PUBLIC

CT-2022-002

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 –

THE ATTORNEY GENERAL OF ALBERTA AND VIDEOTRON LTD.

Intervenors

AFFIDAVIT OF MARK A. ISRAEL

I, Mark Israel, of the County of Montgomery, in the State of Maryland, in the United States of America, make oath and say:

1. I am a Senior Managing Director at Compass Lexecon, an economic consulting firm where I have worked since 2006. From 2000 to 2006, I served as a full-time member of the faculty at Kellogg School of Management at Northwestern University in Illinois. I am an economist by training and by profession. I received my Ph.D. from Stanford University in 2001.

2. I specialize in the economics of industrial organization—which is the study of competition in imperfectly competitive markets, including the study of antitrust and regulatory issues—as well as applied econometrics. I have been involved in the wireless industry throughout my career, have been among the lead economists on many of the recent wireless telecommunications transactions of significance in North America, and have submitted testimony related to the wireless industry before courts, tribunals, and regulatory bodies on many occasions.

3. I have been retained by Lax O'Sullivan Lisus Gottlieb LLP, counsel to the Respondent Rogers Communications Inc. ("Rogers"), to provide my expert opinion regarding the competitive effects resulting from the acquisition by Rogers of certain assets of Shaw Communications Inc.

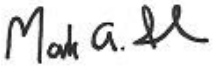
4. I attach my expert report in this matter setting out my opinion as Exhibit "A."

5. I attach my curriculum vitae as Exhibit "B."

6. I attach my Acknowledgement of Expert Witness as Exhibit "C."

7. I attach my Documents Relied Upon as Exhibit "D."

SWORN by Mark Israel, of the County of Montgomery, in the State of Maryland, in the United States of America, before me by videoconference on September 23, 2022, in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.



Commissioner for Taking Affidavits
(or as may be)

MATTHEW LAW

MARK ISRAEL

This is Exhibit "A" referred to in the Affidavit of Mark Israel sworn by Mark Israel, of the County of Montgomery, in the State of Maryland, in the United States of America, before me by videoconference on September 23, 2022 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.

Commissioner for Taking Affidavits (or as may be)

MATTHEW R. LAW

Table of Contents

I. INTRODUCTION AND SUMMARY OF OPINION

A. QUALIFICATIONS, TRANSACTION OVERVIEW, HIGH-LEVEL SUMMARY OF CONCLUSIONS, AND ASSIGNMENT

1. Qualifications

1. I am a Senior Managing Director at Compass Lexecon, an economic consulting firm where I have worked since 2006. From 2000 to 2006, I served as a full-time member of the faculty at Kellogg School of Management at Northwestern University in Illinois.

2. I am an economist by training and by profession. I have Bachelor's, Master's, and Doctoral degrees in economics. I received my B.A. from Illinois Wesleyan University in 1991, graduating summa cum laude. I received my M.S. from the University of Wisconsin-Madison in 1992. I received my Ph.D. from Stanford University in 2001.

3. I specialize in the economics of industrial organization—which is the study of competition in imperfectly competitive markets, including the study of antitrust and regulatory issues—as well as applied econometrics. At Kellogg and Stanford, I taught graduate-level courses covering topics including business strategy, industrial organization economics, and econometrics. My research on these topics has been published in leading peer-reviewed economics journals, including the American Economic Review, the Rand Journal of Economics, the Review of Industrial Organization, Information Economics and Policy, and the Journal of Competition Law and Economics.

4. My work at Compass Lexecon has focused on the application of economic theory and econometric methods to competitive analysis of the impact of mergers, antitrust and pricing issues including a wide variety of single-firm and multi-firm conduct, class certification, and

damages estimation. I have analyzed these competition issues on behalf of a wide range of clients, including private companies and government entities.

5. I have particular interest, experience, and expertise in applying economic analysis to issues involving competition and regulation in telecommunications. I have been involved in the wireless industry throughout my career, have been among the lead economists on many of the recent wireless telecommunications transactions of significance in North America, and have submitted testimony related to the wireless industry before courts, tribunals, and regulatory bodies on many occasions.

6. I have testified in federal courts and multiple state courts in the U.S., and in many regulatory and arbitration proceedings in the U.S. and around the world, including Canada. I have testified repeatedly before the U.S. Federal Communications Commission, which regulates international and interstate communications in the U.S. by, among other things, radio. I have also presented my findings to the Department of Justice and the Federal Trade Commission on dozens of occasions. In addition, I have submitted expert reports, declarations, and affidavits to government agencies and federal and state/provincial courts on a number of occasions over the years, including in the Ontario Superior Court of Justice and the Supreme Court of British Columbia.

7. My *curriculum vitae* is attached as Exhibit "B."

2. Transaction overview

8. Rogers Communications Inc. ("Rogers") is proposing to acquire Shaw Communications Inc. ("Shaw"). As part of that transaction, and prior to its closing, Rogers has agreed to sell all of Shaw's wireless network assets and the Freedom Mobile ("Freedom") brand and subscribers

to Quebecor ("divestiture"), which means that the Freedom wireless assets will remain separate from Rogers, and in the hands of a competitive entity, just as they are today.[1] I henceforth refer to the acquisition after the divestiture as the "transaction."

3. High-level summary of conclusions

9. Quebecor's and Freedom's wireless service areas currently have only very minimal overlap.[2] With the exception of this minor overlap, the transaction will not reduce the number of wireless competitors operating in any area of Canada.

10. As part of the divestiture, Rogers has agreed to take several steps in order to facilitate a smooth transition of Shaw's wireless business to Quebecor. Moreover, Freedom will have a large network relative to its number of subscribers after Shaw Mobile subscribers move to Rogers, creating substantial excess capacity, and it will realize marginal cost savings in its provision of wireless services. For these reasons, the transaction will make Freedom a more effective and aggressive competitor than it would have been absent the transaction.

11. Therefore, I conclude that the transaction will result in no harm to competition in any market for wireless telecommunications services in Canada—and, critically, as detailed in the

---

1 *See* VID00296438 (Share Purchase Agreement, August 12, 2022, hereafter "SPA"), Article 2.2 "Excluded Assets". The divestiture does not include the Shaw Mobile brand and subscribers.

2 The only area of overlap is in Eastern Ontario (mainly in Ottawa), where Freedom and Videotron each operate relatively small wireless network facilities (which are much smaller than those of Bell, Telus, and Rogers). Since Videotron's wireless market share in Ontario is [redacted] in July 2021 (Prof. Miller's backup materials, "[redacted] the transaction will only result in minimal loss of competition. Moreover, combining these two companies' networks in Ottawa is likely to have benefits, as is typically the case when wireless networks are combined. I do not account for the positive or negative welfare effects of this overlap in my welfare calculations (the only exception is in productive efficiencies, as I explain below).

remainder of the report, certainly no harm to competition that has been quantified in any reliable way. In contrast, the transaction will result in substantial efficiencies of a variety of forms, detailed below. Therefore, on net, the transaction is clearly pro-competitive, and blocking it would harm Canadian consumers and the Canadian economy as a whole.

12. In the Bureau's Section 104 application, the Bureau filed a Report by an economic expert, Prof. Miller,[3] who analyzed the competitive effects of the transaction without a divestiture, as well as a transaction with a divestiture of Freedom.[4] Prof. Miller reached a different conclusion from mine, finding harm to competition in wireless telecommunications markets in Canada, even with the divestiture. I explain in this report why that difference in conclusions is due to fundamentally flawed methods used by Prof. Miller, and I show that the marginal cost savings and productive efficiencies that the transaction will generate[5] would outweigh any adverse effect from the transaction (even if there were any).

4. Assignment

13. As reflected in the overall summary of conclusions above, I have been retained by counsel to Rogers to opine on the competitive effects of the transaction. In particular, I was asked to analyze whether the transaction *with the divestiture* raises unilateral or coordinated effects concerns,[6] and I have been asked to evaluate marginal cost savings that affect pricing and

---

3 Affidavit of Nathan H. Miller (Affirmed May 6, 2022) ("Miller Report").

4 Prof. Miller analyzed a divestiture of Freedom to [redacted] which was the proposed divestiture at the time of his report submission. However, most of his report does not depend on the identity of Freedom's acquirer.

5 I understand that marginal cost savings and the value of quality improvements are cognizable under section 92 of the Competition Act, and moreover the value of quality improvements could be calculated differently as a dynamic efficiency under section 96 of the Competition Act.

6 I explain these terms later in my report.

output in this industry. I was also asked to assess the analyses presented by Prof. Miller in his Report.

14. Compass Lexecon is paid for my work at my standard hourly fee. Neither my compensation nor Compass Lexecon's is contingent in any way on the outcome of this proceeding.

B. EXECUTIVE SUMMARY

15. As explained above, my fundamental conclusion is that the proposed transaction will not harm competition in any properly defined market in Canada; instead, the transaction will create marginal cost savings and productive efficiencies that will enhance competition and benefit the Canadian consumers and the Canadian economy as a whole. I support this conclusion with the following more detailed findings:

Prof. Miller improperly calculates and vastly overstates adverse unilateral effects resulting from the transaction

- The merger simulation model Prof. Miller uses to quantify the welfare effects of the transaction focuses on the transfer of Shaw Mobile subscribers from Shaw to Rogers. Yet, it only looks at Shaw Mobile's competition in the *wireless industry*, ignoring the fact that Shaw Mobile is [redacted] This means that Prof. Miller's model is missing a key part of the relevant competitive dynamics that determine the effect of the transaction—the interplay between the wireline and wireless industry, the incentives arising from the fact that Shaw Mobile is sold as part of a bundle with wireline

services, the associated wireline efficiencies, and so on. As a result, Prof. Miller's model cannot reliably predict or quantify the effects of the transaction. Said differently, a *wireless only* model cannot reliably measure any effects of the transfer of subscribers buying a *wireline-wireless bundle* from one firm to another. (Section III.B.1)

- Prof. Miller's model also implicitly assumes that all the *assets* associated with Shaw Mobile service are transferred from Shaw to Rogers as part of the transaction, when in reality only *subscribers* are transferred. As a result, Prof. Miller incorrectly models an increase in concentration resulting from the transaction—by assuming that the assets required to compete become more concentrated when they do not—and therefore predicts adverse welfare effects that will not occur. Prof. Miller's model, if applied in an internally consistent way, implies that Shaw Mobile's subscribers will simply revert back to Quebecor after the transaction, avoiding any adverse effects that might otherwise have occurred. (Section III.B.2)
- Because Shaw Mobile is offered as a wireline-wireless bundle, like Telus Mobility and unlike Rogers in Alberta and British Columbia, the model over-represents the "closeness" between the "merging products," Shaw Mobile and Rogers. This follows because Shaw Mobile is likely a closer competitor to Telus than to Rogers because Telus offers a similar bundled product and Rogers does not. Hence, even had he used proper market shares (which he does not, see next point), Prof. Miller's model would still inflate adverse unilateral effects. (Section III.B.3).
- The logit model that Prof. Miller uses requires pre-merger market shares as an input. In the wireless industry, market share is measured by *share of subscribers* (SoS)—and logit

models also call for shares across all consumers—but Prof. Miller uses instead *share of gross adds* (SOGA) and treats it *as if* it were correctly measuring market share. This violates a key assumption of the model Prof. Miller uses—namely that, among the consumers who have chosen a given firm, there is no systematic difference in preferences between, on the one hand, a group that is actively shopping and considering whether to switch and, on the other hand, a group that is not considering such a choice. This renders his analysis unreliable: If the preferences of those who are considering whether to switch (*i.e.*, shoppers) are systematically different from those who are not considering such a choice, Prof. Miller needs a model that accounts for this, not a model that assumes it away. Within his model, SOGA is simply an inferior proxy for market share that is correctly computed with SoS. (Section III.C.1)

- Shaw Mobile's large SOGA numbers shortly after its launch capture the fact that Shaw Mobile was a new product. Prof. Miller inappropriately interprets this short-term SOGA to represent Shaw Mobile's long-term competitive significance, and in so doing, substantially overstates the increase in concentration following the transaction. The SOGA of a new product cannot serve as a reliable measure of its long-term competitive significance. (Section III.C.2)
- SOGA measures a firm's share of the existing wireless subscribers who decide to switch firms and new wireless consumers entering the market (a relatively small part of the total given the maturity of the wireless industry). It does not consider the significant majority of customers who remain with their current provider, including those who evaluate other firms (that is, "shop'), but decide to stay with their current firm. It therefore does not

measure the shares among "actively shopping" customers as Prof. Miller claims. This distorts the share calculations and likely inflates the SOGA of small firms like Shaw Mobile (because all those shoppers who stay at larger firms are excluded). This is an additional reason why using SOGA inflates the increase in concentration resulting from the transaction. (Section III.C.3)

- Gross add figures that are more recent than those used by Prof. Miller show that Shaw Mobile's [redacted] which directly contradicts the SOGA numbers Prof. Miller uses and confirms the inappropriateness of interpreting Shaw Mobile's SOGA as representing its competitive significance. (Section III.C.4)
- Simply replacing SOGA with SoS in Prof. Miller's 8-brand model, *without correcting any of the model's other errors or accounting for any marginal cost savings or productive efficiencies,* reduces the computed decline in consumer surplus due to the transaction by almost a third ([redacted] and reduces the computed decline in total surplus loss by almost a half ([redacted] (Section III.C.5)
- Prof. Miller's model also implies highly distorted margins and marginal costs. For Freedom, the implied marginal costs from his model are implausibly close to zero. Marginal costs are an important input for predicting the effects of a merger, so this also raises serious doubts about whether the model Prof. Miller uses is capable of predicting the effects of the transaction. (Section III.D)

The transaction will create substantial quantifiable savings

- The transaction will create substantial quantifiable marginal costs savings from Freedom's [redacted] roaming costs and lower [redacted]

[redacted][7] Fundamental economic teachings indicate that, given the characteristics of the wireless industry, lower marginal costs will be passed on to consumers in the form of lower priced plans or higher quality plans for the same price. (Section IV.A.1)

- The transaction will also create additional marginal costs savings that I am currently not able to quantify or incorporate into a merger simulation analysis.
    - First, while Prof. Miller raised concerns in his Report that [redacted] the current divestiture agreement substantially mitigates any such concerns, and, in fact, Rogers will benefit in Western Canada from its integration with Shaw's wireline assets.[8] These unquantified marginal cost savings are expected to further benefit competition in these provinces. (Section IV.A.2)
    - Second, the integration between Freedom and the 3.5 GHz spectrum held by Quebecor will have an immediate positive benefit on Freedom's costs and quality. I conservatively do not include these effects in my analysis because I do not currently have sufficient information to have a good basis for quantifying them precisely. This makes my analysis very conservative in the sense that it understates the welfare gains from the merger. (Section IV.A.3)

---

7 These marginal cost savings result from Freedom being under Quebecor's ownership and having access to its beneficial rates.

8 In particular, Rogers will gain integrated access to Shaw's wireline fiber backhaul network, which will allow it to replace its current microwave backhaul in Western Canada.

- The report of Mr. Harington in this proceeding identifies substantial wireless and wireline productive efficiencies from the transaction. Such productive efficiencies greatly exceed any possible harms from the transaction, which should not be surprising in light of the divestiture and the fact that there is no reduction in the number of competitors from the transaction (but only a shift of Shaw Mobile subscribers to Rogers). (Section IV.A.4)

Proper netting of unilateral effects, marginal cost savings, and productive efficiencies shows that the transaction will substantially increase welfare

- Merger simulation models, including the one used by Prof. Miller, allow balancing between the competitive harm from increased concentration and the competitive benefits from quantifiable marginal cost savings. Despite the fact that Prof. Miller's model significantly overstates the competitive harm from unilateral effects for the reasons explained above, productive efficiencies of [redacted] per year (as calculated by Mr. Harington) still substantially outweigh even the high end of the welfare losses that he calculates.
- When using the most recent market shares (as of March 2022) instead of SOGA from January – April of 2021; and when assuming reasonable (but still very conservative) marginal costs savings (but before accounting for productive efficiencies), [redacted] This range depends on the marginal cost savings scenario and the assumption made regarding Shaw Mobile assets that are transferred to Rogers: The low end of the range assumes the low end of the marginal cost

savings estimate and that all of Shaw Mobile's wireless assets are transferred to Rogers, and the high end of the range assumes the high end of the marginal cost savings estimate and that none of Shaw Mobile's wireless assets are transferred to Rogers. Welfare losses, if any, are *much* smaller than the productive efficiencies [redacted] implying the transaction is highly beneficial to Canadian consumers and the Canadian economy. (Section IV.B). These results are summarized in the table below:

[redacted]

	Consumer Surplus	Total [redacted]
[redacted]		

The transaction does not create any coordinated effects concerns, but rather makes the Canadian wireless telecommunications industry more competitive by reducing any scope for coordination[9]

- Current industry characteristics indicate the Canadian wireless industry is not conducive to coordination across firms. This will become increasingly so in the future due to ongoing industry disruptions, namely the rollout of 5G networks, as such market disruptions are known to undermine any scope for coordination among firms. (Section V.A)

[9] In this report I use the term "coordination" as a shorthand for tacit understandings among competing firms.

- It is improper to draw forward looking conclusions, as Prof. Miller does, from one isolated event from five years ago—the launch of Freedom's Big Gig plan. This launch reflected the unique circumstances of Freedom and its excess network capacity at the time, not current market conditions. (Section V.B.1)
- The transaction will leave Freedom with a much lower number of subscribers relative to its network size, providing it with substantial excess capacity and thus strong incentives to expand aggressively. In fact, Freedom's situation after the transaction bears resemblance to its situation when it launched its Big Gig plan. Hence, rather than create coordinated effects concerns, the transaction will reduce any scope for coordination and thus enhance competition in the Canadian wireless telecommunications industry. (Section V.B.2)
- There is no evidence that the transfer of Shaw Mobile to Rogers will increase the risk of coordinated effects. Prof. Miller's analysis in this context of the impact of Shaw Mobile's launch is incorrect: By misinterpreting market trends that occurred well before Shaw Mobile's launch, and mistakenly assuming they are the result of Shaw Mobile's launch, Prof. Miller reaches flawed conclusions that are entirely reversed once his errors are corrected. Additional qualitative evidence surrounding Shaw Mobile's launch—in particular the fact that it was launched [redacted] also does not support the idea that the transfer of Shaw Mobile subscribers from Shaw to Rogers will increase the risk of coordination or otherwise harm competition. (Section V.C)

II. INDUSTRY AND TRANSACTION BACKGROUND

A. INDUSTRY BACKGROUND

16. The Canadian wireless industry consists of three national carriers—Bell, Telus, and Rogers—and a handful of strong regional carriers with strong regional presences, including: Shaw in Ontario (ON), Alberta (AB), and British Columbia (BC); Videotron (owned by Quebecor) in Quebec and small parts of Eastern Ontario (mostly Ottawa); EastLink in Atlantic Canada; and SaskTel in Saskatchewan. While Bell and Telus compete for customers, they operate a shared wireless network, and thus there are only two national wireless networks in Canada—the Bell/Telus network and the Rogers network.[10] Each national provider offers multiple brands: a premium brand, and one or more lower-priced "flanker" brands.

17. Rogers offers four wireless brands throughout Canada: its premium Rogers Wireless brand;[11] Fido (a lower-priced flanker brand); Cityfone (an additional white-label business that is positioned as a flanker brand); and Chatr.[12] Rogers and Fido are predominantly postpaid brands but also offer prepaid SIM cards, while Chatr only offers prepaid service.[13]

18. Shaw's main wireless brand is Freedom, a mostly postpaid brand which has an average revenue per user ("ARPU") broadly on par with the flanker brands (*e.g.*, Fido) of the main

---

10 *See* "Bell and Telus team up to overhaul wireless network," CBC News, October 10, 2008, available at https://www.cbc.ca/news/technology/bell-and-telus-team-up-to-overhaul-wireless-network-1.709483.

11 The main brands of Rogers, Telus and Bell will be referred to as "premium" in this report.

12 Cityfone is very small and is not addressed in the Miller Report, so I do not discuss it further in this report.

13 Prepaid wireless service is mobile service for which credit is purchased in advance of service use, and users can top up their credit at any time. This is in contrast to postpaid wireless service, where a user enters into a contract and billing arrangement with a mobile phone operator.

carriers. Shaw's wireless network primarily serves the densely populated areas of AB, BC, and ON. Beyond its service footprint (but still within Canada), Shaw offers its Freedom customers the ability to roam on other carriers' networks without extra charges to them (but at an incremental cost for Shaw, paid to the roaming partner) for a limited number of voice minutes and a limited amount of data usage (depending on the plan).

19. On July 30, 2020, following [redacted] Shaw launched the postpaid Shaw Mobile brand in AB and BC (but, notably, not in ON, due to the lack of a Shaw wireline offering there), [redacted][14] Shaw Mobile's *standalone* prices are generally comparable to those charged by the major providers' premium brands, but it offers significantly cheaper plans to Shaw's *residential internet subscribers* as part of a bundle of services.[15] As a result, Shaw Mobile's subscribers almost exclusively purchase Shaw Mobile as a part of such a bundle of services that also includes *wireline* products (*i.e.*, internet and cable TV).[16] Shaw Mobile gained a substantial number of subscribers quickly following its launch, but its rate of subscriber acquisition has [redacted] since then. This is a common pattern following the launch of a new product.

---

14 I return to this issue in Section V.C.2V.C.2

15 *See* https://www.shawmobile.ca/en-CA.

16 Only approximately [redacted] of Shaw Mobile's subscribers in April 2022 do not purchase consumer wireline services from Shaw. *See* [redacted]

20. The other facilities-based (via their shared network) wireless providers in areas where Rogers and Shaw's wireless offerings overlap are Bell and Telus, both of which offer premium and flanker brands, as well as prepaid plans, just like Rogers.[17] As noted above, Bell and Telus share their wireless network, which gives them the benefit of substantial scale economies.[18] It also gives them a substantial advantage over Rogers in deploying a 5G network: Since their combined network carries roughly twice as many subscribes as Rogers, Bell and Telus can spread the fixed costs of 5G deployment over a much larger base of customers.

21. Quebecor is a telecom and media company based in Montreal, Quebec (QC). Its subsidiary, Videotron, provides telecommunications services, including mobile and wireline telecommunications, internet access, television, over-the-top video services, and business telecommunication solutions.[19] Videotron offers wireless services under the brands Videotron and Fizz, the latter of which is a prepaid flanker brand that is sold exclusively online.[20] Its wireless network covers parts of QC and the Ottawa metropolitan area in Eastern Ontario. In July 2021, Quebecor acquired 294 blocks of spectrum in the 3.5 GHz band in QC, southern and eastern ON, AB, BC, and Manitoba.[21] Through the current transaction, that spectrum would be

---

17 Additionally, Videotron provides wireless service in parts of Eastern Ontario, as mentioned above.

18 Bell and Telus also have the advantage of being the legacy telephone companies (*i.e.*, the ILECS). This permits them to install small cells from their own telephone wires, which are ubiquitous throughout the country. Other network operators (*i.e.*, legacy cable companies like Rogers, Shaw, and Videotron) do not have this advantage; instead, to install many small cells, they must pay to gain access to third party infrastructure (*i.e.*, the ILECs infrastructure).

19 Quebecor Annual Information Form – 2021, p.5-6, https://www.quebecor.com/documents/20143/223037/QI_Notice2021_EN.pdf/b927da2d-c1de-e8a6-9226-735bc605ed30?t=1648756160113 – (Quebecor AIF– 2021).

20 VID00379338, p. 7.

21 Quebecor AIF – 2021, p.28.

brought together with Shaw's wireless spectrum, an important competitive benefit to Freedom/Videotron going forward given the well-known economies of scale in spectrum deployment, described below.

B. THE TRANSACTION

22. On March 15, 2021, Rogers and Shaw announced that they had entered into an agreement under which Rogers would acquire Shaw in a transaction valued at approximately $26 billion.[22] As part of that transaction, and prior to its closing, Shaw will sell the Freedom brand, its subscriber contracts, and all of Shaw's wireless network assets to Quebecor.

23. Under Quebecor's ownership, and pursuant to the terms of the divestiture agreement, Freedom will benefit in the following ways:

- Freedom will continue to have access to the same spectrum as it has today, and *also* to the 3.5 GHz spectrum that Quebecor acquired in the most recent spectrum auction, as well as to Quebecor's spectrum holdings and tower assets in Eastern Ontario. Such spectrum combinations are known to generate substantial economies of scale.[23] In the

---

[22] Rogers Communications Inc. Press Release, "Rogers and Shaw Come Together in $26 billion transaction, creating new jobs and investment in Western Canada and accelerating Canada's 5G rollout", 15 March 2021.

