	35	63	not provided	60	52	54

1. 2019 guidance of +3-5% growth excludes \$171 million of non-recurring equity income from 2018 revenue

2. 2019 guidance translates to +8-10% on a base of as-reported 2018 EBITDA, and +4-6% on 2018 EBITDA adjusted for IFRS 16

3. Management guidance is for basic EPS growth (\$2.68 in 2018). On a basic basis, our EPS estimate for 2019 is \$3.06.

4. TDSI Net Debt to EBITDA ratio is based on reported EBITDA, versus EBITDA adjusted for restructuring costs used by TELUS.

Source: Company reports and TD Securities Inc.

Industry Insights

Equity Research

September 4, 2019

Exhibit 18. Rogers Annual Forecasts

	2017R	2018A	2019E	2020E	2021E
	Actual	Actual	Guidance	TDSI Est.	TDSI Est.
Revenue (\$mm)					
Wireless	\$8,569	\$9,200	n.a.	\$9,613	\$10,282
Cable, Internet, and Home Phone	\$3,894	\$3,932	n.a.	\$3,810	\$3,956
Media and Sports	\$2,153	\$2,168	n.a.	\$2,113	\$2,177
Corporate and Other	(\$247)	(\$204)	n.a.	(\$195)	(\$195)
Total	\$14,369	\$15,096	\$15,549 to \$15,851	\$15,341	\$16,221
Adjusted EBITDA (\$mm)⁽¹⁾					
Wireless	\$3,726	\$4,090	n.a.	\$4,514	\$5,066
Cable, Internet, and Home Phone	\$1,819	\$1,874	n.a.	\$1,787	\$1,963
Media and Sports	\$127	\$196	n.a.	\$150	\$157
Corporate and Other	(\$170)	(\$177)	n.a.	(\$171)	(\$168)
Total	\$5,502	\$5,983	\$6,402 to \$6,521	\$6,281	\$7,018
EPS (recurring, FD)	\$3.68	\$4.31	n.a.	\$4.31	\$5.25
Capex (\$mm)⁽³⁾					
Wireless	\$806	\$1,086	n.a.	\$1,333	\$1,412
Cable, Internet, and Home Phone	\$1,334	\$1,429	n.a.	\$1,125	\$989
Media and Sports	\$83	\$90	n.a.	\$127	\$71
Corporate and Other	\$213	\$185	n.a.	\$222	\$200
Total Capex	\$2,436	\$2,790	\$2,850 to \$3,050	\$2,806	\$2,672
Free Cash Flow (\$mm)⁽¹⁾					
Management definition ⁽²⁾	\$1,869	\$2,134	\$2,334 to \$2,434	\$2,342	\$2,778
Discretionary FCF (post leases and contract assets)	\$1,501	\$1,550	n.a.	\$1,791	\$2,478
Discretionary FCF per Share (post leases and contract assets)	\$2.91	\$3.01	n.a.	\$3.48	\$5.67
Cable Subscriber Metrics (k)					
Basic Cable Net Adds (Loss)	(80)	(55)	n.a.	(99)	(74)
High Speed Internet Additions	95	109	n.a.	89	76
Telephony Additions	14	8	n.a.	(30)	(30)
Primary Service Unit Adds	29	62	n.a.	(40)	(28)
Wireless Subscriber Metrics (k)					
Total Wireless Gross Adds (Loss)	2,381	2,383	n.a.	2,255	2,084
Total Wireless Net Adds (Loss)	208	301	n.a.	247	145
Blended ABPU	\$62.31	\$64.74	n.a.	\$67.00	\$69.92
Blended ARPU	\$54.23	\$55.64	n.a.	\$56.42	\$56.98
Postpaid Wireless Net Adds (Loss)	354	453	n.a.	315	315
Postpaid Churn	1.20%	1.10%	n.a.	1.06%	1.03%
Prepaid Wireless Net Adds (Loss)	61	(152)	n.a.	(68)	(170)
Prepaid Churn	3.49%	4.38%	n.a.	4.62%	4.62%

(1) Adjusted EBITDA and FCF account for impacts of IFRS 16 on a prospective basis starting in 2019. 2018 reported adjusted EBITDA and FCF would have been \$174mm higher on an IFRS 16 basis.

(2) Effective January 1, 2019 FCF definition has been amended to exclude the effect of net change in contract assets and deferred commission costs.

