Competition in Canadian mobile wireless markets:

Pricing problems and wholesale solutions

A report prepared in consideration of:

Telecom Notice of Consultation CRTC 2019-57,

"Notice of hearing—Review of mobile wireless services"

By

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For

The Consumers' Association of Canada (Manitoba Branch)

Winnipeg Harvest

The Aboriginal Council of Winnipeg

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Executive Summary

We have been asked by the Public Interest Law Centre (PILC), on behalf of the Manitoba Branch of the Consumers' Association of Canada (CAC Manitoba), Winnipeg Harvest, and the Aboriginal Council of Winnipeg, to prepare a report in response to Telecom Public Notice CRTC 2019-57, "Notice of hearing—Review of mobile wireless services". Specifically, PILC requested that we assess the state of competition in Canada's mobile wireless markets, that we review Canada's mobile wireless markets in comparison to other countries, and that we provide comment on the Commission's preliminary view that mandated wholesale access for mobile virtual network operators (MVNOs) may be an outcome of this proceeding. We note that our agreement with PILC stipulates that our "duty in providing assistance and giving evidence is to help the CRTC" and that "[t]his duty overrides any obligation to the Public Interest Law Centre and its client(s)."

In this report, we begin by exploring the relevant markets for consideration in this proceeding. In terms of relevant product markets, we observe that mobile wireless services typically feature some combination of voice, text, and data capabilities. Further, while the market for mobile wireless services predominantly features postpaid service plans, we note the importance of prepaid plans, in particular for low-income consumers, and therefore suggest that the Commission consider both postpaid and prepaid service models in its analysis. In terms of geographic markets, we note that pricing and other characteristics of mobile wireless services differ from province to province, largely depending on the configuration of firms operating in each province, and that differences at the local level may also be important. We recommend that the Commission take these differences into account when deciding how to approach its analysis from a geographic perspective.

We then examine indicators of the competitiveness of the Canadian mobile wireless marketplace. This begins with an examination of market concentration, using available data at the national and provincial levels. Our analysis shows that, while a "fourth carrier" has emerged over the last decade in most parts of Canada, by standard economic measures the market remains highly concentrated. This is true both at the national and provincial level, and Canada's mobile market is similar to that of other countries in this regard.

Our report then examines issues related to availability of and access to mobile services alongside considerations of adoption and affordability. While Canadian wireless networks perform well with respect to availability and speed, their performance is not remarkably better than what can be found in comparable countries. In other words, Canadian wireless networks perform well, but assertions that they are "world-leading" are not supported by the data. We note that the availability of quality mobile networks is of little benefit to people who cannot afford to use them.

The report then conducts an analysis of mobile adoption and service pricing, which includes an examination of Canada's performance in international comparisons, drawing on a broad range of sources which use a variety of approaches to understanding the performance of mobile markets around the world. The data show that adoption of mobile services for smartphones and other broadband applications in Canada is well below the average in comparable developed nations. Looking at adoption levels by demographics and geography within Canada, the data show that, while high-income earners almost universally adopt mobile services, lower income users are dramatically less likely to subscribe to a mobile service. This is true whether viewed at the national- or provincial level.

The next part of the report surveys numerous studies comparing international mobile service pricing. While no single study shows the full picture of pricing in mobile markets, collectively, these studies show that Canadian mobile service prices are uniformly amongst the highest in developed nations, and sometimes remarkably higher than those found in comparable countries. To the extent that mobile prices are on the decline in Canada and elsewhere, Canadian mobile service prices tend to have declined by a much lower margin than they have in comparable countries. The connection between high prices and low adoption—in other words, that high prices are a barrier to affordability--is confirmed by scholarship on mobile affordability. As our report shows, the signals being sent by the Canadian mobile market are clear: mobile services remain unaffordable for too many people.

Our report also shows that revenues and profitability in the Canadian mobile wireless market are high relative to other countries in the developed and developing world, while usage of mobile services by Canadians is relatively low. At the same time, the data show that Canadian carriers tend to invest less of their revenues back into their networks than the average for comparable countries, although non-national carriers are investing at above average levels while they continue to build out their relatively new networks.

Following our analysis of pricing and other performance metrics in Canada and internationally, we examine the role of MVNOs in mobile wireless markets around the world. This examination begins by defining MVNOs in terms of the functions they fulfill in providing mobile services to retail customers. We then survey the presence of MVNOs in various countries, noting that they are a regular feature of mobile wireless markets around the world. In terms of number and market share, the impact of MVNOs varies; in some markets their presence appears to be marginal, while in a majority of countries they appear to play a substantial and valuable role. In Canada, by contrast, we observe that MVNO presence appears to be negligible, and that this is explained by an unwillingness amongst existing market players to voluntarily enter into agreements with MVNOs.

We then conduct a review of the academic literature on the role of MVNOs in mobile wireless markets. Some authors point to the potential benefits of voluntary agreements between mobile network operators and MVNOs, while noting that it may be appropriate for regulators to consider mandatory access in cases where network operators are found to possess market

power, as is the case in Canada. Other research suggests that mandated MVNO regulations may lead to decreases in network investment, although it is observed that decreased investment may not necessarily lead to inefficient outcomes. Research also indicates that overall profitability in mobile wireless markets can serve as a useful indicator for assessing the benefits of additional competition; in Canada, high profitability levels in the mobile market suggest that the market could sustain additional competition and that this might help to make services more competitive and affordable. Further research shows that mandated access regulations enabling MVNO entry can benefit consumers.

Following the review of academic literature, our report examines a series of European mergers in which mandated MVNO access was implemented in order to allay concern that mobile mergers would otherwise lead to decreases in competition. The conditions according to which these arrangements were structured can serve as a useful guide for the CRTC as it considers how to develop its own wholesale framework for MVNOs. In addition, the findings of a post-merger analysis, conducted by the Body of European Regulators of Electronic Communications (BEREC) are reviewed. In at least some cases, BEREC found that the MVNO remedy had a positive effect on post-merger prices.

Finally, our report points to the CRTC's longstanding approach to wholesale access obligations in the Canadian wireline broadband market. We note similarities between this market and the mobile wireless market in Canada, and highlight the fact that the Commission has consistently found that wholesale access obligations are a necessary and beneficial requirement ensuring sustainable competition in retail markets for broadband internet access. The ongoing processes associated with wireline wholesale access regulations demonstrate the Commission's capacity to develop and manage these and similarly complex mechanisms. It also indicates that there are firms already present in adjacent markets that are capable of leveraging their existing competence and market position to expand into mobile wireless markets should the opportunity arise.

Based on our findings, we recommend that it would be beneficial to mandate wholesale MVNO access for MVNOs, using a capacity-based rather than a per-unit or usage-based approach. This access should, furthermore, not be adopted as a temporary measure, but rather should be subject to periodic review to ensure its effectiveness, and to be updated and amended as evolving circumstances require.

About the authors

This report has been prepared by Benjamin Klass and Dr. Dwayne Winseck.

Mr. Klass is a PhD student at Carleton University's School of Journalism and Communication. During his time as a PhD student, Mr. Klass has been invited to deliver lectures on the topic of telecommunications economics, policy, regulation, and law at universities across Canada, including Carleton University, the University of Manitoba, University of Winnipeg, York University, the University of Ottawa, and the University of Alberta.

In 2012, Mr. Klass began work with the Canadian Media Concentration Research Project (CMCRP), which is directed by Dr. Dwayne Winseck. As a research assistant, Mr. Klass was responsible for collecting, organizing, and analysing information on Canadian telecommunications markets. At present, Mr. Klass continues his work for the CMCRP as senior research associate, under the direction of Dr. Winseck. In 2015, Mr. Klass completed a Master of Arts degree at the University of Manitoba, for which he produced a thesis paper entitled "Mobile Wireless in Canada: Policy, Problems, and Progress", which presented an historical and contemporary analysis of the political economy of mobile communications in Canada.

Building on his ongoing research, Mr. Klass has actively participated as an interested citizen and a scholar in the sphere of Canadian communications policymaking for more than five years. He has participated in numerous CRTC and Competition Bureau proceedings related to broadcasting and telecommunications. This participation has included the development and presentation of numerous scholarly reports, as an individual as well as together with other scholars and groups such as the CMCRP. Mr. Klass has also appeared in person before several Commission oral hearings. A full list of these reports and presentations can be found in Mr. Klass's curriculum vitae, appended to this report below.

From 2013-2016, Mr. Klass initiated and pursued an application before the CRTC and later the Federal Court of Appeal which ultimately resulted in the prohibition of Bell Mobility's discriminatory zero-rated pricing for its "mobile TV" application. This decision later contributed to the development of an over-arching CRTC policy which prohibits on a broad basis the use of content-specific discriminatory pricing in the Canadian telecommunications market.

Outside of his position as a PhD student at Carleton, Mr. Klass acts in a volunteer capacity as a research associate for the First Mile Connectivity Consortium (FMCC), a registered national not-for-profit research and advocacy organization whose members include First Nations community-based telecommunications organizations serving remote and rural communities. The FMCC is dedicated to engaging in the development of evidence-based policy related to broadband infrastructure, digital services and technology adoption in remote and rural communities. Mr. Klass also fills a voluntary position on the policy committee of the Internet Society Canada Chapter, an organization which develops positions on Canadian legislation that affects the affordability, accessibility, fairness and security of the Internet.

Mr. Klass's work has been featured in media ranging from local stations and newspapers to national print and broadcast outlets, and his views have been solicited by print, online, and broadcast media such as the CBC, Globe & Mail, Winnipeg Free Press, Financial Post, Mobilesyrup, the Wire Report, and Toronto Star.

Mr. Klass has also occasionally acted as a consultant, providing communications research, analysis, and expert opinion to law firms, consumer groups, and advocacy organizations.

Dr. Winseck is Professor at the School of Journalism and Communication, with a cross-appointment at the Institute of Political Economy, Carleton University. He has taught courses or given lectures and workshops in Argentina, China, Denmark, Mexico, Turkey, the United Kingdom, the United States and Uruguay.

His main research interests include the political economy of telecommunications, the internet and media as well as communication history and theory. He is also director of the Canadian Media Concentration Research Project and was the lead Canadian researcher in the International Media Concentration Research Project between 2009 and 2016. His research, data and views on the telecommunications, internet and media industries, as well as the policy and regulatory issues affecting them, are well known and have been solicited or cited widely in the scholarly literature, by journalists across Canada and in other countries including the New York Times and The Guardian, as well as by the Parliament of Canada, Canadian Senate, Department of Canadian Heritage, the Canadian Radio-television and Telecommunications Commission, the Competition Bureau, the World Trade Organization and the International Telecommunications Union, amongst others.

In 2012, Dwayne was a keynote Speaker at New Zealand Commerce Commission's The Future with High-Speed Broadband Conference, and he is currently serving as an expert adviser to the Independent Communications Authority of South Africa. He is also a regular participant in regulatory and policy proceedings in Canada convened by the CRTC, the Competition Bureau and Parliament of Canada committees. Dwayne was also a columnist for the Globe and Mail, and maintains a well-regarded blog, Mediamorphis and another for the Canadian Media Concentration Research Project. His co-authored book with Robert Pike*, Communication and Empire: Media, Markets and Globalization, 1860-1930* won the Canadian Communication Association's book-of-the-year prize in 2008. He is also co-editor, with Dal Yong Jin, of Political Economies of the Media (2011) and several other edited and sole-authored books.

For further information regarding the authors' experience and qualifications, please see our curricula vitae, appended to the end of this report.

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Introduction

To begin, we present our views regarding the state of competition in Canada's mobile wireless markets. First, we discuss the relevant product and geographic markets under consideration in this proceeding. We then provide information regarding the structure and competitiveness of Canadian mobile wireless markets, focused first on levels of market concentration and then on more detailed competitive dynamics, including an extended examination of prices in Canada and around the world, using a broad variety of authoritative sources and metrics. We then examine carrier profitability and capital intensity.

Following this examination, we survey the academic literature on the role of MVNOs in mobile markets. We then examine several European mobile mergers in which regulators required access be granted to MVNOs at fixed rates in order to ensure the continuing competitiveness of those markets. Finally, we draw comparisons between the Commission's approach to wholesale wireline regulation, which should be taken into account when deciding how to approach similar situations regarding the wireless market.

Overall, we find that mobile wireless markets in Canada are characterized by oligopolistic competition. The three national firms (Bell, Rogers, and Telus) continue to occupy a dominant position in the marketplace, leading to high prices, low adoption, low usage, and less diverse and responsive service offerings than would be present in a more competitive and dynamic environment. To be certain, there have been improvements in the mobile wireless space in recent years—mainly attributable to the growth of regional "fourth carriers" Videotron, Freedom Mobile, and Eastlink—but progress has been mixed, with the benefits of increased competition fluctuating over time, varying in intensity, and extending only partially across Canada's geography.

The persistent problems attending the Canadian mobile wireless market require workable solutions. Considering the circumstances, we believe it would be appropriate for the Commission to require that mobile wireless carriers provide wholesale access to their networks for MVNOs.

Defining relevant markets

In competition analysis, competition authorities define relevant markets as a first step when they examine mergers or investigate cases of abuse of dominant position. [1] In the present case, the Commission has asked for input about relevant markets in the context of Canada's mobile wireless marketplace, in order to assess its competitiveness, and, specifically, whether the market is "sufficiently competitive to protect the interests of users", or whether continuing down the current trajectory without additional intervention might be "likely to impair unduly the establishment or continuance of a competitive market".[2] Canada's Competition Bureau

[1] Competition Bureau (2011). Merger enforcement guidelines. Available at: https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/vwapj/cb-meg-2011-e.pdf/$FILE/cb-meg-2011-e.pdf

[2] Telecommunications Act, section 34. Available at: https://laws.justice.gc.ca/eng/acts/T-3.4/page-5.html#h-17

describes market definition as "an analytical tool that may assist with the determination of whether a firm is dominant."[3] As the Bureau notes, "The Tribunal has recognized that often it is neither possible nor necessary to precisely define a market (or markets) […] In some cases, it may be clear that a firm is dominant under all plausible market definitions."[4] There are two main dimensions along which relevant markets are defined: the product market, and the geographic market. Below we provide our views on each in turn.

Defining the relevant product market

The relevant product market analysis focuses on defining, as narrowly as possible, a group of substitute goods and/or services, in order to assess the effects of a change in price on demand. If a hypothetical monopolist is found to be capable of imposing a small but significant non-transitory increase in price (SSNIP) on goods or services in that market, then the monopolist is found to possess "market power." Market power, if exercised in anti-competitive ways or other ways that run contrary to the public interest as defined in the relevant law or regulation, requires a proportionate response to correct the problem.

In the case at hand, the analysis concerns a real oligopoly rather than a hypothetical monopoly, but the principle is the same.[5]

In recent European mobile merger analyses the trend has been to define relevant markets in fairly broad terms, for instance by opting not to distinguish between post-paid and pre-paid service plans, by network technology, by voice, SMS, and data, or by high- or low-value plans.[6]

By contrast, the Canadian Competition Bureau, in its assessment of the 2017 BCE-MTS merger, defined the market more narrowly; it considered postpaid and prepaid services, consumer and corporate (enterprise) customers, and landline telephones to each constitute separate markets, and opted to assess the market for "postpaid mobile wireless plans sold to consumers."[7]

We agree that landline and mobile services constitute separate markets.[8] We also believe that postpaid and prepaid services may, under some circumstances, be considered separate markets. However, we wish to stress that the Commission should not ignore prepaid markets in its assessment of the competitiveness of the Canadian mobile market. For some low income

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[3] Competition Bureau (2019). Abuse of dominance enforcement guidelines. Available at: https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/vwapj/CB-ADEG-Eng.pdf/$file/CB-ADEG-Eng.pdf p. 4.

[4] Ibid.

[5] An oligopoly, if it comprises collectively dominant firms, would not display unilateral price increases, but issues would stem instead from coordinated effects. In either case, the harm to consumers and the economy more broadly is the same.

[6] See for instance: European Commission (2014). Commission decision addressed to Telefónica Deutschland Holding AG declaring a concentration to be compatible with the internal market and the EE Agreement (Case M.7018 – Telefónica Deutschland / E Plus). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m7018_6053_3.pdf

[7] Competition Bureau (2017). Competition Bureau statement regarding Bell's acquisition of MTS. Available at: https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04200.html

[8] See: Klass, B. & Winseck, D. (2016). Why Bell's Bid to Buy MTS is Bad News: Report Submitted to the Competition Bureau assessing Bell Canada Enterprises' proposed bid to acquire Manitoba Telecommunications Services. Available at: http://www.cmcrp.org/why-bells-bid-to-buy-mts-is-bad-news-report-submitted-to-the-competition-bureau-assessing-bell-canada-enterprises-proposed-bid-to-acquire-manitoba-telecommunications-services/

consumers, particularly those without access to credit, prepaid services may be the only available option. Indeed, the US Federal Communications Commission acknowledges this state of affairs in its 2018 Communications Marketplace Report, where it states:

> "The prepaid and postpaid versions of a given pricing plan or promotion still differ somewhat, largely because prepaid subscribers may lack the credit background or income necessary to qualify for postpaid service. To prevent credit losses and mitigate the credit risk associated with the prepaid segment, service providers require advance payment for both prepaid service and handsets."[9]

Although the overall proportion of prepaid plans in the Canadian mobile wireless marketplace is small, at 12% of subscriptions in 2017,[10] we urge the Commission not to ignore or minimize the importance of these plans since they are likely the only means of obtaining mobile services for some people—and therefore should be considered as a separate but still important component of the Commission's analysis. In its 2017 review of the Wireless Code, the CRTC recognized that "a significant portion of the population continues to use prepaid services", and that "complaints about prepaid services are trending up."[11]

In the review of the Wireless Code, the Commission decided to extend the full protection of the Code to prepaid services. This might suggest a single relevant market for mobile wireless services.[12] In any case, the key point here is this: the Commission should consider both postpaid and prepaid mobile services that include voice, SMS, data, or some combination thereof to be relevant product markets for the purpose of its analysis in this proceeding.

Defining the relevant geographic markets

A relevant geographic market analysis focuses on defining the area in which substitute goods or services are supplied and in demand, where a price increase or change in quality would cause consumers to seek out and potentially switch suppliers. A relevant geographic market may be defined more widely or narrowly depending on a variety of factors, such as the level of variance in competitive conditions, the strategy and identity of buyers, switching, and transportation costs.[13]

The geographic characteristics of the Canadian wireless market are highly complex. The market is dominated by three national carriers, each offering national coverage, as the Commission has noted in its notice of consultation. Customers expect to receive a signal wherever they might be, whether at home, in their local area, and when travelling. The nature of mobile service

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[9] FCC (2018). Communications Marketplace Report. Available at: https://www.fcc.gov/document/fcc-adopts-first-consolidated-communications-marketplace-report Footnote 42.
[10] CRTC (2018). Communications Monitoring Report 2018. Infographic 6.6. Available at: https://crtc.gc.ca/eng/publications/reports/policymonitoring/2018/cmr3d.htm#i606
[11] CRTC (2017). Telecom Regulatory Policy CRTC 2017-200. Review of the Wireless Code. Paras. 89 & 90.
[12] Ibid, para. 95.
[13] Competition Bureau (2019). Abuse of dominance enforcement guidelines. Available at: https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/vwapj/CB-ADEG-Eng.pdf/$file/CB-ADEG-Eng.pdf p. 8-9.

itself, therefore, is clearly national. However, market composition is characterized by a patchwork of different configurations of regional and sometimes local carriers operating in areas across the country. These regional carriers, and the national carriers, price their services on a provincial or territorial and sometimes local basis. Within Ontario, for instance, pricing and other service characteristics in Toronto, where service is available from Bell, Rogers, Telus, and Freedom Mobile (as well as a number of national carrier affiliate brands) may be different than in Ottawa, where Videotron also offers service, or in Thunder Bay, where Tbaytel is present, but Freedom and Videotron have no retail presence.

Although the competitive dynamics of mobile markets vary from place to place, the predominant factors influencing price appear to be provincial and/or territorial. National carriers offer different pricing from province to province, with prices tending to be homogeneous within those provinces. However, it is possible that unadvertised offers may exist at a more locally targeted level, and in some circumstances, local pricing may be influenced by the presence of a local carrier such as Tbaytel (i.e. Thunder Bay) or Eastlink (i.e. Sudbury and Timmins). We therefore urge the Commission to consider province-level pricing dynamics, but to be mindful that conditions may differ within provinces as well.

While treating the relevant geographic market as provincial may be the best way to reflect actual competitive conditions, it might raise difficulties for intervenors in presenting sufficiently detailed information. Availability of province- or local-level information on many metrics is spotty at best, as the Commissioner of Competition has noted;[14] indeed, the CRTC's public data on wireless carrier market share by province excludes information about either Freedom Mobile or Eastlink, making it difficult to assess their position and impact on the market.

We note that a survey of carrier websites shows that national carriers appear to charge the same prices in Alberta, British Columbia, Ontario, New Brunswick, Newfoundland and Labrador, Nova Scotia, Prince Edward Island, NWT, Nunavut, and Yukon. Based on this, observation we believe that national comparisons, such as the ones presented below, adequately reflect conditions in those provinces mentioned above. In Manitoba, Saskatchewan, and Quebec, the national carriers have adjusted their pricing in response to the strong presence of a regional carrier; in these cases, the specific characteristics of those markets should be taken into account.[15]

Overall, it is clear that there are a variety of ways of looking at mobile markets; the extent to which analysis can be comprehensive depends upon the availability of fine-grained information. We believe that it is important to consider both national and provincial characteristics of

[14] See Competition Bureau letter of 6 May, 2019, "RE Review of mobile wireless services, Telecom Notice of Consultation CRTC 2019-57 ("Proceeding") – Request for Reconsideration".

[15] Particular attention should be paid to the situation in Manitoba, where the regional incumbent MTS was taken over by Bell in 2017. After significant delay, Xplornet began to offer service in the fall of 2018; however, it is still to early to tell whether Xplornet will successfully apply competitive pressure in this market. There are, as we note elsewhere in this report, indications that Bell has already raised prices and removed unlimited service offerings from the marketplace.

mobile wireless markets in order to properly assess their dynamics; local information, to the extent possible, should be collected where appropriate.

Marketplace indicators: High concentration, high prices, low adoption

Below we present indicators useful in assessing the state of Canada's mobile wireless market. First, concentration levels are presented using the Herfindahl-Hirschman Index (HHI), at the national level, for the Quebec, Manitoba, and Saskatchewan markets, and comparing Canada's concentration level to OECD countries. We then discuss the number of mobile network operators (MNOs) in various countries. Following this, we discuss performance metrics, beginning with availability of 4G networks and network speed. We then present information regarding service adoption and affordability, an area where Canada fares particularly poorly in comparison to other developed nations.

We also examine service pricing, beginning with regional pricing trends, and expanding to canvass Canada's standing in international comparisons using a variety of metrics. The section concludes with a discussion of profitability and investment.

Market structure—Canadian mobile wireless markets remain highly concentrated

Concentration measures give a high-level view of the competitiveness of a given marketplace. A highly competitive marketplace is characterized by many buyers and sellers, with individual firms having little or no influence on price levels. By contrast, in highly concentrated markets, there are relatively few producers, which tend to be large firms and may possess the ability to set prices or otherwise influence markets in ways that run counter to the public interest—the extreme case is monopoly. In communication markets, problems of marketplace concentration extend beyond issues of price, as Dr. Winseck has written about in depth elsewhere.[16]

For our analysis of mobile wireless market concentration, we rely on the Herfindahl-Hirschman Index (HHI). The HHI is a standard measure of concentration used in economic analysis. It takes the sum of the squares of firms' market share in a given market, using either revenue or subscriber share, and arrives at a figure between 100 (representing a highly competitive market) and 10,000 (representing a monopoly). The US Department of Justice embraced new HHI guidelines in 2010 for categorizing the intensity of competition. The new thresholds are as follows: a market with an HHI score < 1500 represents an unconcentrated market; HHI >1500 but <2500 is moderately concentrated; HHI >2,500 is highly concentrated.[17] Regulators such as

[16] While price, service quality, and market dynamics are of course important, communication is fundamental in ways that escape economic analysis. For instance, communication is vital for maintaining interpersonal connections between family and friends; for promoting and sustaining culture, and for participation in public life in a democratic society. For a detailed discussion of market concentration and its implications in communications markets, see, for instance: Winseck, D. (2018). Media and Internet Concentration in Canada, 1984 – 2017 (UPDATED). Available at: http://www.cmcrp.org/media-and-internet-concentration-in-canada-1984-2017-updated/

[17] U.S. Department of Justice and the Federal Trade Commission (2010). Horizontal merger guidelines. Available at: https://www.justice.gov/sites/default/files/atr/legacy/2010/08/19/hmg-2010.pdf

the US Federal Communications Commission (FCC) rely on this measure when assessing the competitiveness of communication markets in their respective jurisdictions.[18]

In the present proceeding the CRTC has registered its concern that "retail market concentration remains high (due in part to a series of acquisitions)" and that this suggests "that certain aspects of this market are not, in fact, sufficiently competitive in their current state to properly protect the interests of users and further the policy objectives".[19] The use of well-established standards such as the HHI can be helpful in empirically assessing these concerns.

The Canadian Media Concentration Research Project (CMCRP), directed by Dr. Winseck, collects and analyses data on Canadian communications markets, including the mobile wireless market. According to CMCRP data, the Canadian mobile wireless market was highly concentrated in 2017, with an HHI of 2857 by revenue. Concentration in the market has slowly declined over the last decade, from a high of 3151.3 in 2008, following the entry of "new entrant" regional mobile carriers Freedom Mobile in BC, Alberta, and Ontario; Videotron in Quebec; and Eastlink in the Maritime and Atlantic provinces and parts of Northwestern Ontario.[20] While this downward trend is undoubtedly positive, concentration levels remain squarely above the HHI threshold for "highly concentrated" markets.[21]

Due to the regional footprint of the new entrants and other non-national Canadian wireless carriers, and the differing competitive dynamics from province to province, the ideal geographical measure of concentration for Canada would be at the provincial level. Due to a lack of information about provincial market share for two of three new entrant carriers, however, it is not possible to provide a realistic estimate of market concentration for those provinces in which they operate—BC, Alberta, and Ontario for Freedom Mobile,[22] and the Maritime and Atlantic provinces, as well as parts of Northwestern Ontario (i.e. Sudbury and Timmins) for Eastlink. In Quebec, where the CRTC does provide data on Videotron's market share, concentration was at 2610 in 2017, still highly concentrated but substantially less than the country-level figure. Saskatchewan shows a highly concentrated HHI of 4409.5, although we note that competitive dynamics in that province result in national carrier pricing that is substantially lower than their pricing in Ontario, BC, Alberta, and the Maritime and Atlantic provinces due to their need to compete with the strong presence of Sasktel, the province-

[18] FCC (2018). Communications marketplace report. Available at: https://www.fcc.gov/document/fcc-adopts-first-consolidated-communications-marketplace-report pp. 25-26.
[19] CRTC (2019). Telecom Notice of Consultation CRTC 2019-57. Review of mobile wireless services. Available at: https://crtc.gc.ca/eng/archive/2019/2019-57.htm
[20] For a broader discussion of the last decade's developments in the Canadian mobile wireless market, see: Winseck, D. (2018). Media and Internet Concentration in Canada, 1984 – 2017 (UPDATED). Available at: http://www.cmcrp.org/media-and-internet-concentration-in-canada-1984-2017-updated/
[21] All of the CMCRP's data is made freely available to the public. Available at: http://www.cmcrp.org/about/archived-data/ or via Dataverse, at: https://dataverse.scholarsportal.info/dataset.xhtml?persistentId=doi:10.5683/SP2/ME0MVH
[22] CMCRP estimates that Freedom's market share was approximately 5% by subscribers across its entire operating territory, but has not estimated individual provincial market shares for Freedom due to a lack of credible information.

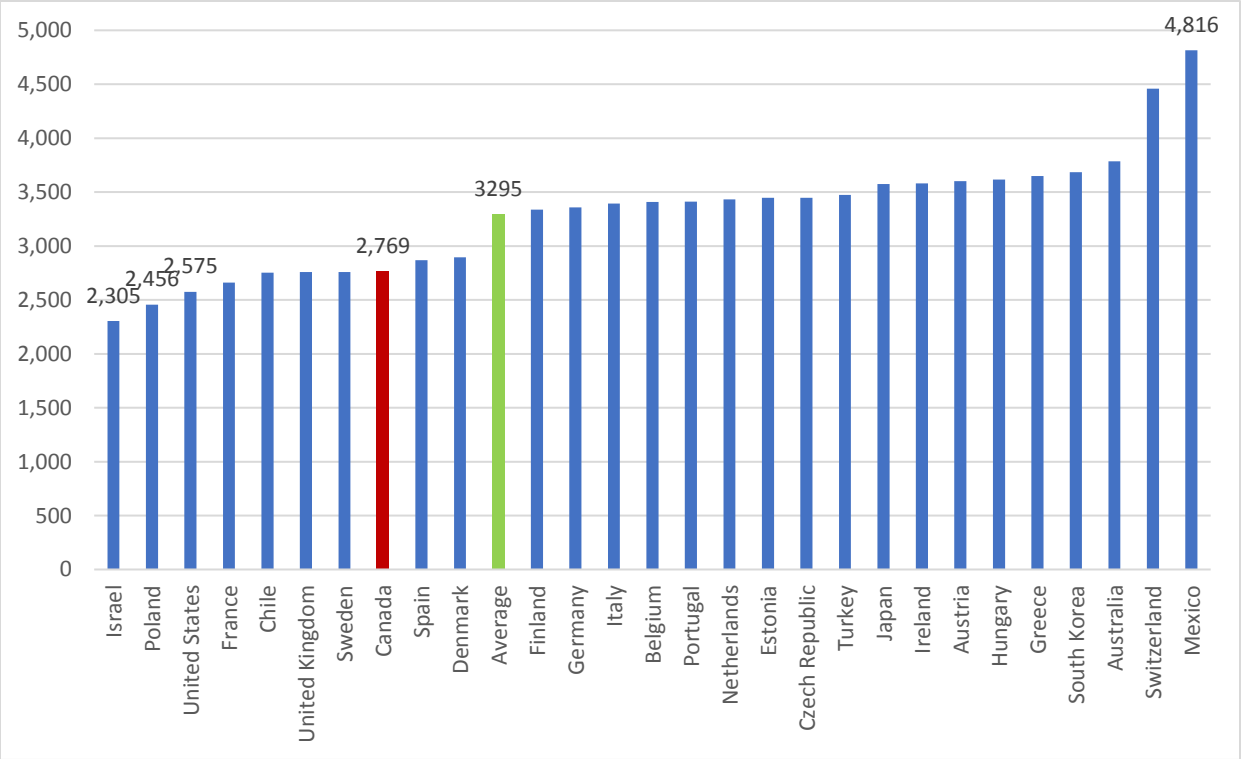
owned incumbent telco. In Manitoba, concentration increased from an HHI of 3733.9 in 2016 to 3813.4 in 2017, following Bell's takeover of regional incumbent MTS.[23]

According to Lipsey and Ragan, "we can divide Canadian industries into two broad groups—those with a large number of relatively small firms and those with a small number of relatively large firms." [24] Canada's mobile wireless market—and the telecommunications industry more generally—falls squarely within the latter category.

In sum, mobile wireless markets in Canada are highly concentrated, whether measured at the national or provincial level. There is little reason to believe that the situation is substantially different in the areas where Freedom and Eastlink operate, or in the North.

Concentration in mobile markets is not unique to Canada. In the following figure, we present Canada's mobile wireless market concentration in comparison to EU and OECD countries for the beginning of 2018, drawing on underlying data from the Economist Intelligence Unit's Inclusive Internet Index.[25]

Figure 1: Mobile Wireless Market HHI, 2018Q1



Source: Economist Intelligence Unit (2019). Inclusive Internet Index. Available at: https://theinclusiveinternet.eiu.com/

[23] Province level HHI was calculated based on data found in table 6.6 of the CRTC's 2018 Communications Monitoring Report. Available here: https://open.canada.ca/data/en/dataset/f4233c69-f639-4cab-a234-80dbdd04eaa0

[24] Lipsey, R. & Ragan, C. (2001). *Economics: Tenth Canadian edition.* Toronto, Canada: Addison Wesley Longman, p. 252.

[25] The Economist (2019). Inclusive Internet Index. Available at: https://theinclusiveinternet.eiu.com/

The comparison in figure 1, which relies on underlying data from research firm Telegeography, shows that Canada's mobile wireless concentration, at an HHI of 2769, is lower than the average of 3295.[26] However, of all countries measured in this figure, only two fell below the highly concentrated threshold of 2500—Israel and Poland, both of which are classified as moderately concentrated. In other words, the main conclusion to be drawn is that mobile wireless markets around the world are highly concentrated, and Canada is no outlier.

The fact is that high barriers to entry, economies of scale, network effects, path dependency, and other factors[27] combined minimize the possibility that mobile wireless markets will be competitive in the economic sense of having many network operators who individually have little or no influence on overall price levels. Instead, wireless markets which are exclusively composed of facilities-based operators tend to oligopoly, where large firms control markets and have pricing power, a situation which presents the opportunity for firms to coordinate their behavior for their own benefit at the expense of consumers and the economy more broadly. Indeed, the Commission reached such a conclusion in its previous review of mobile services with respect to the wholesale markets for roaming and mobile virtual network operator (MVNO) access. Although the focus of analysis in that case was wholesale markets, the finding ultimately speaks to conditions at the retail level.[28] The Competition Bureau reached a similar conclusion with respect to retail markets in its assessment of the BCE-MTS merger in 2017, where it found that "as a result of coordinated behaviour among Bell, TELUS and Rogers, mobile wireless prices in Canada are higher in regions where Bell, TELUS and Rogers do not face competition from a strong regional competitor."[29]

Next we present the number of national mobile network operators (MNOs) in EU and OECD countries, using data from country regulators and the European Commission.[30] As figure 2

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[26] We note that the data presented in this chart appear to underestimate HHI compared to measures available from country regulators in the US, Australia, as well as CMCRP data. We have reached out to Telegeography for an explanation of their methodology, but have not heard back at time of writing. However, we consider these figures to be appropriate for the purpose of international comparison.

[27] In mobile wireless markets, there are numerous barriers to entry that make competition in the classical economic sense difficult, if not impossible, to achieve, under the assumption that facilities-based providers are the only or primary market actors. The first and most obvious barrier to entry is the requirement to obtain a license for radio spectrum, which is a managed resource that is considered finite under present arrangements. Other barriers to entry include the high capital requirements of establishing a competitive network, and the fact that access to public rights of way is also a requirement of developing such networks. Economies of scale refers to the economic concept of diminishing marginal cost; once high-up front costs are sunk, it is increasingly inexpensive to produce additional units, typically considered in terms of traffic (e.g. volume, throughput) in communication markets, but also involving factors such as bargaining power and the ability to obtain volume discounts for inputs. This implies that larger firms may be more economically efficient than smaller ones. Network effects, or network externalities, refers to the economic concept for whereby a good or service becomes more valuable with increasing adoption. The telephone is a classic example of network externalities; a telephone network with one user would be worthless, while one that connects all users in a given area is exponentially more valuable because of the increase in connections it affords. Finally, incumbency, or path dependency, is a concept that suggests decisions made at a certain point in time will influence the shape of markets down the road, with those decisions "locking in" a certain course that is difficult to correct once underway. In Canadian mobile wireless markets, for instance, Bell, Rogers, and Telus have been operating mobile networks for more than 30 years, giving them a significant head start along a number of vectors. This presents a steep uphill challenge for any new market entrant, as incumbents may have incentives to use their dominance to deny access to key inputs, raise rivals' costs, or otherwise employ exclusionary tactics to maintain their market position.

[28] Telecom Regulatory Policy CRTC 2015-177.

