COMPETITION TRIBUNAL
TRIBUNAL DE LA CONCURRENCE

FILED / PRODUIT
Date: September 26, 2022
CT- 2022-002

Sara Pelletier for / pour
REGISTRAR / REGISTRAIRE

OTTAWA, ONT. | Doc. # 288

CT-2022-002

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c. C-34;

AND IN THE MATTER OF the proposed acquisition by Rogers Communications Inc. of Shaw Communications Inc.;

AND IN THE MATTER OF an application by the Commissioner of Competition for one or more orders pursuant to section 92 of the *Competition Act*.

B E T W E E N :

COMMISSIONER OF COMPETITION

Applicant

- and -

ROGERS COMMUNICATIONS INC. AND SHAW COMMUNICATIONS INC.

Respondents

- and -

ATTORNEY GENERAL OF ALBERTA AND VIDEOTRON LTD.

Intervenors

WITNESS STATEMENT OF NATHAN H. MILLER

---

1. My name is Nathan H. Miller. I am a Professor at Georgetown University, in Washington, DC, with a joint appointment in the McDonough School of Business and the Department of Economics. I earned my Ph.D. in Economics from the University of California at Berkeley in 2008. I have served as a Visiting Professor at Toulouse School of Economics in 2019 and 2020. Prior to joining Georgetown University in 2013, I served as a Staff Economist at the U.S. Department of Justice from 2008-2013.

2. My area of expertise is in the field of Industrial Organization, which is the area of economics that addresses the behavior of firms, industries, and their markets.

Within that field I have specialized in antitrust economics, with a recent focus on collusion and the competitive effects of mergers. I have taught graduate level courses on Microeconomics, Industrial Organization, Firm Analysis and Strategy, and Strategic Pricing. My research has been published in leading economics journals, including the *American Economic Review*, *Econometrica*, and the *RAND Journal of Economics*, among others. I am an editor at the Journal of Law and Economics and am on the editorial boards of the *Review of Industrial Organization* and the *International Journal of Industrial Organization*.

3. In addition to my academic work in the area of antitrust economics, I have provided economic analysis for antitrust litigation matters. I served as a staff economist at the U.S. Department of Justice (DOJ), where I received an Award of Distinction for my work on a high-profile merger review. As a staff economist for the DOJ, I analyzed a number of merger matters across multiple industries, including Bazaarvoice/PowerReviews, AT&T/T-Mobile, and Ticketmaster/Live Nation. I have also analyzed the competitive effects of a merger on behalf of the merging parties, specifically the Express Scripts acquisition by Cigna. Finally, I have been retained by both the DOJ and Federal Trade Commission (FTC) as a testifying expert on several merger-related matters, and I worked with the Commissioner of Competition on the matter regarding Evonik Industries AG's acquisition of PeroxyChem Holding Company LLC, Parrish & Heimbecker, Limited's acquisition of certain grain elevators from Louis Dreyfus Company Canada ULC, and the merger between SECURE Energy Services Inc and Tervita Corporation. In the Parrish & Heimbecker, Limited and SECURE Energy Services Inc matters, I prepared reports and was qualified as an expert economic witness before the Competition Tribunal. Additional information on my qualifications is contained within my curriculum vitae attached as Exhibit B.

4. I have been asked by the Commissioner of Competition to prepare a report examining the likely effect on competition of the proposed acquisition by Rogers

Communications Inc. of Shaw Communications Inc. and other related matters specified in the report.

5. I attach as Exhibit “A” to this statement my report.

6. I attach as Exhibit “B” to this statement my curriculum vitae.

7. I attach as Exhibit “C” to this statement an Acknowledgement of Expert Witness.

8. I attach as Exhibit “D” to this statement a list of documents relied upon.

Signed this 21st day of September, 2022.

Nathan H. Miller

EXHIBIT A

THE COMPETITION TRIBUNAL

IN THE MATTER OF *the Competition Act*, R.S.C. 1985, c.C-34;

AND IN THE MATTER OF the proposed acquisition of Shaw Communications Inc. by Rogers Communications Inc.;

AND IN THE MATTER OF an Application by the Commissioner of Competition for an order pursuant to section 92 of the *Competition Act*;

BETWEEN:

COMMISSIONER OF COMPETITION
Applicant

- and -

ROGERS COMMUNICATIONS INC.
SHAW COMMUNICATIONS INC.
Respondents

- and -

ATTORNEY GENERAL OF ALBERTA AND VIDEOTRON LTD.
Intervenors

EXPERT REPORT OF NATHAN H. MILLER

September 21, 2022

Table of contents

1. Qualifications

1. My qualifications are included in the statement to which this expert report is attached and the appended curriculum vitae.[1]

2. Background and assignment

2. Rogers Communications Inc. (hereafter, "Rogers") is one of the largest telecommunication and media companies operating in Canada. Rogers offers mobile wireless telecommunication services, wireline telecommunication services, and media content.[2] Rogers' total revenue in 2020 was roughly $13.9 billion, of which about $8.5 billion was from mobile wireless services.[3]

3. Shaw Communications, Inc. (hereafter, "Shaw," and collectively with Rogers "the parties") is a Canadian telecommunication company offering mobile wireless telecommunication services, wireline telecommunication services, and satellite video.[4] Shaw's total revenue in 2021 was $5.5 billion, of which about $1.3 billion was from mobile wireless services.[5]

4. [redacted]

5. [redacted] The divestiture proposal was finalized by Rogers, Shaw,

[1] Witness Statement of Nathan H. Miller, September 21, 2022.
[2] Rogers Communications Inc., "2020 Annual Report," March 5, 2021 ("Rogers 2020 Annual Report"), p. 28.
[3] All dollar amounts in Canadian dollars. Rogers 2020 Annual Report, p. 25.
[4] Shaw Communications, Inc., "2021 Annual Report," October 29, 2021 ("Shaw 2021 Annual Report"), p. 8.
[5] Shaw 2021 Annual Report, pp. 10, 16.
[6] Letter from [redacted] p. 5.
[7] Letter from [redacted] p. 1.

and Quebecor on August 12, 2022 ("Videotron divesture proposal" or "divestiture proposal").[8]

6. I was asked by counsel for the Commissioner of Competition to prepare a report assessing the likely effects on competition of the proposed acquisition. In assessing those effects, if any, I was asked to the extent possible to quantify the anti-competitive effects, identify those effects which cannot be adequately or completely quantified and to describe any likely qualitative anti-competitive effects of the acquisition.

7. I was also asked to evaluate, based on available information, the effectiveness of the Videotron divesture proposal in addressing the anti-competitive effects that I identified from the proposed acquisition. I understand from counsel that the receipt and review of materials on the proposed divestiture is ongoing and hence that any conclusions reached may have to be updated when more of the relevant information has been obtained and provided to me.

8. I was asked by counsel not to rely on Comlink data in forming an overall opinion concerning the likelihood of any anti-competitive effects, but to consider that data separately. As a result, I have segregated my analysis so that any consideration, observation, or opinion based on such data is independent from analysis and conclusions based on other data available to me.

9. On May 6, 2022, at the request of counsel, I completed an expert report which was filed in the context of the proceedings related to the Application by the Commissioner of Competition for an interim order pursuant to section 104 of the Competition Act.[9]

[8] Share Purchase Agreement, Videotron Ltd., and Quebecor Inc., and Rogers Communications Inc., and Shaw Communications Inc., and Shaw Telecom Inc., and Freedom Mobile Inc., August 12, 2022 ("Share Purchase Agreement"), Title Page.

[9] Affidavit of Nathan H. Miller (Affirmed May 6, 2022), Exhibit A – Expert Report of Nathan H. Miller.

3. Summary of opinions

10. In this report, I will address the following issues and offer the following opinions:

- The merger affects an industry, wireless communications, that has a historic and regulatory context in Canada that suggests competitors such as Shaw have played a significant role in bringing consumers better terms and higher utilization of mobile phones. (**Section 4)**

- The merger presents all of the indicia that harm to consumers is likely from a loss of competition in a well-defined market. (**Section 5)** Specifically,

    - Mobile wireless services offered to consumers in Alberta, British Columbia, and Ontario are well-defined markets for analyzing competitive effects. (**Section 5.1**)

    - These relevant markets have barriers to entry that make them susceptible to competitive effects. (**Section 5.2**)

    - Rogers and Shaw have significant share, particularly as indicated by the share of customers seen to be actively participating in the market at a given time, and their combined market share would exceed [redacted] percent in Alberta, British Columbia, and Ontario. (**Section 5.3**)

    - The environment of close competition indicated by these shares is also reflected in the history of competition between Rogers and Shaw in these markets, as demonstrated by their internal documents and by data on the frequency with which customers transfer between their brands. (**Section 5.4**)

- Economic analyses of the competitive effects of the proposed merger demonstrate that the loss of competition between Rogers and Shaw is

likely to be significantly adverse to consumers in Alberta, British Columbia, and Ontario. (**Section 6**)

- Event studies of Shaw's aggressive competitive offerings demonstrate that Shaw has led the market to offer significantly more attractive terms to consumers. (**Section 6.1**)

- A quantitative model of competitive incentives in these markets predicts market-wide price increases ranging from 6.9 percent to 10 percent inducing an increased loss of efficiency to the Canadian economy (the "deadweight loss" of market power) of over $320 million per year. The increased prices also constitute a transfer of wealth from consumers in these markets to mobile wireless carriers predicted to exceed $580 million dollars per year. (**Section 6.2**)

- The quantification model understates overall effects of the proposed merger as certain effects cannot be quantified to a reasonable degree of accuracy based on the information available to me. These include lost future competition for customers that Shaw does not presently serve, but which would have been likely to see expansion of Shaw's competitive presence in the near future. The quantification also does not include the prospect that Shaw's loss as a disruptive competitive force in these markets may result in more cooperative and less competitive interactions among Rogers, Bell, and Telus. (**Section 6.3**)

- The proposed divestiture of Freedom Mobile to Videotron leaves competitive harm unaddressed and creates incentives that make coordination more likely. (**Section 7**)

  - A lower-bound estimate of quantifiable harms from the proposed acquisition of Shaw with a divestiture of Freedom Mobile predicts a deadweight loss of $42 million per year and a transfer of wealth from consumers in these markets to mobile wireless carriers of $63 million per year. (**Section 7.1**)

  - The estimate is a lower bound of the quantifiable harms because it assumes the divestiture can perfectly transfer incentives and

ability to compete from Shaw to Videotron. Yet, the terms of the divestiture leave the Freedom product with an owner that, relative to Shaw, will have reduced incentives and ability to compete aggressively and reduced incentives to invest in the product's ability to compete with Rogers. Consequently, there is an unquantifiable element of this harm that would also be unaddressed. Moreover, the same unquantifiable harms of Rogers' acquisition of Shaw are still present and unaddressed by the proposed remedy. (**Section 7.2**)

- Videotron is not likely to recreate the incentive to compete in wireless markets that derives from Shaw Mobile's wireless-wireline bundled products. [redacted] Even Rogers, which I assume in my lower-bound estimate will inherit this incentive, has indicated it is less likely to pursue it. (**Section 7.3**)

- Moreover, the divestiture proposal makes more likely coordination that would lessen competition from Videotron more broadly. It creates incentives that would make coordination between New Freedom and New Rogers more likely. In addition, it creates incentives for Videotron to go along with any coordination occurring among Roger, Telus, or Bell making it less likely to disrupt coordination attempts among them. (**Section 7.4**)

4. Context of competition in the Canadian wireless industry

4.1. Overview of wireless services and service providers available to Canadian consumers

11. In what follows I offer an overview of the services that Canadian consumers purchase to satisfy their mobile communication needs and of the firms that offer these services to Canadian consumers.

12. Canadian consumers typically access a carrier's cellular network with a mobile device on a subscription basis to place phone calls, exchange texts, and consume (i.e., download and upload) data.[10] While technically they could purchase voice, text, and data services separately from different providers, in practice they purchase them as a bundle through a subscription known colloquially as a "plan."[11]

13. A mobile wireless plan specifies, among other terms, the amount of voice minutes, the amount of text, and an allocation of data (measured in megabytes or gigabytes) that the consumer can use in a month in exchange for a payment. Carriers offer a variety of plans at different price points that come with more or less generous allocations for voice, text, and data. The plans currently offered by Canadian carriers typically offer unlimited voice and text, but different data allocations.[12]

14. Consumers are billed for the services they purchase on a postpaid or prepaid basis. Subscribers with postpaid plans receive a bill each month for the services they consumed in the prior month. Subscribers with prepaid plans pay for their plan services in advance.[13] Most Canadian consumers subscribe to postpaid plans.[14] Postpaid plans may have a fixed term (typically two years, and sometimes three years) or no term.[15] Prepaid plans do not have a pre-specified

[10] Rogers 2020 Annual Report, p. 28; Canadian Radio-television and Telecommunications Commission, "Telecom Regulatory Policy CRTC 2021-130," April 15, 2021 ("CRTC April 2021 Decision"), ¶ 41.

[11] CRTC April 2021 Decision, ¶ 41; Shaw 2021 Annual Report, p. 16.

[12] CRTC April 2021 Decision, ¶¶ 530, 535. Data allocation refers to the amount of data users are allowed to consume based on the terms of their plan; CRTC April 2021 Decision, ¶ 529; When consumers exceed their allocation they may incur additional charges or experience reductions in download speeds depending on the conditions of their plans; CRTC April 2021 Decision, ¶¶ 508, 523. See, for example, Rogers Communications, Inc., "Rogers Infinite Plans," available at https://www.rogers.com/plans.

[13] Canadian Radio-television and Telecommunications Commission, "Postpaid versus prepaid services," available at https://crtc.gc.ca/eng/phone/mobile/prepay.htm.

[14] See for example CRTC April 2021 Decision, ¶ 534 ("According to the 2019 *Communications Monitoring Report*, in 2018 over 88 percent of mobile wireless service subscribers were on a postpaid plan, in comparison to about 12 percent on a prepaid plan, a proportion that has increased from about 83 percent in 2013.").

[15] For example, [redacted] The CRTC attempted to prevent the wireless companies from offering three-year terms, but carriers continued to offer three-year terms in some circumstances. The CRTC reviewed these plans in a recent proceeding and found that "…device financing plans with terms longer than 24 months are not compliant with sections G.1. and G.2. of the Wireless Code. However, in light of the significant debate on the record and the complexity of the analysis required to provide clarification to parties as to whether and in what manner the Wireless Code applies to device financing plans, the Commission declines to make a specific finding of violation in this instance." Canadian Radio-television and Telecommunications Commission, "Telecom Decision CRTC 2021-98," March 4, 2021, available at https://crtc.gc.ca/eng/archive/2021/2021-98.htm, ¶ 62.

term.[16] Instead, the consumer pays in advance of the service provision, typically on a monthly basis.[17]

15. Plan pricing involves numerous components usually including a fixed fee, allocations of voice, text, and data, and consequences of exceeding the allocation (possibly reduced speed or service quality or a usage-based charge for the overage).[18] Other items tangentially related to wireless service might also appear on a consumer's monthly bill. For example, the consumer may also pay installments for her mobile device if she purchased it or financed it through the carrier at the time she subscribed to the plan.[19] [redacted] Average Revenue per User ("ARPU").[20]

16. Depending on the province or territory in which they will be primarily using mobile wireless services, Canadian consumers can choose between different sets of carriers to which they can subscribe. The ability of a carrier to offer service in a given location depends on whether that carrier has spectrum licenses and network infrastructure in place to serve that particular location.[21] Most Canadian consumers purchase mobile wireless service from three large national carriers that offer services throughout Canada. These carriers are Bell, Rogers, and Telus, and are known collectively as the "Big 3" of Canadian mobile wireless service.[22] In some parts of Canada, consumers can also purchase services from other providers that operate only in certain provinces, territories,

[16] See, for example, Rogers Communications, Inc., "Prepaid Plans - Talk, Text & Data Plans," available at https://www.rogers.com/plans/prepaid.

[17] See Canadian Radio-television and Telecommunications Commission, "Postpaid versus Prepaid Services," available at https://crtc.gc.ca/eng/phone/mobile/prepay.htm, "You have prepaid services when you top up your account to activate your services for the month."

[18] Canadian Radio-television and Telecommunications Commission, "Communications Monitoring Report," January 21, 2020, p. 142. For an example of reduced data speed after exceeding the data allocation, see Rogers Communications, Inc., "Rogers Infinite Plans," available at https://www.rogers.com/plans.

[19] Rogers Communications, Inc., "Phones," available at https://www.rogers.com/phones/?icid=R_WIR_JOR_WBOM11.

[20] Rogers 2020 Annual Report, p. 88; Shaw 2021 Annual Report, p. 38. For examples [redacted] See SJRB-CCB00356295 at pp. 2, 5; SJRB-CCB00361187 at p. 8; ROG00186819 at pp. 4, 23, 39; ROG00192359 at pp. 3, 11, 19, 29.

[21] When these assets are not deployed mobile devices cannot connect to that carrier network. See, for example, Shaw 2021 Annual Report, p. 32. Carriers can still offer service in these locations via roaming. For example, under roaming a Shaw customer can receive mobile wireless service, via another carrier, as long as Shaw has a roaming agreement with that carrier. See, for example, Shaw 2021 Annual Report, p. 53.

[22] Canadian Radio-television and Telecommunications Commission, "Annual highlights of the telecommunications sector 2020," December 15, 2021, p. 24.

or portions thereof. Some of these regional carriers include: Shaw (operating in Alberta, British Columbia, and Ontario), Videotron (operating in Quebec and Ottawa), and SaskTel (operating in Saskatchewan).[23]

17. The Big 3 carriers each offer mobile wireless services to consumers through the brands that they own. These are typically a premium brand (Bell Mobility, Rogers Wireless, and Telus Mobility), a flanker brand (Virgin Mobile, Fido, and Koodo Mobile), and a prepaid brand (Public Mobile, Chatr, and Lucky Mobile). In some places, a wireless carrier may also offer wireline communications services,[24] and in some of these cases the carrier may offer plans that bundle together wireline and wireless services.[25] In addition, carriers often provide service for other, non-phone devices (e.g., tablets), and mobile phone service to commercial/enterprise customers.[26] The plans offered for these services often have different data allocations and pricing terms than the consumer mobile phone plans that I described above.[27]

18. Carriers incur large operating and capital expenditures. As I mentioned above, carriers can offer service only if they have a license to use a band of radio frequency spectrum and network infrastructure assets in a given location. A mobile device in that location can connect over the air to a carrier's nearest antenna using the radio frequencies that carriers license from the Canadian government.[28] The antenna allows information to be transmitted over the carrier's network. Network infrastructure includes antennas, towers on which these antennas are placed, and infrastructure that connects the antennas to one another and to the telecommunications network more broadly.[29] Carriers incur

[23] SaskTel, "2020/21 Annual Report," June 29, 2021, p. 13; Shaw 2021 Annual Report, p. 113; Videotron, "Annual Information Form," March 30, 2021, p. 8.

[24] For example, Shaw and Telus offers both wireless and wireline services in British Columbia and Alberta. Rogers and Bell provide both wireless and wireline services in Ontario and parts of Atlantic Canada. See Shaw 2021 Annual Report, p. 13; Rogers 2020 Annual Report, p. 30 [redacted]

[25] Shaw 2021 Annual Report, p. 13; Telus Corporation, "Annual Report 2020," February 19, 2021, p. 48.

[26] See for example Rogers 2020 Annual Report, 28; Rogers Communications, Inc., "Rogers Infinite Plans," available at https://www.rogers.com/plans (referencing that Rogers Infinite plans allow data use on connected devices).

[27] See for example Rogers' menu of dedicated business wireless plans and pricing for adding smartwatches to a wireless plan. Rogers Communications, Inc., "Business wireless plans," available at https://www.rogers.com/business/wireless/plans; Rogers Communications, Inc., "Wireless Device Add-Ons: Apple Watch Series 7," available at https://www.rogers.com/consumer/wireless/apple-watch?icid=R_WIR_JOR_FFGAOY.

[28] Industry Canada, "CPC-2-1-23 – Licensing Procedure for Spectrum Licenses for Terrestrial Services," Section 3, available at https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01875.html.

[29] CRTC April 2021 Decision, ¶¶ 98, 206; Shaw 2021 Annual Report, p. 26.

large operating and capital expenditures to secure spectrum licenses; to operate, maintain, or expand the coverage and capacity of their network; and to update network equipment as mobile wireless technology standards evolve.[30] Carriers also sustain operating expenses to provide customer service, to operate stores in which consumers can purchase subscriptions and mobile devices, and to conduct advertising and promotional campaigns.[31]

19. Most of these expenditures are fixed rather than varying with the number of customers or the amount a customer uses the carrier's service.[32] However, a degree of variability might be reasonably assumed. For example, as the amount of network infrastructure in an area that is needed to provide a given level of service quality to users can be affected by the number of users in that area, it is customary to treat a portion of the network costs as if they were variable costs related to usage.[33] Even so, the wireless industry is generally characterized by high fixed costs and high margins.[34]

4.2. Wireless services prices are higher and data consumption is lower in Canada than in other developed countries likely as a result of insufficient competition among carriers

20. Company documents indicate that prices for mobile wireless services in Canada are among the highest in the world [redacted][35] Studies of wireless prices across countries have reached similar conclusions. For example, in a comparison of 29 countries, the U.S. Federal Communications Commission ranked Canada among those with

[30] CRTC April 2021 Decision, ¶¶ 96-99; Rogers 2020 Annual Report, pp. 38, 48.

[31] Rogers 2020 Annual Report, pp. 30-31; Shaw 2021 Annual Report, p. 62; [redacted]

[32] CRTC April 2021 Decision, ¶ 97.

[33] See, for example, Rogers 2020 Annual Report, p.71; SJRB-CCB00223356 at p. 4 [redacted] See ROG00206352 at pp. 3, 30.

[34] CRTC April 2021 Decision, ¶¶ 126-130.

[35] ROG00192359 at p. 3.

the highest prices for mobile data.[36] Similar findings have also been obtained in earlier studies.[37]

21. While I am not drawing any conclusions about the determinants of these cross-country differences, I understand that Canadian Radio-television and Telecommunications ("CRTC") has recently found that insufficient competition in Canada likely contributes to higher prices relative to other countries.[38]

22. CRTC further observed that a history of price differences between Canadian provinces suggests the importance of competition and particularly of competitors beyond the Big 3. I understand that they observed a historic pattern of lower prices in Manitoba, Quebec, and Saskatchewan—i.e., in provinces that had strong regional carriers competing alongside the Big 3—relative to other areas in Canada.[39] Recognizing that differences across provinces may reflect different demand and supply conditions and not just the effect of competition, the CRTC considered and rejected a number of such alternative explanations such as differences in the quality of networks, in flanker brand penetration, and in data usage levels.[40] The CRTC also observed that while pricing differences across Canadian provinces appear to have decreased in recent years, as of April 2021, competition was "not currently sufficient to discipline the market and protect the interests of consumers."[41]

23. In this respect, as well, Rogers' internal documents recognize a similar relationship between the competitiveness of prices in a province and the strength of a competitor beyond the Big 3. [redacted][42]

[36] Sixth Report Before the Federal Communications Commission, *In the Matter of International Comparison Requirements Pursuant to the Broadband Data Improvement Act*, February 2, 2018, available at https://docs.fcc.gov/public/attachments/DA-18-99A1.pdf, p. 90.

[37] CRTC April 2021 Decision, ¶¶ 118–119 for a discussion of these studies.

[38] CRTC April 2021 Decision, ¶ 122. See also CRTC April 2021 Decision, ¶ 120 ("The Commission acknowledges that there are challenges associated with the comparisons of retail prices across countries. In this regard, considerable debate occurred with regard to the validity or appropriateness of the methodologies and data used in studies cited in this proceeding. That being said, almost all international reports and studies that were submitted or referred to throughout this proceeding, despite using different methodologies and different datasets, pointed to similar conclusions and consistently reported higher retail prices in Canada.").

[39] CRTC April 2021 Decision, ¶¶ 131–132.

[40] CRTC April 2021 Decision, ¶ 135.

[41] CRTC April 2021 Decision, ¶¶ 124–125.

[42] ROG00192359 at p. 11.

[redacted][43]

24. While prices for wireless services in Canada have been high, data usage has been low relative to other developed countries. [redacted][44]

Exhibit 1

[redacted]

Source: ROG00141352 at p. 6

Note: [redacted]

25. These results suggest that Canadians are on the unfavorable end of a relationship that is seen across countries: Canadians face relatively high prices

[43] ROG00192359 at p. 12.

[44] ROG00646941 at p. 2; ROG00192359 at p. 3.

for mobile wireless service and make less use of their phones—particularly less use of mobile data. While I have not conducted an analysis of the determinants of these cross country differences, analyses I conducted for this affidavit confirm that competition does reduce prices for Canadian consumers and that they respond by increasing their data usage.[45] Taken together, these observations indicate that wireless communications services in Canada are vulnerable to a loss of competition from the proposed acquisition—that returning to competition only between the Big 3 would likely increase prices and likely lower consumption of wireless services, including data usage, to the detriment of Canadian consumers.

4.3. The three major wireless carriers attempt to signal each other to limit outbreaks of competitiveness among them

26. In this section, I examine whether the relatively high prices for wireless services experienced by consumers in Alberta, British Columbia, and Ontario may in part be the result of the Big 3 having been successful in coordinating their activity to soften any competition among them. Their pattern of behavior with respect to each other's promotions suggests that such coordination may be present among them in these three provinces.

27. Wireless carriers often use promotions as a tool to compete for customers. Company documents indicate that the Big 3 carriers monitor each other's pricing and promotions in the ordinary course of business.[46] When one carrier launches a new promotion, the other carriers routinely identify and track detailed information about it including the level of discounts offered, customer eligibility terms, geographic reach, and duration. I also understand that the Big 3 carriers may attempt to coordinate their offers by signaling a desired end date

[45] See Section 6.1 and 6.2.5.

[redacted] See ROG00655110. See also ROG00666010 [redacted] ROG00193299 [redacted] See SJRB-CCB00410822; ROG00575901 at pp. 54–62.

or other limitation of a promotion in the terms they advertise for a responsive promotion. For example:

- [redacted] [7]
- [redacted] [8]
- [redacted] [49]

28. In addition to monitoring promotions and sending each other signals about the duration of promotions, the Big 3 carriers engage in behavior that may maintain less aggressive price competition within a carriers' tacitly acknowledged "home market," i.e., the province or provinces from which a Big 3 carrier recruits a larger portion of its customer base relative to other carriers. For example, [redacted] [0] Another Rogers document proposes [redacted]

[47] ROG00665131 [redacted]

[48] ROG00206967 [redacted]

[49] ROG00666010 [redacted]

[50] ROG00666115 [redacted] ROG00662331 [redacted]

[redacted][51]

29. The overall pattern here is similar to the one seen in recent theoretical models of collusion such as Bernheim and Madsen (2017).[52] In such models, the market participants can sustain long-term coordination on price more easily if they also engage in some limited deviation from the target collusive price, which can be achieved by market participants offering temporary discounts relative to that price. The behavior of the Big 3 in the context of price promotions could fit that pattern, as carriers attempt to signal each other and thereby limit the extent of such outbreaks of price competition, particularly in their "home market." Regardless of how coordinated the current state of affairs between the Big 3 may be, these signals appear to be designed to rein in outbreaks of particularly intense competition. As such, some softening of competition through coordinated actions seems to be likely among the Big 3 carriers in Alberta, British Columbia, and Ontario.

4.4. Likely impact of recent CRTC regulatory changes aimed at addressing persistent market power in wireless telephony

30. In April 2021, the CRTC determined that Bell, Rogers, and Telus "together exercise market power in the provision of retail mobile wireless service in all provinces except Saskatchewan, where SaskTel exercises sole market power."[53] This situation led CRTC to expand regulatory measures "given the extent of retail market power that exists throughout the country."[54] The changes include an obligation to support Mobile Virtual Network Operator ("MVNO") options for certain carriers (MVNO is a relationship where one wireless carrier resells

[51] ROG00662331 [redacted]

[52] Douglas Bernheim and Erik Madsen, "Price Cutting and Business Stealing in Imperfect Cartels," *American Economic Review*, 107(2), 2017, pp. 387–424, at pp. 388–389.

[53] CRTC April 2021 Decision, p. 1.

[54] CRTC April 2021 Decision, p. 1.

the network of another wireless carrier) and an expectation by CRTC that these carriers will offer regulated retail plans with minimal characteristics.[55] Neither of these changes is likely to reduce the competitive effects of the proposed acquisition.

31. The MVNO portion of these changes would, if anything, make Shaw a more significant competitor than it otherwise would be. In considering MVNO access as an option for carriers that the CRTC mandated, it is useful to distinguish a carrier that has its own facilities and might use MVNO access for a period of time to more quickly expand the footprint of its service (a "facilities-based" MVNO), from a carrier that depends entirely on MVNO access to another carrier's network to offer service (a "pure" MVNO). The MVNO option mandated by the CRTC does not make pure MVNO a more likely or more competitively significant option;[56] instead it is only available for a limited time period and only to facilities-based MVNOs.[57] These limitations mean that this change would primarily allow a regional carrier like Shaw to "use the networks of Bell Mobility, RCCI, TCI, and SaskTel, where these four exercise market power, to serve new areas while they build out their networks."[58] I discuss barriers that impact the competitive significance of MVNOs further in Section 5.2.

32. The changes related to regulated retail plans will also likely have a limited impact in the marketplace. As part of the April 2021 decision, the CRTC introduced an expectation that the Big 3 carriers and SaskTel introduce low-cost and occasional-use postpaid plans, as well as "emergency use" prepaid plans, by mid-July 2021 and make them widely available.[59]

---

[55] CRTC April 2021 Decision, p. 2.

[56] While pure MVNO carriers currently do exist in Canada, they play a very limited role. In particular, only a few MVNO carriers have been able to negotiate access to the wireless network of a Big 3 carrier, and they essentially resell the services of the Big 3 carriers to narrow segments of the market. The restrictive terms under which these pure MVNOs operate has limited their offerings to consumers and their effectiveness to compete in the market for consumer wireless services. CRTC April 2021 Decision, ¶¶ 77, 99, 280.

[57] CRTC April 2021 Decision, p. 2.

[58] CRTC April 2021 Decision, p. 2. The CRTC also required the Big 3 carriers to "implement seamless roaming as part of their wholesale roaming service. This measure will benefit consumers by helping to prevent dropped calls and data sessions when consumers move from one network to another. It will also benefit competition because it will enable wireless competitors to offer a higher overall quality of service."

[59] CRTC April 2021 Decision, ¶¶ 544–545, 552–553, 557–558. These low-cost plans were to include unlimited talk and text and a minimum of 3 GB of data per month at 3G speed for a rate not exceeding $35 per month. Occasional-use plans were to include unlimited talk and text and 250 MB of data at 3G speed for a rate not exceeding $15 per month. The emergency use prepaid plans were to include a yearly allotment of voice minutes and text, but not data, available for a year on a prepaid basis, for a yearly maximum of $100. See CRTC April 2021 Decision, ¶¶ 531, 545, 553, 557.

33. Some of these low-cost plans have since been introduced. However, these plans have not attracted a large volume of customers, suggesting that their significance is limited. [redacted][60] Moreover, as Rogers' introduction of such plans exclusively under the Fido brand illustrates, these plans have not generally been associated with carriers' premium brands.[61] The CRTC indicated in its policy decision that this approach would likely reduce the popularity of the plans among consumers.[62]

34. The limited significance of these plans can also be inferred from similar plans that existed before them, that also obtained similarly limited uptake. [redacted][63] [redacted][64] Rogers also offered a variety of low-cost plans with similarities to the CRTC-mandated occasional-use and emergency-use plans as early as December 2019.[65] [redacted][66] More broadly, the newly-introduced plans have similarities to plans currently offered by Rogers under its prepaid brands both in terms of price point and network speed.[67] The

[60] Rogers Updated Answers to Undertakings, p. 15; Workpaper 4.4.a.

[61] ROG00664598. For example, at the time of writing Bell, and Telus did not offer plans with the characteristics described by CRTC for the "low-cost plan," but flanker brands Virgin Mobile, and Koodo did. See Bell Canada, "Prepaid," available at https://www.bell.ca/Mobility/Cell_phone_plans/Prepaid_plans/Prepaid_plans.tab; Virgin Mobile, "Bring Your Own Phone," available at https://www.virginplus.ca/en/plans/postpaid.html?province=ON&geoResult=failed#!/BYOP/research/; "Other plans" tab, Telus Corporation, "Stay connected for less with TELUS Prepaid," available at https://www.telus.com/en/mobility/prepaid/plans?linktype=subnav; Koodo Mobile, "Bring Your Own Phone," available at https://www.koodomobile.com/rate-plans?INTCMP=KMNew_NavMenu_Shop_Plans; Telus, "Starter plan FAQ," available at https://www.telus.com/en/on/support/article/starter-plan-faq?INTCMP=Tcom_Plans_existing_customer_starter_plan_support.

[62] CRTC April 2021 Decision, ¶¶ 542–543.

[63] Shaw Response to Undertakings, pp. 66–67; SJRB-CCB00895961.

[64] Shaw identified seven such plans in a response to undertakings. In the same response Shaw also identified two Shaw Mobile plans as meeting CRTC's criteria. These plans, however, are only available as part of a wireless-wireline bundle. See Shaw Response to Undertakings, pp. 66–68; SJRB-CCB00895961; Workpaper 4.4.b.

[65] Rogers listed these plans in a response to a CRTC request to identify the low-cost plans that Rogers brands had in the market at that time. See ROG00201939. See also Letter from Howard Slawner to Mr. Claude Doucet, "RE: Review of mobile wireless services, Telecom Notice of Consultation 2019-57 – Response to Requests for information," January 15, 2020, available at https://applications.crtc.gc.ca/instances-proceedings/Default-Defaut.aspx?lang=eng&YA=2019&S=C&PA=t&PT=nc&PST=a#2019-57 (click "Responses to requests for information" and then file "DM#3785125 - Réponse-Response - 23 December 2019 - Rogers Response to RFIs Mobile Wireless Services January 15 2020.doc").

[66] Workpaper 4.4.c.

[67] At the time of writing, Chatr offers, among others, a 2.5GB (with available bonus data) of 3G data plan with unlimited voice and text for $35 per month and a plan with 500 MB of data for $25 per month. See Chatr Wireless, "Nation-wide prepaid plans," available at https://www.chatrwireless.com/plans.

fact that prepaid brands only serve about 12 percent of subscribers in the marketplace suggests that the low-cost and occasional-use plans are likely to serve only a small number of customers.[68]

35. For these reasons, it does not seem that the newly-offered plans introduce a difference that will make them more competitively significant than the old plans, nor that they are likely to introduce a significant constraint on unregulated prices.

4.5. Existing or additional regulation would be a poor substitute for the competition Shaw has recently brought to Canadian wireless markets

36. As I explain in Section 6.1 below, Shaw has recently enhanced competition in the provinces where it operates without the need for further regulation. In its April 2021 Decision the CRTC stated multiple times that one of its lodestars in crafting the specific regulations it proposed was to not disrupt competition that is already occurring in the marketplace, and, instead, foster such competition and make it sustainable over the long term.[69]

37. This preference for competition over regulatory fiat is evident throughout the CRTC's decision. In particular, the CRTC motivated its decision to limit the mandate of MVNO access only to facilities-based carriers such as Shaw as a way to preserve competition for the long term. While the CRTC expected that broad MVNO access would reduce prices in the short term, it offset that possibility with its recognition that the competition from new MVNO entrants would disproportionally affect regional carriers and hamper their ability to continue

[68] See Section 4.1. See also Exhibit 35 in Appendix 8.7 presenting percentages of subscribers by brand in Alberta, British Columbia, and Ontario and Canadian Radio-television and Telecommunications Commission, "data-retail-mobile-sector-2020.xlsx," sheet "MB-I7." The emergency use plan is a prepaid plan. CRTC April 2021 Decision, ¶ 557. As I explained in Section 4.1 above the vast majority of Canadian subscribers subscribe to mobile wireless services on a postpaid basis.