(3) Capex guidance includes proceeds on disposition but does not include expenditures for spectrum licences.

Source: Company reports and TD Securities Inc.

Industry Insights

Equity Research

September 4, 2019

Exhibit 19. Quebecor Annual Forecasts

(\$mm, except per share amounts)

	2017A	2018A	2019E	2020E	2021E
Revenue					
Wireless	\$469.8	\$534.4	\$695.6	\$940.2	\$1,035.6
Videotron Ex-Wireless	\$2,818.0	\$2,847.6	\$2,784.7	\$2,719.9	\$2,764.6
Total Telecommunications	\$3,287.8	\$3,382.0	\$3,480.2	\$3,660.0	\$3,800.1
Media (incl. TVA)	\$769.9	\$728.6	\$734.3	\$595.3	\$580.2
Sports and Entertainment	\$181.2	\$182.1	\$192.4	\$196.2	\$200.2
Head Office and Inter-Segment Eliminations	(\$113.8)	(\$111.7)	(\$113.0)	(\$113.2)	(\$113.5)
Total Revenue	\$4,125.1	\$4,181.0	\$4,294.0	\$4,338.4	\$4,467.0
EBITDA					
Wireless	\$170.6	\$259.1	\$311.3	\$382.1	\$442.7
Videotron Ex-Wireless	\$1,413.9	\$1,456.4	\$1,423.8	\$1,473.0	\$1,526.5
Total Telecommunications	\$1,584.5	\$1,715.5	\$1,735.1	\$1,855.2	\$1,969.2
Media (incl. TVA)	\$72.6	\$60.1	\$49.8	\$41.4	\$31.8
Sports and Entertainment	\$10.3	\$10.5	\$10.4	\$10.8	\$11.2
Head Office and Inter-Segment Eliminations	(\$18.5)	(\$9.9)	(\$7.4)	(\$10.6)	(\$13.5)
Total EBITDA	\$1,648.9	\$1,776.2	\$1,787.8	\$1,896.7	\$1,998.6
Capex					
Telecommunications (ex-wireless capex)	\$612.8	\$618.8	\$646.4	\$584.8	\$608.2
Consolidated (ex-spectrum capex)	\$744.0	\$750.4	\$791.8	\$769.3	\$806.5
Spectrum purchases	\$0.0	\$0.0	\$255.8	\$200.0	\$100.0
EPS	\$1.44	\$1.96	\$2.00	\$2.26	\$2.53
Free Cash Flow (QMI)	\$453.1	\$695.7	\$423.2	\$660.6	\$618.3
Free Cash Flow (QI)	\$348.1	\$633.5	\$417.2	\$654.6	\$612.3
Internet Subscribers	1,666.5	1,704.5	1,733.4	1,758.4	1,783.8
Internet Net Adds	53.7	38.0	28.9	25.0	25.3
Basic Cable Subscribers	1,640.5	1,597.3	1,543.3	1,492.6	1,440.6
Basic Cable Net adds	(50.4)	(43.2)	(54.0)	(50.7)	(51.9)
Cable Telephony Lines	1,188.5	1,113.9	1,031.4	946.4	859.5
Cable Telephony net adds	(64.6)	(74.6)	(82.5)	(85.0)	(86.9)
Wireless Subscribers	1,024	1,154	1,316	1,470	1,616
Wireless Net Adds	130	130	162	154	146

1. 2017 financials have been restated for IFRS 15, and 2017/2018 financials have been restated for IFRS 16.

2. Prior periods restated to exclude 4Degrees Colocation (sold January 24, 2019).

Source: Company reports and TD Securities Inc.