[23] In the U.S., *see*, for example, the FCC Order in Sprint – T-Mobile merger: "[The merged company] will have far greater the network capacity than the standalone firms combined, which will give it the incentive to lower per-GB prices and expand output." (Para 5); "The combination of spectrum and other resources brought together as a result of the proposed transaction would give [the merged company] the capability to deploy a highly robust nationwide 5G network." (Para 236); "We agree with the Applicants that [the merged company] can put that spectrum to more productive use than the standalone companies, and that [the merged company] will be able to leverage the variety of spectrum at its disposal to deploy more spectrum per cell site to more cell sites throughout the network. We also agree with the Applicants that [the merged company] will have significantly lower marginal costs for providing advanced wireless services leading, as conditioned, to lower prices for consumers, and that the new network will have much faster speed

quantitative analysis later in this report, I conservatively exclude the benefits associated with the combination of Quebecor's and Freedom's spectrum holdings because I do not currently have sufficient information to quantifying them precisely, but there is no doubt that they are substantial, making my calculations highly conservative.

- [redacted] Moreover, Shaw has no such wireline network in ON, where almost [redacted] of Freedom's subscribers reside. [redacted] Shaw has no

and improved coverage. We fully anticipate the proposed transaction will result in a number of benefits in the deployment of a highly robust nationwide 5G network. In particular, we are persuaded that the [the merged company] network will have substantially increased coverage and capacity (and in turn, user speeds and cost structure) compared to the standalone companies." (Para. 236). Memorandum Opinion and Order, Declaratory Ruling, and Order of Proposed Modification, In the Matter of Applications of T-Mobile US, Inc., and Sprint Corporation for Consent to Assign or Transfer Control of Licenses and Authorizations, FCC, WT Docket No. 18-197, November 5, 2019 *available at* https://docs.fcc.gov/public/attachments/FCC-19-103A1.pdf. In Canada, Industry Canada recognizes that the cost savings and efficiency gains that can be realized through the use of spectrum sharing can enable more rapid deployment of next generation services to Canadians, including those in rural areas, and can also support investment and service innovation since next generation technologies require large amounts of spectrum. *See* Government of Canada, *Framework Relating to Transfers, Divisions and Subordinate Licensing of Spectrum Licenses for Commercial Mobile Spectrum*; June 28, 2013, available at https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10653.html.

[redacted] putting it in a stronger position in ON than it is today. In the quantitative analysis below, I exclude the marginal cost savings associated with these reductions in [redacted] since I do not have a precise estimate of what portion of the backhaul costs is marginal. Again, this makes my calculations conservative.

- [redacted][24] Hence, in all these ways, Freedom's roaming costs (like its backhaul costs) will fall due to the transaction. Notably, [redacted] are paid as subscribers [redacted] marginal costs. I account for these savings in my quantifications below.
- [redacted] on favorable terms and conditions. [redacted]

---

24 If Rogers pays third parties a roaming rate lower than $8.50 per GB, it must also provide this lower rate to Freedom.

25 Third Party Internet Access, or TPIA, refers to the provision of wholesale third-party internet access by firms with a wireline network to wireless companies without a wireline network, so the latter could offer a wireline-wireless bundle. *See* https://crtc.gc.ca/eng/archive/2013/2013-36.htmhttps://crtc.gc.ca/eng/archive/2013/2013-36.htm.

[redacted] further reducing any potential for harm to competition before even accounting for the transaction's substantial other benefits.

- [redacted] I account for these savings in my quantifications below.

III. PROF. MILLER'S UNILATERAL EFFECTS MODEL IS FLAWED AND USES INCORRECT INPUTS THAT DRAMATICALLY INFLATE HARM

24. Prof. Miller presents in his Report two different versions of merger simulation models:

- In Section 6, he presents a "4-3" model that analyzes the case in which Shaw is fully absorbed into Rogers in AB, BC, and ON, and hence the number of competitors in these provinces goes down from four—Bell, Telus, Rogers and Shaw—to just three—Bell, Telus, and Rogers. This simulation is not relevant to the transaction as actually proposed, which includes the divestiture. As such, I do not consider it further.
- In Section 7, he presents a "divestiture model" to account for a situation in which Freedom, along with all of Shaw's wireless assets, is fully divested to an entity not currently operating in AB, BC and ON, while Rogers is assumed to gain full ownership over Shaw Mobile. The model in Section 7 only shows an impact in AB and BC, since Shaw Mobile does not operate in ON. Given Rogers' agreement to sell Freedom to

[redacted] However, according to Quebecor, this category of savings is not expected to be substantial, so I ignore it for the remainder of this report.

Quebecor, this model is the only potentially relevant (although fundamentally flawed) one for the transaction, and therefore the model that I respond to in this report.

A. OVERVIEW OF PROF. MILLER'S MERGER SIMULATION MODEL

25. In Prof. Miller's model, Shaw Mobile (in its entirety) is assumed to move from being co-owned with Freedom to being co-owned with Rogers. Because Rogers has a larger market share than Freedom, this assumption results in increased concentration. Since the model does not account for *any* marginal cost savings or productive efficiencies—and since it does not account for any closeness of substitution other than that implied by shares—it *automatically* predicts welfare losses in any case where a product such as Shaw mobile is assumed to move from ownership by a smaller firm to ownership by a larger firm.[27]

26. In addition to ignoring marginal cost savings and productive efficiencies, Prof. Miller's welfare loss estimates are incorrect and inflated for several reasons explained below. Some of these reasons derive from the use of a flat logit with its flawed substitution patterns, and some of them derive from Prof. Miller's specific implementation of the model, including his complete omission of wireline competition issues despite the fact that Shaw Mobile is [redacted]

27. An important step in developing a merger simulation model is the choice of the demand system, which reflects how each competitor's sales quantity varies with its own price and its competitors' prices. Critically, the demand system and its parameters ultimately represent substitution patterns among consumers of the products at issue. The demand system must be

[27] *See* Prof. Miller's welfare results in Exhibit 23 of his Report.

flexible enough to accommodate observed substitution patterns, but tractable enough to allow estimation or calibration for use in the merger simulation model to predict post-merger prices.

28. The starting point for analyzing substitution patterns in mergers between producers of differentiated products is often the assumption of share-proportional diversion,[28] which means that diversion ratios are proportional to overall market shares (here, share of subscribers). For example, if there are three firms, A, B and C, and they serve 40%, 40%, and 20% of customers, respectively, then the model will assume that diversion from firm A to firm B is double the diversion from firm A to C (so, excluding consumers who are new to the market or who are leaving the market entirely, diversion is 66% and 33%, respectively). In reality, this proportionality assumption may or may not represent the observed diversion in the market. If it does not (that is, if some products are more similar to each other than they are to others, and thus have greater than proportional diversion to one another), this requires a more flexible model that can depart from the proportional diversion assumption.[29]

29. The first step in the simulation is calibration of the model. The model is a system of equations that are derived from consumers' and firms' optimization decisions.[30] To calibrate the model, one needs one "data point" to pin down each unknown parameter in the model. In this case, data points include observed prices, profit margins, market shares, aggregate elasticity, and

---

[28] Diversion from product A to product B is the fraction of those customers leaving product A following product A's price increase (or quality reduction) who will switch to product B.

[29] One example of such model is the nested logit model.

[30] A typical assumption for the type of competition in these models is "Bertrand" competition. This means that firms compete on prices—*i.e.*, choose the prices that maximize their profits given the prices of their competitors. In other words, it assumes a "Nash in prices equilibrium," in which each firm has a best response function holding fixed the prices of other firms. The equilibrium is the interaction of these best response functions. "Quantities" of the different firms—how many subscribers choose each—adjust according to the relative prices.

in a model that allows deviation from a flat logit assumption, also diversion ratios (a measure of the strength of substitution between brands). The model is calibrated by setting its parameters such that, when the market is simulated, each of the data points used in the calibration is matched.

30. Because a tractable model has a limited number of parameters, a model cannot always be set up to perfectly match every data point. The model is therefore calibrated to match as closely as possible the data points that are most important for predicting the effects of the merger—such as diversion ratios between the merging parties and their profit margins–even though this means other data points may not be matched as well. If there are more data points that the model is trying to match than there are parameters in the model, the model can be calibrated by choosing parameters that get "as close as possible" to matching those data points using some commonly used metric (such as minimizing squared distances). Notably, in the current case, the model only allows calibration to a single profit margin parameter (meaning the profit margin of one firm, such that the model's predicted margins for other firms may be far from reality, which would provide a strong signal that the model is not reliable).

31. More generally, while some deviation from key parameters may be tolerable, an important diagnostic is to check whether the model was able to get reasonably close for key parameters (*i.e.*, have "implied parameters" that are reasonably close to the actual values). If this is not the case, this shows that the model is not a good fit for the data and is unreliable.

32. After the model is calibrated, changes are made to account for the changes that result from the merger. These include a change in the ownership over the assets used to produce the products and introduction of marginal costs savings that yield lower marginal costs. The equations are then solved again to predict the post-merger equilibrium prices. Given the post-

merger prices, consumers make a new decision over their preferred products, and these choices determine the new market shares.

33. As I show in the next section, Prof. Miller's model fails on three key structural issues. I then show in Section III.C that Prof. Miller mistakenly uses the wrong inputs for shares, a key input of the model. In Section III.D, I show the model generates implausible parameters.

B. FLAWS IN PROF. MILLER'S MODEL

34. Prof. Miller's modeling approach embeds key assumptions that do not correspond to the reality in which the parties compete. Specifically:

- The merger simulation model Prof. Miller uses to quantify the welfare effects of the transaction focuses on the transfer of Shaw Mobile subscribers from Shaw to Rogers. Yet it only looks at Shaw Mobile's competition in the *wireless industry*, ignoring the fact that Shaw Mobile is [redacted] This means that Prof. Miller's model is missing a key part of the relevant competitive dynamics that determine the effect of the transaction—the interplay between the wireline and wireless industry, the incentives arising from the fact that Shaw Mobile is sold as part of a bundle with wireline services, the associated wireline efficiencies, and so on. As a result, Prof. Miller's model cannot reliably predict or quantify the effects of the transaction. Said differently, a *wireless only* model cannot reliably measure any effects of the transfer of subscribers buying a *wireline-wireless bundle* from one firm to another. (Section III.B.1)

- Prof. Miller's model also implicitly assumes that all the *assets* associated with Shaw Mobile service are transferred from Shaw to Rogers as part of the transaction, when in reality only *subscribers* are transferred. As a result, Prof. Miller incorrectly models an increase in concentration resulting from the transaction—by assuming that the assets required to compete become more concentrated when they do not—and therefore predicts adverse welfare effects that will not occur. Prof. Miller's model, if applied in an internally consistent way, implies that Shaw Mobile's subscribers will simply revert back to Quebecor after the transaction, avoiding any adverse effects that might otherwise have occurred. (Section III.B.2)
- Because Shaw Mobile is offered as a wireline-wireless bundle, like Telus Mobility and unlike Rogers in Alberta and British Columbia, the model over-represents the "closeness" between the "merging products," Shaw Mobile and Rogers. This follows because Shaw Mobile is likely [redacted] Hence, even had he used proper market shares, Prof. Miller's model would still inflate adverse unilateral effects. (Section III.B.3).

I describe these points in greater detail in the following sections.

1. Prof. Miller ignores wireline competition even though Shaw Mobile purchases are driven [redacted]

35. Shaw Mobile—whose ownership transfer is at the core of Prof. Miller's [redacted] By focusing exclusively on wireless competition, Prof. Miller's model does not capture the nature of this product. Therefore, his model is inherently ill-suited to the task at hand, which requires assessment of the

effect of acquisition by Rogers of a brand focused on wireline-wireless bundles. Indeed, as described above, since the lower price for Shaw Mobile occurs only when consumers purchase it as part of a bundle with wireline products, the relevant competitive questions for the proposed transaction necessarily involve wireline products and bundles. Yet, these are absent from Prof. Miller's model, meaning it cannot reliably assess any effects in such markets.

36. Compounding the problem for Prof. Miller's model, wireless switching costs are known to be generally lower than wireline switching costs, and households typically have a single wireline account (*e.g.*, one per household) but multiple wireless accounts (*e.g.*, one per individual). Therefore, the wireless component of a bundle is often an add-on to wireline service. In other words, if subscribers of a certain wireline service are interested in a bundle, they are much more likely to switch their wireless service to match their existing wireline service than the opposite.[31]

37. This implies that decisions to purchase wireline-wireless bundles are heavily driven by a customer's existing wireline service, and pricing of such bundles is also largely driven by wireline competition. Having ignored these key factors, Prof. Miller's model cannot reliably assess the competitive effects of the transaction; it is omitting the most important part of the competition. Further, as I show below, this particular omission biases Prof. Miller's results towards inflating the competitive effects because of what it misses about the closeness of substitution between various products.

[redacted]

2. Prof. Miller assumes wireless assets are being transferred to Rogers when they are not

38. Prof. Miller's merger simulation model also mischaracterizes the nature of the transaction by modeling a change of ownership structure over *assets*, while the proposed transaction involves Rogers acquiring *subscribers* without the assets used to provide service to those subscribers.[32] Fundamentally, Prof. Miller's wireless-only model cannot explain why the *subscribers* would stay with Rogers post-closing when Rogers does not acquire Shaw's wireless *assets*. Said differently, absent a transfer of assets, Prof. Miller's model predicts no change in concentration in any wireless market—subscribers would simply return to their preferred option—and thus the harms that Prof. Miller's model predicts are inconsistent with the true nature of the transaction (a transfer of subscribers).

39. As explained above, in the merger simulation model used by Prof. Miller, the ownership structure over certain assets (*i.e.*, assets used in the production of a good or service)—which changes following a merger—determines firms' pricing incentives. Consumers then self-sort into the different products based on their preferences and the attributes of the products produced by the firms, including price.[33] Such a model is not capable of predicting the effects of a transfer of *customers* independent of assets—indeed, a transfer of customers does not even make sense within the model, because in the model, consumers *choose* which firm to buy from in each period (and with no explicit linkage across periods accounted for).

---

[32] According to the SPA, Articles 2.1 and 2.2, all of Shaw's wireless network assets will be transferred to Quebecor, with the exception of the Shaw Mobile brand name [redacted] and Shaw Mobile's subscribers (who will retain the option to switch networks should they desire to do so).

[33] *See* A. Colin Cameron and Pravin K. Trivedi (2005), *Microeconometrics: Methods and Applications*, 1st Ed., Cambridge University Press, pp. 504-507.

40. The fact that Prof. Miller's model does not take into account switching costs or any other such dynamics of consumer choices, combined with Prof. Miller's approach of ignoring wireline altogether (wireline assets are the only *assets* that are changing ownership), implies there is nothing in his model preventing "transferred" customers from reverting back immediately, thus undoing any effects from the transaction. Said differently, Prof. Miller does not model any possible "stickiness" in customers' behavior—which could explain why transferring customers could be meaningful—and the only relevant assets that changed hands—the wireline assets—are also ignored.[34] Thus, his model cannot predict any effect from a transfer of *wireless-wireline bundle consumers* between firms, which means it cannot predict the very competitive effects that Prof. Miller tries to use it for.

41. By ignoring these issues, Prof. Miller's model implicitly assumes that Rogers is acquiring *all* the physical assets associated with Shaw Mobile subscribers (such as the portion of the wireless network that is used to serve them). But since these assets are not transferred to Rogers, Prof. Miller overstates the assets Rogers is acquiring and overstates the adverse welfare effects from the transaction.

---

[34] Prof. Miller cannot argue that his approach somehow "proxies" for consumer stickiness or wireline competition, as both are complex economic issues that cannot reliably be addressed with a wireless-only static model and a vague claim that it proxies for something else. The literature on switching costs, for example, shows that analyzing their effects on consumer choices and competition is extremely complicated, with results turning on very specific modeling features. It is therefore inappropriate to assert that an inherently static logit model like the one Prof. Miller uses can capture any effects of switching costs in some approximate way. Any such approximation is flawed when the implications of switching costs turn so heavily on precise modeling choices. For an example of a model in which switching costs matter, see Paul Klemperer (1987), "The Competitiveness of Markets with Switching Costs," The Rand Journal of Economics, 18(1): 138-150.

3. Prof. Miller's use of a flat logit model inflates the diversion between the merging parties

42. Given its "diversion proportional to market share" assumption, the flat logit model used by Prof. Miller effectively assumes that market shares alone represent how closely two products compete. In other words, according to the model, no two products are closer competitors to each other than their market shares suggest. However, since the closeness between products is a very important determinant of the outcome of any merger simulation model, when this assumption is not realistic, a more appropriate model—specifically one that better captures the actual closeness between products—should be used.[35]

43. For example, such a model may allow premium products to compete more with one another than they do with non-premium products (*i.e.*, if a consumer leaves a premium product following a price increase, she is more likely to choose another premium product than a non-premium product). Particularly relevant here, as discussed below, it should allow wireline-wireless bundled offerings to compete more closely with other similar bundled offerings than with wireless-only offerings. Failure to allow such intuitive substitution patterns is a well-known limitation of the flat logit model.[36]

---

35 For example, in their analysis of the merger between T-Mobile US, Inc. and Sprint Corporation, economists at the Federal Communications Commission relied on a "nested" logit demand model proposed by the merging parties to simulate the potential outcomes of the merger. A nested logit demand model allows for more flexible and realistic substitution patterns than the flat logit demand model used by Prof. Miller. *See* Memorandum Opinion and Order, Declaratory Ruling, and Order of Proposed Modification, In the Matter of Applications of T-Mobile US, Inc., and Sprint Corporation for Consent to Assign or Transfer Control of Licenses and Authorizations, FCC, WT Docket No. 18-197, November 5, 2019 *available at* https://docs.fcc.gov/public/attachments/FCC-19-103A1.pdf.

36 *See* A. Colin Cameron and Pravin K. Trivedi (2005), *Microeconometrics: Methods and Applications*, 1st Ed., Cambridge University Press, p. 503.

44. While, as I discuss in the next section, the use of SOGA is a core flaw with Prof. Miller's approach (and one that significantly inflates the welfare losses of the transaction relative to proper use of SoS, the correct measure of market share and therefore the correct input into a logit model), even the SoS-based flat logit model is biased towards inflating the welfare losses from the transaction. This is because a flat logit model assumes all products are equally close to each other, with only market shares determining diversion between them. In practice, Shaw Mobile is likely more similar to Telus than to Rogers: Telus also sells wireless-wireline bundles in AB and BC, while Rogers does not (since it does not offer wireline services in those western provinces). Therefore, Shaw Mobile's market share likely *overstates* the diversion it receives from Rogers (and vice versa) and thus likely overstate the adverse welfare effects from the transaction. Put simply, if Shaw is closer to Telus than Rogers, share-based diversion between Rogers and Shaw will overstate merger effects.

45. [redacted]

[37] *See* Miller Report Exhibit 10 (p. 53).

[redacted]

46. Critically, these switching patterns indicate that Rogers' and Shaw's customers are *different*—those who want a bundle go with Shaw, not Rogers—and thus they cannot be used to indicate large merger effects. For the merger, what is relevant is switching due to relative price or quality changes: More similar products are expected to have more price or quality-induced switching and larger adverse welfare effects when they merge. Since Shaw and Telus both offer bundles, they are more similar to each other than they are to Rogers, and more price-induced switching is expected between them.[38]

47. Hence, a properly computed diversion ratio between Shaw Mobile and Telus will likely be higher than a flat logit (which assumes diversion is proportional to market shares) will predict. This implies that diversion between Shaw Mobile and Rogers is likely *lower* than what a flat logit would predict,[39] meaning the flat logit model that is calibrated based on market shares—while better than Prof. Miller's faulty SOGA based model (an issue I explain next)—will still *overstate* the potential for harm from the proposed transaction. This means that the columns

---

[38] Diversion ratios measure the degree to which buyers would substitute to other products in response to a price or quality change and, thus, are important determinants of the effects of a merger on price- and quality-setting incentives. By contrast, switching rates capture all consumer movements between products, including those that have nothing to do with price or quality changes. For example, a consumer may switch service providers because he or she has moved to another province or suffered a bout of unemployment – in those cases switching is more likely to occur between less similar products, not between more similar ones. For a discussion of the issues associated with using switching rates as estimates of diversion ratios, *see* Yongmin Chen and Marius Schwartz (2016), "Churn vs. Diversion: An Illustrative Model," *Economica*, 83(332): 564-583. Chen and Schwartz state that it is widely recognized that churn or switching rates can differ from diversion ratios depending on the factors that cause the switching.

[39] Since diversion ratios add to 100%, underestimating the Telus-Shaw Mobile diversion implies that the Rogers-Shaw Mobile diversion (as well as the Bell-Shaw diversion) are overestimated.

labeled "using SoS" in Table 4 below—while better than Prof. Miller's use of SOGA—still exaggerate the welfare losses from the transaction (before accounting for marginal cost savings or productive efficiencies).

48. Instead of accounting for these factors and assuming that diversion between Shaw Mobile and Rogers is *lower* than proportional to market shares, Prof. Miller did the exact opposite: By using SOGA, he effectively assumed that diversion between Shaw Mobile and Rogers is *much higher* than proportionally to market shares. I discuss this issue next.

C. PROF. MILLER INCORRECTLY USES SOGA INSTEAD OF MARKET SHARES TO CALIBRATE HIS MERGER SIMULATION MODEL

49. Market shares are among the most important inputs (and perhaps the single most important input) in a merger simulation model—particularly one based on a flat logit demand system—because they are assumed to reflect the relative competitive strength of each market participant. They therefore determine the direct impact of the merger on market concentration and the associated effect on prices—combining higher share firms yields larger adverse effects, all else equal. However, instead of using each product's share of subscribers (SoS) as the key input into his flat logit model, Prof. Miller uses each product's share of gross adds (SOGA) over a four-month period (January 2021 – April 2021). He makes no corrections for this in his model: The model is "blind" to the fact that he uses SOGA instead of SoS, so the model is misled and treats his SOGA numbers *as if* they were market shares.

50. Compounding this error, the four-month period over which Prof. Miller calculates SOGA occurred less than a year after Shaw Mobile's launch, meaning that it was a period of transition in the industry. Such a pattern does not reflect the true equilibrium in the industry once the

period of transition ends, and thus cannot predict the effect of the transaction going forward, well after the launch of Shaw Mobile.

51. Prof. Miller attempts to justify this approach by saying that SOGA best represents the importance of brands to "actively shopping" subscribers,[40] and also that it is more consistent with observed switching rates, including the ones between the merging parties.[41] Neither of these arguments can support his faulty use of SOGA. In fact, as I show in more detail below, Prof. Miller's use of SOGA is incorrect for conceptual and measurement reasons, more recent data contradicts his approach, and his comparison to observed switching rates is tautological.

1. Using SOGA to calibrate Prof. Miller's merger simulation model is conceptually invalid

52. Conceptually, using SOGA to calibrate Prof. Miller's flat logit merger simulation model is inconsistent with crucial assumptions underlying his model. In a flat logit model, market shares reflect *both* the preferences of "likely switchers" (*i.e.*, the marginal consumers: those more likely to move following prices changes) and the preferences of the existing "installed base" (*i.e.*, inframarginal consumers: those less likely to move in such cases). In particular, the model *assumes* that were they to switch to a new firm, all consumers of all firms have the same switching probabilities, and that the diversion ratios implied by those switching probabilities are proportional to market shares.[42] The preferences of both of these groups drive firms' profit optimization decisions, which are a key component of any merger simulation model.

---

40 Miller Report at ¶56.

41 Miller Report at ¶171.

42 This follows from the fact that each consumer in the flat logit demand model is differentiated only by a random additive error term that is independently distributed according to the type one

53. Since Prof. Miller calibrates his model using only SOGA and not overall share of subscribers (SoS), he in effect *assumes* that the preferences of switchers are systematically different from the preferences of non-switchers. This contradicts the assumptions of the flat logit model, which does not allow for such differences based on any consumer characteristics, including based on whether they are switchers or not. While Prof. Miller says he is only studying the preferences of "actively shopping" customers (*i.e.*, the switchers), the model he relies on assumes that those preferences are the same as the preferences of non-switchers. If, instead, it is *not* the case that switchers' preferences are identical to non-switchers' preferences, then the core assumption of the merger simulation model that he relies on is wrong.