[69] See, for example, CRTC April 2021 Decision, pp. 1–2 ("While these findings are concerning, there are also positive signs that competition is intensifying. Retail prices, although higher than what would prevail in a fully competitive market, are clearly trending down across Canada, and there is evidence of rivalrous behaviour among wireless carriers. Regional wireless carriers are having an impact on the market in terms of disciplining, to a certain extent, dominant wireless carriers; they have introduced innovative plans and features that have led to new offerings in the market such as unlimited data plans and plans that allow data to be carried over month to month, and have been successful in attracting customers, including customers switching from other wireless carriers…In considering its regulatory approach, the Commission must take care not to disrupt the competition that is already occurring, but instead foster an environment where this competition can grow and be sustainable over the long term.").

competing with Big 3 carriers over the long term.[70] The CRTC chose competition over regulation in deciding that broad MVNO access would disrupt the incentive of regional carriers like Shaw to keep investing in the networks and thus reduce their ability to discipline market power by Big 3 carriers in the future.[71] The CRTC stated that competition is more effective than regulation in weighing the two options and that "it is reasonable to expect prices to decline further in the future as the regional wireless carriers grow their market shares."[72]

38. The preference CRTC has demonstrated for the ongoing and future competition by regional carriers such as Shaw also reflects on the welfare considerations in the proposed acquisition. I discuss my own calculations of welfare effects in Section 6.2.

5. Fundamental elements of market analysis

5.1. Mobile wireless services offered to consumers in Alberta, British Columbia, and Ontario constitute relevant markets for competition analysis

39. A common theme in competition analysis is that mergers or acquisitions are likely to lessen competition when they enhance the ability of market participants to exercise market power, such as by raising prices above the competitive level. This principle is articulated in the *Merger Enforcement*

[70] CRTC April 2021 Decision, ¶ 199 ("the Commission considers that it is likely that, upon entry into retail markets, MVNOs would take a greater share of subscribers from regional wireless carriers than from the national wireless carriers or SaskTel, particularly with respect to their main brands, and would therefore have a disproportionate impact on regional wireless carriers…while there may be some initial downward pressure on overall pricing as MVNOs seek to gain customers, over the longer term the net impact of broad-based MVNO presence on competition, particularly as a means of affecting retail market power, is not likely to be substantial.").

[71] CRTC April 2021 Decision, ¶¶ 200, 261.

[72] CRTC April 2021 Decision, ¶ 200 ("Furthermore, in the Commission's view, while competition is intensifying and prices are lower in areas where regional wireless carrier operates in competition with the national wireless carriers, it is reasonable to expect prices to decline further in the future as the regional wireless carriers grow their market shares, the potential beneficial impacts on retail competition resulting from the mandated provision of a broad MVNO access service are speculative at best. Further, the available evidence is not persuasive enough to support a conclusion that any such impact would outweigh any negative impacts on established regional wireless carriers with regard to their subscriber base and their corresponding ability to invest in expanding and upgrading their network coverage and, thus, on their ability to discipline retail market power.").

Guidelines ("*Guidelines*") issued by the Competition Bureau,[73] which provide general direction for the Bureau's analytical approach that, while not a statement of Canadian law, is a useful framework for merger review.[74]

40. As explained in the *Guidelines*, a useful analytical tool in assessing how a merger changes the industry participants' abilities to exercise market power is market definition.[75] Defining a relevant market involves identifying the products and services for which a competitive effect can be assessed including those of the merging parties as well as products or services that customers consider to be reasonable substitutes. It also involves identifying a geography within which competition may be affected.[76]

41. For my analysis of the effects of the proposed acquisition:

- I define the relevant product market to be no broader than postpaid and prepaid mobile wireless services offered to consumers; and
- I define the relevant geographies for this product to be no broader than a province and identify three geographic markets of interest: Alberta, British Columbia, and Ontario.

In what follows, I describe these product and geographic markets and explain why they constitute relevant markets for analyzing the competitive effects of the proposed acquisition.

42. The question of how to define a relevant product market with respect to mobile telecommunication services has been examined by the CRTC in a recent regulatory policy decision. The CRTC found that "retail mobile wireless services, that is, retail mobile voice, text, and data services, offered to

---

[73] Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011 ("Merger Enforcement Guidelines"), ¶ 2.1, ("A substantial prevention or lessening of competition results only from mergers that are likely to create, maintain or enhance the ability of the merged entity, unilaterally or in coordination with other firms, to exercise market power."), ¶ 2.3 ("Market power of sellers is the ability of a firm or group of firms to profitably maintain prices above the competitive level for a significant period of time").

[74] Merger Enforcement Guidelines, p. 1.

[75] "Market definition is not necessarily the initial step, or a required step, but generally is undertaken." Merger Enforcement Guidelines, ¶ 3.1. This can be useful because "market definition generally sets the context for the Bureau's assessment of the likely competitive effects of a merger." It can do this by specifying the line(s) of commerce and geographic area(s) in which competitive concerns arise. It "identif[ies] the set of products that customers consider to be substitutes for those produced by the merging firms." Then, customers that might be harmed by the merger are those that might reasonably purchase any of the identified products. Additionally, it allows the identification of the industry participants and measurement of their market shares / concentration, and how such concentration changes after the merger. Merger Enforcement Guidelines, ¶ 3.2.

[76] Merger Enforcement Guidelines, ¶¶ 4.1, 4.2.

individuals and small businesses, irrespective of the network technology used" constitute a relevant product market.[77]

43. The analysis that the CRTC conducted to substantiate this definition tracks well with the considerations of whether a product market is suitable for an examination of competitive effects. In particular, the CRTC found that Canadian consumers do not currently have practical alternatives to consumer mobile wireless services to satisfy their mobile telecommunication needs, and furthermore that enterprise plans are not viable substitutes for consumer plans:

- Given the technology commonly available on mobile devices, consumers cannot place calls, send texts, and consume data with their mobile devices unless these are connected to a mobile wireless carrier network, a Wi-Fi hotspot, a fixed wireless router, or a wireline network router. Wi-Fi hotspot, fixed wireless, and wireline services, however, do not provide practical alternatives to consumer mobile wireless services. Fixed wireless and wireline services do not provide the degree of mobility that consumers expect of a mobile wireless service. In Canada, Wi-Fi hotspots are not yet and are not expected to be as ubiquitously available as mobile wireless carriers' cellular network to provide consistent mobile telecommunication services.[78]
- The plans that carriers offer to enterprises or institutional customers are not substitutes because these services tend to be marketed differently from mobile wireless services and would not be generally available to consumers looking for an alternative.[79]

44. As the CRTC analysis indicates, wireless services are sold to consumers and to businesses in distinct markets. While the underlying service is the same, business customers evaluate the characteristics of a service differently, which is reflected in the different way in which carriers market to them. [redacted][80] [redacted]

[77] CRTC April 2021 Decision, ¶ 47 ("the relevant product market consists of retail mobile wireless services, that is, retail mobile voice, text, and data services, offered to individuals and small businesses, irrespective of the network technology used.").

[78] CRTC April 2021 Decision, ¶ 43.

[79] See for example, CRTC April 2021 Decision, ¶ 45.

[80] Examination for Discovery of Dean Prevost, Day 2, 356:20–357:17.

[redacted][81][redacted][82][redacted][83]

45. Although the consumer and business markets are distinct, some particularly small businesses (e.g., a self-employed individual) are indistinguishable from a consumer and are generally included in the market for consumer service.[84] As Dean Prevost, former president of Rogers for Business, indicated in his examination for discovery [redacted][85]

46. As discussed in Section 4.1, consumers can purchase consumer mobile wireless services either on a postpaid or a prepaid basis. There are differences between prepaid and postpaid service, including different prepaid brand characteristics such as lower prices and advertised quality,[86] and different customer characteristics such as poor credit and a higher tendency to temporarily or permanently separate from their chosen wireless service brands (known as "churn" in the industry). I have not been able to determine whether

[81] SJRB-CCB00787140 at p. 5; Examination for Discovery of Dean Prevost, Day 2, 361:17–363:6. See also ROG00291286 at p. 20 [redacted] See also Examination for Discovery of Dean Prevost, Day 2, 356:11–356:14 [redacted] See, for example, Examination for Discovery of Dean Prevost, Day 2, 363:7–12 [redacted]

[82] See, e.g., ROG00139126 at p. 19 [redacted]

[83] [redacted] See ROG00614952 at p. 11. As I discuss in Section 6.3.3 below, Shaw considered entry into the business market [redacted]

[84] These customers may choose to purchase mobile wireless services in the consumer market and the carrier may not be able to distinguish these customers from a household or an individual.

[85] Examination for Discovery of Dean Prevost, Day 2, 359:2–5.

[86] See for example, Chatr Mobile, "Nation-wide Plans," available at https://www.chatrwireless.com/plans.

these or any other differences between prepaid and postpaid service are sufficient to consider these separate markets. My analysis of porting data indicates that some consumers switch between postpaid and prepaid service.[87] The type of data available to me, however, does not allow for a precise quantification of the extent to which consumers consider postpaid and prepaid services as substitutes to one another and whether the services should be in distinct markets. Therefore, for the purpose of this analysis of the effects of the proposed acquisition, I will consider postpaid and prepaid mobile wireless services as part of the same relevant market,[88] acknowledging that a degree of differentiation appears to exist between postpaid and prepaid service, but note that the difference is not likely to change the substance of my conclusions.[89]

47. Based on the above discussion, a product market defined as no broader than postpaid and prepaid consumer mobile wireless services constitutes a reasonable candidate for a relevant product market.[90]

48. I now turn to the relevant geography in which to assess competition. Shaw offers consumers mobile wireless services in three provinces: Alberta, British Columbia, and Ontario. Rogers also offers mobile wireless services in these

[87] I have analyzed ports between main/flanker (most of which are postpaid) and prepaid brands over the period January–April 2021 using Comlink data. I found that a large percentage of consumers that port out from prepaid brands ports into main/flanker brands, specifically: [redacted] These percentages are consistent with the large shares of gross adds that main/flanker brands account for in these provinces: [redacted] I also found that a small percentage of consumers that port out from main/flanker brands ports into prepaid brands: [redacted] These low percentages likely reflect the low share of gross adds that prepaid brands account for in these provinces [redacted] as well as the possibility that ports into prepaid brands are likely to be underreported in the Comlink data, as I understand that consumers that switch to a prepaid brand do not always port their number but rather start with a new one. See Workpaper 5.1.a.

[88] In a recent policy regulation, the CRTC considered postpaid and prepaid mobile wireless services as part of the same product market. See CRTC April 2021 Decision, ¶ 44 ("Some parties submitted that the retail market should be segmented, for example, between plans offered on a prepaid and postpaid basis; between plans with varying amounts of data, minutes for voice calls, and number of text messages included in a plan; and between services offered on different technologies (i.e. 3G, LTE, LTE-A, or 5G). While there might be differences between the offerings in each of these segments, and further segmentation may be conceptually possible, the Commission considers that regardless of the sub-segment considered, the essential functionality of mobile voice, text, and data communications remains. As such, the Commission does not consider that it would be appropriate to divide the broader product market into the proposed segments.").

[89] As both companies predominantly offer postpaid service, the difference would not raise the possibility that separate markets mean the parties are less competitive with one another than a combined market suggests. Separate markets could mean that overlaps were more significant in one type of the service, likely postpaid, and that the effect of the merger on customers in such a market could be larger than a combined market would suggest.

[90] I rely on customer-level data produced by Rogers, Shaw, Bell and Telus as inputs to the merger simulation analysis presented in Section 6.2 below. To the extent that some business customers are included in the produced data as part of the consumer segment, I include them in the merger simulation analysis in recognition that some small business users are indistinguishable (by me and by the carriers) from consumers. To the extent business customers are explicitly identified as "business" in the produced data, I have excluded them from the analysis as I describe in Appendix 8.3.

provinces. In defining the geographic bounds of markets for this service, I consider three possibilities: a national market, provincial markets, or local markets within each province.

49. Of these options, and in light of the available data, geographical markets no broader than a province seem to be the most reasonable way to evaluate the competitive effects of the merger. First, the competitors available to consumers vary from province to province and sometimes even across geographic areas within the same province.[91] Second, my analysis of ordinary course documents indicates that [redacted][92] Third, in its assessment, the CRTC chose to define markets at the province level.[93] While there are differences between service areas of different providers even within a province that may be worth consideration (e.g., Videotron offers service in a very small portion of Ontario), for this assessment of competition, I follow the approach of the CRTC and define markets for the three provinces in which Shaw and Rogers both offer mobile wireless services.

50. Defining relevant markets at the sub-provincial level would also be impractical and would likely not alter the conclusion of my analysis. While there is some variation in coverage and pricing promotions across carriers at the sub-province level, adequate data to obtain accurate estimates of each carriers' market share, pricing, and costs at the sub-province level, including the extent to which consumers travel to purchase from local areas with lower

[91] See Section 4.1. Note that Rogers also offers service in most areas within-province in which Shaw offers service. See ROG00646474 at p. 4 for a comparison of coverage maps as of January 2018. Shaw has since expanded its network into additional coverage areas in Alberta, British Columbia, and Ontario. See for example, Shaw Communications , "More Affordable Data for More Canadians: Freedom Mobile Launches in Red Deer and Victoria," February 8, 2019, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452197; Shaw Communications , "More Canadians get access to affordable plans and an abundance of data as Freedom Mobile expands into Eastern Ontario," March 8, 2019, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452211.

[92] [redacted] See ROG00456355. See ROG00118354. See SJRB-CCB00223003 at pp. 8–9, 46.

[93] CRTC April 2021 Decision, ¶ 58 ("the Commission finds that the relevant geographic market for retail mobile wireless services is provincial/territorial.").

prices, are not available to me at this time and may not exist. Abstracting from sub-provincial differences in coverage is unlikely to meaningfully alter the results of my analysis because Shaw and the Big 3 carriers have substantial overlap in their within-province coverage in Alberta, British Columbia, and Ontario, particularly in major population centers.[94] While I do not directly consider the impact of the merger on carriers' pricing incentives at the sub-province level, the pricing data I rely on in my analysis reflects the price actually paid by consumers, and thus incorporates any local variation in price.

51. A commonly-applied test discussed in the *Guidelines* to assess whether a defined market is sufficiently broad to constitute a relevant market is the "hypothetical monopolist test."[95] This test evaluates whether a hypothetical monopolist of the candidate relevant product would find it profitable to impose a small but significant and non-transitory increase in price ("SSNIP") in the candidate relevant geographic market. I now perform this test for the product and geographic markets that I identified.

52. One way to implement the hypothetical monopolist test is to examine the effects of a merger among all of the participants in a candidate market, in this case all suppliers of consumer mobile wireless services in each of the provinces of interest. As I discuss in Section 6.2 below, a standard model of oligopolistic competition predicts that large price effects arise from the proposed acquisition, which is a merger among a *subset* of the products that would be merged into a hypothetical monopolist. As a merger of Shaw and Rogers is predicted to impose a price increase larger than a SSNIP on mobile wireless service in each of the three relevant provinces, a hypothetical monopolist comprised of these and the other competitors in these markets would be predicted to impose an *even larger* price increase. Therefore, I conclude that a hypothetical monopolist would find it profitable to impose a SSNIP.[96]

[94] See for example ROG00646474 at p. 4 for a comparison of Rogers and Shaw coverage areas as of January 2018. Shaw has since expanded its coverage in certain areas in Alberta, British Columbia, and Ontario.

[95] Merger Enforcement Guidelines, ¶ 4.4.

[96] See also Workpaper 5.1.b.

5.2. There are barriers to entry for the provision of retail mobile wireless services in Canada

53. The *Guidelines* explain that "[e]ntry is only effective in constraining the exercise of market power when it is viable."[97] If entry by new firms or expansion by fringe firms is not "likely, timely, and sufficient in scale and scope," then attempts to raise and sustain prices by incumbent firms are more likely to be successful.[98] As I explain in what follows, it would be difficult for new facilities-based mobile wireless service firms to enter the relevant markets, and for fringe firms such as pure MVNOs to substantially expand their competitive significance in them [redacted][99] [redacted][100]

54. Prospective operators contemplating entry into the market for facilities-based mobile wireless service need to undertake substantial and protracted upfront investments, including: (1) securing spectrum, which is a scarce resource expensive to acquire;[101] and (2) building up or acquiring a cellular network, which is an infrastructure that requires lengthy construction periods for its deployment as well as large operating and capital expenses to maintain and expand.[102] Consistent with these facts, in its April 2021 Decision, the CRTC

[97] Merger Enforcement Guidelines, ¶ 7.2.

[98] Merger Enforcement Guidelines, ¶ 7.2.

[99] Shaw's Reponses to Undertakings at Examination for Discovery of Paul McAleese, (Day 1 and 2), No. 49, p. 26 [redacted] Examination for Discovery of Dean Prevost, Day 2, pp. 269:13–270:7.

[100] [redacted] p. 2.

[101] CRTC April 2021 Decision, ¶ 96 ("Spectrum is a scarce resource and, while set-asides may have improved access for competitors, it can still prove to be relatively expensive to acquire. For example, large amounts were invested in the 600 megahertz (MHz) auction by each successful WSP, and these amounts were proportionally higher for carriers that benefited from the set-asides."), and ¶ 97 ("Further, market participants do not control when and what types of spectrum are made available. Spectrum auctions may also take place well before wireless carriers are ready to use the spectrum.").

[102] CRTC April 2021 Decision, ¶ 98 ("The mobile wireless service industry is also highly capital-intensive: it takes considerable investments to build, upgrade, and maintain a RAN, and mobile wireless network deployment involves lengthy construction periods.").

found that barriers to entry into consumer mobile wireless services "remain high and adversely impact new market entry or market expansion by regional wireless carriers and others."[103]

55. Shaw benefited from a rare combination of assets that facilitated its entry by securing the rapid acquisition of a customer base and reducing the upfront costs *and* time to build up a wireless network. As I explain in Section 6.1, Shaw first entered the market for retail mobile wireless services in 2016, by acquiring an existing regional operator (Wind Mobile) with an established customer base. Shaw later leveraged its large existing wireline customer base to launch Shaw Mobile as a bundled product in 2020. It also leveraged its existing wireline network infrastructure to provide mobile wireless services to Shaw Mobile customers via Wi-Fi hotspots linked to Shaw's wireline network.[104] Because Shaw benefited from a rare set of complementary assets, I expect its experience to be unusual.

56. I have also considered whether new MVNOs might enter the market or whether existing MVNOs might succeed in expanding their footprint and customer bases, at a scale sufficient to offset the lost competition between Rogers and Shaw. This is unlikely. I expect MVNOs (either the pure or facilities-based) will continue to be less competitive than carriers that rely on their own network infrastructure and spectrum licenses to provide service in a given area. Because MVNOs do not own network assets, they are dependent on the wholesale terms that they can obtain from facilities-based carriers. Those facilities-based carriers would not be motivated to provide terms that would make the MVNOs very competitive because that would reduce the facilities-based carriers' own sales. In addition, the competitive significance of MVNOs would likely be affected by the MVNOs' reliance on the owners of the network to make any changes to facilities that the MVNO may need to better fit their customers' usage.

57. These limitations persist despite CRTC's April 2021 regulation to expand MVNO access. Because the CRTC mandated that MVNO access be offered to facilities-based carriers that meet certain specific requirements,[105] only few carriers can potentially take advantage of the regulation to expand their service

[103] CRTC April 2021 Decision, ¶ 100, emphasis added. See also CRTC April 2021 Decision, ¶ 101 ("The Commission also finds that those barriers relate mainly to the availability of spectrum, the capital-intensive nature of the industry, the time it takes to deploy mobile wireless networks and to generate positive cash flows.").

[104] See Section 6.1.

[105] CRTC April 2021 Decision, ¶ 390.

areas through MVNO access. In fact, as one participant in the proceeding observed, "although the Commissioner mentioned several potential candidates, only Shaw would have the subscriber base and resources to be in a position to fully benefit from the proposal."[106] In addition, the regulation does not guarantee that MVNO access will be available at a regulated rate. Rather, it directs carriers to negotiate a tariff rate. If commercial negotiations fail, the regulation only directs final offer arbitration as the recourse.[107] Moreover, if negotiation with the national carriers does result in tariffs that do not prohibit competitive pricing, the service is only available for seven years, so the recipient would still need to focus on transitioning service to their own network, which would entail substantial investment costs.[108]

5.3. Rogers and Shaw have significant shares of mobile wireless service in Alberta, British Columbia, and Ontario

58. Having defined a set of relevant markets for the analysis, I next calculate shares for the participants in those markets.

59. I first need to consider the appropriate measure of market shares. The *Guidelines* state that one should use "the best indicators of sellers' future competitive significance" when calculating market shares.[109] As explained in Section 4.1 above, consumers of mobile wireless services do not actively shop for new plans in each monthly billing cycle. Instead, only a fraction of current subscribers updates their plans or switches carriers in any given month. Mobile wireless carriers thus routinely consider their subscriber base as composed of an installed base of existing consumers and a group of newly acquired consumers that joined the carrier in any given month.[110]

60. The distinction between existing and newly acquired customers is important in assessing the proposed acquisition because in Alberta and British

[106] CRTC April 2021 Decision, ¶ 275.

[107] CRTC April 2021 Decision, ¶¶ 354, 390.

[108] CRTC April 2021 Decision, ¶¶ 386, 390.

[109] Merger Enforcement Guidelines, ¶ 5.3 ("When calculating market shares, the Bureau uses the best indicators of sellers' *future* competitive significance.").

[110] The carriers' financial reports also subdivide their customers into total subscribers and net additions for both prepaid and postpaid subscribers. See, for example, Rogers 2020 Annual Report, p. 26 and Shaw Communications, Inc., "2020 Annual Report," October 30, 2020, p. 10. See also S24_File04_Wireless_Factpack_2018_2021.xlsx for a detailed subdivision of Rogers' wireless subscribers.

Columbia the entry of the Shaw Mobile brand has provided consumers with a new and attractive option for mobile wireless services. As a new entrant, Shaw Mobile has a small installed base, even though it has been successful in attracting new consumers.[111] In such a setting, the *Guidelines* state that it may be more appropriate to consider the proportion of new customers that a firm gets (as opposed to its installed base) to measure market shares:

> When a regulated or historical incumbent firm is facing deregulation or enhanced competition, shares based on new customer acquisitions may be a better indicator of competitive vigor than are shares based on existing customers.[112]

61. The best approximation of "new customer acquisitions" that is available to me is the same measure that mobile wireless carriers often use to assess their competitive success, their share of "gross adds."[113] Gross adds are the new customers that a wireless carrier gains during a particular period of time. Thus, for that period of time, the *share* of gross adds for a wireless carrier is their percentage of all new subscribers in the market.[114] Unlike the percentage of subscribers—which compares the relative sizes of the carriers' subscriber bases and thus comprises all customers, including those not actively looking for a wireless plan—shares of gross adds approximate the choices made by customers that are actively shopping among the current competitive options. They provide a better indicator of competitive vigor and future competitive significance of market participants than the percentage of subscribers. A firm that has a high share of gross adds—such as Shaw—is likely to be an important competitor in the market even if its installed base of customers is relatively small. Over time,

[111] See Exhibits 18 and 35.

[112] Merger Enforcement Guidelines, ¶ 5.4.

[1] [redacted] See, for example, ROG00341090; SJRB-CCB00427328 [redacted] Shaw, "Freedom Mobile Inc. Management Report QTD Oct 2020," November 24, 2020 at p. 1, ("QTD Gross Adds of 147K is higher by 31K vs budget"); Shaw, "Audit Committee Meeting – Q2 Fiscal 2021," p. 89; Rogers 2019 Annual Report, p. 39, ("We believe the decreases in gross and net additions to our postpaid subscriber base this year were a result of our disciplined approach around subscriber base management and an overall softness in the market in the first half of the year.").

[114] This percentage is an approximation of the percentage of all customers who are shopping in a given month. What it does not include is measurement of customers that may engage in some shopping and then decide to stay with their current provider. If these shopping customers who stay with their current provider do so for the same reasons that new subscribers would choose that provider, which seems likely, the percentages may be effectively the same.

all else equal, a high share of gross adds will lead to a large share of subscribers as that carrier builds an installed base.

62. For these reasons, in my analysis I consider the share of gross adds as the appropriate measure of market shares. Other ways that one might attempt to measure share in a market, such as the share of current subscribers, would not reflect current competitive conditions as well.

63. In Exhibit 2 I report the market share based on gross adds of consumer mobile phone service between January and April of 2021 in each province for Rogers and Shaw as well as Bell and Telus.[115] I choose this particular time period because it is the most recent period in which data that I use to conduct the merger simulation are consistently available for all carriers.[116] I exclude new subscriptions to non-phone mobile service (e.g., connectivity for tablets) to allow for the possibility that adding a device to an existing consumer account may not reflect the same competitive situation as a new phone subscription for a consumer.[117] I also exclude new subscriptions for business accounts that are distinguished from consumer accounts to reflect the fact that competition for these accounts is considered to occur in a distinct market with different competitive conditions.

Exhibit 2
Market Shares Based on Gross Adds of Consumer Phone Service: January – April 2021

[redacted]

Source: [redacted]

Note: For each province, a carrier's share of gross adds is calculated as that carrier's gross adds divided by the total gross adds of all carriers considered. Only consumer gross adds are included using categories reported in produced data. Gross adds for each carrier and province are the sum of gross adds from January – April 2021. Brands not owned by Rogers, Shaw, Bell, or Telus are not considered. See Appendix 8.3 for additional information about how gross adds are calculated.

[115] I do not consider PC Mobile or brands not owned by Shaw or the Big Three.

[116] See Appendix 8.3.

[117] [redacted]
Workpaper 5.3.

64. The Competition Bureau has recognized in its *Guidelines* that an analysis of market shares, while not enough on its own, is an informative starting point to establish whether or not the merged entity will be able to exercise market power post-merger.[118] More specifically the *Guidelines* state that a substantial lessening of competition is unlikely if the combined shares of the merging parties are less than 35 percent.[119] In each of the three relevant provinces, the combined market share of Rogers and Shaw [redacted]

65. Indeed, combined, Rogers and Shaw [redacted] share of gross adds among the carriers that would be competing for customers in these provinces post-merger [redacted] percent in Alberta, [redacted] percent in British Columbia, and [redacted] percent in Ontario. Share of gross adds for Shaw are particularly large in Alberta and British Columbia, [redacted] and [redacted] percent respectively, due to the large share of new customers that the Shaw Mobile brands attracts in these two provinces where it was recently launched.[120]

66. Although, as I explained above, subscriber bases—which comprise all customers, including those not actively looking for a wireless plan—are not an appropriate measure of competitive significance in the relevant markets, I nonetheless examine the relative size of the carriers' subscriber bases. The percentage of all subscribers in the three markets are reported in Exhibit 3 below. As this table makes clear, Shaw's higher share of gross adds has not yet generated an installed base comparable to its more established competitors. Put differently, calculating shares based on each carrier's installed base as a share of all wireless subscribers, which includes consumers not actively looking for a wireless plan, would not fully capture the competitive significance of Shaw. Even so, if one nevertheless applied the 35 percent threshold to such shares, the proposed merger would still indicate a basis for competitive concern. [redacted]

[118] Merger Enforcement Guidelines, ¶ 5.8 ("[I]nformation that demonstrates that market share or concentration is likely to be high is not, in and of itself, sufficient to justify a conclusion that a merger is likely to prevent or lessen competition substantially. However, information about market share and concentration can inform the analysis of competitive effects when it reflects the market position of the merged firm relative to that of its rivals.").

[119] Merger Enforcement Guidelines, ¶ 5.9 ("The Bureau has established the following thresholds to identify and distinguish mergers that are unlikely to have anti-competitive consequences from those that require a more detailed analysis: The Commissioner generally will not challenge a merger on the basis of a concern related to the unilateral exercise of market power when the post-merger market share of the merged firm would be less than 35 percent.").

[120] I will detail shares by brand of gross adds in my analysis of competitive effects. See Section 6.2.4.

Exhibit 3
Percentage of Consumer Subscribers to Consumer Phone Service: January – April 2021

Source:

Note: For each province, a carrier's subscriber share is calculated as that carrier's subscriber count divided by the total subscriber count of all carriers considered. Only consumer subscribers are included using categories reported in produced data. Subscriber counts are the average monthly consumer phone subscriber counts from January – April 2021 for Rogers, Shaw and Telus' brands. Bell's subscriber counts for this period are estimated using the simple average of December 2020 subscribers and July 2021 subscribers. See Appendix 8.3 for additional information on how I calculated subscriber counts from produced data. The share of "Other" brands is estimated using CRTC data from 2020. In particular, the ratio of "Other" subscribers to the subscribers of Rogers, Bell, and Telus is assumed to be the same as the ratio of respective shares in the CRTC data.

67. In sum, the evidence presented above indicates that the proposed acquisition involves parties with significant share of the relevant markets.

5.4. Rogers and Shaw compete closely with each other for consumers of mobile wireless services in Alberta, British Columbia, and Ontario

68. In Section 5.3 I showed that the parties to the proposed acquisition have market shares (based on gross adds) that the *Guidelines* identify as raising the possibility of a substantial lessening of competition. Evidence from porting data and ordinary course documents, which I examine in what follows, confirms that Rogers and Shaw do indeed compete closely with one another, as their market shares would indicate, and that the proposed acquisition is likely to lessen competition.

69. I start by analyzing porting data, which provide information on wireless subscribers' switching behavior between wireless carriers.[121] Exhibit 4 shows ports to and from Rogers and Shaw in each of the three relevant provinces.

[121] Porting occurs when a consumer switches from one wireless carrier to another but keeps their same phone number.

Exhibit 4
Shares of Port-outs, January – April 2021

Source:
Note: The percentages represent the share of all wireless accounts diverting out from the "From Carrier" that diverted to the "To Carrier" within a given province. Only consumer port-outs are included as part of Rogers port-outs. Switches within the same brand (e.g., from Freedom to Freedom) or involving a wireline service and brand migrations within the same carrier (e.g. from Fido to Rogers Wireless) are not considered for this analysis. The port-outs from Rogers cover switches labeled in the data as switches from Rogers Wireless and Fido to Freedom, Bell Mobility, Telus Mobility, Public Mobile, and other brands. The port-outs from Shaw cover switches labeled in the data as switches from Freedom and Shaw Mobile to Rogers Wireless, Fido, Bell Mobility Wireless, Telus Mobility, Public Mobile, and other brands.

70. The data reported in Exhibit 4 indicate that consumers often switch between Rogers and Shaw.[122] In Alberta and British Columbia, approximately [redacted] percent of consumers porting out from Rogers chose to switch to Shaw, Conversely, [redacted] percent of consumers porting out of Shaw in Alberta and [redacted] percent of consumers porting out of Shaw in British Columbia chose to switch to Rogers. In Ontario, where the Shaw Mobile brand is not available, [redacted] percent of consumers porting out from Rogers chose to switch to Shaw, and [redacted] percent of consumers porting out from Shaw chose to switch to Rogers.[123]

71. I also reviewed ordinary course documents produced by Rogers and Shaw that discuss each carrier's view of the competitive landscape in wireless services. My review of these documents provides some confirmation that Rogers and Shaw see each other as important competitors in each of the three relevant provinces.

[122] I note that Rogers operates a premium, a flanker, and a prepaid brand. Rogers 2020 Annual Report, p. 40; Shaw does not operate a prepaid brand; Shaw 2021 Annual Report, p.16. I also consider the share of ports from Rogers' premium and flanker brands to Shaw's brands, and vice versa, excluding prepaid brands, using the Comlink data. Results, reported in Workpaper 5.4.a, are similar.

[123] I also considered net adds for the four carries over the period December 2019 - December 2020. [redacted] See Workpaper 5.4.b.

72. For example:

- [redacted][124][redacted][125][redacted][126]
- [redacted][128][redacted][129]
- [redacted][30]

[124] SJRB-CCB00434040 [redacted] ROG00118354 [redacted]

[125] SJRB-CCB00434040.

[126] SJRB-CCB00434040 [redacted] SJRB-CCB00434040 [redacted]

[127] ROG00646941 at pp. 2–3.

[128] ROG00646941 at p. 5 [redacted]

[129] ROG00186819 at p. 9 [redacted]

[130] ROG00662331, [redacted]

- [redacted][131][redacted][32][redacted][33]

73. Together, the porting data and the party documents indicate that the proposed acquisition is likely to lead to a lessening of competition, which is consistent with the large combined market shares I discussed in Section 5.3. The substitutability for consumers between Rogers and Shaw, their history of head-to-head competition, and Shaw's growth as a recent entrant all indicate that the competition between them is substantial.[134]

6. Competitive effects of the Rogers-Shaw acquisition

6.1. Shaw has enhanced competition in Ontario, Alberta, and British Columbia since its entry into mobile wireless services

74. Evidence about a firm's historical behavior in a market can help to inform whether its acquisition by a horizontal competitor is likely to lead to higher prices, lower quality, or other effects on the market that harm consumers and can result in deadweight loss. The *Guidelines* note that a merger involving a firm that is a "vigorous and effective competitor" may be of concern. The *Guidelines* characterize this type of competitor as follows:

> A firm that is a vigorous and effective competitor often plays an important role in pressuring other firms to compete more intensely with respect to existing products or in the development of new products. A firm does not have to be among the larger competitors in a market in order to be a vigorous and effective competitor. Small firms

[131] ROG00186068, p. 7 [redacted]

[132] ROG00186068, p. 16.

[133] ROG00186068, p. 18.

[134] See Section 6.1.

> can exercise an influence on competition that is disproportionate to their size.[135]

75. As discussed in this and the following sections, Shaw has played an important role in introducing new and less expensive wireless service plans that compete with those offered by the Big 3, including its Shaw Mobile bundled plans which offer both wireless and wireline services at lower prices than other carriers.

76. Shaw entered the wireless market in 2016 with its acquisition of Wind Mobile, a facilities-based carrier operating a 3G network in Ontario, Alberta, and British Columbia.[136] Shaw changed Wind Mobile's name to Freedom and began rolling out an LTE network to major Canadian cities in Alberta, British Columbia, and Ontario in November 2016.[137] Since 2016, Shaw has competed with Rogers and other large wireless carriers through the introduction of low-priced data plans. These competitive offerings, including the launch of Big Gig plans in 2017, the introduction of the Big Binge Bonus promotion in 2018, and the introduction of Big Gig Unlimited plans in 2019, have contributed to expanding Shaw's subscriber base in all three provinces since 2016.[138]

77. Shaw expanded its subscriber base further in Alberta and British Columbia with the launch of the Shaw Mobile brand in 2020. Shaw Mobile offers bundled wireless and wireline service plans that leverage its large wireline subscriber base in Western Canada to offer low prices for wireless data plans.[139] The launch of this brand also allows Shaw to compete more directly with Telus,

---

[135] Merger Enforcement Guidelines, ¶ 6.5, fn. 33.

[136] SJRB-CCB00420123.

[137] Shaw Communications, "Freedom Mobile expands new LTE network to Calgary and Edmonton," May 17, 2017, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442451980.

[138] Shaw Communications, "Life is a big gig, live it with Freedom: Freedom Mobile gives Canadians 10 GB for only $50," October 17, 2017, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452038. Shaw Communications, "Break free from data overages: Freedom Mobile introduces unprecedented 100 GB Big Binge Bonus," November 19, 2018, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452169; Shaw Communications, "Freedom Mobile Lowers Monthly Bills with Absolute Zero Phone-Included Offers and More Affordable Unlimited Plans," July 25, 2019, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452253. Shaw's postpaid wireless subscribers grew from 667 thousand in 2016 to 1.3 million in 2019. Shaw Communications, Inc., "2016 Annual Report," November 28, 2016 ("Shaw 2016 Annual Report"), p. 7; Shaw Communications, Inc., "2019 Annual Report," November 27, 2019 ("Shaw 2019 Annual Report"), p. 10.

[139] See Section 6.1.3.

which also offers wireless and wireline services in Western Canada, including some bundled service options.[140]

78. Rogers, Bell, and Telus have responded to Shaw's competitive initiatives, including by offering price promotions, introducing plans with more data at a less expensive base price (per gigabyte), and reducing data overage charges.