Industry Insights

Equity Research

September 4, 2019

Exhibit 20. Shaw Annual Forecasts

	Mgmt. Guidance					
	2017A	2018A	2019	2019E	2020E	2021E
Revenue (mm)						
Consumer	\$3,747.0	\$3,725.0	n.a.	\$3,705.6	\$3,717.4	\$3,746.8
Business	\$554.0	\$567.0	n.a.	\$598.0	\$640.3	\$682.5
Wireline (Consumer and Business Network Services)	\$4,301.0	\$4,292.0	n.a.	\$4,303.5	\$4,357.7	\$4,429.3
Wireless (Freedom)	\$605.0	\$951.0	n.a.	\$1,034.3	\$1,209.0	\$1,434.7
Intersegment Eliminations	(\$24.0)	(\$4.0)	n.a.	(\$6.1)	(\$6.2)	(\$6.3)
Total	\$4,882.0	\$5,239.0	n.a.	\$5,331.8	\$5,560.5	\$5,857.7
EBITDA (mm)¹						
Wireline	\$1,864.0	\$1,913.0	n.a.	\$1,948.5	\$1,993.8	\$2,051.9
Wireless (Freedom)	\$133.0	\$176.0	n.a.	\$207.7	\$260.6	\$376.9
Total	\$1,997.0	\$2,089.0	~6% growth	\$2,156.2	\$2,254.4	\$2,428.8
Adjusted EPS	\$1.28	\$1.24	n.a.	\$1.38	\$1.36	\$1.53
Capex (mm)						
Wireline	\$970.0	\$1,024.0	n.a.	\$807.9	\$790.5	\$841.6
Wireless (Freedom)	\$255.0	\$343.0	n.a.	\$393.5	\$399.1	\$309.2
Subtotal	\$1,225.0	\$1,367.0	~\$1,200	\$1,201.4	\$1,189.6	\$1,150.8
Spectrum Purchases	\$430.0	\$0.0	n.a.	\$492.0	\$0.0	\$300.0
Total Capex	\$1,655.0	\$1,367.0	n.a.	\$1,693.4	\$1,189.6	\$1,450.8
FCF (pre Spectrum; COA; W/C; rest'n) (mm)²	\$432.0	\$383.0	~\$550	\$549.5	\$628.3	\$806.5
FCF (post restructuring, W/C & COA) (mm)	\$322.0	\$102.0	n.a.	\$319.6	\$514.9	\$783.8
Net FCF (pre dividends) (mm)¹	(\$108.0)	\$102.0	n.a.	(\$172.4)	\$514.9	\$483.8
FCFPS (post restructuring, W/C & COA)	\$0.66	\$0.20	n.a.	\$0.63	\$1.00	\$1.52
Subscriber Metrics (in 000's)						
Basic Subscribers	1,722.3	1,634.8	n.a.	1,530.1	1,440.0	1,355.2
Basic Cable Net Adds (Loss)	(9.9)	(87.5)	n.a.	(104.7)	(90.2)	(84.8)
Internet Subscribers	2,031.7	2,049.8	n.a.	2,079.7	2,109.1	2,139.0
Internet Net Adds	64.1	18.2	n.a.	29.9	29.4	29.9
Telephony Subscribers	1,252.7	1,208.8	n.a.	1,167.1	1,131.8	1,098.4
Telephony Net Adds	(5.4)	(44.0)	n.a.	(41.6)	(35.4)	(33.4)
Wireless Subscribers	1,147.2	1,402.9	n.a.	1,658.4	1,953.4	2,240.4
Wireless Net Adds	103.9	255.7	n.a.	255.5	295.0	287.0
Total Primary Service Units	5,006.7	4,893.4	n.a.	4,776.9	4,680.9	4,592.6
Total Primary Service Units Additions	48.9	(113.3)	n.a.	(116.5)	(96.1)	(88.3)
Satellite Subscribers	805.1	785.2	n.a.	747.4	716.4	686.7
Satellite Net Adds	(16.5)	(19.8)	n.a.	(37.9)	(31.0)	(29.7)
Net Debt/EBITDA	2.0x	2.0x	n.a.	2.0x	2.0x	1.9x

1. EBITDA & FCF exclude a number of one-time items.

2. FCF is shown post equipment subsidy costs.

Source: Company reports and TD Securities Inc.