54. Another way to say this is the following: Using SOGA to calibrate the model assumes diversion is *not* proportional to market shares, but his model assumes it is. Consequently, if he is right that switchers have systematically different preferences (and thus different diversion ratios) than non-switchers, then his model assumes that firms optimize their profits based on substitution patterns that do not reflect reality, meaning it cannot be reliable. If, in a logit model, diversion ratios are not proportional to market shares, then a different model needs to be used that better reflects reality, *e.g.*, a nested logit model or some other model that allows different preferences for different types of consumers, and thus enables one to divorce the share of the installed base from the preferences of switchers. In a flat logit model, one cannot use wrong

---

extreme value distribution. This error term represents idiosyncratic preferences of individual customers. However, in the flat logit model, the distribution of the random error term is not a function of any observable product or customer characteristics, which is the reason the model often time fails to generate realistic diversion ratios.

market shares, and one cannot justify them with an assumption that actively shopping customers are different from other customers, as that violates the core assumption of the model.[43]

2. SOGA of a new product does not represent its competitive significance

55. Beyond the conceptual point above (but also a clear demonstration of the risks in Prof. Miller's approach), the use of Shaw Mobile's SOGA following its launch is inappropriate in practice given that it *does not* reflect Shaw Mobile's current and ongoing competitive strength (or lack thereof). Shaw Mobile was introduced as a new and different product: It was offered as a wireline-wireless bundle to Shaw's wireline customers who did not previously have access to such a bundled option from Shaw. Also, one of the two wireless plans offered by Shaw Mobile is structured differently from existing wireless plans in the market: Shaw Mobile offers a "by the Gig" plan that allows subscribers to pay $10 per GB of data used rather than a pre-set data allowance.[44] Around [redacted] of Shaw Mobile's subscribers in April 2022 choose this plan.[45]

56. Since Prof. Miller's merger simulation model is about change of ownership over Shaw Mobile, Shaw Mobile's current market share—which reflects its current competitive significance—is a crucial input in driving the model's results, with a larger Shaw Mobile share

---

43 Moreover, if it were true that SOGA represented preferences of both switchers and non-switchers, that would still not justify *only* looking at decisions by switchers, as that would artificially reduce the sample size. If switchers and non-switchers have the same preferences and thus substitution patterns, one should look at the shares among *all* consumers to make use of all the data, which yields more precise statistical estimates.

44 *See* Miller Report at ¶116 ("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)").

45 *See* [redacted]

increasing the predicted adverse merger effects. The use of Shaw Mobile's SOGA shortly following its launch as a proxy for market share inflates Shaw Mobile's steady state market share because a new product (particularly one that is quite differentiated from existing products) is expected to get a burst of new subscribers who would have already purchased this product earlier had it been available. Moreover, a new product is often offered for low introductory prices ("penetration pricing") that do not reflect steady state prices. Thus, the new product will capture a high share of switchers—yielding a high SOGA—for a short period of time, but this is *only because it is new*, and does not reflect the product's competitive significance as reflected in its ultimate steady-state market share.[46] Put differently, using a product's SOGA shortly after launch as a measure of its long-term share assumes it will always maintain its "newness" advantage, which is clearly wrong—as the product matures, it settles down to its steady-state share, which reflects its true ongoing competitive strength. By using SOGA, Prof. Miller computes harm from the proposed transaction as though Rogers is buying a product that retains Shaw Mobile's newness advantage, which is incorrect.

57. Prof. Miller cites the Merger Enforcement Guidelines in support of his decision: "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."[47] But this quote does not fit the current situation. In

---

[46] Consider a simple example: In a market with 10,000 total buyers, a new product is introduced, and 200 subscribers who have been waiting for this product to enter switch to it, all in the first month, while all other subscribers remain with their current provider. In that case, the new product will have a SOGA of 100% in the first month due to its introduction as the key event driving switching in a given period, even though its market share will then settle in at only 2%.

[47] *See* Miller Report ¶55.

general, when measuring the effects of a merger, it may be meaningful to account for a permanent increase in the level of competition. However, it is still meaningless to *measure* this constant increase using consumer switching shortly after a one-off entry event. That is, even if one wanted to look at shares among switching customers—which cannot properly be done in a flat logit setting as described above—it would still not make sense to look at SOGA just after the launch of a new product to get a metric for what shares (of all customers or switching customers) will look like once the product is no longer new. If the *event* that caused switching is the launch of a new product, then of course its share of those switchers is high—but this does not say anything about its share of subscribers or switchers in going-forward market conditions in which the events that cause switching are things other than the product's entry.

58. Prof. Miller's second justification for using SOGA—that it better matches porting data—is a tautology, not a justification. The porting data he uses suffers from the exact same flaws as SOGA. Indeed, it is capturing the exact same thing, so of course it matches well: Porting to Shaw Mobile over this period is also largely triggered by Shaw Mobile's recent entry, and therefore diversion ratios computed from ports observed soon after Shaw's entry are overstated for the same reason that SOGA computed in this period overstates Shaw Mobile's long-term share. Put differently, while the relevant diversion ratio from Rogers to Shaw Mobile for use in a merger simulation model is the rate of switching from Rogers to Shaw Mobile following a price increase or quality reduction at Rogers, what porting data just after Shaw Mobile's entry measure is primarily the rate of switching *due to Shaw Mobile's entry*, which is both necessarily high and the wrong thing to measure. So, looking at such porting data cannot confirm the use of SOGA; instead, it simply confirms that *both* porting data and SOGA data capture switching due

to the newness of Shaw Mobile, not its competitive significance (or closeness between the Shaw Mobile and Rogers products, as I explained above).

3. SOGA cannot appropriately measure the shares of "actively shopping" subscribers as Prof. Miller claims

59. Even if one (wrongly in a flat logit) wanted to study the preferences of "actively shopping" subscribers, looking at SOGA would not be a valid way to do so and would, again, likely overstate Shaw Mobile's share. This is because SOGA observes the choices of not all shoppers, but rather just those shoppers who ultimately make a decision to switch brands—that is the set captured in gross adds. In reality, many actively shopping subscribers likely choose to stay with their existing brands, and these are not accounted for by SOGA. In other words, the set of "switchers" is a non-random sample of the set of all "shoppers," and so measuring shares just among switchers cannot even provide a reliable measure of share among all shoppers, let alone all subscribers. Moreover, looking just at switchers, rather than all shoppers, is likely to bias the results toward substantially overstated shares for brands with few current subscribers, such as Shaw Mobile.

60. To demonstrate this, consider the case where there are two wireless brands, Brand A with 800 existing subscribers and Brand B with 200 existing subscribers. Also assume that for each brand, 10 percent are shoppers (*i.e.*, have expired contracts and consider their options), and that 10 percent of shoppers decide to switch. Therefore, out of Brand A's 800 subscribers, 80 are shoppers and 8 switch to Brand B, and out of Brand B's 200 subscribers, 20 are shoppers and 2 switch to Brand A. In total, there are 100 shoppers, of which, 74 chose Brand A (72 of its own shoppers who decided to stay and 2 of Brand B's shoppers who decided to switch), and 26 choose Brand B (18 of its own shoppers that decided to stay and 8 of Brand A's shoppers who

decided to switch). The shares of shoppers are therefore 74 percent for Brand A and only 26 percent for Brand B. However, Prof. Miller's use of SOGA will look only at the 10 switchers, of which only 2 chose Brand A and 8 chose Brand B. Thus, he would use SOGA of 20 percent for Brand A and a SOGA of 80% for Brand B. This is very far from being a good proxy of the preferences of shoppers.

61. This example demonstrates a general principle: Using SOGA, which is based on switcher shares, as a proxy for shopper shares, is likely to inflate the shares of small firms compared to big ones, as larger firms likely have a larger pool of non-switching shoppers who are not counted.

62. This can be further demonstrated by combining actual wireless subscriber data from the time period used by Prof. Miller to calculate SOGA (January 2021 – April 2021) with alternative illustrative assumptions on the frequency with which existing subscribers "actively shop" for a wireless plan.[48] In

[48] Given data limitations, I only consider in this illustrative example existing subscribers and not new customers joining the market.

Table 2 below, I calculate Shaw Mobile's "share of active shoppers" in AB and BC under three alternative assumptions: that all wireless subscribers shop every 12 months, that all wireless subscribers shop every 24 months, and that all wireless subscribers shop every 36 months. In each case, I include in a brand's share its current subscribers who are active shoppers but who decided not to switch brands.

Table 2: Illustration of Shaw Mobile Share of Shoppers Under Alternative Assumptions for Frequency of Subscriber Shopping

Frequency of Shopping by Existing Subscribers	Shaw Mobile Share of Active Shoppers	
	AB	BC
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Source: Prof. Miller's backup materials.

63. This illustrative calculation shows that Shaw Mobile's share of active shoppers is very different from the SOGA share used by Prof. Miller for the same period [redacted] for AB and [redacted] for BC), even though he claims to capture the share of shoppers. It shows that his SOGA figures are not measuring what he claims they are. *i.e.*, decisions by "actively shopping" subscribers.

4. More up-to date data refute the SOGA numbers that Prof. Miller uses

64. Trends in gross adds after the time period used by Prof. Miller to calibrate his model both demonstrate the flaws in his approach and *directly refute* the key SOGA inputs he used for his model. Figure 1 below shows gross adds for Shaw Mobile, Freedom, Rogers, Fido, and Chatr in AB and BC before, during and after the time period used by Prof. Miller and until the latest data available.[49] Figure 2 shows Shaw Mobile's monthly growth in market share over time, in percentage points. Figure 3 shows the evolution of Shaw Mobile's market share over time (until

[49] I do not have access to Bell and Telus gross add data required for calculating SOGA for a later period than Prof. Miller did in his report.

March 2022, the latest data available to me), compared to the SOGA numbers used by Prof. Miller in his merger simulation analysis.

Figure 1: Shaw and Rogers gross adds in AB and BC, August 2020 – April 2022

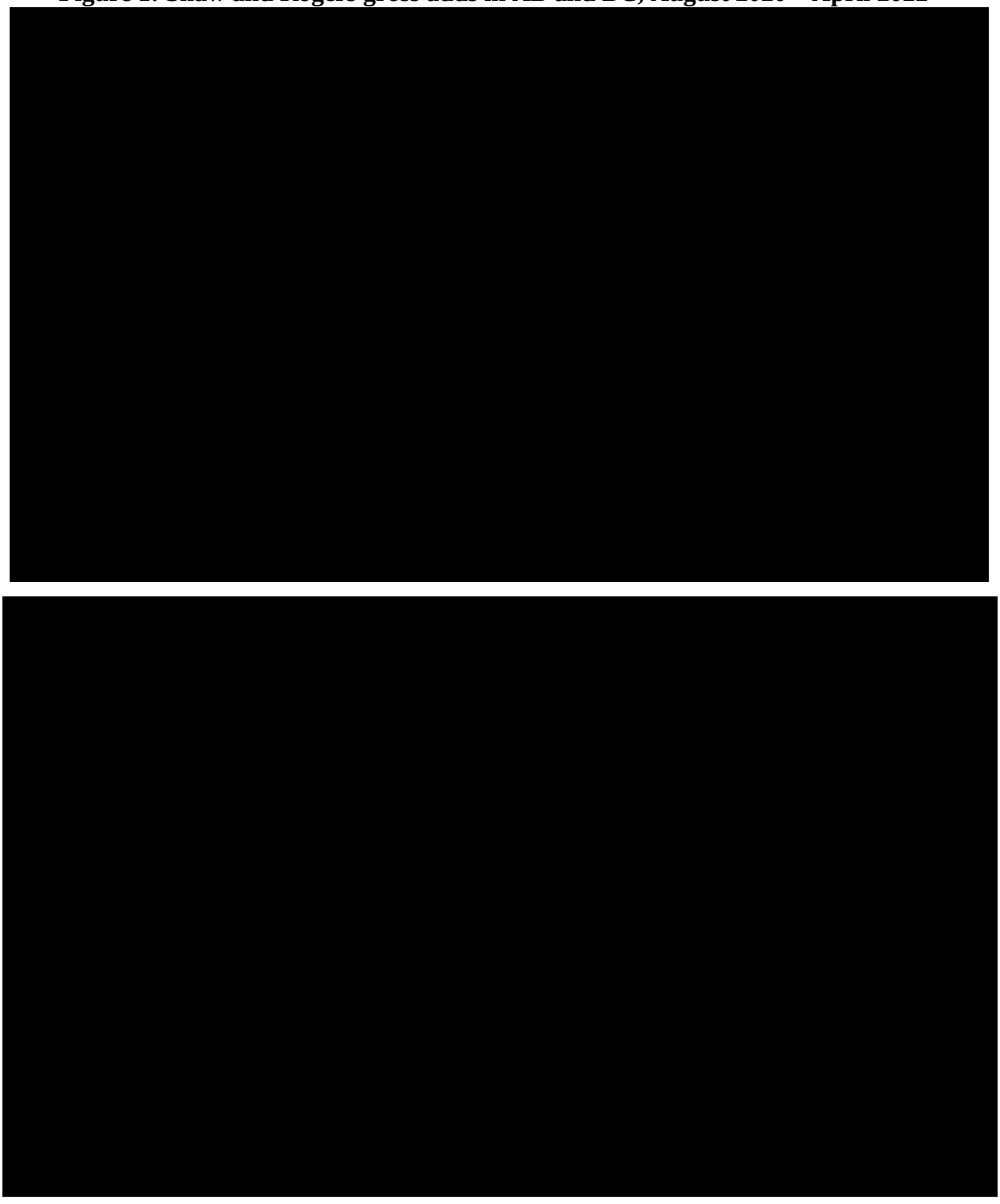


Figure 2: Shaw Mobile's monthly market share growth, percentage points, July 2020 – March 2022

Sources: Prof. Miller's backup materials, "[redacted]

Figure 3: Shaw Mobile share of subscribers in AB and BC, July 2020 – April 2022

Sources: Same as Figure 2.

65. [redacted]

66. The implications of these trends are demonstrated in Figure 2 and Figure 3. Figure 2 shows that Shaw Mobile's market share growth has been [redacted]

67. This confirms that by using SOGA calculated shortly following Shaw Mobile's introduction, Prof. Miller captures the newness of Shaw Mobile, not its long-term competitive significance, which substantially overstates his estimate of Shaw Mobile's competitive significance. As a result, the adverse welfare effects of the transaction that he finds are correspondingly substantially exaggerated, as demonstrated in the next section.

5. Welfare losses (before accounting for marginal cost savings or productive efficiencies) when replacing SOGA by market shares in Prof. Miller's model are much smaller

68. Notwithstanding the many problems mentioned above, I now show that using Prof. Miller's exact input and methodology but replacing SOGA by SoS substantially reduces the welfare losses from the transaction (*before accounting for marginal cost savings and productive efficiencies).* This analysis still vastly inflates the welfare losses from increased concentration, for all the reasons described throughout this report.

69. The market shares used by Prof. Miller in his 8-brand merger simulation analysis, as well as the most recent market shares available (for March 2022)[50] are presented in Table 3 below.

[50] Rogers and Shaw subscriber counts are updated to March 2022 using the most recent data produced by the companies. I do not have updated data from Bell and Telus, so I estimate their March 2022 subscriber counts by taking their actual subscribers as of June 2021 for Telus and July 2021 for Bell (as Bell did not produce data for June 2021), and assuming that the growth rate through March 2022 for their subscriber base at the brand and provincial level is proportional to the total national growth rate of their subscribers from June 2021 to March 2022, as described in their publicly available financial data. If more recent market share data becomes available, I will update my analysis accordingly.

Table 3: Wireless market shares used in Prof. Miller's 8-product merger simulation model and March 2022 market shares[51]

	Prof. Miller's SOGA			Updated SoS		
[redacted]						

Sources: [redacted]
and my calculations.

70. As shown in the Table 4 below, simply switching from SOGA to the most recent SoS, without correcting any of the other issues with Prof. Miller's model, substantially reduces both estimated consumer surplus losses and total welfare losses (both before accounting for marginal cost savings or productive efficiencies). Consumer surplus loss falls by almost a third and total surplus loss falls by almost a half.

[51] Prof. Miller deems his 8-product more reliable than his 11-product model. *See* Miller Report at ¶170 ("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."). I therefore refer in this report only to this version of his model.

Table 4: Welfare effects of transaction before marginal cost savings or productive efficiencies using Prof. Miller's model ($Million/Year)

Sources: Same as Table 3.

71. As I show in Section IV, the marginal cost savings and productive efficiencies expected from the transaction easily overwhelm these modest (but still exaggerated) welfare losses.

D. PROF. MILLER'S MODEL GENERATES UNREASONABLE MARGINS AND MARGINAL COSTS

72. In addition to market shares, another critical input in the calibration of a merger simulation model is producers' gross margins.[52] A producer's gross margin is the difference between the price it receives for its products and the marginal cost of producing those products, with the difference expressed as a percentage of the price.[53] Generally, in a merger simulation,

[52] In some cases, demand elasticities are used rather than gross margins. Because of the well-known Lerner condition, gross margins can be derived from elasticities and vice versa. Either way, this parameter (gross margin or elasticity) is the most important one, other than shares, in determining the results of a flat logit merger simulation.

[53] The correct margins to use in a merger simulation model are "economic margins" that properly incorporate all marginal costs, including capital costs and opportunity costs. These can differ from "accounting margins," which typically do not align perfectly with economic margins. However, economic margins are often difficult to measure precisely. As a result, Professor Miller used accounting margins to calibrate his merger simulation model.

all else being equal, the larger the merging parties' pre-merger margins, the larger the adverse welfare effects the model will predict post-merger.[54]

73. It is important that a merger simulation model, once calibrated, implies economic margins and marginal costs for all producers that are reasonable.[55] This is because, as noted above, the gross margins implied by the model are closely related to the results of the merger simulation. If the implied gross margins and marginal costs are unreasonable, this calls the results of the simulation into serious question: If the model cannot accurately match pre-merger margins, why should one trust its predictions of merger effects on prices (and thus margins)? Evaluating these implied gross margins is therefore an important diagnostic of the reliability of the merger simulation model.

74. The gross margins and marginal costs implied by Prof. Miller's model for each producer in the market are set out in Table 5 below.

---

54 *E.g.*, when calculating a UPP index for evaluating the impact of a merger, higher margins imply a higher index and therefore potentially larger adverse effects of the merger on competition. *See* Nathan Miller and Gloria Sheu, "Quantitative Methods for Evaluating the Unilateral Effects of Mergers," *Review of Industrial Organization*, Vol. 58, No. 1, 143-177 (2021). Special Issue: The 2010 Horizontal Merger Guidelines after Ten Years, at section 2.3.

55 Implied marginal costs are the marginal costs inferred by the analysis—effectively the marginal costs under which observed prices are consistent with the modeling assumptions. Together with data on prices, the implied marginal costs can be used to compute implied margins. These implied marginal costs and margins may be different from the true marginal costs and margins if the model is mis-specified (or if it is "over-identified," meaning it has more unknown parameters than can be determined with available data).

[redacted]

	Data used by Prof. Miller for Calibation			Prof. Miller's Model Using SOGA		Prof. Miller's Model Using SoS	
	Price	MC	Margin	Implied MC	Implied Margin	Implied MC	Implied Margin
[redacted]							

Sources: Prof. Miller's backup materials.

75. The gross margins and marginal costs implied for Freedom—at least [redacted] margin and a marginal cost of less than [redacted]—demonstrate the unreliability of Prof. Miller's model.[57] They cannot reflect Freedom's true economic margins and marginal costs. Prof. Miller provides no meaningful explanation for these results. The only explanation he puts forward is that Freedom

56 Prof. Miller's 11-product model implies highly negative marginal costs for Chatr, which is even more implausible.

57 Prof. Miller's claim that "[t]he model, thus calibrated, predicts market shares, prices, and profit margins that are reasonably close to those I observe in the data" (Miller Report at ¶148) is surprising. First, his model is constructed to *exactly* fit market shares and prices, so a claim that it does a good job in predicting those parameters is meaningless. Regarding predictions of margins, as I have shown, his claim is false.

offers a bundled product.[58] But this could not be a plausible explanation for the extremely high margin produced by his model. [redacted] Second, conceptually, regardless of the take rate of the bundle, such an explanation would be self-contradictory. Prof. Miller calibrates his model using Freedom's accounting margins; that is, he assumes the Freedom accounting margins serve as a reliable proxy for economic margins (the only meaningful margins for the model). It therefore makes no sense for him to, on the one hand, use accounting margins to measure Freedom's economic margins, and yet claim that it is fine that Freedom's economic margins are very different from accounting margins.

76. Looking at the results in more detail demonstrate further that the implied margins and marginal costs also do not match the accounting margins to which Prof. Miller purports to calibrate his model. For example, Freedom's accounting marginal cost in Alberta is [redacted], but the model implies a marginal cost of [redacted]. The mismatch between the cost used for calibration and the costs implied by the model therefore means the model does not remotely fit the data. And given that the model is designed to predict post-merger prices given marginal costs—meaning it is designed to predict post-merger *margins*—the fact that it cannot even predict pre-merger margins when fed pre-merger accounting data means that its predictions of post-merger prices, and thus merger-induced price changes, are highly doubtful.

---

58 "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 Mobile subscribers [redacted] (Emphasis added) (Miller Report, p. 82, fn. 219).

77. The margins and marginal costs implied for Shaw Mobile—at least [redacted] margin and marginal costs of between [redacted] and [redacted] marginal cost—are even more striking. Because Prof. Miller did not use Shaw Mobile accounting margins to calibrate his model, this could theoretically be explained by the fact that Shaw Mobile is a bundled product and the wireless portion—which is the only portion Prof. Miller models—is sold well below the cost of providing the service in order to sell more wireline subscriptions. However, since he does not model this bundling (and ignores the wireline market in general), there is no way to verify whether the implied marginal costs (and thus margins) for Shaw Mobile are correct; and since his Freedom margins are clearly implausible, this is likely also the case for Shaw Mobile. A wrong margin for Shaw Mobile will certainly distort the results of the merger simulation exercise, with an inflated margin tending to inflate welfare losses. This is yet another demonstration of the problems that could arise from Prof. Miller's decision to ignore wireline competition.

78. Finally, in the columns labeled "Prof. Miller's model using SoS" in Table 5, I calculate the margins implied by Prof. Miller's model when I replace SOGA by SoS calculated over the same time period. The implied margins in this case are somewhat more reasonable than the margins implied by a model that uses SOGA. This is another indication that it is more proper to use SoS to measure shares than it is to use SOGA. But even then, Freedom's marginal costs are implausibly low, demonstrating that, while better than using SOGA, Prof. Miller's merger simulation model remains unreliable even when calibrated using SoS.

IV. PROPER NETTING OF UNILATERAL EFFECTS AND MARGINAL COST SAVINGS AND PRODUCTIVE EFFICIENCIES SHOWS THAT THE TRANSACTION WILL SUBSTANTIALLY INCREASE WELFARE

79. A proper welfare analysis of the transaction must account for marginal cost savings and productive efficiencies, as they will benefit both consumers and the Canadian economy as a whole. If the cost of providing wireless services falls, this will put downward pressure on prices (benefiting consumers), upward pressure on output (benefiting the full economy) and will mean that the wireless service is sold more efficiently, using fewer resources (again, benefiting the full economy). Such effects cannot be ignored when assessing the transaction's overall welfare effects.

80. In this section, I describe the marginal cost savings from the transaction in more detail and provide a quantification of a few marginal cost savings categories for which the information needed for quantification is currently available. I then show that quantified marginal cost savings alone, when incorporated into Prof. Miller's model (notwithstanding my serious reservations about the applicability of his model to the current matter, particularly given all the ways it overstates harms), are enough to drastically reduce his findings of welfare losses. More generally, once productive efficiencies are considered, the model predicts that the transaction will be highly beneficial to consumers and to the Canadian economy, as the predictions of harm are vastly outweighed by productive efficiencies under any reasonable scenario.[59]

A. THE TRANSACTION WILL CREATE SUBSTANTIAL MARGINAL COST SAVINGS

81. In his Report, Prof. Miller raised concerns that the sale of Freedom to [redacted] which was the proposed divestiture known to him at the time of writing his Report—would leave

[59] The version of the model I rely on uses SoS rather than SOGA, as described above.

Freedom a weaker, higher cost competitor. Now that Freedom will be sold to Quebecor, not to [redacted] many of his arguments are reversed: The sale will make Freedom a stronger, more aggressive competitor with lower costs. Hence, Prof. Miller's arguments now point in the opposite direction, in favor of the transaction.

82. Freedom's marginal costs will decrease due to its integration with Quebecor and due to the commitments made by Rogers to Quebecor under the divestiture agreement. The immediate combination of Freedom and Quebecor's spectrum will increase Freedom's wireless network capacity, thus lowering the incremental costs associated with adding consumers and improving its network quality, making Freedom more competitive for such consumers. Freedom's marginal costs will also diminish for other reasons, such as [redacted] discussed in more detail below.