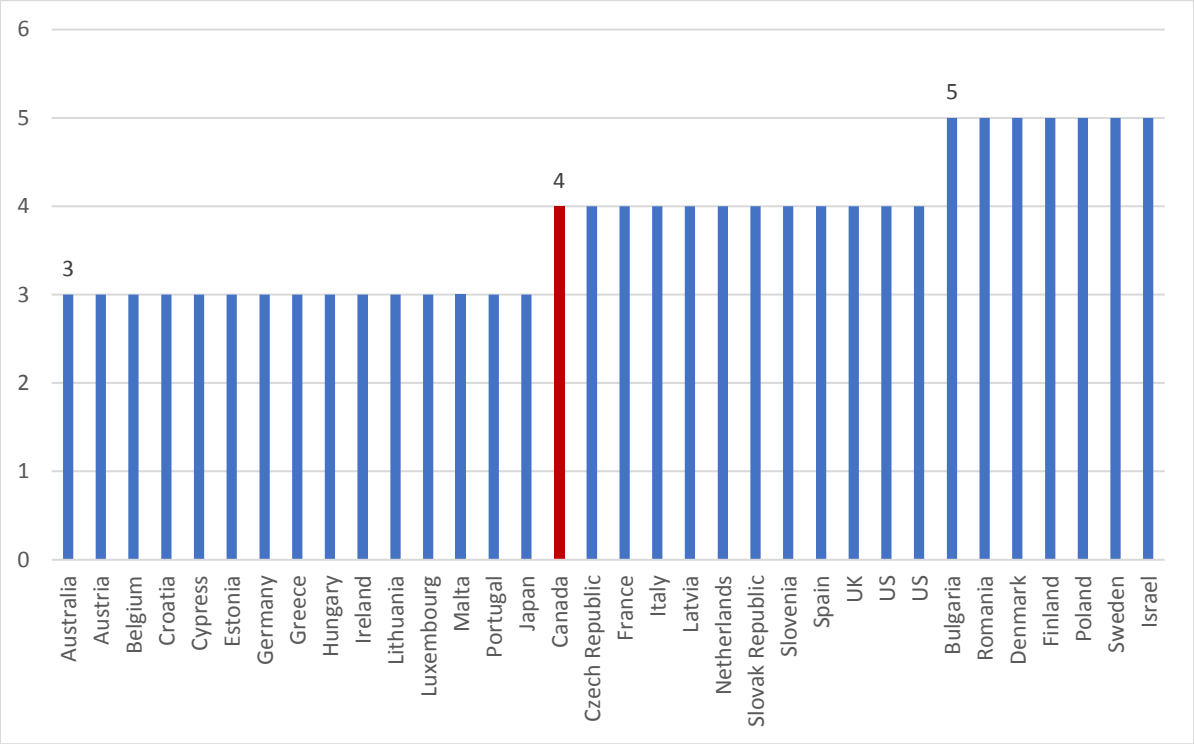
[29] Competition Bureau (2017). Competition Bureau statement regarding Bell's acquisition of MTS. Available at: https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04200.html For a discussion of how competition analysis defines coordinated behaviour, and other relevant concepts, see: Competition Bureau (2019). Abuse of dominant enforcement guidelines. Available at: https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04420.html

[30] This situation, in Canada and around the world, is not new, but has been a topic of debate amongst policymakers and the general public for a number of years. For an in depth examination of the state of competition in Canada's mobile markets and around the world, along with copious

shows, a majority of countries for which data were available, at 19 of 34, had 4 or more MNOs in 2017. This is not an accident. In recent years, communications and competition regulators around the world have sought to foster the entry and sustainable operation of a "fourth carrier" in mobile markets, based on the disruptive competitive effects that "maverick" fourth operators bring to otherwise stable coordinated oligopolistic markets.[31]

Promotion of the fourth network operator has been the focus in spectrum auctions as well as in merger assessment, which has sometimes resulted in the rejection of "4 to 3" merger attempts,[32] and in other cases has resulted in conditions, such as divestment or mandated wholesale access, designed to maintain or improve post-merger competition, as we discuss at greater length later in this report. A fourth network operator is seen as beneficial in terms of improvements in competitive conditions that they bring both directly to the retail level, as well as indirectly through the increase in wholesale competition that they engender.

Figure 2: Number of national MNOs, 2017



Source: European Commission (2018). Digital Economy and Society Index, Telecom Chapters. Available at: https://ec.europa.eu/digital-single-market/en/news/desi-report-2018-telecoms-chapters Canada, Australia, Japan sourced from national regulators.

underlying data, see: Winseck, D. (2013). Mobile wireless in Canada: Recognizing the problems and approaching solutions. Available at: http://www.cmcrp.org/mobile-wireless-in-canada-recognizing-the-problems-and-approaching-solutions/

[31] See: OECD (2014). Wireless Market Structures and Network Sharing, OECD Digital Economy Papers, No. 243, OECD Publishing, Paris. Available at: http://dx.doi.org/10.1787/5jxt46dzl9r2-en

[32] Such was the case, for instance, in the 2011 attempted merger between AT&T and T-Mobile in the United States, and the Hutchison 3UK-02 merger in the UK in 2016. See: FCC (2011). AT&T and T-Mobile. Available at: https://www.fcc.gov/proceedings-actions/mergers-transactions/att-and-t-mobile; and BBC (2016). EU blocks Three's takeover of O2. Available at: https://www.bbc.com/news/business-36266924

While factors such as concentration and number of operators gives a broad, general view of the competitiveness of mobile markets, the small level of variation observed between comparable countries means that these figures only have so much analytical value. In order to look more closely at the competitive dynamics in Canada and elsewhere, in the following section we present data on Canadian provincial and national pricing, usage, revenue per user, operating profit,[33] and investment levels. Although Canada now qualifies as a four-carrier market (three national carriers and a regional carrier in most markets), the information presented below shows that, roughly a decade after the "new entrants" first began to offer service, their disruptive competitive impact has been slow to develop, remains muted, and is unevenly distributed across Canada, to the extent that it has had a measurable impact on overall pricing and other service attributes. This suggests that additional measures will be required to bring the benefits of competition to everyone in Canada.

Mobile market performance

In the following section, we provide statistics highlighting Canada's standing in international comparisons of mobile service availability, adoption, and price, and other indicators of market performance such as profitability and investment. This section builds on data presented in our previous report, "Poor internet for poor people? Why Canada needs better and more affordable mobile services for everyone", submitted to the CRTC's 2018 consultation on lower-cost data-only plans for mobile wireless services.[34]

The data that follows draw on a wide range of sources. These include the CRTC's Communications Monitoring Report; the Organization for Economic Cooperation and Development (OECD)'s broadband portal; Statistics Canada's Survey of Household Spending; Wall Communication's survey of telecommunications pricing, conducted for ISED in 2018 (a report which was previously undertaken by Nordicity); several consulting agencies specializing in mobile market analysis; the International Telecommunications Union (ITU)'s price baskets; the US FCC reports on telecommunications markets; and other sources where appropriate.

The evidence presented below shows that some aspects of Canada's mobile wireless market have improved in absolute terms in recent years. However, in comparison to other countries, Canada remains in a similar position – an above-average performer on network speeds and availability, but poor when it comes to adoption, price, and usage.

[33] EBITDA, or earnings before interest, tax, depreciation, and amortization is used as a measure of operating profit by Canadian national carriers in their annual reports and by the CRTC in its Monitoring reports.

[34] Telecom Notice of Consultation CRTC 2018-98, as amended by TNC 2018-98-1. Available at: https://services.crtc.gc.ca/pub/instances-proceedings/Default-Defaut.aspx?lang=eng&YA=2018&S=C&PA=t&PT=nc&PST=a#2018-98

Mobile network performance—Canadian mobile networks perform well on speed and availability

A common argument used to highlight the competitiveness of Canada's wireless markets, and to justify prevailing price levels, is that service quality in Canada is high relative to other areas. In other words, customers are getting good value for their money, according to Canada's major wireless carriers. For instance, as we noted in our previous report, Bell and Telus both have argued against the need for additional regulatory intervention by referring in superlative terms to the performance of their wireless networks.

During the Commission's investigation of lower-cost data-only plans,[35] Bell argued that Canada's wireless carriers have rolled out "multiple generations of the newest wireless technologies more quickly and more widely than in almost any other country […] and provide consumers with ubiquitous, reliable, and competitively-priced wireless services across our vast and sparsely populated country."[36] Similarly, Telus pointed to the broad geographic coverage its network provides, as well as the superior performance of Canadian networks in international comparisons of mobile network speeds, in furtherance of the argument that no new regulation is required.

In the following figures, we present data on 4G/LTE availability and overall download speeds. These figures draw on the most recent data available from Opensignal, a market analysis firm that "combines real-world measurements with analysis to provide independent insights on mobile connectivity globally".[37] For availability, we have taken the average of measured network operator scores as representative of country level performance. For speeds, we show "overall download speeds", which Opensignal defines "as the average mobile data connection a user experiences based on both the speeds and availability of a country's 3G and 4G networks."[38]

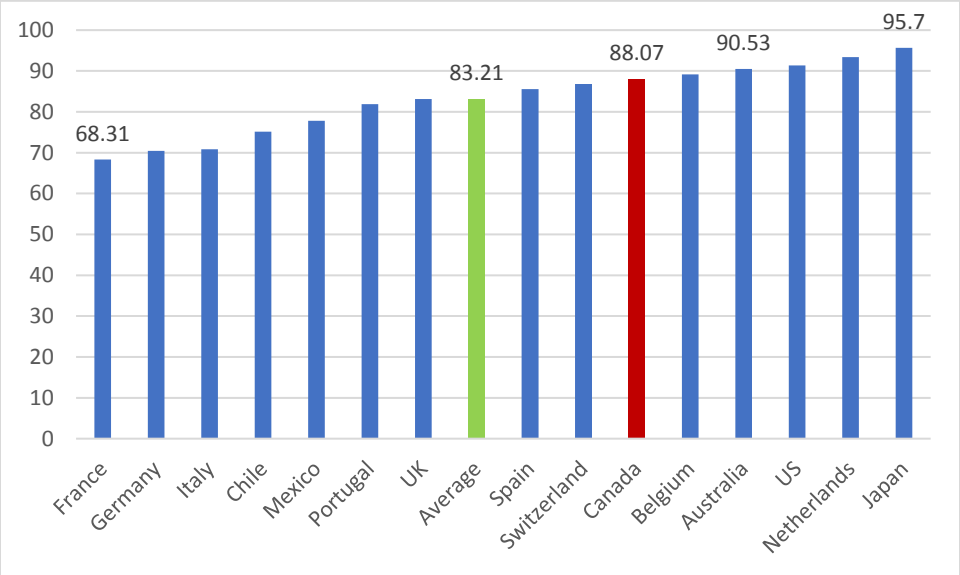
Opensignal's availability data "shows how consistently accessible 4G networks are in each country. Rather than measure geographic coverage, Opensignal's availability metric tracks the proportion of time users have access to a particular network".[39] At the end of December 2017, as presented in our previous report, mobile users in Canada spent 82.4% of their connected time on an LTE network, which placed Canada at a slightly-above-average 17th out of 38 countries measured. While Opensignal's most recent "State of LTE" report has not been

[35] Ibid. Bell (2018). Intervention to Telecom Notice of Consultation 2018-98, "Call for comments: Lower-cost data-only plans for mobile wireless services", para. 1.
[36] Bell (2018). Intervention to Telecom Notice of Consultation 2018-98, "Call for comments: Lower-cost data-only plans for mobile wireless services", para. 1.
[37] Opensignal. Available at: https://www.opensignal.com/
[38] Opensignal (2018). State of Mobile Video (September2018). Available at: https://www.opensignal.com/reports/2018/09/state-of-mobile-video
[39] Opensignal (2018), "The State of LTE (February 2018)", available at: https://opensignal.com/reports/2018/02/state-of-lte

published at time of writing, we collected the most recently available data on 4G/LTE availability from Opensignal for OECD-member country-level reports. These include data for all G7 countries, plus Chile, Mexico, Portugal, Spain, Switzerland, Belgium, Australia, and the Netherlands.

In comparison to these other developed countries, Canada's availability is modestly above average, at 88.07%, compared to 83.21%. This places Canada at a rank of 5 out of 15 countries for which data are available (see figure 3). With regard to Canada's progress over the last year, Opensignal observes the following: "All three national operators had excellent 4G Availability scores above 86%, but they've yet to hit the next big milestone in LTE reach: a national 4G Availability score of 90%. We've been expecting the first Canadian operator to cross that threshold for the last year, but growth in 4G Availability has been slow. It hasn't quite stopped, but we have only been seeing incremental increases from the three operators every six months."[40]

Figure 3: 4G / LTE Availability Comparison (Sept 2018-March 2019, % time on 4G)



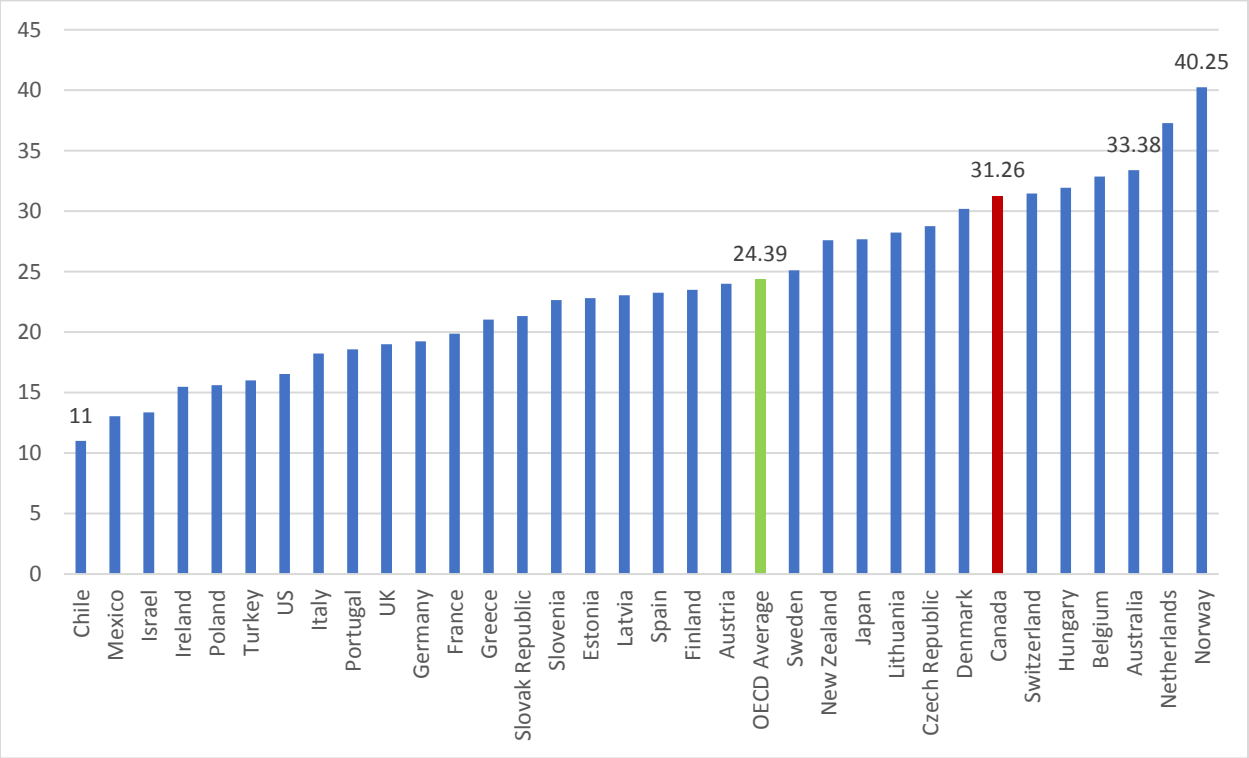
Source: Opensignal, Country reports, October 2018-April 2019. Available at: https://www.opensignal.com/market-analysis Notes: New report not released; data collected on all available OECD countries in the last year (Includes all G7+Australia).

With respect to speed, last year Canada placed 9th of 33 countries covered by Opensignal's report, on the measure of 4G/LTE download speeds. This exact metric is not yet available, so instead we present data on overall download speeds from Opensignal's September 2018 State of Mobile Video report. As figure 4 shows, Canada still performs well in terms of overall speeds

[40] Opensignal (2019). Canada mobile network experience report Feb 2019. Available at: https://www.opensignal.com/reports/2019/02/canada/mobile-network-experience

by comparison to other countries, at 7th out of 33 countries. With an observed overall speed of 31.26 Mbps, Canada is significantly higher than the OECD average of 24.39 Mbps, but is slightly behind Australia (33.38Mbps) and Norway (40.25Mbps).

Figure 4: Overall Download Speed, May-August 2018 (Mbps)



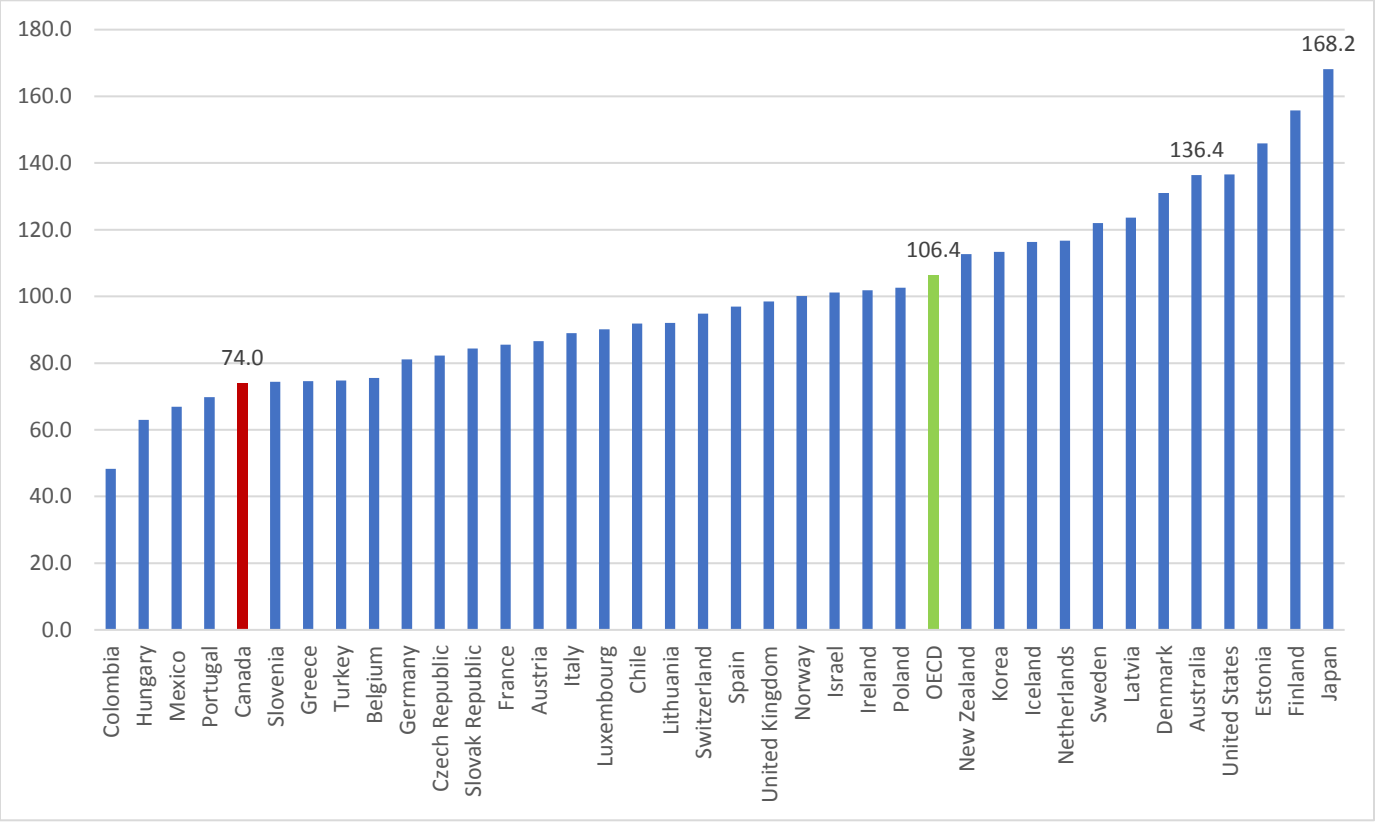
Source: Opensignal, State of Mobile Video (September 2018). Available at: https://www.opensignal.com/reports/2018/09/state-of-mobile-video

In terms of 4G/LTE availability and overall download speeds, Canada's mobile networks do indeed perform well. That being said, high performance and availability of mobile networks is of no benefit to those who cannot afford access in the first place. While modern, high-speed mobile services may be *available* across most of Canada, they remain out of reach for too many, particularly individuals and households who earn low incomes. As we noted in our previous report, these conclusions are supported by a recent report on affordability commissioned by the CRTC, which found that "[i]n addition to documenting the persistence of the digital divide, the literature has increasingly recognized that geographic network coverage is not in itself enough to ensure widespread access and use".[41] In what follows, we explore the recent trends in adoption and affordability.

[41] Rajabiun, R., Ellis, D., & Middleton, C. (2016). "Literature review: Affordability of communications services", page 25. Available at: https://www.ryerson.ca/~cmiddlet/ourresearch/lit-review-for-crtc-2016-affordability-rajabiun-ellis-middleton.pdf

Adoption and (un)affordability—Mobile wireless services remain out of reach for too many people

Figure 5: Overall mobile broadband penetration, June 2018 (subscriptions/100 people)



Source: OECD Broadband Portal. Available at: https://www.oecd.org/sti/broadband/broadband-statistics/

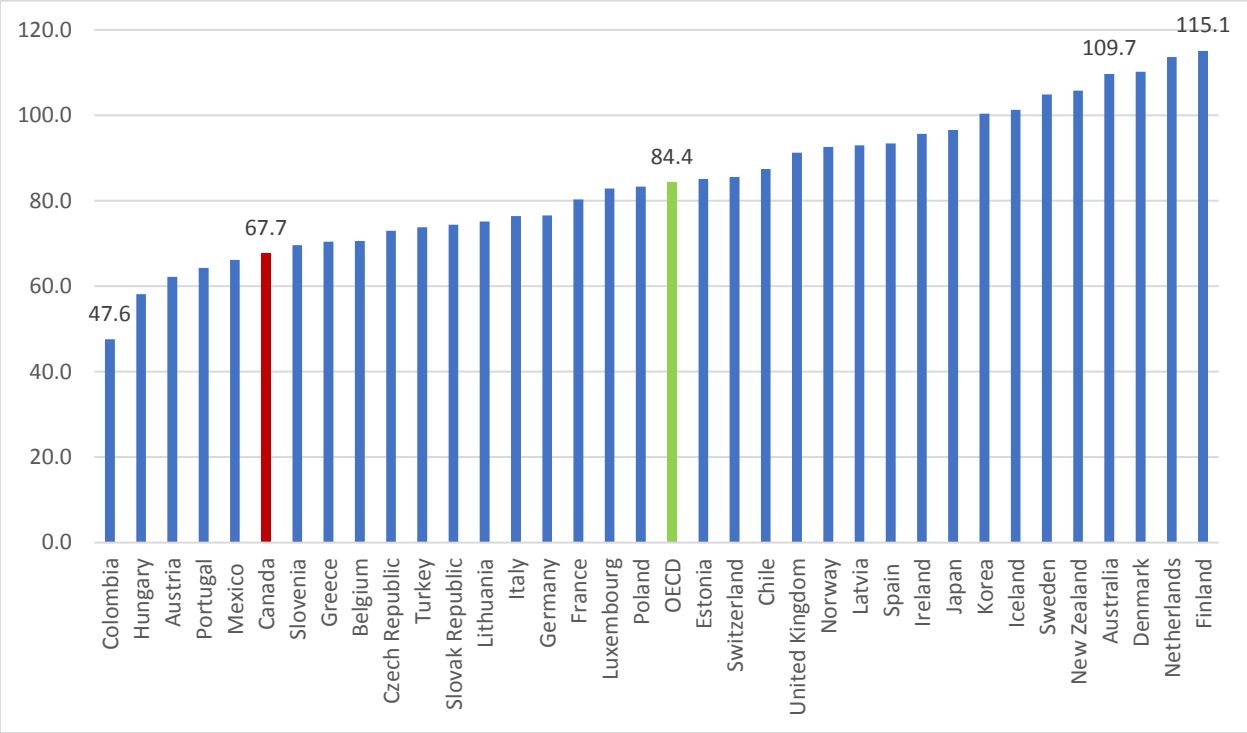
It has long been the case that Canada lags behind other nations in terms of mobile adoption. In 2006, Canada sat at the bottom of the OECD rankings for overall mobile cellular penetration.[42] Our status as a laggard in adoption of mobile services began in the days of flip-phones and pagers, and has continued through to the era of smartphones, tablets, and other connected devices. As of June 2018, Canada was ranked 33rd of 37 OECD member countries for overall mobile broadband penetration, a metric which includes both "voice and data" (i.e. smartphone) and "data-only" (i.e. tablet or laptop-centric) services.[43] As figure 5 shows, at 74 subscriptions per 100 inhabitants Canada is behind the OECD average, which sits at over 106 subscriptions per 100 inhabitants. A growing number of countries, including Australia (136.4), the US (136.6), and Japan (168.2) have well above one mobile broadband subscription per inhabitant.[44]

[42] For historical statistics on cellular adoption, see: OECD Communications Outlook (various years). Available at: https://www.oecd-ilibrary.org/science-and-technology/oecd-communications-outlook-2013_comms_outlook-2013-en

[43] Colombia joined the OECD as the 37th member in the summer of 2018.

[44] Penetration figures exceed 100 when there is more than one mobile subscription per inhabitant. This is explained by people having more than one subscription to service, for instance for personal and work use, and/or by the proliferation of connected non-phone devices, such as tablets.

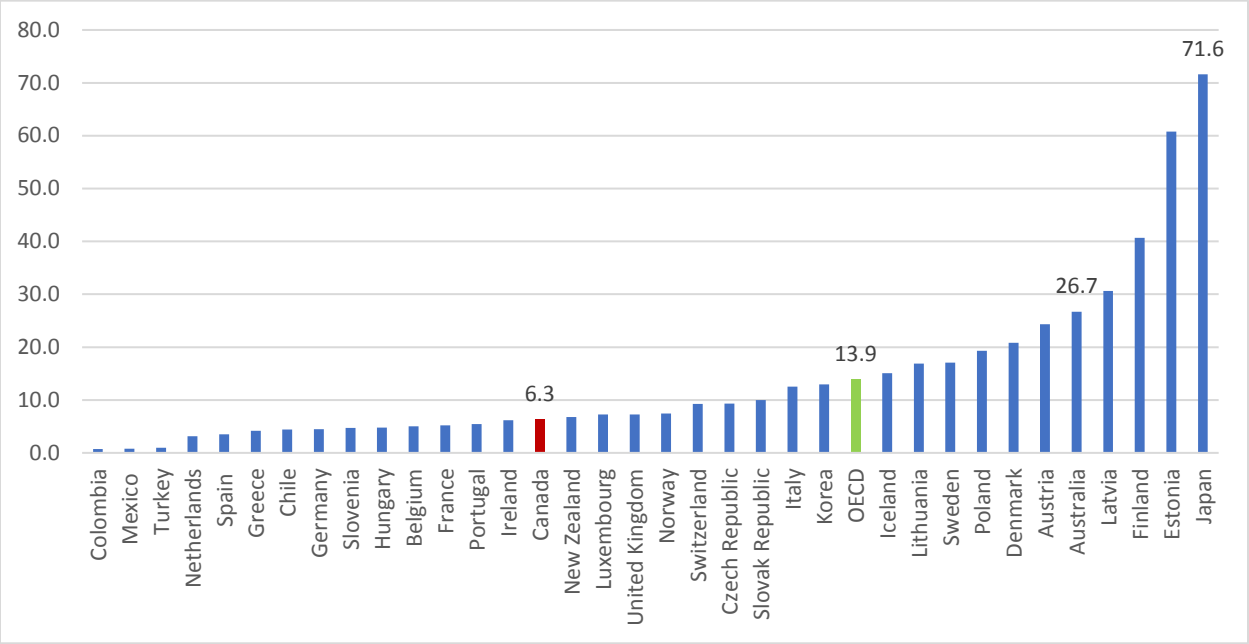
Figure 6: Data and voice plan penetration, June 2018 (subscriptions/100 people)



Source: OECD Broadband Portal. Available at: https://www.oecd.org/sti/broadband/broadband-statistics/

In terms of "data and voice plan" penetration (i.e. plans typically associated with smartphones), figure 6 above shows that Canada also fares poorly in comparative terms, ranking 30th out of 37 countries. At 67.7 subscriptions per 100 inhabitants, it is substantially behind the OECD average of 84.4, and well behind Australia (109.7), which, like Canada, is a large and sparsely populated country. Canada's growth has been slow over the last year, adding only 2.9 subscriptions per 100 compared to the OECD average of 8.7, and Canada's standing reflects this: it has fallen from 26th to 30th place over this time.

Figure 7: Data-only plan penetration, June 2018 (subscriptions/100 people)

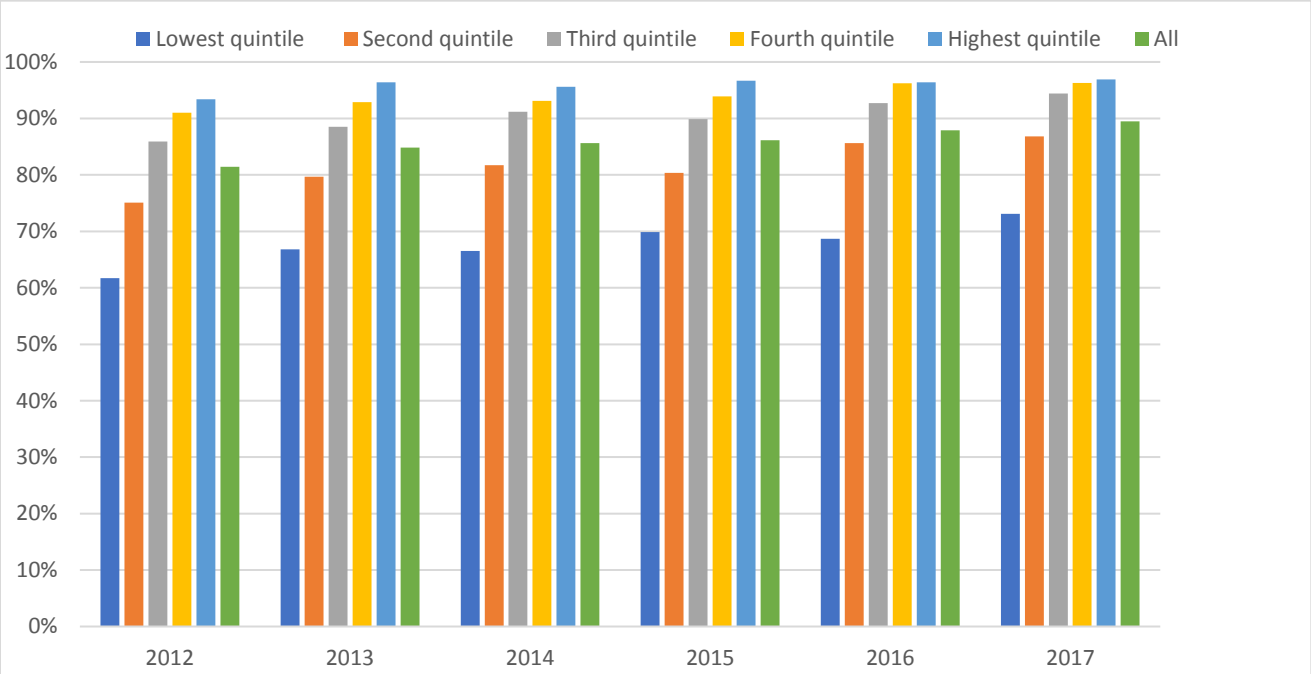


Source: OECD Broadband Portal. Available at: https://www.oecd.org/sti/broadband/broadband-statistics/

The situation is similar with regard to data-only plans, as can be seen in figure 7. Data-only plans are are typically used for tablets or mobile connectivity for laptops; data-only plans may also be used as a measure of last resort for people living in areas with no option for fixed broadband access. Last year, Canada ranked 21st out of 36 countries at 6.3 subscriptions per 100 people. This year, it has stood still at 21st out of 37. At an absolute rate of 6.3 data-only plans per 100 inhabitants, Canada has less than half the OECD average subscribership of 13.9 and less than ¼ of Australia's data-only take-up rate.

Each of these metrics demonstrates that there is much room for improvement if mobile service for everyone is the objective. They are also indicative of a market that is not sufficiently competitive to deliver on the policy goal of universal service. If the benefits of mobile services are to be delivered into the hands of all who need them, the status quo will not be enough.

Figure 8: Household Access to Mobile Phone Service by Income Quintile, Canada, 2012-2017



Sources: Statistics Canada (2018-2013).'Dwelling characteristics, by household income quintile, Canada, Survey of Household Spending. **Notes:** Upper bounds for 2017 income quintiles are as follows: 1st—$32,914; 2nd—$56,495; 3rd—$86,098; 4th—$132,808. Bounds decrease moderately going back each year.

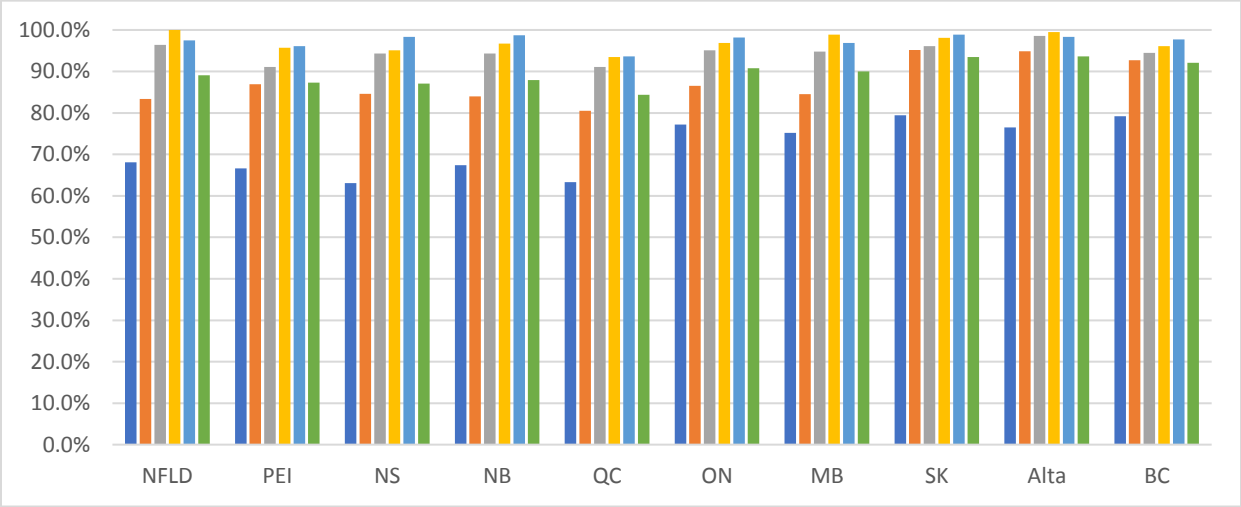
While the comparative data on adoption show that Canada is behind its international peers, the more fine-grained information reveals an equally if not more disconcerting trend. Figures 8 and 9 show adoption of mobile services based on income, at the national and provincial levels, respectively.[45]

The national level data in figure 8 show that low income people in Canada are dramatically less likely to have a mobile subscription than their higher-earning peers. At 73.1%, households in the lowest income quintile are significantly less likely to subscribe to a mobile service than either the overall average (89.5%) or their higher earning counterparts. Second-quintile households subscribed at 86.8%, while, by contrast, mobile adoption is nearly universal amongst the highest-earning households.

Adoption of mobile phones among the lowest income bracket did grow by 11.4% from 2012-2017, outpacing average growth across income quintiles by 3.3%. After a 1.2% drop from 2015-2016, adoption in the lowest income bracket did pick up with 2016-2017 growth of 4.4%. This recent growth should not be discounted, but it still leaves low income households in Canada far behind middle earners, and even farther behind the national average.

[45] These figures are higher than the OECD statistics because they include mobile services that do not include data, i.e. standard cellular voice and SMS subscriptions.