Industry Insights

Equity Research

September 4, 2019

Exhibit 21. Cogeco Communications Annual Forecasts

	2017A	2018A	2019 Guidance (constant-currency) ³	2019E	2020 Guidance (constant-currency) ⁴	2020E	2021E
<i>(\$mm, except per-share amounts)</i>							
Total Canadian Cable Revenues	\$1,296.5	\$1,299.4	n.a.	\$1,270.1	n.a.	\$1,300.0	\$1,313.4
U.S. Revenues	\$643.1	\$848.1	n.a.	\$1,040.7	n.a.	\$1,096.5	\$1,141.8
Inter-segment eliminations & Other	(\$3.5)	(\$0.5)	n.a.	\$0.0	n.a.	\$0.0	\$0.0
Total Revenue	\$2,226.9	\$2,147.0	6%-8%	\$2,310.8	2%-4%	\$2,396.4	\$2,455.1
Canadian Cable EBITDA	\$678.2	\$674.7	n.a.	\$660.0	n.a.	\$689.2	\$705.2
EBITDA margin	52.3%	51.9%	n.a.	52.0%	n.a.	53.0%	53.7%
U.S. EBITDA	\$271.2	\$370.7	n.a.	\$475.0	n.a.	\$506.0	\$536.9
EBITDA margin	42.2%	43.7%	n.a.	45.6%	n.a.	46.1%	47.0%
Inter-segment eliminations & Other	(\$35.5)	(\$38.3)	n.a.	(\$44.7)	n.a.	(\$44.5)	(\$45.0)
Total EBITDA³	\$1,005.0	\$1,007.0	8%-10%	\$1,090.2	2.5%-4.5%	\$1,150.7	\$1,197.0
EBITDA margin ²	45.1%	46.9%	n.a.	47.2%	n.a.	48.0%	48.8%
Canadian Cable Capex and Equipment Subsidies ¹	\$250.7	\$251.6	n.a.	\$250.4	n.a.	\$247.5	\$249.8
Capex as a % of Revenues	19.3%	19.4%	n.a.	19.7%	n.a.	19.0%	19.0%
U.S. Capex	\$129.7	\$213.9	n.a.	\$205.6	n.a.	\$230.3	\$239.8
Capex as a % of Revenues	20.2%	25.2%	n.a.	19.8%	n.a.	21.0%	21.0%
Total Capex and Equipment Subsidies¹	\$428.1	\$465.4	\$450 - \$470	\$456.0	\$460 - \$480	\$477.8	\$489.6
Capex as a % of Revenues	19.2%	21.7%	20%-21%	19.7%	19%-20%	19.9%	19.9%
Earnings per share (adj)	\$6.04	\$5.49	n/a	\$6.40	n/a	\$7.23	\$8.17
Reported Free Cash Flow	\$373.7	\$302.0	38%-45%	\$419.7	5%-11%	\$461.8	\$511.1
Free Cash Flow Normalized for ABB taxes and M.I.²		\$283.7	n.a.	\$357.4	n.a.	\$394.6	\$430.9
Normalized Free Cash Flow per share	\$7.55	\$5.75	n.a.	\$7.19	n.a.	\$7.91	\$8.64
Debt to EBITDA	2.4x	3.4x	n.a.	2.6x	n.a.	2.2x	1.8x
Canadian Subscriber Metrics (k)							
Basic Cable Subscribers	720.6	688.8	n.a.	649.7	n.a.	613.8	576.6
Net adds/(loss)	(18.7)	(31.9)	n.a.	(39.0)	n.a.	(36.0)	(37.2)
Internet Subscribers	769.9	782.3	n.a.	792.7	n.a.	812.2	829.9
Net adds/(loss)	36.2	12.4	n.a.	10.5	n.a.	19.5	17.6
Telephony Subscribers	426.4	395.9	n.a.	364.6	n.a.	334.2	302.9
Net adds/(loss)	(14.6)	(30.5)	n.a.	(31.3)	n.a.	(30.4)	(31.4)
Canadian PSU	1,916.9	1,866.9	n.a.	1,807.1	n.a.	1,760.2	1,709.3
Net adds/(loss)	2.8	(49.9)	n.a.	(59.9)	n.a.	(46.8)	(50.9)
U.S. Subscriber Metrics (k)							
Basic Cable Subscribers	236.1	317.3	n.a.	305.2	n.a.	290.4	275.3
Net adds/(loss)	(7.5)	(6.8)	n.a.	(12.1)	n.a.	(14.7)	(15.1)
Internet Subscribers	273.1	424.9	n.a.	449.6	n.a.	466.7	484.1
Net adds/(loss)	19.5	21.4	n.a.	24.7	n.a.	17.0	17.4
Telephony Subscribers	103.6	142.3	n.a.	143.1	n.a.	142.0	140.8
Net adds/(loss)	7.1	5.6	n.a.	0.9	n.a.	(1.1)	(1.2)
U.S. PSUs	612.8	884.5	n.a.	897.9	n.a.	899.1	900.2
Net adds/(loss)	19.1	20.3	n.a.	13.5	n.a.	1.2	1.1
Total PSU's	2,529.7	2,751.4	n.a.	2,705.0	n.a.	2,659.4	2,609.5
Net adds/(loss)	21.9	(29.7)	n.a.	(46.4)	n.a.	(45.6)	(49.8)