83. Prof. Miller raised concerns that, once Freedom is separated from Shaw's wireline assets in Western Canada, [redacted]

[60] [redacted]

[61] [redacted]

84. Finally, the transaction will also create substantial wireless and wireline productive efficiencies for both Rogers and Quebecor, as a result of savings of resources to the Canadian economy. These efficiencies were calculated by Mr. Harington and summarized in Schedule 1 of his report ("Harington Report").[62]

85. The remainder of this section discusses these marginal cost savings, and their effect when fed into Prof. Miller's model, in more detail.

1. Quantified marginal costs savings

86. A reduction in a firm's marginal costs of attracting and serving additional subscribers implies that each additional subscriber is more valuable (*i.e.*, has lower cost to serve), and thus, as a fundamental matter of economics, the firm will have an incentive to pass such marginal cost reductions to consumers in the form of lower prices or a better product at the same price.[63] Such pass-through will benefit consumers and will increase efficiency (since more output is generally

---

62 Affidavit of Andrew C. Harington, Report Assessing Productive Efficiencies Arising from the Proposed Transactions, *Commissioner of Competition v. Rogers Communications Inc. and Shaw Communications Inc.*, September 23, 2022.

63 It is a well-established principle that every company facing a downward demand curve (even a monopolist) has incentives to pass through marginal cost decreases to consumers in whole or in part. (*See, e.g.*, Jeremy I. Bulow and Paul Pfleiderer (1983) "A Note on the Effect of Cost Changes on Prices," *Journal of Political Economy*, Vol. 91, No. 1, pp. 182-85; Paul L. Yde and Michael G. Vita (1996), "Merger Efficiencies: Reconsidering the 'Passing-On' Requirement," *Antitrust Law Journal*, Vol. 64, No. 3, pp. 735-47; Paul Yde and Michael Vita (2006), "Merger Efficiencies: The 'Passing-On' Fallacy," *Antitrust* 20:59-65, at 62-63; or virtually any microeconomics textbook.) Intuitively, a firm has incentives to pass on portions of marginal cost reductions to consumers in the form of lower prices because doing so generates additional sales that would have been unprofitable at the previous cost level but are now profitable at the new, lower-cost level. It should also be observed that the conclusion that firms have incentives to pass through marginal cost savings is based on the same logic that finds upward pricing pressure from a merger. Under that theory, the upward pricing pressure from a merger is equivalent to that associated with an increase in marginal cost, namely, the "cannibalization cost" associated with sales diverted from the merger partner. (*See, e.g.*, Joseph Farrell and Carl Shapiro (2010), "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," *The B.E. Journal of Theoretical Economics*, Vol. 10, No. 1, pp. 1-39.)

produced). Moreover, a lower price can be expected to induce the firm's competitors to also lower their prices (or increase their quality), further benefiting welfare. Once modified to incorporate marginal cost savings, merger simulation models capture this dynamic, as I explain in the next section.

[redacted]

[redacted]

90. Even in provinces where Freedom does operate its own network, its coverage is not as dense or broad as other carriers. When Freedom's subscribers use data outside of major urban areas in AB, BC, and ON, they often need to roam on other carriers' networks. And beyond AB, BC and ON, Freedom does not have a wireless network at all. [redacted]

[redacted]

64 *See* [redacted]

65 SJRB-CCB00665009, p. 8 and RBCL00005_000006406.

66 *See* [redacted] and Marginal Cost Savings workpapers.

67 I have previously found that Freedom's marginal cost of traffic is well below [redacted] per GB, but even if it were slightly above that measure, the effect on the outcome would be negligible.

68 *See* [redacted]

69 *See* [redacted]

70 *See* [redacted]

[redacted][71] Applying these rate differentials to Quebecor's estimates of data usage and using its estimate that [redacted]

91. As mentioned above, Quebecor has modeled that [redacted] For calculating the path of roaming savings over the next five years, I consider two alternative scenarios: One scenario in which roaming rates are assumed to decrease at a [redacted] compound annual rate [redacted] and a second scenario in which roaming rates are assumed to remain flat. The former case (decreasing roaming rates)—[redacted] I treat this as a lower-end prediction of marginal costs savings in this savings category. The latter case (flat roaming rates) results in the following marginal cost savings per subscriber per month: [redacted] I treat this as the upper-end prediction of marginal costs savings in this savings category.

92. In addition to [redacted] the transaction also generates marginal cost savings for [redacted]

---

71 [redacted]

72 *See* [redacted]

73 *See* [redacted]

[redacted]

[redacted] By comparing contractual rates and historical roaming traffic, Quebecor estimates annual savings of [redacted] which translate to [redacted] per subscriber per month.[75]

[redacted]

74 [redacted]

75 [redacted] I conservatively do not assume data growth in this category.

76 [redacted]

77 [redacted]

(c) Total quantified marginal costs savings

95. Table 6 below summarizes the total marginal costs savings resulting from the transaction that I quantify (from roaming and handset purchasing):

Table 6: Total Quantified Marginal Cost Savings, per Subscriber per Month

	2023	2024	2025	2026	2027	Average 2023-2027
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: Marginal Cost Savings workpapers.

2. Unquantified marginal costs savings

96. In addition to the quantified marginal costs savings discussed above, the transaction will result in additional marginal costs savings—likely substantial—that I currently do not have sufficient information to quantify with precision. I therefore could not directly include them in my welfare calculations that use Prof. Miller's merger simulation model. The existence of these additional marginal costs savings is yet another reason for why the welfare gains I find from the transaction are conservative—even if these marginal costs savings cannot precisely be quantified, they are surely positive, so treating them as zero by excluding them is definitely conservative.

[redacted] Given the divestiture agreement between Shaw and Quebecor, there are several

78 [redacted]

reasons to conclude that the opposite will occur: Backhaul costs will go down. Moreover, at least some of these savings are expected to reduce marginal costs.

98. First, almost [redacted] of Freedom's wireless subscribers are in ON where Shaw [redacted]

99. Second, the divestiture agreement provides that [redacted]

100. [redacted]

79 *See* SJRB-CCB00896520 at Column U.

80 [redacted]

101. Finally, following the transaction, Rogers will own a wireline network in Western Canada. The vertical integration between Rogers' wireless business and Shaw's wireline business in these areas will reduce Rogers' backhaul costs. That is, Rogers will gain from its access to Shaw's wireline network and the associated improvement in backhaul (relative to microwave) and reduction in backhaul costs (relative to market rates).

102. At least some of the cost savings on backhaul will be marginal cost savings. Since adding new subscribers requires expanding the network to handle the additional data—that is, because network costs are marginal costs—this means that at least some of the backhaul savings are also marginal. Prof. Miller also treats backhaul costs as at least partially marginal: His claim that a gap between the "market rates" of backhaul and the "marginal costs" of backhaul will create an inefficiency only makes sense if backhaul costs are marginal costs.[82]

102. Because I am currently not quantifying the portion of backhaul costs that are marginal,

---

81 In addition,

82

and thus I do not include any backhaul savings in my implementation of Prof. Miller's merger simulation below, my results are conservative in the sense that they understate the welfare gains from the merger.

(b) Additional cost savings categories

103. The Harington Report has not separated between wireless and wireline efficiencies and between fixed and marginal costs. However, several of the efficiencies he calculates are clearly related to wireless efficiencies, and some of these likely have a marginal cost component. Wireless costs savings include Videotron's efficiencies (Section K), [redacted] Some of these wireless components likely have a marginal cost component due to economies of scale created by the transaction. These could include, for example, Videotron's labor, marketing, and IT costs. Since I currently do not have a reliable approach for measuring the marginal costs savings component of these categories, I ignore them in my calculations, making my calculations conservative.

104. Quebecor's [redacted] will diminish because [redacted]

[redacted] Based on Quebecor's estimate, this generates a net savings, after conservatively accounting for true network costs,[83] of about [redacted]

105. These substantial savings will reduce Videotron's marginal costs in QC and will therefore reduce wireless prices and increase welfare there.[85]

3. Spectrum synergies

106. Following the transaction, Freedom will have immediate access to Quebecor's 3.5 GHz spectrum, which will be combined with the spectrum that Shaw currently owns. Combining the two companies' spectrum will create more network capacity due to the economies of scale in combining spectrum—including by allowing more spectrum to be deployed on each cell tower—thus allowing Freedom to offer higher quality and lowering its marginal costs relative to the case in which the spectrum is held separately.

107. To be conservative, I do *not* incorporate in this report these spectrum synergies when balancing marginal cost savings, productive efficiencies, and competitive harm (the latter calculated using Prof. Miller's model) below. This approach is likely *very* conservative, because regardless of whether Quebecor would have maintained this spectrum for its own use or sold it to someone else, the use of this spectrum would have been delayed for a potentially long period of

---

83 Again, I conservatively assume "true network costs" are [redacted] per GB.

84 [redacted]

85 These savings are all marginal costs, but since I have not done a merger simulation of QC, I do not quantify the welfare implications of these marginal costs savings.

time, while the transaction allows the spectrum to be deployed more quickly by Freedom [redacted] That acceleration of spectrum use is a clear benefit of the transaction.

108. [redacted][86] According to Prof. Miller, MVNO entry is likely to take time and is not likely to have a substantial competitive effect.[87] For these reasons, ignoring the effect of the transaction on Quebecor's potential entry *and* ignoring spectrum synergies is yet another conservative assumption.

---

86 In order to incorporate an MVNO entrant into a merger simulation model, one needs to make assumptions on its likelihood and timing of entry, as well as its price, margin, and market share following entry. [redacted] I do not have any basis for making such assumptions and therefore did not attempt to model such entry. As I explain, my approach is very likely overall conservative.

87 *See* Miller Report at ¶51-2: "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…These limitations persist despite CRTC's April 2021 regulation to expand MVNO access."

And in ¶156: "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 transaction."

4. Wireless and wireline productive efficiencies

109. As mentioned above, for productive efficiencies, I rely on the Harington Report. As explained in the Report, Mr. Harington considers productive efficiencies generated by the transaction to reflect the likely reduction in the resource costs incurred by Rogers and Videotron, following the transaction, as compared to the aggregate resource costs that Rogers, Videotron, and Shaw would have incurred separately absent the transaction but with no reduction in output. He includes only efficiencies that would not likely have been attained "but for" the transactions. He only includes gains to the Canadian economy and excludes savings that would represent a redistribution of income within the Canadian economy. He offsets from the productive efficiencies the costs that need to be incurred to achieve the efficiencies. [88]

110. In his Schedule 1, Mr. Harington shows a summary of productive efficiencies. The figure relevant for a comparison with the results of the merger simulation model is the "Effective Annual Rates" when [redacted] This amounts to [redacted] per year. This includes both wireless and wireline efficiencies, occurred to both Rogers and Quebecor.[89]

B. INCORPORATING QUANTIFIABLE MARGINAL COST SAVINGS AND PRODUCTIVE EFFICIENCIES INTO PROF. MILLER'S MODEL

111. The goal of a merger simulation exercise is to simulate the net unilateral competitive effects of a merger, netting (i) the potential upwards pricing pressure ("UPP") from increased

---

88 *See* Harington Report, Section H.

89 This figure also includes the productive efficiencies resulting from the removal of the overlap between Freedom and Quebecor in Ottawa, which I was instructed by counsel to include in my calculations. In any case, this is a small portion of productive efficiencies and does not affect the overall results.

concentration following the merger and (ii) the potential downward (quality-adjusted) pricing pressure ("DPP") from marginal costs reductions and quality improvements. In particular, a properly constructed model allows for calculation of the net effects on prices and output, as well as welfare, which then can be combined with any welfare changes (*e.g.*, productive efficiencies) that are calculated outside the model to produce an estimate of the transaction's overall effect on welfare.

112. As I have explained at length in Section III, the model produced by Prof. Miller almost surely inflates the UPP from the transaction for many reasons. Moreover, the marginal costs that I am currently able to quantify substantially understate the full extent of the marginal costs savings from the transaction, and therefore understate the DPP. For each of these reasons, my estimates are conservative.

113. Nevertheless, I show that even ignoring these two biases, Prof. Miller's merger simulation model, once accounting for quantified marginal cost savings and productive efficiencies, shows the transaction will be welfare-enhancing under any plausible scenario.

114. I present two versions of Prof. Miller's model. In the first version, I assume that none of the assets associated with providing Shaw Mobile service are transferred from Shaw to Rogers. Because, as explained above, Prof. Miller's model only predicts harms to competition if some assets actually change hands—and because it is a model of wireless markets only—there are no adverse effects from lost competition if none of the assets associated with providing Shaw mobile service change hands. Once marginal costs savings are accounted for, the model therefore necessarily shows consumer and total welfare gains.

115. In the second version of the model, I follow Prof. Miller's approach of (wrongly) assuming that *all* the assets associated with providing Shaw Mobile service are transferred to

Rogers. As I previously explained, this necessarily inflates the increase in concentration and the resulting adverse welfare effects, because (among other reasons) Shaw is *not* transferring all the assets used to provide Shaw Mobile wireless service (*e.g.*, it keeps its spectrum, network, and stores). Nevertheless, this version provides an upper threshold that the adverse welfare effects could not exceed.[90]

116. In both models, I use the same inputs as Prof. Miller used in him model, **except for one change**: I replace SOGA by the latest market shares available (from March 2022),[91] as I did in Table 4 in Section III.C.5. This is because, as I explained above, the use of SOGA to calibrate a flat logit model is conceptually incorrect, and in particular the SOGA numbers used by Prof. Miller were not calculated properly and contradict more recent data.

[90] The expected prices changes in this version of the model are presented in Appendix A.

[91] If later market share data becomes available, I will update my results accordingly.

117. The results of this analysis are presented in Table 7 below. I compute two measures of welfare: consumer welfare and total welfare.[92, 93, 94]

118. I find that the transaction is welfare enhancing in some reasonable scenarios even before accounting for productive efficiencies, and it is *highly* welfare enhancing under any reasonable scenario after accounting for productive efficiencies. Specifically:

- When the marginal costs are at the low end of the range, annual consumer surplus change is between a [redacted] (if none of Shaw Mobile's assets are transferred to Rogers) and a [redacted] (if all of Shaw Mobile assets are transferred to Rogers). Total surplus change is between a [redacted] (if none of Shaw Mobile's assets are transferred to Rogers) and a [redacted] (if all of Shaw Mobile assets are transferred to Rogers).

---

92 An economically consistent approach, even one that takes into account distributional effects, needs to measure welfare effects in the range between consumer surplus and total welfare. If the standard is efficiency, and consumer and producer welfare are treated equally, then only total welfare should be accounted for. If, at the other extreme, firm profits and total welfare are not important *at all*, then only consumer surplus should matter. Specifically in this case, before accounting for productive efficiencies, consumer surplus is larger than total welfare, implying firms actually *lose* from the transaction. [redacted] This means that the question of how to treat distributional effects is moot.

93 I should also note that if the Bureau calculates its welfare predictions based on the results of Prof. Miller's model, and if it wants to account for distributional effects, it needs to account for the benefits to income distribution from the *drastic* fall in Freedom's pricing predicted by his model: [redacted] fall in AB and [redacted] fall in BC (Miller Report at Exhibit 22, p. 102). Freedom, being a lower priced product, likely has, on average, lower income subscribers than Bell, Telus, and Rogers.

94 When calculating the effect of marginal cost savings on total welfare, I *only* consider their role on firms' marginal pricing decisions. That is, I do not treat the rectangle "delta MC times quantity" as a welfare gain. This ensures that there is no "double-counting" between marginal cost savings and productive efficiencies, and that I do not count as welfare gains savings that are simply transfers between Canadian companies.

- When the marginal costs are at the high end of the range, annual consumer surplus change is between a [redacted] (if none of Shaw Mobile's assets are transferred to Rogers) and a [redacted] (if all of Shaw Mobile assets are transferred to Rogers). Total surplus change is between [redacted] (if none of Shaw Mobile's assets are transferred to Rogers) and a [redacted] (if all of Shaw Mobile assets are transferred to Rogers).
- In all scenarios in which there are welfare losses, productive efficiencies are *much* higher than these welfare losses.
- Even when using Prof. Miller's approach of: (a) assuming full transfer of Shaw Mobile's assets; (b) using SOGA from January 2021 – April 2011 instead of market shares; and (c) assuming no marginal costs savings, all of which strongly bias the model towards showing welfare losses, he still only finds [redacted] consumer welfare losses and [redacted] total welfare losses (*see* Table 4 above), which are easily swamped by productive efficiencies.

Table 7: Welfare effects of transaction based on Prof. Miller's merger simulation model with market shares and quantified marginal cost savings and productive efficiencies ($Million/Year)

[redacted]

Sources: Prof. Miller's backup materials, market shares are based on Table 3, marginal costs savings are from Table 6, productive efficiencies from Harington Report.

V. THE TRANSACTION REDUCES COORDINATED EFFECTS CONCERNS

119. Prof. Miller and the Bureau have claimed that the transaction would make coordination in wireless more likely and/or more effective, thus softening competition and, according to them, creating competitive harm. Specifically, they claim that wireless carriers monitor and respond to each other, that Freedom has disrupted coordinated behavior, and that Bell, Telus, and Rogers have weaker incentives to disrupt a coordinated equilibrium because doing so would force them to "reprice the base."[95] In this section, I explain why any claim that the transaction will lead to harm due to "coordinated effects" is without basis, and in fact, the opposite is more likely: The transaction will make the Canadian wireless industry less susceptible to any coordination and more competitive.

120. To understand how coordinated effects analysis fits in with the discussion thus far in my report, note that Prof. Miller's merger simulation model is a "unilateral effects" model, meaning that it holds the nature of competition fixed. Specifically, it assumes that firms compete according to the Bertrand model of competition with Nash Equilibrium in prices.[96] In contrast, when evaluating coordinated effects resulting from a merger transaction, the question is whether the merger will *change the nature of competition* in the industry such that it becomes less intense (or "softer"). That is, one does not assume that competition will remain as Bertrand in prices, but rather considers whether the merger may change the nature of competition to a form that is less competitive.

---

95 *See* Miller Report, Section 4.3.

96 This means each firm chooses an optimal price to maximize their individual profits, holding the prices charged by all other firms constant.

121. As with unilateral effects, the relevant question with respect to coordinated effects arising from a merger is to what extent the merger would increase the likelihood of such effects. I see no reason to expect the transaction to increase the likelihood of coordination. To the contrary, under Quebecor's ownership, Freedom will be incentivized to compete more aggressively than Freedom does today. I reach this conclusion for the following reasons:

- First, the characteristics of the Canadian wireless industry are not conducive to coordinated behavior; this is both currently and increasingly true given the dynamic changes affecting the Canadian wireless industry, including the rollout of 5G. (Subsection A).
- Second, and most importantly for analyzing the transaction, analysis of Freedom's incentives following the divestiture shows the divestiture will create strong incentives for Freedom under Quebecor's ownership to compete more aggressively, and thus is likely to disrupt any coordination that may exist today. Put simply, a transaction that creates substantial excess capacity—as this one does for Freedom—creates new incentives to, and more likely to, disrupt coordination, not facilitate it. Freedom's launch of its Big Gig plan five years ago only demonstrates how the transaction could give Freedom similar incentives to behave aggressively going forward. (Subsection B).
- Finally, Prof. Miller has not identified, let alone quantified in any reliable way, coordinated effects related to Shaw Mobile's transfer. In fact, this empirical analysis of the launch of Shaw mobile yields the opposite conclusion, once corrected. (Subsection C).

A. THE ABILITY TO COORDINATE EFFECTIVELY IS HINDERED BY INDUSTRY CHARACTERISTICS

122. According to the standard economic framework of coordinated effects, in order for firms to successfully engage in coordinated behavior to soften competition, all of the following conditions must hold:[97]

- Condition 1: A sufficient number of firms need to be able to reach a tacit agreement on their actions—or at least a tacit understanding of how they each need to behave—to soften competition;
- Condition 2: The coordinating firms would need to have effective means of monitoring each other's compliance with the tacit agreement; and
- Condition 3: The coordinating firms would need to have credible means of punishing other firms for violating the tacit agreement, and these punishments need to be sufficient to outweigh the gains to the deviating firm.

123. In the remainder of this subsection, I demonstrate that the Canadian wireless industry does not have the necessary characteristics to satisfy these conditions in order to support effective coordination. I then show that future developments in the Canadian wireless industry will make it even harder for firms to coordinate.

---

97 *See* the seminal paper on this by George Stigler, "A Theory of Oligopoly." *Journal of Political Economy* 72 (1964), Vol. 1, No. 1, pp. 44-61. Reprinted as Chapter 5 in George Stigler, The Organization of Industry. Homewood, IL: Richard D. Irwin, 1968, 39–63. These conditions are consistent with the first set of circumstances that are required for coordinated behavior to be sustainable that are described by the Competition Bureau in the Merger Enforcement Guidelines, at ¶6.26.

1. Current industry characteristics

124. Conditions 1 and 2—regarding reaching and monitoring a coordinated agreement—tend to be more easily met for commodity products, something wireless service is not. Instead, mobile wireless carriers pursue complicated, multidimensional strategies.[98] Service providers offer a variety of different rate plans, each of which has several different parameters, such as multi-line discounts, free roaming outside Canada, equipment subsidies and bundling with other services (*e.g.*, music or video subscriptions, such as Apple Music and Disney+). The fact that some firms bundle their mobile wireless services with other products, such as wireline internet access, cable television, and home phone service—which themselves vary substantially across providers—further increases the complexity of reaching and monitoring a tacit understanding between competitors. This follows for many reasons including the fact that, even if there were a tacit agreement on one element of competition—for example, price of wireless—the underlying competitive dynamics of the industry would still be expected to win out, but simply taking the form of more competition on other dimensions (*e.g.*, discounts, bundling terms, and so on) from which consumers also benefit.

125. Wireless firms also compete over various elements of customer care, marketing strategies, and store locations, providing further mechanisms to continue to compete aggressively for customers, even if there were a tacit agreement on price competition. Customer care quality can be particularly difficult to observe and measure and is also multidimensional and may

---

98 The Bureau noted the differences in carriers' strategies in its submission to the CRTC, explaining that "Wireless service offerings can vary, with each provider selling a particular range of service plans." Telecom Notice of Consultation CRTC 2019-57 – Further Comments of the Competition Bureau, at ¶21.

include "customer base retention offers."[99] Therefore, coordination with respect to customer care and other dimensions of customer service quality would be more difficult to monitor than list prices. Even if wireless providers could coordinate on price, they would be likely to compete away excess profits via competition on service quality, thus eliminating incentives to coordinate in the first place and offsetting any harms were coordination to occur.

126. Service providers' competitive strategies also include network investments (which impact network coverage and capacity), innovation, and the range and types of devices supported by the networks.[100] Network investment is multi-dimensional, involving, among other things, deploying spectrum, adding sectors or cell sites, and adding small cells. This not only adds to the complexity of reaching a tacit understanding (related to Condition 1), but it also complicates the ability to monitor deviations from coordination (related to Condition 2).

127. Monitoring network investments is difficult for several other reasons. Providers cannot easily monitor rivals' network investment expenditures or the impact of those expenditures on rivals' network quality. Although some network investment expenditures are public information, such information is typically available only on an aggregated basis at the national level and reported with a lag relative to the timing of the actual investment. Even after aggregate

---

99 *See*, for example, Bell Canada which refers to its "customer base management" efforts as influencing an overall reduction in its churn: "For full-year 2019, postpaid churn decreased 0.03 percentage points to 1.13%, reflecting Bell's mobile network quality and focus on subscriber base management." Bell Canada explained that its efforts were undertaken to respond to "seasonally high level of competitive intensity" and "aggressive competitor promotions. Link: https://www.bce.ca/news-and-media/releases/show/bce-reports-2019-q4-and-full-year-results-announces-2020-financial-targets-1.

100 According to Telecom Regulatory Policy CRTC 2021-130, "Wireless carriers that add capacity in order to expand their coverage enhance their networks and compete for customers by increasing and innovating in the plans and features they offer" (at ¶290).

investment is reported, the geographic areas where network investment takes place and the effect of that investment on network capacity and performance are not public information. Such effects can be detected only imperfectly through business intelligence collection, and the relationship between the amount invested in the network and network performance levels is not subject to easy or timely monitoring. All of this makes competition on investment more likely and more intense, thus strengthening the point that such competition would undo attempts to coordinate on price or offset harms were such coordination to occur (by lowering the quality-adjusted price). Given the obvious importance of network quality to wireless competition, these considerations regarding the difficulty of coordinating on such quality are particularly important here.