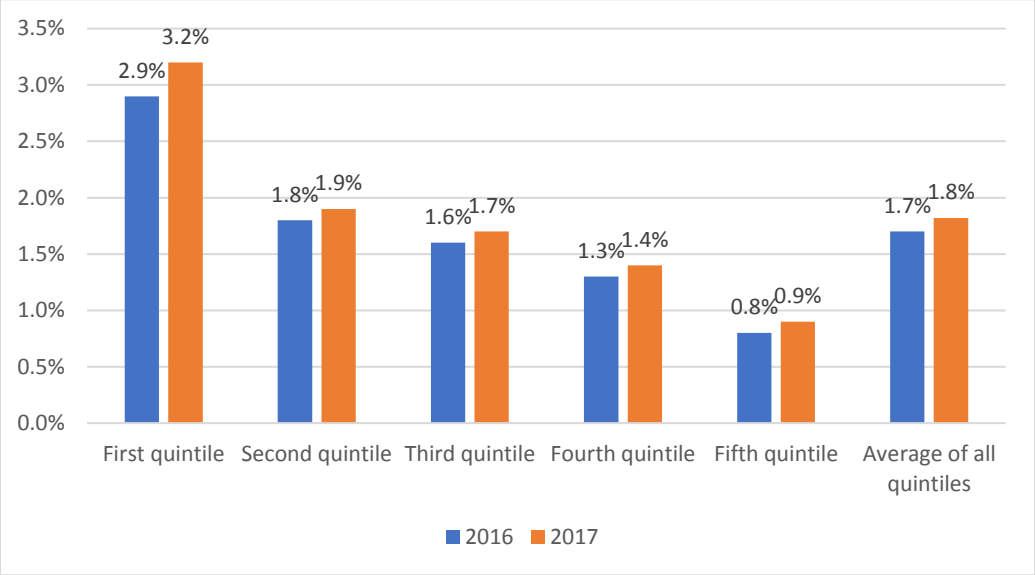
Figure 9: Household Access to Mobile Phone Service by Income Quintile and by Province, 2017



Sources: Statistics Canada (2018).'Dwelling characteristics, by household income quintile in 2016 by Province, Survey of Household Spending in 2016. **Notes:** Upper bounds for 2016 income quintiles are as follows: 1st—$32,090; 2nd—$55,470; 3rd—85,336; 4th—130,045.

The province-level data in figure 9 tells much the same story. No province acts as an exception to the trend observed at the national level: low income households are drastically less likely to subscribe to mobile services than wealthier ones. In no province does adoption among low-income households reach the national average for overall adoption rates (87.9%); in some provinces, such as New Brunswick (67.4%), Québec (63.3%), Nova Scotia (63.1%) and PEI (66.6%), the problem appears to be particularly acute. Adoption has grown among low-income households in most provinces since 2017, but it remains very low by comparison to the average and by international standards.

Figure 10: Mobile service expenditures as a percentage of average annual income, by income quintile, 2016 vs 2017



Sources: Statistics Canada (2019).'Dwelling characteristics, by household income quintile in 2017 by Province, Survey of Household Spending in 2016.Statistics Canada (2018).'Dwelling characteristics, by household income quintile in 2016 by Province, Survey of Household Spending in 2016.

Figure 10 presents Statistics Canada data on mobile service expenditures by income quintile as a percentage of average annual income, comparing 2016 to 2017. As it shows, households in the lowest income spent more of their income on mobile services than their higher-earning peers, with spending increasing to 3.2% of average income in 2017.

In 2011, the International Telecommunications Union's Broadband Commission set an affordability threshold for broadband services (applicable to either fixed or mobile broadband) at 5% of gross national income per capita (GNI p.c.), hoping that this would be achieved by 2015. Subsequently, it has revised this threshold to 2% GNI p.c. to be reached by 2025.[46] In other words, communication services which require households to spend more than this 2% of their income to subscribe are considered unaffordable.

If we apply the ITU's 2% threshold to the data shown above, we see that mobile services for people in the lowest-income quintile are not affordable, and that services for people in the second quintile are very near the mark of being unaffordable. This observation helps to explain why adoption amongst lower-income households in Canada is so low: services are either unaffordable, or very hard to afford for those people.

The evidence presented above makes one thing very clear: mobile phones are unaffordable for many low-income people in Canada. An affordability report commissioned by the CRTC

[46] ITU (2018). Measuring the Information Society 2018. Available at: https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2018/MISR-2018-Vol-1-E.pdf p.101

supports this conclusion, finding that "…low incomes and high costs represent two main barriers to affordability". [47] Furthermore, the authors note that:

> The research shows that broadband penetration rates continue to be substantially lower among low income Canadians (e.g. 60% for the lowest income quintile versus over 95% for the highest income quintile). It also confirms the tendency of subscribers on low incomes to engage in fewer activities online relative to those with high incomes. While lack of interest or low skill levels partially explain lower adoption and use among low-income individuals, cost remains a dominant motive for why low-income Canadians do not use the Internet. Nevertheless, the growing essentiality of broadband and increases in the inelasticity of demand to price, along with country-specific factors, enable incumbent operators in Canada to charge prices that are higher than offerings by their counterparts in most other advanced economies. International comparisons also suggest that the range of low-cost options available in the Canadian market tend to be relatively limited, meaning that low-income households are likely to have fewer affordable options in service plans than their counterparts in other advanced economies. [48]

In the following section, we survey mobile price levels in Canada and other countries using a variety of metrics. We begin by examining price at the regional level. We then examine Canada's mobile pricing in the context of international comparisons. This survey confirms what the affordability report observed: price levels in Canada are high, placing services out of reach for too many people.

Regional pricing within Canada—the benefits of competition are unevenly distributed

Differences in service pricing across the country indicate that competition has developed unevenly since the entry of regional "fourth carriers" more than a decade ago. In the following figures (11-13), we present mobile wireless service pricing for plans that include voice and data between 1GB and 5GB, drawn from the 2018 Wall Report on telecommunications pricing in Canada and other countries.[49] These comparisons show pricing from the national carriers (Bell, Rogers, and Telus), their flanker brands (e.g. Virgin Mobile (Bell), Fido (Rogers), and Koodo (Telus)), and regional competitors (i.e. Eastlink, Videotron, Freedom Mobile, Sasktel) for Nova Scotia, Quebec, Ontario, Manitoba, Saskatchewan, and British Columbia. It is not clear why the authors exclude Alberta from this study; however, we note that a survey of carrier websites shows that pricing in Alberta is the same as Ontario and BC, so we assume the conclusions drawn below with regard to Ontario and BC apply to Alberta as well.

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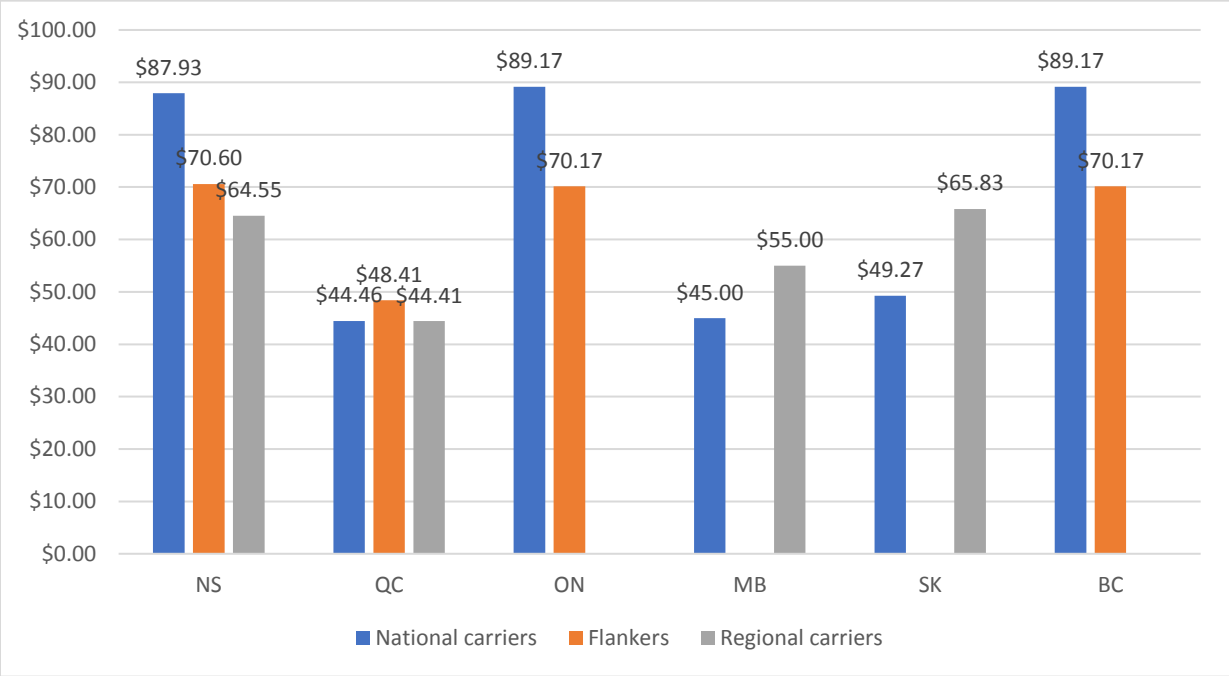
[47] Rajabiun, R., Ellis, D., & Middleton, C. (2016). "Literature review: Affordability of Communications services", Report commissioned by the Canadian Radio-television and Telecommunications Commission, p. 11. Available at: https://www.ryerson.ca/~cmiddlet/ourresearch/lit-review-for-crtc-2016-affordability-rajabiun-ellis-middleton.pdf

[48] Rajabiun, R., Ellis, D., & Middleton, C. (2016). "Literature review: Affordability of Communications services", Report commissioned by the Canadian Radio-television and Telecommunications Commission, p. 25, emphasis added. Available at: https://www.ryerson.ca/~cmiddlet/ourresearch/lit-review-for-crtc-2016-affordability-rajabiun-ellis-middleton.pdf

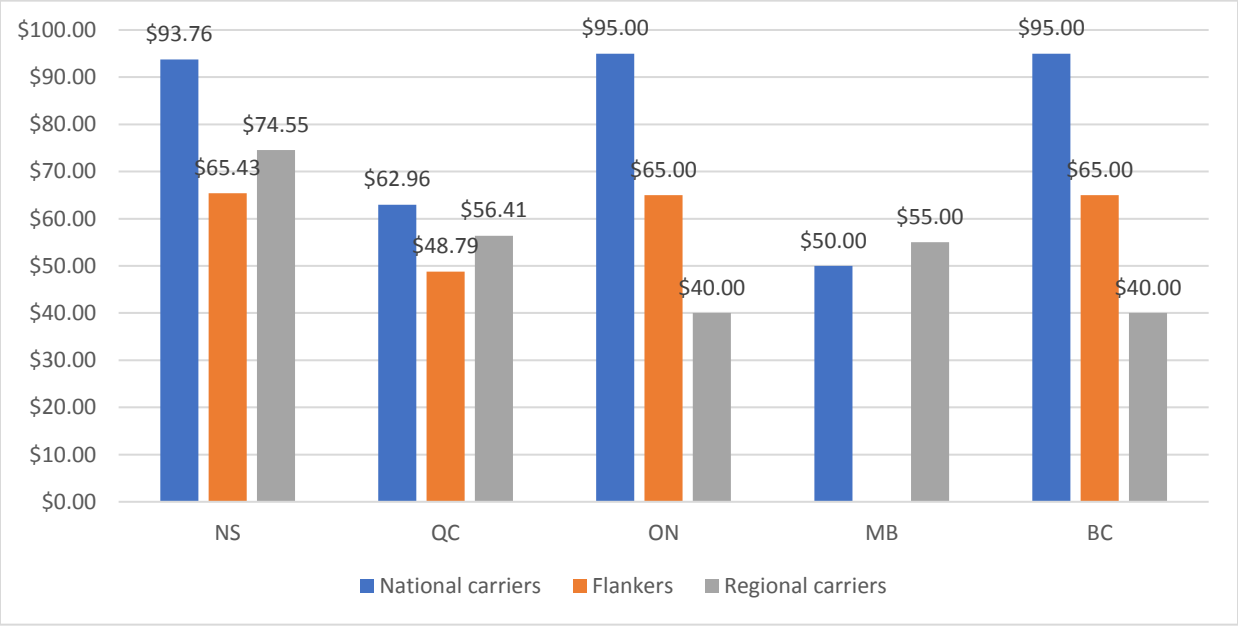
[49] Wall Communications (2018). Price comparisons of wireline wireless and internet services in Canada and with foreign jurisdictions. Prepared for Innovation, Science and Economic Development Canada. Available at: https://www.ic.gc.ca/eic/site/693.nsf/eng/00169.html

Figure 11: Mobile telephony service plans that include 1200min, 300SMS, and 1GB



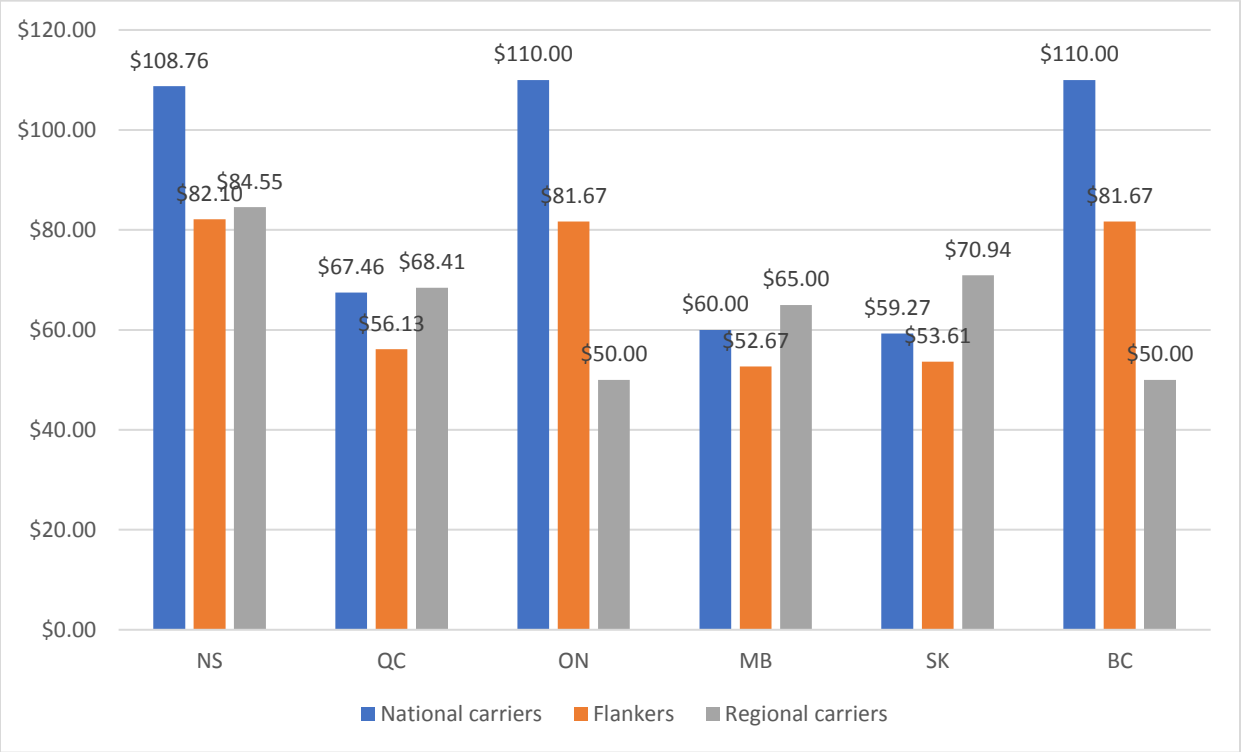
Source: Wall Report 2018. Notes: no data for regionals in Ontario or BC, or Flankers in MB or SK.

Figure 12: Mobile telephony service plans that include unlimited min, SMS, and 2GB



Source: Wall Report 2018. Notes: no data for Saskatchewan; No data on flankers for Manitoba.

Figure 13: Mobile telephony service plans that include unlimited min, SMS, and 5GB



Source: Wall Report 2018.

Examining the figures above, several clear trends can be seen.

First, prices charged by national carriers are generally lower in the Prairie provinces than they are elsewhere in Canada. This has long been the case, as we have documented before.[50] The reason for this is that the national carriers have had to compete against incumbent telcos Sasktel and MTS, which have kept prices low in order to maintain market share, resulting in a more competitive marketplace than is found in other parts of the country.[51] This is consistent with the Competition Bureau's observation in its disposition of the 2017 BCE-MTS merger, where it found that "where Bell, TELUS and Rogers do not face competition from a strong regional competitor, prices are substantially lower."[52] Additionally, the Bureau noted that its "investigation also found that, generally, Canadians in areas with a strong regional competitor use substantially more data than Canadians in areas without a strong regional competitor", another indicator of the impacts of competition (or the lack thereof) in Canadian mobile

[50] Klass, B. & Winseck, D. (2016). Why Bell's Bid to Buy MTS is Bad News: Report Submitted to the Competition Bureau assessing Bell Canada Enterprises' proposed bid to acquire Manitoba Telecommunications Services. Available at: http://www.cmcrp.org/why-bells-bid-to-buy-mts-is-bad-news-report-submitted-to-the-competition-bureau-assessing-bell-canada-enterprises-proposed-bid-to-acquire-manitoba-telecommunications-services/

[51] See: CBC (2018). Bell MTS cancelling unlimited wireless data plans. Available at: https://www.cbc.ca/news/canada/manitoba/bell-mts-cancelling-unlimited-wireless-data-plans-1.4742013

[52] Competition Bureau (2017). Competition Bureau statement regarding Bell's acquisition of MTS. Available at: https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04200.html

wireless markets.[53] We note, however, that since Bell took over MTS in 2017, it has since ceased to offer mobile plans with unlimited data in the Manitoba wireless market, and has also increased wireless prices by $5 per month.

If lower prices are an indication of the strength of regional competitors, then the data above lead us to conclude that competition from Freedom in Ontario and British Columbia, and Eastlink in Nova Scotia, remains marginal.[54] It is clear that Freedom's low pricing relative to the national carriers has not had a major impact on the nationals' main brand pricing – which remains set at more than twice the price of Freedom's plans—and similarly, the competitive pressure exerted by Eastlink in the Maritimes and Atlantic provinces has been less than that of Videotron in Quebec or Sasktel in Saskatchewan.

Lastly, we note that prices in Quebec appear to be decreasing to levels that resemble those found in the Prairie provinces, which may be a sign that competition is improving in la belle province. The key indicator here is the fact that the national carriers have lowered prices not just with the use of their flanker brands but with their main brands as well. It will be important to monitor this market going forward, as Videotron has recently launched a discount brand of its own—Fizz—which, at early impression, appears to have competitive offers that may force a further response from incumbents.[55]

With that being said, we do urge caution not to be too optimistic with regard to the conclusions to be drawn from price comparisons between provincial markets. Although people in the Prairies and Quebec may have it better than those living in the rest of Canada, those benefits do not extend to the rest of the country, and international comparisons, as we discuss later in this report, continue to show that overall price levels in Canada remain significantly more expensive than in other countries in the G7 and Europe.

International comparisons of mobile wireless service pricing: high prices, little progress

In the following section, we present pricing data at the national level, drawing on publicly available sources from Wall Communications (commissioned by Innovation, Science and Economic Development/ISED), the International Telecommunications Union (ITU), the US Federal Communications Commission (FCC), scholarly research, the OECD, scholarly studies and market analysis firms.[56]

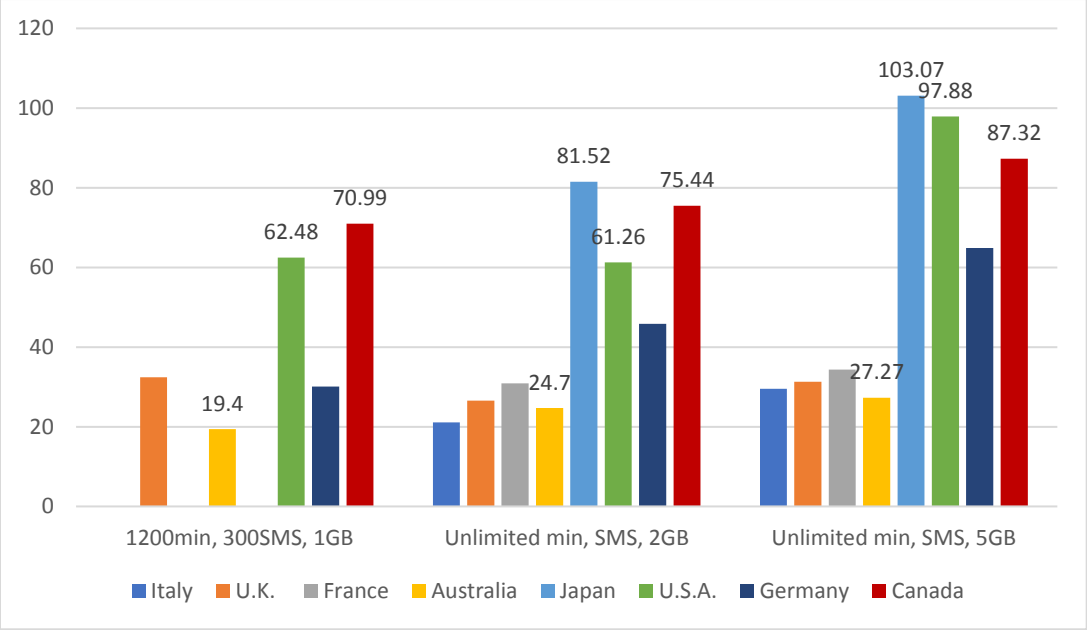
These sources, which present data using a variety of methods and metrics (including mobile price as a percent of gross national income per capita, purchasing power parity (PPP), price declines over time, price per GB, and international comparison of a common mobile service basket) all lead to the same conclusion: mobile wireless services in Canada are more expensive,

[53] Ibid.
[54] The same likely applies to Alberta as well, by implication: the prices national carriers and Freedom charge in Alberta do not differ from those on offer in Ontario or BC.
[55] It is conceivable that Fizz was launched in anticipation of further regulatory intervention, particularly with respect to MVNO access.
[56] For more information on these organizations, please consult the glossary of terms included in this report.

and as a result are less affordable than they are elsewhere in comparable countries, particularly for low-income households and individuals.

In figures 14 & 15, we present international comparison data on price levels observed in the Wall Report. These figures show that Canada fares poorly in comparison to its peer countries in the G7 and Australia. Although price increases in some of the countries have moved Canada up in the rankings on some measures compared to the previous year, price levels remain relatively high and in some cases are still more expensive than in any other country.

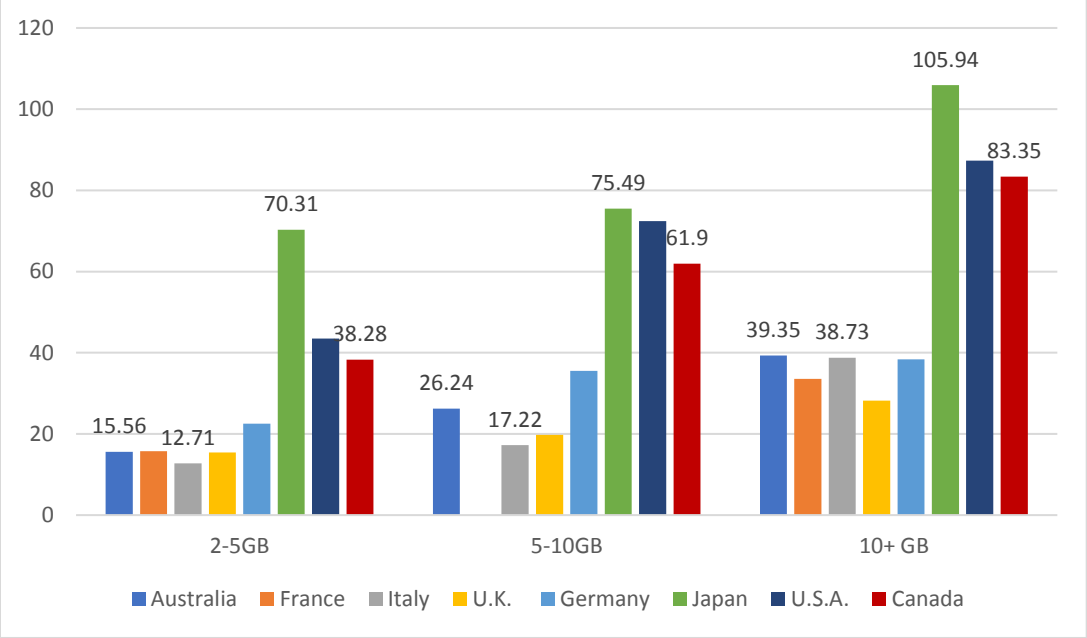
Figure 14: Prices for non-shared mobile wireless telephony service baskets that include data, 2018, PPP-Adjusted CA$



Source: Wall Report 2018

In the previous year's report, Canadian prices were the most expensive for all three service levels. Figure 14 shows that in 2018, Canada's prices remained the most expensive in the first service level, which represents plans that include 1,200 minutes, 300 SMS, and 1GB. At $70.99 per month, Canadian prices at this level are more than triple the Australian price of $19.40. At the second level, which includes unlimited minutes, SMS, and 2GB of data, a sharp increase in Japanese prices, to $81.52 per month, moved Canada into the position of second-most expensive. For this level, Canada's price of $75.44 is still more than triple the Australian price of $24.70. For the largest level, which includes unlimited minutes, SMS, and 5GB per month, a sharp increase in price was observed in both Japan and the United States, moving Canada into the rank of 3rd most expensive. Like the other two tiers, Canadian pricing for plans that include 5GB, at $87.32, is more than three times the Australian price of $27.27.

Figure 15: Prices for data-only mobile wireless broadband service baskets, 2018, PPP-Adjusted CA$



Source: Wall Report 2018.

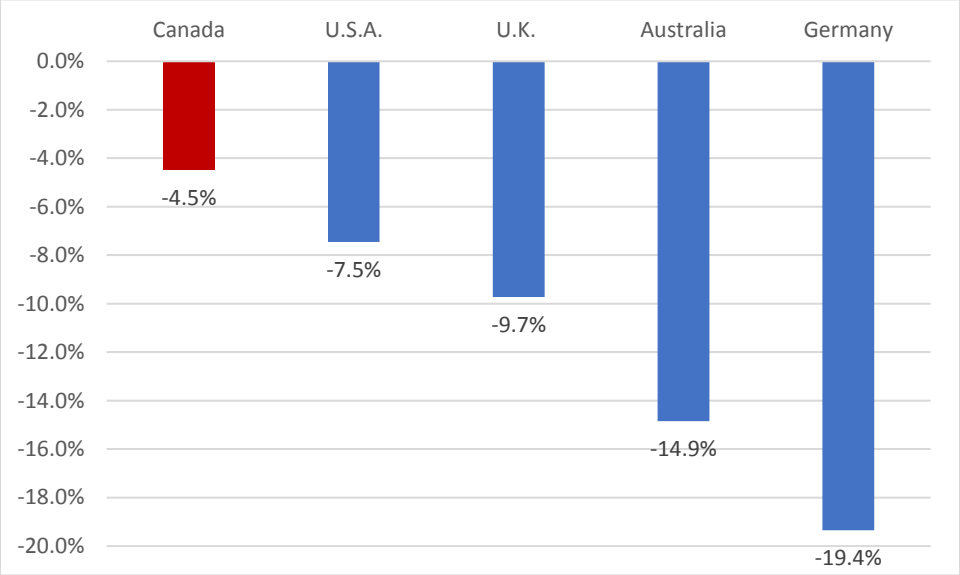
For data-only mobile broadband plans, figure 15 shows that Canada's relative standing improved across all three tiers. Although Canadian prices remained relatively stable compared to last year, sharp increases in the price of service, particularly in Japan, moved Canada up in the rankings. For plans with between 2 and 5 GB, Canada now stands in third place, compared to most expensive last year. However, Canadian plans, at $38.28 per month, are more than twice as expensive as Australian ones ($15.56) and roughly three times those of the leading country, Italy ($12.71). For plans with between 5-10 GB, Canada has moved from second-most expensive last year to third place this year. Canadian prices at this level ($61.90), however, are more than double Australian ones ($26.24) and more than triple Italian ones ($17.22). For the largest service level, Canada is also third-most expensive, moving up from second last year. Canadian prices ($83.35) are more than double Australian ones ($39.35) for this level of service.

Next we focus on the Wall Report's observations on trends over time in mobile pricing, first for plans that include voice and data, and then for plans that solely provide broadband connectivity. The study observes price declines across most of these services; however, as was the case with the previous year's report, in almost all cases declines in Canadian pricing have been outpaced by our international peers in G7 countries and Australia. In only one instance of the relevant comparisons does Canada fare better than second-worst, and in that case prices actually increased in the majority of countries (including Canada). The following figures show these comparative declines over time for non-shared mobile telephony baskets which include data,[57] as well as for mobile broadband plans (i.e. mobile broadband plans that do not include

[57] Non-shared plans are mobile plans that are offered to individual subscribers. Shared plans, by contrast, make available a pool data allowances to multiple devices on the same account. The plans proposed by the carriers in this proceeding are non-shared plans, and therefore

voice minutes). Changes are expressed in terms of compound annual growth rates (CAGR) for the respective survey periods.

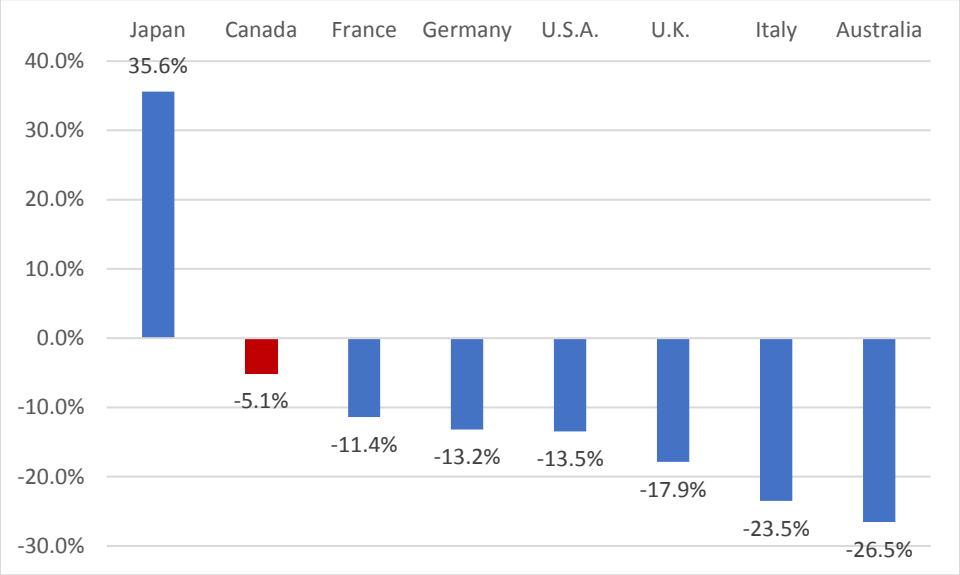
Figure 16: Mobile telephony price declines, CAGR 2008-2018, plans with 1200 minutes, 300 SMS, & 1GB data



Source: Wall Report, 2018 (no data in this basket for Italy or France in 2018 report)

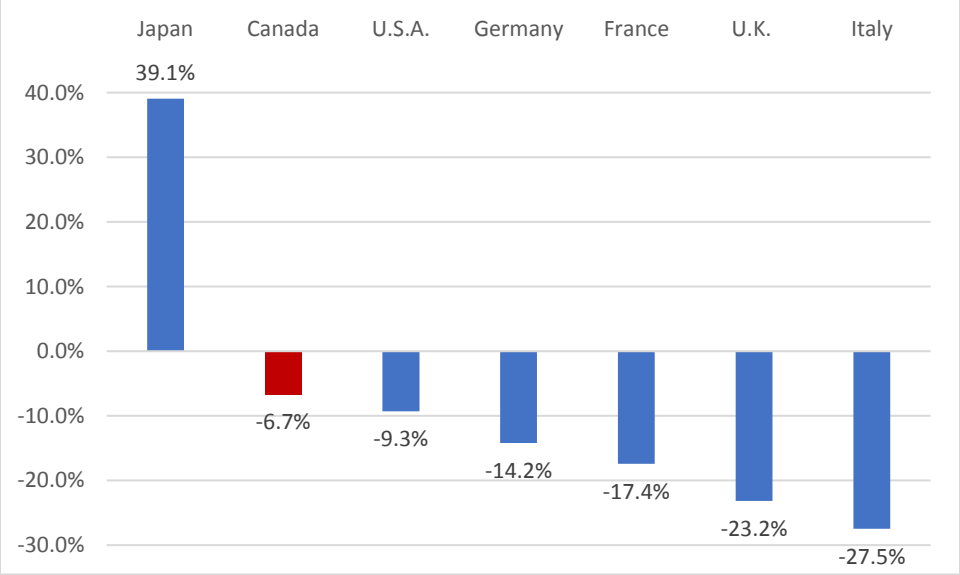
shared plans are not considered directly comparable for the purpose of this report. However, the evidence presented by Nordicity for shared plans places Canada in a similarly poor position with respect to comparator nations when considering shared plan price declines and overall prices. For service level 6, which represents shared plans featuring unlimited minutes, SMS, 10GB of data, and 3 lines, Canada ranked 4th of 5 countries (2nd most expensive). See: Nordicity, 2017 Price Comparison Study of Telecommunications Services in Canada and Select Foreign Jurisdictions.

Figure 17: Mobile telephony price declines, CAGR 2014-2018, plans with unlimited minutes, SMS, & 2GB data



Source: Wall Report, 2018

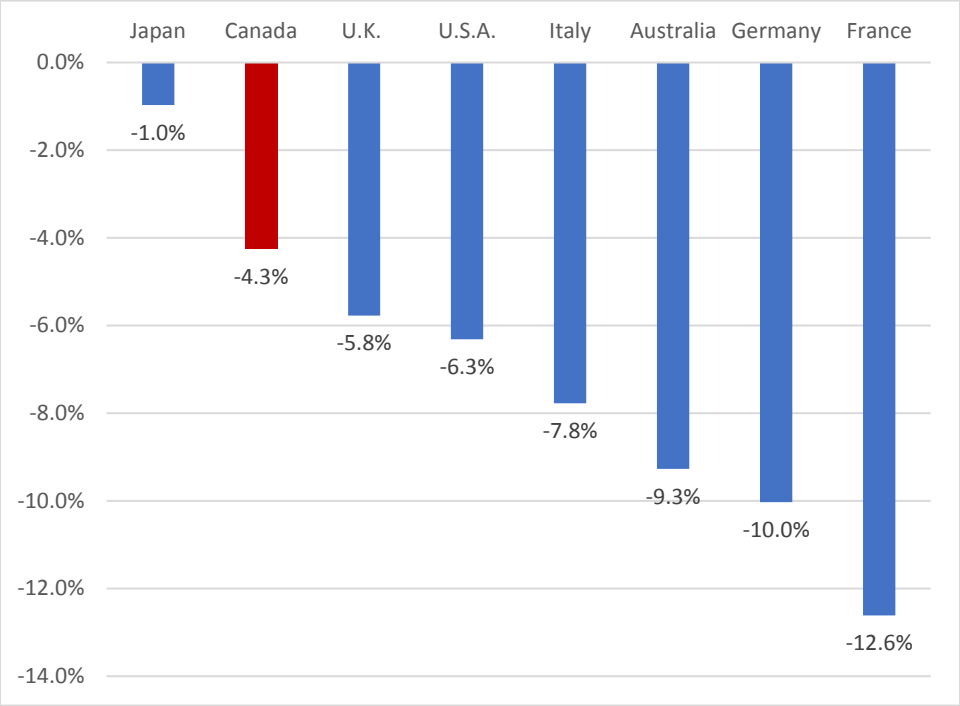
Figure 18: Mobile telephony price declines, CAGR 2015-2018, plans with unlimited minutes, SMS, & 5GB data



Source: Wall Report 2018.