79. This section discusses Shaw's incentives to compete for new subscribers through novel plan offerings (Section 6.1.1) and analyzes evidence on the competitive impact of two events in particular, the introduction of Big Gig plans in 2017 (Section 6.1.2), and the launch of Shaw Mobile in 2020 (Section 6.1.3). I analyze data and the parties' documents that show these plan offerings expanded Freedom's subscriber base and induced competitors to reduce the price per gigabyte that their subscribers pay for data in Alberta, British Columbia, and Ontario. These benefits for consumers demonstrate the impact Shaw has had in promoting competition in the relevant markets. In particular, they represent pertinent examples of vigorous competition between Rogers and Shaw in wireless. As I discuss below, the merged entity resulting from the acquisition of Shaw by Rogers ("merged entity") would have a reduced incentive to compete as aggressively as Shaw has done.

6.1.1. Shaw has a greater incentive to compete for new consumers with lower prices than Rogers, Telus, and Bell

80. Wireless carriers face a basic tradeoff when designing their menu of plans. Offering a less expensive plan can help attract new consumers, but it creates a risk that existing customers on more expensive plans might switch to the new, less expensive plan. Therefore, carriers that have larger bases of installed consumers can have a weaker incentive to compete by introducing lower-priced plans. A smaller carrier, in contrast, may find it more worthwhile to offer such plans in order to grow its subscriber base. In their ordinary course of business, both Rogers and Shaw reference this tradeoff between attracting new subscribers and "repricing" the existing subscriber base.[141]

[140] Telus Corporation, "Build your bundle," available at https://www.telus.com/en/shop/home-services/bundle/build-your-own.

[141] ROG00340339 [redacted]

81. As a relatively new competitor in wireless, Shaw has a smaller base of established customers than the Big 3 carriers and therefore has a greater economic incentive, all else equal, to engage in an aggressive strategy focused on attracting subscribers from other carriers. Shaw's documents related to its Big Gig and Shaw Mobile plan offerings state that [redacted] [142] Consistent with these economic incentives, Shaw describes itself as a [redacted] [143]

82. One pricing strategy through which Shaw has competed aggressively is the bundling of wireless and wireline service at a discount. Because Shaw provides both wireless and wireline services in Alberta and British Columbia, it has the incentive to compete aggressively in wireless by bundling wireless and wireline service together. By conditioning a wireless discount on continued purchase of wireline services, Shaw can offer its existing wireline customers who were on the margin of reducing or discontinuing service a reason to stay, while also attracting new wireless customers. The implication of such strategy is that, by offering the customers wireless service at a low price, Shaw not only earns the smaller margins on that wireless service, it also earns additional profits through bundling of these customers to the wireline service. The additional wireline profits give Shaw Mobile an incentive to compete by offering bundled wireless service at a lower price compared to non-bundled wireless service, and thus, from an economics perspective, affect the pricing of wireless service in a way that is similar to a reduction in the marginal cost of providing that service.

83. Indeed, Shaw documents indicate that, consistent with economic incentives, the [redacted]

SJRB-CCB00618778 at p. 9

[142] SJRB-CCB00618778 at p.

[143] SJRB-CCB00368092 at p. 1

SJRB-CCB00406603

[redacted][144] Shaw's press release reporting financial results for the second quarter of 2021 indicated that the introduction of the Shaw Mobile brand was associated with an increase in "household profitability of bundled customers."[145]

84. A merger between Rogers and Shaw would reduce the incentives for Shaw to compete vigorously with the Big 3 carriers both through low-priced conventional plans and through bundled plans. The merged entity would take into account the impact of the introduction of competitive plan offerings by Shaw on Rogers' subscriber base in Alberta, British Columbia, and Ontario. As shown in the following sections, Rogers has often been the carrier to lose the most subscribers following the introduction of a new plan offering by Shaw.

85. The same consideration would affect the merged entity's incentives with respect to the bundled discounts that Shaw Mobile currently offers in Alberta and British Columbia. While the merged entity would continue to benefit from retaining profits associated with Shaw's wireline customers, it would also consider two additional effects of this competitive strategy. First, it would consider the loss of wireless margin coming from Rogers' customers switching to the less profitable Shaw Mobile product. Indeed, Rogers' internal documents indicate that [redacted][146] The merger simulation presented in Section 6.2 quantifies the effect of incentives of this sort on prices after the proposed acquisition.

86. Second, the merged entity would consider the [redacted]

[144] SJRB-CCB00361187 at p. 7.

[145] Shaw Communications, "Shaw Announces Second Quarter and Year-to-Date Fiscal 2021 Results," April 14, 2021, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452492.

[146] ROG00236681 [redacted] ROG00193628 [redacted]

[redacted][147] As discussed in Section 6.3, there is evidence that accommodative strategic behavior (such as competing less aggressively in another carrier's "turf") occurs among the Big 3 carriers.

6.1.2. Shaw's Big Gig plans resulted in lower data prices for consumers in Alberta, British Columbia, and Ontario

87. In October 2017, Shaw introduced a new menu of Freedom plans collectively referred to as "Big Gig" plans, which reduced the price per gigabyte of data.[148] After introducing changes to its menu of plans, Shaw began extending the availability of its Freedom plans to iPhone users in late November and early December 2017.[149] I refer to the Big Gig plan introduction and iPhone expansion from October 2017 to December 2017 collectively as the "Big Gig event."

88. With the Big Gig event, Shaw reduced plan prices and thereby expanded the pool of potential customers. The new Freedom plans offered more generous data allocations at a lower price per gigabyte.[150] The expansion of Freedom's

[147] SJRB-CCB00434040 [redacted] ROG00333914 [redacted]

[148] SJRB-CCB00347785 at p. 2 [redacted] Shaw Communications, "Life is a big gig, live it with Freedom: Freedom Mobile gives Canadians 10 GB for only $50," October 17, 2017, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452038.

[149] Shaw first offered the newest generations of iPhone in November, and then expanded its spectrum in major metropolitan areas to support legacy iPhone and other devices. Shaw Communications, "iPhone X, iPhone 8 and iPhone 8 Plus arrive at Freedom Mobile on Friday, December 8," November 22, 2017, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452055.

[150] Shaw Communications, "Life is a big gig, live it with Freedom: Freedom Mobile gives Canadians 10 GB for only $50," October 17, 2017, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452038; In its press release, Shaw described these plans as an offering that "resets the marketplace and redefines what Canadians should be paying for data." The press release also highlighted that the Freedom plans did not charge penalties for data overages: "Until now, the approach to wireless data pricing has been deliberately punitive, and out of line with customer usage…Better wireless prices for Canadians will only come through competition without compromise. Our Big Gig plans don't compromise on price or value, so our customers don't have to compromise on using their data." Shaw Communications, "Life is a big gig, live it with Freedom: Freedom Mobile gives Canadians 10 GB for only $50," October 17, 2017, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452038.

compatibility with older iPhone models and its introduction of new iPhones at its stores allowed Shaw to make the Big Gig plans accessible to many more wireless subscribers in Alberta, British Columbia, and Ontario because, as of 2017, approximately [redacted] percent of Canadian wireless subscribers used iPhone devices.[151] As had been the case with previous Freedom plans, the Big Gig plans did not charge data overage penalties, unlike the Big 3 carriers. The expansion of iPhone coverage thus increased the ability of iPhone subscribers to not only reduce the cost of their wireless service plan, but also potentially avoid data penalties.[152]

89. In what follows, I evaluate whether the available evidence indicates that Shaw's Big Gig plan offerings resulted in more vigorous competition with the Big 3 resulting in lower prices for data and increased data consumption.

90. I first observe that Rogers, Bell, and Telus responded to the Big Gig event by [redacted]

- [redacted] [153]
- [redacted] [154]
- [redacted] [155]

[151] SJRB-CCB00138803, [redacted] ROG00504796 at p. 2 [redacted]

[152] Shaw Communications, "Life is a big gig, live it with Freedom: Freedom Mobile gives Canadians 10 GB for only $50," October 17, 2017, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452038.

[153] ROG00118354 [redacted]

[154] SJRB-CCB00434040.

[155] SJRB-CCB00434040 [redacted]

- [redacted][156]

91. At the time, the carriers noted that [redacted][157]

92. On December 16, 2017, Shaw in turn responded to these short-term offers from the Big 3 carriers [redacted][158]

93. In the following paragraphs, I analyze the effect that the introduction of the Big Gig plans had on the market for wireless services in Alberta, British Columbia, and Ontario using wireless subscriber billing data produced by Shaw and Bell, postal code-plan level data produced by Telus, and data on wireless number porting between Shaw and other carriers produced by Shaw.[159] Evidence from these data indicate that consumers responded strongly to the introduction of the Big Gig plans and the associated promotions. Many more new data subscribers joined each carrier for which I have data during the relevant period than in the surrounding months. These newly added subscribers benefitted from lower prices for mobile data and consumed more data than subscribers who joined outside the timeframe of the Big Gig event.

94. I start by analyzing the effect of the introduction of the Big Gig plans and associated price promotions on each carriers' addition of new data subscribers.[160] Exhibit 5 below shows the number of added Freedom data subscribers and Bell postpaid data subscribers each month between May 2017 and April 2018 in each of Alberta, British Columbia, and Ontario. The effect of the Big Gig event on new data subscriber additions for both carriers is most apparent in December 2017, after the Big 3 carriers and Shaw introduced short-term promotions. Freedom added [redacted] new data subscribers in Alberta, [redacted] in British Columbia, and [redacted] in Ontario in December

[156] ROG00171065 at p. 2.

[157] SJRB-CCB00427328; See ROG00171065 at pp. 3–4 fo[redacted]

[158] SJRB-CCB00103709; SJRB-CCB00103686.

[159] While Rogers also produced billing data [redacted] made a similar analysis infeasible.

[160] Note that Exhibit 5 looks specifically at the subset of added subscribers who purchase a data plan and appear in the billing data. Gross adds as reported at the brand level will differ as they contain subscribers without data plans and may contain subscribers who do not appear in the billing data.

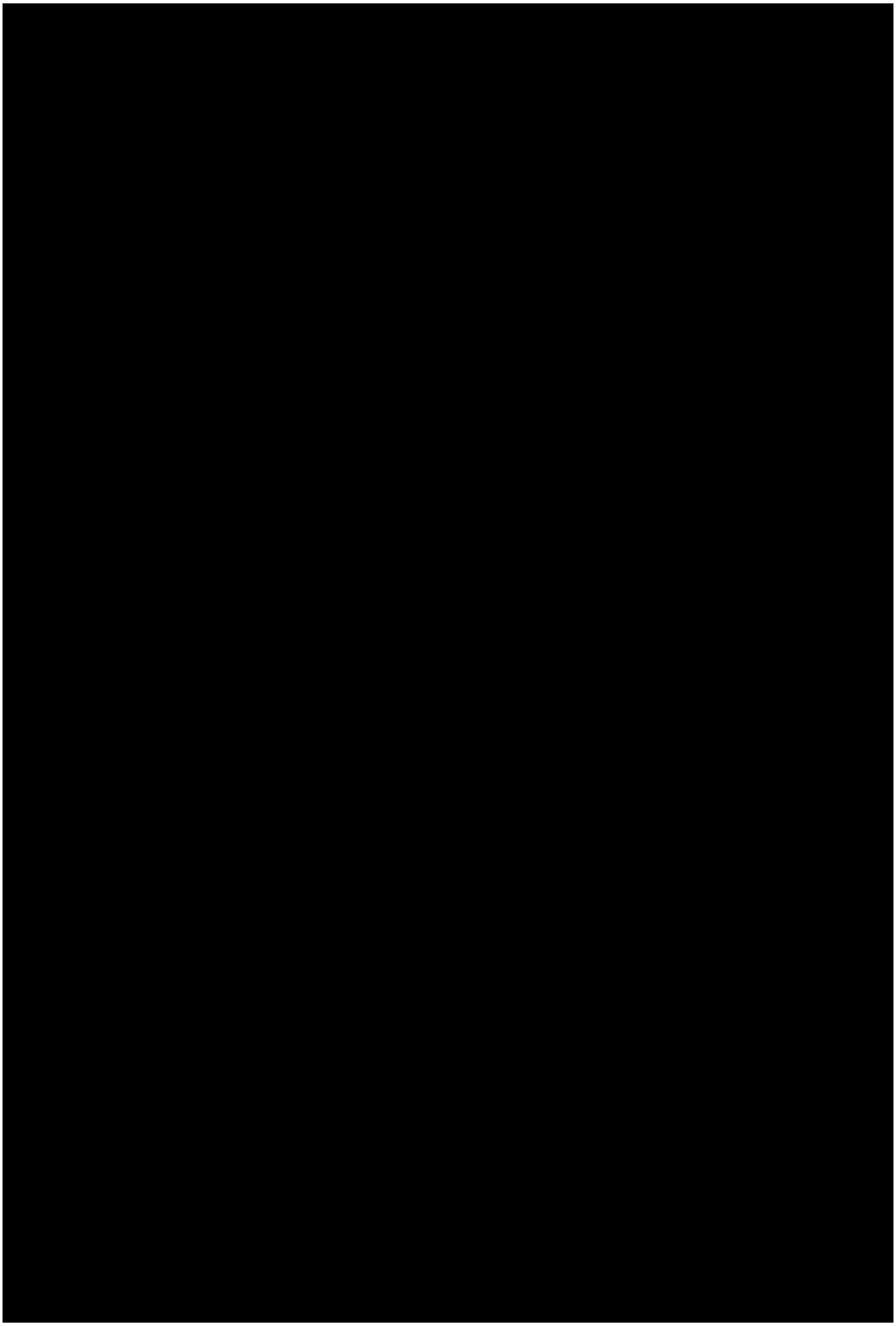
2017.[161] Shaw's added new data subscribers associated with the Big Gig event included port-ins from each of the Big 3 carriers, including from Rogers.[162] Bell's main brand and flanker brand Virgin Mobile added [redacted] new postpaid data subscribers in Alberta, [redacted] in British Columbia, and [redacted] in Ontario.[163]

[161] See Workpaper 6.1.2.a.

[162] See Exhibit 10 below.

[163] See Workpaper 6.1.2.b.

Exhibit 5
Monthly Added Data Subscribers, May 2017 – April 2018



Source: [redacted]

Note: Only subscribers with plans including at least 0.5 GB of data are included. All subscribers without record of a past active line are considered new. Bell's monthly added data subscribers include postpaid subscribers for the Bell Mobility and Virgin Mobile brands.

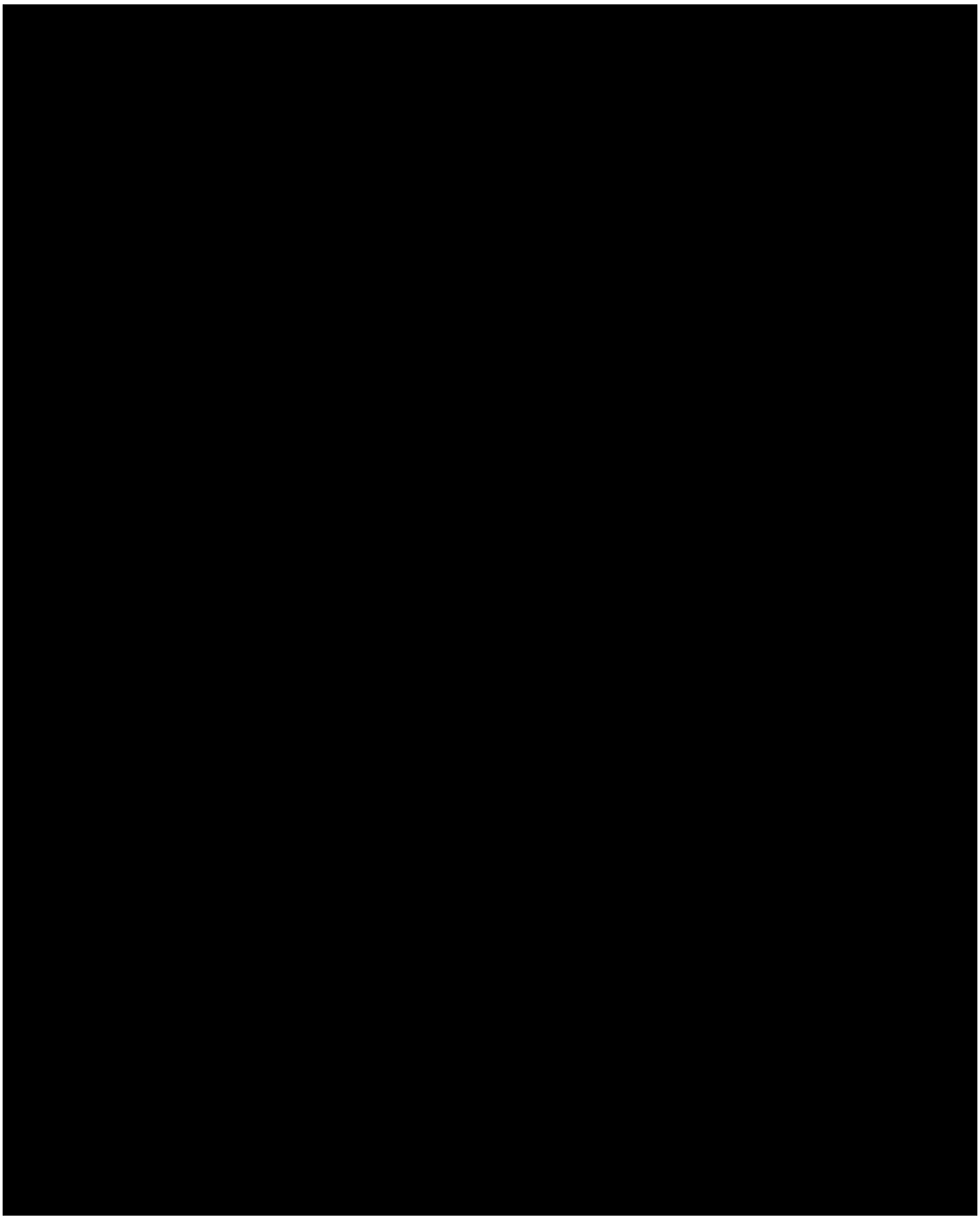
95. The format of the Telus data I use does not allow me to report a statistic that is directly comparable to what I report for the Shaw and Bell in Exhibit 5: [redacted][164] Accordingly, I analyze the subscribers added to the new promotional plans introduced by Telus in December 2017 in response to Freedom. Telus' premium brand Telus Mobility and flanker brand Koodo added [redacted] new data subscribers to these promotional plans introduced in December 2017 in Alberta, [redacted] new data subscribers in British Columbia, and [redacted] in Ontario. The newly added data subscribers accounted for [redacted] percent of all newly added subscribers in that month in Alberta, [redacted] percent in British Columbia, and [redacted] percent in Ontario.[165]

96. Next, I analyze the data usage of new subscribers who joined during the Big Gig Event. Exhibit 6 displays data usage for newly added Freedom and Bell data subscribers in Alberta, British Columbia, and Ontario who joined in the months surrounding the Big Gig Event. I group subscribers into "cohorts" based on the period of time during which they joined Freedom or Bell, respectively, and track their average monthly data usage over time. Tracking the behavior of user cohorts who joined at different times allows me to evaluate whether the Big Gig event and the associated promotions on data plans resulted in persistently higher data usage for subscribers who signed up for a new wireless plan when those data plans were offered, compared with subscribers who signed up for a new wireless plan when the lower-cost data plans were not offered.

[164] I considered two datasets produced by Telus for the purpose of this analysis. Data produced in response to Specification 12 of its Section 11 Order include plan price information at the subscriber level, but do not include data add-ons, overage fees, or other forms of charges associated with wireless service. Additionally, the data may not consistently include province information for all subscribers. Telus produced data associated with Specification 17 that include information on all wireless service revenue and data usage at the wireless plan-postal code-month level. While the format of the data provided by Telus in connection with Specification 17 does not allow me to report a statistic that is directly comparable to the one I calculated for Shaw and Bell (because it aggregates all subscribers within a plan-postal code-month), I chose to use the Specification 17 data in the analysis in this section because it allows me to observe a measure of wireless service charges per subscriber that is more comparable to the Shaw and Bell billing data (i.e., including data add-ons, overage fees, or other forms of charges), and because the province associated with wireless charges and data usage appears to be more consistently available.

[165] See Workpaper 6.1.2.c.

Exhibit 6
Average Data Usage by Newly Added Subscriber Cohort, September 2017 – June 2018



Source:

Note: Each cohort includes data subscribers in Alberta, British Columbia, and Ontario. For Freedom, the Pre-Big Gig cohort includes subscribers who first activated in July – September 2017, the During Big-Gig cohort those who first activated October – December, and the Post-Big Gig cohort those who first activated in January – March 2018. For Bell Mobility and Virgin Mobile, the Pre-December Cohort includes postpaid subscribers who first activated in July – November 2017, the December cohort those who first activated in December, and the Post-December cohort those who first activated in January – March 2018. Only subscribers with plans including at least 0.5 GB of data are included.

97. For Freedom, the exhibit displays cohorts of newly added data subscribers grouped into three time periods based on Freedom's actions in the wireless market around that time: before the Big Gig event, during the Big Gig event (i.e., between October and December 2017), and after the Big Gig event. For Bell, the exhibit displays cohorts of subscribers who joined Bell during three time periods: before December 2017, December 2017 (when Bell reacted to Freedom's Big Gig plans with short-term promotions), and after December 2017 (when Bell had removed those promotions from the market).

98. The same impacts can be observed in each of the relevant provinces. In Exhibit 7, I break out the effect of the Big Gig event on data usage by subscribers in Alberta, British Columbia, and Ontario separately and confirm that the increase in data consumption for cohorts of subscribers who joined during the Big Gig event is statistically significant. Specifically, I find that:

- Shaw subscribers who joined after the Big Gig event consumed [redacted] percent more data in Alberta, [redacted] percent more data in British Columbia, and [redacted] percent more data in Ontario. These effects are statistically significant at the 99 percent confidence level.
- Bell Mobility postpaid subscribers in each province who joined in December 2017 (when Bell offered promotional pricing) consumed between [redacted] percent and [redacted] percent more data than subscribers who joined in the surrounding months. Virgin Mobile postpaid subscribers consumed between [redacted] percent and [redacted] percent more data than subscribers who joined in the surrounding months. These effects are statistically significant at the 99 percent confidence level.

Exhibit 7
Change in Data Usage by Carrier and Province

Source: [redacted]
Note: The percent change in data usage for Shaw compares the data usage of new data subscribers in Alberta, British Columbia, and Ontario who first activated Freedom service in July – September 2017 and new data subscribers who first activated in October 2017 – February 2018. The comparison for Bell brands compares the cohort of new postpaid data subscribers who first activated in December 2017 with cohorts who first activated from July – November 2017 and January – March 2018. For all carriers, the cohorts are compared over the period April – June 2018. Only subscribers with plans including at least 0.5 GB of data are included [redacted] ** denotes that the change in data usage between groups is statistically significant at the 99 percent level.

99. As discussed above, the format of the Telus data I use differs from that of Shaw and Bell in that it reports information at the plan level rather than the subscriber level. Nevertheless, it still allows me to confirm that the promotional plans that Telus introduced in December were associated with higher data usage than other similar Telus plans. I compare data usage associated with Telus' promotional plans introduced in December by Telus Mobility and Koodo in response to the Big Gig event with the average data consumption across other plans from each Telus brand with at least 5 gigabytes of allocated data. I find that data usage associated with Telus Mobility's promotional plans is [redacted] percent higher in Alberta, [redacted] percent higher in British Columbia, and [redacted] percent higher in Ontario. The data usage associated with the promotional plans of Koodo is [redacted] percent higher in Alberta, [redacted] percent higher in British Columbia, and [redacted] percent higher in Ontario.[166] These effects are statistically significant at the 99 percent confidence level, and indicate that Telus Mobility and Koodo's promotional plans were associated with higher data usage

[166] The promotional plans introduced by Telus in response to Big Gig generally offered 10 gigabytes of data allocation. I compare these plans with the overall average usage of plans with similar data allocations of 5 gigabytes or greater, during the period April to June 2018. The effects reported are from a means comparison weighted by the number of subscribers associated with each plan-postal code-month observation. See Workpaper 6.1.2.c.

compared with their other plan offerings with similar data allocations at that time.

100. The magnitude of the change in data usage, [redacted] is consistent with the fact that these promotions represented a substantial decrease in their typical pricing for similar data plans. I therefore quantify, in what follows, the extent to which the average incremental price that newly added data subscribers paid for data dropped in connection with the Big Gig event.

101. In order to quantify this change in price, I again focus on the same three cohorts of Shaw subscribers discussed in Exhibit 6 above. In order to measure the prices that each cohort paid for data on average, I calculate the incremental price paid by subscribers per gigabyte of data allocation offered by their plans, taking into account all wireless service charges.[167] Exhibit 8 below displays these prices per gigabyte of data allocation for each of these cohorts.[168] The exhibit shows that, by April 2018, newly added subscribers who joined Freedom during or after the Big Gig event paid less per gigabyte of plan data allocation each month than those who chose a new plan before the event.[169] Subscribers who joined during the Big Gig event paid [redacted] percent less per gigabyte, and subscribers who joined after the Big Gig event paid [redacted] percent less per gigabyte, than did subscribers who joined before the event. These effects are significant at the 99 percent confidence level.[170]

[167] [redacted] See, for example, Shaw Mobile, "Plans," available at https://shop.shawmobile.ca/en-CA/plans; Rogers Communications, Inc., "Prepaid Plans - Talk, Text & Data Plans," available at https://www.rogers.com/plans/prepaid; Bell Canada, "Prepaid," available at https://www.bell.ca/Mobility/Cell_phone_plans/Prepaid_plans/Prepaid_plans.tab; Telus Corporation, "Stay connected for less with TELUS Prepaid," available at https://www.telus.com/en/mobility/prepaid/plans?linktype=subnav .

[168] [redacted]

[169] [redacted]

[170] See Workpaper 6.1.2.d.

Exhibit 8
Freedom Average Incremental Price per Gigabyte of Data Allocation by Newly Added Subscriber Cohort, September 2017 – June 2018

Source:

Note: Each cohort includes data subscribers in Alberta, British Columbia, and Ontario. The Pre-Big Gig cohort includes subscribers who first activated in July – September 2017, the During Big-Gig cohort those who first activated October – December, and the Post-Big Gig cohort those who first activated in January – March 2018. Only subscribers with plans including at least 0.5 GB of data are included.

102. Next, I quantify the effect of the Big Gig event on prices per gigabyte of data allocation paid by subscribers in Alberta, British Columbia, and Ontario by comparing the prices paid across cohorts. The results of this comparison are reported in Exhibit 9. Specifically, I find that:

- Shaw subscribers who joined Freedom after the Big Gig event faced a cost of data percent less in Alberta, percent less in British Columbia, and percent less in Ontario. These effects are statistically significant at the 99 percent confidence level.
- Bell Mobility subscribers in each province who joined during the month of its promotional pricing paid between percent and percent less per gigabyte of data allocation than subscribers who joined in the surrounding months. Virgin Mobile subscribers paid between percent and percent less per gigabyte compared with subscribers

who joined in the surrounding months. These effects are statistically significant at the 99 percent confidence level.

Exhibit 9
Change in Average Incremental Price per Gigabyte of Data Allocation by Carrier and Province

[redacted]

Source: [redacted]
Note: The percent change in price per gigabyte for Shaw compares the price per gigabyte of new data subscribers in Alberta, British Columbia, and Ontario who first activated in July – September 2017 and new data subscribers who first activated in October 2017 – February 2018. The comparison for Bell compares the cohort of new data subscribers who joined in December 2017 with cohorts who joined from July – November 2017 and January – March 2018. For both carriers, the cohorts are compared over the period April – June 2018. Data subscribers are defined as subscribers with a data allocation of at least 0.5 gigabytes [redacted]
** denotes that the change in price per gigabye between groups is statistically significant at the 99 percent level.

103. Telus Mobility subscribers who joined the promotional plans introduced in response to the Big Gig event in December 2017 paid [redacted] percent less per gigabyte of data allocation than the average price per gigabyte across other Telus Mobility plans with at least 5 gigabytes of allocated data in Alberta, [redacted] percent less in British Columbia, and [redacted] percent less in Ontario. Koodo subscribers who joined the plans introduced in December 2017 paid [redacted] percent less per gigabyte of data allocation than the average price per gigabyte across other Koodo plans with at least 5 gigabytes of allocated data in Alberta, [redacted] percent less in British Columbia, and [redacted] percent less in Ontario. These effects are statistically significant at the 99 percent level.[171]

104. While I was not able to perform a similar analysis of the impact of the Big Gig event and the promotions offered by Rogers on its subscribers, the available evidence from Rogers documents indicates [redacted]

[171] See Workpaper 6.1.2.c.

105. Overall, I find that the Big Gig event promoted vigorous competition between Shaw's Freedom brand and its competitor carriers. The Big Gig event was associated with an increase in new data subscriber additions for Freedom and persistent lower prices per gigabyte of data and higher data usage for these newly added subscribers. In other words, the Big Gig event spurred incumbents into action, reduced prices and increased output. These outcomes, when considered together, are consistent with a strengthening of competition. These pro-competitive outcomes also translated into benefits for consumers.

106. Freedom's Big Gig plans benefited consumers through lower prices for data allocations. The lower price for data plans led to higher data consumption for Freedom subscribers. The fact that consumers responded to Freedom's lower data plan pricing by increasing their consumption illustrates that they benefitted directly from Freedom's offer. This benefit alone indicates that there is reason for concern that the merger may reduce Shaw's incentive to compete in the future with plans as effective as the Big Gig plans.

[172] ROG00171144.
[173] ROG00171144.
[174] ROG00508635 at p. 2.
[175] ROG00508635 at p. 2;

107. But as shown in this section, consumers had even more benefit from the Big Gig plan through its competitive effect on the Big 3. Despite its smaller subscriber base, Freedom's offerings prompted the Big 3 to offer—at least in the short term—lower prices for data plans that led to increased data consumption for many more consumers.[176] This suggests that Shaw, in the context of the Big Gig event, acted as a significant impetus for more vigorous competition and produced an outsized benefit for subscribers in Alberta, British Columbia, and Ontario.

108. This impetus would be lost if the acquisition is consummated. While the Big 3 carriers' responses to the Big Gig event benefitted their subscribers, they only introduced lower promotional rates in response to increased competition. The Big 3 carriers had found it more profitable to charge higher prices up to that point and likely would have continued doing so as long as they did not face a competitor like Shaw. Therefore, a merger with Rogers, by removing the competitive pressure of Shaw's stand-alone incentive to compete through lower-prices for data plans like the Big Gig plans, would likely let them return to competing less aggressively.

109. While each of the Big 3 carriers lost subscribers to Shaw, there is evidence that Rogers lost the most subscribers in each province. Exhibit 10 below reports the sources of port-ins to Freedom during December 2017, the month in which Freedom experienced the largest increase in gross adds during the Big Gig event. In all three provinces, Rogers was the largest source of ports to Freedom. In Alberta, [redacted] percent of port-ins to Freedom came from Rogers. In British Columbia, [redacted] percent of port-ins came from Rogers. In Ontario, [redacted] percent came from Rogers. Despite the fact that porting data do not capture all flows between the Big 3 carriers and Shaw, Exhibit 10 suggests that, among the Big 3 carriers, Rogers was particularly affected by competition from Shaw in the context of the Big Gig event. This conclusion is corroborated by my review of ordinary course documents which indicate that [redacted][177] The

[176] [redacted] ROG00118354 [redacted]

[177] ROG00118354 [redacted] ROG00173212 [redacted] ROG00341090 [redacted]

evidence from porting data and ordinary course documents thus suggest that Rogers would have a strong incentive, all else equal, to raise prices for Freedom plans after its acquisition of Shaw.

Exhibit 10
Freedom Share of Port-ins by Carrier, December 2017

[redacted]

Source: [redacted]
Note: 'Other' includes Vidéotron and Execulink Wireless. The percentages represent the share of all wireless accounts of each of the reported carriers out of all accounts porting into Freedom within a given province. Switches within the same brand (e.g., from Freedom to Freedom) or involving a wireline service are excluded from the data.

110. After the Big Gig event, Shaw introduced other low-price plan offers. For example, in November 2018, Shaw introduced its Big Binge Bonus plan promotion, in which consumers were offered 100 gigabytes of flexible data for signing up for a Big Gig plan, an offer marketed as a way to consume larger amounts of data while avoiding the overage fees charged by the Big 3.[178] Meanwhile, the Big 3 also offered new plans that continued to make Canadian wireless consumers better off. For example, in 2019 the Big 3 carriers, led by Rogers, introduced the first unlimited plans in Canada, the first plans offered by the Big 3 that eliminated overage fees.[179] [redacted] [180] In 2020, Shaw introduced a new competitive strategy through the Shaw Mobile brand, an event I discuss in the next section.

[redacted]

[178] Shaw Communications, "Break free from data overages: Freedom Mobile introduces unprecedented 100 GB Big Binge Bonus," November 19, 2018, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452169.

[179] ROG00343982; SJRB-CCB00665632.

[180] ROG00203878 at pp. 25–26, [redacted] ROG00186819 at pp. 4–6, [redacted] SJRB-CCB00419360 [redacted]

6.1.3. Shaw's launch of the Shaw Mobile brand also enhanced competition in Alberta and British Columbia

111. Shaw expanded its subscriber base further at the end of July 2020 with the launch of the Shaw Mobile brand in Alberta and British Columbia. The brand offers heavily-discounted prices for its data plans to customers who also subscribe to Shaw's wireline internet services.[181] [redacted] plans at launch were offered to its wireline subscribers: a voice and text plan with no recurring monthly charge that offers by-the-gig data purchases (the "By-the-Gig" plan), and an unlimited plan charging $45 for 25 gigabytes of unthrottled data.[182] [redacted] [83] The plans also offer access to Shaw Wi-Fi hotspots, thereby leveraging Shaw's wireline assets to potentially reduce subscribers' consumption of mobile data. Shaw Mobile marketed this feature as an option that could allow some subscribers to consume less data, to "virtually eliminate their monthly wireless data bill."[184]

112. Shaw documents indicate that launching the Shaw Mobile brand offered two benefits for Shaw: [redacted] [185]

[redacted]

[181] Shaw Mobile, "Plans," available at https://shop.shawmobile.ca/en-CA/plans.

[182] [redacted] Shaw Mobile currently offers tiered pricing for the By-the-Gig and 25 gigabyte plans, with pricing that depends on the su[redacted] SJRB-CCB00638803; SJRB-CCB00410822,

[184] Shaw Communications, "Shaw Mobile Has Arrived — Fast LTE And Shaw's Fibre+ Network Combine to Give Customers an Innovative Wireless Experience with Unprecedented Savings," July 30, 2020, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452394.

[185] SJRB-CCB00361187 at p. 7 [redacted]

113. In what follows, I evaluate the launch of Shaw Mobile, the response of competitors to the launch, and the extent to which it resulted in more vigorous competition with the Big 3 that can be seen in lower prices of data and increased data consumption for consumers.

114. Rogers documents indicate that the Shaw Mobile launch in the latter half of 2020 [redacted][186] In that light, it is worth noting the timeline of promotional pricing strategies of each major carrier around the time of the Shaw Mobile launch:

- [redacted][187] [redacted][188]
- [redacted][189]
- [redacted][190]
- [redacted][191]

[186] ROG00333914 [redacted]

[187] SJRB-CCB00411081; SJRB-CCB00411099.

[188] SJRB-CCB00409287; SJRB-CCB00480007; SJRB-CCB00409778; SJRB-CCB00136936; SJRB-CCB00138497; SJRB-CCB00410737.

[189] ROG00186068 at p. 18; ROG00456355; SJRB-CCB00367431; ROG00008832; SJRB-CCB00142380; SJRB-CCB00142763 [redacted]

[190] ROG00456355; SJRB-CCB00367431; ROG00008832; SJRB-CCB00142380.

[191] SJRB-CCB00421464 [redacted] ROG00340339 [redacted]

- [redacted][192]

115. In the following paragraphs, I analyze the effect that the launch of the Shaw Mobile brand had on the market for wireless services in Alberta, British Columbia, and Ontario using the same wireless subscriber billing data and porting data for Shaw, Bell, and Telus previously described in Section 6.1.2.[193] Evidence from these data indicate that consumers responded strongly to the introduction of the Shaw Mobile brand and the associated promotions offered by Shaw and its competitors: Many more newly added data subscribers joined after the launch of Shaw Mobile than in the months prior at each carrier for which I have data. These newly added subscribers benefitted from lower prices for mobile data and consumed more data than subscribers who joined before the launch of the Shaw Mobile brand.