1. Our capex numbers include equipment subsidies.

2. Normalized to assume cash taxes paid at ABB and to adjust for the 21% Caisse minority interest in ABB.

3. 2019 guidance is based on constant currency rates (USD/CAD of 1.28)

4. 2020 guidance is based on constant currency rates (USD/CAD of 1.33) and on a pre-IFRS 16 basis.

Source: Company reports and TD Securities Inc.

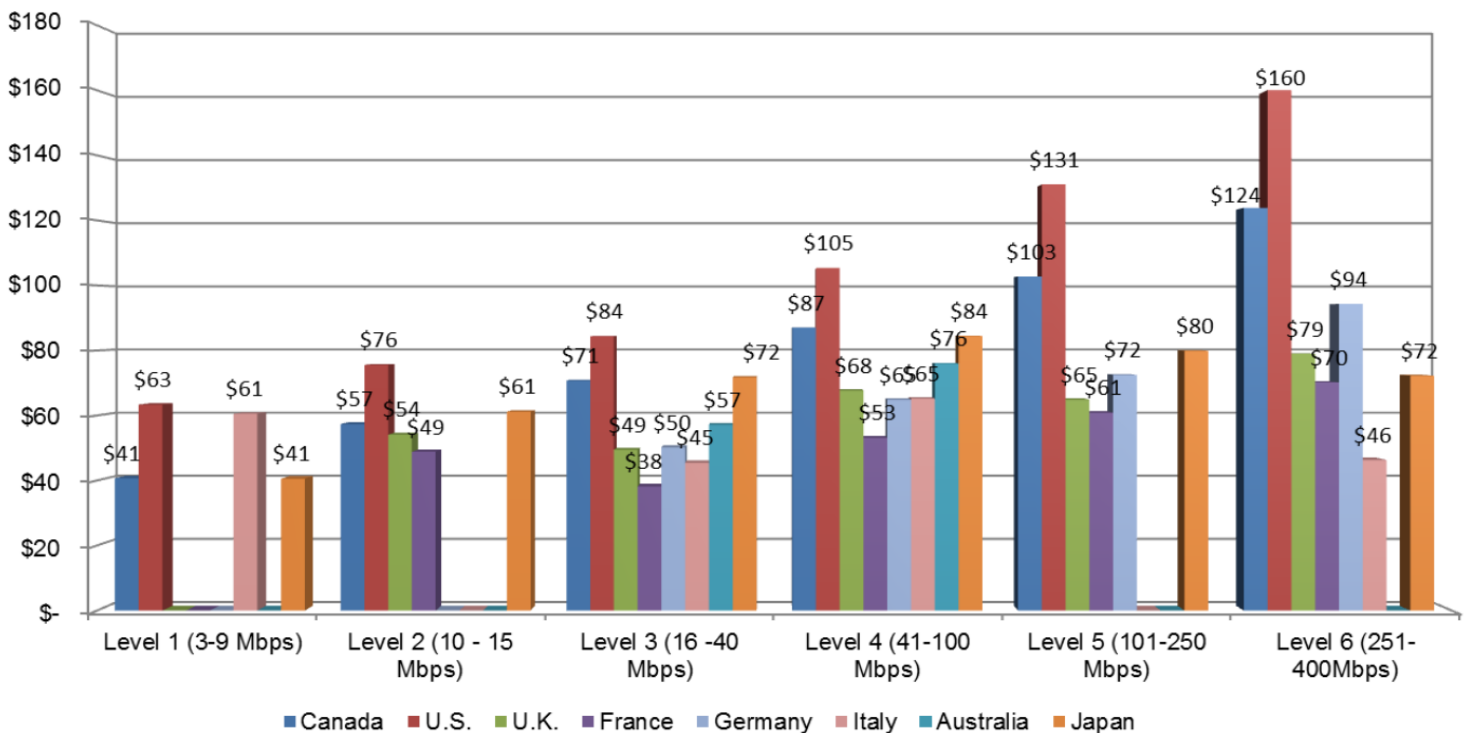
Exhibit 22. Comparables

Company	Symbol	Price	Mkt Cap	EV/EBITDA				P/E				P/FCF				Curr. Div Yield	2019E Div Payout Ratio	2019E Net Debt/EBITDA
				2018A	2019E	2020E	2021E	2018A	2019E	2020E	2021E	2018A	2019E	2020E	2021E			
Canadian Telecom																		
BCE	BCE	\$63.05	\$56,764	8.7x	8.5x	8.1x	7.8x	18.0x	18.4x	17.2x	16.4x	15.9x	15.4x	14.4x	13.4x	5.0%	77%	2.8x
TELUS	T	\$48.64	\$29,233	8.2x	8.0x	7.5x	7.0x	17.1x	16.3x	15.0x	14.2x	24.2x	27.9x	17.1x	14.4x	4.6%	130%	2.9x
Rogers Communications	RCLB	\$65.59	\$33,779	7.5x	7.5x	6.9x	6.4x	15.2x	15.2x	13.6x	12.5x	21.8x	18.8x	13.6x	11.6x	3.0%	57%	2.8x
TeraGo	TGO	\$9.45	\$149	13.2x	11.0x	11.4x	n/a	n/mf	n/mf	n/mf	n/a	115.4x	23.9x	30.2x	n/a	0.0%	n/a	1.1x
Average (Ex-TeraGo)				8.1x	8.0x	7.5x	7.1x	16.7x	16.6x	15.3x	14.4x	20.6x	20.7x	15.0x	13.1x	4.2%	88%	2.8x
U.S. Telecom																		
AT&T	T	\$35.38	\$260,149	7.6x	6.9x	6.7x	6.6x	10.1x	10.0x	9.8x	9.9x	11.6x	9.2x	9.5x	9.8x	5.8%	53%	2.6x
Verizon	VZ	\$58.04	\$240,228	7.4x	7.2x	6.9x	6.6x	12.3x	12.1x	11.9x	11.7x	13.6x	13.4x	12.3x	12.2x	4.2%	56%	2.2x