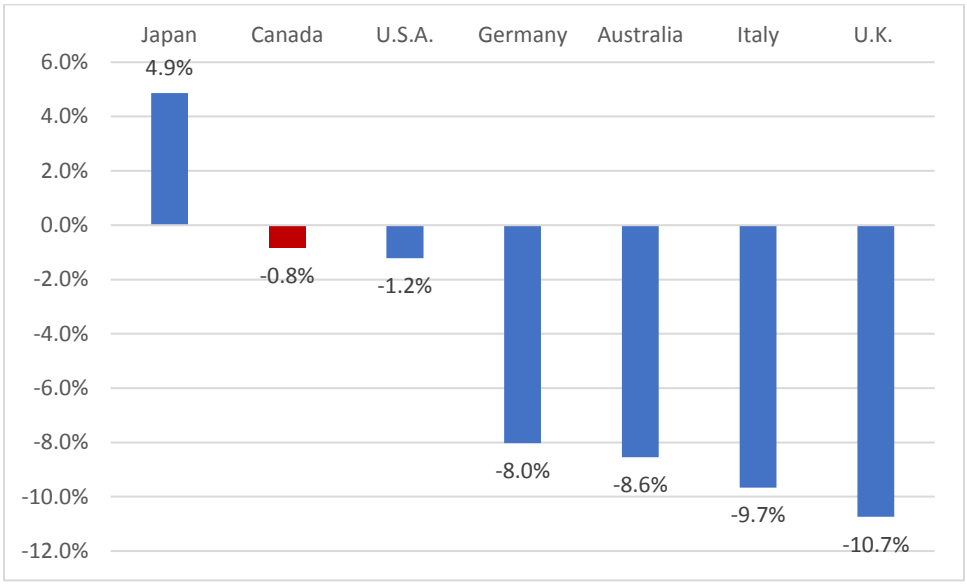
Figures 15-18 show that prices in Canada declined substantially less than other countries that experienced declines over the observation period. In two cases, substantial increases in Japanese prices left Canada in second-last of the countries measured. The changes shown above are cumulative with those presented in our previous report.

Figure 19: Price declines for mobile wireless data-only plans with 2GB-5GB, CAGR 2010-2018



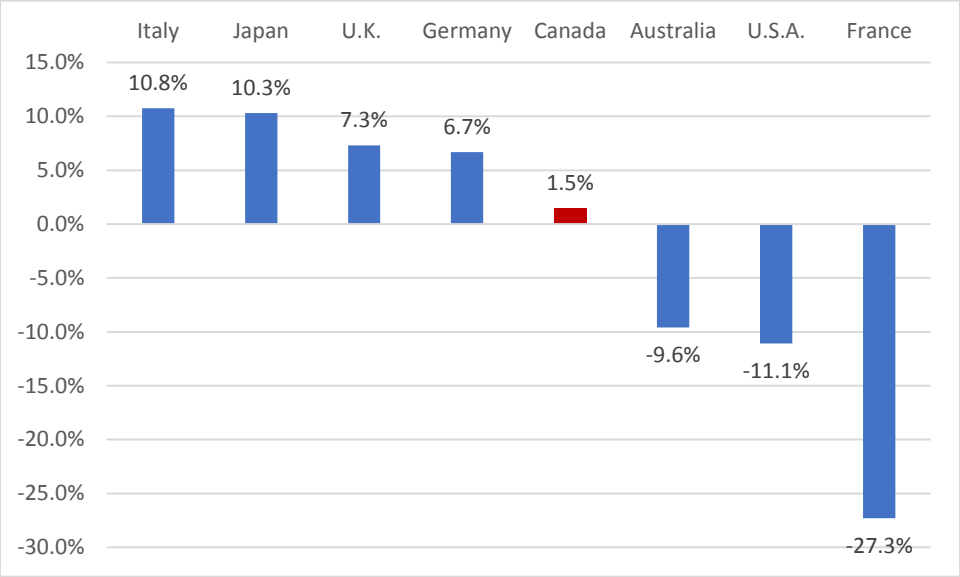
Source: Wall Report 2018.

Figure 20: Price declines for mobile wireless data-only plans with 5GB-less than 10GB, CAGR 2012-2018



Source: Wall Report 2018 (No data for France)

Figure 21: Price declines for mobile wireless data-only plans with 10GB and more, CAGR 2016-2018



Source: Wall Report 2018.

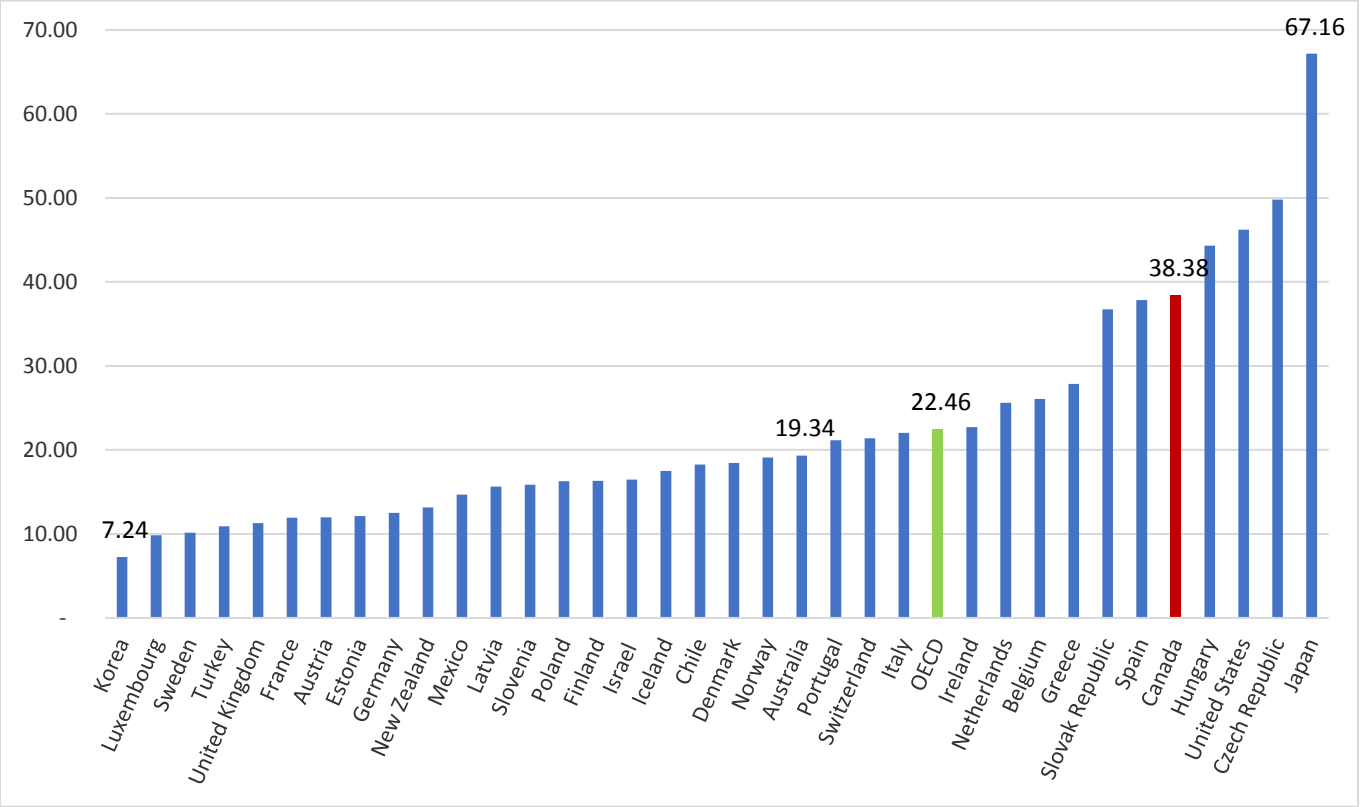
Similar to the case with the mobile telephony plans, the data presented in figures 19-21 show that mobile wireless data-only plans in Canada have generally been subject to modest price decreases, with the exception of plans that include more than 10GB, which increased in price by 1.5% from 2016-2017, less than the increases in Italy, Japan, the UK, and Germany. However, prices in this tier fell substantially in Australia, the US, and France, leaving Canada in the middle of the pack.

Many sources agree: mobile services are more expensive in Canada than elsewhere

In what follows, we expand our survey of Canada's mobile market performance by presenting additional comparative pricing data from the OECD, ITU, FCC, a scholarly study, and Rewheel research. Because mobile markets are complex, no single source can be comprehensive in its representation of market dynamics. For this reason, we have made effort to use a broad range of sources in order to more accurately and comprehensively capture the situation.

These data, which are drawn from a variety of sources that use a variety of different measures, do not show a Canada in a flattering light. Rather, they confirm that Canadian mobile pricing is not competitive by international standards; to the contrary, the majority of sources surveyed show that Canada is well above the average for mobile pricing, and, in some cases, is among the most expensive of OECD countries. Although no single source can capture all aspects of the Canadian mobile market, the fact that so many different studies point to the same conclusion—expensive mobile service in Canada--is noteworthy.

Figure 22: OECD Mobile broadband basket,
Low user, including 100 calls + 500 MB, May 2017, VAT included, USD$ PPP

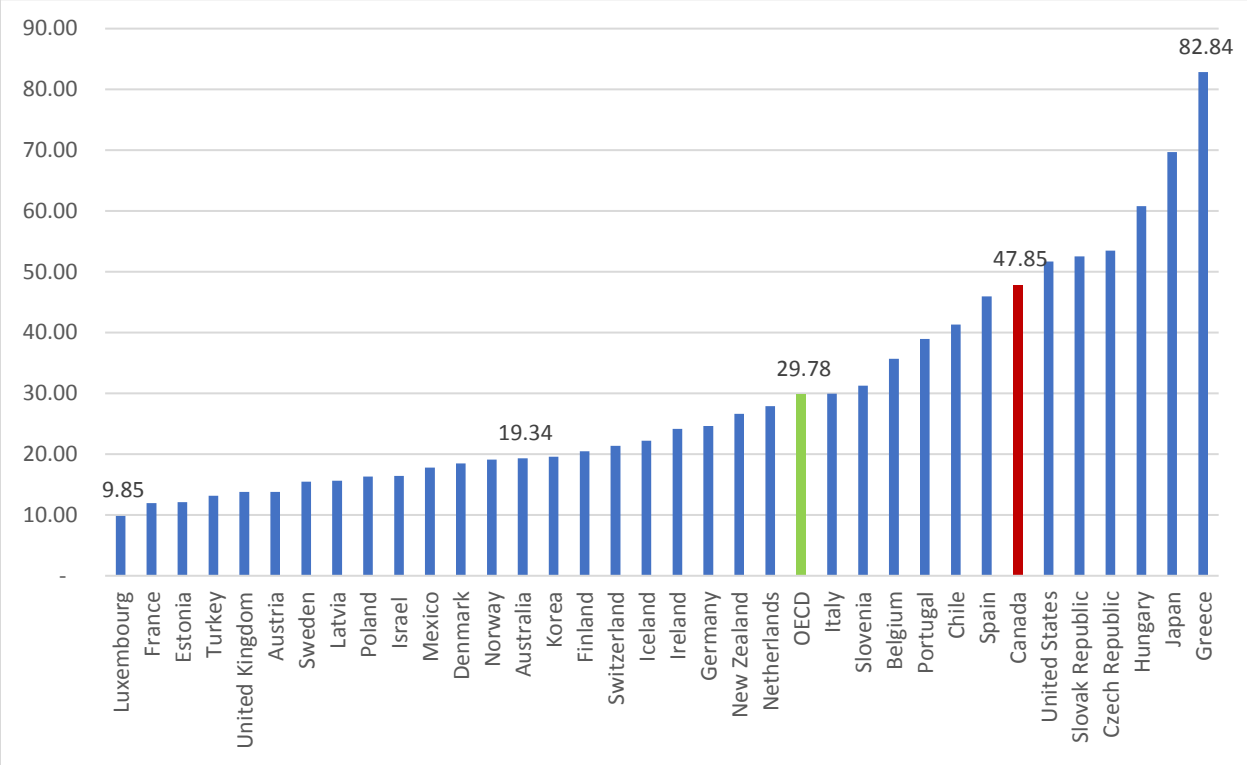


Source: OECD Broadband Portal. Available at: http://www.oecd.org/sti/broadband/broadband-statistics/ Data for 2018 not yet available.

The first data we present are from a survey conducted by the OECD of low-use mobile broadband plans that included at least 100 calls and 500 MB of data as of May 2017 (figure 22). The data in this survey include applicable taxes, and are calculated using the purchasing power parity method, in terms of USD$. As figure 22 clearly shows, at $38.38 USD PPP, Canadian plans were notably more expensive than the OECD average of $22.46 USD PPP. Indeed, Canada ranked at a disappointing 31st of the 35 countries covered in the comparison. The price of Canadian plans was nearly double the Australian price ($19.34 USD PPP), and only less expensive than plans in Hungary ($44.30 USD PPP), the US ($46.21 USD PPP), Czech Republic ($49.79 USD PPP), and Japan ($67.16 USD PPP).

Figure 23 shows OECD data for medium-use mobile broadband plans. These plans include at least 300 calls and 1 GB of data as of May 2017 (figure x). At $47.85 USD PPP, Canadian plans ranked 29th of 35 and were more expensive than the OECD average of $29.78 USD PPP. Australian plans, at $19.34 USD PPP, were less than half the price of Canadian ones, and French plans, at $11.94 USD PPP, could be had for less than one quarter the Canadian price.

Figure 23: OECD Mobile broadband basket, Medium user, including 300 calls + 1 GB, May 2017, VAT included, USD$ PPP



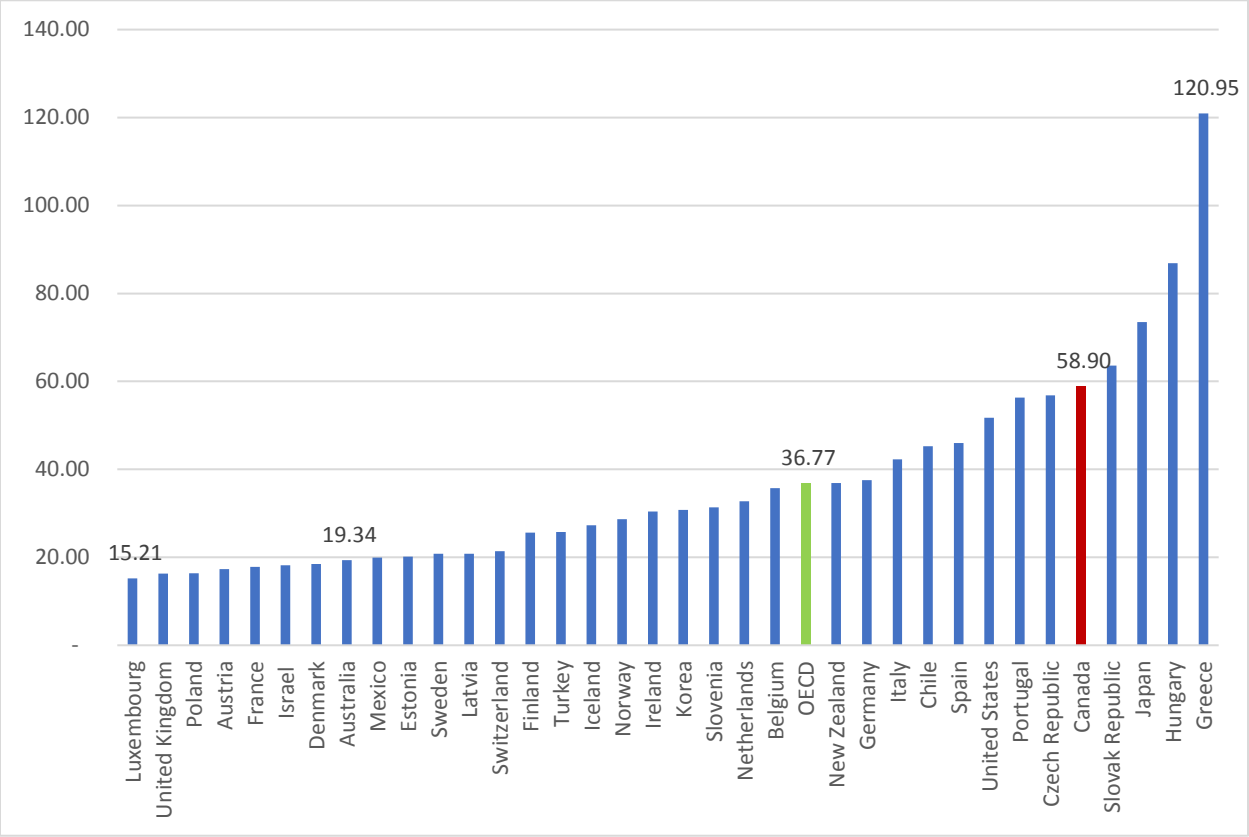
OECD Broadband Portal. Available at: http://www.oecd.org/sti/broadband/broadband-statistics/

The OECD also provides data on "high user" plans which include 900 calls and 2GB of data from May 2017 (shown in figure 24). Similar to the lower-use baskets discussed above, Canada does not fare well in this category, with a rank of 30th of 35 countries surveyed. The Canadian price of $58.90 USD PPP is substantially higher than the OECD average of $36.77 USD PPP, and nearly three times as much as the Australian price of $19.34 USD PPP. We note that the Australian plan calculated in each of the baskets presented above is the same; this is because the OECD methodology makes comparisons based on "the lowest cost offer calculated for each operator and basket".[58] In other words, the Australian plan, which includes 3GB of data, is the lowest-cost option that meets the criteria for all three levels available in the Australian market. Thus, while the low- and medium-use plans in Australia are not the same, strictly speaking, as the Canadian ones, the disparity nevertheless reveals an interesting insight: Australian plans for the lower two use baskets include more features than Canadian ones for substantially less money, and for the high use basket, the plans are the same (each features 3GB of monthly data use) but the Australian one is substantially cheaper. Despite what some may consider limitations in the basket method of price comparison, the data presented here and in the charts below,

[58] See: OECD (2017). Revised OECD telecommunication price baskets. Available at: https://www.oecd.org/sti/broadband/DSTI-CDEP-CISP(2017)4FINAL.pdf

which make use of a variety of methods and metrics, all point to a similar conclusion: Canada's mobile market is not performing up to competitive standards on the measure of price.

Figure 24: OECD Mobile broadband basket, High user, including 900 calls + 2 GB, May 2017, VAT included, USD$ PPP



OECD Broadband Portal. Available at: http://www.oecd.org/sti/broadband/broadband-statistics/

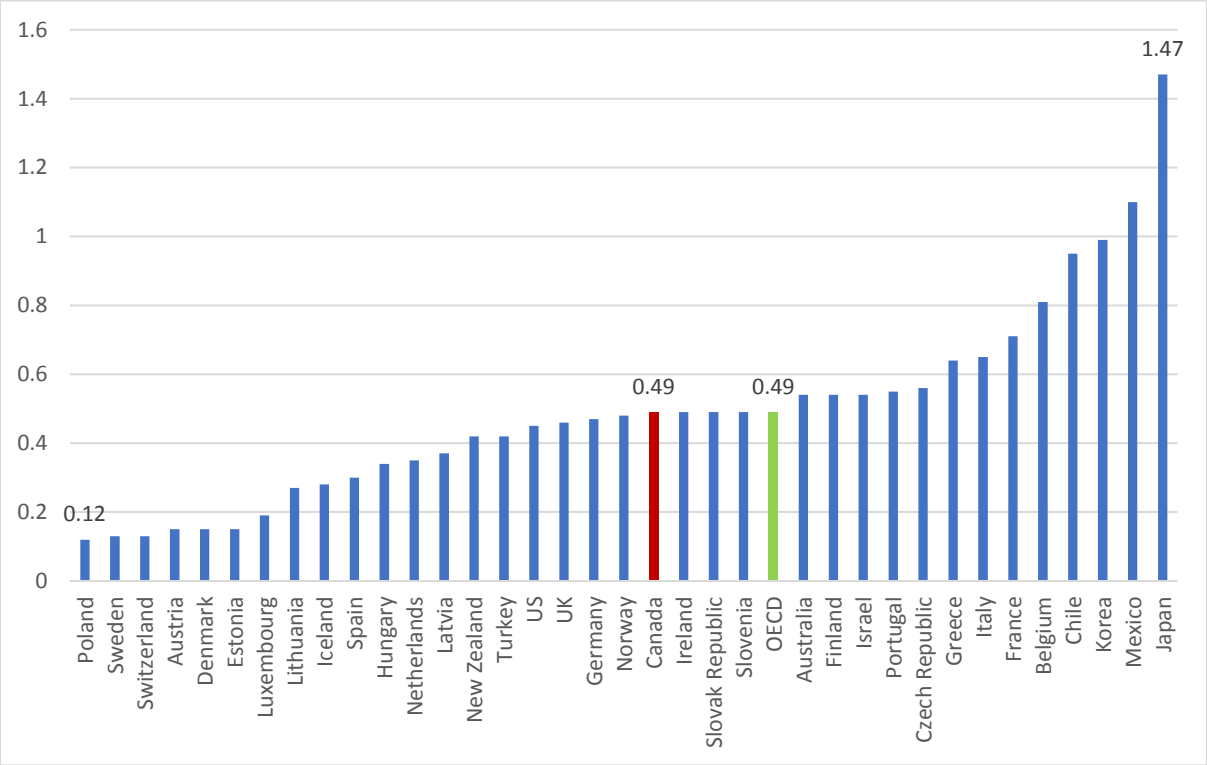
In the figures below, we present pricing and affordability data from the International Telecommunications Union (ITU)'s ICT price baskets database.[59] These figures, like the OECD ones presented above, focus on specific baskets of service, although they include an additional metric which measures the price of service as a percentage of gross national income per capita (%GNI p.c.). This measure is of particular relevance when considering the relationship between price and affordability, since it presents pricing as a function of average income and thus draws a direct link between the two variables. This method is used by the ITU to assess the affordability of service pricing for the two baskets it measures, namely handset-based prepaid service plans that include at least 500MB of data, and mobile broadband laptop-based service plans that include at least 1GB of data.

As mentioned above, the ITU has set an affordability threshold target for 2025 which characterizes service pricing under 2% of GNI p.c. as affordable. By this measure, at the country

[59] ITU (2019) ICT Price baskets. Available at: https://www.itu.int/net4/ITU-D/ipb/

level, prepaid handset-based plans with 500MB in all OECD countries fall below the affordability threshold. However, we do note that these figures do not account for disparity between income within a country, as we have done above.

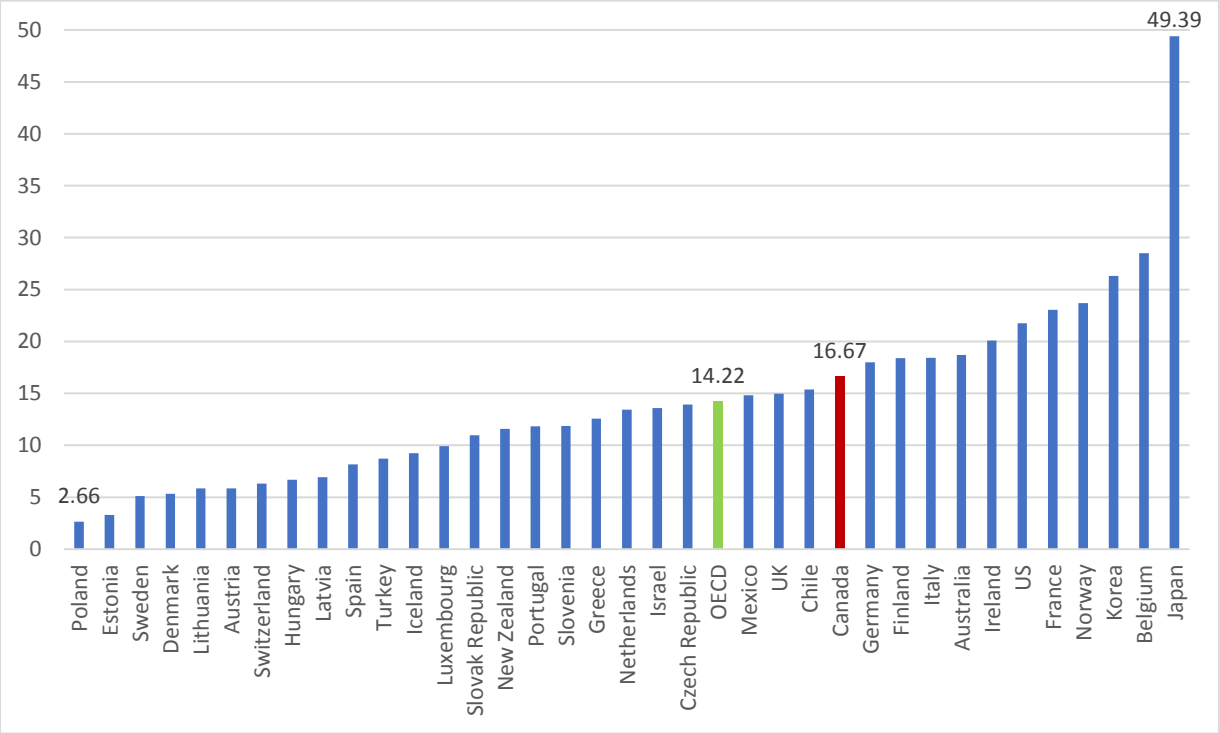
Figure 25: Mobile-broadband, prepaid handset-based (500 MB), 2017, As % of GNI per capita



Source: ITU, ICT Price Baskets (2018). Available at: https://www.itu.int/net4/ITU-D/ipb/

Although figure 25 shows that, at 0.49 %GNI p.c., Canada's prices for the prepaid handset-based 500 MB service plan qualify as affordable by ITU standards, there are several qualifications that need to be observed. First, as discussed above, the national-level metric does not account for income disparity within a country. So, while this service plan may appear affordable for an average-income-earning household, when measured by varying income levels, we see that mobile services may be unaffordable for many lower-income households in Canada. Second, while the OECD average has decreased from 0.52 %GNI p.c. in 2016 to 0.49 %GNI p.c. in 2017, Canada's level has increased from 0.43 %GNI p.c. in 2016 to 0.49 %GNI p.c. in 2017. So, while prices relative to income have declined on average in the OECD countries, Canada has experienced the opposite on this measure.

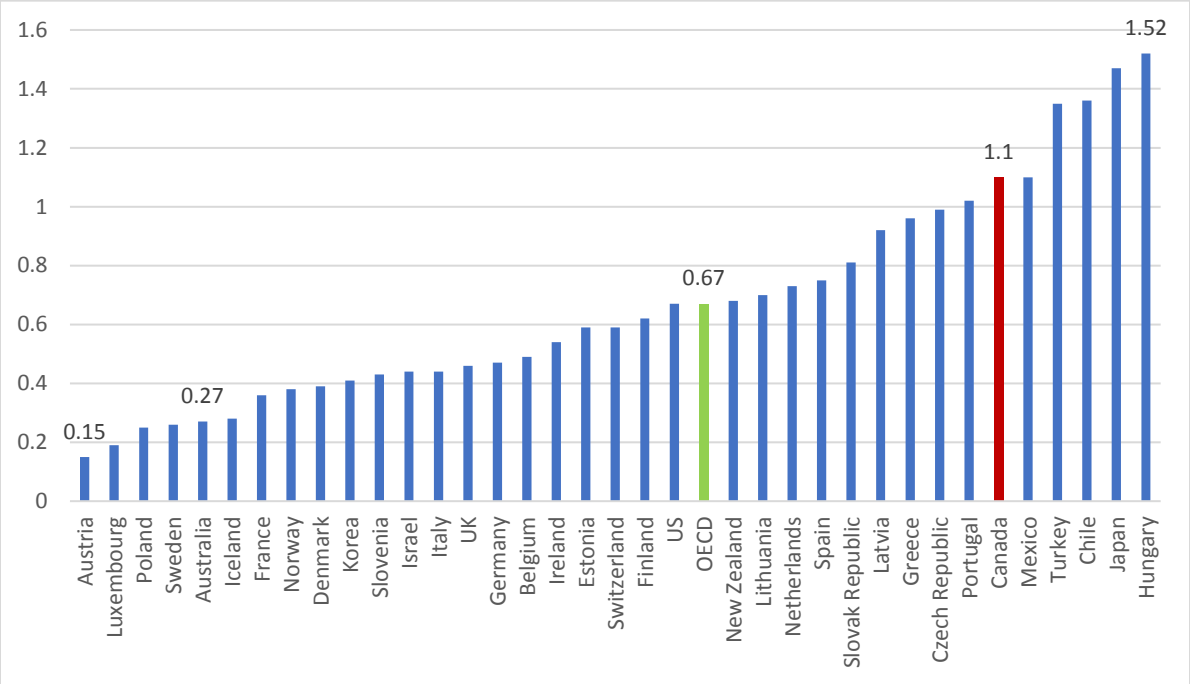
Figure 26: Mobile broadband, prepaid handset-based (500 MB), 2017, PPP, USD$



Source: ITU, ICT Price Baskets (2018). Available at: https://www.itu.int/net4/ITU-D/ipb/

The ITU also presents 2017 data on the price level using the purchasing power parity (PPP) measure, shown in figure 26. Canada sits just above the OECD average in terms of price, at $16.67 PPP USD per month vs. the OECD average of $14.22 PPP USD. This price level places Canada in 25th rank of 36 OECD countries measured. Additionally, Canada's price on this measure stayed relatively flat since the previous year ($16.67 PPP USD in 2017 vs. $16.84 PPP USD in 2016), while the OECD average prices fell by a greater margin ($14.22 PPP USD in 2017 vs. $16.25 USD PPP in 2016). This is consistent with observations made earlier that mobile prices in Canada may be declining, but are doing so at a slower pace and to an otherwise lesser degree than in other comparable countries.

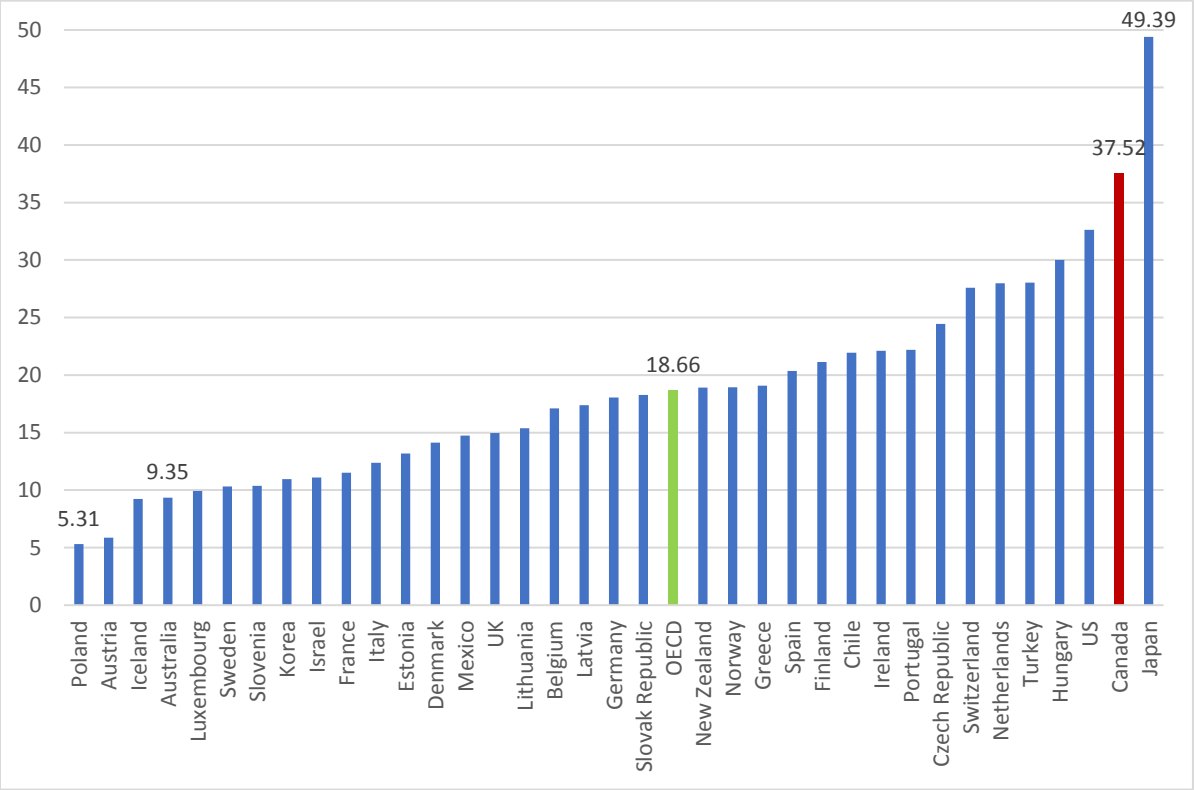
Figure 27: Mobile-broadband, postpaid computer-based (1 GB), 2017, as a % of GNI per capita



Source: ITU, ICT Price Baskets (2018). Available at: https://www.itu.int/net4/ITU-D/ipb/

According to the ITU (figure 27), Canada fares worse when it comes to postpaid computer-based mobile broadband plans with at least 1 GB than it does with regard to prepaid handset-based plans. When measured by %GNI p.c., Canadian plans in this basket stand in 30th place of 35 measure countries, and at 1.1 %GNI p.c. are significantly higher than the OECD average of 0.67 %GNI p.c.. Canadian plans in this basket are substantially less affordable than in Australia, where the figure was 0.27 %GNI p.c. for 2017.

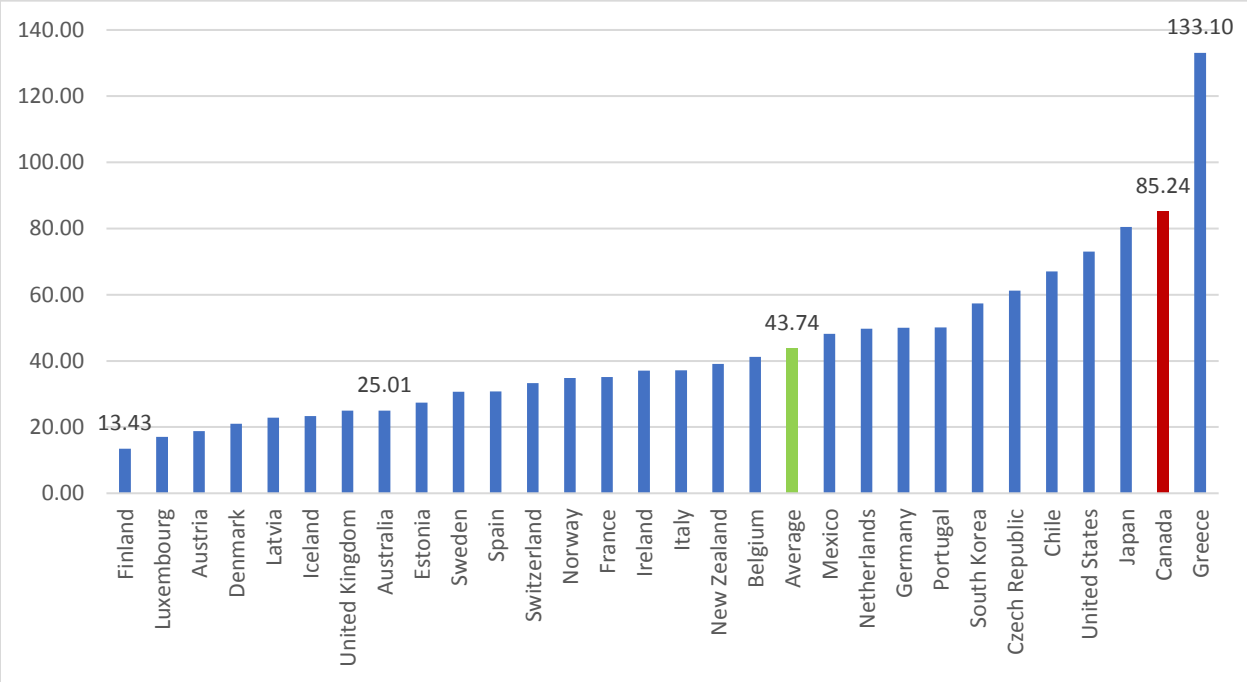
Figure 28: Mobile-broadband, postpaid computer-based (1 GB), 2017, PPP, USD$



Source: ITU, ICT Price Baskets (2018). Available at: https://www.itu.int/net4/ITU-D/ipb/

When measured in terms of PPP USD$ PPP, Canada remains in 34th rank of 35 countries for postpaid computer-based 1GB plans in 2017, the same spot it held in 2016. Figure 28 shows that the ITU's observed price for Canada ($37.52 PPP USD) on this metric is roughly double the OECD average ($18.66 PPP USD), and roughly four times the price of similar plans in Australia ($9.35 PPP USD per month).