116. I start by analyzing the effect of the introduction of the Shaw Mobile brand and the associated price promotions on each carriers' addition of new data subscribers.[194] Exhibit 11 below shows the number of added Freedom and Shaw Mobile data subscribers each month between March 2020 and February 2021 in each of Alberta, British Columbia, and Ontario (for Freedom) and Alberta and British Columbia (for Shaw Mobile). [redacted][195]

117. Shaw Mobile launched on July 30, 2020 and added [redacted] thousand data subscribers by the end of August, as well as [redacted] thousand subscribers to its By-

[192] SJRB-CCB00421464.

[193] While Rogers also produced billing data, [redacted] made a similar analysis infeasible. The format of the data provided by Telus does not allow me to report a statistic that is directly comparable to Shaw and Bel [redacted]

[194] Exhibit 11 considers specifically the subset of added subscribers who purchase a data plan and appear in the billing data. Gross adds as reported at the brand level will differ as they contain subscribers without data plans and may contain subscribers who do not appear in the billing data.

[195] SJRB-CCB00421464 [redacted]

the-Gig plan, [redacted] Shaw Mobile continued to add an average of [redacted] thousand new data subscribers each month between October 2020 and February 2021, as well as an additional [redacted] thousand By-the-Gig subscribers each month.[196] [redacted] [197]

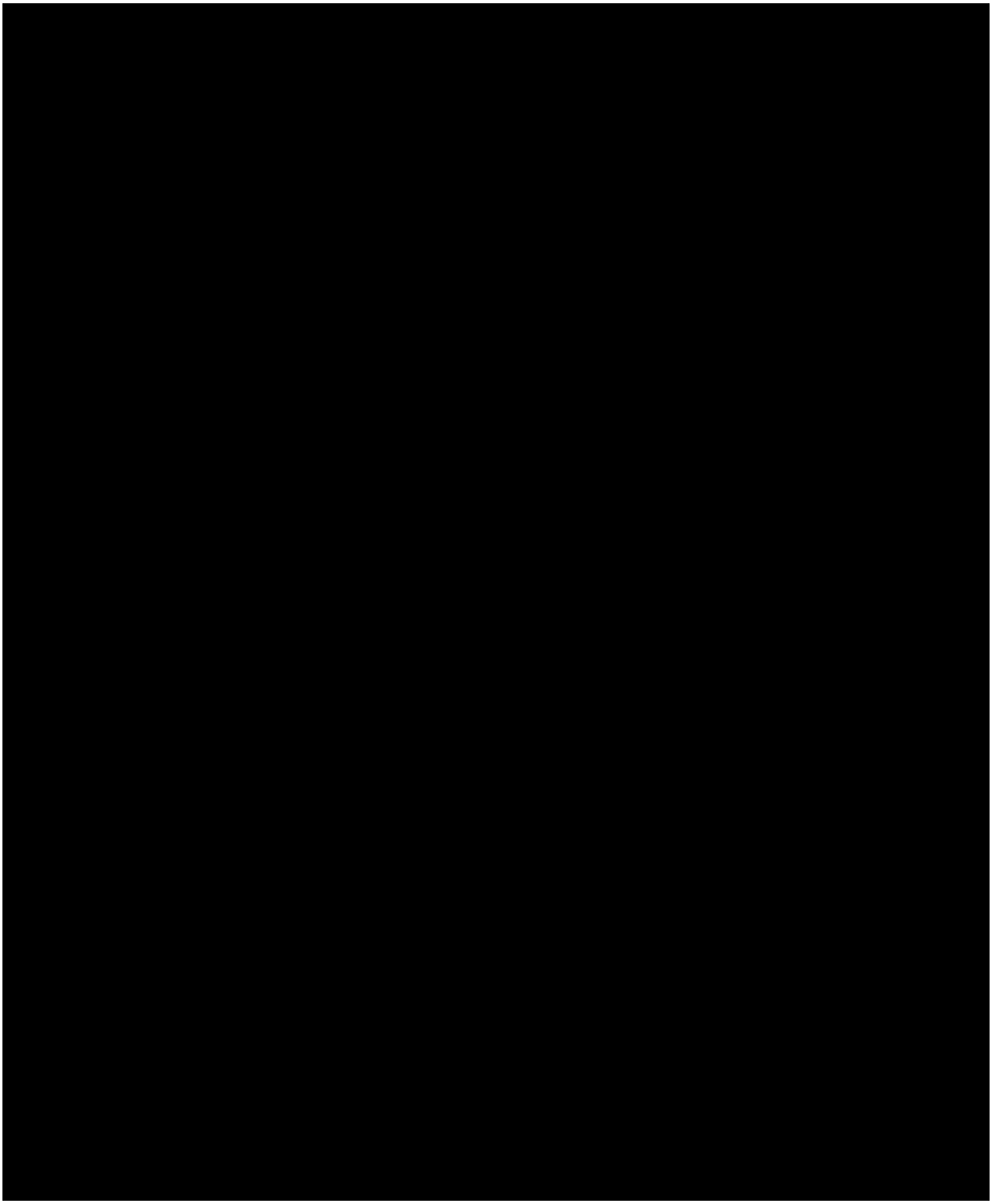
118. Bell's brands, Bell Mobility and Virgin Mobile, each experienced an increase in additions of data subscribers during late 2020 and early 2021 as well, as shown in Exhibit 12, consistent with their promotional activity at that time. [redacted] [98] [redacted]

[196] See Workpaper 6.1.3.b.

[19] [redacted]

[198] [redacted] SJRB-CCB00368266; SJRB-CCB00411467; ROG00194928 at p. 2; ROG00209733 at p. 2; ROG00453404 at p. 6.

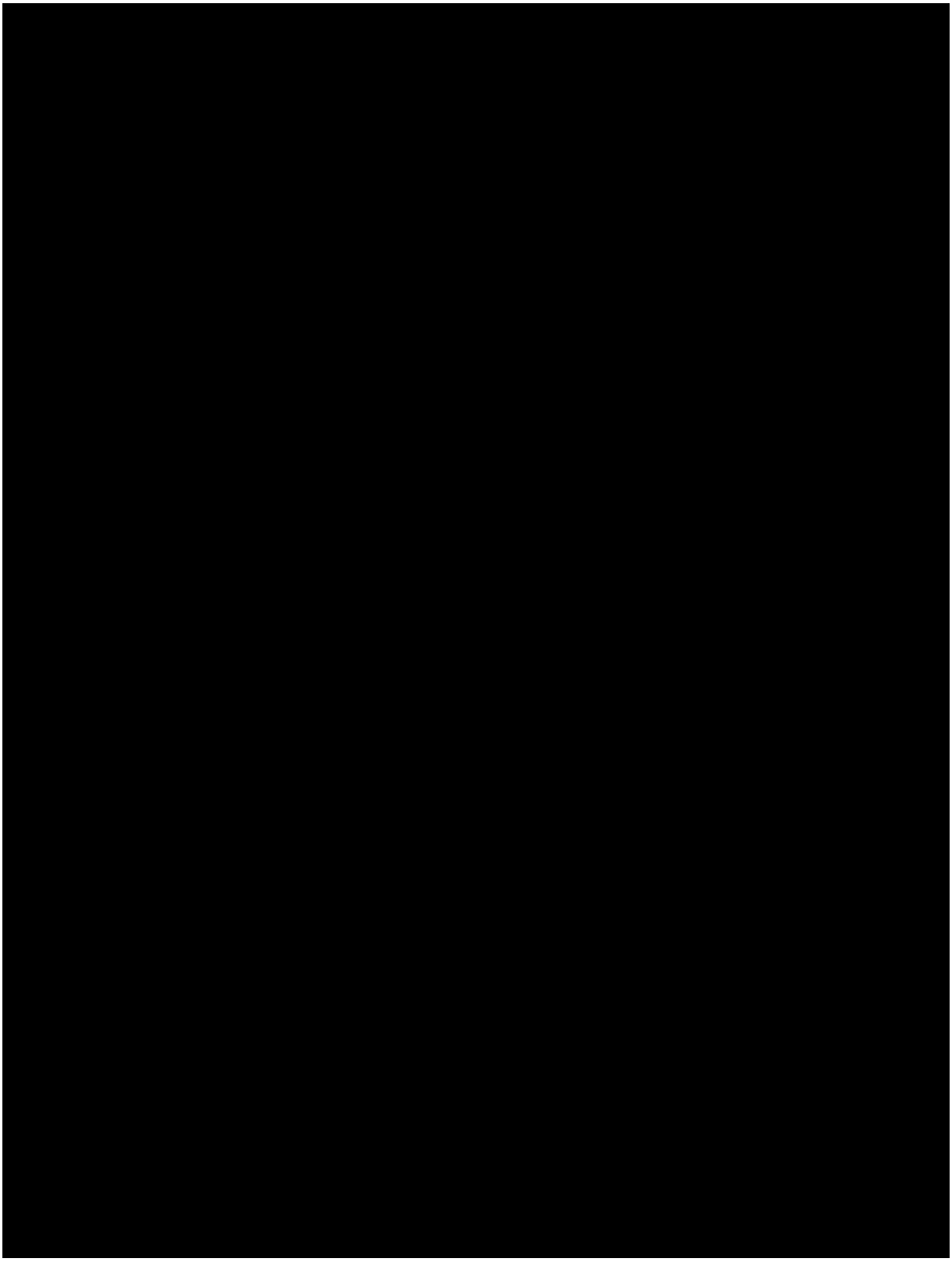
Exhibit 11
Monthly Added Data Subscribers, March 2020 – February 2021



Source: [redacted]

Note: All subscribers without record of a past active line are considered new. Only subscribers with plans including at least 0.5 GB of data are included for Freedom. Subscribers with By-the-Gig plans or plans including at least 0.5 GB of data are included for Shaw Mobile. The dashed lines indicate the number of subscribers excluding By-the-Gig plans. Shaw Mobile launched on July 30, 2020.

Exhibit 12
Monthly Added Data Subscribers, March 2020 – February 2021



Source:

Note: All subscribers without record of a past active line are considered new. Only postpaid subscribers with plans including at least 0.5 GB of data are included.

119. As described in Section 6.1.2, the format of the Telus data I use differs from that of Shaw and Bell in that it reports information at the plan level rather than the subscriber level. Accordingly, I analyze the data in order to identify the Telus Mobility promotional plans that were offered from January to July 2020 (immediately before the launch of Shaw Mobile) and separately, those offered from August to November 2020 (immediately after the launch of Shaw Mobile).[199] The number of new subscribers in January to July 2020 added to pre-Shaw Mobile promotional plans offered by Telus Mobility was [redacted] on average per month in Alberta, [redacted] on average per month in British Columbia, and [redacted] on average per month in Ontario. The number of new subscribers in August to November 2020 added to post-Shaw Mobile promotional plans offered by Telus Mobility was [redacted] on average per month in Alberta, [redacted] on average per month in British Columbia, and [redacted] on average per month in Ontario.[200]

120. Rogers documents indicate that [redacted] [201] A Shaw document from January 2021 indicates that [redacted]

[199] Based on my review of the Specification 17 data produced by Telus, [redacted] See ROG00456355.

[200] See Workpaper 6.1.3.c.

[201] ROG00662266 [redacted] ROG00333914 [redacted]

[redacted][202][redacted]

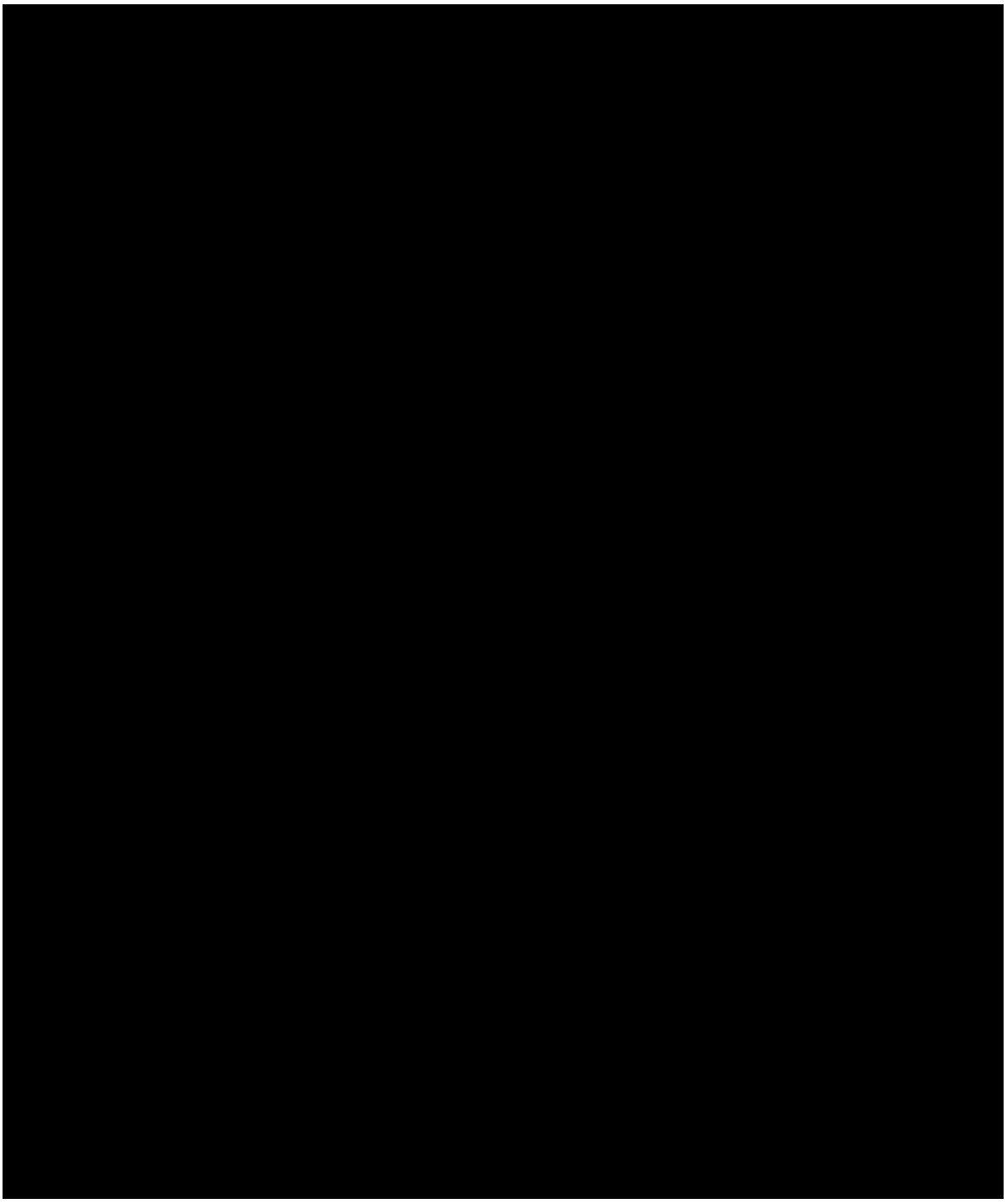
121. Next, I analyze the effect of the launch of the Shaw Mobile brand and the promotions in the latter half of 2020 on Shaw and Bell subscribers' data usage. I do not include the data usage of Shaw Mobile subscribers who purchase the By-the-Gig plan. The distinctive feature of the By-the-Gig plans is that it offers bundled subscribers the option of using their Shaw home Wi-Fi and Shaw's Wi-Fi hotspots as a substitute for mobile data, thereby potentially eliminating all charges associated with their wireless service plan (since there is no charge associated with voice and text).[203] Given the number of new subscribers who chose to sign up for a By-the-Gig plan, this option is attractive for consumers. However, moving data transmissions to the Wi-Fi network takes them out of the data I have available so including the data I can measure for these customers would miss the value of this product.

122. Exhibit 13 displays data usage for Freedom subscribers before and after the launch of Shaw Mobile and Shaw Mobile data subscribers after its launch. The chart shows that new Freedom subscribers who joined after the launch of Shaw's second mobile brand used [redacted] more data each month than those who joined Freedom before the launch, likely due to Freedom's promotional activity in response to targeted promotions by other carriers, which reduced the price of certain data plans. New Shaw Mobile data plan subscribers use more data on average than Freedom subscribers, which is consistent with the Shaw Mobile data plan's relatively large data allocation.

[202] SJRB-CCB00421464[redacted]

[203] Shaw Communications, "Shaw Mobile Has Arrived — Fast LTE And Shaw's Fibre+ Network Combine to Give Customers an Innovative Wireless Experience with Unprecedented Savings," July 30, 2020, available at https://newsroom.shaw.ca/corporate/newsroom/article/materialDetail.aspx?MaterialID=6442452394.

Exhibit 13
Average Data Usage by Newly Added Subscriber Cohort, March 2020 – February 2021



Source:

Note: The Freedom, Bell Mobility, and Virgin Mobile Pre-Launch cohorts include data subscribers in Alberta, British Columbia, and Ontario that first activate in January – July 2020. The Freedom, Shaw Mobile, Bell Mobility, and Virgin Mobile Post-Launch cohorts include subscribers who first activated in August – December 2020. Shaw Mobile was launched on July 30, 2020.

Only subscribers with plans including at least 0.5 GB of data are included.

123. Data usage is also higher for Bell Mobility and Virgin Mobile subscribers who join after the launch of Shaw Mobile than for cohorts of subscribers who join these brands before.[204] The increase in usage is consistent with the fact that Bell Mobility and Virgin Mobile's promotions reduced the price of certain data plans offering relatively large data allocations.[205]

Exhibit 14
Change in Data Usage by Carrier and Province

[redacted]

Source: [redacted]
Note: The percent change in data usage for Shaw compares the data usage of new data subscribers in Alberta, British Columbia, and Ontario who first activated Freedom service in January – July 2020 and new data subscribers who first activated Freedom service in August – October 2020. The comparison for Bell brands compares the cohort of new data subscribers who joined in January – July 2020 with cohorts who joined from August – November 2020. For both carriers, the cohorts are compared over the period December 2020 – February 2021. Data subscribers are defined as subscribers with a data allocation of at least 0.5 gigabytes. [redacted] ** denotes that the change in data usage between groups is statistically significant at the 99 percent level.

124. Exhibit 14 reports the difference in data usage between these cohorts of subscribers and their statistical significance. The exhibit compares the average data usage of Freedom subscribers who joined before and after the launch of Shaw Mobile in each province. In an average month, subscribers who joined Freedom after the launch of Shaw Mobile used [redacted] percent more data in Alberta, [redacted] percent more data in British Columbia, and [redacted] percent more data in Ontario. These effects are statistically significant at the 99 percent confidence level. The larger effect in Western Canada is consistent with the fact that Shaw

[204] [redacted]

[205] See for example, ROG00008832.

Mobile is only offered in these provinces, leading to particularly intense price competition between Shaw's brands and the Big 3 in Western Canada.[206]

125. Next, the exhibit compares the average data usage of Bell subscribers who joined before and after the launch of Shaw Mobile in each province. Bell Mobility and Virgin Mobile subscribers who joined after Shaw Mobile's launch used [redacted] percent more data and [redacted] percent more data, respectively, across the three provinces than subscribers who joined in other months. These effects are statistically significant at the 99 percent confidence level.

126. I compare data usage associated with Telus Mobility's promotional plans (described above) that were offered after the launch of Shaw Mobile to the average data usage on all other Telus Mobility plans with at least 10 gigabytes of allocated data.[207] Data usage associated with Telus' promotional plans offered after the launch of Shaw Mobile is [redacted] percent higher than the average data usage on other Telus Mobility plans with at least 10 gigabytes of allocated data that were active at that time in Alberta, [redacted] percent higher in British Columbia, and [redacted] percent higher in Ontario.[208] These differences are statistically significant at the 99 percent confidence level.

[206] ROG00333914 [redacted]

[207] [redacted]

[208] See Workpaper 6.1.3.c. I weight promotional plan usage by the gross adds from August to November 2020 associated with each plan-postal code observation in order to reflect their relative importance in gross adds during the post-Shaw Mobile period. I weight average usage across all other plans by the total number of subscribers associated with each plan-postal code-month observation.

127. Next, I evaluate the impact of the launch of Shaw Mobile on the incremental price per gigabyte of data allocation faced by Shaw, Bell, and Telus subscribers before and after the launch.

Exhibit 15
Shaw Brands Average Incremental Price per Gigabyte of Data Allocation by Newly Added Subscriber Cohort

Source:

Note: The Freedom Pre-Launch cohorts include data subscribers in Alberta, British Columbia, and Ontario who first activate in January – July 2020. The Freedom and Shaw Mobile Post-Launch cohorts include subscribers who first activated in August – December 2020. Shaw Mobile was launched on July 30, 2020. Only subscribers with plans including at least 0.5 GB of data are included.

128. Exhibit 15 displays the comparison of the incremental price of data for cohorts of Freedom subscribers who joined before and after the launch of Shaw Mobile. [209]

129. Subscribers faced a lower price per gigabyte of plan data allocation in Ontario as well. Even though Shaw Mobile was not available, promotions

[209]

targeted at Freedom subscribers extended to Ontario, as discussed above. These promotions contributed to lower-priced plan offerings in Ontario as well.[210] To the extent that Shaw Mobile provided the impetus for these promotions that may not have otherwise been introduced, the launch of Shaw Mobile in Western Canada provided additional benefit to consumers in Ontario through more vigorous price competition.

Exhibit 16
Change in Average Incremental Price per Gigabyte of Data Allocation by Carrier and Province

[redacted]

Source: [redacted]

Note: The percent change in price per gigabyte for Freedom compares the price per gigabyte of new data subscribers in Alberta, British Columbia, and Ontario who first activated in January – July 2020 and new data subscribers who first activated in August – October 2020. The comparison for Bell brands compares the cohort of new data subscribers who joined in January – July 2020 with cohorts who joined from August – November 2020. For both carriers, the cohorts are compared over the period December 2020 – February 2021. Only subscribers with plans including at least 0.5 GB of data are included. [redacted] ** denotes that the change in price per gigabyte between groups is statistically significant at the 99 percent level.

130. Next, I report the breakout of the change in incremental price per gigabyte of data across each province for Shaw and Bell's wireless brands. Exhibit 16 reports the difference in the price per gigabyte of data faced by these cohorts of subscribers and their statistical significance:

- Subscribers who joined Freedom after the launch of Shaw Mobile paid [redacted] percent less in Alberta, [redacted] percent less in British Columbia, and [redacted] percent less in Ontario. These differences are significant at the 99 percent confidence level.

[210] ROG00456355; SJRB-CCB00367431.

- Bell Mobility subscribers who joined after the launch of Shaw Mobile faced an incremental price per gigabyte of data allocation between [redacted] percent and [redacted] percent lower than subscribers who joined in early January. Virgin Mobile subscribers who joined after the launch of Shaw Mobile faced a price between [redacted] percent and [redacted] percent lower than subscribers who joined in early January. These differences are statistically significant at the 99 percent confidence level.

131. I also compare the incremental price per gigabyte of data associated with Telus Mobility's promotional plans described above that were offered after the launch of Shaw Mobile to the average price per gigabyte of data on all other Telus Mobility plans with at least 10 gigabytes of allocated data.[211] The incremental price per gigabyte of data associated with Telus' promotional plans introduced after the launch of Shaw Mobile is [redacted] percent lower in Alberta, [redacted] percent lower in British Columbia, and [redacted] percent lower in Ontario than the average price per gigabyte of data associated with Telus' other plans active at that time.[212] These effects are statistically significant at the 99 percent confidence level.

132. While I was not able to perform a similar analysis of the impact of the launch of Shaw Mobile and the promotions offered by Rogers on its subscribers, the available evidence from Rogers documents indicates that [redacted]" [213] [redacted]

[211] [redacted]

[212] See Workpaper 6.1.3.c. [redacted]

[213] ROG00572858 at p. 2.

[redacted][214][redacted][215]

133. Overall, I find that the launch of Shaw Mobile promoted vigorous competition between Shaw's brands and competitor carriers. Its launch benefitted consumers directly because Shaw Mobile offered bundled service options that were differentiated from the offerings of existing wireless brands at low prices. It also prompted an increase in price competition with and between existing brands. The launch of Shaw Mobile was associated with an increase in new data subscriber additions for Shaw overall, including both Freedom and Shaw Mobile. The promotions offered by the Big 3 and Shaw's Freedom resulted in persistent lower prices of data and higher usage of data for these newly added subscribers. These benefits accrued not only in Alberta and British Columbia, where Shaw Mobile entered, but spilled over to Ontario as well, as the result of retaliatory promotions targeted at Freedom. These outcomes, when considered together, are consistent with a strengthening of competition that conveyed a benefit to consumers.

134. The impetus for more vigorous competition prompted by Shaw would be lost if the acquisition is consummated. While each of the Big 3 wireless carriers operates a wireline network in parts of Canada, I am not aware of a bundled wireless plan currently marketed by any of the Big 3 with wireless pricing comparable to Shaw Mobile's plan offerings.[216] Therefore, a merger with Rogers, by removing the competitive pressure of Shaw's stand-alone incentive

[214] ROG00572858 at pp. 11–12, 14.

[215] [redacted] SJRB-CCB00421464 at p. 1; ROG00655389 at p. 2 [redacted]

[216] [redacted] ROG00236681 [redacted] Telus, which offers wireless and wireline service in British Columbia and Alberta, also offers bundled wireless-wireline plans involving discounted wireline service. The bundle appears to offer a $10 discount on wireline internet subscriptions for consumers who purchase both wireless and home internet. https://www.telus.com/en/shop/home-services/bundle/build-your-own.

to compete through bundled offerings like Shaw Mobile, would likely let the Big 3 return to competing less aggressively.

135. While each of the Big 3 carriers lost subscribers to Shaw, there is evidence that [redacted] Exhibit 17 below reports the sources of port-ins to Shaw brands during August to October 2020, the months immediately following Shaw Mobile's launch. In Alberta [redacted] percent of port-ins to Freedom came from Rogers. In British Columbia [redacted] percent of port-ins came from Rogers. In Ontario [redacted] percent came from Rogers. Despite the fact that porting data do not capture all flows between the Big 3 carriers and Shaw, Exhibit 17 suggests that, among the Big 3 carriers, Rogers was particularly affected by competition from Shaw in the context of the launch of Shaw Mobile. This conclusion is corroborated by my review of ordinary course documents which indicate that [redacted][217]

Exhibit 17
Freedom and Shaw Mobile Share of Port-ins by Carrier, August 2020 – October 2020

[redacted]

Source: [redacted]

Note: 'Other' includes Vidéotron, Execulink Wireless, SearsConnect Wireless, Petro Canada Mobile, 7 Eleven Speakout Wireless, Solo Mobile, PC Mobile, and DCI Wireless. The percentages represent the share of all wireless accounts of each of the reported carriers out of all accounts porting into Freedom or Shaw Mobile within a given province. Switches within the same brand (e.g., from Freedom to Freedom) or involving a wireline service are excluded from the data. Brand migrations within the same carrier (e.g., from Shaw Mobile to Freedom are excluded).

[217] ROG00662331 [redacted] ROG00251667 [redacted]

6.2. A quantitative model allows estimation of unilateral effects of the proposed acquisition

136. The previous section commented on evidence related to Shaw's history of competing in wireless since its 2016 acquisition of Wind Mobile. This section evaluates the likely impact of the merger on future competitive conditions in the market for mobile wireless services, including prices for wireless services and the deadweight loss resulting from predicted price increases associated with the merger.

137. This section develops an economic model, commonly known as a "merger simulation model," that can be used to predict the effects of the merger in Alberta, British Columbia, and Ontario. Merger simulation models are a well-known method for assessing the competitive effects of a merger that has gained wide acceptance at the Competition Bureau and at competition authorities in other jurisdictions.[218]

138. My analysis in this section proceeds in the following steps:

- I explain why the merger between Rogers and Shaw creates an incentive for the merged carrier to raise price and why this can harm consumers (Section 6.2.1).
- I explain how I use an economic model to quantify the price and welfare effects of this change in incentives introduced by the merger (Section 6.2.2).
- I explain how the economic model captures consumers' preferences across wireless brands and the nature of competition between wireless carriers (Section 6.2.3).

[218] See, for example, Jonathan B. Baker, and David Reitman, "Research Topics in Unilateral Effects Analysis" in *Research Handbook on the Economics of Antitrust Law*, ed. Einer Elhauge, Edward Elgar Publishing, 2012, pp. 34–39; Gregory J. Werden and Luke M. Froeb, "The Effects of Mergers in Differentiated Products Industries: Logit Demand and Merger Policy," *Journal of Law, Economics, and Organization*, 10(2), 1994, pp. 407–426 at p. 407; Nathan H. Miller and Matthew C. Weinberg, "Understanding the Price Effects of the MillerCoors Joint Venture," *Econometrica*, 85(6), 2017, pp. 1763–1791; *The Commissioner of Competition v. Superior Propane Inc.*, 2000 Comp. Trib. 15, available at https://decisions.ct-tc.gc.ca/ct-tc/cdo/en/464664/1/document.do, ¶ 247; Government of Canada, "Competition Bureau statement regarding Evonik's proposed merger with PeroxyChem," January 28, 2020, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04519.html; Government of Canada, "Proposed acquisition of Cargill Limited's grain and retail crop inputs businesses in Ontario by La Coop fédérée," November 13, 2018, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04403.html; Government of Canada, "Competition Bureau statement regarding Superior Plus LP's proposed acquisition of Canwest Propane from Gibson Energy ULC," September 28, 2017, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04307.html; Government of Canada, "Merger between Heinz and Kraft," June 17, 2015, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/03965.html.

- I explain how I incorporate data on consumers' choices of wireless brand and carriers' prices and markups into the model in order to generate predictions about the likely effect of the merger (Section 6.2.4).
- I describe the model's predictions for the prices charged by each wireless carrier after the merger, and the effect on each carrier's market share (Section 6.2.5).
- I describe the model's predictions for total surplus, consumer surplus, and transfers between consumer and wireless carriers in the wireless services market in each province, and show that the merger is expected to result in deadweight loss in each province (Section 6.2.6).
- I describe the model's predictions for prices, total surplus, consumer surplus, and transfers between consumer and wireless carriers for a sensitivity analysis that considers different values for the market elasticity (Section 6.2.7).

6.2.1. A merger between two competing wireless carriers can harm customers and welfare in the market for mobile wireless services in the relevant provinces

139. As discussed in Section 5.1, a focus of merger review analysis is the extent to which the merger allows the combined entity to exercise market power.[219] Economic theory indicates that a merger between substitutes, such as Rogers' and Shaw's wireless services, can lead to less favorable pricing terms for consumers of wireless services and ultimately harm them.[220] In this section, I discuss in detail the intuition behind that conclusion.

140. In the market for wireless services, a carrier faces a trade-off when deciding whether to raise its prices. On the one hand, higher prices increase revenue earned from subscribers that continue to purchase from the carrier. On the other hand, some subscribers will switch to other carriers or reduce their consumption as a result of the higher prices. The carrier loses all profit associated with subscribers that switch away and incremental profit associated

[219] "Market power of sellers is the ability of a firm or group of firms to profitably maintain prices above the competitive level for a significant period of time." See Merger Enforcement Guidelines, ¶¶ 2.1, 2.3.

[220] Merger Enforcement Guidelines, ¶ 2.9.

with subscribers who use their phone less. A profit-maximizing firm balances these considerations when setting prices.[221]

141. A merger between wireless carriers alters one side of this tradeoff. Specifically, after the merger, the merged carrier takes into account that it recaptures some of the lost profit from subscribers that leave, because some of those subscribers will switch to wireless brands owned by the recently acquired carrier. For example, if Rogers were to raise plan prices for the Rogers brands, it would lose some subscribers to Freedom or Shaw Mobile. After the merger, these subscribers are not lost, since Rogers recaptures the sales diverted to the Shaw brands.

142. As a result, a price increase that was not profitable *before* the acquisition can become profitable *after* the acquisition. This change in incentives leads to higher prices for wireless services at Rogers and Shaw, which in turn likely has a number of effects.

143. First, wireless carriers are better off than before the acquisition. As explained above, Rogers and Shaw would now be able to impose a price increase that raises their profits. That change in price also affects Rogers' and Shaw's competitors. As the merging firm raises its prices, consumer demand increases for the brands of the non-merging firms, which allows these firms to maintain higher prices as well. As a result, prices and profits in the market as a whole will rise.

144. Second, the wireless carriers' increase in profit comes at the expense of wireless subscribers—especially those most likely to purchase from Rogers and Shaw—who are worse off than they were before the acquisition. Some subscribers simply absorb the higher price of wireless services, leaving them with less disposable income for other household expenditures. Other subscribers purchase less wireless service from wireless brands owned by Rogers and Shaw in response to the price increase. Subscribers who reduce their consumption of wireless service may do so by switching to lower-cost plans offering smaller data allocations, by reducing the number of lines purchased within a household, or by discontinuing wireless service altogether,

[221] Carriers typically offer multiple brands and multiple plan options within a brand. When all prices of a given carrier rise, some customers who choose to use their phone less might do so by purchasing a smaller data allocation or switching to another of the carrier's brands. A carrier will set prices across its brands to optimize the relative attractiveness across the carrier's menu of brands and plans, and that may mean that the prices of some plans rise more or less than others. The core intuition of the tradeoff faced by the carrier still governs how high the average price can be across the entire menu of its plans.

among other strategies. Finally, others could respond by switching to a less-preferred wireless brand and could reduce their consumption in the process depending on the particular plan they subscribe to.

145. The reduction in the consumption of mobile wireless services associated with an increase in prices resulting from the merger reflects an inefficiency caused by the exercise of market power by the merged carrier. Subscribers who decrease consumption or switch to a less-preferred wireless service brand in response to the increase in price associated with the merger are willing to pay more for the forgone service than it would cost the merged carrier to provide, but less than the merged carrier charges, and so these subscribers do not purchase the same service as before the merger. In the language of economics, this reduction of consumption is a source of deadweight loss, meaning that the potential benefits of mobile wireless usage that does not happen due to the exercise of market power are lost to the economy.

146. It should be noted that my analysis, as well as the deadweight loss concept just described, is measuring the effects of competition only with respect to the relevant markets—the market for consumer mobile wireless services in Alberta, British Columbia, and Ontario—while the rest of the economy is treated as if it were unaffected, as is common practice. The focus on a specific market may intentionally set aside some of the interrelationships between the market and the larger economy in which broader economic concepts, such as consumer welfare, are properly defined. For example, the welfare implications of a transfer between customers and carriers are likely understated without some macroeconomic considerations of the welfare implications of income inequality, a point I discuss further in Section 6.2.6.

147. Even with respect to the relevant markets, my analysis may under-predict the adverse competitive effects of the merger. For example, the model presented in this section considers the effect of the merger in provinces in which both Rogers and Shaw currently operate, setting aside the impact of any additional competition that might be created in the future if Shaw continues to expand its service area to a greater portion of the relevant provinces. Ordinary course documents indicate that, before the proposed merger with Rogers was announced, [redacted]

[redacted] [222]

148. The analysis presented in this section may also understate the adverse competitive effects of the merger to the extent that competition from Shaw has disrupted price coordination by the Big 3 carriers in Alberta, British Columbia, and Ontario, and that price coordination would be more effective after the merger. As discussed in Section 4.3, the Big 3 engage in signaling behaviors that are consistent with an attempt to coordinate wireless pricing. If the merger of Rogers and Shaw facilitates this coordination, the model presented in this section—which assumes that carriers set prices independently—will tend to underestimate the effect of the merger on wireless prices and deadweight loss.

149. I discuss these and other reasons to expect harms that I cannot include in this quantification of the proposed acquisition's effects in Section 6.3.

150. Having discussed these consequences in the abstract, I next employ an economic model to simulate and quantify the effects of the merger, particularly the resulting price changes and welfare consequences of the acquisition.

6.2.2. Quantifying the effects of the merger through an economic model of competition in the market for mobile wireless services in Alberta, British Columbia, and Ontario

151. In order to quantify the likely effects of a merger, I conduct a merger simulation analysis, which consists of three steps: model specification, model calibration, and model simulation. I discuss these in turn.