2. Future industry disruptions (not related to the merger)

128. It is difficult to coordinate on quality even in a static world. It is yet harder when the demands for various elements of product quality are changing due to innovation and technological evolution. The introduction of 5G—accompanied by massive investments by industry participants—will create an industry "shock" that would disrupt any existing coordination (if any), will make monitoring an agreed-upon equilibrium (if any) harder, and will give firms a stronger incentive to deviate from such an equilibrium (if any).

129. The race to 5G will create strong incentives for competition to remain intense, especially since deployment levels of the different carriers cannot move exactly in parallel during the rollout due to varying complexities in rolling out 5G among networks. In such a situation, coordination is effectively impossible: Individual carriers will move ahead or fall behind on the race to 5G as part of the process, but there would likely be no way for other carriers to tell that

apart from cheating on the agreement, causing any coordination to fall apart. Among the effects of 5G rollout will be:

- Marginal costs for serving a GB of traffic will fall as 5G is rolled out, making it profit-maximizing to adjust the price per GB of data downward, but costs will fall at different rates for different carriers.
- Consumer preferences will shift as new applications develop (*e.g.*, the Internet of Things), which would make it harder to coordinate on the design of new rate plans, or plan elements, to accommodate these new applications.
- Network quality levels will shift over time and across network operators, which can affect the network operators' optimal price levels and can make monitoring of competition on network quality much more difficult.
- Finally, a firm that moves ahead of others in 5G deployment will have every reason to monetize its investments by aggressively poaching competitor subscribers. Such a carrier will face little risk of deterring retaliation by other carriers because of its quality lead (*i.e.*, Condition 3 will become even less likely to be met).[101]

B. THE SALE OF FREEDOM WILL MAKE COORDINATION LESS LIKELY

130. While the factors described above explain why effective coordination is unlikely in general in the wireless industry—and will become less likely over time—the most important

[101] The effects of technology in the wireless sector on the nature of competition was also acknowledged by the Court in the Sprint/T-Mobile merger litigation in the United States ("Considering also the rapidly changing nature of mobile wireless technological offerings, opportunities for innovation and differentiation may abound and materially alter the terms of competition." *See* State of New York et al. v. Deutsche Telekom et al., United States District Court, Southern District of New York, 19 Civ. 5434, Decision and Order, February 11, 2020, p. 132.)

conclusion when analyzing the transaction is that the sale of Freedom is likely to *reduce* the risk of coordination and intensify competition, not increase it.

1. No forward-looking conclusions could be drawn from the launch of Freedom's Big Gig plan

131. It is difficult at best to draw forward-looking conclusions from one isolated event that occurred five years ago, particularly in such a fast-moving industry. While at the time of its launch in 2017, Freedom's Big Gig plan was considered a substantial shift in the industry, the fact that Shaw made such a shift *once* in the past does not imply that Shaw will or can offer similarly attractive plans in the future. And as I discuss below, it definitely does not mean it is less likely to do so if the transaction were to take place than without the transaction. In fact, it is quite the opposite—the capacity increases (relative to the number of subscribers) and the cost savings that Freedom will experience due to the transaction puts it in a *better* position to play such a role again (and a position more like the one it was in when it launched the Big Gig plan in the first place, with substantial excess capacity).

132. To understand this conclusion, the Big Gig plan needs to be put in context of the time it was offered. Freedom started offering this plan in 2017 following the launch of its LTE network.[102] At the time, Shaw re-farmed a portion of its AWS-1 spectrum from 3G to 4G LTE as well as deployed its newly acquired 2.5 GHz for 4G LTE,[103] resulting in a big improvement to coverage in urban areas (which was previously spotty). The spectrum additions to 4G LTE also

---

102 In addition, Freedom was able to sell iPhones on its network for the first time in this time period, making its service more attractive to subscribers. *See* https://globalnews.ca/news/3875605/freedom-mobile-iphone-x-iphone-8/.

103 *See* Mobile Syrup, "Freedom is enabling LTE for customers with grandfathered 3G plans", November 7, 2017, available at https://mobilesyrup.com/2017/11/07/freedom-enabling-lte-customers-grandfathered-plans/.

increased Freedom's network capacity substantially, meaning that the marginal cost of serving new subscribers was very low. These circumstances came together to create an incentive to decrease the cost per GB, as implemented in the Big Gig plan. Indeed, this experience is a demonstration of the fact that increases in network capacity and decreases in network costs, such as the transaction yields, create incentives to compete more aggressively.

133. As highlighted in the announcement of this plan, Shaw used the Big Gig event to market an increase in its network quality, expanding consumers' ability to stream music and video, conduct video calls, and use message applications outside of traditional text messaging, all of which were enabled by its LTE network launch.[104] However, given the changes occurring since then in the wireless industry, the experience in other countries, and the introduction of 5G, it seems clear that the move to larger data allowances would ultimately have occurred regardless of Freedom's Big Gig plan. And it is clearly the case that the shifts that have occurred towards unlimited data are now irreversible, so this single disruption by Freedom years ago cannot anyhow be undone by the sale of Freedom to Quebecor.

134. In fact, the most recent major quality improvement in the industry was not launched by Shaw but by Rogers in mid-2019, with its introduction of Infinite Plans into the marketplace.[105] This was not triggered by Shaw's Big Gig event as it was launched almost two years later and also in areas without Freedom's presence. It was followed by Bell and Telus and led to

---

104 *See* Freedom Mobile, "Life is a Big Gig, Live it with Freedom: Freedom Mobile Gives Canadians 10 GB for only $50", October 17, 2017, available at https://www.globenewswire.com/news-release/2017/10/17/1284666/0/en/Life-is-a-Big-Gig-Live-it-with-Freedom-Freedom-Mobile-Gives-Canadians-10-GB-for-only-50.html.

105 *See* https://about.rogers.com/news-ideas/rogers-introduces-infinite-wireless-data-plans-no-overage-charges/.

significant increases in data usage. Hence, there is no support for the claim that Shaw has been unique in introducing quality improvements into the market.[106]

2. Freedom will have strong incentives to be disruptive after the transaction

135. In Section III, I discussed Prof. Miller's merger simulation model that assumes Freedom's divestiture. He labeled this as "Model with a Perfect Transfer Divestiture." Consistent with this label, Prof. Miller suggested that the results of his model are conservative, because he believed that Freedom's transfer to [redacted] (which was the relevant purchaser at the time) would be less than "perfect" in the sense that Freedom will be weakened. Regardless of whether this was true for a sale of Freedom to [redacted] the sale to Quebecor reverses this conclusion. Therefore, what he calls a "perfect transfer" is in fact highly conservative (*i.e.*, prone to overstating the potential adverse effects of the transaction) because it ignores the fact that Freedom will be more competitive after its sale to Quebecor. This will occur for several reasons.

136. Most importantly, the sale of Freedom to Quebecor will put Freedom in a position in which it will have substantial excess capacity and thus both the incentives and the ability to be more aggressive in the market. Following the transaction, Freedom will remain with the same network, but it will have fewer subscribers in AB and BC. [redacted]

---

106 Prof. Miller also claimed that parties' announcements of promotion end dates may support coordination (Miller Report at ¶25). Conceptually, promotion expiration announcements should be viewed differently from regular price increase announcements. Promotions, unlike price increases, are beneficial to consumers. So even if firms did use coordinated tactics to "test" the end of promotions in the way that is alleged, the existence of the promotion in the first place is beneficial. Therefore, the existence of a strategy to determine when to end the promotion could *benefit* consumers by making promotions more attractive for companies to initiate in the first place.

Quebecor's spectrum, and it will have lower marginal costs due to the marginal costs savings I discussed above. Each of these forces will provide Freedom a strong incentive to grow its subscriber base. There is clear resemblance between this dynamic—that is, a significant amount of spare network capacity post-transaction—and Freedom's situation in late 2017, when it launched its 4G LTE network and its Big Gig plan.

137. Prof. Miller also claims that a small firm has stronger incentives than a large firm to price aggressively.[107] I do not agree that a smaller firm *always* has an incentive to price more aggressively than a larger firm.[108] Nevertheless, if it is true that a smaller carrier has, all else equal, a larger incentive to behave as a maverick, then the sale of Freedom to Quebecor should only make it more aggressive, not less. Because of the transfer of Shaw Mobile's subscribers, Freedom will be smaller following the transaction than Shaw's wireless business today.

138. Finally, it is my understanding that [redacted]

---

107 *E.g.*, Miller Report Section 6.1.1. starting on p. 37.

108 In particular, this will depend on the ability to discriminate between new and existing subscribers and the ability of a small firm to "punch above its weight," *i.e.*, attract new subscribers disproportionally to its current size.

109 *See* The Globe & Mail, "Quebecor launches discount wireless brand 'Fizz', September 13, 2018, available at https://www.theglobeandmail.com/business/article-quebecor-launches-discount-wireless-brand-fizz/.

139. For all these reasons, Freedom will have stronger incentives and increased ability to be disruptive following the transaction and the divestiture than before.[110]

C. THE TRANSFER OF SHAW MOBILE TO ROGERS WILL NOT INCREASE THE RISK OF COORDINATED EFFECTS

140. Prof. Miller suggests that beyond the unilateral effects of the transaction captured (according to him) by his merger simulation model, the transfer of Shaw Mobile to Rogers increases the risk of coordinated effects. He supports this claim by what he claims is empirical evidence of increased usage and reduced price per GB by Bell, Virgin and Freedom following Shaw Mobile's launch ("SM launch").[111]

141. As I explain in this section, his analysis is incorrect and actually proves the opposite of what he claims that it proves; that is, it proves that there was *no* increased usage or reduced price associated with the SM launch, thus refuting his own argument using his own method. I also explain why regardless of this analysis, coordinated effects should not be a concern following the transfer of Shaw Mobile subscribers to Rogers.

1. Prof. Miller's analysis of the impact of Shaw Mobile's launch is incorrect

142. In paragraphs 116-125 and in Exhibits 13-16 of his Report, Prof. Miller conducts a "case study" in which he analyzes data usage and price per GB for Bell, Virgin, and Freedom, and

---

110 It is also noteworthy that Prof. Miller's merger simulation model predicts a drastic [redacted]

111 Prof. Miller also presents analysis of the *number of new data subscribers* before and after SM launch, but the relevancy of this analysis is unclear to me, and in any case, Prof. Miller's Exhibits 11 and 12 clearly show there was [redacted] in trend following SM launch, implying SM launch had no discernable impact on the number of new subscribers.

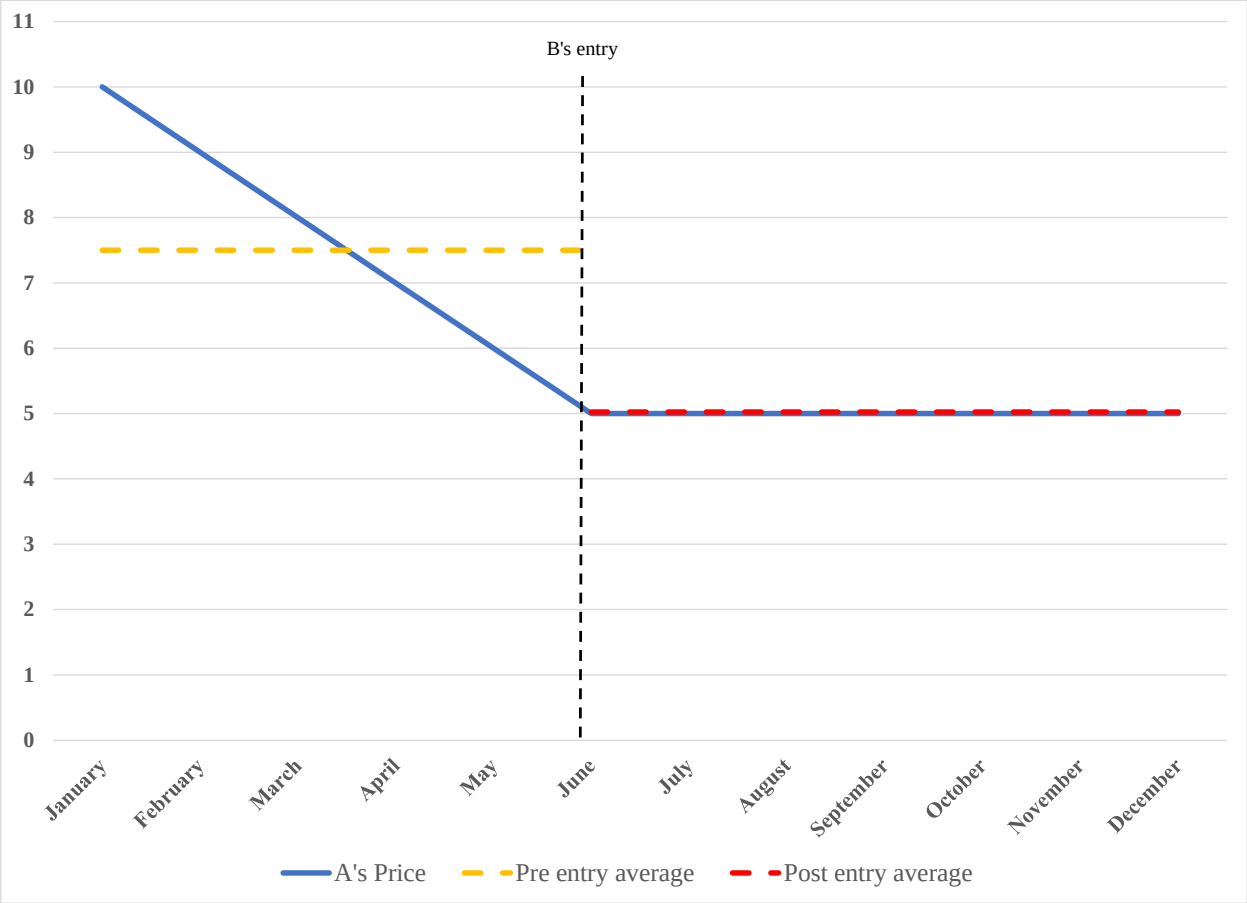
compares these measures before the SM launch to these measures afterwards. He claims to find that the cohort of subscribers who joined after the launch used substantially more data and paid substantially less per GB than those who joined before the SM launch. He presents his results both graphically (Exhibits 13 and 15) and using group averages and statistical tests (Exhibits 14 and 16).

143. On their face, Prof. Miller's findings seem dramatic in their magnitude: He finds an increase in data usage of up to [redacted] a drop in price per GB of up to [redacted] following the SM launch. But these findings are spurious and misrepresent the actual patterns of data usage and pricing around the time of the SM launch. What Prof. Miller fails to account for in his analysis is the fact that if one were to take *any* trending variable and choose *any* arbitrary cutoff point, then one would find a difference between the average of that variable before the cutoff and afterwards. In such a case, it would be completely wrong to assign the difference in the averages to an event at the time of the cutoff. Doing so would be akin to measuring a child throughout kindergarten and throughout first grade, noting that her average height in first grade is 2 inches higher than her average height in kindergarten, and concluding that going to first grade increases height.

144. In fact, one would find differences between the "before" and "after" periods even if the variable *stopped* trending at the cutoff. Take the following simplified example. Imagine the price of product A was $10 in January, $9 in February, $8 in March, $7 in April, $6 in May, and then $5 starting at June and throughout the year. Let's assume that product B entered the same market midyear. The results of a before-after analysis of the type performed by Prof. Miller would show that A's average price before B's entry was $7.5 (the average of January to June), while the average afterwards was just $5. It would therefore conclude that B's entry reduced A's

price by 33% from $7.5 to $5. But in fact, the exact opposite occurred: A's price, in this example, *stopped* declining following B's entrance so if anything, B had a *positive* impact on A's price. Figure 4 below provides a graphical representation of this.

Figure 4: Illustration of Prof. Miller's event study fallacy



145. This fallacy is not just a theoretical concern: As I show in the remainder of this section, this is exactly what happens in Prof. Miller's analysis. I demonstrate this for Bell and Virgin, the only Shaw Mobile competitors that Prof. Miller analyzes.[112]

---

112 Prof. Miller also performs similar analysis for Freedom. But since Freedom is not Shaw Mobile's competitor (it is also owned by Shaw), its relevance is less clear. Also, Freedom data demonstrates anomalies, [redacted]

146. The easiest way to demonstrate this is to repeat Prof. Miller's **exact same analysis**, with his **exact same data**, but to simply "decompose" the "before SM launch" and the "after SM launch" cohorts presented by Prof. Miller in his exhibits into the different months over which they are averaged.[113] For example, the line labelled "Feb-20" in Figure 5 below tracks the data usage over time of all Bell subscribers who joined Bell in February 2020 (the "Feb-20 cohort").

147. What is immediately apparent is that all cohorts move generally together over time. This is expected, as they are all affected by the same "shocks" over time (*e.g.*, covid related factors that affect data usage of subscribers of all cohorts). This, by itself, is not relevant for the analysis. The striking result—which is clearly visible from all four charts below—is that in almost all cases, every successive cohort uses more data than the previous cohort did (Figure 5 and Figure 6) and pays less per GB than previous cohorts did (Figure 7 and Figure 8). For example, looking at the price per GB charts, new cohorts started at a lower price than the previous ones, and generally stayed at lower prices. This trend started before the SM launch and did not intensify afterwards, meaning that this trend had nothing to do with the SM launch. It makes clear why Prof. Miller's two cohort charts are misleading.

[redacted] Nevertheless, I present similar analysis for Freedom in Appendix B. Though a bit less clear, the findings for Freedom are qualitatively similar to Bell and Virgin and show that no conclusion could be drawn that SM launch led to an increase in Freedom's subscriber data use or a drop in the price they pay per GB.

113 Using an analogy from the numerical example above, instead of just presenting the $7.5 for the before period and $5 after, I present prices in every month, which allows seeing the full picture.

Figure 5: Data Usage by Activation Cohort, Bell Mobility

Source: Prof. Miller's backup materials.

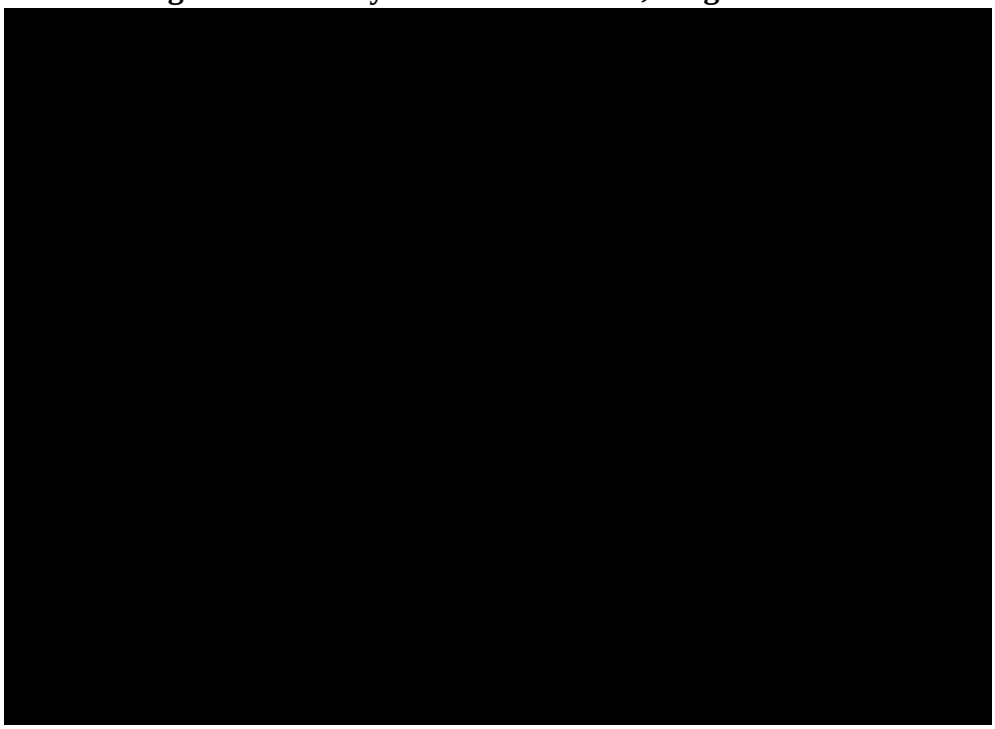
Figure 6: Data Usage by Activation Cohort, Virgin Mobile

Source: Prof. Miller's backup materials.

Figure 7: Price by Activation Cohort, Bell Mobility

Source: Prof. Miller's backup materials.

Figure 8: Price by Activation Cohort, Virgin Mobile



Source: Prof. Miller's backup materials.

148. Next, I present *the exact same information as in Figure 5 to Figure 8*, but further simplify the exposition by replacing every cohort by a single data point that represents the average for that cohort, after controlling for trends that affect all cohorts similarly (and are therefore not relevant for the analysis). This is done by regressing the dependent variable (monthly data usage for Figure 9 and Figure 10, price per GB for Figure 11 and Figure 12, both in logs[114]), against (i) time fixed effects (*i.e.*, a fixed effect for all subscribers of all cohorts in February 2020, a fixed effect for all subscribers of all cohorts in March 2020, and so on), and (ii) cohort fixed effects (*i.e.*, a fixed effect for all subscribers who *joined* in February 2020, a fixed effect for all subscribers who *joined* in March 2020, and so on).

149. The time fixed effects control for changes that are similar across all cohorts and are therefore of no interest in this analysis as of themselves. The cohort fixed effects represent the differences in the dependent variable, in percentages (approximately), between the different cohorts after controlling for factors that affected all cohorts. *These are the coefficients of interest for the analysis*. So, for example, if in Figure 9, the March 2020 data point is 0.1 higher than the February 2020 data point, which means that subscribers who joined in March 2020 used, throughout the analysis period, about 10% more data than subscribers who joined in February 2020, after controlling for common trends of all cohorts. These charts thus correspond exactly to the question that Prof. Miller set out to analyze, but again allow decomposing the "before SM launch cohorts" and the "after SM launch cohorts" into the months over which they are averaged, while keeping the charts tractable.

---

[114] Using a log transformation of the dependent variable is standard for these regressions. It allows interpreting the coefficients in percentages.

150. I run the regressions separately for each province. I then plot the cohort fixed effects in Figure 9 to Figure 12. Figure 9 shows that data usage by Bell subscribers increased for cohorts who joined before SM launch *and plateaued for those who joined afterwards*—which is the exact opposite of Prof. Miller's conclusion that SM launch increased data usage (and a similar situation to my simplified numerical example above). For Virgin Mobile subscribers (Figure 10), the usage did in fact increase significantly for cohorts signing up in September 2020, right after the SM launch, but there was also a comparable increase in data usage for cohorts joining in March 2020; however, the increase in March 2020 was *permanent* while the increase after Shaw Mobile's launch was quickly *reversed* for subscribers joining in the following months. This indicates that SM launch had at most a one-cohort-month effect on data usage.

151. Figure 11 and Figure 12 show that price per GB decreased consistently for cohorts signing up throughout 2020 for both Bell and Virgin Mobile; there is clearly no change in the trend around SM launch, meaning SM launch had no effect.

152. Another important fact is the similarity in trends between AB and BC on the one hand, and ON on the other hand. This is true in all four figures. Since Shaw Mobile was not launched in ON, if any of these trends could be attributable to Shaw Mobile's launch, one would expect ON to behave differently than AB and BC: either experience no SM launch effect at all or at most experience a much smaller knock-on effect. But since the behavior in all three provinces is practically identical, this as well refutes the idea that Shaw Mobile's launch had any effect on data usage or on price per GB.

Figure 9: Activation Cohort Fixed Effect Coefficients, Bell Mobility Data Usage

Source: Prof. Miller's backup materials.

Figure 10: Activation Cohort Fixed Effect Coefficients, Virgin Mobile Data Usage

Source: Prof. Miller's backup materials.

Figure 11: Activation Cohort Fixed Effect Coefficients, Bell Mobility Price

Source: Prof. Miller's backup materials.

Figure 12: Activation Cohort Fixed Effect Coefficients, Virgin Mobile Price

Source: Prof. Miller's backup materials.

153. Finally, I replace the optical representation by regression analyses. These analyses are similar in nature to Prof. Miller's simple group comparisons presented in his Exhibits 14 and 16, but it allows adding controls in order to understand what is driving the difference between the two cohort groups that he compares. In each regression, I regress the dependent variable (again, monthly data usage or price per GB, both in logs) against (i) an SM launch indicator,[115] which captures the average difference between the cohorts before the SM launch and the cohort afterwards after controlling for the control variables, (ii) province fixed effects (which control for differences between provinces), (iii) time fixed effects (fixed effects for every month that control for changes that affect all cohorts), and, in some regressions, (iv) trend variables or product fixed effects, as explained below.