Figure 29: Mean monthly plan charge for smartphone data plans with ≥2 to <5 GB Usage Limit, 2017 (PPP$)



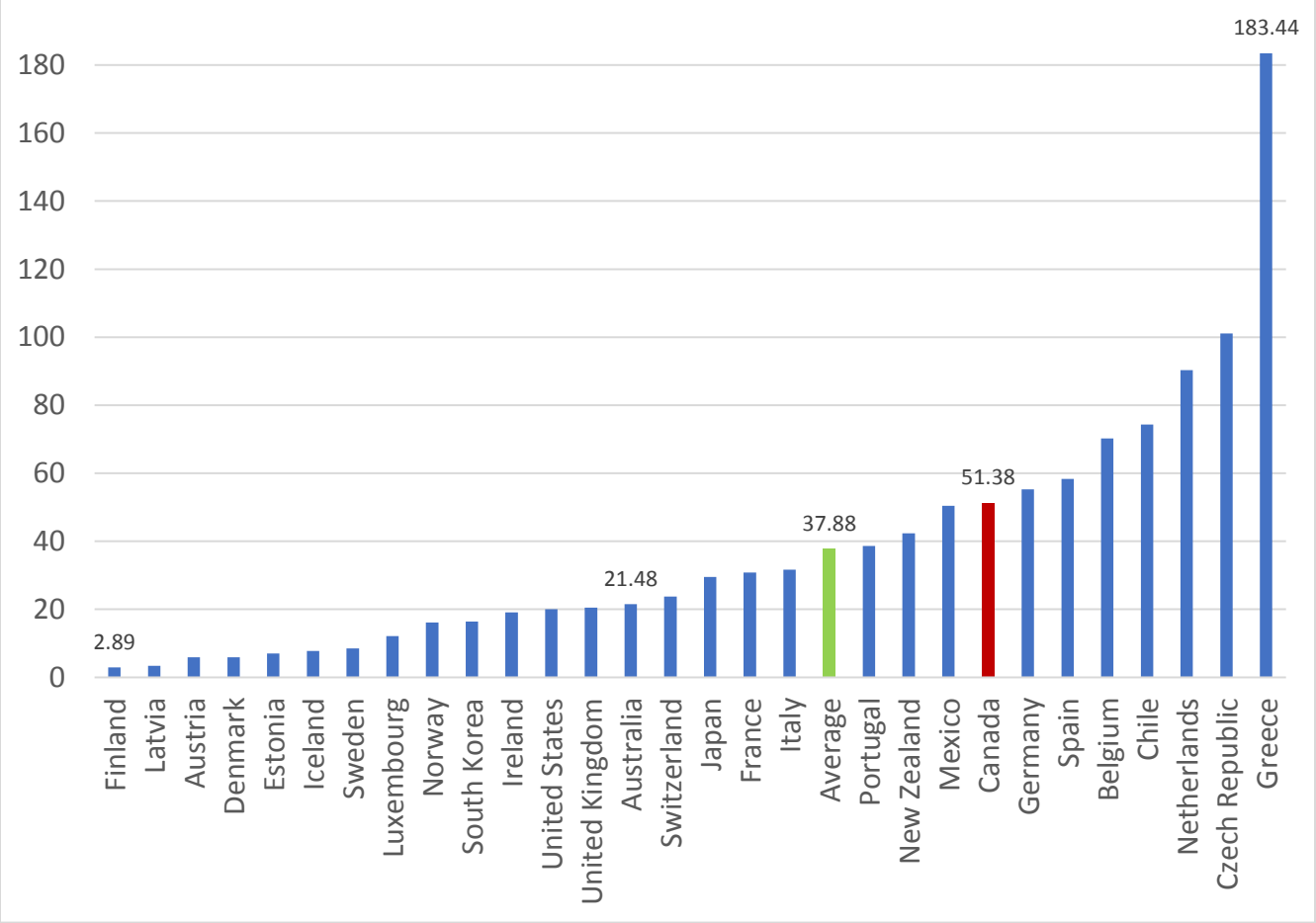
Source: FCC (2018) International Broadband Data Report. 6th. ed, Table 5. Available at: https://apps.fcc.gov/edocs_public/attachmatch/DA-18-99A1.pdf Note: FCC did not include Canada in price comparisons this year.

In 2018 the FCC moved to a new format for reporting on international communications market performance. Its previous International Broadband Data Report has been folded into an omnibus market report titled "Communications Marketplace Report".[60] Unfortunately, this new report did not include Canada in international pricing comparisons. We are therefore presenting the most recently available data, drawn from the FCC's earlier International Broadband Data Report, with figures from 2017.

Shown in figure 29, the FCC's 2017 data confirm the observation that Canada fares poorly with respect to the mean monthly plan charge for smartphone data plans with usage limits ≥2 to <5 GB. For these plans, the FCC presents data for 29 of the OECD countries. Of these countries, Canada ranked 28th, or second most expensive, at $85.25 USD PPP, nearly double the average of $43.74 USD PPP. Only Greece had plans of this type that were more expensive ($133.10 USD PPP), while such plans in the United States ($72.99 USD PPP) came in slightly lower than Canada. The price of plans in Australia ($25.01) was less than a third the price of Canadian ones, while plans in the cheapest country, Finland ($13.43) were less than one sixth the price of Canadian plans.

[60] See: FCC (2018). FCC adopts first consolidated communications marketplace report. Available at: https://www.fcc.gov/document/fcc-adopts-first-consolidated-communications-marketplace-report-0

Figure 30: Mobile broadband price indices: Price/GB of mobile data (July-August, 2017) (PPP)



Sources: FCC (2018) International Broadband Data Report. 6th. ed, Table 7: Mobile Broadband Price Indices (PPP), p. 70. Available at: https://apps.fcc.gov/edocs_public/attachmatch/DA-18-99A1.pdf Note: FCC did not include Canada in its most recent price comparisons.

The US FCC's International Broadband Data Report also provides a composite measure of the price per GB of mobile data for the period July-August 2017, again using the PPP measure. In order to calculate this measure, the FCC estimates "a hedonic regression model to adjust prices for country-level differences in cost and demographic factors, differences in mobile broadband product quality (e.g., plan usage limits) and content quality."[61] Even controlling for quality as described above, Canada fares poorly by this measure, as shown in figure 30. It ranked 22nd of 29 countries surveyed with a 2017 price per GB of $51.38 PPP, substantially higher than the

[61] FCC (2018) International Broadband Data Report. 6th. ed, Table 7:Mobile Broadband Price Indices (PPP), pp. 70-71. Available at: https://apps.fcc.gov/edocs_public/attachmatch/DA-18-99A1.pdf

average of $37.88 PPP. The US, by contrast, ranked 12th, at $20.02 PPP, while Australia ranked 14th at $21.48 PPP.

The findings of a new study conducted by Korean scholars complements the FCC's findings. This study, published in *Telecommunications Policy* in 2019, used a similarly sophisticated hedonic pricing model to compare mobile service prices across major cities in 10 countries, including all G7 countries plus Spain, Sweden, and Australia.[62] This study, which collected and analysed data from 2015, ranked countries' performance using seven different models in order to rank prices while correcting for service quality and additional fees. Models accounting for service quality (Models 1-4) factored for different combinations of metrics, such as basic data allowance, upload and download speed, measurements of performance while stationary, or in motion on roads and subways, and by variation in experience quality. Toronto ranked most expensive for each of the four models that corrected for service quality. The second set of models, which focused on correcting for device subsidy and other additional fees, found that service in Toronto was either the most expensive or second-most expensive of the cities observed. The findings of this study are reproduced below in figures 31 and 32; the numbers in the right-hand columns represent rank, with 1 being most expensive and 12 being least expensive.

Figure 31: Quality-adjusted price indices of mobile telecommunications services (1) – service quality (2015)

Quality-adjusted price indices of mobile telecommunications services (1) – service quality.

City	Price Indices				Ranking			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Los Angeles	1	1	1	1	5	5	6	6
San Francisco	1	0.7974	1.0775	1.0034	5	8	5	5
New York	1.0010	1.0217	1.2891	1.2275	4	4	2	2
Toronto	1.3324	1.2948	1.5157	1.4779	1	1	1	1
London	0.6359	0.6370	0.6608	0.6619	11	11	9	9
Madrid	0.8400	0.8124	0.9007	0.8917	9	7	8	8
Stockholm	0.3788	0.3227	0.5062	0.4574	12	12	11	11
Frankfurt	1.0847	1.0283	1.1482	1.1368	3	3	4	4
Paris	0.6573	0.6697	0.5385	0.5679	10	10	10	10
Rome	0.8756	0.8741	0.9169	0.9185	7	6	7	7
Tokyo	1.1705	1.1216	1.1552	1.1515	2	2	3	3
Melbourne	0.8589	0.7862	0.3612	0.4162	8	9	12	12
Basic Allowance	YES	YES	YES	YES	YES	YES	YES	YES
Level of Service Quality	NO	YES	NO	YES	NO	YES	NO	YES
Variation in Experienced Quality	NO	NO	YES	YES	NO	NO	YES	YES

Source: Yun, S. H., Kim, Y., & Kim, M. (2019). Quality-adjusted international price comparisons of mobile telecommunications services. Telecommunications Policy, 43(4), 339–352. https://doi.org/10.1016/j.telpol.2018.09.001

[62] Yun, S. H., Kim, Y., & Kim, M. (2019). Quality-adjusted international price comparisons of mobile telecommunications services. Telecommunications Policy, 43(4), 339–352. https://doi.org/10.1016/j.telpol.2018.09.001

Figure 32: Quality-adjusted price indices of mobile telecommunications services (2) – additional fixed charge (2015)

Quality-adjusted price indices of mobile telecommunications services (2) – additional fixed charge.

City	Price Indices				Ranking			
	Model 4	Model 5	Model 6	Model 7	Model 4	Model 5	Model 6	Model 7
Los Angeles	1	1	1	1	6	6	4	4
San Francisco	1.0034	1.0036	1.0119	1.0121	5	5	3	3
New York	1.2275	1.2250	1.1807	1.1783	2	2	1	1
Toronto	1.4779	1.4572	1.1393	1.1279	1	1	2	2
London	0.6619	0.6488	0.6138	0.6046	9	9	10	10
Madrid	0.8917	0.8730	0.9809	0.9652	8	8	5	6
Stockholm	0.4574	0.4493	0.5341	0.5268	11	11	11	11
Frankfurt	1.1368	1.1424	0.9703	0.9721	4	4	6	5
Paris	0.5679	0.5573	0.6231	0.6145	10	10	9	9
Tome	0.9185	0.8985	0.7568	0.7448	7	7	8	8
Tokyo	1.1515	1.1457	0.9386	0.9367	3	3	7	7
Melbourne	0.4162	0.4118	0.3969	0.3937	12	12	12	12
Monthly Price including Line Fee	YES	YES	YES	YES	YES	YES	YES	YES
Subscription Fee	NO	YES	NO	YES	NO	YES	NO	YES
Subsidized Price of Mobile Phone	NO	NO	YES	YES	NO	NO	YES	YES

Source: Yun, S. H., Kim, Y., & Kim, M. (2019). Quality-adjusted international price comparisons of mobile telecommunications services. Telecommunications Policy, 43(4), 339–352. https://doi.org/10.1016/j.telpol.2018.09.001

Although this ranking uses a small sample of available service plans, and the information from 2015 may be dated, its unique method nevertheless complements the other figures presented here, since it takes quality into account when comparing price in ways the others do not. As the authors of the study note: "Because commonly used basket-based approaches compare only the offered price of service plans among countries within each basket, they cannot account for diversity in subscribers' consumption patterns or broad differences in the development of mobile telecommunication technology from country to country. By contrast, the hedonic pricing model proposed in this study can compare the price of service plans both within the same basket and between baskets."[63] According to those comparisons, the price of mobile service in Canada performed poorly compared to other developed nations in 2015.

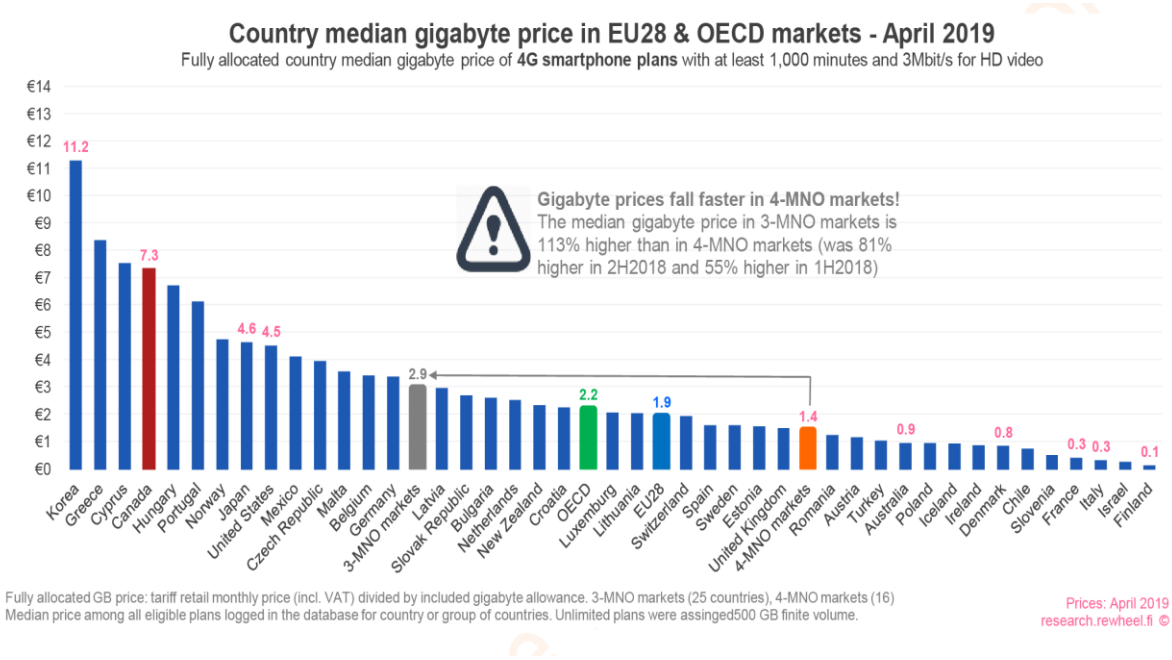
Similar to the FCC's comparison of per GB pricing, Finnish consultancy Rewheel provides comparative data on per GB pricing across OECD and EU countries. Rewheel calculates a median "fully allocated gigabyte price" metric in order to make meaningful international pricing comparisons. As Rewheel explains, the "[f]ully allocated GB price = tariff retail monthly price (incl. VAT) divided by [the] included gigabyte allowance". The values presented by Rewheel represent the country-specific median price; Rewheel further explains its method as follows: "when calculating the country median we have used the fully allocated gigabyte prices from all the eligible plans of operator main brands, their sub-bands and the MVNOs we tracked".[64]

In the following figures, we present data from Rewheel on the comparative performance of Canada across several measures. These figures are the most current presented in this survey, as

[63] Ibid, p. 351.
[64] Rewheel Research (2018). "Digital Fuel Monitor: The state of 4G pricing—1H2018, Digital Fuel Monitor 9th release", p. 34.

the primary data were collected at the beginning of April 2019. The metrics presented include the country median fully allocated gigabyte price for 4G smartphone plans that include at least 1,000 minutes and 3Mbit/s speeds (i.e. smartphone plans) as well as the fully allocated country median gigabyte price of 4G mobile & wireless home broadband plans with at least 3Mbit/s (i.e. data-only plans for tablets, laptops, and other connected devices), both in Euros (€). In addition, this year Rewheel conducted a focused examination of Canadian performance in comparison to other, more competitive markets (i.e. France, Italy, and Israel). We also present the findings from this examination. In sum, Rewheel's data suggest that Canada's mobile market severely lags behind other comparable countries, placing near the bottom of rankings for EU28 and OECD markets by all available measures.

Figure 33: Fully Allocated Gigabyte Price (4G smartphone plans with at least 1,000 minutes & 3Mbit/s for HD video) €, April 2019, Country median



Source: Rewheel Research. Digital Fuel Monitor. "The state of 4G pricing—1H2019, Digital Fuel Monitor 11th release".

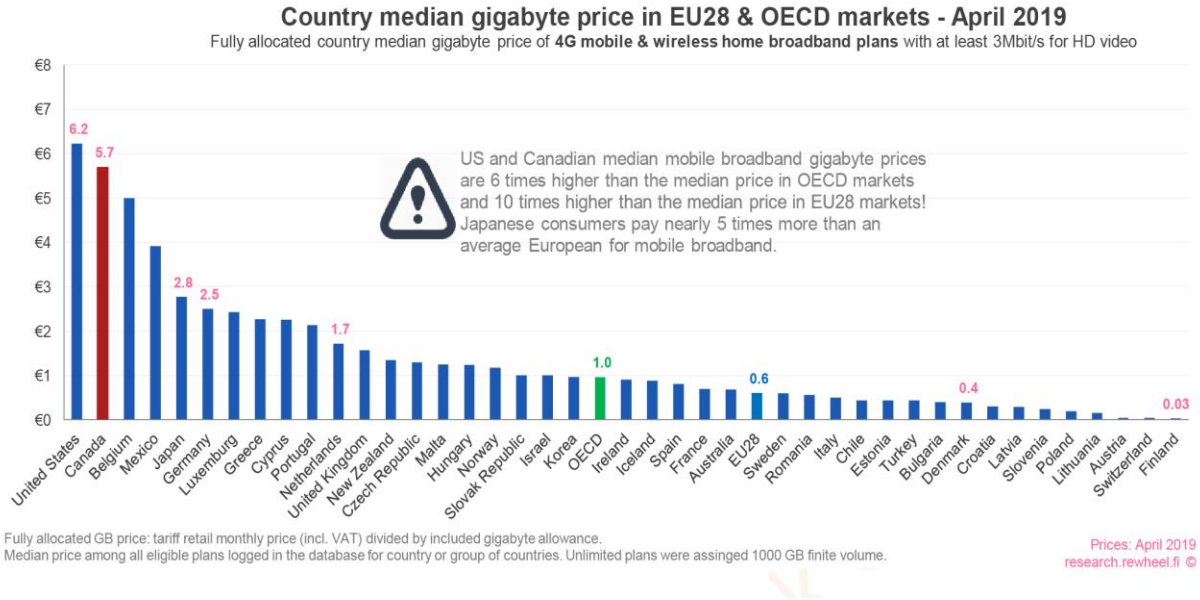
For smartphone plans, figure 33 shows Canada near the bottom of the rankings – at €7.3 median price per GB, Canada places in 38th of 41 countries measured, or 4th more expensive, just ahead of Korea, Greece, and Cyprus. Although Canada has moved up one spot since last year, and the price of a gigabyte by this measure has fallen from €9.6 in 2018, Canadian prices still perform very poorly in comparison to other countries. In last year's report, Rewheel noted that prices in Canada are "exorbitant"; [65] this year, the story is much the same. Rewheel observes that "Gigabyte prices in the Canadian, Japanese and US markets are a *universe apart*

[65] Rewheel Research (2018). "Digital Fuel Monitor: The state of 4G pricing—1H2018, Digital Fuel Monitor 9th release", p. 20.

from prices in 4-MNO [mobile network operator] competitive large European markets or from the ultra-competitive Israeli 5-MNO market".[66]

Similar to the case of smartphone plans, figure 34 shows that Canadian prices for mobile data-only plans fare poorly by comparison to those found in peer countries. By this measure, Canada's median price of €5.7, although down from €7.7 the previous year, nevertheless remains the second most expensive, placing Canada in a rank of 40th of 41 countries measured – the same spot it occupied last year.

Figure 34: Fully Allocated Gigabyte Price (4G LTE mobile broadband plans with at least 3Mbit/s for HD video) €, April 2019, Country median

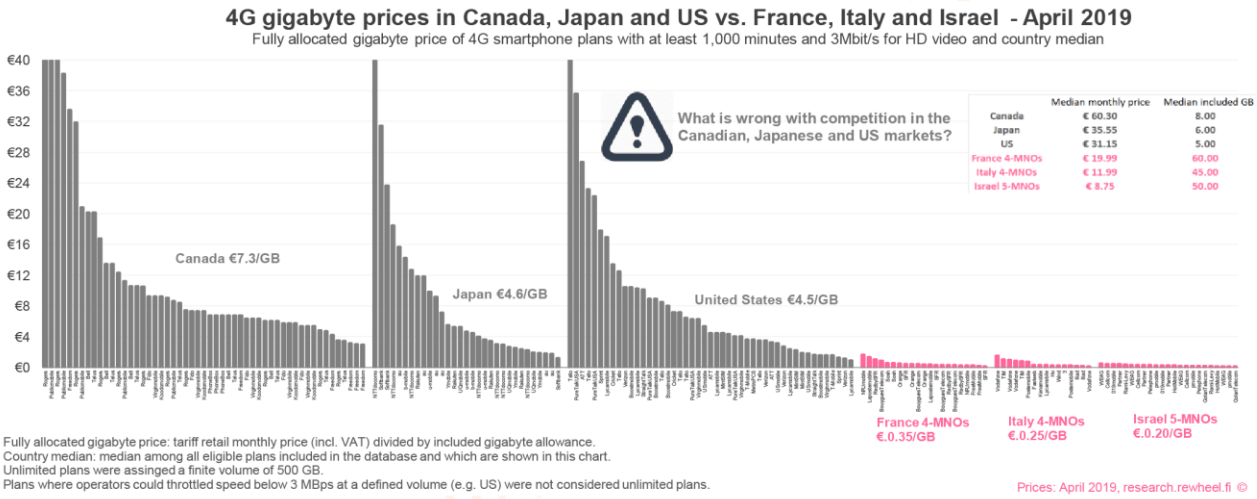


Source: Rewheel Research. Digital Fuel Monitor. "The state of 4G pricing—1H2019, Digital Fuel Monitor 11th release".

This year, Rewheel focused a section of its report on a specific comparison of Canada (together with the US and Japan, two other countries that it characterizes as non-competitive) with more competitive markets (i.e. France, Italy, and Israel). In terms of the Canadian plans examined here, Rewheel collected data on all plans offered by Bell, Rogers, Telus, and Freedom Mobile, including their sub-brands and MVNOs, that offer at least 1,000 minutes and 3Mbps for April 2019, and compared them to a similar sampling from the other countries listed above. The results are presented in figure 35, with further explanation below.

[66] Rewheel Research (2019). " Digital Fuel Monitor: The state of 4G pricing – 1H2019, Digital Fuel Monitor 11th release", p. 1.

Figure 35: 4G gigabyte prices in Canada, Japan and US vs. France, Italy and Israel – April 2019 **€, April 2019, Allocated and Country median**



Source: Rewheel Research. Digital Fuel Monitor. "The state of 4G pricing—1H2019, Digital Fuel Monitor 11th release".

Figure 35 shows a comparison between both the country-level median gigabyte price as well as median prices for country service plans collected at the beginning of April 2019. At 7.3€ per GB, Canada's median GB prices were higher than the other two non-competitive countries in the study (Japan at 4.6€/GB and the US at 4.5€/GB). The per-GB prices in these three countries were each much higher than those found in France (€0.35/GB), Italy (€0.25), and Israel (€0.20GB). Overall price plans were also much more expensive in Canada than in any of the other 5 countries. The median monthly price observed in Canada was €60.30, and the median monthly data allowance was 8GB. By stark contrast, French median monthly prices were €19.99 and included 60GB, with Italian plans costing a median of €11.99 and including a median 45GB. In Israel, a median price of €8.75 was observed, and a median 50GB was offered.

According to Rewheel:

> "such huge price differences cannot be explained by differences in the underlying costs […] Prices are much lower in 4-MNO markets because as we have shown in many of our previous studies a 4th MNO plays an indispensable role in creating and maintaining effective competition. Canada, until recently was a 3-MNO tight oligopoly market and will in essence continue to largely behave as a 3-MNO market until the no.4 MNO Freedom mobile builds a network with sufficiently high national coverage and its parent, Shaw Communications, decides to disrupt the cosy [sic] 30-MNO oligopoly."[67]

[67] Ibid, pp. 31-32. We acknowledge that Rewheel does not measure the impact of regional competitors other than Freedom. However, its results are in our view applicable to markets where Freedom is the main (and only) competitor, which include BC, Alberta, and southern Ontario.

Usage and revenue: Canadian mobile customers pay more and get less than people in other countries

In this section, we examine average revenue per user (ARPU), usage per subscription, profitability, and investment. The ARPU metrics show that people in Canada are paying more on average for their mobile services than people in other countries, and that while ARPU is in decline on average, in Canada it is increasing. Figures on usage show that, despite their high spending, mobile subscribers in Canada use less data per month than the average amongst peer countries. In other words, the high prices that mobile services fetch in Canada cannot be explained by greater usage: these data show that Canadians are paying more, and getting less, than people in other countries. At the same time, data from the CRTC and the GSM Association show that profits in the Canadian mobile market are higher than in other countries, and that Canadian carriers are investing less of their revenue back into their networks than operators in peer countries.

First we present comparative statistics on ARPU in Canada and internationally. ARPU is a figure that represents average spending on mobile services per subscription. Although this figure does not precisely reflect all price options available on the market, regulators, such as the US FCC and the European Commission, do treat ARPU as a proxy for price in their analysis of mobile market performance. For instance, in its 2018 Communications Marketplace Report, the US FCC noted that "[v]arious measures of Average Revenue per Unit (ARPU) are frequently used as a proxy for price, particularly in industries with multiple pricing plans and complex rate structures, such as mobile wireless service."[68] Similarly, the European Commission has noted (in the context of merger assessment) that "ARPU allows the use of a single value to conceptually represent the price of the "typical" phone bundle".[69] Comparative ARPU figures are illustrative across several dimensions, as we show below.

In figure 36, we present ARPU plotted against monthly mobile data usage from mobile analysis firm tefficient for 1H2018. Although the data underlying this chart is not available, a remarkable observation is nevertheless clear: ARPU in the Canadian mobile market is substantially higher than any of the other countries surveyed, while usage is on the low end of the scale (usage is discussed further below). As tefficient notes: "Of our studied markets, there are three where operators derive ARPUs much higher than elsewhere: Canada, Switzerland and the USA."[70] Among the three countries to receive this dubious distinction, ARPU in Canada is the highest, while monthly data usage is the lowest.

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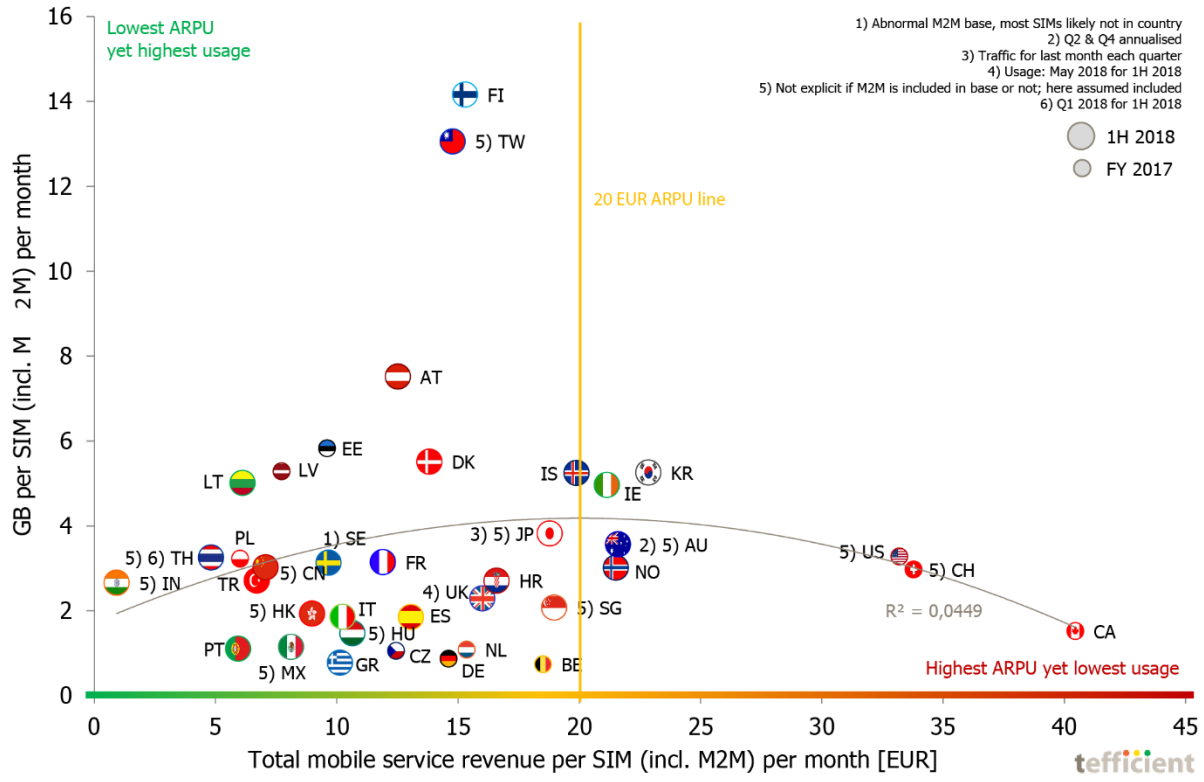
[68] FCC (2018). Communications Marketplace Report. Available at: https://www.fcc.gov/document/fcc-adopts-first-consolidated-communications-marketplace-report Para 20.

[69] European Commission (2014). Commission decision addressed to Telefónica Deutschland Holding AG declaring a concentration to be compatible with the internal market and the EE Agreement (Case M.7018 – Telefónica Deutschland / E Plus). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m7018_6053_3.pdf Section 3.2.4, "ARPU as price measure".

[70] tefficient (2019). China and India shift to 4th gear—leave many mature markets in the dust. Available at: https://tefficient.com/china-and-india-shift-to-4th-gear-leave-many-mature-markets-in-the-dust/ p. 19.

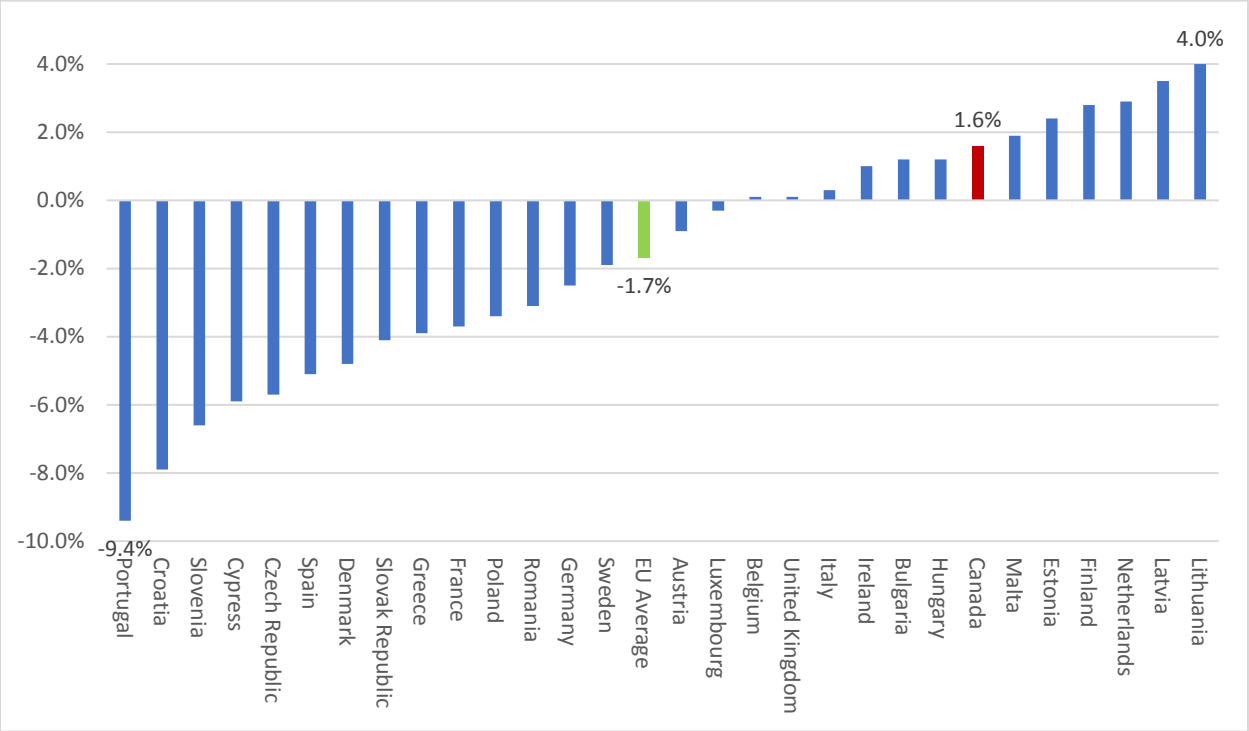
Figure 36: Total mobile service revenue per SIM (incl. M2M) per month, FY2017/1H2018 [EUR]



Source: tefficient (2019). China and India shift to 4th gear—leave many mature markets in the dust. Available at: https://tefficient.com/china-and-india-shift-to-4th-gear-leave-many-mature-markets-in-the-dust/

In figure 37, we show Canada and EU countries' compound annual growth rates (CAGR) for mobile ARPU from 2013-2016. During this period (the most recent for which comparable data were available), ARPU declined across the EU by an average of 1.7%. Canadian mobile ARPU, by contrast, rose by 1.6%, a difference of more than 3%. Although prices increased more during this period in some EU countries than they did in Canada, those were in the minority; Canada ranked 23rd of 29 countries for which data were available on this measure.

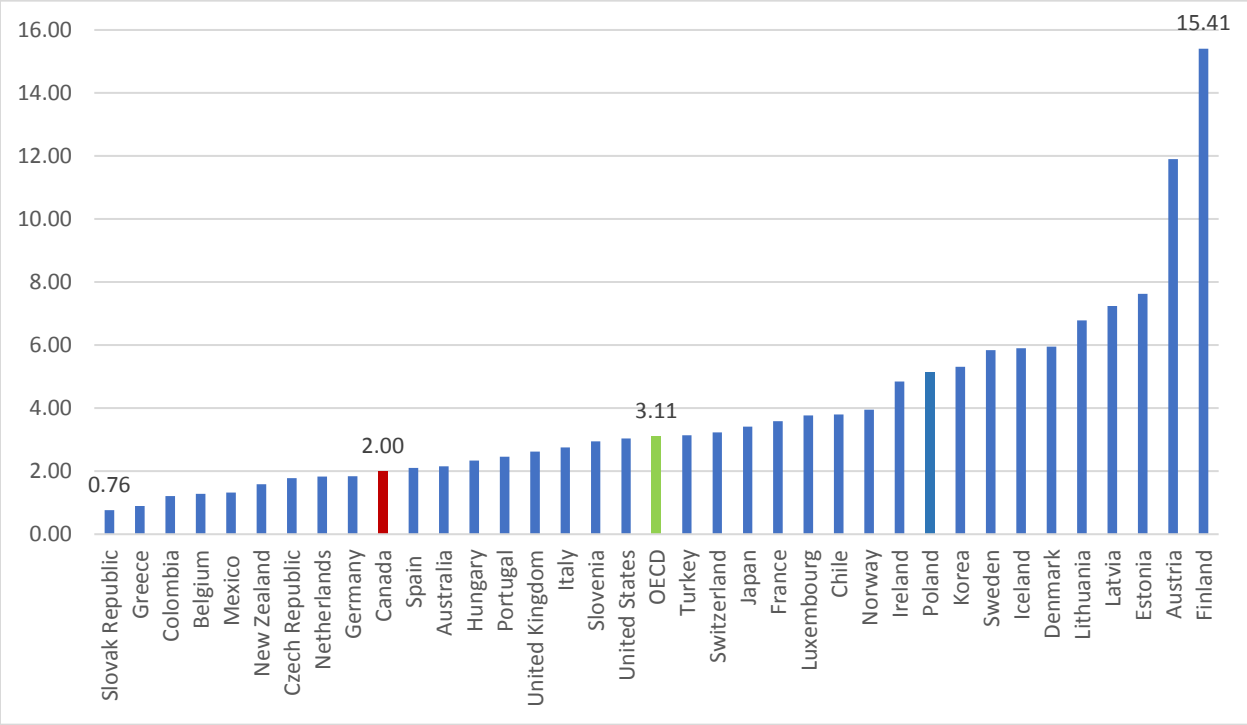
Figure 37: Mobile ARPU, by country, CAGR (%) 2013-2016



Sources: Canada: CRTC Communications Monitoring Report 2018; Europe: European Commission (n.d.). Broadband connectivity: Financial indicators, fixed and mobile telephony, broadcasting and bundled services indicators, 2016-2013. Available at: https://ec.europa.eu/digital-single-market/en/connectivity

In figure 38 we present mobile data usage for OECD countries. Usage is expressed in GB per month, per mobile broadband subscription. The data show that mobile data usage in Canada is comparatively low. Canadian mobile broadband subscribers use 2GB per month on average, less than the OECD average of 3.11 GB per month, and far behind Europe's most active mobile users. Canada's mobile networks may feature high speeds, but this is of little use if prices are so high as to discourage usage.