152. ***Model Specification***. I begin the analysis by formulating an economic model that describes the way consumers of the product make choices, and the way the firms interact with each other and determine market prices and quantities in an equilibrium. The model comprises a number of equations that represent consumer preferences and govern the interaction between firms. These equations include two types of terms: parameters and outcomes. Parameters govern the nature of consumer preferences (such as a value specifying that consumers prefer lower prices to higher prices) and firm characteristics (such as marginal costs and brand ownership indicators).

[222] See Section 6.3.1.

Outcomes typically represent observable magnitudes of economic significance, such as prices and market shares, that the model can calculate once the values of the parameters are specified.

153. ***Model Calibration***. I select values for the parameters such that the model can replicate, as a prediction, outcomes that are observed in real-world data available before the merger. This process is commonly referred to as "model calibration." Specifically, to calibrate the model, I calculate values for the parameters representing consumer preferences and firm marginal costs based on data on market shares and prices that were provided to the Competition Bureau by the merging parties, as well as by Bell and Telus. The model, thus calibrated, predicts market shares, prices, and profit margins that are reasonably close to those I observe in the data.

154. ***Model Simulation***. I use the calibrated model to recalculate prices, market shares, and profit margins in a scenario in which the Rogers and Shaw brands belong to a single owner, the combined entity that would result from the consummation of the proposed acquisition. In order to do so, I use the calibrated parameter values from the previous step and adjust the ownership indicators to account for the change in ownership of brands belonging to the merging firms. With this adjustment, the model can take into account the change in the merging firms' pricing incentives and calculate the new prices and quantities chosen by all market participants after the merger. Finally, based on these prices and quantities, I calculate the deadweight loss, the change in consumer surplus, and the transfer of wealth from consumer to producers due to the merger and thus quantify the welfare effects of the merger.

155. In the remainder of this subsection, I discuss in more detail how I implemented these three steps and summarize the results of the model simulation. For each of these steps, I also prepared accompanying appendices that cover the more technical aspects of the implementation.

156. Before delving into the details of the model and the analysis it is important to note that merger simulation models, like economic models in general, are meant to capture the most salient features of markets. As I explain in my 2020 paper "Quantitative Methods for Evaluating the Unilateral Effects of Mergers," they cannot be expected to capture all details and complexities of markets.[223]

[223] Nathan Miller and Gloria G. Sheu, "Quantitative Methods for Evaluating the Unilateral Effects of Mergers," *Review of Industrial Organization* 58(1), 2021, pp. 143–177 at 144. Special Issue: "The 2010 Horizontal Merger

Instead they focus on the mechanisms and economic interactions that are most salient for the task at hand; other features are often incorporated in a more stylized manner.

157. The key competitive impetus that Shaw has provided to mobile wireless services in the provinces in which it operates has been reducing prices for consumers.[224] Given this background, it is the competitive vigor that Shaw introduced to wireless pricing that is most at risk of being lost with the proposed acquisition. Accordingly, the model that I specify and calibrate for my analysis is one focused on price competition. The simulations based on such a model indicate the magnitude of the merger's effect on pricing incentives and provide a useful measure of overall changes that are likely to occur. As such, they are not intended to predict precise changes in every price and plan choice post-merger. Finally, they allow me to assess how such changes in pricing incentives translate into welfare changes for producers and consumers.

6.2.3. Specifying the model of the market for wireless service in Alberta, British Columbia, and Ontario

158. I model consumers' decisions related to their purchase of wireless services from one of the four major wireless carriers operating in Alberta, British Columbia, and Ontario using a framework known as the Logit demand system (or Logit model).[225] Within this framework, when consumers decide to purchase wireless services, they choose between a discrete set of wireless brands, factoring in the differing prices and contractual terms offered for those brands, among other considerations. They also consider the option of not using

Guidelines after Ten Years." ("Models by their nature are simplified representations of the world. Their purpose is to isolate the most important ways that mergers affect economic incentives, and they need not account for secondary and tertiary details… Furthermore, as parametric assumptions are necessary to make predictions, some uncertainty is inevitable. Thus, our view is that modeling should not be expected to provide precise estimates of merger effects, but rather should be used to assess countervailing forces and provide an overall sense of magnitudes.").

[224] See Section 6.1.

[225] This framework for analyzing consumer choice was developed by Professor Daniel McFadden. His framework has been widely adopted by economists. See Daniel McFadden, "Conditional Logit Analysis of Qualitative Choice Behavior," *Frontiers in Econometrics*, ed. Paul Zarembka (New York: Academic Press, 1974), pp. 105–142 at p. 106 ("This paper outlines a general procedure for formulating econometric models of population choice behavior from distributions of individual decision rules…The relevance of these methods to economic analysis can be indicated by a list of the consumer choice problems to which conditional logit analysis has been applied: choice of college attended, choice of occupation, labor force participation, choice of geographical location and migration, choice of number of children, housing choice, choice of number and brand of automobiles owned, choice of shopping travel mode and destination.").

a mobile phone or of using a mobile phone less often as part of their choice among wireless services (referred to in what follows as the "outside option"). I assume that consumers choose among a selection of representative plans, one for each brand, taking prices into account. The model captures consumers' average valuation of each brand, which reflects non-price characteristics such as the quality of the network. [226]

159. I model competition among the wireless carriers as an equilibrium of the Bertrand pricing model, which is commonly used to model unilateral effects when competition is on price. [227] That is, equilibrium consists of a collection of prices such that each carrier maximizes profits, taking as given the prices chosen by all other carriers. In equilibrium, no carrier can unilaterally improve its profit by changing the price of one or more of its brands. [228]

160. For practical purposes, I focus my analysis on the brands that constitute the most popular and most common types of consumer mobile wireless service currently available. These include the following premium, flanker, and prepaid brands: Rogers Wireless, Fido, and Chatr; Bell Mobility, Virgin Mobile, and Lucky Mobile; Telus Mobility, Koodo Mobile, and Public Mobile. In addition, these include Freedom and Shaw Mobile. These carriers provide wireless service to the vast majority of wireless subscribers in Alberta, British Columbia, and Ontario. [229]

161. My model does not explicitly address consumers' option to purchase mobile wireless services from MVNO brands or the option to subscribe to low-priced regulated plans, which have been the object of a recent CRTC regulatory policy decision. I do not expect that explicitly incorporating these choices into the model would change the substance of my conclusions. As discussed in Section 4.4, market participation by MVNOs in Canada has been limited historically, and the recent regulatory changes are not anticipated to change competition in any way that would lessen competitive concerns of the acquisition.

---

[226] See Appendix 8.1 for a detailed description of the Logit model I use for the analysis.

[227] Organisation for Economic Co-operation and Development, "Glossary of Statistical Terms," February 28, 2003, available at https://stats.oecd.org/glossary/detail.asp?ID=3151 ("In a Bertrand model of oligopoly, firms independently choose prices (not quantities) in order to maximize profits. This is accomplished by assuming that rivals' prices are taken as given. The resulting equilibrium is a Nash equilibrium in prices, referred to as a Bertrand (Nash) equilibrium.").

[228] See Appendix 8.1 for a detailed description of the Logit model I use for the analysis.

[229] See Exhibit 3.

6.2.4. Calibrating the model of the market for wireless service in Alberta, British Columbia, and Ontario

162. To calibrate the model presented in Section 6.2.3—in other words, to calculate the parameters of the model from the data—I use information on observed prices, markups, market elasticity, and market shares. I discuss in what follows how I obtain information on these variables, outline the calibration procedure and present its results.

163. ***Prices***. I measure representative prices as the ARPU for each Rogers and Shaw wireless brand calculated using data provided by the parties.[230] Measuring prices with ARPU allows me to aggregate the components of wireless prices for each plan (e.g., plan price, add-ons, data overage charges, and promotions) into a brand-level average price that is relevant for the firm's profit per subscriber. A similar approach has been taken in the literature.[231] [redacted] [232] Because ARPU reflects a measure of the average total price charged across all subscribers of the brand it also reflects the phone usage of the average consumer of that brand.

164. ***Markups***. I define markups as the brand's price minus marginal cost.[233] Calibration of the model requires observations on markups for at least one brand. I observe a price for each Rogers and Shaw brand (its ARPU), and use accounting data to calculate marginal costs for Rogers Wireless, Fido, and Freedom. Thus, I am able to calibrate the model using the markups for those three brands. I do not include Shaw Mobile because its effective marginal costs incorporate the wireline revenue that it preserves through bundling—thus, the accounting data do not provide an accurate measure of its effective marginal costs. I do not include remaining brands due to a lack of comparable data. See

[230] See Appendix 8.3 for additional information on how ARPU is calculated. [redacted] so I make an assumption that their premium brands have the same price as Rogers Wireless, their flanker brands have the same prices as Fido, and their prepaid brands have the same price as Chatr.

[231] Marc Bourreau, Yutec Sun and Frank Verboven, "Market Entry, Fighting Brands, and Tacit Collusion: Evidence from the French Mobile Telecommunications Market," *American Economic Review* 111(11), 2021 ("Bourreau et al. (2021)"), pp. 3459–3499.

[232] [redacted] See, for example, SJRB-CCB00361187 at p. 8; ROG00186819 at pp. 4, 23, 39; ROG00192359 at pp. 3, 11, 19, 29.

[233] See Appendix 8.3 for additional information on how markups are calculated.

Appendix 8.1 and 8.3 for details on my calibration procedure and markup calculations.

165. ***Market Elasticity***. The market elasticity describes the percentage of consumers that switch to the outside option in response to a one percent increase in the average price of wireless brands. I consider a range of evidence in order to select values of the market elasticity reflecting a wireless subscriber's possible responses to an increase in wireless service prices, which may include consuming less (reducing data usage, texting, etc.) and, in the extreme, canceling their wireless service. I discuss this evidence and the calculation further in Appendix 8.2. Based on this evidence, the baseline version of the model considers an elasticity of [redacted] in Alberta, [redacted] in British Columbia, and [redacted] in Ontario. As a sensitivity, I also consider the effects of the merger using an alternate value of the market elasticity that I derive from a review of estimates of the market elasticity in the academic literature. I discuss these sensitivities and the associated results in Section 6.2.7.

166. ***Market shares***. I calculate market shares as the share of gross adds for each brand, which, as discussed in more detail below, is the best available metric to calculate market shares in the relevant markets, [redacted] [234]

167. With a Logit demand system, market shares correspond to the probabilities with which consumers purchase the brands available in the market. [235] This aspect of the model is consistent with using market shares that best reflect the choices of consumers who are actively making purchase decisions.

168. As discussed in Section 5.3, each wireless brand's share of gross adds is the best available metric to calculate such market shares in the relevant markets. Shares of gross adds capture the proportion of subscribers actively switching carriers who decide to select that particular brand. As a result, shares of gross adds reflect the competitive significance of the Shaw brands in recent years, which have drawn a large number of gross adds from other carriers. I present

[234] [redacted] ROG00341090; SJRB-CCB00427328 [redacted]

[235] With a logit demand system, diversions as well are proportional to market shares. See the discussion at the end of this Section 6.2.4.

the share of gross adds for all the brands I consider in the analysis in Exhibit 18 below.

Exhibit 18
Brand-Level Market Shares Based on Gross Adds of Consumer Phone Service: January – April 2021

[redacted]

Source: [redacted]

Note: For each province, a brand's share of gross adds is calculated as that brand's gross adds divided by the total gross adds of all brands considered. Only consumer gross adds are included using categories reported in produced data. Gross adds for each brand and province are the sum of gross adds from January – April 2021. Brands not owned by Rogers, Shaw, Bell, or Telus are not considered. See Appendix 8.3 for additional information on how gross adds are calculated.

169. The exhibit shows that from January to April 2021, gross adds associated with Shaw Mobile [redacted] I considered this time period in order to exclude the first few months after Shaw Mobile's launch in July 2020 [redacted] [236] In Ontario, Freedom's share of gross adds [redacted]

170. Rogers and Shaw contend that [redacted]

[236] See Workpaper 6.2.4.

[redacted][237]

171. I examined this [redacted] Unlike a completely independent firm, then, Shaw's pricing decisions are colored by the benefits of competing less aggressively with its future owner or of at least appearing not to compete as aggressively. So, the decision to raise prices cannot be interpreted as reflecting the choices that an independent Shaw would make. Consequently, the best available information on how competitive the Shaw Mobile product would be in the absence of a merger with Rogers remains the gross adds the product was generating before the merger was agreed to. I discuss my analysis of these gross adds figures and the associated changes in prices by Shaw in Appendix 8.4.

172. Using the information about prices, markups, market elasticity, and market shares that I just discussed, I calibrate the parameters of the model that pertain to consumer preferences as well as the firms' marginal costs. The calibration procedure involves calculation of these model parameters, using data from the pre-merger period, and is discussed in greater detail in Appendix 8.1. Using the calibrated marginal costs and the data on prices, I also calculate the modeled pre-merger markups of the brands.

173. As discussed in Section 5.1, a degree of differentiation appears to exist between postpaid and prepaid wireless service. For this reason, I implement this calibration procedure for two versions of the model, one version that includes just the premium, flanker, and Shaw brands (which I refer to as the "8-brand model"), and another that also includes the prepaid brands owned by the Big 3 (which I refer to as the "11-brand model"). I report the calibrated marginal

[237] [redacted]

costs and the model-implied markups for both versions of the model in Exhibit 19 below.[238]

Exhibit 19
Calibration Results

Source: Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report.

Note: This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using market elasticities of in Alberta, in British Columbia, and in Ontario . See Appendices 8.1 and 8.3 for the calibration procedure, and additional information on the data inputs.

174. For both versions, the model infers markups for the Shaw brands that are commensurate with Shaw's overall market share. In Alberta and British Columbia, I attribute this to Shaw's bundling strategy. As I have previously discussed in Section 6.1.3, part of the reason Shaw Mobile's wireless plans in Alberta and British Columbia are priced below those of other mobile wireless brands is that Shaw offers a substantial discount on wireless service purchased as part of a bundle with its wireline products.

[238] Other calibrated parameters of the model such as the price coefficient, non-price values of the brands, and the marginal costs of the non-merging firms, as well as the modeled pre-merger outside share, are reported in Appendix 8.7.

[redacted] [239] Thus, some of the incremental profit that Shaw obtains from its wireless products accrues through increased revenues from its wireline products.

175. Focusing the model on the pricing incentives of firms in the wireless services market means that it is not designed to explain the decision of Shaw or any other carriers to offer bundled wireless-wireline service. Still, the implications of those decisions are included in the model. That is, the model implicitly incorporates the bundling strategy adopted by Shaw—and the revenue that Shaw earns on its wireline products—by allowing for relatively low marginal costs for Shaw's wireless products in Alberta and British Columbia. As adding new subscribers is more profitable if marginal costs are lower, all else equal, having low (or even negative) marginal costs is economically equivalent to having an additional source of revenue that is captured by the firm from other products that are not part of the relevant market. Thus, I interpret the markups and marginal costs calibrated in the model as reflecting the relevant economic tradeoffs faced by Shaw. [240]

176. In the 11-brand version of the model, a similar outcome arises with respect to the carriers' decisions to offer prepaid brands and the calibration of [redacted] marginal costs to each of the prepaid brands, Chatr, Public Mobile, and Lucky Mobile. Prepaid brands are somewhat differentiated from premium and flanker brands, including in the amount of churn associated with their subscribers. [241] The model does not impose a differentiation for prepaid brands. Rather, it calibrates to the lower prices charged by the prepaid brands, coupled with their [redacted] share of gross adds, by treating these brands as especially cost-efficient. While this aspect of the 11-brand model is stylized, properly interpreted, it does not prevent the model from generating reasonable predictions about the likely impact of the merger on pricing incentives, because those incentives arise due to Roger's acquisition of, Freedom and Shaw Mobile, which are not prepaid brands.

[239] See Section 6.1.3.

[240] The model also infers a low marginal cost for Freedom in Alberta and British Columbia. I understand that, in addition to the bundled Shaw Mobile product, Shaw offers a discounted "Freedom Home Internet" to Freedom subscribers, but not many Freedom subscribers have chosen this bundle. See SJRB-CCB00359132 at p. 3; Shaw Communications, "Consumer QBR – Q3 Results, June 2020," p. 24; Freedom Mobile, "Home," available at https://www.freedommobile.ca/en-CA/home-internet.

[241] See Section 5.1.

177. The 8-brand model, which focuses on premium and flanker brands, appears to better match the data inputs as it is not required to reconcile the prices, market shares, and markups for an additional group of brands (the prepaid brands) that is somewhat differentiated from the other two groups (premium and flanker brands). Accordingly, the 8-brand model is likely to deliver more informative predictions about the merger of Rogers with a competitor that does not operate a prepaid brand. Nevertheless, I continue to report the predictions of both models in my discussion of the merger simulations results below. As the results indicate, the predictions of the two models are consistent with one another.

178. Finally, I also confirmed that, in Alberta and British Columbia, the model calibrated to market shares based on gross adds matches substitution patterns observed in porting data better than the model calibrated to the percentages of subscribers.[242] Therefore, in Alberta and British Columbia, where the recent entry of the Shaw Mobile brand makes the difference relevant to assessing the competitive effects of the proposed acquisition, I expect the model calibrated to market shares based on gross adds to provide more accurate predictions about the effects of the merger than the model calibrated to the percentage of subscribers. In Ontario, the model matches substitution patterns observed in porting data similarly well whether it is calibrated with market shares based on gross adds or the percentages of subscribers.[243]

[242] See, for example, ROG00133092, ROG00186068 (slides 7-9); ROG00203193.

See ROG00173212.

[243] The distinction is less salient in Ontario given the lack of a recent entrant like the Shaw Mobile brand and See Section 5.3.

6.2.5. The model predicts that the proposed acquisition will increase prices

179. Using the model to simulate the results of the acquisition is straightforward. As discussed above, I note the merged carriers' altered incentives—i.e., the fact that Rogers takes into account profits at Shaw when setting its price, and vice-versa—and then calculate the model-predicted post-merger prices that maximize profits for the combined entity, Bell, and Telus, as well as the implied post-merger shares of each carrier and the outside option.

180. As shown in Exhibit 20, in all three provinces, both the 8-brand and the 11-brand model predict that prices for brands owned by the merging carriers increase. Predicted price effects are similar in both versions of the model. The 8-brand model predicts slightly larger price increases for Rogers' brands in all three provinces, compared to the 11-brand model. The opposite is true for Shaw brands. The results across two models may be summarized as follows:

- Prices for Rogers and Fido brands increase by 13.3 to 19.6 percent in Alberta, 10.1 to 18.4 percent in British Columbia, and 6.1 to 11.1 percent in Ontario. Prices for Chatr increase by 22.9 percent in Alberta, 20.2 in British Columbia, and 10.4 percent in Ontario.
- Prices for Freedom and Shaw Mobile increase by 10.0 to 20.3 percent in Alberta and 13.2 to 29.9 percent in British Columbia, while prices for Freedom increase by 23.5 to 27.5 percent in Ontario.

Exhibit 20
Percent Price Increases for the Parties' Brands Predicted by the Model

Source: Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report.

Note: This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using market elasticities of in Alberta, in British Columbia,and in Ontario . See Appendices 8.1 and 8.3 for the calibration and simulation procedures, and additional information on the data inputs.

181. Prices also rise in the model for Bell and Telus brands, albeit to a lesser extent, across model specifications and provinces. The predictions of the model are consistent with Bell and Telus's profit-maximizing incentive to share in the benefit of reduced competition, rather than take steps in the opposite direction. As I explained above, because the merging firm raises its prices, consumer demand increases for the brands of the non-merging firms, which allows these

firms to maintain higher prices as well.[244] The predictions of the model are also consistent with the evidence I presented in Section 6.1, showing that vigorous price competition from Shaw in recent years has provided the impetus for Bell and Telus to offer lower prices for data plans to consumers in Alberta, British Columbia, and Ontario. If this impetus to offer lower prices is reduced through the merger, Bell and Telus will not have an incentive to replicate that lost competition.

182. Because the merging parties increase their prices by more than the non-merging parties, the average price effects are more modest than the effects on Rogers and Shaw prices, although still reflecting some degree of harm for customers throughout the market and not just those of Rogers and Shaw. I calculate the average price increase post-merger to be 7.1 to 8.3 percent in Alberta, 9.3 to 10.0 percent in British Columbia, and 6.9 to 8.1 percent in Ontario.

6.2.6. The model predicts that the proposed acquisition will result in deadweight loss in the absence of merger-specific efficiencies

183. In this section, I report the results of the merger simulation for the 8-brand and 11-brand versions of the model with respect to annual deadweight loss, consumer surplus, and transfer from consumers to producers in Alberta, British Columbia, and Ontario. For these simulations, I do not consider any merger-specific efficiencies for mobile wireless service that the parties may claim.

184. Exhibit 21 below presents the results of these simulations. Taken together, the two versions of the model predict deadweight losses of comparable magnitude across the three relevant provinces. Specifically:

- Across the three relevant provinces, the deadweight loss is predicted to amount to $324 million per year by the 8-brand model and $322 million per year by the 11-brand model.
- In Alberta, the deadweight loss is predicted to amount to $47 million per year by the 8-brand model and $54 million per year by the 11-brand model.

[244] Se Section 6.2.1.

- In British Columbia, the deadweight loss is predicted to amount to $81 million per year by the 8-brand model and $88 million per year by the 11-brand model.
- In Ontario, the deadweight loss is predicted to amount to $196 million per year by the 8-brand model and $179 million per year by the 11-brand model.

Exhibit 21
Annual Welfare Results in Millions of Dollars Predicted by the Model

Source: Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: All dollar values in millions of dollars annually. This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using market elasticities of in Alberta, in British Columbia, and in Ontario. See Appendices 8.1, 8.3, and 8.6 for the calibration and simulation procedures, additional information on the data inputs, and the deadweight loss calculation.

185. The two versions of the model also predict losses in consumer surplus in each of the provinces:

- The losses predicted by the 8-brand model are $103 million per year in Alberta, $145 million per year in British Columbia, and $420 million per

year in Ontario, for a combined predicted loss in consumer surplus across all provinces of $669 million per year.
- The losses predicted by the 11-brand model are $115 million per year in Alberta, $151 million per year in British Columbia, and $364 million per year in Ontario, for a combined predicted loss in consumer surplus across all provinces of $631 million per year.

186. The decrease in consumer surplus comes from multiple sources:

- First, some subscribers choose to remain with their current wireless brand and pay the higher post-merger price.
- Second, some subscribers that were customers of Rogers or Shaw brands pre-merger choose to switch to Bell or Telus post-merger, as reflected by the fact that the model predicts that the shares of the merging parties' brands decrease while the share of Bell and Telus brands increase.[245] This represents a loss for those consumers, first because they are now consuming services from a brand that provided them with less value pre-merger than their original choice of a Rogers or Shaw brand, and, second because they need to pay a higher price for service post-merger because Bell and Telus increase their prices post-merger.
- Third, some consumers choose the outside option of reduced or discontinued wireless service consumption post-merger. Since these consumers did not originally choose the outside option, they now receive less benefit from their choice of the outside option than they did from their brand choice pre-merger.

187. As shown in the exhibit, however, most of the harm to consumers comes from the fact that they pay higher prices to the producers. The transfer of money from consumers due to the merger is predicted to amount across all provinces to $619 million per year by the 8-brand model and $582 million per year by the 11-brand model, thus accounting for 93 and 92 percent, respectively, of the predicted loss in consumer surplus. The rest of the harm to consumers reflects the forgone consumption of phone services in the market.

188. One implication of the simulations results is that although all wireless customers are worse off than pre-merger, the primary source of the loss in consumer surplus comes from Rogers and Shaw customers. As discussed in

[245] See Exhibit 39 in Appendix 8.7.

Section 6.2.5, prices of all brands rise post-merger, but do so especially for the Rogers and Shaw brands. Thus, Rogers and Shaw customers are ones that contribute the most to the transfer from consumers to producers.

189. Additionally, I understand there are inefficiencies from income inequality that the proposed acquisition would exacerbate by transferring surplus between wireless consumers and the owners of the combined firm. To the extent this transfer of wealth adds to the task of government actions to address income inequality, such as the progressive tax system used in Canada, I understand such programs also introduce their own inefficiencies.[246] Thus, in light of these social inefficiencies, another implication is that transfers between wireless consumers and owners of Rogers, Bell and Telus should be recognized as contributing to a portion of this real resource cost for Canada.

6.2.7. Even when considering a lower-bound on the market elasticity, the model predicts that the proposed acquisition will increase prices and result in deadweight loss in the absence of merger-specific efficiencies

190. In this section, I present the predictions of the merger simulation model when I calibrate it using an alternative market elasticity parameter value. I select an alternative value of 0.1 based on a review of estimates of the market elasticity from the academic literature, as described in more detail in Appendix 8.2. This estimate comes from a recent academic article in the literature I examined that was published in a prestigious economics journal, Bourreau et al. (2021), which studies the market for consumer mobile wireless services in France.[247]

191. I consider the elasticity value estimated in this article a lower bound on the value of the market elasticity. Within the framework of this article, consumers can respond to a price increase by a wireless brand either by switching to

[246] The economics literature has explored a number of inefficiencies that may flow from income inequality. At a high level, when the marginal utility of income is decreasing, a more unequal distribution of resources is less socially desirable, which suggests the transfer of income in this merger may constitute an element of social loss. See Piketty and Saez (2013) for an illustration of this mechanism in the context of optimal taxation and the inefficiencies associated with addressing it through tax systems. As a more specific example of the inefficiencies that have been associated with inequality, see Cingano (2014) finding that income inequality has a negative and statistically significant impact on economic growth and providing a survey of other studies in this area. Thomas Piketty and Emmanuel Saez, "Optimal Labor Income Taxation," in *Handbook of Public Economics,* Volume 5, eds. Alan J. Auerbach, Raj Chetty, Martin Feldstein and Emmanuel Saez (North Holland: Elsevier, 2013), at pp. 400, 404, 410–445; Federico Cingano, "Trends in Income Inequality and its Impact on Economic Growth," *OECD Social, Employment and Migration* Working Papers No. 163, 2014, at pp. 6, 37–39.

[247] See Appendix 8.2 for further discussion.

another brand or by discontinuing wireless service altogether, but not by reducing their consumption of mobile phone services. As I explained in Section 6.2.1, reducing consumption of mobile phone services constitutes an important adjustment consumers can make in response to a price increase, so an elasticity excluding this option is an underestimate.

192. Using a value of the market elasticity that does not reflect the possibility for consumers to reduce usage would not be appropriate to analyze the competitive effect of the proposed acquisition. A model calibrated to a value of the market elasticity that does not reflect how consumers can adjust their usage of wireless services without discontinuing service cannot reflect the extent to which the proposed acquisition would restrict the consumption of mobile wireless services through reduced usage, and would likely understate the extent to which the proposed acquisition would reduce consumer surplus. Nevertheless, it is instructive to evaluate the prediction of such a model.

193. I present the price and welfare effects of the model calibrated to such a lower-bound value of the market elasticity in Appendix 8.2.[248] The model predicts price increases that are larger than the ones presented above in Exhibit 20.[249] The deadweight losses predicted by the model calibrated to this elasticity value are lower as a result of the prediction of the model that, with a lower market elasticity, carriers are able to recapture more of the losses in consumer surplus as transfers. The deadweight loss across all provinces in this version of the merger sim model is no less than $182 million per year. The associated decrease in consumer surplus is no less than $1,062 million per year, with an associated transfer from consumers to producers of no less than $971 million per year.[250]

6.3. Additional effects of the proposed acquisition that are not captured by the model could make its consequences even more significant

194. The quantitative model of harm from the proposed acquisition discussed in Section 6.2 may not fully capture all of the harms that are likely to result. In

[248] I do not consider any merger-specific efficiencies in fixed or marginal costs of the merging firms for this analysis. Results are qualitatively consistent with the ones presented in Section 6.2.5–6.2.6 above. See Exhibits 26 and 27 in Appendix 8.2.2.

[249] The model also predicts that prices for Bell and Telus brands will increase.

[250] See Appendix 8.2.2.

this section I consider two ways in which the overall harm is likely to exceed the estimates I can quantify.

195. First, the model necessarily omits some products and customers from the calculation. In particular, the model does not consider wireless customers in areas that Shaw does not currently serve,[251] but will likely benefit from expansions of Shaw's service area if Shaw continues to operate as an independent provider. It also excludes plans associated with non-phone wireless devices, such as tablets.

196. Second, the model assumes that wireless carriers will continue to compete in the same fashion after the merger as before, and only considers the changed incentives the new ownership would bring to that form of competition. To the extent that the history of competition in this industry suggests the Big 3 have been prone to coordinating amongst themselves in provinces which lack a strong fourth competitor, it is possible that the acquisition of Shaw by Rogers might see a return to more effective coordination and less vigorous competition than I have assumed in the model.

197. Finally, the model does not consider customers in the business wireless market since, as I explained above, this market is distinct from the market for consumer wireless services. Shaw took the first step in entering the business wireless market in 2021 but has since paused this effort. The proposed acquisition would ensure that Shaw never resumes this expansion as an independent competitor.

6.3.1. The products and customers necessarily omitted from the quantitative model represent an unquantified element of the harms from the proposed acquisition

198. In quantifying effects of the proposed acquisition, I have taken Shaw's current wireless service area as given. However, internal company documents indicate that [redacted]

[251] See Section 6.3.1.

[redacted][252][redacted]
[redacted][253][redacted]
[redacted][254]

199. Customers in areas where Shaw is likely to expand its service, if left to continue as an independent competitor, are a group of customers that would have seen competitive benefits absent the merger. The loss of these future benefits is not included in the quantification of harms. To be precise, while I have modeled the competition as occurring throughout a province, the province-wide attractiveness of Shaw's service, reflected in its current share of province-level gross adds, is effectively its share over a blend of areas it can serve currently and areas where it does not yet offer service. The quantification model misses the benefit of Shaw's future expansion of service, continuing to treat these areas as ones where the Shaw wireless brands cannot attract new customers. As a result, the model likely understates the province-wide share of wireless subscribers that Shaw will serve as it continues to expand its network.

200. In quantifying effects of the proposed acquisition, I have focused on the consumer phone market. This focus reflects the fact that [redacted]

201. [redacted]

[252] SJRB-CCB00223356 at pp. 4–6; See also SJRB-CCB00224154 at p. 4; SJRB-CCB00221090 at p. 2. [redacted]

[253] SJRB-CCB00221090 at p. 2. [redacted]

[254] [redacted] SJRB-CCB00477492 at p. 3.

[redacted][255][redacted][256] The proposed acquisition will ensure that pursuit of this opportunity is never resumed competitively.

202. These two omitted elements of likely future competition between Shaw and the Big 3, though not quantifiable to a reasonable degree of accuracy based on the information available to me, would mean that the overall harm is larger than the amount I have quantified.

6.3.2. The likelihood of more effective coordination or softened competition among the Big 3 in the relevant provinces means that the model likely understates harm from the proposed acquisition.

203. As I discussed in Section 4.2, there is a history of higher prices in Canadian provinces that lack a strong fourth competitor. One reason why provinces without a strong fourth competitor may have higher prices may be that the Big 3 are more successful in softening the competition among the three of them. As I also discussed in Section 4.3, the Big 3 actively monitor one another's promotions and signal one another to try to coordinate such activity. If, without Shaw, the Big 3 would be more effective at implementing such a strategy in Alberta, British Columbia, and Ontario, consumers would be harmed to a greater extent than the quantification model can encompass

[255] [redacted] See Workpaper 6.3.1.

[256] SJRB-CCB00501784[redacted]

because it assumes that there is no coordinated behavior among wireless carriers before or after the merger.

204. It is worth noting the characteristics of the Canadian wireless markets that make coordination of this form a considerable risk if a merger leaves the Big 3 as the only wireless carriers throughout most or all of a province. These three carriers:

- Set prices in a form that is conducive to reaching an implicit agreement on terms to offer (that is, they offer certain common key plan features and prices, e.g., voice, text, and data allowances, [redacted][258]
- Can detect deviations from such an agreement [redacted][259]
- Can communicate about such an agreement and any perceived deviations [redacted][260]
- [redacted]"[261] [redacted]

---

[257] [redacted] See SJRB-CCB00410822; ROG00575901 at pp. 54–62. [redacted] SJRB-CCB00359348; SJRB-CCB00473316; SJRB-CCB00120181; SJRB-CCB00120495. See also Sections 6.1.2 and 6.1.3 [redacted]

[258] [redacted] See also ROG00206967 ([redacted]. See, ROG00655110. See also ROG00666010 [redacted]

[259] ROG00655110 [redacted] ROG00666010 ([redacted]

[260] ROG00206967 [redacted]: ROG00666010 [redacted]

[261] [redacted] ROG00118354 [redacted]

[redacted] [262]

- Have a history suggestive of coordination having been successful among these firms in some past instances as discussed in Sections 4.2 and 4.3.

205. It is worth noting that in a recent regulatory submission, Shaw cited to evidence that it and other regional wireless carriers were responsible for fostering "effective and sustainable wireless competition," including by disrupting coordinated behavior.[263] Moreover, Shaw's position to CRTC, claiming "substantial evidence of coordinated behaviour" before the entry of regional competitors such as Shaw, includes high prices in areas without a strong regional competitor as part of the behavior that Shaw believes it disrupted.[264]

206. Taking all of these factors into account, it is reasonably likely that Shaw's presence as a strong fourth carrier in Alberta, British Columbia, and Ontario has inhibited coordination among the Big 3 in those provinces. If so, the merger simulation model discussed in Section 6.2, which assumes that carriers set their prices independently may be missing the element of harm to consumers that arises if it is easier for the Big 3 carriers to coordinate effectively on price (or other terms) than it is for them to coordinate when facing additional competition from Shaw.

207. Specifically, the merger simulation model assumes that competition after the merger is still well-described by the same Logit-Bertrand model in which

[redacted] ROG00662331 [redacted]

[263] Shaw Communications Inc., "In the matter of Telecom Notice of Consultation CRTC 2019-57, Call for additional comments – Review of mobile wireless services: Final Comments," July 15, 2020, available at https://services.crtc.gc.ca/pub/DocWebBroker/OpenDocument.aspx?DMID=3891000, ¶ 28 ("Industry analysts have also observed that the price per GB declined by ~30% in last year's back-to-school promotional period and facilities-based competitors have disrupted coordination by the national carriers.").

[264] Shaw Communications, Response to Questions from the CRTC, July 5, 2019, Response to Q117, p. 34.

carriers make unilateral profit-maximizing decisions, and the harm arises because, as explained in Section 6.2.1 the merged carrier finds it profitable to increase prices on its brands above pre-merger levels. If, in addition, competition among the Big 3 without Shaw is likely to be softened through signals conveying information that would allow carriers to coordinate on price to a greater degree, the effect of the merger on wireless prices is likely to be higher than what the unilateral model predicts. The additional increase in prices coming from coordination and the associated harms are not quantifiable based on the information available to me.[265]

208. For example, the prospect of retaliation against the merged entity may also present a disincentive for the merged entity to continue offering substantially discounted wireless service as part of a bundle with its wireline service. The model does not quantify the impact such a change in incentives would have on prices.

209. Since its launch, the Shaw Mobile brand has offered bundled wireless-wireline plans to subscribers who also purchase Shaw wireline services. A substantial fraction of Shaw Mobile subscribers since Shaw launched the brand have come from Rogers brands.[266] The merger would lead to a decreased incentive to compete for these Rogers subscribers. The quantitative model does reflect some of the merged entity's incentive to raise the price of the Shaw Mobile brand, but likely understates it because it does not include any effect that the threat of retaliation from other carriers would impose on pricing and bundling decisions of the parties once they are merged.

210. As discussed above, t [redacted] [267] The Big 3 may also factor the threat of retaliation among them in their willingness (or unwillingness) to offer similar discounts for bundled plans. If these bundles of

[265] I have not seen data from all parties on their attempted signaling and so have not attempted to explore whether a model of such signaling activity can be practically connected to outcomes in the market. I would note that it may be particularly difficult to quantify such a connection even if the data were available, as firms generally have an incentive to conceal the extent to which they have restrained competition through coordination.