154. These regressions are a more rigorous way of performing the comparison of averages done by Prof. Miller in his Exhibits 14 and 16, with the coefficient on the SM launch indicator representing the difference between the two groups of cohorts that Prof. Miller compares. However, there are some benefits in running the analysis in a regression format instead of just comparing means of groups as Prof. Miller did. First, running the analysis in regression format allows me to pool all the provinces into one regression analysis while controlling for the differences between provinces using province fixed effects. This pooling, by itself, is not material for the results (as Figure 9 to Figure 12 show, the trends across all provinces are almost identical), but it reduces the number of regressions that need to be run and increases the sample size. Second, it allows me to include month fixed effects. The month fixed effects themselves

[115] This variable gets a value of zero for cohorts before the SM launch and a value of one for cohorts afterwards.

are also not material for the results, but the advantage in including them is that they allow me to compare a longer time period than Prof. Miller did: I can compare all months that have data for both before the SM launch cohorts and after the SM launch cohorts without the risk of biases due to later cohorts missing data for earlier months. While Prof. Miller only compared usage and price per GB over the December 2020 – February 2021 time period, I compare the cohort groups for a much longer time period: between August 2020 (just after the SM launch) and February 2021.

155. Third, and most importantly, using regression analysis allows me to include a time trend or product fixed effects as controls. By including these controls, I can see how they affect the coefficient on the SM launch indicator, and hence diagnose what has been driving the differences between the "before SM launch" and the "after SM launch" cohorts (which is what this coefficient represents). I explain this further below.

156. For each measure and brand, I present three sets of regressions. The first set of regressions uses Prof. Miller's approach that ignores trends. The results are presented in Table 8 below. They do not include trend variables or product controls and are therefore the most similar to Prof. Miller's analysis (and suffer from the same flaws). As shown below, this approach seemingly shows that Shaw Mobile's launch increased data usage by [redacted][16] for Bell

---

[116] Coefficients on indicator variables in a logistic regression are converted into percentages by doing an exponential transformation, *i.e.*, taking the exponential of the coefficient and subtracting 1. [redacted] Note that for coefficients that are close to zero, this transformation does not make a big difference and the coefficient itself could be interpreted as an approximation of the percentage difference between the groups.

(regression (1)) and by [redacted] for Virgin (regression (2)), and reduced price per GB by [redacted] for Bell (regression (3)) and by [redacted] for Virgin (regression (4)). As expected, these numbers are fairly close to the average across provinces of Prof. Miller's findings shown in his Exhibits 14 and 16, as the exercise is fairly similar. But the next two sets of regressions prove his interpretation is completely wrong.

Table 8: Regressions using Prof. Miller's incorrect approach

[redacted]

Source: Prof. Miller's backup materials.

157. In the second set of regressions, I add cohort trend variables (linear and logged) to the regressions.[117] These trend variables capture differences between cohorts that occurred consistently throughout the data period and are therefore independent of the SM launch, and thus are important controls for a reliable analysis. That is, after including the trend variables, the SM launch indicator shows whether Shaw Mobile's launch impacted the dependent variable *on top* of the pre-existing trend. Table 9 below shows the results of this analysis, which are drastically different from the results of the regressions without trend variables shown in Table 8. Now, the

[117] The linear variable is equal to 1 for the first cohort, 2 for the second cohort and so on. The logged trend variable is the same, but the counts are logged. Including both of these variables allows controlling for trends that are not exactly linear.

[redacted] For Virgin, I find the opposite signs but also very small magnitudes. The average data and price coefficients across the two brands is almost exactly zero.[118] These findings, which are consistent with Figure 5 to Figure 12 above, are yet another way to illustrate that Prof. Miller's averaging approach incorrectly attributes trends that are independent of Shaw Mobile's launch to Shaw Mobile's launch.

Table 9: Regressions using Prof. Miller's approach with added trend variables

[redacted]

Source: Prof. Miller's backup materials.

158. While the findings in Table 9 are sufficient to refute Prof. Miller's findings, I perform additional analyses to better understand what is responsible for the upward trend in data usage and the downwards trend in price per GB for successive cohorts. There are three potential hypotheses for explaining these trends: (a) new plans were introduced with better value (more data for the same price or the same data for lower price); (b) the price of existing plans decreased for newer subscribers (or they were given data bonuses without increasing the price), and (c) new

[118] The fact that the coefficients are not exactly zero shows that there is some "noise" in the analysis. This is fairly negligible, what matters for the results is the very small magnitude of the coefficients.

subscribers chose plans that existed before SM launch (and whose prices haven't changed), but they chose plans with larger data allowances and therefore lower prices per GB.[119]

159. The data do not support explanation (a): I find that of the subscribers who joined Bell after SM launch, [redacted] chose plans that existed before SM launch. The analogous number for Virgin is [redacted].

160. Next, to distinguish between explanations (b) and (c), I run the third set of regressions that adds product fixed effects[120] to the regressions. Once these are added, the regressions capture how the dependent variables (data usage or price per GB) changed *for the same plans* for newer subscribers. The results are presented in Table 10 below. For data usage, I find a *decrease* for Bell and no change for Virgin between the pre-SM launch and the post-SM launch cohorts. For price per GB, I find a very small decline between the two periods, which is negligible compared to the respective coefficients in Table 8. This means that the price per GB *of the same plans* did not go down for newer subscribers, ruling out explanation (b). It therefore leaves explanation (c) as the only possible explanation of the observed trends in usage and in price per GB: Subscribers joining after SM launch chose plans that existed (and were priced similarly) before SM launch, but they chose plans with higher data allowances. As I have shown, this trend occurred throughout the year and not specifically after Shaw Mobile's launch, so it could not be attributed to Shaw Mobile's launch. And in any case, there is no plausible explanation for why the launch of Shaw Mobile could be the reason why subscribers of

---

119 Price per GB is typically lower for higher data allowance plans.

120 This means that each plan gets a separate indicator variable.

competitors shifted between different plans of these competitors, particularly given that these plans existed both before the launch and afterwards and have not experienced a change in prices.

161. Therefore, the results in Table 10, by themselves, are enough to refute Prof. Miller's findings regarding the SM launch effect, just like the findings in Table 9, by themselves, were enough to do so.

Table 10: Regressions using Prof. Miller's approach with added product FEs

Source: Prof. Miller's backup materials.

2. Additional factors remove concerns of coordinated effects following Shaw Mobile's transfer

162. As I have shown above, Prof. Miller's analysis, once corrected to account for underlying time trends, actually refutes any notion that there was a systematic change in data usage or in price per GB in the industry following Shaw Mobile's launch. However, I should note that, even if there was—contrary to the data—some moderate short-term response of competitors to Shaw Mobile's launch, such a limited competitive response following a new product launch is typical and could not be generalized to predict the effects of a transaction on future competition.

163. Moreover, [redacted] This again demonstrates why it is inappropriate to ignore the wireline market when analyzing the transfer of a product that is part of a wireline-wireless bundle.

164. Finally, as I explained above, Freedom will be more disruptive following the transaction (with fewer subscribers relative its network size), a fact that should ensure the markets in AB and BC will stay competitive and make "disruption" from Shaw Mobile less material.

VI. CONCLUSION

165. To conclude, the analysis of unilateral effects, marginal cost savings, and productive efficiencies analysis presented in Section IV indicates that the transaction will be beneficial to Canadian consumers and will result in substantial welfare gains to the Canadian economy. The analysis of coordinated effects in Section V indicates that the transaction will decrease the

---

121 Scotiabank Equity Research Alert, "[redacted] July 30, 2020, p. 1 and BMO Capital Markets Report, [redacted]," July 30, 2020, p. 1.

likelihood of coordination among competitors, further benefiting Canadian consumers and the Canadian economy.

VII. [redacted]

[redacted]

	Prof. Miller's SOGA			Updated SoS		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

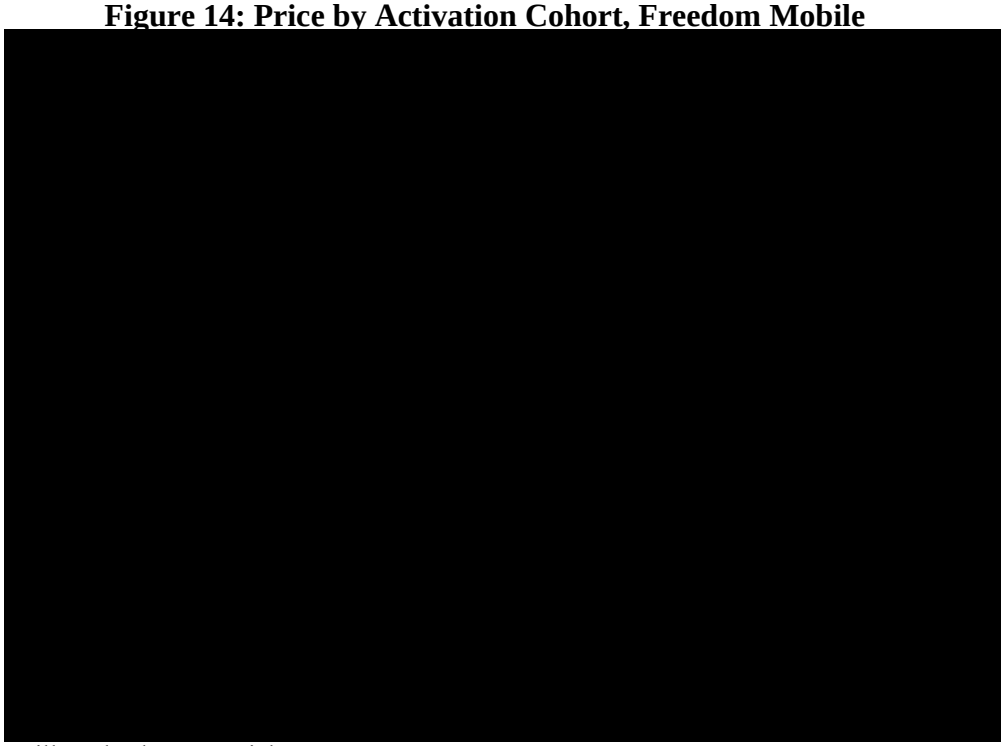
[redacted]

VIII. APPENDIX B: SHAW MOBILE LAUNCH EVENT STUDY RESULTS FOR FREEDOM

Figure 13: Data Usage by Activation Cohort, Freedom Mobile

Source: Prof. Miller's backup materials.

Figure 14: Price by Activation Cohort, Freedom Mobile

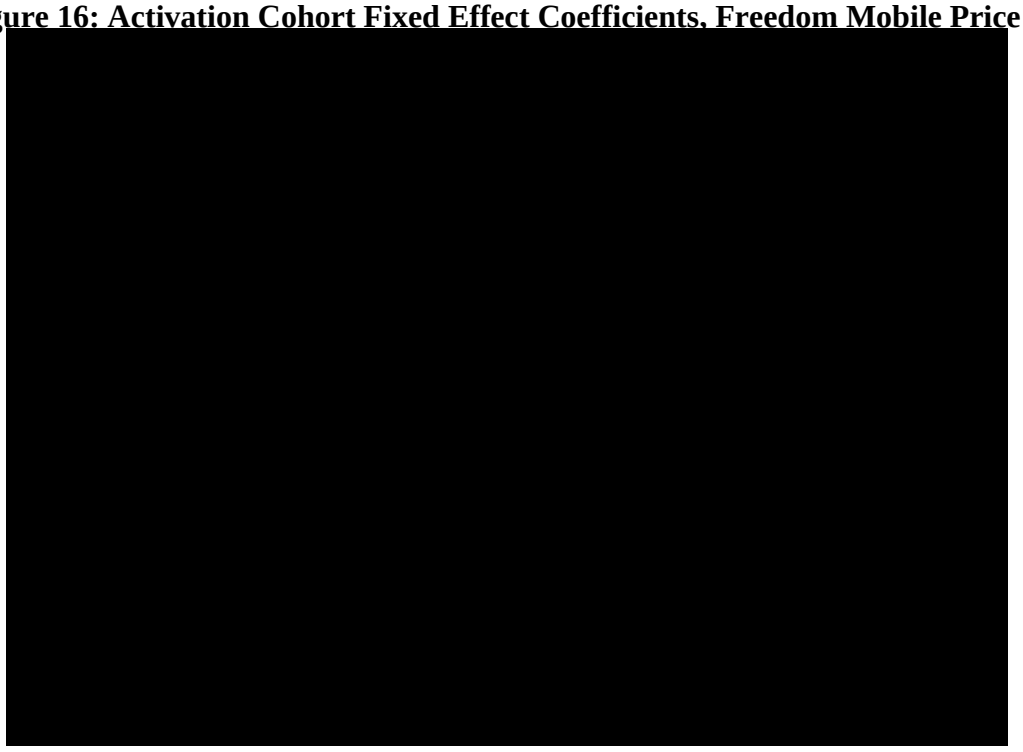


Source: Prof. Miller's backup materials.

Figure 15: Activation Cohort Fixed Effect Coefficients, Freedom Mobile Data Usage

Source: Prof. Miller's backup materials.

Figure 16: Activation Cohort Fixed Effect Coefficients, Freedom Mobile Price



Source: Prof. Miller's backup materials.

This is Exhibit "B" referred to in the Affidavit of Mark Israel sworn by Mark Israel, of the County of Montgomery, in the State of Maryland, in the United States of America, before me by videoconference on September 23, 2022 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.

Commissioner for Taking Affidavits (or as may be)

MATTHEW R. LAW

Exhibit B

Mark A. Israel **September 2022**
Senior Managing Director, Compass Lexecon

[redacted]
Washington, DC 20004
[redacted]
misrael@compasslexecon.com

PROFESSIONAL EXPERIENCE HIGHLIGHTS

- Served as an expert for the Federal Government and private parties in cases involving: fixed and mobile telecommunications, cable television, broadband internet service, airlines, social media, other high technology industries, food distribution, coal and other energy markets, railroads, shipping, health insurance, financial markets, credit cards, retail, and many others.
- Testified in Federal Court, in multiple state courts, in front of the United States Copyright Royalty Judges, in front of international competition authorities, and in arbitration proceedings. Appeared in front of government agencies including DOJ, FTC, and FCC, and state agencies on behalf of numerous clients.
- Submitted expert reports in Federal Court, and affidavits, declarations, and papers to U.S. competition agencies, FCC, DOT, international competition authorities, and state regulators.
- Written numerous academic articles on topics including competition economics, merger policy, telecommunications, airlines, insurance markets, and labor markets. Research published in leading scholarly and applied journals including *The American Economic Review*, *The Rand Journal of Economics*, *International Journal of Industrial Organization*, *The Journal of Competition Law and Economics,* and many others, and presented to business, government, and academic audiences worldwide.
- Co-author of the chapter on Econometrics and Regression Analysis in the ABA Treatise, *Proving Economic Damages: Legal and Economic Issues*, 2017.

AREAS OF EXPERTISE

- Antitrust and competition economics; industrial organization economics
- Applied econometrics
- Economic and econometric analysis of horizontal and vertical mergers
- Economic and econometric analysis of antitrust litigation topics, including: Class certification, damages, and liability issues in cases involving price fixing, exclusive dealing, monopolization, bundling, price discrimination, and exclusionary practices

EDUCATION

- Ph.D., Economics, STANFORD UNIVERSITY, June 2001.
- M.S., Economics, UNIVERSITY OF WISCONSIN-MADISON, August 1992.
- B.A., Economics, ILLINOIS WESLEYAN UNIVERSITY, Summa Cum Laude, May 1991.

EMPLOYMENT HISTORY

Compass Lexecon: *Senior Managing Director*, Head of Compass Lexecon North American Antitrust Practice, January 2016 – Present.

(Previously: *Executive Vice President*, April 2013 – January 2016; *Senior Vice President*, January 2009 – March 2013; *Vice President*, January 2008 – December 2008; *Economist*, January 2006 – December 2007.)

Kellogg School of Management, Northwestern University: *Assistant Professor of Management and Strategy*, 2000 – 2006; *Associate Professor of Management and Strategy*, 2007 – 2008.

State Farm Insurance: *Research Administrator*, 1992 – 1995.

RECENT PROFESSIONAL RECOGNITIONS

Global Competition Review Who's Who Legal, Thought Leader in Competition: 2019, 2020.

Global Competition Review Who's Who Legal, Global Leader in Competition – Economists 2020; Experts – Economics – Competition Economists 2020; Experts – Financial Advisory and Valuation – Quantum of Damages 2020.

Global Arbitration Review's International Who's Who of Commercial Arbitration, Leading Expert Witness, 2018.

LIVE TESTIMONIAL EXPERIENCE

Testimony as Economic Expert on behalf of American Airlines, Inc., In the Matter of *United States of America, et al. v. American Airlines Group Inc. and JetBlue Airways Corporation*, In the United States District Court for the District of Massachusetts, Civil Action No. 1:21-cv-11558-LTS, Deposition: August 22, 2022.

Testimony as Economic Expert on behalf of KOA Corporation and KOA Speer Electronics, Inc., In the Matter between *Sean Allott and Panasonic Corporation; Panasonic Corporation of North American; Panasonic Canada Inc.; KOA Corporation; KOA Speer Electronics, Inc., et al.*, In the Ontario Superior Court of Justice, Court File No. 1899-2015 CP, Deposition: August 16, 2022.

Testimony as Economic Expert on behalf of Arconic, Inc. et al., In the Matter of *Arconic, Corp., and Howmet Aerospace, Inc. v Novelis, Inc., and Novelis, Corp.*, United States District Court for the Western District of Pennsylvania, Case No. 2:17-cv-014340-JFC, Deposition: April 29, 2022.

Testimony as Economic Expert on behalf of Norfolk Southern Railway Corporation, "Reciprocal Switching," In Front of the Surface Transportation Board, Docket No. EP 711 (Sub-No. 1), Live Testimony: March 16, 2022.

Live testimony in front of arbitration panel in confidential arbitration regarding wholesale roaming rate for wireless telecommunications: December 13-14, 2021.

Testimony as Economic Expert on behalf of Nippon Chemi-Con and United Chemi-Con, *In Re Capacitors Antitrust Litigation*, United States District Court for the Northern District of California Division, No. 3:14-CV-03264, Deposition: March 14, 2020; Live Jury Trial Testimony: December 8, 2021.

Testimony as Economic Expert on behalf of Norfolk Southern Railway Company, *In Re Rail Freight Fuel Surcharge Antitrust Litigation*, In the United States District Court for the District of Columbia, MDL No. 1869, Case No. 07-0489 (PLF/GMH), Deposition: November 18, 2021.

Testimony as Economic Expert on behalf of JPMorgan, Goldman Sachs and Glencore, *In Re Aluminum Warehousing Antitrust Litigation*, MDL 2481, In the United States District Court Southern District of New York, No. 16-CV-5955, Deposition: November 5, 2021.

Testimony as Economic Expert on behalf of Cox Automotive, Inc. et al., In the Matter between *Cox Automotive, Inc., Autotrader.com, Inc., Dealer Dot Com, Inc., Dealertrack, Inc.; Homenet, Inc.; Kelley Blue Book Co., Inc.; Vauto, Inc.; Vinsolutions, Inc.; and Xtime, Inc. vs. The Reynolds and Reynolds Company*, American Arbitration Association, Case No. 01-19-0000-4548, Deposition: October 21, 2021.

Testimony as Economic Expert on behalf of the Joint Defense Group, In the Matter between *Cygnus Electronics Corporation and Sean Allott and Panasonic Corporation et al.*, In the Ontario Superior Court of Justice, Court File No. 3795-14 CP, Deposition: September 29, 2021.

Testimony as Economic Expert on behalf of American Express, In the Matter of *B & R Supermarket, Inc., d/b/a Milam's Market, et al., Individually and on Behalf of All Others Similarly Situated v. Visa, Inc., et al.*, In the United States District Court Eastern District of New York, Case No. 117-cv-02738-MKB-VMS, Deposition: August 6, 2021.

Testimony as Economic Expert on behalf of Bio-Rad Laboratories, Inc., In the Matter of *Bio-Rad Laboratories, Inc. and President and Fellow of Harvard College v. 10X Genomics, Inc., and 10X Genomics, Inc. v. Bio-Rad Labs, Inc. and President and Fellow of Harvard College as Counterclaimants*, In the United States District Court for the District of Massachusetts, Civil Action No. 1:19-cv-12533-wgy, Deposition: June 1, 2021.

Testimony as Economic Expert on behalf of Joint Applicants, In the Matter of *TracFone Wireless, Inc. (U4321C), América Móvil, S.A.B. de C.V. and Verizon Communications, Inc. for Approval of Transfer of Control over TracFone Wireless, Inc.*, Public Utilities Commission of the State of California, Application 20-11-001, Opening Testimony: March 12, 2021; Rebuttal Testimony: April 9, 2021; Live Trial Testimony: May 5, 2021; Supplemental Testimony: May 28, 2021.

Testimony as Economic Expert on behalf of Peabody Energy Corporation and Arch Coal, Inc., In the Matter of *Federal Trade Commission v. Peabody Energy Corporation and Arch Coal, Inc.*, In the United States District Court for the Eastern District of Missouri, Civil Action No. 4-20-cv-000317-SEP, Deposition: June 29, 2020; Live Trial Testimony: July 24, 2020.

Testimony as Economic Expert on behalf of Authenticom, Inc., *In Re Dealer Management Systems Antitrust Litigation*, MDL 2817, United States District Court for the Northern District of Illinois Eastern Division, No. 1:18-CV-864, Deposition: January 16-17, 2020.

Testimony as Economic Expert on behalf of Trinity, In the Matter of *Jackson County, Missouri, Individually and on behalf of a class of others similarly situated, v. Trinity Industries, Inc., and Trinity Highway Products, LLC*, In the Circuit Court of Jackson County, Missouri at Independence, Case No. 1516-CV23684, Stage 1 Testimony: May 24, 2017; Stage 2 Deposition: November 14, 2019.

Testimony as Economic Expert on behalf of Joint Applicants, In the Proposed Merger of T-Mobile US, Inc. and Sprint Communications, Inc., Public Utilities Commission, State of California, San Francisco, California, Docket Nos. A.18-07-011 and A.18-07-012, Direct Rebuttal Testimony: January 29, 2019; Live Testimony: February 7, 2019; Direct Supplemental Testimony: November 7, 2019.

Testimony as Economic Expert on behalf of Turner Network Sales, Inc., In the Matter of *DISH Network L.L.C. v. Turner Network Sales, Inc.*, JAMS Arbitration No. 1100103066, Deposition: August 9, 2019; Live Trial Testimony: August 29, 2019.

Testimony of Economic Expert on behalf of Marriott Vacations Worldwide Corporation, et al., In the Matter of *RCHFU, LLC, et al. v. Marriott Vacations Worldwide Corporation, et al.*, In the United States District Court for the Eastern District of Colorado, Civil Action No. 1:16-cv-01301-PAB-GPG, Deposition: July 12, 2019.

Testimony as Economic Expert on behalf of Oscar Insurance Company of Florida, In the Matter of *Oscar Insurance Company of Florida v. Blue Cross and Blue Shield of Florida, Inc., d/b/a/ Florida Blue; Health Options Inc., d/b/a/ Florida Blue HMO; and Florida Health Care Plan Inc., d/b/a/ Florida Health Care Plans*, In the United States District Court Middle District of Florida Orlando Division, Case No. 6:18-cv-01944, Live Preliminary Injunction Hearing Testimony: January 23, 2019.

Testimony as Economic Expert on behalf of Wilh. Wilhelmsen Holding ASA, In the Matter of the *Federal Trade Commission v. Wilh. Wilhelmsen Holding ASA Wilhelmsen Maritime Services As Resolute Fund II, L.P. Drew Marine Intermediate II B.V. and Drew Marine Group, Inc.*, In the United States District Court for the District of Columbia, No. 1:18-cv-00414-TSC, Deposition: May 24, 2018; Live Trial Testimony: June 12, June 13, 2018.

Testimony as Economic Expert on behalf of Joint Sports Claimants, In the Matter of *Determination of Cable Royalty Funds*, United States Copyright Royalty Judges in the Library of Congress, Docket No. 14-CRB-0010-CD (2010-2013), Live Testimony: March 12, 2018.

Testimony as Economic Expert on behalf of Comcast Corporation, In the Matter of *Viamedia, Inc. v. Comcast Corporation and Comcast Spotlight, LP*, In the United States District Court Northern District of Illinois Eastern Division, Case No. 16-cv-5486, Deposition: January 5, 2018.

Testimony as Economic Expert on behalf of Energy Solutions, Inc., In the Matter of the *United States of America v. Energy Solutions, Inc., Rockwell Holdco, Inc., Andrews County Holdings, Inc., and Waste Control Specialists, LLC*, In the United States District Court for the District of Delaware, Civil Action No. 16-cv-01056-SLR, Deposition: April 17, 2017; Live Trial Testimony: May 2, May 3, 2017.