Figure 38: GB per month, per mobile broadband subscription (2017)



OECD Broadband Portal. Available at: http://www.oecd.org/sti/broadband/broadband-statistics/

High prices cause affordability problems

The data presented above are relevant for several reasons. First, it is surprising that people in Canada, who are often portrayed as prolific users of communication services, in fact use less mobile data than the average of OECD countries. It is our opinion that this phenomenon is a direct result of the comparatively high prices that characterize the Canadian mobile wireless market. As the affordability report commissioned by the CRTC observed:

> From the perspective of consumers, affordability is broadly viewed as a combination of pricing and income variables, as well as the subjective value individuals derive from spending scarce resources on particular goods and services. Traditional economic theory simplifies the concept of affordability in terms of the consumer's "willingness to pay" (i.e. demand), which tends to increase with incomes and decline with prices.[71]

Expanding further on this dynamic, Rajabiun, Ellis, and Middleton explain:

> Even in countries with high average incomes such as Canada, individuals with very low or no income must balance their spending on access to communications services against spending priorities for other essentials such as food and shelter. Although consumers with higher incomes can afford to pay higher prices for higher quality services, the

[71] Rajabiun, R., Ellis, D., & Middleton, C. (2016). "Literature review: Affordability of Communications services", Report commissioned by the Canadian Radio-television and Telecommunications Commission, p. 1, emphasis added. Available at: https://www.ryerson.ca/~cmiddlet/ourresearch/lit-review-for-crtc-2016-affordability-rajabiun-ellis-middleton.pdf

> extent to which low-income individuals can afford services of quality sufficient to meet their individual requirements depends on the level and range of the price/quality combinations on offer in the market.[72]

Clearly, this is not a situation that has been resolved by market forces, nor have regulatory and policy initiatives to date erased Canada's "digital divide", despite sustained efforts over the past decade. The affordability study describes the problem as follows:

> The incentives of operators to offer low-cost options is often limited in both the early stages of market development, when only a small number of early adopters value a given service sufficiently to pay for it, and in mature markets where the service has become essential to most consumers. Monitoring the evolving pricing structure of the industry offers an important window into understanding affordability as an economic constraint on consumers. To the extent that more affordable communications services are crucial to the growth of the broader ICT economy, network access price and quality information can be particularly valuable to policymakers trying to promote productivity growth and economic development.[73]

It is in the spirit of these observations on the importance of utilizing empirical data and analysis to inform policy development that we have conducted the detailed study presented above. The figures we have presented on overall adoption, adoption by income, service pricing and other metrics therefore bring crucial perspective when assessing the state of the mobile market in Canada: based on the evidence shown above, it is our opinion that Canada's low mobile adoption, and low mobile adoption amongst those earning lower levels of income in particular (i.e. those in the lowest income quintile, and to a lesser extent, those in the second lowest quintile), is explained primarily by the fact that mobile services in Canada are so expensive.

This conclusion is also supported by the authors of the affordability study, who found that:

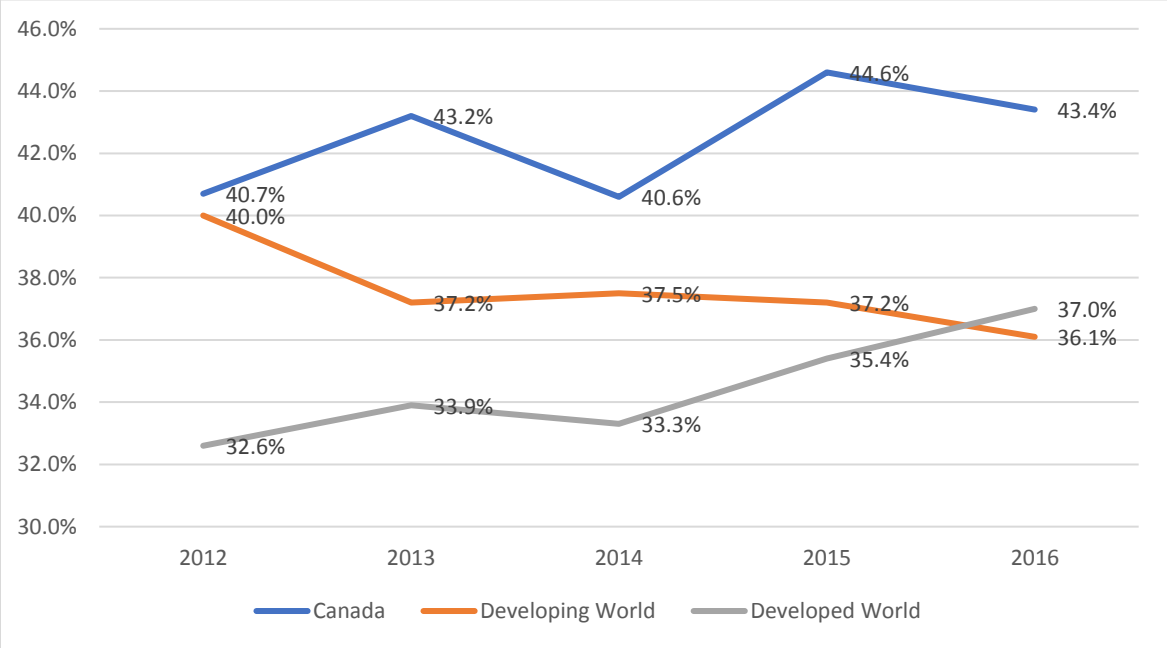
> While lack of interest or low skill levels partially explain lower adoption and use among low-income individuals, cost remains a dominant motive for why low-income Canadians do not use the Internet. Nevertheless, the growing essentiality of broadband and increases in the inelasticity of demand to price, along with country-specific factors, enable incumbent operators in Canada to charge prices that are higher than offerings by their counterparts in most other advanced economies. International comparisons also suggest that the range of low-cost options available in the Canadian market tend to be relatively limited, meaning that low-income households are likely to have fewer affordable options in service plans than their counterparts in other advanced economies.[74]

[72] Ibid, p. 2, emphasis added.
[73] Ibid, p. 12, emphasis added.
[74] Ibid, p. 25, emphasis added.

Beyond price: indicators of profitability and investment in the mobile wireless markets

In what follows we shift the focus from pricing to other indicators of mobile wireless market performance. In figures 39 and 40, we present comparative data on profitability and investment in mobile markets for Canada and internationally. We use earnings before interest, tax, depreciation and amortization (EBITDA) margins as a proxy for gross operating profits. EBITDA margins show the difference between operating revenues and operating expenditures as a percentage of revenue. For investment, we use capital intensity, which shows network investment (excluding fees paid for spectrum, whether in annual licence fees or at auction) as a percentage of revenue. This figure shows how much revenue companies are investing back into their networks.

Figure 39: Profitability (EBITDA margin), Canada vs. Developed and Developing World, 2012-2016

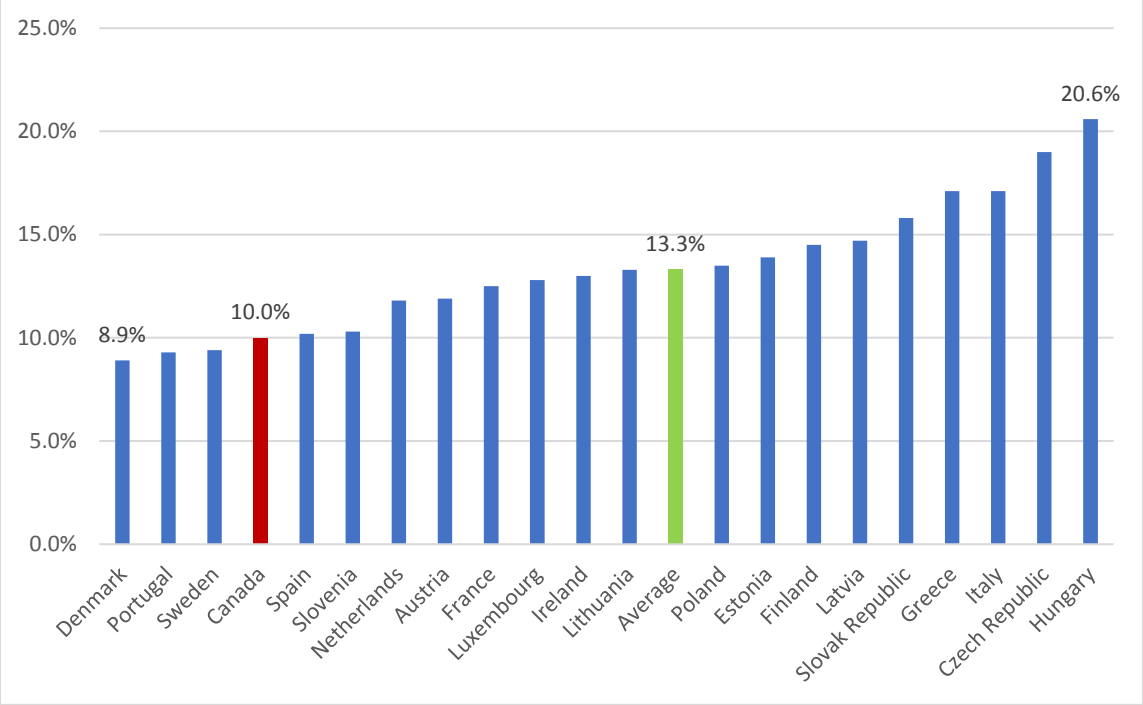


Source(s): Canada-CRTC Communication Monitoring Reports, 2017-2014. Other: GSMA Intelligence (2017). Global Mobile Trends 2017. Available at: https://www.gsmaintelligence.com/research/?file=3df1b7d57b1e63a0cbc3d585feb82dc2&download

Figure 39 shows that EBITDA margins for Canada's mobile wireless market remained notably high in comparison to operators across both the developed and developing world from 2012-2016. Canada's average mobile market EBITDA margin during this period was 42.5%, 4.9% above mobile markets in the developing world, and 8.1% higher than mobile markets in the

developed world, according to GSM Association data.[75] This data makes clear that Canada's mobile network operators are highly profitable, and have been consistently so, regardless of the entry of new carriers and the implementation of various regulatory measures designed to aid competition, including the introduction of the wireless code, and regulated wholesale roaming rates.

Figure 40: Average capital intensity for mobile markets in Canada and the EU (excluding spectrum), 2013-2016



Source(s): Canada-CRTC CMR 2017; EU countries-European Commission

With high revenues per user and profitability, it might be expected that Canadian wireless carriers are leaders when it comes to investment. However, the data in figure 40 tell a different story. According to information collected from the European Commission and the CRTC, Canadian wireless carriers invest less in their networks per dollar of revenue, not including spectrum auction or licence fees, than the average for European ones. At 10% on average for the period 2013-2016, Canadian mobile wireless capital intensity was behind the average for European countries by 3.3%, placing Canada at a rank of 18th of 21 countries for which data were available. We do note that, in recent years, "new entrant" mobile carriers have been investing more of their revenue into their networks than the national carriers. For instance, in

[75] We note that the CRTC reports Canadian mobile ARPU at 39.5% for 2017, however we were unable to obtain comparable figures for other developed & developing countries from publicly available GSMA data for this year.

2017, capital intensity for non-national carriers was 19.7%, according to CRTC data.[76] It is expected that "new entrant" carriers will invest at higher-than-average rates as they continue to build out their relatively new networks to compete with the national carriers.

Summary of comparisons

In the preceding section, we presented data from a variety of authoritative sources on the mobile market in Canada and internationally, including concentration levels, mobile network performance, adoption, pricing, and usage, as well as figures on profitability and investment. The pricing studies surveyed make use of a variety of methods for measuring price, including usage baskets, price as a function of %GNI p.c., several "hedonic" methods that control for variables like quality in order to arrive at a comparable price measure, ARPU, and Rewheel's fully-allocated GB metric. A variety of plan types were examined, using recent data to the extent available, and changes over time were presented.

The survey above builds on our previous report, conducted in 2018, and unfortunately, together the results do not differ substantially in light of changes over the past year: Canada's mobile market continues to do poorly when held up against mobile markets in comparable developed nations.

Although mobile network speeds and availability are solid, prices here are comparatively high; Canada did average or better in only two of all the studies canvassed on price measures. In terms of adoption, Canada lags far behind comparable developed nations, and, viewed in terms of income disparity, the situation is particularly bad for low- and middle-income households in Canada. Mobile carriers are highly profitable; but meanwhile too many people in Canada cannot afford mobile service. For those who can afford to access service, usage is restricted on account of high per-GB prices that prevail across a marketplace that is lacking in competitive vigor and innovation.

In summary, Canadian mobile wireless markets, like mobile wireless markets around the world, are highly concentrated. This is the case whether the scene is viewed at the national level, or at the level of individual provinces and territories. Concentration has decreased somewhat in recent years, but we are still nowhere near conditions that economists would consider highly competitive. Service pricing varies in some provinces, but overall it remains high—especially compared to pricing in other comparable nations. Canadian mobile ARPU has been on the rise, in contrast to the declines seen in other nations. At the same time, network operators in Canada are generating greater profits, and re-investing less in their networks than their European counterparts. This all points to a market that needs correction.

[76] CRTC (2018). Communications Monitoring Report. Underlying data, Figure 6.22. Available at: https://crtc.gc.ca/eng/publications/reports/policymonitoring/2018/index.htm

Survey of wholesale remedies: lessons for dealing with market power in mobile wireless markets

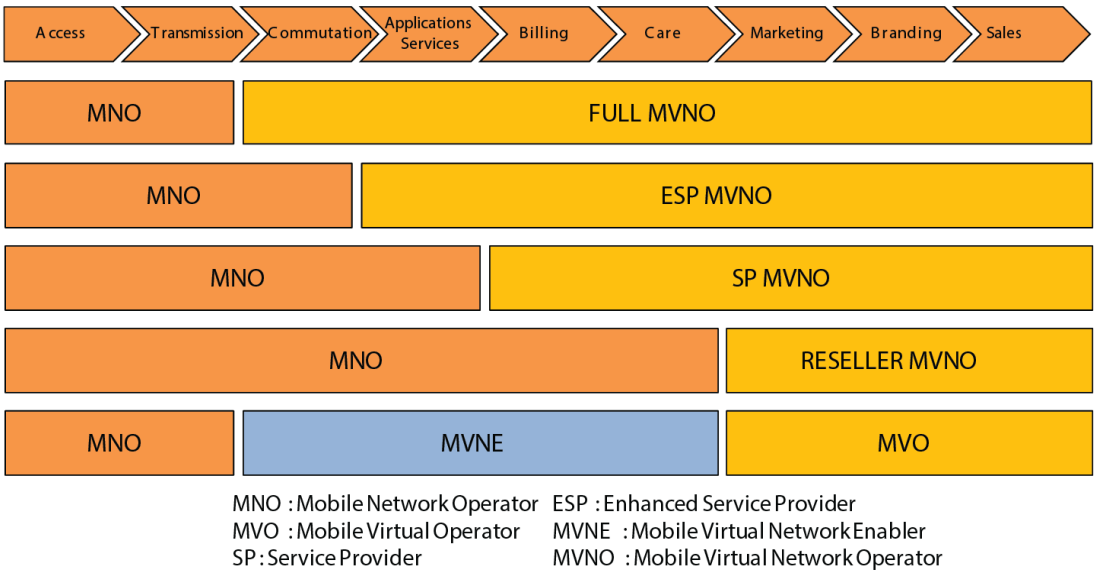
In what follows, we provide comments on the Commission's preliminary view that the national wireless carriers should be required to provide wholesale mobile virtual network operator (MVNO) access on a mandated basis. If properly implemented, we believe that mandated wholesale MVNO access could contribute to improving the competitive conditions in the Canadian mobile wireless marketplace. We also believe that these measures should not be implemented on a temporary basis. This view is informed by the experience with wholesale regulation of the wireline broadband sector; it would be appropriate, however, to regularly review whatever model emerges, to ensure that it remains effective by updating or amending its terms and conditions as circumstances evolve.

Defining MVNOs: more than just resellers

The US Federal Communications Commission (FCC) defines MVNOs as follows: "MVNOs do not own any network facilities, but instead purchase mobile wireless services wholesale from facilities-based service providers and resell these services to customers."[77] This definition, by essentially casting MVNOs as mere resellers, fails to capture the breadth and scope of MVNO characteristics. For instance, Banerjee and Dippon recognize that "MVNOs are much more than mere resellers of mobile services. Although MVNOs resell airtime purchased at wholesale rates from MNOs […], they also distinguish themselves from other wireless resellers by leveraging their brand appeal and reputation in non-wireless or non-telecommunications lines of business to sell mobile services."[78] A more expansive definition is put forward by the Organization for Economic Cooperation and Development (OECD), which defines MVNOs as "mobile network operators without a spectrum license."[79] This broader definition more accurately captures the range of activities undertaken by MVNOs in mobile markets than does the FCC's limited definition; figure 41, below, serves as a useful model for classifying different types of MVNOs and the activities they carry out.

[77] FCC (2018). Communications Marketplace Report. Available at: https://www.fcc.gov/document/fcc-adopts-first-consolidated-communications-marketplace-report p.5.
[78] Banerjee, A., & Dippon, C. M. (2009). Voluntary relationships among mobile network operators and mobile virtual network operators: An economic explanation. Information Economics and Policy, 21(1), 72–84. https://doi.org/10.1016/j.infoecopol.2008.10.003
[79] OECD (2014). Wireless Market Structures and Network Sharing, OECD Digital Economy Papers, No. 243, OECD Publishing, Paris. Available at: http://dx.doi.org/10.1787/5jxt46dzl9r2-en p. 71.

Figure 41: Types of MVNOs



Source: Corrocher, N., & Lasio, L. (2013). Diversification strategies in network-based services: The case of mobile virtual network operators. Telecommunications Policy, 37(11), 1110–1123. https://doi.org/10.1016/j.telpol.2013.03.002

Figure 41 shows that there exists a spectrum of MVNO types, categorized by the functions that they fulfill in providing services to end-users. At one end, some MVNOs operate as simple resellers, fulfilling marketing, branding, and sales functions only. At the other end, full MVNOs assume most of the functions of service provision, aside from their reliance on access and transmission functions of the host MNO—in other words, they are fully featured and largely independent service providers who rely only on access to the spectrum, towers, and other physical aspects of the MNO's network to reach their customers. In between, enhanced service provider and service provider MVNOs fulfill a mix of the various functions described above. Additionally, "mobile virtual network enablers" (MVNEs) act as wholesale intermediaries, which establish a relationship with MNOs designed to enable downstream entry by other types of MVNO.

The European Commission (EC) draws a distinction along similar lines, and therefore provides a useful and nuanced definition. In contrast to the FCC, the EC distinguishes between MVNOs, Service Providers, and Branded resellers. It sets out the distinctions as follows:

> "MVNOs and Service Providers sell mobile communication services to end-customers in their own name and for their own account based on wholesale access granted by MNOs to their respective mobile networks. While MVNOs partially own network infrastructure, such as the core network, which allows them to control their traffic, Service Providers do not own any network infrastructure at all. Hence, MVNOs are characterized by a higher degree of vertical integration. Furthermore, MVNOs have the ability to issue their

> own SIM cards, whereas Service Providers use SIM cards issued by their respective host MNO(s).
>
> In contrast to MVNOs and Service Providers, Branded Resellers do not provide their own mobile communication services, but distribute mobile communication services contracts on behalf of MNOs. That is to say, while Branded Resellers use their own brand and distribution channels for offering mobile communication services, they do not enter into a contractual relationship for mobile services with the customer, but act as agents for their respective MNOs."[80]

For the purpose of this report, our reference to MVNOs is generally meant to encompass the spectrum of wholesale providers, from full MVNO to branded reseller. We will, however, distinguish between these types explicitly where appropriate.

MVNOs are a regular feature of mobile markets around the world

Beyond the conceptual definitions discussed above, it is difficult to reliably ascertain the presence, characteristics, and performance of actual MVNOs in mobile markets. The US FCC notes these difficulties, for instance, in its 2018 Communications Marketplace report: "The Commission is not able to provide an exact figure of the number of MVNOs that currently offer services. This is partly because, as resellers of service offered by facilities based service providers, MVNOs are not licensees and typically do not file Section 214 applications. Furthermore, as the Commission has found in prior competition reports, "[c]omprehensive data on MVNO subscribers are generally not reported by either MVNOs or facilities-based providers that host MVNOs. Estimates of the number of MVNOs operating in the United States vary considerably. Many MVNOs are privately-held companies that do not publicly report financial or subscriber data.""[81] Similarly, the CRTC's annual Communications Monitoring Reports do not provide meaningful information concerning MVNOs, nor does the CRTC's list of registered telecommunications providers identify registrants as MVNOs.

We note that some regulators, such as France's ARCEP, Japan's MIC, Australia's Competition & Consumer Commission (ACC), the German Bundesnetzagentur, Italy's AGCOM, and the European Commission make efforts to provide high-level accounts of the presence and market share of MVNOs in their respective reporting. However, there appears to be little, if any, methodological consistency to this reporting. For example, it is rarely clear whether MVNO reporting distinguishes between independently owned MVNOs and MNO-owned sub-brands ("flankers"). This is the case with OECD data, for instance,[82] although the European Commission

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[80] European Commission (2014). Commission decision addressed to Telefónica Deutschland Holding AG declaring a concentration to be compatible with the internal market and the EE Agreement (Case M.7018 – Telefónica Deutschland / E Plus). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m7018_6053_3.pdf . Page 42.

[81] [81] FCC (2018). Communications Marketplace Report. Available at: https://www.fcc.gov/document/fcc-adopts-first-consolidated-communications-marketplace-report Footnote 16.

[82] We have contacted the authors of the OECD report regarding their method of calculating number of MVNOs in each country, but have not received a definitive response at time of writing.

data purports to exclude branded resellers and sub-brands of MNOs.[83] Few reports classify MVNO presence by type (e.g. Full vs reseller, etc), and it is not clear whether MVNOs reported serve retail or enterprise markets (e.g. Internet of Things or machine-to-machine applications).

With these caveats in mind, below we present best-effort analysis of the available data regarding MVNO presence in markets around the world. In figure 42, we show the number of MVNOs per country, observed in August 2014 by the OECD.[84] In figure 43, we show the number of MVNOs in EU countries and Australia for 2017 based on data from the European Commission and Australian regulator. Figure 44 then presents MVNO market share in EU countries, Japan, and Australia, drawing on data from the European Commission for EU countries and national regulators for Japan and Australia.

Figure 42: Number of MVNOs, 2014

Country	Number of MNVOs		Country	Number of MNVOs
Greece	1		Slovenia	10
Iceland	1		Canada	11[85]
Switzerland	1		Slovak Republic	11
Chile	2		Norway	18
Mexico	2		Poland	19
Latvia	2		Italy	27
Portugal	3		Spain	29
Sweden	3		United Kingdom	33
Luxembourg	4		Turkey	42
Ireland	5		United States	147
Israel	6		Germany	152
Colombia	6		Japan	354
Hungary	7			

Source: OECD (2014). Wireless Market Structures and Network Sharing, OECD Digital Economy Papers, No. 243, OECD Publishing, Paris. Available at: http://dx.doi.org/10.1787/5jxt46dzl9r2-en Annex 1. No data for Australia.

[83] European Commission (2017). Digital Agenda Scoreboard 2017: Electronic communications market indicators: Definitions, methodology and footnotes on Member state data. "MVNO: Mobile Virtual Network operators with own SIM cards and own mobile network code. Operators that fulfil the above two conditions, but are majority owned (more than 50%) by any of the Mobile Network Operators operating in the same national market should not be included (e.g. operators being only a sub-brand of Mobile Network Operator should be excluded)."

[84] OECD (2014). Wireless Market Structures and Network Sharing, OECD Digital Economy Papers, No. 243, OECD Publishing, Paris. Available at: http://dx.doi.org/10.1787/5jxt46dzl9r2-en Annex 1.

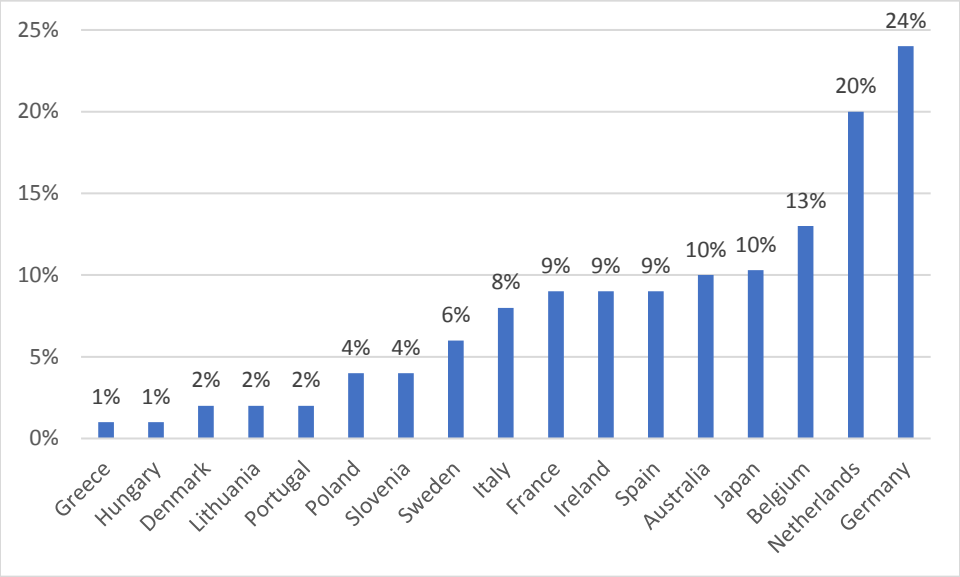
[85] We have contacted the authors of this study to better understand why Canada is listed as having 11 MVNOs. The authors, while unable to provide a definitive answer, referred us to the CRTC as the probable source of the information; in addition, they highlighted that information received regarding MVNOs has been inconsistent. It would be useful if the CRTC would place more information about MVNOs on the public record in order to better inform participants as to the relevant facts necessary to engage in analysis.

Figure 43: Number of MVNOs in EU countries and Australia, 2017

Country	Number of MVNOs		Country	Number of MVNOs
Bulgaria	0		Slovenia	4
Croatia	0		Portugal	5
Slovak Republic	0		Ireland	6
Czech Republic	1		Finland	11
Estonia	1		Latvia	12
Greece	1		Austria	16
Cypress	1		Italy	19
Latvia	1		Spain	22
Denmark	2		Poland	24
Malta	2		UK	27
Romania	2		Netherlands	41
Belgium	4		Sweden	44
Germany	4		France	50
Luxembourg	4		Australia	60
Hungary	4			

Source(s): Source(s): EU Countries: European Commission (2018). Digital Economy and Society Index (DESI). Available at: https://ec.europa.eu/digital-single-market/en/desi ; Australia: Australian Competition & Consumer Commission (2018). Communications Sector Market Study Final Report. Available at: https://www.accc.gov.au/publications/communications-sector-market-study-final-report Notes: The methodological notes provided by the European Commission state that MVNOs shown above are classified as "operators with own SIM cards and own mobile network code." This suggests that the numbers represent a combination of full MVNOs and "Service providers", but exclude branded resellers. Note this does not apply to figures for Australia; no data for Japan.

Figure 44: MVNO market share by subscribers, 2017



Source(s): EU Countries: European Commission (2018). Digital Economy and Society Index (DESI). Available at: https://ec.europa.eu/digital-single-market/en/desi ; Australia: Australian Competition & Consumer Commission (2018). Communications Sector Market Study Final Report. Available at: https://www.accc.gov.au/publications/communications-sector-market-study-final-report ; Japan: Ministry of Internal Affairs and Communications (2018). Information and Communications in Japan 2018. Available at: http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/whitepaper.html

Methodological inconsistencies notwithstanding, several general observations can usefully be made in the context of the Commission's request for comment on its proposal to mandate wholesale access for MVNOs in Canada.

First, MVNOs appear to be a regular feature of the competitive landscape in countries across Europe, and in Japan and Australia. Only a handful of countries in Europe do not feature MVNOs—the majority had four or more in operation as of 2017. For countries with MVNOs, the number ranged from a low of 1, up to 50 in France and 60 in Australia. [86] In 2014, according to the OECD, there were 147 MVNOs in operation in the United States, 152 in Germany, and 354 in Japan (including branded resellers).

Second, the market share of these operators varied substantially in 2017. In five of 17 countries for which data are available, MVNO presence appears to be marginal, at 2% or less of total mobile market subscribers. However, in the majority of countries, MVNO subscriber market share is substantial—in seven of 17 countries MVNOs took between 4-9% of total subscribers, while in 5 countries MVNO subscribers accounted for 10% or more of the market. The Netherlands, at 20% of subscribers, and Germany, with 24%, stand out in this regard.

[86] The methodological notes provided by the European Commission state that MVNOs shown above are classified as "operators with own SIM cards and own mobile network code." This suggests that the numbers represent a combination of full MVNOs and "Service providers", but exclude branded resellers. Note that the figures for Australia do not make such a distinction.

MVNOs are clearly playing a valuable role in their respective mobile markets across Europe and in Japan and Australia. This, however, is not the case in Canada, where MVNOs have a negligible presence. Although the OECD observed 11 MVNOs in Canada in 2014, we believe the majority of these are likely branded resellers or machine-to-machine (m2m) operators with limited or no impact on retail markets.[87] In its 2015 Wireless Framework, the Commission confirmed the limited impact of MVNO arrangements when it observed the following:

> "the national wireless carriers have exhibited limited interest in providing potential MVNOs with access that would enable the provision of retail mobile wireless voice, text, and data services on a national or regional basis. The Commission considers that the inability of these parties to negotiate access to necessary wholesale inputs demonstrates that there is no rivalrous behaviour between the national wireless carriers in the provision of GSM-based wholesale MVNO access at the national level."[88]

Additionally, and despite the lack of publicly available information on MVNOs in Canada, in the present proceeding the Commission has confirmed that the situation has not improved. Since 2015, the Commission notes "it has become increasingly clear that a mix of competitors has not developed to the degree that the Commission had expected in 2015. While facilities-based competitors have continued to expand their operations and reach, and while MVNO activity has increased in the machine-to-machine (M2M)/IoT markets, based on filings to the Commission on MVNO arrangements, there has been virtually no MVNO activity that would provide additional competitive retail options to Canadian consumers."[89] We note that this not only describes the situation with respect to the national carriers, but responses to requests for information regarding MVNOs from the regional new entrant carriers also indicates that they have not taken steps to engage in MVNO relationships either.[90] Ideally, data about MVNO arrangements would be made publicly available so that parties could analyse it for themselves.

In Canada, there appears to be no market-based appetite to provide MVNO access amongst MNOs. In many other markets, by contrast, voluntary, mutually beneficial relationships between MNOs and MVNOs have in fact formed, suggesting that the benefits of voluntary wholesale agreements are real, both for contracting parties and mobile markets more generally.[91] As Banerjee and Dippon explain, "a relationship can form when the MVNO is able to widen or deepen the market for the MNO's services."[92] In other words, an MNO will

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[87] We have contacted the authors of this study to better understand why Canada is listed as having 11 MVNOs. The authors, while unable to provide a definitive answer, referred us to the CRTC as the probable source of the information; in addition, they highlighted that information received regarding MVNOs has been inconsistent. It would be useful if the CRTC would place more information about MVNOs on the public record in order to better inform participants as to the relevant facts necessary to engage in analysis.

[88] CRTC (2015). Telecom Regulatory Policy CRTC 2015-177, Regulatory framework for wholesale mobile wireless services, paragraph 86. Available at: https://crtc.gc.ca/eng/archive/2015/2015-177.htm

[89] CRTC (2019). Telecom Notice of Consultation CRTC 2019-57. Review of mobile wireless services. Para. 37. Available at: https://crtc.gc.ca/eng/archive/2019/2019-57.htm

[90] CRTC MVNO Fact Finding, 2016&2018. CRTC website unavailable at time of writing.

[91] We note that this is not always the case, and discuss further below.

[92] Banerjee, A., & Dippon, C. M. (2009). Voluntary relationships among mobile network operators and mobile virtual network operators: An economic explanation. Information Economics and Policy, 21(1), 72–84. https://doi.org/10.1016/j.infoecopol.2008.10.003 p. 75.

voluntarily agree to host an MVNO when doing so will increase overall profit, with the broader benefit being the ability of the MVNO to serve customers otherwise ignored by the MNO.

It is possible that MVNO arrangements could be particularly beneficial to underserved parts of the Canadian population – in particular, as we noted above, for low-income households, who struggle to afford access to mobile services under prevailing market arrangements. It is important to note, however, that other studies have suggested that "absent access regulation, MVNOs do not exert a competitive constraint on MNOs."[93] That is to say, while voluntary arrangements between MVNOs and MNOs may extend the market to previously unserved people ("widening"), and create new types of service offerings not otherwise available from MNOs ("deepening"), reliance solely on voluntary agreements is unlikely to have significant impact on prices, due to the control exercised by MNOs over the rates, terms and conditions of access for MVNOs. As the authors conclude, "[i]t appears likely that competition authorities and regulators would need to determine access conditions if they aim at [sic] to increase competition."[94]

Sending mixed signals? An academic literature review of MVNO dynamics

The study by Banerjee and Dippon is primarily focused on voluntary agreements between MNOs and MVNOs, which it finds beneficial insofar as they may be capable of widening and deepening mobile markets. The study's authors also express a clear preference for market-based solutions over regulatory intervention as a means to maximizing aggregate social welfare, noting that "a *mandatory* MNO-MVNO relationship arising from a policy that *requires* the MNO to provide the MVNO access to its network can actually backfire in some circumstances."[95]

Although Banerjee and Dippon caution that "the large-scale emergence of voluntary MNO-MVNO partnerships in the US, the EU, and other places casts doubt on any proposition that entry-facilitating regulatory intervention should be either automatic or universal",[96] they nevertheless acknowledge that "where such relationships have not yet emerged, market failure—typically the reason given for regulatory intervention—may not always be the cause. If proven, market failure (e.g., due to monopoly control or denial of wholesale access) can justify entry-facilitating regulation."[97] Moreover, the authors note that one explanation for the failure of voluntary arrangements between MNOs and MVNOs to naturally emerge "may be that MNOs deliberately manipulate the market or exercise market power. If that explanation is true," they add, "then public policy can have a legitimate role for facilitating MVNO entry."[98]

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[93] Kalmus, P., & Wiethaus, L. (2010). On the competitive effects of mobile virtual network operators. Telecommunications Policy, 34(5), 262–269. https://doi.org/10.1016/j.telpol.2010.04.002 p.268.
[94] Ibid.
[95] Banerjee, A., & Dippon, C. M. (2009). Voluntary relationships among mobile network operators and mobile virtual network operators: An economic explanation. Information Economics and Policy, 21(1), 72–84. https://doi.org/10.1016/j.infoecopol.2008.10.003 p. 80. Emphasis in original.
[96] Ibid, p. 74.
[97] Ibid.
[98] Ibid, p. 82.