Sprint	S	\$6.70	\$27,383	5.4x	4.7x	5.4x	5.5x	n/a	27.6x	n/a	n/a	29.0x	n/a	n/a	n/a	0.0%	n/a	2.6x
T-Mobile USA	TMUS	\$77.13	\$66,342	7.7x	6.8x	6.4x	5.9x	23.0x	19.4x	16.1x	14.3x	17.6x	15.3x	13.0x	10.7x	0.0%	n/a	1.8x
Average				7.0x	6.4x	6.4x	6.1x	15.1x	17.3x	12.6x	11.9x	18.0x	12.6x	11.6x	10.9x	2.5%	54%	2.3x
Canadian Cable																		
Shaw Communications ¹	SJR.B	\$25.52	\$13,130	6.3x	6.3x	5.9x	5.4x	20.6x	18.5x	18.8x	16.7x	n/mf	40.8x	25.5x	16.8x	4.6%	81%	2.0x
Cogeco Communications	CCA	\$103.91	\$5,289	8.9x	7.7x	7.1x	6.6x	18.9x	16.2x	14.4x	12.7x	18.1x	14.4x	13.1x	12.0x	2.0%	29%	2.6x
Quebecor Inc.	QBR.B	\$29.68	\$7,613	7.7x	7.8x	7.2x	6.8x	15.1x	14.9x	13.1x	11.8x	11.2x	18.4x	11.5x	12.1x	1.5%	24%	3.2x
Average				7.6x	7.3x	6.7x	6.3x	18.2x	16.5x	15.4x	13.7x	14.6x	24.5x	16.7x	13.6x	2.7%	45%	2.6x
U.S. Cable																		
Comcast	CMCSA	\$43.88	\$202,155	9.1x	8.2x	7.3x	6.8x	16.1x	14.3x	12.6x	12.0x	16.2x	14.4x	11.6x	10.9x	1.9%	28%	2.9x
Charter Communications	CHTR	\$411.81	\$104,517	10.9x	10.1x	9.0x	8.4x	78.9x	61.6x	31.2x	21.9x	48.3x	24.9x	13.7x	11.5x	0.0%	n/a	4.4x
Cable ONE	CABO	\$1,299.27	\$7,445	16.7x	15.6x	13.9x	12.5x	40.4x	41.9x	35.5x	27.2x	39.2x	58.5x	28.8x	21.0x	0.7%	41%	2.0x
WideOpenWest	WOW	\$5.39	\$436	6.6x	6.3x	6.0x	5.8x	4.1x	6.8x	6.3x	6.0x	n/a	44.3x	11.6x	5.6x	0.0%	n/a	5.3x
Altice USA	ATUS	\$28.65	\$19,155	10.1x	9.2x	8.5x	8.0x	n/mf	50.4x	26.1x	19.1x	15.4x	13.7x	10.7x	9.7x	0.0%	n/a	4.9x
Average				10.7x	9.9x	8.9x	8.3x	34.9x	35.0x	22.3x	17.2x	29.8x	31.1x	15.3x	11.7x	0.5%	34%	3.9x