Testimony as Economic Expert on behalf of Facebook, Inc., In the Matter of *Social Ranger, LLC v. Facebook, Inc.*, In the District Court of Delaware, C.A. No. 14-1525-LPS, Deposition: March 6, 2017.

Testimony as Economic Expert on behalf of Regal Entertainment Group, In the Matter of *iPic – Gold Class Entertainment, LLC et al., v. Regal Entertainment Group, AMC Entertainment Holdings, Inc., et al.*, In the District Court of Harris County, Texas, 234th Judicial District, No. 2015-68745, Deposition: January 12, 2016, February 15, 2017; Live Trial Testimony: January 21, 2016.

Testimony as Economic Expert on behalf of Anthem Inc., In the Matter of the *United States of America et al. v. Anthem Inc. and Cigna Corp.*, In the District Court of the District of Columbia, No. 16-cv-01493 (ABJ), Deposition: November 9, 2016; Phase 1 Live Trial Testimony: December 1, December 2, 2016; Phase 2 Live Trial Testimony: December 22, 2016.

Testimony as Economic Expert on behalf of Defendants, In the Matter of *Darren Ewert v. Nippon Yusen Kabushiki Kaisha et al.*, Supreme Court of British Columbia, No. S-134895, Deposition: September 14, 2016.

Testimony in Commercial Arbitration on Issues Related to Mobile Wireless Competition, New York, NY, April 12, 2016.

Testimony as Economic Expert on behalf of Federal Trade Commission, In the Matter of *Federal Trade Commission et al. v. Sysco Corporation and USF Holding Corp.*, Civil Action No. 15-cv-00256 (APM), Deposition: April 28, 2015; Live Trial Testimony: May 7, May 8, May 14, 2015.

Appearances in Federal Communications Commission, Economists Panels:

- Comcast/Time Warner, January 2015
- AT&T/T-Mobile, July 2011
- Comcast/NBCUniversal, August 2010

Appearance before California Public Utility Commission, Public Hearings on Comcast/Time Warner Merger, Los Angeles, April 2015.

Appearance as Economic Expert in front of Department of Justice, Federal Trade Commission, Federal Communications Commission, and State Regulatory Agencies in many additional transactions, including: Danaher/NetScout, AT&T/Leap Wireless, T-Mobile/MetroPCS,

American Airlines/US Airways, SpectrumCo/Cox/Verizon Wireless, oneworld antitrust immunity application, PepsiCo/bottlers, Houghton Mifflin/Harcourt, Chicago Mercantile Exchange/Chicago Board of Trade.

EXPERT REPORTS, AFFIDAVITS, AND DECLARATIONS

Reports of Dr. Mark A. Israel, In the Matter of *Viamedia, Inc. v. Comcast Corporation and Comcast Cable Communications Management, LLC*, In the United States District Court for the Northern District of Illinois Eastern Division, Case No. 16-cv-5486, Rebuttal Report: November 30, 2017; Errata Sheet for Rebuttal Report: January 4, 2018; Rebuttal Report: September 21, 2022.

Expert Declaration of Mark Israel, In the Matter of *Phil Mickelson, Taylor Gooch, Hudson Swafford, et al. v. PGA Tour, Inc.*, In the United States District Court for the Northern District of California San Jose Division, Civil Action No. 5:22-cv-04486-BLF, August 7, 2022.

Expert Reports of Mark A. Israel, In the Matters of *United States of America, et al. v. Google LLC* (Case No.: 1:20-cv-03010-APM), and *State of Colorado, et al. v. Google LLC* (Case No.: 1-20-cv-03715-APM), In the United States District Court for the District of Columbia, Initial Report: June 4, 2022; Rebuttal Report: August 5, 2022.

Expert Report of Mark A. Israel, Ph.D., In the Matter of *United States of America, et al. v. American Airlines Group Inc. and JetBlue Airways Corporation*, In the United States District Court for the District of Massachusetts, Civil Action No. 1:21-cv-11558-LTS, July 11, 2022.

Expert Reports of Mark A. Israel, Ph.D., *In Re Rail Freight Fuel Surcharge Antitrust Litigation*, In the United States District Court for the District of Columbia, MDL No. 1869, Case No. 07-489, Initial Report: April 15, 2021; Surrebuttal Report: May 10, 2022.

Expert Reports of Mark A. Israel, Ph.D., In the Matter of *Arconic Inc. v. Novelis Inc., Novelis Corp.*, In the United States District Court for the Western District of Pennsylvania, No. 2:17-CV-01434, Initial Report: February 11, 2022; Reply Report: March 18, 2022.

Verified Statement of Mark A. Israel, Ph.D., "Reciprocal Switching," Surface Transportation Board, Docket No. EP 711 (Sub-No. 1), February 14, 2022.

Expert Report of Mark A. Israel, In the Matter between *Sean Allott and Panasonic Corporation; Panasonic Corporation of North American; Panasonic Canada Inc.; KOA Corporation; KOA Speer Electronics, Inc., et al.*, In the Ontario Superior Court of Justice, Court File No. 1899-2015 CP, January 17, 2022.

Expert Reports of Mark A. Israel, Ph.D., *In Re Aluminum Warehousing Antitrust Litigation*, In the United States District Court Southern District of New York, MDL No. 2481, Initial Report: September 17, 2021; Supplemental Declaration: January 14, 2022.

Affidavits in confidential arbitration regarding wholesale roaming rate for wireless telecommunications, Initial Affidavit: August 23, 2021; Reply Affidavit: November 15, 2021.

Expert Report of Mark A. Israel, In the Matter of *Bio-Rad Laboratories, Inc. and President and Fellow of Harvard College v. 10X Genomics, Inc., and 10X Genomics, Inc. v. Bio-Rad Labs., Inc. and President and Fellow of Harvard College as Counterclaimants,* In the United States District Court for the District of Massachusetts, Civil Action No. 1:19-cv-12533-wgy, May 14, 2021.

Expert Report of Mark A. Israel, In the Matter of *B & R Supermarket, Inc., d/b/a Milam's Market, Grove Liquors LLC, Strouk Group LLC, d/b/a Monsieur Marcel, and Palero Food Corp. and Cagueyes Food Corp., d/b/a Fine Fare Supermarket v. Mastercard International Inc., Visa Inc., Visa U.S.A., Inc., Discover Financial Services, and American Express Company,* In the United States District Court for the Eastern District of New York, Case No. 17-CV-02738 (MKB) (JO), March 22, 2021.

Expert Report of Dr. Mark A. Israel, In the Matter of *Joshua M. Harman Qui Tam v. Trinity Industries, Inc., et al.,* In the Commonwealth of Massachusetts, Superior Court Department, Civil Action No. 2014-02364-D, February 26, 2021.

Verified Statement of Mark Israel, "Review of Commodity, Boxcar, and TOFC/COFC Exemptions," Surface Transportation Board, Docket No. EP 704 (Sub-No. 1), January 29, 2021.

Expert Report of Mark A. Israel, Ph.D., *In Re Comtech/Gilat Merger Litigation*, Court of Chancery of the State of Delaware, Consolidated C.A. No. 2020-0605-JRS, September 24, 2020.

Declaration of Mark Israel and Allan Shampine, In the Matter of *AMC Networks Inc. v. AT&T Inc.*, Before the Federal Communications Commission, MB Docket No. 20-254, File No. CSR-8993, August 20, 2020.

Expert Report of Mark A. Israel, In the Matter between *Ryan Kett and Mitsubishi Materials Corporation, Mitsubishi Cable Industries, Ltd., Mitsubishi Shindoh Co., Ltd., Mitsubishi Aluminum Co., Ltd., Tachibana Metal Mfg. Co., Ltd., and Diamet Corporation,* In the Supreme Court of British Columbia, Case No. VLC-S-S-1813758, July 15, 2020.

Expert Reports of Mark A. Israel, Ph.D., In the Matter of *Federal Trade Commission v. Peabody Energy Corporation and Arch Coal, Inc.*, In the United States District Court for the Eastern District of Missouri, Civil Action No. 4-20-cv-000317-SEP, Initial Report: May 26, 2020; Reply Report: June 19, 2020.

Expert Reports of Mark A. Israel, Ph.D., *In Re Dealer Management Systems Antitrust Litigation*, United States District Court for the Northern District of Illinois Eastern Division, MDL 2817, No. 1:18-CV-864, Initial Report: August 26, 2019; Reply Report: December 19, 2019.

Expert Reports of Mark A. Israel, Ph.D., *In Re Domestic Airline Travel Antitrust Litigation*, United States District Court for the District of Columbia, MDL Docket No. 2656, Misc.

No. 15-1404 (CKK), Initial Report: September 30, 2019; Rebuttal Report: November 14, 2019.

Expert Reports of Mark A. Israel, In the Matter of *DISH Network L.L.C. v. Turner Network Sales, Inc.*, JAMS Arbitration No. 1100103066, Initial Report: July 23, 2019; Reply Report: August 2, 2019.

Submission of Mark A. Israel, Maya Meidan, and Robert J. Calzaretta, Jr., "The Atlantic Joint Business Generates Substantial Consumer Benefits," Competition and Markets Authority, United Kingdom, July 1, 2019.

Submission of Philip Haile and Mark Israel, "Alternative Approaches to Airport Slot Allocation: Objectives and Challenges," Department for Transport, United Kingdom, June 20, 2019.

Submission of Mark A. Israel, Maya Meidan, and Robert J. Calzaretta, Jr., "The Atlantic Joint Business Has Not Harmed Competition on Nonstop Overlap Routes, Including Focus Routes," Competition and Markets Authority, United Kingdom, June 14, 2019.

Expert Reports of Mark A. Israel, In the Matter of *RCHFU, LLC, et al. v. Marriott Vacations Worldwide Corporation, et al.,* In the United States District Court for the District of Colorado, Civil Action No. 16-01301-PAB-GPG, Initial Report: December 28, 2018; Supplemental Rebuttal Report, June 14, 2019.

Submission of Mark Israel, "The Fidelity/Stewart Merger Does Not Raise Competitive Concerns in the New York Title Insurance Industry," Revised Section 1506 Application Regarding the Proposed Acquisition of Stewart Title Insurance Company by Fidelity National Financial, Inc., New York State Department of Financial Services, April 12, 2019.

Second Report of Dr. Mark A. Israel, Between *UK Trucks Claim Limited and (1) – (5) Fiat Chrysler Automobiles NV and (1) – (4) MAN Truck & Bus AG & ORS,* In the Competition Appeal Tribunal, Case No. 1282/7/7/18, April 11, 2019.

Expert Report of Mark A. Israel, In the Matter between *Ryan Kett, Erik Oun and Jim Wong and Kobe Steel, Ltd., Shinko Metal Products Co., Ltd., Shinko Aluminum Wire Co., Ltd., Shinko Wire Stainless Company, Ltd., Kobelco & Materials Copper Tube Co., and Nippon Koshuha Steel Co., Ltd.,* In the Supreme Court of British Columbia, Case No. S-1710805, March 28, 2019.

Expert Report of Dr. Mark A. Israel, Between *Road Haulage Association and (1) – (10) MAN SE and Others and (1) Daimler AG, (2) Volvo Lastvagnar Aktiebolag,* In the Competition Appeal Tribunal, Case No. 1289/7/7/18, March 22, 2019.

Submission of Robert J. Calzaretta, Jr., Mark A. Israel, and Maya Meidan, "Assessing the Effects of ATI and JV Overlaps on Nonstop Fares: An Event Study Approach," submitted as part of a Supplement to Joint Motion to Amend Order 2010-7-8 for Approval of and Antitrust Immunity for Amended Joint Business Agreement, In the Application of American Airlines, Inc., British Airways PLC, OpenSkies SAS, Iberia Líneas Aéreas de España, S.A., Finnair OYJ, Aer Lingus Group DAC, Before the U.S. Department of Transportation, Washington, DC, Docket DOT-OST-2008-0252-, January 11, 2019.

Declarations of Mark A. Israel, In the Matter of *Oscar Insurance Company of Florida v. Blue Cross and Blue Shield of Florida, Inc., d/b/a Florida Blue; Health Options Inc., d/b/a Florida Blue HMO; and Florida Health Care Plan Inc., d/b/a Florida Health Care Plans,* In the United States District Court Middle District of Florida Orlando Division, Case No. 6:18-cv-01944, Declaration: November 19, 2018; Supplemental Declaration: December 21, 2018.

Reply Declaration of Mark Israel, Michael Katz, and Bryan Keating, In the Matter of Applications of T-Mobile US, Inc. and Sprint Corporation, Consolidated Applications for Consent to Transfer Control of Licenses and Authorizations, Federal Communications Commission, WT Docket No. 18-197, September 17, 2018.

Expert Report of Gustavo Bamberger, Robert Calzaretta, and Mark Israel, In the Joint Application of Hawaiian Airlines, Inc. and Japan Airlines, Co., Ltd., Appendix 6 to "Joint Application for Approval of and Antitrust Immunity for Alliance Agreements," Department of Transportation, Case No. DOT-OST-2018-0084, June 13, 2018.

Expert Reports of Mark A. Israel, In the Matter between *Cygnus Electronics Corporation and Sean Allott and Panasonic Corporation et al.,* In the Ontario Superior Court of Justice, Court File No. 3795/14CP, Initial Report: November 17, 2017; Reply Report: February 23, 2018; Supplemental Report: May 22, 2018.

Expert Report of Mark A. Israel, In the Matter of the *Federal Trade Commission v. Wilh. Wilhelmsen Holding ASA Wilhelmsen Maritime Services As Resolute Fund II, L.P. Drew Marine Intermediate II B.V. and Drew Marine Group, Inc.,* In the United States District Court for the District of Columbia, No. 1:18-cv-00414-TSC, May 11, 2018.

Declaration of Mark A. Israel, In the Matter between *Robert Foster and Murray Davenport and Sears Canada Inc. et al.,* In the Ontario Superior Court of Justice, Court File No. 766-2010 CP, November 1, 2017.

Expert Report of Mark Israel and Bryan Keating, "Economic Analysis of Dr. Evans' Claims as They Relate to *Restoring Internet Freedom*," Federal Communications Commission, WC Docket No. 17-108, October 31, 2017.

Written Rebuttal Testimony of Dr. Mark A. Israel, In the Matter of *Distribution of Cable Royalty Funds,* Before the Copyright Royalty Judges, Washington, D.C., No. 14-CRB-0010-CD, September 15, 2017; Written Direct Testimony: December 22, 2016.

Declaration of Mark A. Israel, Allan L. Shampine, and Thomas A. Stemwedel, In the Matter of *Restoring Internet Freedom,* Federal Communications Commission, WC Docket No. 17-108, July 17, 2017.

Expert Report of Dr. Mark A. Israel, In the Matter of *St. Clair County, Illinois, and Macon County, Illinois, Individually and on behalf of all other counties in the State of Illinois, v. Trinity Industries, Inc. and Trinity Highway Products, LLC,* In the United States District Court for the Southern District of Illinois, Civil Action No.: 3:14-cv-1320, April 25, 2017.

Expert Reports of Mark A. Israel, In the Matter of the *United States of America v. Energy Solutions, Inc., Rockwell Holdco, Inc., Andrews County Holdings, Inc., and Waste Control Specialists, LLC,* In the United States District Court for the District of Delaware, Civil Action No. 16-cv-01056-SLR, Initial Report: March 27, 2017; Rebuttal Report: April 10, 2017.

Expert Report of Mark A. Israel, In the Matter of *Jackson County, Missouri, Individually and on behalf of a class of others similarly situated, v. Trinity Industries, Inc., and Trinity Highway Products, LLC,* In the Circuit Court of Jackson County, Missouri at Independence, Case No. 1516-CV23684, March 24, 2017.

Expert Report of Mark A. Israel, In the Matter of *Honeywell International Inc. v. iControl Networks, Inc. and Alarm.com Holdings, Inc.*, In the United States District Court for the District of New Jersey, No. 2:17-cv-01227, February 26, 2017.

Expert Report of Mark Israel, In the Matter of *Social Ranger, LLC v. Facebook, Inc.*, In the United States District Court for the District of Delaware, C.A. No. 14-1525-LPS, November 23, 2016.

Expert Report of Mark A. Israel, In the Matter between *Darren Ewert and DENSO Corporation et al.*, In the Supreme Court of British Columbia, Vancouver Registry, No. S-135610, November 15, 2016.

Expert Reports of Mark A. Israel, In the Matter of the *United States of America et al. v. Anthem Inc. and Cigna Corp.*, In the United States District Court, District of Columbia, No. 16-cv-01493 (ABJ), Initial Report: October 7, 2016; Supplemental and Rebuttal Report: October 28,2016.

Verified Statements of Mark Israel and Jonathan Orszag, "Review of Commodity, Boxcar, and TOFC/COFC Exemptions," Surface Transportation Board, Docket No. EP 704 (Sub-No. 1), Initial Verified Statement: July 26, 2016; Reply Verified Statement: August 26, 2016.

Declarations of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Analysis of the Regressions and Other Data Relied Upon in the Business Data Services FNPRM And a Proposed Competitive Market Test," Federal Communications Commission, WC Docket Nos. 16-143, 15-247, 05-25, RM-10593, Second Declaration: June 28, 2016; Third Declaration: August 9, 2016.

Expert Declaration of Mark A. Israel, In the Matter of *Liberman Broadcasting, Inc. and LBI Media, Inc. v. Comcast Corporation and Comcast Cable Communications, LLC,* Federal Communications Commission, MB Docket No. 16-121, June 7, 2016.

Expert Report of Mark A. Israel, In the Matter of *La Crosse County, Individually, and on behalf of all others similarly situated v. Trinity Industries, INC. and Trinity Highway Products, LLC,* In the United States District Court, Western District of Wisconsin, Case No. 3:15-cv-00117-scl, May 27, 2016.

Expert Report of Mark A. Israel, In the Matter between *Darren Ewert and Nippon Yusen Kabushiki Kaisha et al.*, In the Supreme Court of British Columbia, Vancouver Registry, No. S-134895, May 20, 2016.

Declarations of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, In the Matter of *Special Access Rates for Price Cap Local Exchange Carriers*, Federal Communications Commission, WC Docket No. 05-25, Declaration: February 19, 2016; Supplemental Declaration: March 24, 2016; Second Supplemental Declaration: April 20, 2016.

Declaration of Mark Israel, Daniel Rubinfeld, and Glenn Woroch, "Competitive Analysis of the FCC's Special Access Data Collection," Federal Communications Commission, WC Docket No. 05-25, January 26, 2016.

Declaration of Dr. Mark Israel, In the Matter of *iPic – Gold Class Entertainment, LLC et al., v. Regal Entertainment Group, AMC Entertainment Holdings, Inc., et al.*, In the District Court of Harris County, Texas, 234th Judicial District, No. 2015-68745, January 18, 2016.

Declaration of Dennis Carlton, Mark Israel, Allan Shampine & Hal Sider, "Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans," Federal Communications Commission, WC Docket No. 15-247, January 7, 2016.

Declaration of Mark A. Israel, Attached to "Response of AT&T Mobility LLC to Notice of Apparent Liability for Forfeiture," Federal Communications Commission, File No. EB-IHD-14-00017504, July 17, 2015.

Reports in the Matter of *Federal Trade Commission et al. v. Sysco Corporation and USF Holding Corp.*, In the United States District Court for the District of Columbia, Civil Action No. 1:15-cv-00256 (APM), Declaration: February 18, 2015; Report: April 14, 2015; Rebuttal Report: April 21, 2015.

Declaration of Mark A. Israel, Bryan G. M. Keating, and David Weiskopf, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Voice and Broadband Services in California," December 3, 2014.

Expert Report of Mark A. Israel, "Economic Analysis of the Effect of the Comcast-TWC Transaction on Broadband: Reply to Commenters," Federal Communications Commission, MB Docket No. 14-57, September 22, 2014.

Supplemental Declaration of Mark Israel and Allan Shampine, In the Matter of *Amendment of the Commission's Rules Related to Retransmission Consent, Appendix A to "Reply Comments of the National Association of Broadcasters*," Federal Communications Commission, MB Docket No. 10-71, July 24, 2014.

Declaration of Mark Israel and Allan Shampine, In the Matter of *Amendment of the Commission's Rules Related to Retransmission Consent, Appendix B to "Comments of the National Association of Broadcasters*," Federal Communications Commission, MB Docket No. 10-71, June 26, 2014.

Expert Report of Mark A. Israel, "Implications of the Comcast/Time Warner Cable Transaction for Broadband Competition," Federal Communications Commission, MB Docket No. 14-57, April 8, 2014.

Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Sprint's Proposed Weighted Spectrum Screen Defies Economic Logic and Is Inconsistent with

Established Facts," Federal Communications Commission, WT Docket No. 12-269, March 14, 2014.

Reply Declaration of Mark A. Israel, "Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T: A Reply Declaration," Federal Communications Commission, WT Docket No. 13-193, October 23, 2013.

Declaration of Mark A. Israel, "An Economic Analysis of Competitive Effects and Consumer Benefits from the Proposed Acquisition of Leap Wireless by AT&T," Federal Communications Commission, WT Docket No. 13-193, August 1, 2013.

Supplemental Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comments on Appropriate Spectrum Aggregation Policy with Application to the Upcoming 600 MHz Auction," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Comment on the Submission of the U.S. Department of Justice Regarding Auction Participation Restrictions," Federal Communications Commission, WT Docket No. 12-269, June 13, 2013.

Reply Declaration of Michael L. Katz, Philip A. Haile, Mark A. Israel, and Andres V. Lerner, "Spectrum Aggregation Policy, Spectrum-Holdings-Based Bidding Credits, and Unlicensed Spectrum," Federal Communications Commission, GN Docket No. 12-268, March 12, 2013.

Declaration of Igal Hendel and Mark A. Israel, "Econometric Principles That Should Guide the Commission's Analysis of Competition for Special Access Service," Federal Communications Commission, WC Docket No. 05-25, February 11, 2013.

Declarations of Mark A. Israel and Michael L. Katz, "Economic Analysis of Public Policy Regarding Mobile Spectrum Holdings," Federal Communications Commission, WT Docket No. 12-269, Declaration: November 28, 2012; Reply Declaration: January 7, 2013.

Declaration of Mark Israel, "An Economic Assessment of the Prohibition on Exclusive Contracts for Satellite-Delivered, Cable-Affiliated Networks," Federal Communications Commission, MB Docket Nos. 12-68, 07-18, & 05-192, September 6, 2012.

Expert Report of Mark Israel, "Implications of the Verizon Wireless & SpectrumCo/Cox Commercial Agreements for Backhaul and Wi-Fi Services Competition," Federal Communications Commission, WT Docket No. 12-4, August 1, 2012.

Expert Report of Mark A. Israel, Michael L. Katz, and Allan L. Shampine, "Promoting Interoperability in the 700 MHz Commercial Spectrum," Federal Communications Commission, WT Docket No. 12-69, July 16, 2012.

Affidavits of Dr. Mark A. Israel in the Matter of *Bloomberg L.P. v. Comcast Cable Communications, LLC*, Federal Communications Commission, MB Docket No. 11-104, Declaration: June 21, 2012; Declaration: June 8, 2012; Supplemental Declaration: September 27, 2011; Declaration: July 27, 2011.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Response to Supplementary Comments of Hubert Horan," Docket DOT-OST-2009-1055, October 22, 2010.

Expert Report of Robert Willig, Mark Israel, Bryan Keating, and Jonathan Orszag, "Measuring Consumer Benefits from Antitrust Immunity for Delta Air Lines and Virgin Blue Carriers," Docket DOT-OST-2009-1055, October 13, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Economic Analysis of the Proposed Comcast-NBCU-GE Transaction," Federal Communications Commission, MB Docket No. 10-56, July 20, 2010.

Expert Report of Mark Israel and Michael L. Katz, "The Comcast/NBCU Transaction and Online Video Distribution," Federal Communications Commission, MB Docket No. 10-56, May 4, 2010.

Expert Report of Mark Israel and Michael L. Katz, "Application of the Commission Staff Model of Vertical Foreclosure to the Proposed Comcast-NBCU Transaction," Federal Communications Commission, MB Docket No. 10-56, February 26, 2010.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity: Response of Robert Willig, Mark Israel, and Bryan Keating" in Docket DOT-OST-2008-0252, January 11, 2010.

Affidavit of Dr. Mark A. Israel on Class Certification in the Matter of Puerto Rican Cabotage Antitrust Litigation, in the United States District Court for the District of Puerto Rico, MDL Docket No. 3:08-md-1960 (DRD), December 10, 2009.