The circumstances described in the Banerjee and Dippon study regarding market power and refusal to deal with MVNOs precisely describes the situation in Canada. In 2015, the CRTC determined that the national carriers have market power in the wholesale provision of MVNO access,[99] and since that time, the Commission has confirmed that there are no indications of change (see above). Furthermore, the regional carriers appear to have joined the nationals in their stance toward MVNOs, a situation which amounts to a near total collective refusal to deal with MVNOs. This state of affairs, while certainly beneficial to the carriers' profit margins, has resulted in a situation where Canadians are being deprived of choice in the mobile wireless marketplace, and has likely contributed to the persistence of a digital divide which disproportionately affects low income households.

Because voluntary MVNO arrangements have failed to emerge in Canada, and due to the persistence of significant problems at in retail markets, we believe it would be appropriate for the Commission to take measures that would require MNOs to grant wholesale access to their networks for MVNOs.

Some research suggests network investment could be dampened by regulation mandating MVNO access. A 2011 study by Kim et al. found that "[w]hile mobile virtual network operators (MVNOs) increase competition in the telecommunications industry, granting market access may have unwanted consequences. In particular, infrastructure investment by incumbent mobile operators (MNOs) may be smaller."[100] However, the authors qualify this observation, noting that "the mobile telecommunications sector does not appear to suffer from insufficient investment and MVNOs generally have small market shares. The possible explanation for a decline of investment intensity associated with mandatory access provisions is that entry by MVNOs and regulation may force MNOs to adjust their investment levels. Services-based competition driven by MVNOs may further promote the efficient use of network resources. […] Therefore, a lower investment intensity should not necessarily be interpreted as evidence against granting market access to MVNOs".[101]

This type of qualification was the subject of a 2015 study by Rajabiun and Middleton examining evidence from the European Union on the interplay between competition, investment, and efficiency in next generation networks.[102] This study provides "an empirical critique of the traditional model that assumes the existence of a tradeoff between static (i.e. market power) and dynamic (i.e. investment incentives) efficiencies in the co-evolution of public policy and broadband connectivity."[103] It finds that "investment is only one input into the process of increasing network capacity and deploying new technologies in response to growing demand

[99] CRTC (2015). Telecom Regulatory Policy CRTC 2015-177, Regulatory framework for wholesale mobile wireless services, paragraph 86. Available at: https://crtc.gc.ca/eng/archive/2015/2015-177.htm para. 88.
[100] Kim, J., Kim, Y., Gaston, N., Lestage, R., Kim, Y., & Flacher, D. (2011). Access regulation and infrastructure investment in the mobile telecommunications industry. Telecommunications Policy, 35(11), 907–919. https://doi.org/10.1016/j.telpol.2011.08.004 p. 907.
[101] Ibid, p. 916.
[102] Rajabiun, R., & Middleton, C. (2015). Regulation, investment and efficiency in the transition to next generation broadband networks: Evidence from the European Union. Telematics and Informatics, 32(2), 230–244. https://doi.org/10.1016/j.tele.2014.09.001
[103] Ibid, p. 241.

for high-speed Internet connectivity. If there is over-investment in sunset broadband platforms (i.e. DSL), too much duplication of essential network facilities, or a lack of competitive discipline on dominant operators, there is no reason to expect that countries with relatively high levels of capital expenditures will develop relatively high quality broadband networks. […] Evidence from the EU lends further support to and helps explain a second class of previous studies that suggest open access regulations which support service-based competition are conducive to the emergence of relatively high quality broadband networks".[104]

Additional research lends perspective to the question of investment in light of the proposed access mandate. A study by Houngbonon and Jeanjean investigated what level of competitive intensity maximises investment in the wireless industry.[105] That study found that "policymakers should consider wireless operators' profit margin levels before allowing a new entrant or a merger in the wireless industry. When profit margin is below 35 per cent, a merger may be a better way to raise social surplus than a new entry. On the other hand, when it is above 42 per cent, an additional entrant may increase social surplus more than a merger due to higher incentives to invest. Between these two thresholds, a case-by-case analysis of merger proposals is recommended."[106]

As discussed above, gross profit margins in the Canadian mobile wireless market averaged 42.5% for the period 2012-2016, above the threshold set by Houngbonon and Jeanjean for maximum investment. The high levels of profitability in Canada's mobile market should therefore be taken into the consideration by the Commission in its decision on mandated wholesale MVNO access, and, in our view suggests that the hypothetical decrease in investment that may accompany mandated access could be outweighed by the benefits of that come from the more intense service-based competition that entry by MVNOs would provide.

Indeed, a recent study that examined evidence from Nordic mobile telecommunications markets regarding the effects of upstream regulation (i.e. mandated access regulations) on competition and consumer welfare supports this conclusion. "Using a [sic] cross-country data of five Nordic mobile telecommunications markets", Jun, Byun, & Yeo found that "both the mandatory provision requirement and the wholesale price regulation affect the competitive environment of mobile telecommunication market [sic]. The influence on retail price level is also found to be favourable to the end-users, although the effect is less significant. In all, the upstream regulatory measures around mobile telecommunications network may enhance competition environment and consumer welfare in the downstream market."[107] The authors qualified their findings as follows: "Note that our results cannot be a counter-argument against the conclusion of the recent literature which often posits that upstream regulation can

[104] Ibid, p. 242.
[105] Houngbonon, G. V., & Jeanjean, F. (2016). What level of competition intensity maximises investment in the wireless industry? Telecommunications Policy, 40(8), 774–790. https://doi.org/10.1016/j.telpol.2016.04.001
[106] Ibid, p. 788. We note that the study examined gross profit margins (i.e. EBITDA).
[107] Jun, J., Byun, J. W., & Yeo, E. (2018). Upstream regulation in mature network industry: evidence from Nordic mobile telecommunications markets. Applied Economics Letters, 25(17), 1230–1236. https://doi.org/10.1080/13504851.2017.1412071 p. 1235.

undermine investment incentives and dynamic efficiency. Our results rather imply that in cases where market power of network providers is the bigger issue than network deployment, upstream regulation can possibly be desirable for the society."[108]

Taken together, the research presented above suggests that there could be a trade-off between investment, on the one hand, and increased competition and consumer welfare, on the other, associated with a decision to mandate wholesale access for MVNOs. That being said, it could also be that the specific facts and circumstances of Canada's mobile wireless market favour the mandated access regime. The high profitability of Canadian carriers suggest that investment could sustain an increase in competitive intensity, and the research is also qualified in that it suggests lower investment, to the extent that it may or may not occur, could actually represent a more efficient outcome than the status quo. In the face of entrenched market power, persistently high prices, internationally low service adoption, slow and uneven progress by regional competitors, and a demonstrated refusal to deal with MVNOS, it could be that a mandated MVNO access regime is the best immediate option available to address these problems.

Can't concentrate? Think again: mandated MVNO access as a remedy for market power in European mergers

In the last sections of this report, we briefly examine several mergers—in Austria, Ireland, and Germany—where MVNO access at regulated rates was mandated as a condition of merger. The conditions attached to these mergers may provide the Commission with some guidance regarding its own efforts to structure the rates, terms, and conditions of MVNO access in Canada. Finally, we point to the regulatory arrangements that prevail in the wireline side of Canada's communications markets as an example of how wholesale MVNO access might develop on the wireless side.

In recent years, mobile markets in several countries have experienced consolidation when carriers merged, reducing the number of mobile network operators from four to three. In what follows, we present select relevant information regarding three of these cases: the Austrian merger between Hutchison 3G Austria (H3G) and Orange Austria in 2012,[109] the Irish merger between Hutchison 3G UK and Telefonica Ireland in 2014,[110] and the German merger between Telefónica Deutschland and E-Plus in 2014.[111] In particular, we describe the commitments imposed upon these mergers with regard to mandated MVNO access. The information

[108] Ibid.
[109] European Commission (2012). COMMISSION DECISION of 12.12.2012 addressed to: Hutchison 3G Austria Holdings GmbH declaring a concentration to be compatible with the internal market and the EEA agreement (Case No M.6497 – HUTCHISON 3G AUSTRIA / ORANGE AUSTRIA). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m6497_20121212_20600_3210969_EN.pdf
[110] European Commission (2014). COMMISSION DECISION of 28.5.2014 addressed to: Hutchison 3G UK Holdings Limited and Hutchison 3G Ireland Holdings Limited declaring a concentration to be compatible with the internal market and the EEA agreement (Case M.6992 - HUTCHISON 3G UK / TELEFONICA IRELAND). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m6992_20140528_20600_4004267_EN.pdf
[111] European Commission (2014). COMMISSION DECISION of 2.7.2014 addressed to: Telefónica Deutschland Holding AG declaring a concentration to be compatible with the internal market and the EEA agreement (Case M.7018 - TELEFÓNICA DEUTSCHLAND/ E-PLUS). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m7018_6053_3.pdf

presented below is intended to assist the Commission as it considers how to best develop a wholesale MVNO model for Canada; these cases are particularly relevant, since, as we discuss below, the Body of European Regulators of Electronic Communications (BEREC) conducted a post-merger review in 2018, which provides useful evidence assessing the effectiveness of the remedies.

In each of these cases, the European Commission (EC) made the merger between MNOs conditional upon the merged entity providing access for national MVNOs to its network at fixed rates. In the Austrian case, the EC required that the H3G provide access to up to 16 MVNOs, and required a commitment to enter into an agreement with at least one "up front" MVNO prior to final approval of the merger. This access was to be provided on a phase-in basis, with the merged entity required to add no more than two MVNOs at a time per year, up to the total of 16. The EC required that access be provided on non-discriminatory terms by requiring H3G to publish the terms of access on its website in the form of a reference offer, while negotiations based on this reference offer between the MNO and MVNOs were made subject to fast-track negotiations in the event that a mutually agreeable arrangement could not be reached. Implementation was to be overseen by a monitoring trustee.

The EC also required that the "up front" MVNO "be independent of and unconnected to H3G or any mobile network operator in Austria" and "possess the financial resources, proven expertise and incentive to be a viable and active competitive force in competition with H3G and other competitors on the Austrian market for mobile communications to end customers. Companies which fulfil the aforementioned criteria may (*inter alia*) include existing MVNOs, companies with telecoms activities, specialised electronic retailers in Austria or mass market retailers in Austria".[112] The duration of the obligation to provide access to MVNOs was set to expire either once H3G transferred divestment spectrum to a new operator, the date on which a new MNO enters the market, or ten years after the merger, whichever was soonest.

The terms of the reference offer in the Austrian case required that H3G offer access to the network for the purchase of voice, SMS, and data services by MVNOs. The reference offer also required H3G to "grant the MVNO access to future evolutions in mobile technologies and/or new products based on existing technologies […] within a reasonable period of the commercial launch of the new technology and/or new products by H3G unless such access is not technically feasible, and subject to negotiation and agreement between H3G and the MVNO of the terms and conditions (and, if applicable, charges)."[113] The reference offer was made available only to MVNOs which could provide their own core network and which could arrange for

[112] European Commission (2012). COMMISSION DECISION of 12.12.2012 addressed to: Hutchison 3G Austria Holdings GmbH declaring a concentration to be compatible with the internal market and the EEA agreement (Case No M.6497 – HUTCHISON 3G AUSTRIA / ORANGE AUSTRIA). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m6497_20121212_20600_3210969_EN.pdf pp. 139-140.
[113] European Commission (2012). COMMISSION DECISION of 12.12.2012 addressed to: Hutchison 3G Austria Holdings GmbH declaring a concentration to be compatible with the internal market and the EEA agreement (Case No M.6497 – HUTCHISON 3G AUSTRIA / ORANGE AUSTRIA). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m6497_20121212_20600_3210969_EN.pdf p. 152.

interconnection, transit or routing services, and did not include international roaming, but required these be subject to separate negotiation.

The reference offer set out a rate schedule, subject to retail price indexation,[114] which includes a set-up fee, security deposit, and per-unit rates for voice (per second), text (per SMS), and data (per megabyte), at base rates and with volume discounts. A retail-minus option was also to be made available at the prerogative of the MVNO.[115] The reference offer also included an additional non-discrimination clause, which required that "H3G shall supply the same quality of service and coverage to the MVNO in respect of the MVNO customers as it does to its own customers and to those of other MVNOs on the H3G network".[116] Other terms include the provision of demand forecasts, conditions related to information exchange, numbering, privacy, intellectual property, and network management, as well as other routine contract terms.

The commitments regarding MVNOs in the case of the Irish and German merger approvals were substantially similar to the conditions set out above, with several major exceptions. First, the Irish merger approval required HG3UK to provide access to 2 MVNOs, while the German approval required up to 3, depending on demand (with a requirement that 30% of capacity must be leased in total). Second, and crucially, the Irish and German approvals fixed rates based on capacity, rather than per-unit prices. In each case, detailed technical specifications were laid out regarding the method by which this capacity was to be provided, including obligations on both the MNO and the MVNO, such as minimum capacity requirements and calculations for capacity allocation. Third, and finally, the fixed rates in these latter two cases were not made public. It is also important to note that, in the case of the German merger, specific provisions were made requiring Telefónica to make access to mobile voice over LTE (mVoLTE) available to MVNOs immediately once implemented for its own retail subscribers.[117]

We hope that the Commission will investigate these MVNO arrangements more closely as it considers how to best implement mandated wholesale MVNO access arrangements in Canada. In each case, the EC approved these commitments in the hope that bringing about a workable MVNO environment that would contribute to addressing concerns related to the increase in market power that was expected to arise as a result of the respective mergers. Notably, the EC described the capacity-based models as "more effective than the typical pay-as-you-go model that MVNOs currently use in Europe and under which they pay for network access according to the actual usage of their subscribers."[118] Additionally, it noted that "with a fixed capacity that they committed to pay upfront at their disposal, the MVNOs will have increased incentives to fill the capacity they have committed to purchase by offering attractive prices and innovative

[114] Ibid, p. 154.
[115] Ibid, pp. 161-165.
[116] Ibid, p. 155.
[117] European Commission (2014). COMMISSION DECISION of 2.7.2014 addressed to: Telefónica Deutschland Holding AG declaring a concentration to be compatible with the internal market and the EEA agreement (Case M.7018 - TELEFÓNICA DEUTSCHLAND/ E-PLUS). Available at: http://ec.europa.eu/competition/mergers/cases/decisions/m7018_6053_3.pdf Annex C, p. 14.
[118] European Commission (2014). Mergers: Commission clears acquisition of Telefónica Ireland by Hutchison 3G, subject to conditions. Available at: http://europa.eu/rapid/press-release_IP-14-607_en.htm

services."[119] We note that in none of these three cases has a fourth carrier entered the market subsequent to the merger; in each country the mandated MVNO remedy remains the primary backstop against the exercise of market power by the remaining three national carriers.

In 2018, the Body of European Regulators of Electronic Communications (BEREC) conducted a post-merger review of market developments in Austria, Ireland, and Germany.[120] In the Austrian case, BEREC found that the merger resulted in significant price increases in the two years following approval, but that this trend was mitigated in 2016, "likely caused by competitive pressure from MVNOs, which gained significant market share since entry at the beginning of 2015."[121] BEREC also noted that "the MVNO remedy took more than three years to actually become effective for Austrian consumers."[122] The Commission may wish to consider this observation, as its costing processes have a propensity to go on for extended periods of time; it is possible that interim tariffs could contribute to speeding up the effects should mandated wholesale MVNO access be implemented.

In the Irish and German cases, BEREC notes that "data are available for only one and a half years after the merger and therefore only short to medium run effects can be estimated."[123] In the Irish case, BEREC found that the "impact of the MVNO remedy was small: two MVNOs entered the market in the second half of 2015, but their market share remained below 1% each by mid 2017 and one of the MVNOs left the market in 2018."[124] Data for the German case were inconclusive; however, the German mandated MVNO 1&1 Drillisch, which entered as a result of the merger conditions, has grown substantially and recently bid on spectrum. It is therefore potentially poised to climb the ladder of investment and become a fourth MNO in the German market, although it is important to emphasize that the mandated MVNO access remedy is not predicated on the assumption that entrants that gain access in the short term will achieve facilities based status over the long run.[125]

BEREC concludes with several observations that are illustrative. "The Austrian case shows that such a remedy might take considerable time (several years) to become effective," it notes, "in particular if the MVNO segment pre-merger is small and MNOs already follow a multi-brand strategy."[126] This observation may be particularly relevant to the case in Canada, where MVNO activity is negligible and national carriers already extensively make use of fighting brands.

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[119] European Commission (2014). Mergers: Commission clears acquisition of E-Plus by Telefónica Deutschland, subject to conditions. Available at: http://europa.eu/rapid/press-release_IP-14-771_en.htm

[120] BEREC (2018). BEREC Report on Post-Merger Market Developments -Price Effects of Mobile Mergers in Austria, Ireland and Germany. Available at: https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/8168-berec-report-on-post-merger-market-developments-price-effects-of-mobile-mergers-in-austria-ireland-and-germany

[121] Ibid, p. 2.

[122] Ibid.

[123] Ibid.

[124] Ibid.

[125] Bloomberg (2019). Dark Horse in 5G Auction Is Trouble for Telefonica. Available at: https://www.bloomberg.com/opinion/articles/2019-04-05/german-5g-spectrum-auction-is-trouble-for-telefonica

[126] BEREC (2018). BEREC Report on Post-Merger Market Developments -Price Effects of Mobile Mergers in Austria, Ireland and Germany. Available at: https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/8168-berec-report-on-post-merger-market-developments-price-effects-of-mobile-mergers-in-austria-ireland-and-germany p. 41.

BEREC expresses disappointment in the Irish results, but notes that in Germany, "[i]t appears that the remedy became effective earlier compared to the Austrian or Irish cases", attributing this measure of success to the ability of converged operator Drillisch to leverage its existing market presence to add additional competitive pressure post-merger.[127]

In light of these conclusions, it will be important for the Commission to be expedient in developing its MVNO model should it elect to do so.

Wireline guideline: A model for approaching wholesale MVNO access in the mobile wireless market

In the last section of this report, we briefly discuss the Commission's approach to wholesale access in the market for wireline broadband services. The approach to wholesale services in the wireline broadband sector provides an informative reference point that the Commission could use as a guideline as it considers developing a similar framework for mobile wireless services.

For the last two decades, the CRTC has required facilities-based wireline telecommunications service providers to provide wholesale access to their networks in order to facilitate competition and innovation at the retail service level. As the Commission has noted, this arrangement allows independent service providers to "bring pricing discipline, innovation, and consumer choice to the retail Internet service market."[128]

This approach has stood the test of time. Throughout successive reviews over the past two decades, the Commission has consistently found that wholesale access to high-speed Internet services is a requirement for retail markets to function competitively. Reflecting this understanding, the Commission has consistently updated and adapted its models to reflect changes in technology and market conditions—most recently, by requiring that incumbent telecommunications carriers provide wholesale access to their fibre-optic facilities.[129] The very fact that the Commission has continuously found mandated access to be a necessary enabler of competition in wireline markets suggests that implementing a transitory or temporary model in the wireless market would not be appropriate.

These processes have taken time, expertise, and substantial resources—a fact that is likely inescapable for decisions as highly complex, dynamic, and consequential as these are—but they are no less necessary for it. As the ongoing process regarding disaggregated access to facilities shows, wholesale service models are a constant work in progress.[130] But the results have been substantially beneficial. Because of wholesale access in wireline markets, Canadians are able to

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[127] Ibid.
[128] CRTC (2011). Telecom Regulatory Policy CRTC 2011-703. Billing practices for wholesale residential high-speed access services. Available at: https://crtc.gc.ca/eng/archive/2011/2011-703.htm para. 3.
[129] CRTC (2015). Telecom Regulatory Policy CRTC 2015-326. Review of wholesale wireline services and associated policies. Available at: https://crtc.gc.ca/eng/archive/2015/2015-326.htm
[130] CNOC (2019). Application to Review and Vary Telecom Regulatory Policy 2015-326 and Telecom Decision 2016-379. Available at: https://services.crtc.gc.ca/pub/instances-proceedings/Default-Defaut.aspx?S=C&PA=T&PT=PT1&PST=A&lang=en

avail themselves of a range of services at affordable prices that would not be available if the market was solely composed of facilities-based providers.

In the current process, the Commission will decide whether to take a similar approach to mobile wireless markets. Although aspects of the technology differ, wireline markets and mobile wireless markets in Canada bear numerous similarities–in some ways they are more similar than Canadian wireless markets are to disparate countries on other continents. Both are highly concentrated,[131] both involve high barriers to entry and economies of scale, and, indeed, with all Canadian mobile network operators now belonging to converged communication conglomerates, the same firms operate across both markets.

With this in mind, we urge the Commission to consider the results of its approach to wireline services when considering how to regulate the mobile services market. As of 2017, independent ISPs' revenue share reached 12% in the residential Internet service market, and 24% of access service revenues in the business market.[132] Despite the frequent protestations of facilities-based incumbent telecommunications carriers, profit and revenues continue to increase, and at the same time investment in the sector is on the rise. Wholesale arrangements ensure that consumers are afforded with a range of options that would otherwise be available in the market.

The independent ISPs that have thrived on this model, including firms such as Teksavvy, VMedia, and Distributel, are also well poised to leverage their existing capabilities and expand into the mobile market if the opportunity becomes available. As the research has shown, it is these types of firms, with core competencies in network services, brand and customer loyalty, and the potential to integrate services from adjacent markets, that have the most success with MVNO arrangements.[133]

The Commission itself has developed the expertise and capacity necessary to successfully implement wholesale arrangements through its experience with the wholesale market. There is little reason to believe that this ability could not be extended to the mobile wireless market. In particular, the development of a capacity-based approach to wholesale network access could be particularly relevant to the proposed MVNO model, consistent with the European Commission's endorsement of this approach as the serious model.[134]

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[131] See: CMCRP (2018). Media and Internet Concentration in Canada, 1984 – 2017 (UPDATED). Available at: http://www.cmcrp.org/media-and-internet-concentration-in-canada-1984-2017-updated/ At the national level, retail internet access markets, with an HHI of 1237, are not classified as concentrated. However, relevant markets for internet service are local – the presence of a carrier in a different province does not factor into competitive conditions when shopping for home internet. At the local level, internet access services are highly concentrated, with an HHI of 4000 in 2017—without the wholesale access provisions, the market would be a duopoly or even a monopoly in some places.

[132] CRTC (2018). Communications Monitoring Report. p. 129 & Infographic 5.6. Available at: https://crtc.gc.ca/eng/publications/reports/policymonitoring/2018/index.htm

[133] Corrocher, N., & Lasio, L. (2013). Diversification strategies in network-based services: The case of mobile virtual network operators. Telecommunications Policy, 37(11), 1110–1123. https://doi.org/10.1016/j.telpol.2013.03.002

[134] For more information about capacity-based vs. usage-based wholesale billing models and their implications, see: CRTC (2011). Telecom Regulatory Policy CRTC 2011-703. Billing practices for wholesale residential high-speed access services. Available at: https://crtc.gc.ca/eng/archive/2011/2011-703.htm

In sum, we believe that the experience with wholesale in wireline should prove an instructive guide when considering similar measures in the mobile wireless market.

Conclusion

In this report, we have examined the state of mobile wireless markets in Canada and internationally. Even though a fourth carrier has emerged in most parts of the country, progress has been slow, the benefits of increased competition have been uneven, and markets remain highly concentrated across the country.

Data from a wide variety of sources confirm that there continue to be serious problems associated with the lack of effective competition that characterizes these highly concentrated markets. While Canadian mobile markets perform relatively well in terms of availability and speed, fast networks are no benefit to those who cannot afford service in the first place. Indeed, adoption of mobile services in Canada has remained stubbornly lower than in the majority of comparable countries. Mobile services are unaffordable for too many people in Canada, particularly those who earn the lowest income.

Simply put, high prices are keeping these vital services out of reach. For those who can afford service, high pricing restricts usage. Mobile subscribers in Canada are not only paying more for service than those in most other countries, but they are getting less in return. This situation is unacceptable in a country that recognizes that broadband service is an essential component of life in the twenty-first century.

In other countries, we see that mobile markets feature lower prices and include a greater degree of diversity when it comes to providers offering service. Mobile virtual network operators are a regular feature of mobile markets around the world, and research shows that these companies contribute to widening and deepening markets—in other words, they help to expand service to customers who would otherwise be ignored by large mobile network operators. Yet in Canada, the market remains firmly under the control of facilities-based providers, who have shown little interest in hosting MVNOs.

MVNOs often find a role in markets with little assistance from regulation. However, in cases where there is concern about the exercise of market power by dominant firms, regulators have not hesitated to require that network operators provide access to MVNOs on a mandated basis. As we have shown, this was the case in three recent European mergers; following these mergers, there is evidence that the entry of MVNOs under the mandatory access obligation have had a positive impact. Similarly, for two decades the Commission has maintained a similar requirement for providers of wireline broadband access—the very same firms who operate in the wireless market—in order to maintain levels of competition sufficient to meet the needs of Canadians.

Persistent problems in the mobile market demand a solution. We hope the Commission will find this report useful in identifying those problems, and developing effective solutions.

Glossary of Key Terms and Acronyms

3G – Third Generation – the third generation standard for mobile wireless technology; enables mobile broadband connectivity. See also: HSPA

4G – Fourth Generation – the fourth generation standard for mobile wireless technology; enables faster speeds for end-users and more efficient use of existing spectrum resources for carriers. See also: LTE.

ARPU – Average revenue per user.

BCE – Bell Canada Enterprises. See: http://www.bce.ca/

BEREC – Body of European Regulators of Electronic Communications. See: https://berec.europa.eu/

CA$ -- Canadian dollars.

CAC – Consumers' Association of Canada, Manitoba Branch.

CAGR – Compound annual growth rate.

CMCRP – Canadian Media Concentration Research Project – Directed by Dr. Dwayne Winseck, see: http://cmcrp.org.

CRTC – Canadian Radio-television and Telecommunications Commission. Administrative regulatory agency charged with administering Canada's *Broadcasting* and *Telecommunications Acts.*

EC – European Commission. See: https://ec.europa.eu/digital-single-market/en

EU – European Union.

FCC – Federal Communications Commission – American administrative regulatory agency tasked with overseeing US communications industry.

G7 – Group of Seven. Seven of the largest advanced economies in the world. Includes Canada, France, Germany, Italy, Japan, the United Kingdom, and United States of America.

GB – Gigabyte. Equal to 1000 megabytes. See also: MB.

GNI – Gross national income.

% GNI p.c. – Percentage of gross national income per capita. Used to measure price of a good or service in terms of average income.

GSM – Global system for mobile communications. For more information, see: https://en.wikipedia.org/wiki/GSM

HSPA – High speed packet access. Technical protocol enabling 3G mobile broadband connectivity. For more information, see: https://en.wikipedia.org/wiki/High_Speed_Packet_Access

ISED – Innovation, Science and Economic Development. Formerly Industry Canada, Canadian federal ministry responsible for telecommunications. See: https://www.canada.ca/en/innovation-science-economic-development.html

ICT – Information and communication technologies.

ISCC – Internet Society, Canada Chapter. For more information, see: https://internetsociety.ca

ITU – International Telecommunications Union. For more information, see: https://www.itu.int

LTE – Long term evolution. Technical protocol underpinning 4G mobile networks.

MB – Megabyte. A unit of digital information. For more information, see: https://en.wikipedia.org/wiki/Megabyte

MNO -- Mobile network operator. Also referred to as mobile wireless carrier.

Mbit/s – Megabits per second. A measure of digital network data transfer rate. See also: Mbps.

Mbps – Megabits per second. A measure of digital network data transfer rate. For more information, see: https://en.wikipedia.org/wiki/Data-rate_units

MTS – Manitoba Telecom Services. Previously Manitoba's incumbent telecommunications service provider before being purchased by Bell Canada Enterprises in 2017.

MVNO – Mobile virtual network operator. A third party service provider which provides end-users with mobile service by purchasing wholesale inputs from mobile network operators. For more information, see: https://en.wikipedia.org/wiki/Mobile_virtual_network_operator

Nordicity – A consulting firm specializing in policy, strategy, and economic analysis in the media, creative, and information and communications technology sectors. For more information, see: http://nordicity.com/home/about

OECD – Organization for Economic Cooperation and Development. For more information, see: http://www.oecd.org

Opensignal – A London, UK based firm specializing in mobile network performance measurement. For more information, see: https://opensignal.com/about

Penetration – a measure of mobile adoption, expressed as connections per 100 inhabitants.

PILC – Legal Aid Manitoba's Public Interest Law Centre. For more information, see: https://www.legalaid.mb.ca/pilc/public-interest-law-centre/

PPP – Purchasing power parity. A method of comparing the cost of goods and services across jurisdictions with different currencies. For more information, see: https://en.wikipedia.org/wiki/Purchasing_power_parity

SIM – Subscriber identity module. A SIM card is installed into a mobile device in order to link it to a users' account and identifying information, such as phone number. For more information, see: https://en.wikipedia.org/wiki/Subscriber_identity_module

SMS – Short message service. More commonly known as a mobile text message. For more information, see: https://en.wikipedia.org/wiki/SMS

RAN – Radio access network. A key component in mobile networks. For more information, see: https://en.wikipedia.org/wiki/Radio_access_network

Rewheel – Finnish consultancy specializing in research and analysis related to mobile networks. For more information, see: http://rewheel.fi

RCCI – Rogers Communications Canada Inc.

TCI – Telus Communications Inc.

UK – United Kingdom.

USA – United States of America.

USD$ -- US dollars.

VAT – Value added tax. European Union equivalent of goods and services tax (GST).

Wi-Fi – Wireless Fidelity. Wireless network protocol that uses unlicensed radio spectrum for wireless networking applications. For more information, see: https://en.wikipedia.org/wiki/Wi-Fi

Curriculum Vitae

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Personal Information

Graduate Student (PhD), School of Journalism and Communication, Carleton University

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Work Experience

CONSULTANT, SELF EMPLOYED, OTTAWA, ON, SUMMER 2015-PRESENT.

Various clients, including public sector, not-for-profit, law firms, advocacy organizations. Provision of research and analysis on matters related to economics of telecommunications, broadcasting, communications regulation, law, and policy.

TEACHING ASSISTANT, CARLETON UNIVERSITY, OTTAWA, ON, FALL 2014-PRESENT

Various courses. Supervised by Dr. Dwayne Winseck, Dr. Kirsten Kozolanka, Cindy Kardash-Lalonde.

TERM EMPLOYEE, CANADA POST, WEST HAWK LAKE, MB, 2006-2014

Responsible for seasonal management of rural postal outlet 2006-2010. Duties include management of day-to-day operations including reception, sorting, and delivery of mail. Processing of cash transactions, face-to-face customer service interaction, and daily financial reporting. Monthly duties include financial account management and inventory management. Part-time/on call 2011-2014.

TEACHING ASSISTANT, UNIVERSITY OF MANITOBA, WINNIPEG, MB, FALL 2012, FALL 2013

POLS1000 - Democracy and Development. Supervised by Prof. Radhika Desai. Led 4 seminars per term, consisting of 12-15 students each. Met with students for extra assistance during office hours. Filled in for Professor's lecture on 2 occasions, also invigilated midterm exam. Graded ~50 papers per term, provided detailed feedback. (See evaluation forms - appended)

BUILDER, DOWN BY CREEK FINE CARPENTRY, (204)349-8484. WEST HAWK LAKE, MB — 2008-2012

Assisted in rural homebuilding, on projects of various scales. Roofing, decking, painting, general maintenance, dock building, timber-frame additions and new construction. Worked solo and under the supervision of journeyman carpenters Trevor Down, Jim Orr, Anna Hargreaves, and Dave Spence.

PREVIOUS EMPLOYMENT — 1997-2008

Details of previous employment available upon request.

Education

University of Manitoba, 2015 - Master of Arts in Political Studies. Supervisor: Dr. Radhika Desai. Thesis title: Mobile Wireless in Canada: Policy, problems, and progress.

University of Toronto, 2006 - Bachelor of Arts (Honours) in Philosophy, Economics, and Aboriginal Studies.

Awards

University of Carleton Doctoral Scholarship, School of Journalism and Communication, 2014

University of Manitoba Political Studies Special Student Award, 2011

University of Manitoba Political Studies Graduate Conference Travel Award - 2012

University of Manitoba Faculty of Graduate Studies Conference Travel Award - 2012

Presentations, Lectures, Workshops

Conference presentation, title: “Just and reasonable? Historical and contemporary perspectives on rate regulation in Canadian telecommunications”, Canadian Communications Association Annual Meeting, University of Regina, Regina, Saskatchewan. May 2018.

Invited lecture and discussant, title: “Net neutrality, common carriage in Canadian telecommunications”, for Communications and technology webinar, University of Alberta, Dr. Rob McMahon, January 17, 2018.

Invited guest lecture, title: “Networks and regulation”, for “Digital media industries” COMMS4403-A, School of Journalism and Communication, Carleton University, Ottawa, Ontario, Dr. Liam Young. October 5, 2017.

Conference presentation, title: “Making waves in wireless: The turbulent development of Canadian wireless policy ca. 2007-2017”, Canadian Communications Association Annual Meeting, Ryerson University, Toronto, Ontario. June 2017.

Conference presentation, title: “Why are less carriers competing? Canadian mobile wireless policy 2006-2017”, for Canadian Spectrum Research Group, Spectrum Summit 2017. University of Calgary, Calgary, Alberta, May 11, 2017.

Invited guest discussant, topic: “Net Neutrality in Canada: 2008-2017,” for “Seminar on the broadband Internet,” COMN 4520, Department of Communication Studies, York University, Dr. David Ellis. March 7, 2017.

Invited guest lecture(s), title: “Why is my smartphone so expensive? Consumers, citizens, corporations, and the CRTC”, for “Introduction to Communication and Media Studies”, COMMS1000, Department of Journalism and Communication, Carleton University, Dr. Sandra Robinson. January 12 & 13, 2017.

Keynote lecture, title: “What does BCE-MTS mean for Manitoba?”, for Consumers Association of Canada, Manitoba Branch; Canadian Centre for Policy Alternatives, The Public Interest Law Centre, Menno Simons College, and the University of Winnipeg Department of Economics. November 29, 2016.

Oral presentation to CRTC, Telecom notice of consultation CRTC 2016-192, “Examination of differential pricing practices related to internet data plans”, Gatineau, Quebec, October 31, 2016.

Conference presentation, title: “Common carriage in Canadian communications”, Canadian Communications Association Annual Meeting, University of Ottawa, Ottawa, Ontario. May 30 2016.

Workshop presentation, title: “Gift horse or trojan horse? Regulators’ responses to the zero rating of mobile applications in Canada and around the world”, International exploratory workshop “Transnational histories of telecommunication @ITU”, Geneva, December 17-19, 2015.

Conference presentation, title: “Zero-rating: gift horse, or Trojan horse?”, for Geopolitical Economy Research Group inaugural conference, University of Manitoba, Winnipeg, Manitoba. Friday, September 25, 2015.

Panellist, “Quasi v. judicial - have expectations for fair process changed in the century”, Forum for Research and Policy in Communications (FRPC), “Rebooting Canada’s Communications Legislation” Conference, University of Ottawa, Ottawa, Ontario. May 22-23, 2015.

Invited Guest Lecture, title: “Foreign ownership in Canadian communications”, for Introduction to Communication Studies”, COMMS 1000, Department of Journalism and Communication, Carleton University, Ottawa, Ontario. For Dr. Benjamin Woo. January 26, 2015.

Oral presentation to CRTC, Telecom notice of consultation CRTC 2014-76, “Review of wholesale mobile wireless services”, Gatineau, Quebec, September 29, 2014.

Lecture: “The Wireless Rip-Off: Oligopoly Control of Telecommunications in Canada,” University of Manitoba Graduate Student Lecture Series, University of Manitoba, Winnipeg, Manitoba. January 31, 2014.