[266] See Sections 5.4 and 6.1. See also, for example, SJRB-CCB00420993 [redacted]

[267] See Section 6.1.

wireless and wireline services are particularly effective at winning subscribers away from other Big 3 competitors for the firm with wireline service in a province, it would make sense that offering such a bundle would be expected to trigger retaliation by other carriers attempting to coordinate on pricing. The merged entity will take into account the [redacted] It is therefore likely that the merged entity will lose some of the incentives which have led Shaw Mobile to be an unusually effective entrant.

211. Consequently, the proposed acquisition would tend to eliminate the strategies Shaw has pursued over the course of its entry and which have particularly enhanced competition in the relevant provinces. The merged entity is less likely to continue the aggressive pricing of a wireless-wireline bundle after the acquisition.[268] However, I cannot quantify the degree to which signaling among Big 3 carriers, including threats of retaliation, might change the merged entity's incentive to compete vigorously or the likelihood that the merged firm reduces or abandons any of Shaw's aggressive strategies for winning new customers. I can only identify these effects as an unquantified harm to consumers.

6.3.3. The proposed acquisition would pre-empt additional competition in the business wireless market

212. The quantitative model of harm discussed in Section 6.2 as well as the additional harms that I discussed above apply to the consumer wireless market. The proposed acquisition, however, would also pre-empt additional competition in the business wireless market that Shaw would bring by expanding its presence in this market.

213. [redacted][269] [redacted][270] [redacted]

[268] The merger simulation model predicts the effect of an impetus to harm as a price increase. The manifestation of these anti-competitive effects, however, could also occur through changes in other terms that matter to consumers.

[269] SJRB-CCB00788145 at p. 20.

[270] SJRB-CCB00788145 at p. 22.

[redacted][271][redacted][272][redacted][273]

214. [redacted][274][redacted][275][redacted]" [276]

215. [redacted] All of the established participants, however, have a presence in this market, and business customer subscriptions constitute a non-negligible fraction of all the customers they serve. [redacted][277] This suggests that if Shaw, which already offers wireline services to business customers,[278] were left to grow in

[271] SJRB-CCB00501784[redacted] See also SJRB-CCB00369593 at p. 12–14.

[272] SJRB-CCB00788321 at p. 17.

[273] SJRB-CCB00787027[redacted] SJRB-CCB00787030 (" [redacted] SJRB-CCB00787001 at p. 5 [redacted]

[274] SJRB-CCB00652204 at pp. 4–5.

[275] SJRB-CCB00652204 at p. 4.

[276] SJRB-CCB00787001 at p. 11.

[277] [redacted]

[278] [redacted] See SJRB-CCB00788352, p. 12; SJRB-CCB00788145, p. 20, pp. 22-25. [redacted] See

competition with Rogers, it could reasonably be expected to develop new offerings to more fully serve business wireless customers.

216. The proposed acquisition would ensure that Shaw would never resume such efforts as an independent carrier in competition with Rogers, thus depriving business customers of the benefit of additional competition in the future.

7. The proposed divestiture of Freedom Mobile to Videotron leaves competitive harm unaddressed

217. I understand that Rogers and Shaw have proposed to ameliorate some competitive effects of the merger by divesting Shaw's subsidiary Freedom Mobile. Even with this proposed remedy, consumers are likely to suffer from lost competition.

218. In this section, I consider two aspects of the parties' proposed remedy. First, I consider the scope of the parties' proposed divestiture and quantify a *minimum* amount of consumer harm that is unaddressed by the proposal even if the divestiture could perfectly replicate the pre-acquisition competitive significance of the products to be divested. Next, I consider reasons that such a divestiture is unlikely to be so perfect and that the harm to consumers is likely to be larger than I can quantify presently.

219. [redacted][279] The Videotron divesture proposal was finalized by Rogers, Shaw, and Quebecor on August 12, 2022.[280]

220. The terms of the Videotron divestiture proposal describe how the assets currently used by Shaw to provide the Freedom products and the Shaw Mobile products would be allocated, and the way that interdependencies between the

ROG00614952, p. 11 [redacted] See ROG00615732, p. 21.

[279] [redacted]

[280] Share Purchase Agreement, Videotron Ltd., and Quebecor Inc., and Rogers Communications Inc., and Shaw Communications Inc., and Shaw Telecom Inc., and Freedom Mobile Inc., August 12, 2022 ("Share Purchase Agreement"), Title Page.

products and assets that are being separated would be converted into supply agreements. Collectively, these arrangements define two new entities ("New Freedom" and "New Rogers") that would respectively offer variants of Shaw's current Freedom and Shaw Mobile products. Specifically:

- [redacted]

[281] Share Purchase Agreement, at pp. 11, 29.

[282] Share Purchase Agreement, Schedule F "Form of Asset Purchase Agreement" ("Asset Purchase Agreement"), Article 2.1; Asset Purchase Agreement, Article 3.1.

[283] [redacted] See Asset Purchase Agreement, Article 2.1.

[284] [redacted] See Share Purchase Agreement, Schedule I [redacted], pp. 5, 19–20; Share Purchase Agreement, Schedule J [redacted] pp. 5, 21–23.

[285] Share Purchase Agreement, Schedule O [redacted]).

[286] [redacted]

[287] See Share Purchase Agreement, Schedule N ("[redacted]).

[redacted]

221. Finally, the Videotron divestiture proposal also includes [redacted]

[redacted]

288 [redacted]
289 [redacted]
290 [redacted]
291 [redacted]
292 [redacted]
293 [redacted]

- Rogers will provide to Videotron (and New Freedom) roaming services for up to 20 years.[294] Nationwide roaming is provided on an incidental, non-permanent basis. The provision is free for the first 1,500,000 GB annually, at a rate of $8.50/GB thereafter.[295] This annual free data appears to be a subsidy from New Rogers to New Freedom. [redacted] 296
- [redacted]

222. The terms of the Videotron divestiture proposal imply that separating New Freedom from Shaw involves some separation of assets that are currently used by Shaw to provide mobile wireless services under the Freedom and Shaw Mobile brands. As I discuss below, assets, such as [redacted] that will be separated from New Freedom or will be reallocated with Rogers, and the general separation of the Freedom product from Shaw's incentives as a wireline carrier are particularly relevant to New Freedom's incentives and ability to compete. And, while the proposal allows

[294] See Share Purchase Agreement, Schedule K ([redacted].

[295] [redacted]

[296] [redacted] VID00353367 at p. 6; Examination for Discovery of Jean-Francois Lescadres, Day 2, pp. 213:8–10.

[297] See Share Purchase Agreement, Schedule M ("[redacted]

[298] According to CRTC Decision 99-8, incumbent cable carriers are required to provide wholesale access services. See Telecom Decision CRTC 99-8, Ottawa, 6 July 1999, ¶ 1.

[299] [redacted] For example, current basic monthly rates for disaggregated gigabit line are $86.68 for Rogers and $75.81 for Videotron. These rates do not include capacity charges, nor any additional services required for operations. See Tariff Applications (8740), Quebecor/Videotron, General Tariff, p. 35, available at https://www.quebecor.com/documents/20143/47347/Partie+B+%28Acc%C3%A8s%29_04.pdf; Tariff Applications (8740), Rogers, Access Services Tariff, available at https://assets.ctfassets.net/8utyj17y1gom/45qXK5qdsU2mmLYAT4Hiyw/baab4f286b4004c25385843d867b882d/Carrier_Access_Tariff_July_21__2022.pdf, ("Rogers' Access Services Tariff"), p. 98.

New Freedom to [redacted][300]

223. In particular, the divestiture proposal places with New Rogers those Shaw wireline assets that have been identified with Shaw's incentive and ability to offer an aggressive wireless plan through Shaw Mobile. Rogers' incentives with respect to the potential to continue with Shaw's strategy are likely to be tempered in the same way as under a merger with no divestiture. In addition, as I explain later in this section, the fact that Quebecor can obtain TPIA services from New Rogers, and thus resell wireline products in the relevant provinces, does not make it likely that Videotron will recreate the type of services currently offered by Shaw. Accordingly, this divestiture proposal would leave some of the harm I identified in Section 6 unaddressed—including the unquantified elements and many of the quantified elements as I will now discuss.

7.1. The merger simulation model quantifies a lower bound on harm that would not be addressed with the proposed divestiture

224. I can quantify a lower bound to the unaddressed portion of quantifiable competitive harm using the same merger simulation model I employed in Section 6.2, but assuming that Rogers acquires the Shaw Mobile brand, while Freedom Mobile becomes an independent entity under the ownership of Videotron. This quantification is a lower bound to the extent that this independent New Freedom is assumed to inherit the same costs and valuation of its non-price aspects despite the provisions of the agreement, which I identified above as separating New Freedom from assets it currently uses to achieve those costs and non-price characteristics.

225. These assumptions imply that New Freedom is expected to perfectly replicate the pre-merger competitive significance of the current Freedom brand and that New Rogers is expected to offer mobile wireless services with one additional brand that replicates the current Shaw Mobile brand.[301] In other

[300] [redacted]

[301] In the context of the merger simulation model, New Freedom is assumed to acquire a brand that has the same appeal in the eyes of consumers and the same marginal costs as the current Freedom brand. Similarly, New

words, the competitive significance of the current Shaw brands is assumed to transfer seamlessly to their new ownership. After presenting this lower bound, I will return to consideration of issues likely to make the transfer less than seamless.

226. I present the results of the merger simulation for Alberta and British Columbia under this "perfect-transfer" scenario in Exhibits 22 and 23 below. I do not present results for Ontario because, under a "perfect transfer," the model predicts that Freedom remains the same independent brand that it is today.[302] As with Alberta and British Columbia, however, this transfer is unlikely to be so perfect and the lower-bound estimate of no harm in Ontario is unlikely to be achieved.

Rogers is assumed to acquire a brand that has the same appeal in the eyes of consumers and the same marginal costs as the current Shaw Mobile brand.

[302] Videotron operates in Ottawa and part of eastern Ontario. Accordingly, the divestiture proposal could lessen the incentives for Videotron and Freedom Mobile to compete as aggressively as they currently do in these areas. The model does not take this aspect of the divestiture proposal into account because Videotron currently has limited market share in Ontario as a whole. To the extent that Videotron's recent spectrum purchases mean that it would have expanded throughout southern Ontario, the loss of this competition is an unquantified additional harm. [redacted] Quebecor Presentation, "3500 MHz Auction: Another Step Towards Expansion Outside Quebec," July 30, 2021, p. 5, available at https://www.quebecor.com/documents/20143/49387/2021-07-30+-+Another+Step+Towards+Expansion+Outside+Qu%C3%A9bec_EN.pdf.

Exhibit 22
Percent Price Increases for the Parties' Brands Predicted by the Model with a "Perfect Transfer" Divestiture

Source: Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using market elasticities o in Alberta, and in British Columbia. See Appendices 8.1 and 8.3 for additional information on the data inputs, the calibration procedure, and the simulation procedure.

227. As shown in Exhibit 22, the 8-brand "perfect-transfer" model predicts that New Freedom decreases its price by 17.3 percent in Alberta and by 15.1 percent in British Columbia.[303] Because New Freedom no longer owns two brands and cannot recapture customers that may switch to Shaw Mobile in response to an increase in the price of Freedom, it finds it profitable to decrease prices of

[303] In the 11-brand version of the model which also includes prepaid brands, the "perfect transfer" prediction is a price decrease for Freedom of 13.8 percent in Alberta and 11.1 percent in British Columbia. In the context of these "perfect-transfer" scenarios, the effects of separating Freedom from Shaw Mobile are equivalent to reversing a merger between the two which is likely to be smaller when the divested Freedom has smaller significance as it competes with ten brands as opposed to only seven brands.

Freedom to capture a higher market share from all other brands including the Shaw Mobile analog now owned by New Rogers.

228. However, prices of New Rogers brands, including the Shaw Mobile brand, are predicted to increase by 5.5 to 14.3 percent in Alberta and by 9.6 to 12.8 percent in British Columbia in the 8-brand "perfect-transfer" model.[304] This increase is consistent with New Rogers taking into account the fact that it can recapture customers that may switch between Shaw Mobile and its legacy brands, and vice versa.

229. As in the case with no divestiture, the 8-brand "perfect-transfer" model predicts that prices for Bell and Telus brands increase slightly,[305] and that prices of all brands increase on average by 0.8 percent in Alberta and by 2.5 percent in British Columbia.[306]

230. As I show in Exhibit 23 below, the model predicts that the proposed acquisition, even with a "perfect-transfer" divestiture, results in deadweight losses, losses in consumer surplus, and transfers between consumers and producers in both Alberta and British Columbia.

[304] The 11-brand "perfect-transfer" model predicts price increases of New Rogers brands of 9.8 to 16.8 percent in Alberta and 7.1 to 21.0 percent in British Columbia.

[305] With the 8-brand "perfect-transfer" model, prices for Bell and Telus brands are predicted to increase on average by 0.2 percent in Alberta and 0.3 percent in British Columbia.

[306] With the 11-brand "perfect-transfer" model, prices for Bell and Telus brands are predicted to increase on average by 0.4 percent in Alberta and 0.3 percent in British Columbia. Prices across all brands are predicted to increase on average by 3.4 percent in Alberta and 5.0 percent in British Columbia.

Exhibit 23
Annual Welfare Results in Millions of Dollars Predicted by the Model with a "Perfect Transfer" Divestiture

Source: Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: All dollar values in millions of dollars annually. This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using market elasticities of in Alberta and in British Columbia. See Appendices 8.1, 8.3, and 8.6 for additional information on the data inputs, the calibration procedure, the simulation procedure, and the deadweight loss calculation.

231. Considering the two provinces combined, the 8-brand "perfect-transfer" model predicts a deadweight loss of at least $42 million per year, a consumer surplus loss of at least $78 million per year, and a transfer from consumers to producers of at least $63 million per year.[307]

7.2. The terms of the proposed divestiture reduce Videotron's incentives and ability to compete with and its incentives to invest in the Freedom product as aggressively as Shaw would have

232. As I mentioned above, applying the merger simulation tool to a proposed divestiture assumes that the divestiture can perfectly replicate the competitiveness of the divested products. That is, Freedom as a brand in the

[307] Across the two provinces, the 11-brand "perfect-transfer" model predicts a deadweight loss of $70 million per year, a loss of consumer surplus of $128 million per year, and a transfer from consumers to producers of $116 million per year.

hands of Videotron is assumed to have all of the same costs, the same product characteristics, and the same customer appeal that it had in the hands of Shaw. In practice, a divestiture is unlikely to replicate so perfectly a divested product's competitiveness. Consequently, there would be an unquantifiable portion of the harms that the model assumes the divestiture addresses which would, in practice, not be addressed.

233. Based on the terms of the divestiture proposal, New Freedom will need to depend on New Rogers for a number of services that were previously provided by Shaw as a within-firm service. Although New Freedom would be receiving those services from New Rogers [redacted] a competitor. With a competitor controlling how these services will be provided, New Freedom faces higher risks that the terms of these services will be abused—or at least not complied with as amicably as in the current state of affairs in which, instead, they are provided within the same integrated enterprise under Shaw's ownership.[308] [redacted] New Freedom would likely have limited recourse based on the terms of the proposed divestiture.

234. This reduced control over services that are integral to the Freedom product likely will diminish New Freedom's incentive and ability to compete—particularly in Alberta and British Columbia. Because New Freedom will have reduced control over the provision of the services it gets from New Rogers, it will also have reduced control (compared to Freedom Mobile) over the quality

[308] [redacted] See ROG00072607 at p. 1. [redacted] See, for example, ROG00072608 at p. 2 [redacted] See ROG00071328. [redacted] Rogers, discussing this lawsuit in its 2021 Annual Report, noted: "Videotron is seeking compensatory damages in the amount of $850 million. We intend to vigorously defend this lawsuit. We have not recognized a liability for this contingency." See Rogers Communications Inc., "2021 Annual Report," March 3, 2022 ("Rogers 2021 Annual Report"), p. 68.

of a user's experience with their product. This reduced control implies that New Freedom will likely need to choose between lowering the quality they promise to customers or incur additional costs to deliver that quality. [redacted] [309] [redacted] In either case, New Freedom would have to either deliver a degraded service or sustain unusual costs to mitigate the degradation. The implications for New Freedom's incentives and ability to compete are clear. Whether it accepts the reduction in the expected quality it can deliver or incurs higher costs to ensure it can deliver the same quality service Freedom offers today, New Freedom's effectiveness as a competitor will be diminished.

235. [redacted] [310] When deciding how aggressively to compete with New Rogers, I would expect Videotron to consider how likely it is that Rogers would react to such competition from New Freedom by making less

[309] [redacted] SJRB-CCB00219615 at p. 5.

[310] While I discuss below the reasons that TPIA is not likely to be an effective replacement for facilities-based wireline services in terms of the competitive incentives related to bundling, that likely lack of effectiveness does not preclude Rogers from using TPIA more in Quebec, if it wanted to, nor protect Videotron from seeing such use as a loss of revenue.

advantageous choices for Videotron. And, the larger the private benefits at stake for Videotron, the more cautious it is likely to be about competing aggressively against Rogers with the New Freedom product.

236. New Freedom will also have less incentive to maintain and grow the Freedom brand to the same extent as Shaw did because the return on that investment will be lower. Without the potential to serve Shaw Mobile customers and to sell Shaw Internet services, any potential gains from improvements in Freedom Mobile's infrastructure will be solely realized among Freedom customers. For example, upgrading existing network sites or building new ones will only benefit existing Freedom customers and only attract new customers that are interested in the services of New Freedom. In the current state of affairs, instead, the same investments would also benefit Shaw Mobile customers and attract new customers that are interested in the Shaw Mobile brand. In addition, the diminished effectiveness as a competitor due the reduced control over services that the divestiture proposal will give to New Rogers, which I discussed above, means that New Freedom has a reduced ability to earn the same return on investments and faces greater uncertainties about their payoff. Faced with lower expected returns, New Freedom will be less likely to undertake investments, further affecting its ability to compete over the long term. While this effect is likely to be most pronounced in Alberta and British Columbia, there are spillovers across provinces in terms of the brand and overall strategy that would affect Ontario. The difference between Wind Mobile and Freedom illuminates that these spillovers can be competitively significant for consumers, including those in Ontario.

237. The incentives to compete aggressively and to invest in the Freedom product that New Freedom will face are more likely to resemble those of Wind Mobile, rather than those currently faced by Freedom and Shaw Mobile under Shaw's ownership. Unlike Shaw, New Freedom will not operate a wireline business in any of the three relevant provinces using its own wireline network and/or relying on an established wireline customer base. The Videotron divestiture proposal appears to recognize this weakness by [redacted] However, as I explain in Section 7.3 below, [redacted] would not give New Freedom the ability to offer bundled services that are comparable to what Shaw currently offers, nor would it restore the same incentives for long-term investment.

238. The difference that ownership by Shaw made as Wind Mobile became Freedom Mobile is, therefore, an indication of how much less competitive a divested Freedom Mobile might be. Indeed, only after Shaw's acquisition and re-branding of the former Wind Mobile brand, and the launch of Big Gig data plans, did Rogers consider that [redacted]" [311] [redacted] [312] This change suggests that Freedom got a substantial benefit from its association with Shaw. That efficiency benefit of their integration may be in the form of access to wireline infrastructure on terms that can only be achieved within the same company, or the incentive Shaw had to invest in Freedom as part of a larger plan to compete for both wireless and wireline, or the assurances customers got from the fact that Freedom was part of Shaw. The investments Shaw has made are also significant. For example, in a confidential February 2022 memorandum, Freedom Mobile states that [redacted]" [313]

239. Under the proposed divestiture, that loss of the benefits of integration between Freedom and Shaw likely means higher costs of infrastructure, lower returns on the capital invested for an expansion, and less managerial incentive in building the brand's reputation for disrupting the market. It likely means even more consequences than I can anticipate as divestitures of this sort, in my experience, are often less successful than they seem likely to be at first glance. Indeed, the US Federal Trade Commission conducted a study which found that 30 percent of the divestitures it had approved as a remedy were not "successful" when the assets divested were less than a full business unit. [314] The Competition Bureau also notes that it applies greater scrutiny to divestitures of less than a full business unit because there is "limited or no proven track record that the

[311] ROG00192359 at p. 12.

[312] ROG00192359 at p. 11.

[313] [redacted]

[314] Federal Trade Commission, "The FTC's Merger Remedies 2006-2012: A Report of the Bureaus of Competition and Economics," January 2017, available at https://www.ftc.gov/system/files/documents/reports/ftcs-merger-remedies-2006-2012-report-bureaus-competition-economics/p143100_ftc_merger_remedies_2006-2012.pdf, pp. 1–2 ("In evaluating the 50 orders in the case study component, Commission staff considered a merger remedy to be successful only if it cleared a high bar—maintaining or restoring competition in the relevant market. Using that standard, all of the divestitures involving an ongoing business succeeded. Divestitures of limited packages of assets in horizontal, non-consummated mergers fared less well, but still achieved a success rate of approximately 70%.").

components of the business will be able to operate both effectively and competitively."[315] A business unit is not so much a matter of corporate structure as it is of the assets that are used in a line of business, including intangible ones such as the value of the brand or the capabilities of management. And, as I have discussed, the proposed divestiture does involve some notable separations of the assets Shaw currently uses for both its Shaw Mobile and Freedom brands. The extent to which the divested product is less effective than it had been pre-divestiture is an unquantifiable harm of the divestiture proposal.

240. I note that the reduced incentives for New Freedom to invest in competing with New Rogers also apply to each type of investment that I discussed in Section 6.3. That is, New Freedom is less likely to address the lost competition for all of the additional groups of customers and services that Shaw was likely to make investments to serve (e.g., the same new geographic areas, non-phone devices, and business customers). These unquantifiable harms of the acquisition would still apply after the proposed remedy, although New Freedom may have a higher incentive to pursue them than Rogers would have had.

7.3. The incentive to compete in wireless markets that derives from Shaw Mobile's bundled product are not likely to be recreated by Videotron or Rogers

241. Videotron has asserted that it will be able to offer consumers a wireless-wireline bundle to replace the service that has been fundamental to Shaw's competitiveness for consumers in Alberta and British Columbia [redacted].[316] However, bundles with a TPIA service, if they are offered by New Freedom, would be unlikely to convey similar competitiveness as those of Shaw Mobile.[317]

242. First, New Freedom will likely face higher costs of providing the wireline services as compared to Shaw Mobile. Mr. Christopher Hickey, a representative

[315] Competition Bureau Canada, "Information Bulletin on Merger Remedies in Canada," September 22, 2006, available at https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02170.html, ¶ 17.

[316] [redacted]

[317] [redacted] Shaw could bundle Freedom with a regulated TPIA service in Ontario today. The fact that Shaw has not pursued this possibility suggests that a such a bundle is not economically viable.

of Distributel (a telecommunications service provider that relies on TPIAs), stated in his September 2022 witness statement that [redacted] Further, New Freedom would not have the benefit of an existing wireline subscriber base, as Shaw Mobile does, [redacted][319]

243. Second, the ability to resell access to another carrier's infrastructure, as TPIA, does not convey the same long-term incentives to invest in complementary assets that Shaw presently has. I[redacted][320] [redacted] only creates an incentive based on the profits earned in the wireline business and TPIA appears to be less profitable than Internet service over one's own facilities. Moreover, New Freedom will have little to no control over the cost or quality of the wireline services it can offer. And recall that New Freedom would already have diminished incentive and ability to compete and invest given its reduced control over services, [redacted] that are currently part of the service but are going to New Rogers in the divestiture proposal. Adding more such issues for the wireline portion of a bundle would only exacerbate such issues.

244. Third, if the TPIA terms nevertheless do allow wireless-wireline bundles as aggressively priced as Shaw Mobile's, New Freedom would have reasons not to act on such a possibility. Doing so would likely jeopardize relationships with New Rogers. As I discussed above, the terms of the divestiture proposal give

[318] Witness Statement of Christopher Hickey, Affirmed September 21, 2022, ("Hickey Witness Statement"), ¶ 15 [redacted] ¶¶ 32, 34; Hickey Witness Statement, Table 2.

[319] See, e.g., SJRB-CCB00156686 [redacted] See also SJRB-CCB00824667 [redacted]

[320] SJRB-CCB00420532, p. 5 [redacted] SJRB-CCB00361187 at p. 7 [redacted]

Videotron incentives to maintain Rogers' goodwill, lest it face retaliation in a number of potential forms. [redacted]

245. My calculation of a minimum harm also assumes that New Rogers is able to seamlessly absorb Shaw Mobile's incentives to compete aggressively—particularly to offer their bundled wireless-wireline product—which is also likely to make this quantification an understatement of harm. As I explained in Section 6.3, New Rogers has considerations that are likely to offset the economic incentives they would be acquiring with Shaw to continue offering bundles that are as generous as Shaw Mobile's. [redacted][321] [redacted][322] [redacted]

246. Lack of incentives and ability to replicate a product similar to Shaw Mobile's offer by either New Freedom or New Rogers would deprive many consumers of a valuable option. As I explained before, Shaw Mobile has been able to attract a large number of new consumers, including from Rogers, thanks to the launch of bundled wireless-wireline plans at low prices—in particular, its "By-the-Gig" plan.[323] This rapid expansion demonstrates the value of these bundled plans to consumers. Under the proposed agreement, Shaw Mobile's customers are transferred to Rogers. Depriving these customers of an available option and returning some of them back to an option they have forgone in favor of Shaw Mobile would decrease their value beyond what is predicted by the model.

[321] ROG00798454 at p. 16 [redacted] ROG00798921 at p.15; ROG00822166 at p. 12; RFI00000245.

[322] [redacted] See RFI00000245 at p 8; ROG00798921 at p. 11; ROG00176917; ROG00236681.

[323] See Section 6.1.3.

7.4. The proposed divestiture creates incentives that make coordination more likely

247. The Videotron divestiture proposal creates incentives that would make coordination between New Freedom and New Rogers more likely, as well as incentives for Videotron to go along with any coordination occurring among the Big 3. These additional harms, like the ones discussed above, are not incorporated in my calculation of minimum harm.

248. As I explained above, the terms of services included in the divestiture proposal can deter Videotron from competing against New Rogers aggressively. The prospect that Rogers can retaliate, if Videotron's operation of New Freedom gives Rogers reason to, would likely incent Videotron to price less aggressively or offer less generous wireless-wireline bundles to reduce the risk of any such retaliation. That is, I discussed the ways that Videotron's private benefits from the divestiture proposal may lead it to be less enthusiastic about pursuing the public benefit of competing which Shaw has as an independent competitor to Rogers.

249. The Videotron divestiture proposal also increases the likelihood of more effective coordination in the relevant provinces and in Quebec. With the acquisition of Freedom Mobile, Videotron would operate across the four most-populous Canadian provinces and come into contact with the Big 3 in each of these provinces. This would call into question how much such a provider would still resemble a regional competitor, like Shaw and Videotron currently are, and not instead a Big 3 carrier. To the extent that the divestiture makes Videotron more attuned to retaliation across provinces than either Shaw or Videotron currently are, Videotron would be more similar to the Big 3 and less likely to disrupt coordination attempts among them.

8. Appendices

8.1. Specification, calibration, and simulation of the model

250. This appendix describes the specification, calibration, and simulation of the Logit-Bertrand model I use to analyze the unilateral competitive effects of the proposed acquisition. As discussed in Section 6.2.2, the model specification provides the economic framework which describes how consumers and firms make choices, the model calibration calculates the model parameters from pre-merger data, and the model simulation predicts the prices and shares of each firm post-merger that can also be used to calculate the welfare effects of the merger.

8.1.1. Model specification

251. The economic model has two parts: The Logit demand system, describing the behavior of consumers, and the Nash-Bertrand market equilibrium, describing the behavior of the firms. I refer to this economic model as the Logit-Bertrand model or merger simulation model in what follows.

252. In the Logit demand system, consumer preferences are parametrized as follows:

$$u_{ij} = \alpha p_j + v_j + \varepsilon_{ij},$$

253. where u_{ij} is consumer i's surplus from choosing mobile wireless brand j, α is a parameter describing the consumer i's preference not to pay a higher price (also called a "price coefficient"), p_j is the price of brand j, v_j is the non-price value of brand j, and $\varepsilon_{ij}$is a random utility term assumed to be independently and identically distributed according to an Extreme Value Type 1 distribution.[324] Consumers are assumed to choose between several wireless brands $j=1, \dots, J$ and an outside option indexed by j=0. Their choices determine

[324] See for example, Kenneth E. Train, *Discrete Choice Methods with Simulation*, 2nd Edition, (Cambridge University Press: Cambridge, 2009) ("Train (2009)"), p. 34.

the shares of the brands, s_1, ..., s_J, and of the outside option s_0. The utility of the outside option is set to:

$$u_{i0} = \varepsilon_{i0}.$$

As discussed in Section 6.2.3, the outside option represents the consumer's option to not use a mobile phone or use a mobile phone less often as part of their choice among wireless services.

254. The Logit demand system implies the following closed-form formulas which determine the relationship between the demand parameters, prices, and market shares:

$$s_j = \frac{\exp(\alpha p_j + v_j)}{1 + \sum_{k=1}^{J} \exp(\alpha p_k + v_k)} \text{ for all brands } j,$$

$$s_0 = \frac{1}{1 + \sum_{k=1}^{J} \exp(\alpha p_k + v_k)} \text{ for the outside share.}$$

255. In the Nash-Bertrand market equilibrium, the firms maximize their overall profits by choosing prices for each of their brands. Given the prices, the quantities of brands purchased are determined by the Logit demand system. Each firm considers other firms' prices as given, and can only affect its profits by varying its own prices.

256. For example, if there are only two firms, each selling one product in the market, 1 and 2, they solve:

$$\max_{p_1} m \cdot s_1(p_1, p_2) \cdot (p_1 - c_1),$$

$$\max_{p_2} m \cdot s_2(p_1, p_2) \cdot (p_2 - c_2),$$

where s are market shares, p are prices, c are marginal costs, $(p - c)$ are markups, and m is the market size.[325] The solution to these profit-maximization problems is given by the following system of first-order conditions:

[325] I assume that, within each of its brands, a carrier faces a constant marginal cost to offer wireless services to customers. Their marginal costs are allowed to vary across brands.

$$s_1(p_1, p_2) + \frac{\partial s_1(p_1, p_2)}{\partial p_1}(p_1 - c_1) = 0,$$

$$s_2(p_1, p_2) + \frac{\partial s_2(p_1, p_2)}{\partial p_2}(p_2 - c_2) = 0.$$

257. Prices which satisfy this system of equations constitute a Nash-Bertrand equilibrium because, given other firms' prices, no firm wants to change its prices.

258. Using this system of equations, markups $(p_j - c_j)$ may be predicted using the shares and the derivatives (i.e., the changes) of shares with respect to prices. Within the Logit framework, both market shares and their derivatives with respect to prices have a closed-form solution in terms of the model parameters and firm prices.

259. The first-order conditions of carriers in the model used here are more complex than the ones presented in the example above because all carriers considered in the model, with the exception of Shaw in Ontario, offer multiple brands in each province. However, markups can be obtained in a similar way. For example, the first-order conditions of a single carrier offering two wireless brands (1 and 2) are given by:

$$s_1(p_1, p_2) + \frac{\partial s_1}{\partial p_1}(p_1 - c_1) + \frac{\partial s_2}{\partial p_1}(p_2 - c_2) = 0 \text{ and}$$

$$s_2(p_1, p_2) + \frac{\partial s_2}{\partial p_2}(p_2 - c_2) + \frac{\partial s_1}{\partial p_2}(p_1 - c_1) = 0.$$

The additional term $\frac{\partial s_2}{\partial p_1}(p_2 - c_2)$ in the first equation reflects an incentive to set a higher price of brand 1 due to the fact that some of the consumers diverted away from brand 1 are re-captured by the same firm as the sales of brand 2. The second equation has a similar term for the price of brand 2.

260. More generally, with many firms and products, firms set prices to equalize: [326]

$$s + (\Omega\Delta) * (p - c) = 0 \qquad (*)$$

where s is a vector of market shares, Ω is the ownership matrix, Δ is a matrix of shares derivatives with respect to prices across brands, p is a vector of prices, and c is a vector of marginal costs. The ownership matrix Ω has as its elements the (0, 1) indicators for whether a given product is owned by a particular firm.

8.1.2. Model calibration

261. The Logit-Bertrand model described above includes two types of terms: parameters and outcomes. Parameters govern the nature of consumer preferences (such as a value specifying that consumers prefer lower prices to higher prices) and firm characteristics (such as marginal costs and brand ownership indicators). Parameters thus represent a sufficient set of numbers from which all other economic outcomes may be calculated using the model. The parameters of the Logit-Bertrand model described above are:

- the non-price values of the brands $v_1, \ldots, v_J$,
- the price coefficient α, and
- the brands' marginal costs $c_1, \ldots, c_J$.

262. Once values for each of these parameters are specified the Logit-Bertrand model can calculate the values of the following outcomes:

- prices, $p_1, \ldots, p_J$,
- market shares of the brands, $s_1, \ldots, s_J$,
- outside option share s_0, and
- markups $(p_1 - c_1), \ldots, (p_J - c_J)$ (referred to in what follows as "modelled markups").

[326] Note that $(\Omega\Delta)$ represents the element-wise multiplication of Ω and Δ. The matrix $(\Omega\Delta)$ is a transformation of the Δ matrix where the cross-price derivatives of brands associated with separate carriers are set to 0.

263. I next discuss the calibration of the model to the pre-merger data. As I explain in Section 6.2.2, the calibration involves selecting the values of the parameters such that the model can replicate, as a prediction, outcomes observed in real-world data before the merger. The observed outcomes that I use to calibrate the model include:

- prices measured as ARPU,
- market shares conditional on not using the outside option measured as shares of gross adds (referred to in what follows as "conditional market shares"), and
- markups for Rogers Wireless, Fido, and Freedom, calculated from the produced data (referred to in what follows as "empirical markups")

264. The calibration procedure fits parameters v_j, α, and the pre-merger value of s_0 to the data in a sequential fashion. Conditional on fixing s_0 and α, it finds v_j by fitting the market shares; conditional on fixing s_0, it finds α by fitting the markups of Rogers Wireless, Fido, and Freedom; and, finally, it finds s_0 by fitting the market elasticity.[327] I next discuss these steps in more detail. In the process, the brands' marginal costs c_j are calibrated, as well, and the modelled pre-merger markups $p_j - c_j$ of all brands are calculated.

265. First, the non-price values v_j are found from fitting the shares predicted by the model to shares of gross adds s_j implied by the data, taking as given prices p_j (calculated as ARPU) and assumed values of s_0 and α. Parameters v_j may be calculated as:

$$v_j = \ln s_j - \ln s_0 - \alpha p_j,$$

which follows from the closed-form solution for the shares in the Logit model presented in Subsection 8.1.1 above.

[327] In programming terms, the code for this calibration has an outer loop which iterates over values of s_0 in order to fit the modeled market elasticity to the empirical one. The calculation of modeled market elasticity requires knowing α, in addition to s_0, so there is an inner loop which, for any s_0, iterates over different values of α to find the one which fits the markups. The values of v_j are calculated in each iteration of the outer loop, after parameter α is calculated: for any value of s_0 which passes through the outer loop and the corresponding optimal value of α, v_j's are given by the equations presented in the text.

266. I do not directly observe shares s_j because the shares I can measure empirically based on gross adds are conditional on choosing one of the brands. Therefore, I express s_j as follows:

$$s_j = (1 - s_0)s_{j|\text{in}},$$

where $s_{j|\text{in}}$ denotes the conditional markets shares based on gross adds presented in Section 6.2.4.