(1) We back out wireless as a hidden asset in our valuation for Shaw. The unadjusted EV/EBITDA multiple is 8.1x 2019E and 7.8x 2020E.

Source: Company reports, Capital IQ and TD Securities Inc.

Exhibit 23. International Pricing Comparison



Source: Industry Canada, Wall Communications, TD Securities Inc.



Exhibit 24. Justification of and Key Risks to Target Prices

Company Name and Ticker	Target Price	Rec.	Risk Rating	Justification of Target Price	Key Risks to Target Price
BCE Inc. (BCE-T)	\$65.00	BUY	MEDIUM	We now derive our target price using an equal-weighted average of: 1) EBITDA multiples based on our long-term fundamental view, adjusted for current interest rates. We use 9.3x wireless (8.5x base-case), 7.6x wireline (6.75x base-case), and 6.5x for Bell Media (equates to ~7.7x proportionate EBITDA for Bell Media) on our 2020E; and 2) Applying a 10-year average spread (2.99%) to bond yields (1.95% TD Economics forecast) to our estimated annualized dividend in one-year.	A prolonged recession could reduce spending on discretionary wireline and wireless services; Aggressive pricing or promotions from cable and VoIP providers could reduce Bell's wireline profits; Increased adoption of OTT video services; Increased wireless competition from new entrants or among the three incumbents could reduce Bell's wireless profits; 5G wireless services could evolve into substitutes for the fixed-line broadband services offered by Bell today; Regulatory changes could actively affect Bell's operations; Escalating capex for FTTH or other projects could lead to lower FCF than we are forecasting; Misguided/overpriced acquisitions; Potential health risks from wireless devices or transmission towers; and Interest rates.
TELUS Corp. (T-T)	\$62.00	BUY	MEDIUM	We base our multiples on our long-term fundamental view, adjusted for current interest rates. In this context, we are using ~9.3x 2020E wireless EBITDA (8.5x base case) and ~8.1x 2020E wireline EBITDA (7.25x base case) to derive our target price.	Increased competition among the three wireless carriers in Canada; Aggressive pricing or promotions by new wireless entrants; Increased adoption of OTT video services; 5G wireless services could evolve into being substitutes for the fixed-line broadband services offered by TELUS; Irrational capex spending on wireless infrastructure or TELUS' IP network could compromise the company's FCF; Misguided or overpriced acquisitions; Regulatory changes could negatively affect TELUS' operations; Aggressive pricing or promotions from cable providers could affect TELUS wireline profits; Potential health risks from wireless devices or transmission towers; Interest rates.
Rogers Communications Inc. (RCI.B-T)	\$89.00	BUY	MEDIUM	Our target price is based on effective 2020E EBITDA multiples of 9.3x for wireless and 7.3x for cable and media (8.5x for wireless and 6.5x for cable and media base multiples plus adjustments for interest rates being below long-term averages).	Key risks to target price include: 1) changes in regulatory environment; 2) increased wireless competition from either Bell/TELUS/Shaw; 3) accelerated fibre deployments by Bell; 4) increased adoption of OTT video services; 5) potential for 5G services to substitute fixed-line broadband services; 6) overpaying for an acquisition; 7) economic downturn; 8) heavier-than-expected capex could reduce FCF; 9) subordinate voting share structure: Rogers family controls 90% of votes; 10) interest rates; 11) potential health risks from wireless devices/transmission towers; and 12) rising labour and input costs
Shaw Communications Inc. (SJR.B-T)	\$31.00	ACTION LIST BUY	MEDIUM	We base our target price on a NAV approach. In our NAV, we use a 7.5x 2020E EBITDA for wireline, and a DCF for the wireless business.	Key risks to target price include: 1) More aggressive TV/Internet pricing by telcos; 2) execution risk in wireless, which is a new business for Shaw and one which can involve heavy capex and start-up losses; 3) subordinate voting share structure (Shaw family controls 80% of votes); 4) increased video cord cutting/shaving by consumers; and 5) interest rates.
Cogeco Communications Inc. (CCA-T)	\$110.00	HOLD	MEDIUM	Our target price is based on 6.5x 2020E EBITDA for Canadian Cable, and 8.75x for U.S. Cable less a 5% holdco discount (i.e. effective multiple of ~8.33x).	Key risks to target price include: 1) A severe recession; 2) potentially overpaying for future acquisitions and integration of already announced acquisitions; 3) new competitors in broadband or video such as IPTV, cable overbuilds, or broadband wireless; 4) changes in CRTC regulations; 5) increased usage of Internet-based video; 6) subordinate voting share structure (Audet family controls greater than 80% of the votes indirectly); and 7) foreign exchange fluctuations.
Quebecor Inc. (QBR.B-T)	\$36.00	BUY	MEDIUM	Our target price is based on 7.2x 2020E EBITDA for Videotron (pre-wireless) and 11x 2020E EBITDA for wireless.	Key risks to target price include: 1) The possible pricing and/or integration of acquisitions; 2) Increased video competition or price retaliation on telephony from Bell Canada; 3) Increased adoption of OTT video services; 4) 5G wireless services could evolve into being substitutes for the fixed-line broadband services offered by Videotron today; 5) Heavier-than-expected capex; 6) Potential health risks from wireless devices or transmission towers; 7) A decline in newspaper advertising in Canada; and 8) Subordinate voting share structure (Peladeau family controls 67% of the votes).