Invited guest discussant, topic: “Net Neutrality and ITMPs,” for “The Electronic Information Network Marketplace”, COMN 4520, Department of Communication Studies, York University, Dr. David Ellis. January 29, 2014.

Conference presentation: “The Technological Imperative in Canada and the Idle No More Movement,” Communication Graduate Conference, Carleton University, Ottawa, Ontario. March 2013.

Conference presentation: “Putting the Common back into Common Carriage: Why Network Ownership Matters,” 4th Annual ICT-S Conference, Uppsala University, Uppsala, Sweden, May 2012.

Publications

Klass, B. (Book chapter, forthcoming). “Why are less carriers competing? Mobile competition in Canada 2006-2017.” In As yet untitled book resulting from Spectrum Summit conference, 2017.

Klass, B. (2016). “Once Manitoba Telecom Services sold, there’s no hitting ‘redial’”, *Winnipeg Free Press*, Tuesday, November 29, 2016. Available at: http://www.winnipegfreepress.com/opinion/analysis/once-manitoba-telecom-services-sold-theres-no-hitting-redial-403515116.html

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Klass, B. (2013). “Sparkling Lakes and Spectrum Auctions,” *Huffington Post*, September 3, 2013. Available at: http://www.huffingtonpost.ca/benjamin-klass/sparkling-lakes-and-spect_b_3857200.html

Klass, B. (2013). “I am Canadian: A Reply to Bell’s Open Letter,” *Huffington Post*, August 8, 2013. http://www.huffingtonpost.ca/benjamin-klass/bell-canada- verizon_b_3726444.html

Additional Research Experience

Research contributor, various roles, Canadian Media Concentration Research Project, supervised by Dr. Dwayne Winseck. 2012-present.

Volunteer Work

Research associate, First Mile Connectivity Consortium. 2015-present.

Member, policy committee. Internet Society, Canada Chapter. 2015-present.

Organizer, Openmedia “Connected Canada Conversation,” Winnipeg public forum on digital issues, January 25, 2014.

Department Representative, University of Manitoba Graduate Students’ Association, 2011-2012. Memberships

Canadian Communication Association, 2014-present.

CUPE4600,2014-present

CUPE3909,2012-2017

CPAA (Canadian Postmasters and Postmasters’ Assistants Association), 2006-2017

Reports and Submissions to Government

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Klass, B., Winseck, D., McKelvey, F., & Nanni, M. “There ain’t no such thing as a free lunch: Historical and international perspectives on why common carriage should be a cornerstone of communications policy in the Internet age.” June 2016.

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Klass, B. "Part 1 Application requesting fair treatment of Internet services by Bell Mobility," November 22, 2013.

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Klass, B. Intervention to "CNOC Part 1 application requesting relief to improve the quality of wholesale high-speed access services provided by cable carriers," September 30, 2013.

Klass, B. Intervention to "Diversity Canada Foundation, Part 1 Application to Review and Vary Section J of Telecom Regulatory Policy CRTC 2013-271" ("The Wireless Code"), October 7, 2013.

Media Coverage

CBC: Lang and O'Leary Exchange; CBC: The National; CBC News Online; CBC On the Money; Various CBC radio programs; The Wire Report; Toronto Star; Huffington Post; CANADALAND Podcast; The Manitoban (Online and Print); Cantechletter; Yahoo! News Online; Moncton Free Press (Online); AM900CHML; rabble.ca; openmedia.ca; DSLReports.com; techdirt.com; etc.

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EDUCATION:

1993 Ph.D. Department of Telecommunication and Film, University of Oregon, Eugene, Oregon.

1989 Master of Arts, Communication Studies, University of Windsor, Windsor, Ontario

1988 Honours Bachelor of Arts, Communication Studies, University of Windsor, Windsor, Ontario

TEACHING EXPERIENCE:

07/2009 to Present Professor

10/2000 to 07/2009 Associate Professor

1/1998 to 10/2000 Assistant Professor School of Journalism and Communication (with Joint Appointment to the Institute of Political Economy), 310 St. Patrick's Building, 1125 Colonel By Drive, Ottawa, ON K1S 5B6 Canada

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8/1994 - 7/1995 Assistant Professor, Department Head Department of Communication and Media Studies, Eastern Mediterranean University, Gazi Magusa, TRNC, via Mersin 10, TURKEY.

8/1993 to 6/1994 Visiting Assistant Professor Department of Communication, Boise State University, Boise, Idaho, U.S.A.

9/1990 to 6/1993 Graduate Teaching Fellow Department of Telecommunication and Film, University of Oregon, Eugene, Oregon, USA.

9/1989 - 7/ 1990 Visiting Instructor Department of International Economics and Trade, Huazhong University of Science and Technology, Wuhan, People's Republic of China.

9/ 1988 - 6/ 1989 Graduate Teaching Assistant, Department of Communication University of Windsor, Windsor, Ontario.

PROFESSIONAL AWARDS & HONOURS

2017 Faculty Graduate Mentoring Award, Faculty of Public Affairs, Carleton University.

2015 Nominated for Capital Educators Award

2014 Public Commentary Award, Faculty of Public Affairs, Carleton University.

2014 Nominated for Teaching Excellence Award, Faculty of Public Affairs, Carleton University.

2013 Mobile Wireless in Canada: Recognizing the Problems and Approaching the Solutions. International Institute of Communication (Canada), 12th Annual Conference, Ottawa Convention Centre November 18-19, 2013

2012 New Zealand's Ultrafast Broadband Plan: Digital Public Works Project for a Network Free Press in the 21st Century or Playfield of Incumbent Interests? Keynote Speaker at the New Zealand Commerce Commission's *The Future with High-Speed Broadband* Conference, Auckland, New Zealand, February 20-21, 2012.

2011 Toward a Critique of the Political Economies of Network Media. Keynote address to the Journalism, Media and Democracy Conference, Auckland University of Technology, Auckland, New Zealand, September 14-16, 2011

2008 Winner of the Canadian Communication Association's G. J. Robinson book of the year award for *Communication and Empire*.

2007 Deepening the Transformation of the Mexican Communications Media Landscape. "Magisterial Lecture" by special invitation of the Profeco, the Consumer Protection Bureau, Government of Mexico, Mexico City, March 15.

BOOKS:

2011 Winseck, D. & Jin, D. Y. (eds.). *Political Economies of Media: the Transformation of the Global Media Industries*. London: Bloomsbury.

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2016 From the BDU-Model of TV to Radical Unbundling: Common Carriage & Culture Policy for the Internet Age. Report commissioned by the Canadian Media Fund (62pp).

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2018 Book Review: Yu Hong (2017). *Networking China: The Digital Transformation of the Chinese Economy*. Urbana, Illinois: University of Illinois, 225pp.

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CONFERENCE PRESENTATIONS/PAPERS/PUBLIC LECTURES:

2018 Do Giant Internet Platforms Rule the World?: A View from Canada. Paper to be presented at the International Association of Media and Communication Researchers Conference, Eugene, Oregon, June 21-25.

2018 The Rise and Fall of the American Internet?: the Geopolitical Economy of the Global Internet Infrastructure. Presented at the Global Media Forum, Chinese Media & its Global Development, York University, March 15.

2017 The Geopolitical economy of the Global Internet Infrastructure. Presented at the International Exploratory Workshop: Transnational Histories of Telecommunication @ITU. Centre for Contemporary and Digital History, University of Luxembourg. October 18-20.

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2017 On Method: Studying Concentration in an ever more internet- and mobile wireless-centric media universe. Paper presented at the Blue Sky Policy Research Workshop, International Communication Association Conference, San Diego, USA, May 29.

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2015 Winseck, D. Unbundling Vertical integration: Too Big to Fail or Too Big to Ignore and Mollycoddle? Rebooting Canada's Communications Legislation Conference, Forum for Policy Research and Communication, University of Ottawa, May 23.

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2012 (co-author with Ph.D. student, Adeel Khamisa) Rapporteurs's Report: the Orbicom – IDRC Workshop on Digital Transformations, Montreal, Quebec, Canada January 12 – 14, 2012

2011 Toward a Critique of the Political Economies of Network Media. Paper presented to the Political Economy Section of the International Association of Media and Communication Researchers, Istanbul, Turkey, July 13-17, 2011

2011 From the Geopolitics of Imperialism to the Empire of Capital: Communication Media and the Global Financial Crisis of 1873. Invited paper presented at the Global Communication Electric Conference, John F. Kennedy Institute, Freie Universität Berlin, Museum of Communication, February 18 – 19, 2011.

2011 The International Media Concentration Research Project: Issues and the State of Media Concentration in Canada, 1984 – 2010. Paper presented at the Media Concentration Around the World Conference, Paris, France, January 21st and 22nd, 2011.

2010 Concentration and the Network Media Industries in Canada: A Presentation of Findings from the International Media Concentration Research Project. *Telecommunications Policy Research Conference*, Arlington, VA, October 19-22.

2010 Financialization and the Crisis of the Media: The Rise and Fall of (Some) Media Conglomerates in Canada. Paper presented at the International Association of Media and Communication Researchers, Braga, Portugal, July 19-24.

2010 Double-Edged Swords: Communications Media and the Global Financial Crisis of 1873. Paper presented at the International Association of Media and Communication Researchers, Braga, Portugal, July 19-24.

2009 Globalizing Telecoms and Media Histories: Beyond Methodological Nationalism and the Struggle for Control Model of Communication History. Invited Paper to be presented to the "Telecommunication and Globalization: Information Flows in the Nineteenth and Early Twentieth Century" Conference. University of Heidelberg, Heidelberg Germany. September 25-28, 2009.

2009 Communication and Empire: A Critique of 'Conventional Knowledge' and an Outline of a New Theoretical Approach to Global Media History. Presented to the Media History section of the International Communication Association, Chicago, USA, May 21-25, 2009.

2008 Communications Media and Global Orders: Media, Markets and Empires – Past and Present. *Keynote Address* to the First Global Media Journal Symposium, University of Ottawa, November 14, 2008.

2008 Information Operations Blowback: Retooling Communication Networks and the Entertainment Media for National Security and 'Global War'. Paper presented to the Political Economy section of the International Association of Media and Communication Researchers, Stockholm, Sweden, July 20-24.

2008 Communication and Empire: A Critique of 'Conventional Knowledge' and an Outline of a New Theoretical Approach to Global Media History. Paper presented to the Media History section of the International Association of Media and Communication Researchers, Stockholm, Sweden, July 20-24.

2007 Deepening the Transformation of the Mexican Communications Media Landscape. "Magisterial Lecture" by special invitation of the Profeco, the Consumer Protection Bureau, Government of Mexico, Mexico City, March 15.

2007 The Global Media and the Age of Empire, 1860-1910. Paper presented at the presented to the Media History section of the International Association of Media and Communication Researchers, Paris, France, July 23-25.

2005 Global Media Mergers and the Empire of Liberal Internationalism. Invited paper presentation (with Professor Robert Pike) for the European Business Historian's Association, Copenhagen, Denmark, August 15-19.

2004 Communication and Empire: Media Markets, Power and Globalisation, 1860-1930. Paper presented presented to the Media History section of the International Association of Media and Communication Researchers, Porto Allegre, Brazil, July 26-30.

2004 Communication and Empire: Rethinking and Revising the History of the Global Media. Invited paper presentation (with Professor Robert Pike) for the Policy History Conference, St. Louis, Missouri, May 20-23, 2004.

2003 Wild Competition, Managed Change and Netscapes of Power: The forces shaping Telecommunications and New Media in Canada. Invited paper presentation to the ETIC Working Group on Telecommunications, University of Quebec at Montreal, Montreal, April 17, 2003.

2002 The Politics of Global Media Reform, 1907-1923 (co-authored with Robert Pike, Professor Emeritus, Queen's University) Paper presented to the Media History section of the International Association of Media and Communication Researchers, Barcelona, Spain, July 19-22.

2001 Wired Cities, Transnational Communication and the Reconfiguration of Geography and Borders. Paper presented at the *Border Crossings Conference*, National Autonomous University, Mexico City, Mexico, July 3- 5.

2001 Lost in cyberspace: Convergence, Consolidation and Power in the Canadian Mediascape. Keynote Addresss at the Annual Conference of the Communication, Energy and Paperworkers union, Edmonton, Alberta, March 30th.

2001Netscapes of power: Convergence, network design, walled gardens and other strategies of control in the information society. Paper presented to the *Surveillance, risk and social categorization* conference, Queen's University, Kingston, May 3-5, 2001.

2001 Cyberspace redesign, 2.0: Regulating and shaping the future of the Net. Paper presented at the Union for Democratic Communication's *Democratic Communication in a Branded World* conference, Carleton University, Ottawa, May 17-19, 2001.

2001 Cyberspace redesign, 2.0: Regulating and shaping the future of the Net. Paper presented at the Canadian Communication Association Annual Conference, Quebec City, May 27-30, 2001.

2000 Telecommunications, new media and global governance. Keynote Address to the British Columbia Library Association Conference on Information Policy, *Globalization, media and cultural diversity*, April 7-10.

2000 Controlling designs: Media architectures, markets and the regulation of information abundance. Paper presented at the International Association of Mass Communications Researchers, Singapore, July 18-21st, 2000.

1999 Illusions of perfect information and fantasies of control in the information society. Paper presented at the Citizens at the Cross-roads: Whose Information Society Conference, University of Western Ontario, London, Ontario, October 22, 1999.

1999 Illusions of perfect information and fantasies of control in the information society. Paper presented at the Union for Democratic Communication, University of Oregon, Eugene, Oregon, USA, October 15, 1999.

1999 The political economy of new and old media in an information society. Roundtable presentation at the Union for Democratic Communication, University of Oregon, Eugene, Oregon, USA, October 14, 1999.

1999 Discussant for the Globalization Team Roundtable, A Project on Trends and a Joint Initiative of the Policy Research Secretariat and the Social Science and Humanities Research Council, Ottawa, September 17, 1999.

1999 Communication, convergence and the crisis of democracy. Invited Public Lecture given at the Canadian Library Association Annual Conference, Toronto, Ontario, June 17.

1999 Monopoly's first moment in global electronic communication: From private monopoly to global media reform, circa 1860-1920 (co-authored with Dr. Robert Pike). Paper presented at the Canadian Historical Association Conference, Sherbrooke Quebec, June 7.

1998 Pursuing the holygrail: Information highways and media reconvergence in Britain and Canada. Paper presented to the Communication, Technology and Policy section of the International Association of Mass Communication Researchers in Glasgow, Scotland, July 26-30.

1998 Pursuing the holy grail: Information highways and media reconvergence in Canada. Paper presented at the Canadian Communication Association's Annual Conference, Communication, the Public Good and Civic Culture, May 31 to June 3.

1996 Canadian telecommunications: A history and political economy of media reconvergence. Paper presented to Political Economy section of the International Association of Mass Communication Researchers, Sydney, Australia, August 18-22.

1994 From UNESCO and the ITU to NAFTA and GATT: International trading regimes in communication as validation of the U.S., U.K and Singapore's decisions to withdraw from UNESCO. Paper presented to the 6th Annual Macbride Roundtable at the University of Hawaii, Monoa, January 20-23.

1994 Cuthbert, M. & Winseck, D. Normative considerations in international communication policy. Paper presented to the 11th Intercultural and International Communication Conference. University of Miami, School of Communication, February 3-5.

1994 Prospects for global communication equity after GATT. Invited paper for the International Law and Policy section of the International Association of Mass Communication Researchers, Seoul, Korea, July, 1994.

WORK IN PROGRESS

Director, the Canadian Media Concentration Research Project, School of Journalism and Communication, Carleton University, Ottawa, Canada < cmcrp.org >

Wilkinson, S. & Winseck, D. Whither Journalism? Crisis or Wrenching Change in Journalistic Work in Canada? Paper submitted to *Journalism Studies* for review (author split 70/30).

GRADUATE SUPERVISIONS

Current: 2 MA, 2 Ph.D. MA Supervisions completed since 2009: 11

Ph.D. Supervisions: 2 Ph.D. External examiner: 9

PUBLIC/POPULAR MEDIA CONTRIBUTIONS Video:

- BNN (November 23, 2017). Why Canadian telecoms may pressure Ottawa after US repeals Net Neutrality.
- BNN (April 20, 2017). CRTC rules in favour of net-neutrality.
- CBC Network News (February 15, 2017). Telecom takeover: regulators approve BCE's $3.1B takeover of MTS.
- CTV News (December 22, 2016). CRTC declares broadband internet a basic service.
- CMCR Oral Presentation to CRTC Hearing on Whether Affordable Broadband Internet should be available to all Canadians (April 11, 2016)
- BNN News (January 29, 2015). Implications of CRTC New Rules.
- CTV News (October 6, 2014). $316M Postmedia deal: Can both brands survive?
- Global News (September 23, 2014). Shaw Media announces proposal for 24-hour channel Global News 1.
- Brownell, C. (September 20, 2014). It's the hottest drama on TV: the CRTC clashes with the online future. *Financial Post*.
- CTV National News (September 10, 2014). Future of Television.
- Global TV (September 9, 2014). Impact of CRTC Let's Talk TV Discussions.
- Debate between Jeffrey Church, Martin Masse and Dwayne Winseck - How Competitive is Canada's Telecom Sector? International Institute of Communication Annual

Conference, November 18, 2013, Ottawa Congress Centre, Ottawa, Canada. http://www.cpac.ca/en/programs/public-record/episodes/28624782/

- Interview with Dwayne Winseck on the CBC's Lang and O'Leary show, August 17, 2012. http://www.youtube.com/watch?feature=player_embedded&v=_V- XTHluIks
- *Unlawful Access: Canadian Experts on the State of Cyber-Surveillance* Video co-produced by the Digitally Mediated Surveillance (DMS, Queens University) research project and the New Transparency project (University of Toronto) (2011). http://vimeo.com/29208533

Audio:

- Catherine Tait appointed as new CEO/President of CBC. *CBC Radio– Saskatchewan* (April 4, 2018).
- Netflix losing customers. CBC business reporter Kate MacNamara (July 19, 2016).
- A more accessible internet for Canadians? Policy Options Podcast #10 with Alex Shadeed, Institute for Research and Public Policy**.** (May 3, 2016).
- Whither journalism in Canada? Interview with Marc Mongomery, RCInet (March 2, 2016).
- Expert testimony to Canadian Heritage Parliamentary Committee study of the media and local communities (@ 9 hr 9min 30 secs)(February 25, 2016).
- Postmedia Combine News Rooms in Cities across Canada. CBC Ottawa Morning with Robyn Bresnahan (January 20, 2016).
- Impact of combining Postmedia and Sun Newspaper Operations in Ottawa and other Cities Across Canada. Interview with Ed Hand at 1310 AM Ottawa (January 20, 2016).
- Corus Acquires Shaw Media. Interview with CBC Radio Vancouver (January 13, 2016).
- All in a Day with Paul Haarvardsrud + Allan Neil. CBC (November 10, 2015).
- Federal Election 2015: Scrutinizing newspaper political endorsements. CBC's The Current (October 9, 2015).
- Interview with CBC's As it Happens on Bell Media president's intervention in CTV, BNN news coverage (March 25, 2015).
- Interview with Radio Canada International's Marc Montgomery. Media Concentration in Canada: new study provides facts (January 6, 2015).

- Interview with CBC Montreal's Shawn Apel on Netflix vs. CRTC over the question of confidential information and possible regulation of OTT Television (September 24, 2014).

- Professor Dwayne Winseck delivers a blistering indictment of Bell, Rogers, and Telus: it's an attack that may have gotten him briefly kicked off Twitter. Interview with Jesse Brown at *CanadaLand* (December 2, 2013). http://canadalandshow.com/wireless-wars/

- Canadian Wireless Telecommunications Association (CWTA) President and CEO Bernard Lord Debates State of Canada's Mobile Wireless Market with CMCR Project Director Dwayne Winseck. 1310 News Ottawa (Rogers). November 27, 2013. Waiting for Audio clip.
- Throne Speech announces cable unbundling/pick-and-pay model for cable tv. CBC morning radio (Halifax, Kitchener-Waterloo, Guelph, Cornerbrook, Yellowknife, Winnipeg, Saskatoon, Sudbury, Kamloops, Victoria). Audio clip from CBC Saskatoon http://www.cbc.ca/player/News/ID/2412767986/
- What does Bell Canada's bid to takeover Astral Media mean for consumers? *The Current*, September 12, 2012. http://www.cbc.ca/thecurrent/episode/2012/09/12/what-does-bell- canadas-bid-to-take-over-astral-media-mean-for-consumers/

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- Jackson, E. (April 9, 2018). Corus defends strategy despite stock price woes. *National Post.*
- Cain, P. (April 5, 2018). Canada flagged Facebook's third-party app privacy problem way back in 2009. *Global TV*.
- Newton, C. (Dec. 15, 2017). What is net neutrality and why it matters, *Al Jazeera*.
- Armiak, D. (July 6, 2017). New Study Undercuts Trump FCC Chair's Justification for Rolling Back Net Neutrality.
- McCarthy, K. (July 3, 2017). America's net neutrality rage hits academia: Corporate shill allegations spark furious response. *The Register*.
- Jackson, E. (June 27, 2017). Rogers and Telus step up wireless promotions to counter serious threat from Freedom Mobile. *National Post*.
- Krashinsky Robertson, S. (June 15, 2017). Report details recommendations for sustainable funding of Canadian media. *Globe and Mail*.

- Brousseau-Pouliot, V. (June 14, 201y7). Les dates importantes du Regne de Jean-Pierre Blais: Un mandat pro-consommateur. La Presse+
- Klym, N. (May 18, 2017). Jean-Pierre Blais at MIT. Internet Policy Research Initiative at the *MITBlog*.
- Internet Society of Canada (May 9, 2017). Net-heads rejoice!: The Canadian branch of the Internet Society salutes the CRTC's Internet Policy Decision. *Internet Society Canada* blog.
- Layton, R. (May 1, 2017). What Canadians Should Know About The CRTC's Internet Decision. *Huffington Post.*
- Jackson, E. (April 28, 2017). Why Canada is dragging its feet on the next spectrum auction while demand keeps growing. *Financial Post*.
- McCarthy, K. (April 25, 2017). A very Canadian approach: how net neutrality rules reflect a country's true nature. The *Register*.
- Marowitz, R. (April 18, 2017). Transcontinental puts newspapers in Quebec and Ontario up for sale. *Globe and Mail* (Canadian Press).
- Watson, H. G. (March 6, 2017). The Canadian newspaper industry is getting a new jolt of life. *Editor and Publisher*.
- Selley, C. (February 26, 2017). Conservatives at war with conservatism on display at Manning Centre conference. *National Post*.
- Evelyn, C. (February 25, 2017). CBC 'dimmer star' in media landscape, conservative event hears. *The Wire Report* (paywalled)
- O'Malley, K. (February 24, 2017). Manning Manifests: CBC a prime target as conference winds down. *Macleans*.
- Britneff, B. (February 14, 2017). Liberal MPs grill Competition Bureau over Postmedia-Sun deal. *iPolitics*.
- Britneff, B. (February 12, 2017). Public Policy Forum report on media crisis 'flawed': professor. *iPolitics*.
- Horgan, C. (February 1, 2017). The cost of journalism. *Article Magazine*.
- Watson, H. G. (January 26, 2017). Six key takeaways from the Public Policy Forum's report on media. *J-Source*.
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- Brousseau-Pouliot, V. (December 22, 2016) Le CRTC vise l'accès à la haute vitesse pour tous. *La Presse+*
- Morrison, I. (December 6, 2016). Local media and the democracy deficit. *Policy Options*.
- Klass, B. (November 29, 2016). Once Manitoba Telecom Services sold, there's no hitting 'redial'. *Winnipeg Free Press*.
- Wood, E. (November 22, 2016). Google and Facebook receive almost two-thirds of online ad revenue, study finds. *Itbusiness.ca.*
- Jackson, E. (October 31, 2016). Telecoms, consumer advocates face off over Internet data pricing and date usage caps. *Financial Post*.
- Dobby, C. (October 30, 2016). CRTC to review differential pricing practices on Internet service. *Globe & Mail*.
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- Nowak, P. (October 14, 2016). Trump hires Bell, Telus consultant for advice. *Alphabeatic*.
- Evelyn, C. (June 23, 2016). 'Separate silo' approach to regulation wrong- footed in internet age: report. *The Wire Report*.
- Chung, E. (June 2, 2016). Google, Canadian media outlets launch AMP websites. *CBC News*.
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- Jackson, E. (May 19, 2016). They're right on our doorstep: SaskTel orders risk report after Bell buys MTS. *Financial Post*.
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- Libin, Kevin (April 4, 2016). The ugly side of skinny cable: Why the CRTC got this file wrong again. *Financial Post*.

- Harris, S. (March 3, 2016). $25 'skinny' TV packages called a 'ripoff' as industry 'stares down' CRTC. *CBC*.
- Abma, S. (March 1, 2016). Will 'skinny packages' tempt cable customers to stay connected? CBC.
- White, A. (March 1, 2016). Canada takes first step in national fight against cord cutting. *Paste Magazine*.
- Vlessing, E. (February 29, 2016). Canada's Great Cable Unbundling. *The Hollywood Reporter*.
- Watson, H. G. (February 29, 2016). Media concentration in Canada climbs as news rooms shrink. *J-Source.*
- Reynolds, C. (February 29, 2016). Bell's TV starter package is now only $25 -- but will anyone want it? *Toronto Star*.
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- Shaw, G. (November 24, 2015). Netflix, shomi, Crave TV: Choosing the streaming service that best for you. *Financial Post*.
- Harris, M. (November 12, 2015). Citizen Shame: Politics, Paul Godfrey and Postmedia's humiliation. *iPolitics*.
- Tencer, D. (November 10, 2015). Canada's Newspapers Were In The Tank For Harper, Media Analysis Finds. Huffington Post.
- Barber, J. (November 1, 2015). Election deals blow to Canada's dominant press group. *The Guardian*.

- McGee, C. (October 21, 2015). Do editorial endorsements matter? Ryerson Review of Journalism.
- Buckler, G. (July 8, 2015). Does Media Ownership Matter. Canadian Journalists for Freedom of Expression.
- Desjardins, L. (March 25, 2015). Corporation executive interferes in news coverage. Radio-Canada International.
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- Nowak, P. (February 11, 2015). Canada's looming streaming video showdown. *Canadian Business*.
- Myers, C. (2014-2015). The Business of Media. Canadian Media Directors Council. Toronto: Rogers.
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- Montgomery, M. (January 6, 2015). Media concentration in Canada: new study provides facts. Radio-Canada International.
- Mills, C. (November 17, 2014). TC Media sells 15 consumer magazines to TVA, including *Canadian Living* and *The Hockey News*. J-Source.ca.
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Columns

- Winseck, D. (March 3, 2017). The CBC's role in the 'Internet Age'. *Poicy Options*.
- Winseck, D. (July 1, 2016). Modular media: A radical communication and cultural policy for Canada. Canadian Centre for Policy Alternatives: The Monitor. https://www.policyalternatives.ca/publications/monitor/modular- media.
- Winseck, D. & Klass, M. (May 18, 2016). MTS deal would set a harmful precedent for wireless competition. *Globe and Mail*.
- Winseck, D. (May 17, 2016). Why Bell's bid to buy MTS is bad news. *Policy Options*.

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- Winseck, D. (November 3, 2015). Canadian newspaper editorial election endorsements: elite and out of sync. *Policy Options.*
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Public Lectures and Workshops:

- Media and Internet Concentration in Canada, 1984-2016. National University of Quilmes, Buenos Aires, Argentina, November 28, 2016.
- Workshop on Media Industries Research Methods. National University of Quilmes, Buenos Aires, Argentina, November 23, 2016.
- Common Carriage and Cultural Policy for an Internet- and Mobile Wireless-Centric World. Public talk to the Facultad de Ciencias Sociales, Universidad de la Republica, Uruguay. Constituyente 1502 Montevideo, November 22, 2016.
- A Political Economy of Communication for an Evermore Internet- and Mobile Wireless-Centric World. Presentation to the School of Journalism and Communication, Fudan University, Shanghai, China, November 10, 2016.

- A Political Economy of Communication for an Evermore Internet- and Mobile Wireless-Centric World. Presentation to the Academy for International Communication of Chinese Culture, Beijing Normal University, Beijing, China, October 27, 2016.
- Communication and Empire: Media, Markets, Power and Globalization, circa the late-19th and early-20th Centuries – Implications for Today? Presentation to the Academy for International Communication of Chinese Culture, Beijing Normal University, Beijing, China, October 27, 2016.
- State of Media and Internet Concentration in Canada, 1984 - 2014 @ University of Ottawa, Desmarais Building, Room 1140, November 1, 2015. Hosted by Professor Daniel Pare https://www.dropbox.com/s/6c4lvs5rgz9wfp1/Winseck%20UO%20A nnouncement.pdf
- Mobile Wireless in Canada: Recognizing the Problems and Approaching Solutions. PPT Slides for Presentation to Panel on How Competitive is Canada's Telecom Sector at the International Institute of Communication Annual Conference, November 18, 2013, Ottawa Congress Centre, Ottawa, Canada.
- State of Media and Internet Concentration in Canada, 1984 - 2011 @ University of Ottawa, Desmarais Building, Room 1140, February 13, 2013. Hosted by Professor Daniel Pare https://www.dropbox.com/s/6c4lvs5rgz9wfp1/Winseck%20UO%20A nnouncement.pdf

UNPUBLISHED WORK:

1993: A study of the (de) regulatory process in Canadian telecommunication: Labour struggles and the public interest. Ph.D. Dissertation, University of Oregon, Eugene, Oregon.

1989 Towards a new satellite regulatory regime: Is there equity in the global village? Masters Thesis, University of Windsor, Ontario.

GRANTS

2012 Social Sciences and Humanities Research Council Insight Grant for "Canadian Media Concentration Research Project" ($234,523).

2006 Dean of Faculty of Public Affairs and Vice-President Research and International Award in Support of SSHRC Category 4A Applicants for the project: Communication and the Crisis of Globalism, 1860-1930 ($10,000).

2004 Faculty of Graduate Studies and Research Grant, Carleton University, for research project entitled, "Communication and Empire" ($4,500).

2000 Social Sciences and Humanities Research Council for the project:

Electronic empires and wired worlds: Electronic media and the foundations of globalization, circa 1860-1920 (Co-researcher: Dr. Robert Pike) ($78,500).

1999 Faculty of Graduate Studies and Research Grant, Carleton University, for research project entitled, "Electronic Media and the Foundations of Globalization" ($5,000).

1998 Faculty of Graduate Studies and Research Grant, Carleton University, for research project entitled, "Electronic Media and the Foundations of Globalization" ($5,000).

1997 Faculty of Social Sciences Grant, University of Leicester, for research on Canadian telecommunications ($4,800).

1996 Faculty of Social Sciences Grant, University of Leicester, for research on Canadian telecommunications ($3,600).

1993 School of Journalism and Communication Award for the Best Doctoral Dissertation, School of Journalism and Communication, University of Oregon, Eugene, Oregon.

1991 University of Oregon Merit Award, Graduate Studies, University of Oregon, Eugene, Oregon.

1991-4 Graduate Teaching Fellow. University of Oregon. Department of Telecommunication and Film, University of Oregon, Eugene, Oregon.

OTHER PROFESSIONAL ACCOMPLISHMENTS

2017 The State of the increasingly internet- and mobile wireless-centric media in Canada, 1984 – 2014. Paper to be presented to the 42nd Annual Congress of the Association of Quebec Economists, Gatineau, QC, May 18.

2017 The CBC's Place and Role in the Networked Media Universe. Presented at the Manning Centre Conference, Ottawa, Canada, February 25.

2016 Media and Internet Concentration in Canada, 1984 – 2014 and the Information, Communication and Media Needs of Canadians. Expert testimony to the Standing Parliamentary Committee on Canadian Heritage, Ottawa, Canada, February 25.

2015 Experts Panel for the Evaluation of the Canadian Periodical Fund, Ministry of Canadian Heritage.

2014 Guest instructor at Centre for Communication, Media and Information Technologies' Summer School, Aalborg University, Copenhagen, Denmark, August 19-24.

2013 Expert Witness. Written brief and testimony for the Public Interest Advocacy Centre in the matter of Bell Canada Enterprise's Second Bid to Purchase Astral Media Hearings before the Canadian Radio-television and Telecommunications Commission, Montreal, Quebec, May 2013.

2012 Expert Witness. Written brief and testimony for the Public Interest Advocacy Centre in the matter of Bell Canada Enterprise's Bid to Purchase Astral Media Hearings before the Canadian Radio-television and Telecommunications Commission, Montreal, Quebec, September 2012.

PROFESSIONAL MEMBERSHIPS:

International Association of Mass Communication Researchers. Canadian Communication Association International Studies Association

SERVICE:

2018 Member of the advisory search committee for the selection of new Associate Dean, Students and Enrolment.

2017-Present Faculty Board, Kroeger College Representative 2017-Present Editorial Board Member, *The Information Society*. 2016-Present Faculty of Public Affairs Public Commentary Adjudication

Committee. 2016-Present CCA/CRTC Student Prize Adjudication Committee

2016 Speakers' Series Coordinator, School of Journalism and Communication.

2016 Hiring Committee, School of Journalism and Communication, Carleton University

2015 Faculty of Public Affairs Public Commentary Adjudication Committee.

2015 Undergraduate Curriculum Review Committee.

2015 Academic oversight committee for the SSHRC supported Community Media Convergence Policy Working Group.

2015 Speakers' Series C-coordinator (with Merlyna Lim), School of Journalism and Communication.

2014 Tenure and Promotions Committee, School of Journalism and Communication

2013-Present Editorial Board Member. *Journal of the Political Economy of Communication*.

2012-Present Editorial Board Member. *Canadian Journal of Communication*

2011-2012 Elected member of the Board of Directors, the National Press Club Foundation of Canada.

2011-Present Editorial Board Member, *tripleC (cognition, communication, co-operation): Journal for a Global Sustainable Information Society*.

2010 Hiring Committee, School of Journalism and Communication, Carleton University

2007-Present Editorial Board Member, *Compass (Sociology*

2006-Present *)* Editorial Board Member, *Global Media Studies Journal*

2007 Hiring Committee, School of Journalism and Communication, Carleton University

2006-Present Member of the Ontario Graduate Scholarship Selection Committee

2005/6 Member of the Computing and Computing Services Advisory Committee, Public Affairs and Management.

2005/6 Tenure and Promotion Review Committee (Representing Institute of Political Economy).

2000 to Present Research Grant Application Reviewer for Social Sciences and Humanities Research Council (Canada).

1997 to Present Reviewer for *Media, Culture and Society*, *Global Media and Communication*, *Global Media Journal*, *Journal of Information Technology and Law*, *Journal of International Communication*, *Canadian Journal of Communication*, *Media History*, *Gazette: International Journal of* Communication; *European Journal of Communication*.

1999 to 2002 Member of the Manor Park and Hopewell Public School Councils and Representative to the Ottawa Carleton School Board

1998 to 2003 JCAS Committee Member, Carleton University

1998 to 1999 Hiring Committee, School of Journalism and Communication, Carleton University

1998 to 2003 Graduate School Admittance Committee, School of Journalism and Communication, Carleton University

1998 to 2000 Consultant to the MA in Mass Communication by Distance Learning offered by the Centre for Mass Communication Research, Leicester University.

1997 to 1998 External Examiner for Mass Communications, Bath College of Higher Education, Bath, UK.

1994 to 1996 Reviewer for the *Journal of Broadcasting and Electronic Media*.

1994/5 Advisor to Student Radio at Eastern Mediterranean University.

08/ 1994- 1995 Department Head, Department of Communication and Media Studies, Eastern Mediterranean University, Gazi Magusa,TRNC, via Mersin 10, TURKEY.

Responsibilities included:

Design and implement communication and media studies program.

03/1991-06/1993 Editorial advisor, *Studies in communication and culture*, University of Oregon, Eugene, Oregon.

Responsibilities included:

Solicit articles for publication, decide journal format and review and edit submissions for the journal.

06/1987-09/1988 Public Liaison Officer, Windsor's Olde Towne, Windsor, Ontario

Responsibilities included:

Preparing promotional and information brochures Direct public and government fund-raising Survey available federal, provincial and municipal funding opportunities Prepare presentations to city council and news releases.

REFERENCES:

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