267. Parameter α is found by fitting the modelled markups to the empirical markups. Because I fit multiple markups (those of Rogers Wireless, Fido, and Freedom), these markups are not fit exactly, but rather the quadratic sum of the differences between predicted and actual markups is minimized:

$$\alpha = \underset{a}{\text{argmin}} \sum_{j \in \{\text{Rogers Wireless, Fido, Freedom}\}} (\text{modelled markup}_j(a) - \text{empirical markup}_j)^2$$

268. The modelled markups are derived from the carriers' first order conditions presented in a matrix form in equation (*) above. Plugging in the expressions for the market shares and derivatives and solving the system of equations, one can find the expressions for markups. For example, in the 8-product model, the markups of Rogers Wireless depend on the share of Rogers Wireless (indexed below by *R*) and Fido (indexed below by *F*) brands, as well as the price coefficient α:

$$p_{\text{R}} - c_{\text{R}} = -\frac{1}{\alpha(1 - s_{\text{R}} - s_{\text{F}})} = p_{\text{F}} - c_{\text{F}}$$

269. As may be seen from this expression, the Logit demand system implies that markups are the same for the brands of the same carrier. To understand why this occurs, suppose that a carrier has a higher markup on one brand, and a lower markup on another. In that case, it has an incentive to raise price on the lower-markups brand in order to shift consumers to the (more profitable) higher-markup brand. With Logit demand and profit maximization, this leads to markups that are the same across all brands owned by the same carrier. This "common markups" property extends to economic models that use a number of

other demand systems, though not across all economic models.[328] I have not seen the need to impose the complications of such other demand systems to fit empirical differences in markups.

270. Each markup in the system could theoretically be used to inform calibration. However, as I discuss in Section 6.2.4, I only use markups of particular Rogers and Shaw brands in the calibration because the cost data available to me are more reliable for these products. These data are sufficient to calibrate the system and avoid problems of reconciling parameter implications between more and less reliable data.

271. Given the value of the price coefficient α, I calculate the modelled markups of all brands from the same system of first-order conditions (*). I calculate marginal costs of the brands, c_j, as empirical prices minus modelled markups.

272. The share of the outside option s_0 is calculated by equating the empirical market elasticity to that predicted by the model. The market elasticity is another outcome term that can be calculated from the model and represents the percentage change in the inside brands' share following a percentage increase in all prices of the brands considered in the model. In the Logit model, the market elasticity is derived as:[329]

$$Mkt\ elas = \sum_{j=1}^{J} \frac{\partial \ln(1 - s_0)}{\partial \ln p_j} = -\frac{1}{1 - s_0} \sum_{j=1}^{J} \frac{\partial s_0}{\partial p_j} p_j = \frac{\alpha}{1 - s_0} \sum_{j=1}^{J} s_0 s_j p_j$$

$$= \alpha s_0 \frac{\sum_{j=1}^{J} s_j p_j}{1 - s_0}.$$

Therefore, the predicted value of the market elasticity may be calculated from α, s_0, and the shares and prices data. I explain in Appendix 8.2 how I obtain the empirical values of the market elasticity that I use to fit the model-predicted market elasticity.

[328] See Volker Nocke and Nicholas Schutz, "Multiproduct-Firm Oligopoly: An Aggregative Games Approach," *Econometrica*, 86(2), 2018, pp. 523–557, at p. 523. See also Peter Caradonna, Nathan Miller, and Gloria Sheu, "Mergers, Entry, and Consumer Welfare" *Georgetown McDonough School of Business Research Paper No. 3537135*, 2021, (July 30, 2021) p. 8.

[329] The market elasticity defined in this equation is negative. I refer to the absolute value of the market elasticity throughout the text of this affidavit.

273. I report in Appendix 8.3 all the inputs which go into calibration, the calibrated values of the model parameters, and the modelled values of the pre-merger outside share and markups.

8.1.3. Merger simulation

274. The merger simulation keeps the following calibrated parameters of the model fixed: the consumer valuations of brands v_j, the price coefficient α, and the brands' marginal costs c_j. Based on these parameters the model then predicts how prices, shares, and welfare metrics change after the merger.

275. Specifically, before the merger, Rogers and Shaw solve the profit optimization problems which contain only their own brands. Post-merger in the analysis presented in Section 6.2, the merged firm owns all brands of Rogers and Shaw and, therefore, solves a different profit maximization problem. In the model, this is achieved by editing the matrix of brands' ownership Ω post-merger, leaving the calibrated parameters unchanged, and running the model to generate new predicted outcomes.

276. The system of firms' first-order conditions, updated with the new ownership matrix, is solved for the new equilibrium prices. The post-merger shares are calculated using these post-merger prices and the model parameters v_j and α based on the formulas discussed in Subsection 8.1.1. I also calculate the weighted average price increases in percentage terms by 1) calculating weighted average prices post- and pre-merger, using brands' shares as weights; 2) taking the difference between the price post-merger and the price pre-merger and dividing by the price pre-merger. I calculate these weighted average price increases for all brands and for just Bell and Telus brands. I explain in Appendix 8.6 how I calculate welfare metrics before and after the merger.

8.2. Market elasticity

8.2.1. Obtaining estimates of the market elasticity in the market for wireless services

277. The market elasticity quantifies the extent to which wireless consumers decrease their consumption in response to an increase in the average price of wireless services.

278. In order to obtain a value or range of values for the market elasticity in Canada, I start by reviewing publicly available data collected by the CRTC on consumers' average wireless data consumption over time and their average price paid per gigabyte of data over time. I find that between 2018 and 2019—the most recent years for which data from the CRTC is consistently available—consumption of mobile wireless data among subscribers with a data plan rose by 18.8 percent, while the revenue per a gigabyte of data fell by 20.0 percent.[330] Assuming that this change in usage is solely a result of observed change in price, the implied market elasticity is equal 0.94 (absolute value).[331]

279. The CRTC data only provide a rough measure of the market elasticity because multiple factors may drive the observed increase in data usage rather than just the observed decrease in the price of a gigabyte. For example, aggregate data usage may have grown over the period just as a result of changing consumption habits or as a result of increasing smartphone penetration.[332] In addition, the CRTC estimates are reported for the whole of Canada, rather than for the three provinces of interest. Even with these limitations, I interpret these CRTC estimates as showing that, in the aggregate, usage responds to changes in the price of data.

280. To obtain a more accurate estimate, I therefore examine Canadian wireless subscribers' response to a recent market event which altered the menu of prices they face. In June 2019, each of the Big 3 carriers introduced unlimited plans for the first time (i.e., plans that throttle data once the subscriber exceeds their data allocation, rather than charging data overage

[330] CRTC, "data-retail-mobile-sector-2020.xlsx," sheets "MB-F15," "MB-S3"; Workpaper 8.2.1.

[331] I report all price elasticities in absolute value.

[332] Smartphone penetration in Canada has been rising in recent years, and increased from 81 percent to 85 percent between 2018 and 2019. See CRTC, "data-retail-mobile-sector-2020.xlsx," sheet "MB-F18."

fees).[333] This event is an appropriate context in which to quantify the market elasticity because the introduction of unlimited plans represents an immediate and near-simultaneous decrease in the price per gigabyte across each of the Big 3 carriers' data plans.

281. In order to measure consumers' response to this event in Alberta, British Columbia, and Ontario, I analyze Bell data on its subscribers' plan choices and data consumption around the time of the introduction of its unlimited plans.[334] I measure the change in price per gigabyte and change in consumption experienced by subscribers in each province who migrate to a new plan in the first three months after the introduction of unlimited plans by comparing their consumption during two time periods: five months before the introduction of unlimited plans (January to May 2019) and three months after the introduction of unlimited plans (September to December 2019).[335]

282. As discussed in Section 4.1, wireless service plans generally include voice, text, and data. Plans currently offered to Canadian consumer typically include unlimited domestic voice and text as well as a data allocation of varying size. The total plan charges represent the total price for these various services. In order to determine the average price of data under these plans, therefore, I distinguish between two parts of the price of a wireless plan: a fixed component relating to services other than data usage, and a component that increases in the size of the subscribers' data allocation.

283. I determine the average price of the data allocation faced by Bell subscribers in each province who upgrade after the introduction of Bell's "Unlimited" plans by regressing their total wireless service charges, including base plans, data add-ons, overage charges, etc., on their data allocation during the pre-period and post-period. I include interaction terms for the post-unlimited period and to distinguish subscribers who switch to the unlimited plans from subscribers who switch to other plans in the post-unlimited period.

---

[333] [redacted] SJRB-CCB00359348; [redacted] SJRB-CCB00473316; see also for same: SJRB-CCB00120181; [redacted] SJRB-CCB00120495.

[334] [redacted] Due to the similarity of Rogers' and Bell's unlimited plan offers, I expect that the effect of the introduction of unlimited plans would be similar for Rogers.

[335] I limit the analysis to data from 2019 to avoid any potential confounding effects stemming from the COVID-19 pandemic starting in 2020.

284. Wireless data consumption may trend upward over time or experience seasonal fluctuations. In order to assess how the consumption of subscribers that migrated plans after the introduction of unlimited in each province might have changed had they not upgraded, I compare their consumption and price paid with the data usage growth and growth in price paid by subscribers in the same province who remain on the same Bell plan before and after the introduction of unlimited plans.[336] In order to determine the average price of data faced by Bell subscribers in each province who do not change their plans during the period, I similarly regress their total price paid for wireless service on their data allocation, including an interaction term for the post-unlimited period.

[336] In order to exclude subscribers who change plans very infrequently (such as subscribers with particularly low demand for mobile data), I restrict this comparison group to subscribers who joined Bell or changed their plan in 2018. I also restrict the analysis to the set of subscribers who remain in the same province during 2019, the analysis period.

Exhibit 24
Elasticity of Data Consumption Calculated from 2019 Bell Unlimited Plan Event

Source:

Note: The "Adjusted Percent Change" column reports the value of data usage or price per gigabyte for the corresponding subscriber group deflated by the growth of that metric in the "No Plan Migration" subscriber group. The overall percent change in data usage and price per gigabyte used to calculate the elasticity for each province are calculated by taking the weighted average of the adjusted change in data usage and price per gigabyte for "Unlimited Migrations" and "Other Migrations" for that province. The average is weighted by the percent of plan migrations and new additions joining an unlimited plan in the province during the period of June – August 2019.

285. The average price per gigabyte of data allocation computed for each group of subscribers in each province is reported in Exhibit 2 By construction, subscribers who change plans during the period, whether to unlimited or another plan, have the same marginal price of data in the pre-period within each province.

[redacted] As discussed above, I use the growth of data usage and price paid by these subscribers to determine how the usage of subscribers in the same province who migrated to a new plan would have changed had they not migrated to another plan. Exhibit 24 reports the adjusted growth in usage and price per gigabyte for subscribers who migrate to unlimited and non-unlimited plans respectively by province.

286. To obtain a measure of the average elasticity among subscribers who change plan, I then take, for each province, a weighted average of the adjusted change in data consumption and adjusted change in the average price of data. Weights are based on the relative share of unlimited subscribers and non-unlimited subscribers among subscribers who change plan or join Bell during the event period within each province.[337] I find an elasticity of data consumption to the average price of data of [redacted] in Alberta, [redacted] in British Columbia, and [redacted] in Ontario (reported in absolute value).

287. In order to place in perspective the number I obtain through this analysis of an event of the wireless market in these three provinces, I now consider my estimate of the market elasticity above in relation to estimates available in the economic literature on wireless services. Studies in the literature use samples from a range of different countries and different time periods (often before the widespread use of smartphones). Many articles in the literature focus specifically on the extensive margin: the consumers' choice of whether or not to continue purchasing a wireless plan in response to an increase in price. For these reasons, the number I obtain from recent data will not be directly comparable to the estimates available in the literature. Nevertheless, it is still informative to consider how the estimated elasticities of [redacted] that I obtained above relate to estimates from the literature and to consider alternative values that I can use as a sensitivity for my analysis.

288. Many of the academic studies studying demand in the wireless market are based on relatively old data from a time when wireless technology was much different (i.e., before the widespread use of smartphones or the advent of LTE

[337] Results are similar if I instead use the share of unlimited subscribers only among existing subscribers who change plan during the event period.

wireless networks).[338] Additionally, many articles examine the wireless market in developing countries that likely have different per capita incomes, wireless infrastructure, and mobile penetration rates than Canada. In order to narrow down the literature to studies that are more comparable with Canada's wireless market today, I do not discuss studies whose entire data sample is more than twenty years old, or that primarily study a country that is not part of the OECD, because those articles are less likely to be comparable to contemporary Canada.[339]

289. Several of the articles I consider have market elasticity estimate that considers both the extensive and intensive margin. For example, an article might measure the response of total minutes of calls to a change in price. In this case the reduction in call volume would encapsulate both the extensive margin (giving up the wireless plan altogether) and the intensive margin (making fewer calls). Among these studies: Lee and Lee (2006) estimate a wireless market elasticity in Korea of 0.48 to 0.64;[340] Dewenter and Haucap (2008) find a market elasticity for consumers of 0.37 in Austria;[341] Grzybowski and Pereira (2008) use a panel data set in Portugal to estimate the intensive margin of call and message price elasticity, finding that messages have a market price elasticity of 0.28 and calls have a market price elasticity of 0.38;[342] Huang (2008) estimates the market elasticity in Taiwan to be 1.13 (extensive margin only) or 1.35 (total call volume);[343] Karacuka, Haucap, and Heimeshoff (2011) estimate the market elasticity in Turkey to be about 0.45;[344] finally,

[338] As points of reference in the evolution of wireless services over time, LTE wireless network technology first appeared in Canada in 2011. Canadian Radio-television and Telecommunications Commission, "Communications Monitoring Report," January 21, 2020, p. 155.

[339] Nevertheless, most, but not all, of these additional papers I do not include in this section also estimate market elasticities that are similar to the papers I do consider. For more details, see the literature reviews in Hausman and Ros (2013) and Karacuka, Haucap, and Heimeshoff (2011).

[340] Duk Hee Lee, and Dong Hee Lee, "Estimating Consumer Surplus in the Mobile Telecommunications Market: The Case of Korea," *Telecommunications Policy* 30, 2006, pp. 605–621.

[341] Ralf Dewenter and Justus Haucap, "Demand Elasticities for Mobile Telecommunications in Austria," Jahrbücher für Nationalökonomie und Statistik 228(1), 2008, pp. 49–63.

[342] Lukasz Grzybowski and Pedro Pereira, "The Complementarity Between Calls and Messages in Mobile Telephony," *Information Economics and Policy* 20, 2008, pp. 279–287.

[343] Ching-I Huang, "Estimating Demand for Cellular Phone Service Under Nonlinear Pricing," *Quantitative Marketing and Economics* 6, 2008, pp. 371–413. Although Taiwan is not an OECD country, I chose to include this paper since the economy of Taiwan is similar to other countries I consider.

[344] Mehmet Karacuka, Justus Haucap, and Ulrich Heimeshoff, "Competition in Turkish Mobile Telecommunications Markets: Price Elasticities and Network Substitution," *Telecommunications Policy* 35, 2011, pp. 202–210.

Agiakloglou and Polemis (2018), using a broad index of 19 European Union countries, estimate a market elasticity of 0.82.[345]

290. As mentioned above, some articles only consider an extensive margin, where consumers who switch in response to an average price change among the inside good firms do so by not using a wireless plan offered by any of the inside good firms at all. Among these studies: Grzybowski and Pereira (2007) estimate an elasticity of 0.32 to 0.45 in Portugal over a longer duration than measured in their 2008 article;[346] and Hausman and Ros (2013) estimate the elasticity in Mexico to be between 0.48 and 0.59.[347] The most recent article that estimates a wireless market elasticity is Bourreau, Sun, and Verboven (2021), also corresponding to the extensive margin.[348] This article uses data from France during 2011-2014 and estimates an extensive margin market elasticity of about 0.1. Additionally, this elasticity is lower than the rest of the literature has found. For these reasons, I consider their 0.1 estimate to be a lower bound on the market elasticity.

291. Many of the studies discussed above present more than one estimate of the market elasticity resulting from alternative model specifications or because the article offers a measure of an extensive margin elasticity and a total (extensive and intensive) margin elasticity. In Exhibit 25 below, I show a table of both the lower and higher of the market elasticities from each of the articles described above. For articles that report only one estimate of the market elasticity, I consider that estimate to be both the low and the high estimate. I take an average of all of the lower estimates and an average of all of the higher estimates to derive a range of market elasticities from the literature. This range of 0.47 to 0.55 provides more evidence that the market elasticities [redacted] in Alberta, [redacted] in British Columbia, and [redacted] in Ontario that I calculate above are a reasonable input for the merger simulation model.

[345] Christos Agiakloglou and Michael Polemis, "Evaluating the Liberalization Process on Telecommunications Services for EU Countries," *Economics and Business Letters* 7(3), 2018, pp. 98–107.

[346] Lukasz Grzybowski and Pedro Pereira, "Merger Simulation in Mobile Telephony in Portugal," *Review of Industrial Organization* 31, 2007, pp. 205–220.

[347] Jerry A. Hausman and Agustin J. Ros, "An Econometric Assessment of Telecommunications Prices and Consumer Surplus in Mexico Using Panel Data," *Journal of Regulatory Economics* 43(3), 2013, pp. 284–304.

[348] Marc Bourreau, Yutec Sun, and Frank Verboven, "Market Entry, Fighting Brands, and Tacit Collusion: Evidence from the French Mobile Telecommunications Market," *American Economic Review* 111(11), 2021, pp. 3459–3499.

Exhibit 25
Market Elasticity Estimates from the Literature

Article	Low	High
Lee and Lee (2006)	0.48	0.64
Dewenter and Haucap (2008)	0.37	0.37
Grzybowski and Pereira (2008)	0.28	0.38
Huang (2008)	1.13	1.35
Karacuka, Haucap, and Heimeshoff (2011)	0.45	0.45
Agiakloglou and Polemis (2018)	0.82	0.82
Grzybowski and Pereira (2007)	0.32	0.45
Hausman and Ros (2013)	0.48	0.59
Bourreau, Sun, and Verboven (2021)	0.10	0.11
Average	0.49	0.57

Note: Elasticities are reported in absolute value. Some academic articles whose market elasticity estimates are reported above contain multiple values coming from alternated specifications, while other articles report only one. For articles that report only one estimate of the market elasticity, the table reports that estimate as both the low and the high estimate. Some articles also report a 'short-run' market elasticity. These results are not reported above.

8.2.2. Price increases and deadweight loss from the merger in a sensitivity using a lower bound on the market elasticity.

292. As discussed in Section 6.2.7, I also consider a sensitivity in which I calibrate the merger simulation model using an alternative elasticity value of 0.1, taken from the Bourreau, Sun, and Verboven (2021) article discussed above. I choose an alternative market elasticity value taken from this article because: (1) the authors find a value on the low end of the literature, reflecting only the extent to which consumers start buying fewer subscriptions in response to a change in the overall price of wireless services, as opposed to an additional effect of lower data consumption I consider; (2) the study is recent and has been published in a prestigious economics journal. The values in this article represent a reasonable lower bound on consumers' response.

293. I present the price and welfare effects of the model calibrated to a lower-bound value of the market elasticity in Exhibit 26 and Exhibit 27 below.

Exhibit 26
Percent Price Increases for the Parties' Brands Predicted by the Model Calibrated to a Market Elasticity of 0.1

Source: Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using a market elasticity of 0.1. See Appendices 8.1 and 8.3 for the calibration and simulation procedures, and additional information on the data inputs.

Exhibit 27
Annual Welfare Results in Millions of Dollars Predicted by the Model Calibrated to a Market Elasticity of 0.1

Source: Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using a market elasticity of 0.1. See Appendices 8.1, 8.3, and 8.6 for the calibration and simulation procedures, additional information on the data inputs, and the deadweight loss calculation.

294. The higher price effects and lower deadweight losses predicted by this implementation of the model, compared with the version of the model presented in Exhibit 20 and Exhibit 21, are a consequence of using a lower market elasticity. With a lower market elasticity, consumers are less likely to reduce their consumption of mobile wireless services in response to a price increase. From the carriers' perspective, consumers' smaller reduction in consumption means that they can profitably impose a larger price increase. As a result, in each province, the loss in consumer surplus predicted by a model calibrated to an elasticity of 0.1 is larger than the one predicted by a model calibrated to the province-level elasticity estimates used in Section 6.2.

295. Carriers recapture a larger amount of the losses in consumer surplus as transfers, which are larger than those reported in Section 6.2.6. These larger

transfers to firms offset the larger losses of consumer surplus, resulting in lower deadweight loss than in the version of the model reported in Section 6.2.6.

296. The model calibrated to an elasticity of 0.1 still predicts that the proposed acquisition will result in competitive harm. The deadweight loss across all provinces is no less than $182 million per year and the associated decrease in consumer surplus is no less than $1,062 million per year, with an associated transfer from consumers to producers of no less than $971 million per year.

8.3. Calibration inputs

297. In this appendix I discuss how I obtain from data produced by the Rogers and Shaw, as well as Bell and Telus, three of the inputs required to calibrate the Logit-Bertrand model: gross adds for the brands' market shares, ARPU used as brand prices, and markups. In this appendix, I also describe how I obtain subscriber counts, which I use to calculate the size of the market—an input to the calculation of the deadweight loss and other welfare metrics.[349] One additional calibration input, the market elasticity, is discussed in a dedicated appendix.[350]

298. In what follows I describe how I construct these inputs from the information that Rogers, Shaw, Bell, and Telus provided to the Competition Bureau in response to the Supplementary Information Requests ("SIRs"), orders pursuant to section 11 of the Competition Act ("Section 11 Orders") in connection with the Bureau's review of the proposed acquisition, as well as in discovery.

299. I calculate all inputs required to calibrate the Logit-Bertrand model over the period January 2021 – April 2021. I chose this time period for two reasons. First, I use April 2021 as the end period because it is the last month for which the data required is consistently available across carriers between the data produced in response to the SIR and data produced in discovery.[351] Second,

[349] See Appendix 8.6.

[350] See Appendix 8.2.

[351] [redacted]

[redacted][352]

8.3.1. Gross adds

300. For each of the relevant provinces, a brand's share of gross adds is calculated as that brand's gross adds in that province divided by the total gross adds in that province for all brands considered in the model.

301. For each province I consider the total gross adds of consumer mobile phone service that a brand obtained over the period January 2021 – April 2021. I exclude the non-phone gross adds to allow for the possibility that adding a device to an existing consumer account may not reflect the same competitive situation as a new phone subscription for a consumer.[353] [redacted][354] I also exclude new subscriptions for business accounts that are distinguished from consumer accounts to reflect the fact that competition for these accounts is considered to occur in a distinct market with different competitive conditions.

(1) Gross adds for Rogers brands

302. [redacted]

[redacted]

[352] See Section 6.2.4.

[353] See Sections 5.1, 5.3.

[354] [redacted]

[redacted]355

- [redacted]356 I [redacted]
- [redacted]357

303. [redacted]

- [redacted]358 [redacted]

355 See [redacted]

356 [redacted]

357 To construct the percentages, I divide each provincial subscriber counts by national subscribers at the brand-prepaid segment level.

358 [redacted]

[redacted]359 [redacted]360

- [redacted]
- [redacted]

(2) Gross adds for Shaw brands

304. [redacted]361 [redacted]

359 [redacted] See Workpaper 8.3.1.a. A [redacted]

360 [redacted]

361 [redacted]

305. [redacted][362][redacted][363][redacted]

(3) Gross adds for Bell brands

306. [redacted][364][redacted]

307. [redacted][365][redacted]

308. [redacted][366][redacted][367]

---

362 [redacted] See Workpaper 8.3.1.b. See also, Shaw Communications Inc., Shaw Announces Second Quarter and Year-to-Date Fiscal 2021 Results, p. 17.

363 [redacted]

364 [redacted]

365 [redacted]

366 [redacted]

367 [redacted]

309.

310.

(4) Gross adds for Telus brands

311. [368]

312. [369]

313.

314.

[368] See

[369] See

[redacted][370] [redacted]
[redacted][371]

8.3.2. Subscribers

315. I use the data on subscriber counts as an input to calculate the changes in welfare predicted by the model.[372] As with gross adds I only consider subscriber counts for consumer phone customers over the period January 2021 – April 2021. I calculate the average monthly subscriber counts by province and brand over this four-month period. In what follows, I describe how I construct these subscriber counts from the information that Rogers, Shaw, Bell, and Telus produced to the Competition Bureau.

(1) Subscribers for Rogers brands

316. [redacted][373] [redacted][374]

317. [redacted]

[370] See [redacted]
[371] See [redacted]
[372] See Appendix 8.6.
[373] See [redacted]
[374] See Appendix 8.3.1.

[redacted]

318. [redacted]

(2) Subscribers for Shaw brands

319. [redacted]

(3) Subscribers for Bell brands

320. [redacted][375]

(4) Subscribers for Telus brands

321. [redacted]

[375] [redacted]

[redacted]

8.3.3. ARPU

322. I use the average monthly ARPU in January 2021 – April 2021 as the pre-merger prices in the merger simulation.

323. [redacted][376]

[redacted][377]

324. [redacted] I use the ARPU for the Rogers' brands in place of Telus and Bell prices. In particular, in each province, I use Rogers Wireless ARPU to approximate Bell Mobility and Telus Mobility ARPU, Fido ARPU to approximate Virgin Mobile and Koodo Mobile ARPU, and Chatr ARPU to approximate Lucky Mobile and Public Mobile ARPU.[378]

(1) ARPU for Rogers brands

325. [redacted]

[376] [redacted]

[377] "Mobile phone average billing per user (ABPU) or subscriber approximates the average amount billed to customers on a monthly basis, including monthly billings related to device financing receivables owing from customers on contract, which is used to track our recurring billing streams." See BCE Inc., 2021 First Quarter Shareholder Report, p. 32.

[378] I report prices used as data inputs for all brands and provinces in Exhibits 36 and 37 in Appendix 8.7.

p

326.

(2) ARPU for Shaw brands

327.

8.3.4. Markups

328. To calibrate the logit model, I use the monthly dollar markups per customer. I refer to the dollar difference between price and marginal cost as markup. I refer to the ratio of the markup and price as margin. The monthly dollar markup is calculated as

$$Markup = p - c = \frac{p - c}{p} p = Margin * p$$

As discussed above, I use ARPU as prices in the merger simulation:

$$Markup = Margin * ARPU$$

I next discuss how I calculate the margins.

329. In order to calculate the margins, I first need to calculate the marginal costs. I approximate the marginal costs starting with the subset of costs identified as variable costs of wireless services in Shaw's and Rogers' produced data. In an abundance of caution, I added costs that, even though not included on the list of variable costs produced by the parties, appear likely to increase with providing wireless services to a larger number of customers.[379]

330. Generally speaking, these costs may be of two types: costs which the firm pays every month on an existing customer ("carrying costs per user," or CCPU), and costs which are only paid upon customer acquisition ("costs of acquisition," or COA). Such per-user costs are not directly observable in the data, which report total costs. Therefore, to obtain per-user costs, I divide the carrying costs by the number of subscribers, and the costs of acquisition by the number of gross adds.[380] I calculate the per-user cost for each category I consider within a month and province, then sum up across cost categories within a month and province, and then average across four months (January 2021 – April 2021) in each province.[381]

331. Because I need to combine COA and CCPU, which are incurred at different points in time, into a single value, I calculate the present value of marginal costs as follows:

$$PV\ MC = PV\ CCPU - COA,$$

where $PV\ CCPU$ refers to the present value of the stream of future carrying costs per user.

[379] As explained below I did not include costs related to the sales of handsets.

[380] [redacted]

[381] [redacted]

332. Similarly, I calculate the present value of the stream of future ARPU, so that the prices and the marginal costs are consistent with each other. The resulting calculation of the margin is as follows:[382]

$$Margin = \frac{PV\ ARPU - PV\ CCPU - COA}{PV\ ARPU}$$

333. To calculate the present value of ARPU and CCPU, I take the average monthly values and sum up across all future months. I illustrate this present value calculation using ARPU; the calculation for CCPU is similar. To calculate the present value of the stream of future ARPU I discount each future month with the factor β^t where t is the number of months from the present:

$$PV\ ARPU = ARPU + \beta ARPU + \beta^2 ARPU + \cdots = \frac{ARPU}{1-\beta}$$

I calculate the discount factor β as

$$\beta = \frac{1 - churn}{1 + discount\ rate}$$

334. Churn represents the share of users who deactivate service in any given month, and the discount rate discounts the value of future dollars relative to the present. I use the monthly average churn at the brand-province level from each company's produced data and the wireless-specific discount rate from each company's 2020 annual report.[383]

[382] [redacted]

[383] [redacted] The wireless-specific discount rate is 7.0 percent for Shaw and 8.4 percent for Rogers. I convert these annual discount rates to a monthly basis by taking the 12th root of 1 + the annual discount rate and subtracting 1 as follows: monthly rate = $\sqrt[12]{1 + \text{annual rate}} - 1$. See Shaw 2020 Annual Report, p. 105; Rogers 2020 Annual Report, p. 118.

(1) Shaw's variable costs

335. [redacted][384] [redacted][385] [redacted][386] F[redacted][387]

336. [redacted][388]

337. [redacted][389] [redacted]

[384] [redacted]

[385] [redacted]

[386] For example, Shaw's 2020 Annual Report describes ARPU as the "*service* revenue divided by the average number of subscribers on the network during the period [emphasis added]." See Shaw 2020 Annual Report, p. 46.

[387] [redacted]

[388] [redacted]

[389] [redacted]

[redacted][390]

338. F[redacted]

(2) Rogers' variable costs

339. [redacted][391][392][redacted]

[390] See [redacted]

[391] [redacted]

[392] See [redacted]

[393] [redacted]

[redacted][394][redacted]

340. [redacted]

[redacted][395]

341. [redacted]

[redacted][396][redacted]

[394] See [redacted]

[395] See [redacted]

[396] [redacted]

8.4. The decline in Shaw Mobile gross adds does not well reflect how Shaw Mobile would compete absent the merger

342. [redacted][397][redacted]

343. [redacted]

344. [redacted][398][redacted][399][redacted][400][redacted]

---

[39][redacted]

[398] [redacted] SJRB-CCB00872845. [redacted] See SJRB-CCB00824646 [redacted]

[399] SJRB-CCB00829142 [redacted]

[40][redacted] Shaw's Reponses to Undertakings at Examination for Discovery of Paul McAleese (Day 1 and 2), No. 70, pp. 36–38. [redacted] SJRB-CCB00827944 ("[redacted] See Examination for Discovery of Paul McAleese, Day 2), pp. 356:19–357:5 ([redacted]

[redacted]401[redacted]
[redacted]402[redacted]
[redacted]403[redacted]
[redacted]404[redacted]
[redacted]405[redacted]

345. Exhibit 28 below shows the actual and forecasted sales as of June – July 2021 for the period from April 2021 to August 2022. [redacted]
[redacted]406[redacted]

[redacted] Examination for Discovery of Paul McAleese, Day 2, p. 356:16–18.

401 [redacted] SJRB-CCB00822858.

402 See, e.g., SJRB-CCB00873298 [redacted] See also SJRB-CCB00824647, [redacted]

403 SJRB-CCB00872845; See also SJRB-CCB00872846, Row 3: [redacted]

404 SJRB-CCB00824646 [redacted] SJRB-CCB00368445. [redacted] See SJRB-CCB00649408 at p. 5. [redacted] See SJRB-CCB00649408 at p. 4.

405 SJRB-CCB00824721 [redacted]

406 SJRB-CCB00821611 [redacted]

[redacted]407

Exhibit 28
Shaw Mobile Gross Adds Forecasts, April 2021 – August 2022

[redacted]

Source: SJRB-CCB00895966; SJRB-CCB00821611; SJRB-CCB00822857; SJRB-CCB00822858
Note: Gross adds forecasts are reported in documents created by Shaw in the normal course of business. Actual gross adds are reported in SJRB-CCB00895966. Gross adds are not restricted by region or subscriber type.

346. Exhibits 29 through 31 below show the unfolding of subsequent Shaw Mobile forecasts over time. [redacted]408 [redacted]409 [redacted]

407 SJRB-CCB00822858, [redacted]
408 SJRB-CCB00826492 ([redacted]
409 SJRB-CCB00824647.

a [redacted] [410] [redacted] [411] [redacted]

Exhibit 29
Shaw Mobile Gross Adds Forecasts, April 2021 – August 2022

[redacted]

Source: SJRB-CCB00895966; SJRB-CCB00821611; SJRB-CCB00822857; SJRB-CCB00822858; SJRB-CCB00824647; SJRB-CCB00825570

Note: Gross adds forecasts are reported in documents created by Shaw in the normal course of business. [redacted] (SJRB-CCB00825570). Actual gross adds are reported in SJRB-CCB00895966. Gross adds are not restricted by region or subscriber type.

347. As I show in Exhibit 30 below, [redacted]

[410] See Workpaper 8.4.a.

[411] SJRB-CCB00824716. See also SJRB-CCB00827944 [redacted]

[redacted]412 [redacted]

Exhibit 30
Shaw Mobile Gross Adds Forecasts, April 2021 – August 2022

[redacted]

Source: SJRB-CCB00895966; SJRB-CCB00821611; SJRB-CCB00822857; SJRB-CCB00822858; SJRB-CCB00824647; SJRB-CCB00825570; SJRB-CCB00827314

Note: Gross adds forecasts are reported in documents created by Shaw in the normal course of bus [redacted] Actual gross adds are reported in SJRB-CCB00895966. Gross adds are not restricted by region or subscriber type.

348. [redacted]413 [redacted]

412 SJRB-CCB00827314.

413 [redacted] See SJRB-CCB00827232 [redacted] see SJRB-CCB00827595 [redacted]

[redacted]414 [redacted]

[redacted]415 [redacted]

[redacted]416

[redacted]

414 [redacted] See SJRB-CCB00827314 ([redacted]

415 SJRB-CCB00832269 [redacted]

416 [redacted] See SJRB-CCB00830373 [redacted] SJRB-CCB00827415 ([redacted] SJRB-CCB00827564 [redacted]

Exhibit 31
Shaw Mobile Gross Adds Forecasts, April 2021 – August 2022

Source: SJRB-CCB00895966; SJRB-CCB00821611; SJRB-CCB00822857; SJRB-CCB00822858; SJRB-CCB00824647; SJRB-CCB00825570; SJRB-CCB00827314
Note: Gross adds forecasts are reported in documents created by Shaw in the normal course of bus
Actual gross adds are reported in SJRB-CCB00895966. Gross adds are not restricted by region or subscriber type.

349.
417
418
419

417 See detailed discussion above.
418 See P
419 see Exhibit 32.

[redacted][420][redacted]
[redacted][421][redacted]
[redacted][422][redacted]
[redacted]).[423][redacted]
[redacted][424]

Exhibit 32
Shaw Mobile Base and Gross Adds Average MRC Per Month, August 2020 – March 2022

[redacted]

Source: SJRB-CCB00838087
Note: [redacted]

[420] SJRB-CCB00873298 [redacted]
[421] SJRB-CCB00872845; See also SJRB-CCB00872846, [redacted]
[422] SJRB-CCB00878198, at p.2; See also SJRB-CCB00877967 [redacted]
[423] [redacted] SJRB-CCB00876610, [redacted]
[424] [redacted] SJRB-CCB00876694, at p. 4 [redacted]

350. [redacted][426] (Emphasis added).

351. [redacted][427] [redacted][428] [redacted][429] [redacted][430] [redacted][431]

[425] [redacted]

[426] SJRB-CCB00880307 [redacted]

[427] SJRB-CCB00876354 [redacted]

[428] See Workpaper 8.4.b.

[429] SJRB-CCB00826492 [redacted]

[430] [redacted]

[431] SJRB-CCB00826992 [redacted]

[redacted] [432]

352. Consistent with the above examples of Shaw Mobile regularly outperforming internal projections prior to the change in pricing, an analysis of port-outs from Rogers to Shaw shows that Shaw historically competes with Rogers to a considerable degree, particularly following the launch of Shaw Mobile. In Exhibit 33 below, I show Shaw's share of port-outs from Rogers over time in Alberta, British Columbia, and Ontario. As the exhibit shows, the introduction of Shaw Mobile in 2020 corresponds to a significant increase in the share of Rogers port-outs going to Shaw brands in Alberta and British Columbia. [redacted] [433]

[432] SJRB-CCB00828353 ([redacted])

[433] ROG00697616 [redacted]

Exhibit 33
Shaw's Share of Port-Outs from Rogers, January 2017 – April 2022

Source:

Note: The percentages represent the share of port-outs to Shaw out of all wireless accounts diverting out from Rogers that went to another carrier within a given province. Only consumer port-outs are included as part of Rogers port-outs. Switches within the same brand (e.g., from Freedom to Freedom) or involving a wireline service and brand migrations within the same carrier (e.g., from Fido to Rogers Wireless) are not considered in this analysis. The port-outs from Rogers cover switches labeled in the data as switches from Rogers Wireless and Fido to Freedom, Bell Mobility, Telus Mobility, Public Mobile, and other brands.