Source: Company reports and TD Securities Inc.



Industry Insights

Equity Research

September 4, 2019

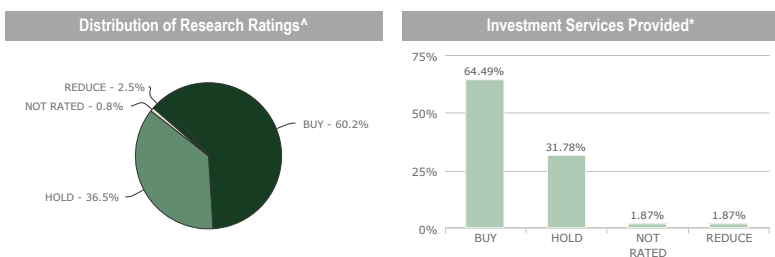
Appendix A. December 10, 2019 Council Order

Therefore, Her Excellency the Governor General in Council, on the recommendation of the Minister of Industry, pursuant to subsections 12(1) and 12(5) of the Telecommunications Act, hereby refers Telecom Decision CRTC 2008-117 and Telecom Order CRTC 2009-111 back to the Commission for reconsideration, to be completed no later than September 1, 2010, and considers that it is material to the reconsideration that the Commission consider whether:

- (a) the speed matching requirements unduly diminish the incentives to invest in new network infrastructure in general and, in particular, in markets of different sizes;
- (b) in the absence of the speed matching requirements there would be sufficient competition to protect the interests of users;
- (c) the respective wholesale obligations imposed on incumbent telephone and cable companies are equitable or represent a competitive disadvantage; and
- (d) the impact of these wholesale requirements unduly impairs the ability of incumbent telephone companies to offer new converged services, such as Internet Protocol television (IPTV)

Source: CRTC

TD Securities Equity Research Disclosures



Current as of: September 4, 2019

^A Percentage of subject companies under each rating category: BUY (covering ACTION LIST BUY, BUY and SPECULATIVE BUY ratings), HOLD, and REDUCE (covering TENDER and REDUCE ratings).

^{*} Percentage of subject companies within each of the three categories (BUY, HOLD, and REDUCE) for which TD Securities Inc. has provided investment banking services within the last 12 months.

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