353.

434

[434] Response of Shaw Communications, Inc., June 3, 2022, ¶98.

[redacted][435][redacted]
[redacted][436][redacted]
[redacted][438][redacted]
[redacted][439]

354. [redacted]
[redacted][440][redacted]
[redacted][441][redacted]

[435] SJRB-CCB00823524, at p. 9; See also SJRB-CCB00821948 [redacted]

[436] [redacted] SJRB-CCB00878198, at p. 2. [redacted] SJRB-CCB00864934, at p. 2. [redacted] SJRB-CCB00876610, [redacted]

[437] SJRB-CCB00827992 [redacted] SJRB-CCB00831211 [redacted]

[438] [redacted] See SJRB-CCB00830373 [redacted] CCB00827415 ([redacted] SJRB-CCB00827564 [redacted] See Shaw's Responses to Undertakings at Examination for Discovery of Paul McAleese (Day 1 and 2), No. 82, pp. 43–44.

[439] [redacted] Annual reports from other firms in the industry confirm this. See e.g. BCE Inc. "Annual Report 2020," March 4, 2021, p. 98("Bell Wireless operating results are influenced by the timing of new mobile device launches and seasonal promotional periods, such as back-to-school, Black Friday and the Christmas holiday period."); Rogers 2020 Annual Report p. 54("The third and fourth quarters typically experience higher volumes of activity as a result of "back to school" and holiday season-related consumer behaviour.").

[440] [redacted]

[441] [redacted]

[redacted][442][redacted]

8.5. Comparison of model predicted diversions to porting data

355. Diversion ratios can be used to quantify how much consumers substitute between different brands. The diversion ratio between brand i and brand j is equal to the share of consumers who switch to brand j from brand i, out of all consumers which leave brand i, in response to i raising its price. Diversion ratios are important to predict the competitive effects of a merger: the higher the diversion ratio between the merging brands, the more consumers the merged firm would be able to recapture as it raises its prices. This implies that a model that better fits substitution patterns (as measured by diversions) will provide more accurate predictions on the competitive effects of the merger. In the logit model, the diversion ratios are given by the conditional shares of the brands considered. In other words, consumers switch to the brands in the same proportion as given by these brands' shares:

$$D_{ij} = s_{j|\text{in}} / \sum_k s_{k \neq i|\text{in}}.$$

356. Therefore, I can calculate the diversions predicted by the model—either calibrated to market shares or calibrated to subscriber percentages—using only the shares of gross adds and subscribers. Porting data from Comlink may be used to approximate "empirical" diversion ratios. Porting data track the number of customers who switch between brands of different carriers (for any reason). Thus, while they not provide perfect experiments in which one brand changes its price, and the other market conditions are held constant, porting data still include useful information on substitution patterns between brands.

357. I calculate the "empirical" diversion ratio between brand i and brand j by counting the consumers who port from brand i to brand j, and then dividing by

[442] SJRB-CCB00814711, at p. 22.

consumers who port out from brand *i* to any of the competitor's brands. With rare exceptions, Comlink does not track migrations (i.e., switches between brands of the same carrier), so I do not use diversions between brands of the same carrier in this exercise. Comlink does not report Freedom separately from Shaw Mobile. I split the port-ins to Shaw brands from each brand using the ratio of ports to Freedom and Shaw Mobile from that brand in the porting data that Shaw produced. I do not have information that would allow me to apportion port-outs from Shaw brands between Freedom and Shaw Mobile. Therefore, I calculate the diversion ratios from Shaw overall and assume the diversion ratios from Freedom and Shaw Mobile are the same.

358. Having calculated "empirical" diversions from porting data and diversion predicted by the model—either calibrated to market shares or to subscriber percentages, I evaluate how much they differ from each other on average. I do so by computing a statistic called mean square error ("MSE"). Porting data may not reflect flows to prepaid brands as well as to main/flanker brands, as I understand that consumers who switch to prepaid brands are likely to do so with a new phone number, as opposed to porting an existing number, and, thus, such flows are not captured by the porting data. Accordingly, I focus my comparison on premium and flanker brands.

359. I report the calculated MSEs in Exhibit 34 below. The diversions based on the gross adds are much closer to the actual diversions than the ones based on the subscriber shares in Alberta and British Columbia, as evidenced by lower MSEs. Additionally, the difference is even larger when the set of errors is restricted to the merging carriers' brands (which is especially important in order to calculate predictions about the effects of the merger). In Ontario, the diversions based on the subscriber shares reflect the actual diversions better. However, the difference is not as high as it is in the other direction for Alberta and British Columbia. In other words, the diversions in Ontario are similar, whether one uses subscriber shares or gross adds shares.

Exhibit 34
Mean Squared Error between Diversions Predicted by the Model and the Actual Diversions, January – April 2021

Source: [redacted] Comlink data

Note: Diversions are calculated using eight premium and flanker brands of Rogers, Shaw, Bell, and Telus. Only diversions to external brands are included (e.g., there are no diversions from Rogers to Fido in this analysis). Actual diversions are calculated from Comlink data. Comlink data do not separate between Freedom and Shaw Mobile brands. Produced Shaw data are used to divide port-ins to Shaw from external brands between Freedom and Shaw Mobile. Produced Shaw data do not contain a brand-level breakdown of port-outs, so diversions from both Shaw Mobile and Freedom to each external brand are assumed to have the same proportions. Predicted diversions are based on gross adds shares and subscriber shares as given by the logit formula. The error term for brand pair within a province is the difference between the actual and the predicted diversion. Each error term within a province is squared and the average of error terms is calculated for each province. The panel with only Rogers' and Shaw's brands reports the MSE using the same errors which are in the all brands calculation, but subset to those between Rogers' and Shaw's brands (as opposed to recalculating diversions and the errors for this subset of brands).

8.6. Deadweight loss calculation

360. The deadweight loss following the merger is equal to the total welfare after the merger minus the total welfare before the merger. From the merger simulation model I obtain the welfare loss per unit of quantity per month for each of the provinces I consider. I therefore rescale the model output to capture the total annualized welfare loss for the entire province. I do so by multiplying the model output by the market size in each province and 12, the number of months in a year.

361. Specifically, for each province p the deadweight loss DWL_p is the product of three components: the deadweight loss per unit of quantity per month,

dwl_p, obtained from the merger simulation model, market size Q_p, and 12, the number of months in a year:[443]

$$DWL_p = dwl_p \times Q_p \times 12.$$

In what follows I describe in detail the three components of this formula.

8.6.1. Deadweight loss per unit of quantity per month

362. The deadweight loss per unit of quantity per month can also be expressed as the difference in welfare per unit of quantity per month before and after merger, as follows[444]:

$$dwl = tw^{\text{post}} - tw^{\text{pre}}.$$

363. The total welfare (whether pre- or post-merger) is calculated as the consumer surplus plus carriers' profits:

$$tw = cs + \sum_k \pi_k,$$

where k indexes carriers.

364. The Logit model provides an average expected consumer surplus which has a closed-form solution:

$$cs = -\frac{1}{\alpha} \ln\left(1 + \sum_j e^{\alpha p_j + v_j}\right),$$

where j indexes brands, v_j is the brand-specific term in the consumer utility function, p_j is the price of brand j, and α is the absolute value of the sensitivity of consumer utility to price.[445]

[443] I also perform the same calculation for the other metrics of welfare reported in the affidavit, such as the transfer of welfare from producers to consumers and the change in consumer surplus.

[444] All welfare metrics in lowercase are per unit of quantity per month.

[445] See Train (2009), p. 55.

365. The firms' profits per unit of quantity are given by

$$\sum_k \pi_k = \sum_j (p_j - c_j)\, s_j,$$

where the sum is over all brands j, c_j is the marginal cost of brand j, and s_j is the unconditional share of brand j (i.e., share out of the total market size). That is, the profits per unit of quantity are given by the sum, across all brands, of the markup on that brand (i.e., the difference between the price and the marginal cost) times the brand's share.

The changes in the welfare post-merger are due to the changes in equilibrium prices p_j and the brand shares s_j.[446] The parameters of the model α and v_j are assumed to have the same values before and after the merger. I also assume that the firms' marginal costs c_j do not change.

366. The resulting expression for the deadweight loss per unit of quantity per month is:

$$dwl = -\frac{1}{\alpha}\ln\left(1 + \sum_j e^{\alpha p_j^{\text{post}} + v_j}\right) + \sum_j \left(p_j^{\text{post}} - c_j\right) s_j^{\text{post}} + \frac{1}{\alpha}\ln\left(1 + \sum_j e^{\alpha p_j^{\text{pre}} + v_j}\right) - \sum_k \left(p_j^{\text{pre}} - c_j\right) s_j^{\text{pre}}.$$

8.6.2. Market size

367. All the welfare metrics above are defined per unit of quantity. These units of quantity refer to the amount of mobile wireless service that consumers *may* consume, which is consistent with the interpretation of the market elasticity and the outside option that I articulated in Section 6.2.

368. The market elasticity that I consider reflects not only the possibility that consumer may cancel their wireless service in response to a price increase, but also that they reduce their consumption of wireless services.[447] Accordingly

[446] Note that these are not the shares conditional of choosing one of the brands, $s_{j|\text{in}}$, that I calculate based on gross adds. Accordingly, they add up to $(1 - s_0)$ and not to 1. Thus, it is possible for the sum of these shares to decline after the merger if more consumers elect to choose the outside option.

[447] Section 6.2.4.

the possibility of choosing the outside option in the model reflects not only the possibility of not using a mobile phone at all but also of not using it as often.[448] Consistent with this interpretation, more consumers would choose the outside option if they want to reduce their consumption of mobile wireless services in response to a price increase. Conversely, fewer consumers would choose the outside option, if they want to increase their consumption of mobile wireless services. These adjustments could take the form of subscribing to fewer or additional phone lines, subscribing to plans with less or more generous data allocations, or risking a charge for going over an allocation.

369. The formulas for the welfare metrics presented above incorporate this notion of consumption. For example, the profits per unit of quantity are defined not in terms of the shares conditional on buying a brand—which sum to 1—but in terms of the shares of the total quantity—which sum up to $(1 - s_0)$ because the remainder is the share of the outside option. Thus, if consumers decided to consume more at the same prices, then some share of consumption would switch from the outside option to the inside brands, and profits would increase.[449]

370. A measure of total market size therefore needs to consider both the amount of mobile wireless services currently consumed ("inside brands" market size) and the service which could be consumed ("outside option" size). Formally, market size Q_p of province p is then given by:

$$Q_p = Q_{\text{inside brands},\, p} + Q_{\text{outside option},\, p}.$$

Since $\frac{Q_{\text{outside option},\, p}}{Q_{\text{inside brands},\, p}} = \frac{s_{\text{out},\, p}}{1 - s_{\text{out},}}$, the equation above can be rewritten as:

$$Q_p = Q_{\text{inside brands},\, p}\left(1 + \frac{s_{\text{out},\, p}}{1 - s_{\text{out},\, p}}\right) = \frac{Q_{\text{inside brands},\, p}}{1 - s_{\text{out},\, p}}.$$

As explained in Section 6.2.4, I calculate prices based on ARPU, which is the average revenue per user per month and reflects the phone usage of the average consumer of that brand. Thus, in the model, units of quantity are already normalized to the usage

[448] Section 6.2.4.

[449] Similarly, the derivation of consumer surplus includes the possibility that, instead of buying an additional unit of phone service, the consumer chooses the outside option.

of an average user. Accordingly, I approximate the market size of the inside brands with the total number of consumer phone subscribers on these brands. Specifically:

$$Q_p = \frac{Number\ of\ consumer\ phone\ subscribers_p}{1 - s_{\text{out},\,p}},$$

where the $Number\ of\ consumer\ phone\ subscribers_p$ is calculated from the produced data as the average number of phone consumer subscribers in January – April 2021, and the $s_{\text{out},\,p}$ is the outside share calibrated in the model.[450]

8.6.3. Annualization

371. In order to convert the monthly deadweight loss values obtained from the model to annualized values, I multiply them by 12. The model takes as inputs the prices (i.e. ARPU) and the marginal costs which are monthly values. Thus, any dollar amount calculated within the model, including welfare, is also monthly. However, a consumer who made a plan choice and incurred a surplus loss due to higher prices post-merger does not only incur that loss in the first month; she continues to do so in subsequent months. Similarly, a firm collecting higher plan prices due to the merger does so in every month.

372. In addition, welfare losses and price increases are predicted by the model assuming that the merger is a permanent shock. Thus, welfare losses and price increases are assumed to remain in place indefinitely. This means that, eventually, consumers will incur a welfare loss as their contracts expire or as they go to market looking for new and better plans that they no longer find, and that these harms will persist indefinitely relative to the scenario in which the merger never takes place. [redacted][451] The annualized deadweight loss value thus represents the long-term welfare loss that the merger is predicted to have on average per year after all consumers shop for new plans or have the terms of their plans updated.

[450] See Workpaper 8.6.2 for the number of subscribers, outside option share, and the market size for the 8-brand and 11-brand model.

[451] See, for example, ROG00436005; ROG00436006, at pp. 6-8; ROG00436610.

8.7. Supplemental exhibits

Exhibit 35
Brand-Level Percentage of Consumer Subscribers to Consumer Phone Service: January – April 2021

[redacted]

Source: [redacted]

Note: For each province, a brand's subscriber share is calculated as that brand's subscriber count divided by the to [redacted] See Appendix 8.3 for additional information on how I calculated subcriber counts from produced data. The share of "Other" brands is estimated using CRTC data from 2020. In particular, the ratio of "Other" subscribers to the named subscribers is assumed to be the same as the ratio of respective shares in the CRTC data.

Exhibit 36
Data Inputs and Calibrated Values for the 8-brand Model

[redacted]

Source: [redacted] Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The model is calibrated using market elasticities of [redacted] in Alberta, [redacted] in British Columbia, and [redacted] in Ontario. See Appendices 8.1 and 8.3 for the calibration procedure, and additional information on the data inputs.

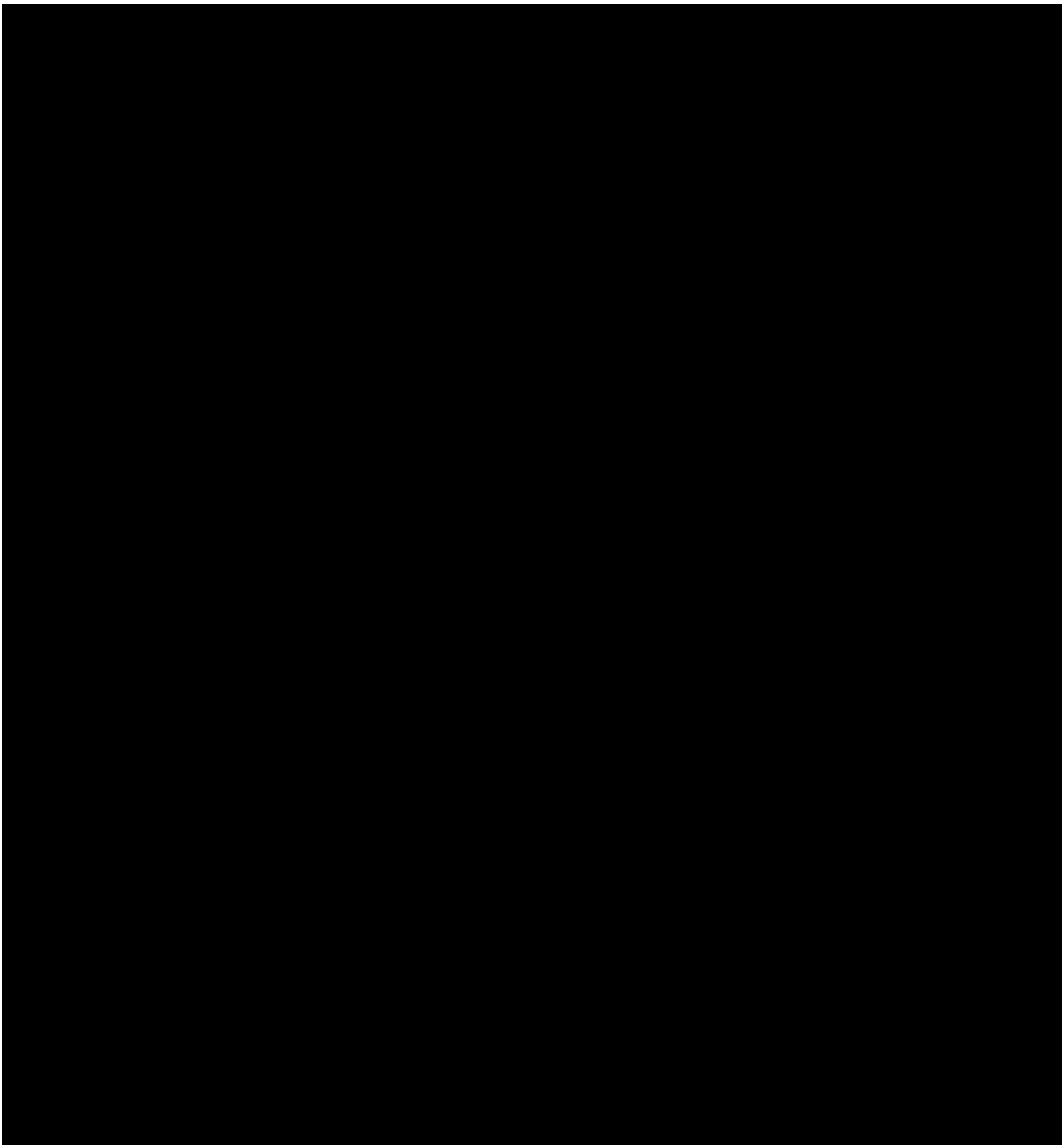
Exhibit 37
Data Inputs and Calibrated Values for the 11-brand Model

[redacted]

Source: [redacted] Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: This analysis uses data ranging from January 2021 through April 2021. The 11-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile, as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. The model is calibrated using market elasticities of [redacted] in Alberta, [redacted] in British Columbia, and [redacted] in Ontario. See Appendices 8.1 and 8.3 for the calibration procedure, and additional information on the data inputs.

Exhibit 38
Percent Price Increases Predicted by the Model



Source: Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: This analysis uses data ranging from January 2021 through April 2021. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using market elasticities of in Alberta, in British Columbia, and in Ontario. See Appendices 8.1 and 8.3 for the calibration and simulation procedures, and additional information on the data inputs.

Exhibit 39
Changes in Shares Predicted by the Model

[redacted]

Source: [redacted] Rogers Communications Inc., 2020 Annual Report; Shaw Communications Inc., 2020 Annual Report

Note: This analysis uses data ranging from January 2021 through April 2021. Unconditional market shares are reported. The 8-brand model includes Rogers Wireless, Fido, Chatr, Freedom, Shaw Mobile, Bell Mobility, Virgin Mobile, Telus Mobility, and Koodo Mobile. The 11-brand model includes those brands as well as the prepaid brands: Chatr, Lucky Mobile, and Public Mobile. Both models are calibrated using market elasticities of [redacted] in Alberta, [redacted] in British Columbia, and [redacted] in Ontario. See Appendices 8.1 and 8.3 for the calibration and simulation procedures, and additional information on the data inputs.

Nathan H. Miller

Georgetown University
McDonough School of Business
37th and O Streets, NW
Washington, DC 20057

Work: (510) 735-6411
nhm27@georgetown.edu
www.nathanhmiller.org
Updated August 2022

Current Positions

Professor, Georgetown University, 2022–
McDonough School of Business (primary)
Department of Economics (secondary)
Senior Policy Scholar, Georgetown Center for Business and Public Policy, 2017–

Previous Positions

Georgetown University
Provost's Distinguished Associate Professor, 2021-2022
Saleh Romeih Associate Professor, McDonough School of Business, 2019-2022
Affiliated Professor, Economics Department, 2019-2022
Associate Professor, McDonough School of Business, 2017-2022
Assistant Professor, McDonough School of Business, 2013-2017

Other Positions
Visiting Professor, Toulouse School of Economics, 2019-2020
Economist, Department of Justice Antitrust Division, 2008-2013

Degrees

Ph.D., Economics, University of California at Berkeley, 2008.
B.A., Economics and History, University of Virginia, 2000.

Refereed Publications

"Oligopolistic Price Leadership and Mergers: The United States Beer Industry" (with Gloria Sheu and Matthew Weinberg). *American Economic Review*, Vol. 111, No. 10, 3123-3159 (2021).

"Finding Mr. Schumpeter: Technology Adoption in the Cement Industry" (with Jeffrey Macher and Matthew Osborne). *RAND Journal of Economics*, Vol 52, No. 1, 78-99 (2021).

"Forward Contracts, Market Structure, and the Welfare Effects of Mergers" (with Joseph Podwol). *Journal of Industrial Economics*, Vol. 68, No. 2, 364-407 (2020).

"Understanding the Price Effects of the MillerCoors Joint Venture" (with Matthew Weinberg). *Econometrica*, Vol. 85, No. 6, 1763-1791 (2017).

"Pass-Through in a Concentrated Industry: Empirical Evidence and Regulatory Implications" (with Matthew Osborne and Gloria Sheu). *RAND Journal of Economics*, Vol. 48, No. 1, 69-93 (2017).

"Upward Pricing Pressure as a Predictor of Merger Price Effects" (with Marc Remer, Conor Ryan and Gloria Sheu). *International Journal of Industrial Organization*, Vol. 52, 216-247 (2017).

"Pass-Through and the Prediction of Merger Price Effects" (with Marc Remer, Conor Ryan and Gloria Sheu). *Journal of Industrial Economics*, Vol. 64, December, 684-709 (2016).

"Spatial Differentiation and Price Discrimination in the Cement Industry: Evidence from a Structural Model" (with Matthew Osborne), *RAND Journal of Economics*, Vol. 45, No. 2, 221-247 (2014, lead article).

"Modeling the Effects of Mergers in Procurement," *International Journal of Industrial Organization*, Vol. 37, November, 201-208 (2014).

"Automakers' Short-Run Responses to Changing Gasoline Prices" (with Ashley Langer), *Review of Economics and Statistics*, Vol. 95, No. 4, 1198-1211 (2013).

"Why Do Borrowers Pledge Collateral? New Empirical Evidence on the Role of Asymmetric Information" (with Allen Berger, Marco Espinosa-Vega, and Scott Frame), *Journal of Financial Intermediation*, Vol. 20, No. 1, 55-70 (2011).

"Strategic Leniency and Cartel Enforcement," *American Economic Review*, Vol. 99, No. 3, 750-768 (2009).

"Debt Maturity, Risk, and Asymmetric Information" (with Allen Berger, Marco Espinosa-Vega, and Scott Frame), *Journal of Finance*, Vol. 60, No. 6, 2895-2923 (2005).

"Does Functional Form Follow Organizational Form? Evidence from the Lending Practices of Large and Small Banks" (with Allen Berger, Mitchell Petersen, Raghuram Rajan, and Jeremy Stein), *Journal of Financial Economics*, Vol. 76, No. 2, 237-269 (2005, lead article).

"Credit Scoring and the Availability, Price, and Risk of Small Business Credit" (with Allen Berger and Scott Frame), *Journal of Money, Banking, and Credit*, Vol 37, No. 2, 191-222 (2005, lead article).

Shorter Refereed Articles

"On the Misuse of Regressions of Price on the HHI in Merger Review" (with Steven Berry, Fiona Scott Morton, Jonathan Baker, Timothy Bresnahan, Martin Gaynor, Richard Gilbert, George Hay, Ginger Jin, Bruce Kobayashi, Francine Lafontaine, James Levinsohn, Leslie Marx, John Mayo, Aviv Nevo, Ariel Pakes, Nancy Rose, Daniel Rubinfeld, Steven Salop, Marius Schwartz, Katja Seim, Carl Shapiro, Howard Shelanski, David Sibley, and Andrew Sweeting), *Journal of Antitrust Enforcement*, Vol. 10, No. 2, 249-259 (2022).

"Bias in Reduced-Form Estimates of Pass-Through" (with Alexander MacKay, Marc Remer and Gloria Sheu), *Economics Letters*, Vol. 123, No. 2, 200-202 (2014).

"Consistency and Asymptotic Normality for Equilibrium Models with Partially Observed Outcome Variables" (with Matthew Osborne), *Economics Letters*, Vol. 123, No. 1, 70-74 (2014).

"Using Cost Pass-Through to Calibrate Demand" (with Marc Remer and Gloria Sheu), *Economics Letters*, Vol. 118, No. 3, 451-454 (2013).

"The Entry Incentives of Complementary Producers: A Simple Model with Implications for Antitrust Policy" (with Juan Lleras), *Economics Letters*, Vol. 110, No. 2, 147-150 (2011).

Book Chapters and Non-Refereed Publications

"Quantitative Methods for Evaluating the Unilateral Effects of Mergers" (with Gloria Sheu), *Review of Industrial Organization*, Vol. 58, No. 1, 143-177 (2021). Special Issue: The 2010 Horizontal Merger Guidelines after Ten Years.

"How the MillerCoors Joint Venture Changed Competition in U.S. Brewing" (with Matthew Weinberg), *Microeconomic Insights*, 2017.

"Ex Post Merger Evaluation: How Does It Help Ex Ante?" (with Daniel Hosken and Matthew Weinberg), *Journal of European Competition Law & Practice*, 2016.

"Choosing Appropriate Control Groups in Merger Evaluations" (with Aditi Mehta), in More Pros and Cons of Merger Control, Konkurrensverket 2012.

Working Papers and Research Projects

"Estimating Models of Supply and Demand: Instruments and Covariance Restrictions" (with Alexander MacKay), 2022.

"Mergers, Entry, and Consumer Welfare" (with Peter Caradonna and Gloria Sheu), 2021.

"Rising Markups and the Role of Consumer Preferences" (with Hendrik Döpper, Alex MacKay, and Joel Stiebale), 2022.

"The Evolution of Concentration and Markups in the Cement Industry" (with Matthew Osborne, Gloria Sheu and Gretchen Sileo), 2022.

"Buyer Power in the Beef Packing Industry" (with Francisco Garrido, Minji Kim and Matthew Weinberg), 2022.

"The Curious Case of the Canned Tuna Cartel" (with Minhae Kim, Ryan Mansley, Marc Remer, and Matthew Weinberg), 2021.

"An Empirical Study of Inmate Telecommunication Services Procurement" (with Marleen Marra and Gretchen Sileo), in progress.

"An Empirical Study of the Reynolds/Lorillard Merger" (with Kenneth Rios and Ted Rosenbaum), in progress.

"Modeling the Effects of Mergers in Procurement: Addendum," SSRN Working Paper, 2017.

"Cumulative Innovation and Competition Policy" (with Alexander Raskovich), EAG Discussion Paper 10-5, 2010.

"Competition when Consumers Value Firm Scope," EAG Discussion Paper 8-7, 2008.

Grants and Awards

Robert F. Lanzillotti Prize for Best Paper in Antitrust Economics, 2022
Rising Markups and the Role of Consumer Preferences
Jerry S. Cohen Award for Best Antitrust Article on Merger Retrospectives, 2022
Oligopolistic Price Leadership and Mergers: The United States Beer Industry
Washington Center for Equitable Growth Grant, AWD-7774872, $75,278, 2021-2022
Buyer Power in the Beef Packing Industry
Concurrences Antitrust Award: Best Academic Economics Article, 2021
Mergers, Entry, and Consumer Welfare
National Science Foundation Grant, SES 2117197, $59,436, 2021-2022
An Empirical Study of Inmate Telecommunication Services
Washington Center for Equitable Growth Grant, AWD-7774249, $51,750, 2020-2021
The Evolution of Market Power in the Cement Industry
National Science Foundation Grant, SES 1824318, $88,635, 2018-2020
Market Power in Differentiated Products Industries
Association of Competition Economics Best Paper Award, 2017
Understanding the Price Effects of the MillerCoors Joint Venture
Robert F. Lanzillotti Prize for Best Paper in Antitrust Economics, 2015
Understanding the Price Effects of the MillerCoors Joint Venture
Assistant Attorney General's Award of Distinction, AT&T/T-Mobile merger, 2013
Jerry S. Cohen Award for Antitrust Scholarship, Honorary Mention, 2009
Strategic Leniency and Cartel Enforcement
COMPASS Prize for Best Paper in Antitrust Economics by Graduate Students, 2007
Strategic Leniency and Cartel Enforcement
UC Berkeley Dean's Normative Time Fellowship, 2006-2007
UC Berkeley Competition Policy Center Dissertation Award, 2006
UC Berkeley Institute of Business and Economic Research Mini-Grant, 2006

Invited Seminar Presentations

2008: DOJ; Duke University; FTC; George Washington University; Johns Hopkins University; University of Iowa; University of North Carolina, Chapel Hill

2009: BEA; BLS; College of William and Mary; Georgetown University

2010: University of British Columbia

2011: University of Virginia

2012: DOJ; Michigan State University

2013: DOJ; Drexel University; Georgetown University; Stony Brook University

2014: DOJ; University of California, Berkeley; UCLA; University of Virginia

2015: Clemson University; FTC; Indiana University; University of Colorado, Boulder; Yale University

2016: Boston College; Columbia University; Federal Reserve Board; Harvard University; London School of Economics; University of British Columbia; University of Texas, Austin; University of Toronto

2017: FTC; University of Kentucky; University of Pennsylvania; University of Wisconsin–Madison
2018: FTC; MIT; Texas A&M; Penn State University; University of Maryland
2019: Harvard University; Toulouse School of Economics; MINES ParisTech; KU Leuven; University of Mannheim; Berlin Applied Economics
2020: Research Institute of Industrial Economics (RIFN); Sciences Po; University of Düsseldorf (DICE); Directorate-General for Competition of the European Commission (DG COMP); Hong Kong University of Science and Technology
2021: CBO, Washington University at St. Louis; George Mason University; Joint DOJ/FTC; West Virginia University; FTC; University of Maryland
2022: University of California, Berkeley; University of Pennsylvania; University of Virginia; Iowa State University; Indiana University; University of Delaware; University of Michigan (scheduled); University of North Carolina (scheduled); University of Connecticut (scheduled)

Conference Presentations

APIOS (2018); Association of Competition Economics (2018, 2022 scheduled); Barcelona GSE Summer Forum (2018); DC IO Day (2020); EARIE (2019); ESEM (2019); FTC Microeconomics (2010, 2014, 2021); Hal White Antitrust (2013, 2014, 2017, 2019); IEF Applied Microeconomics (2016); IIOC (2008, 2009, 2013, 2015, 2016, 2018, 2022); NASMES (2019); SEA (2013, 2018); Searle Antitrust (2013, 2015, 2022 scheduled); Triangle Microeconomics (2016)

Conference Discussions

AEA (2015); DC IO Day (2015); Toulouse Digital Economics Conference (2020); HEC Montreal–RIIB Conference on IO (2018); IIOC (2008, 2009, 2013, 2015, 2016, 2018, 2021, 2022); NY IO Day (2020); RIDGE IO (2021); SEA (2013, 2018); Searle Antitrust (2018); WCEG (2020)

Panels

"Upward Pricing Pressure and Simulation in Merger Review," Economists' Roundtable with the Canadian Competition Bureau, 2017.

"Institutional Shareholdings: Is There an Antitrust Issue?" Concurrences Global Antitrust Conference, 2018.

"Digital Mergers: Need for Reform?" Concurrences International Mergers Conference, 2020.

"Making Competition Work: Promoting Competition in Labor Markets," Joint Hearings of the Department of Justice and Federal Trade Commission, 2021.

"Reforming America's Food Retail Markets," Yale University, 2022.

"Amendments to the Competition Act," Canadian Economic Association Meetings, 2022.

Teaching

Firm Analysis and Strategy, MBA Core Curriculum
Industrial Organization, PhD Economics
Strategic Pricing, MBA Elective
Microeconomics, Executive Education
Causal Inference, MSBA Core Curriculum

Ph.D Advising and Dissertation Committees

Georgetown University
Francisco Garrido (co-chair), 2020, ITAM
Yanyang Wang (committee), 2021, Amazon Web Services
Peter Caradonna (committee), 2022, California Institute of Technology

Service

Georgetown University
Research Executive Committee, 2021-
MSB Graduate Curriculum and Standards Committee: 2013-2019, 2021

Other Service
Editor, *Journal of Law and Economics*, 2021–
Associate Editor, *International Journal of Industrial Organization*, 2022–
Editorial Board, *Review of Industrial Organization*, 2019-present
DC IO Day: Program Committee 2015-2019, Organizer 2017
IIOC: Program Committee, 2019-2021

Referee reports for:

American Economic Journal; American Economic Review; Econometrica; European Economic Review; International Journal of Industrial Organization; Journal of Economics & Management Strategy; Journal of the European Economics Association; Journal of Finance; Journal of Industrial Economics; Journal of Law and Economics; Journal of Political Economy; Management Science; National Science Foundation; *The RAND Journal of Economics; Review of Economic Studies; Review of Economics and Statistics; Review of Industrial Organization; Quarterly Journal of Economics,* others.

CT-2022-002

Exhibit C

THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S.C. 1985, c. C-34;

AND IN THE MATTER OF the proposed acquisition by Rogers Communications Inc. of Shaw Communications Inc.;

AND IN THE MATTER OF an application by the Commissioner of Competition for one or more orders pursuant to section 92 of the *Competition Act*.

B E T W E E N :

COMMISSIONER OF COMPETITION

Applicant

- and -

ROGERS COMMUNICATIONS INC. AND SHAW COMMUNICATIONS INC.

Respondents

- and -

ATTORNEY GENERAL OF ALBERTA AND VIDEOTRON LTD.

Intervenors

ACKNOWLEDGEMENT OF EXPERT WITNESS

NATHAN H. MILLER

I, Nathan H. Miller, acknowledge that I will comply with the Competition Tribunal's code of conduct for expert witnesses which is described below:

1. An expert witness who provides a report for use as evidence has duty to assist the Tribunal impartially on matters relevant to his or her area of expertise.

2. This duty overrides any duty to a party to the proceeding, including to person retaining the expert witness. An expert is to be independent and objective. An expert is not an advocate for a party.

September 21, 2022

Date

Nathan H. Miller

EXHIBIT D TO THE WITNESS STATEMENT OF NATHAN H. MILLER
SOURCES AND DOCUMENTS RELIED UPON

Sources and documents relied upon in the Miller Report are those referenced in the report, appendices, workpapers, and other supporting materials.

The data and documents relied upon also include records from the following sets of materials provided by the Competition Bureau:

1. Records and written returns of information provided in the merger notification filings and request for advance ruling certificate by Rogers Communications Inc. ("Rogers") and Shaw Communications Inc. ("Shaw"), including related email exchanges;
2. Records and written returns of information provided in response to Supplementary Information Requests, made pursuant to subsection 114(2) of the Competition Act, by Rogers and Shaw, including related email exchanges;
3. Records, written returns of information, oral examination responses, and undertaking responses provided as part of discovery by Rogers and Shaw, including related email exchanges;
4. Records, written returns of information, oral examination responses, and undertaking responses provided as part of discovery by Quebecor Inc./Videotron Ltd. ("Videotron");
5. Letters from counsel to Rogers, Shaw, and Videotron to the Commissioner of Competition regarding proposed remedies;
6. Records and written returns of information provided in response to orders made pursuant to section 11 of the Competition Act, from BCE Inc. and TELUS Corporation, including related email exchanges;
7. Freedom Mobile Confidential Information Memorandum, February 2022;
8. Witness statement of Christopher Hickey (Distributel Communications Limited), September 21, 2022;
9. Videotron, "Annual Information Form," March 30, 2021;
10. Videotron, "3500 MHz Auction: Another Step Towards Expansion Outside Quebec," July 30, 2021;
11. Records and written returns of information provided in the request for advance ruling certificate by Videotron and Shaw, including related email exchanges; and

12. The August 12, 2022 Share Purchase Agreement between Rogers, Shaw, and Videotron, and associated schedules including General Tariffs filed with the CRTC.