Expert Report of Robert Willig, Mark Israel, and Bryan Keating, "Competitive Effects of Airline Antitrust Immunity," Docket DOT-OST-2008-0252, September 8, 2009.

Expert Report and Supplemental Expert Report of Dennis W. Carlton and Mark Israel in the Matter of *Toys "R" Us-Delaware, Inc., and Geoffrey Inc. v. Chase Bank USA N.A.*, in American Arbitration Association New York, New York, Commercial Arbitrations No. 13-148-02432-08, Expert Report: February 27, 2009; Supplemental Expert Report: March 20, 2009.

Expert Reports of James Levinsohn and Mark Israel, In the Matter of *2006 NPM Adjustment Proceeding pursuant to Master Settlement Agreement*, October 6, 2008; January 16, 2009; March 10, 2009.

SELECTED OTHER EXPERT WORK IN REVIEW OF MERGERS/TRANSACTIONS

Successful merger of Sony's Cruncyhroll and AT&T's Funimation anime streaming platforms. 2021. Served as lead economic expert for AT&T. Made multiple presentations to DOJ, demonstrating lack of significant competitive interaction between the parties, including extremely limited consumer switching between them, as well as extensive competition with a broader marketplace including Netflix, Amazon, and others. DOJ closed the investigation allowing the merger to proceed with no conditions.

Successful acquisition of Innovative Industries, Inc. by Ex Libris. 2020. Served as lead economist in interactions with FTC. Demonstrated that the acquisition would not harm competition due to the *de minimis* extent of head-to-head competition between Ex Libris and Innovative and the recent decline of Innovative' s business. FTC closed investigation allowing acquisition to proceed with no conditions.

Successful acquisition of TD Ameritrade by Charles Schwab. 2020. Served as lead economist in interactions with DOJ. Presented analyses demonstrating broad market for investor dollars rather than narrow market for RIA Custodian Services. DOJ closed investigation allowing acquisition to proceed with no conditions.

Successful acquisition of Reinhart Foodservice by Performance Food Group Company. 2019. Served as lead economics expert on behalf of the parties in the FTC's investigation of the merger. Presented detailed data analyses showing ample competition and lack of harm to competition in any geographic market. FTC closed the investigation with no divestitures required in late 2019.

Successful acquisition of SGA's Food Group of companies by US Foods. 2019. Served as lead economic expert on behalf of the parties in the FTC's investigation of the merger. Presented detailed economics and econometric analyses showing ample competition and lack of harm to competition in any geographic market. FTC cleared the merger subject to divestitures in three geographic markets in the Fall of 2019.

Successful acquisition of Time Warner by AT&T Inc. 2017-2019. Lead economist throughout the DOJ investigation. Then director of all economic work during trial, serving as the central connection point between all experts and counsel and directing development of all aspects of the economic case. Defendants ultimately prevailed in trial and the merger closed in June 2018.

Successful acquisition of Keystone Foods by Tyson Foods, Inc. 2018. Served as lead economic expert for U.S. jurisdiction. Presented economic analyses demonstrating that competition would remain strong post-merger. Ultimately, antitrust agencies in the U.S., China, Japan, and Korea cleared the transaction.

Successful acquisition of NEX Group PLC by CME Group Inc. 2018. Co-lead economic expert with Thomas Stemwedel. Presented several econometric analyses demonstrating that Treasury futures contracts and cash Treasury securities were economic complements rather than substitutes. Based heavily on these Compass Lexecon submissions, the DOJ and CMA closed their investigations without requiring any divestitures.

Successful acquisition of VCA Inc. by Mars, Inc. 2017. Co-lead economic expert with Mary Coleman. Made multiple presentations to FTC demonstrating ample competition in general, emergency, and specialty veterinary services, including econometric analyses showing lack of direct competitive impact of Mars and VCA on one another. Transaction was ultimately cleared subject to a small number of divestitures.

Successful acquisition of Mobileye by Intel. 2017. Served as lead economic expert for Intel. Assisted counsel in preparing FTC presentations and materials demonstrating lack of

significant head-to-head competition and lack of valid vertical foreclosure theories. Investigation was closed without Second Request.

FTC litigation against DraftKings, Inc. and FanDuel Inc. (Civil Action No. 17-cv-1195 (KBJ)). 2017. Served as lead economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to the parties' abandonment of the proposed merger. Developed economic and econometric evidence that the merging parties were closest substitutes and thus likely would have increased prices as a result of their proposed merger.

Successful merger of ASE Group and SPIL. 2017. Lead economic expert on behalf of ASE Group. Submitted reports and testified to the Taiwan Fair Trade Commission, which ultimately cleared the transaction, then made multiple presentations to U.S. FTC, which also cleared the transaction. Economic analyses focused on implications of profit margins for market definition and competitive effects, ultimately demonstrating that the transaction was unlikely to cause significant harm to competition.

Successful acquisition of Alarm.com of two business units (Connect and Piper) from iControl Networks. 2017. Led team that demonstrated substantial and growing competition in home security and connected home marketplace and thus lack of competitive harm from acquisition. Work focused on importance of downstream market definition as well as empirical evidence of impact of competition on Alarm.com pricing and profitability.

Successful acquisition of Samsung Electronics, Ltd.'s printer business by HP Inc. 2016. Led team in evaluating the competitive effects of the acquisition, including assessing shares and competitive effects in overlap areas. Notably, the transaction gained regulatory approval in the U.S. during the initial review period without issuing a Second Request.

Successful acquisition of Sun Products Corp. by Henkel AG. 2016. Led team demonstrating lack of competitive impact despite overlaps in laundry detergent and related products.

Successful acquisition of Starwood Hotels & Resorts by Marriott International. 2016. Led team that performed detailed analysis of competitive conditions, extensive econometric analysis of pricing, and full review of Marriott's internal pricing models to demonstrate that Starwood and Marriott were not close competitors, combined ownership of the brands would not lead to upward pricing pressure, and competition would remain robust post-merger.

Successful acquisition of PR Newswire by GTCR. 2016. Lead economic expert for GTCR. Made presentations to DOJ showing lack of competitive harm from the transaction, based on detailed analysis of win/loss data, including calculations showing no possible upward pricing pressure (UPP) concerns regardless of the level of margins.

Successful acquisition of Schurz Communications' Broadcast Stations by Gray Television. 2015. Lead economic expert for Gray. Made presentations to DOJ demonstrating output expanding effects of proposed transaction in light of the scale economies in television production and advertising and the small size of the DMAs affected by the transaction.

Successful acquisition of the Communications Business of Danaher Corporation by NetScout Systems. 2015. Lead economic expert for NetScout. Made presentations to DOJ

describing proper economic framework for analysis of competition and potential merger harms, and demonstrated that the presence of multiple viable competitors and numerous other credible threats to be used by powerful buyers in a dynamic industry made theories of anti-competitive harm from the merger implausible.

Successful acquisition of Windmill Distribution Co. by Manhattan Beer Distributors. 2015. Lead economic expert for Manhattan Beer Distributors. Submitted White Paper to DOJ demonstrating, based on margin data, that the merger would be highly unlikely to lead to anti-competitive effects. Transaction was granted early termination from the Hart Scott Rodino process by the DOJ.

Proposed acquisition of Time Warner Cable by Comcast Corporation. 2014-2015. Served as lead economic expert on broadband issues on behalf of Comcast Corporation. Submitted multiple Declarations and made multiple presentations to DOJ and FCC, explaining lack of horizontal, bargaining, or vertical/foreclosure concerns with regard to broadband competition as a result of the transaction.

Successful acquisition of Leap Wireless by AT&T. 2014. Lead economic expert for AT&T. Submitted multiple Declarations to FCC and made presentation to DOJ, demonstrating the transaction would generate substantial consumer benefits, while generating at most minimal upward pricing pressure in a properly defined mobile wireless services market and no issues related to spectrum concentration or other competitive concerns.

Successful merger of American Airline and US Airways. 2013. Lead consulting expert, managing Compass Lexecon team of over 25 economists supporting multiple experts. Made multiple presentations to DOJ, worked on expert reports in litigation, and assisted counsel with the analysis leading to settlement of litigation, permitting transaction to close.

Successful merger of T-Mobile USA and MetroPCS. 2013. Lead economic expert for T-Mobile USA. Conducted economic analyses of competitive effects of the transaction, as well as consumer benefits from reduced costs and increased network quality. Presented analyses to both DOJ and FCC.

FTC investigation of acquisition of Dollar Thrifty Automotive Group by Hertz. 2012. Served as a lead economic expert for FTC and prepared to serve as FTC's testifying expert against the merger, prior to case settlement. Conducted empirical analyses based on previous rental car mergers demonstrating likely price increases from the transaction.

Decision by Federal Communications Commission not to extend the ban on exclusive contracts for satellite-delivered, cable-affiliated networks. 2012. Lead economic expert for National Cable and Telecommunications Association. Submitted economic analysis demonstrating that the ban on exclusive distribution of satellite-delivered, cable affiliated networks is no longer warranted given increased marketplace competition. FCC made decision to allow the ban to sunset.

Successful sale of wireless spectrum by SpectrumCo and Cox ("Cable Companies") to Verizon Wireless and successful completion of related commercial agreements. 2012. On behalf of the Cable Companies, performed economic analyses demonstrating lack of

competitive harm from the transaction on markets for backhaul and Wi-Fi services. Presented analyses to FCC.

Successful acquisition by LIN Media of broadcast television stations from NVTV. 2012. Lead economic expert for LIN Media. Prepared economic analysis demonstrating lack of competitive concern over potential issues related to Shared Service and Joint Sale Arrangements.

Proposed acquisition of T-Mobile USA by AT&T. 2011. Served as one of the lead economists, initially for T-Mobile (along with Michael Katz) and ultimately for both parties (along with Michael Katz and Dennis Carlton). Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop, ex parte meeting.

S*uccessful application for antitrust immunity by Delta and Virgin Blue*. 2010. Together with Robert Willig, Bryan Keating, and Jon Orszag, prepared economic analyses demonstrating substantial net consumer benefits from antitrust immunity. Submitted results in expert reports to Department of Transportation.

Successful joint venture between Comcast and NBC Universal (and ultimate full acquisition of NBC Universal by Comcast). 2010. Served as one of the lead economists (along with Michael Katz) on behalf of the merging parties. Wrote multiple reports submitted to FCC (with Michael Katz) demonstrating lack of significant competitive concerns from the transaction. Made multiple presentations to DOJ and FCC. Appeared in FCC Workshop of economists, ex parte meeting.

Successful application for antitrust immunity for oneworld alliance and associated joint venture of American Airlines, British Airways, and Iberia Airlines. 2009-2010. Together with Robert Willig and Bryan Keating, prepared economic analyses demonstrating substantial net consumer benefits associated with antitrust immunity for the joint venture. Submitted results in expert reports to Department of Transportation.

Successful acquisition by PepsiCo of bottlers, PBG and PAS. 2009. Performed econometric and simulation analyses demonstrating pro-competitive effect of merger on PepsiCo's own brands, other brands distributed by PBG and PAS, and overall marketplace. Presented results to FTC (together with Dennis Carlton).

Successful merger of Delta Airlines and Northwest Airlines. 2008. In support of Dennis Carlton, developed empirical and theoretical analyses to demonstrate merger's pro-competitive nature. Work focused on (ultimately settled) private litigation opposing the merger.

Successful acquisition of Harcourt Education by Houghton Mifflin. 2007. Along with Daniel Rubinfeld and Frederick Flyer, developed econometric analyses demonstrating lack of competitive harm from proposed merger. Presented results to DOJ.

Successful acquisition of Chicago Board of Trade by Chicago Mercantile Exchange. 2007. Along with Robert Willig and Hal Sider, developed and presented multiple empirical analyses demonstrating lack of competitive harm from merger. Submitted multiple white papers and made multiple presentations to DOJ.

SELECTED OTHER EXPERT/CONSULTING WORK

Led team supporting Dennis Carlton's testimony in Toshiba/Hannstar TFT-LCD Antitrust litigation vs. Plaintiff Best Buy, 2013.

Led team supporting Dennis Carlton's testimony in Toshiba's TFT-LCD Class Action Antitrust litigation. Named Litigation Matter of the Year for 2012 by *Global Competition Review*, 2012.

As economic expert for US Airways, developed econometric analysis of air traffic at major US airports, presented to Philadelphia Airport management team, 2011.

Prepared analysis of the competitive impact of low-cost-carrier competition in Washington, D.C. and New York airports. Filed with DOT, 2011.

On behalf of major pharmaceutical firm, developed econometric model to forecast pharmaceutical expenditures, 2009.

Developed econometric model to measure of the importance of network effects in credit cards in the context of measuring damages incurred by a major credit card issuer, 2007-2008.

OTHER CONFIDENTIAL CONSULTING WORK IN THE FOLLOWING INDUSTRIES

Automobiles and Components

Consumer Durables

Consumer Services

Financial Services

Energy

Food, Beverage, and Tobacco

Healthcare Equipment and Services

Media

Pharmaceuticals, Biotechnology, and Life Sciences

Retail

Semiconductors and Semiconductor Equipment

Software and Related Services

Technology: Hardware and Equipment

Telecommunication Services

Transportation

Utilities

PUBLICATIONS

- "The Economics of the LCD Cartel: Organization, Incentives, and Practical Challenges," *Cartels Diagnosed: New Insight on Collusion* (with Dennis W. Carlton, Ian MacSwain, and Allan Shampine), available at *https://ssrn.com/abstract=4190535*, August 15, 2022.
- "A Retrospective Analysis of the AT&T/Time Warner Merger" (with Dennis W. Carlton, Georgi V. Giozov, and Allan L. Shampine), Forthcoming in the *Journal of Law and Economics*, available at *https://ssrn.com/abstract=3911492*, October 1, 2021.

"Vertical Mergers with Bilateral Contracting and Upstream and Downstream Investment," (with Daniel P. O'Brien), available at *https://ssrn.com/abstract=3886048*, July 15, 2021.

"International Broadband Price Comparisons Tell Us Little about Competition and Do Not Justify Broadband Regulation," working paper (with Michael Katz and Bryan Keating), commissioned by NCTA – The Internet & Television Association, May 11, 2021.

"Effects of the 2010 Horizontal Merger Guidelines on Merger Review: Based on Ten Years of Practical Experience," (with Dennis W. Carlton), Volume 58, Issue 2, in the *Review of Industrial Organization*, March 2021.

"Lessons from *AT&T/Time Warner*," (with Dennis W. Carlton and Allan L. Shampine), *Competition Policy International*, July 2019.

"Are You Pushing Too Hard? Lower Negotiated Input Prices as a Merger Efficiency," (with Thomas A. Stemwedel and Ka Hei Tse), Volume 82, Issue 2, Pages 623-642, in the *Antitrust Law Journal*, April 2019.

"Vertical Integration in Multichannel Television Markets: Revisiting Regional Sports Networks Using Updated Data," (with Georgi Giozov, Nauman Ilias, and Allan Shampine), Volume 4:1 in *The Criterion Journal on Innovation*, 2019.

"Are Legacy Airline Mergers Pro- or Anti-Competitive? Evidence from Recent U.S. Airline Mergers," (with Dennis Carlton, Ian MacSwain, and Eugene Orlov), Volume 62, Pages 58-95, in the *International Journal of Industrial Organization*, January 2018.

"Competitive Effects of International Airline Cooperation," (with Robert J. Calzaretta and Yair Eilat), Volume 13, Issue 3, Pages 501-548, in the *Journal of Competition Law & Economics*, September 2017.

"Econometrics and Regression Analysis," (with Chris Cavanagh, Paul Denis, and Bryan Keating), Chapter 6 in the *American Bar Association's Proving Antitrust Damages: Legal and Economic Issues, Third Edition*, 2017.

"Complementarity without Superadditivity," (with Steven Berry, Philip Haile, and Michael Katz), Volume 151, Pages 28-30, in *Economics Letters*, February 2017.

"Antitrust in a Mobile World," (with Yonatan Even, Jonathan M. Jacobson, Scott Martin, and Dr. Helen Weeds), Chapter 17 of *International Antitrust Law & Policy: Fordham Competition Law 2015*, Edited by James Keyte, Juris Publishing, Inc., 2016.

"Buyer Power in Merger Review," (with Dennis W. Carlton and Mary Coleman), Chapter 22 of *The Oxford Handbook of International Antitrust Economics*, Volume 1, Roger D. Blair and D. Daniel Sokol, eds, Oxford University Press, 2015.

"The Evolution of Internet Interconnection from Hierarchy to 'Mesh': Implications for Government Regulation," (with Stanley M. Besen), *Information Economics and Policy*, December 2013.

"Airline Network Effects and Consumer Welfare," (with Bryan Keating, Dan Rubinfeld, and Robert Willig), *Review of Network Economics*, November 2013.

"The Delta-Northwest Merger: Consumer Benefits from Airline Network Effects (2008)," (with Bryan Keating, Daniel L. Rubinfeld, and Robert D. Willig), *The Antitrust Revolution*, Sixth Edition, Edited by John E. Kwoka, Jr. and Lawrence J. White, Oxford University Press, New York, July 2013.

"Proper Treatment of Buyer Power in Merger Review," (with Dennis W. Carlton), *Review of Industrial Organization*, July 2011.

"Response to Gopal Das Varma's Market Definition, Upward Pricing Pressure, and the Role of the Courts: A Response to Carlton and Israel," (with Dennis W. Carlton), *The Antitrust Source*, December 2010.

"Will the New Guidelines Clarify or Obscure Antitrust Policy?" (with Dennis W. Carlton), *The Antitrust Source,* October 2010.

"Should Competition Policy Prohibit Price Discrimination?" (with Dennis W. Carlton), *Global Competition Review*, 2009.

"The Empirical Effects of Collegiate Athletics: An Update Based on 2004-2007 Data," (with Jonathan Orszag), Paper commissioned by National Collegiate Athletic Association, available *at* *http://www.epi.soe.vt.edu/perspectives/policy_news/pdf/NCAASpending.pdf*, February 2009.

"Services as Experience Goods: An Empirical Examination of Consumer Learning in Automobile Insurance," *The American Economic Review*, December 2005.

"Tenure Dependence in Consumer-Firm Relationships: An Empirical Analysis of Consumer Departures from Automobile Insurance Firms," *The Rand Journal of Economics*, Spring 2005.

"The Impact of Youth Characteristics and Experiences on Transitions Out of Poverty," (with Michael Seeborg), *Journal of Socio-Economics*, 1998.

"Racial Differences in Adult Labor Force Transition Trends," (with Michael Seeborg), *Journal of Economics*, 1994.

SELECTED RECENT PRESENTATIONS

American Bar Association Section of Antitrust Law, "Nuts & Bolts of Presenting Economic Evidence to the Agencies: Common Pitfalls and Best Practices, Panelist, October 2019.

Dechert LLP, 2019 Annual Antitrust Spring Seminar, Keynote Speaker, March 2019.

Concurrences Review and The George Washington University Law School, 6th Bill Kovacic Antitrust Salon: Where is Antitrust Policy Going?, "A Judge's Eye View on Antitrust: Mergers, Cartels, Remedies…," Panelist, September 2018.

Fordham Competition Law Institute, 45th Annual Conference on International Antitrust Law and Policy, "Merger Remedies," Panelist, September 2018.

Georgetown Center for Business and Public Policy, "Airline Competition Conference," Panelist, July 2017.

J.P. Morgan Special Situations Investor Forum, "The Antitrust Merger Review Process," Panelist, March 2017.

American Bar Association Section of Antitrust Law, "Economic Issues Raised In The Comcast – Time Warner Cable Merger," Panelist, February 2016.

Fordham Competition Law Institute, 42nd Annual Conference on International Antitrust Law and Policy, "Antitrust in a Mobile World," Panelist, October 2015.

American Bar Association Section of Antitrust Law, "Merger Practice Workshop," Faculty Member, October 2015.

Searle Center Conference on Antitrust Economics and Competition Policy, Panel on Recent Transactions in the Telecom Industry, Panelist, September 2015.

National Bureau of Economic Research, Summer Institute 2015, Industrial Organization Meetings, "Panel Discussion of the Comcast-Time Warner Merger," Panelist, July 2015.

Federal Communications Bar Association, "How the Antitrust Agencies and the FCC are Likely to Analyze Vertical Mergers," Panelist, November 2014.

The Coca Cola Company Global Antitrust Forum, "Round Table Discussion on Use of Economics and Economists," Panel Chair, November 2014.

Compass Lexecon Competition Policy Forum, Lake Como Italy, "Consolidation of the Telecoms Industry in the EU and the U.S.," Panelist, October 2014.

The IATA Legal Symposium 2014, Aviation Law: Upfront and Center, "Merger Analysis – A sudden shift in approach by DOJ in the American Airlines and US Airways merger," Panelist, February 2014.

Georgetown Law 7th Annual Global Antitrust Enforcement Symposium, "Merger Enforcement and Policy," Panelist, September 2013.

American Bar Association Section of Antitrust Law, "Airline Mergers: First Class Results or Middle-Seat Misery?" Panelist, May 2013.

American Bar Association Section of Antitrust Law, "Go Low or Go Home! Monopsony a Problem?" Panelist, March 2012.

Federal Communications Bar Association Transactional Committee CLE Seminar, "The FCC's Approach to Analyzing Vertical Mergers," Panelist, October 2011.

The Technology Policy Institute Aspen Forum, "Watching the Future: The Economic Implications of Online Video," Panelist, August 2011.

American Bar Association Forum on Air & Space Law, 2011 Update Conference, "Antitrust Issues: What's on the Horizon for the Industry," Panelist, February 2011.

American Bar Association Section of Antitrust Law, "Antitrust in the Airline Industry," Panelist, September 2010.

GRANTS AND HONORS

Searle Fund for Policy Research Grant, 2004-2006, for "An Empirical Examination of Asymmetric Information in Insurance Markets."

Kellogg School of Management Chairs' Core Course Teaching Award, 2003 & 2005.

Bradley Dissertation Fellowship, Stanford University, 1999-2000.

Stanford University, Outstanding Second Year Paper Prize, 1997.

ADVISORY, EDITORIAL, AND TRUSTEE BOARDS

Global Competition Review, Editorial Board, Member

Holton-Arms School, Board of Trustees, Trustee

Illinois Wesleyan University, Board of Trustees, Trustee

This is Exhibit "C" referred to in the Affidavit of Mark Israel sworn by Mark Israel, of the County of Montgomery, in the State of Maryland, in the United States of America, before me by videoconference on September 23, 2022 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.

Commissioner for Taking Affidavits (or as may be)

MATTHEW R. LAW

Exhibit C

CT-2022-002

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.

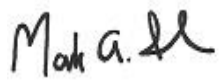
Intervenors

ACKNOWLEDGEMENT OF EXPERT WITNESS

I, Mark Israel, acknowledge that I will comply with the Competition Tribunal's code of conduct for expert witnesses which is described below:

An expert witness who provides a report for use as evidence has a duty to assist the Tribunal impartially on matters relevant to his or her area of expertise.

This duty overrides any duty to a party to the proceeding, including the person retaining the expert witness. An expert is to be independent and objective. An expert is not an advocate for a party.



September 23, 2022

Mark A. Israel
Compass Lexecon
555 12th Street NW, Suite 501
Washington, DC 20004 USA
misrael@compasslexecon.com

This is Exhibit "D" referred to in the Affidavit of Mark Israel sworn by Mark Israel, of the County of Montgomery, in the State of Maryland, in the United States of America, before me by videoconference on September 23, 2022 in accordance with O. Reg. 431/20, Administering Oath or Declaration Remotely.

Commissioner for Taking Affidavits (or as may be)

MATTHEW R. LAW

EMBEDDED ATTACHMENTS TO THE AFFIDAVIT OF MARK ISRAEL, SWORN SEPTEMBER 23, 2022

Footnote	Document Name
74, 75	VID00320438
79	SJRB-CCB00896520 at Column U
81	ROG00841348

Exhibit D

PUBLICALLY AVILABLE DOCUMENTS

"Bell and Telus team up to overhaul wireless network," CBC News, October 10, 2008, *available at* https://www.cbc.ca/news/technology/bell-and-telus-team-up-to-overhaul-wireless-network-1.709483.

Bell Canada Enterprises Inc., "BCE Reports 2019 Q4 and Full-Year Results, Announces 2020 Financial Targets," *available at* https://www.bce.ca/news-and-media/releases/show/bce-reports-2019-q4-and-full-year-results-announces-2020-financial-targets-1.

BMO Capital Markets, "Shaw Introduces 'Shaw Mobile' Plans in B.C. and Alberta,"July 30, 2020.

Canadian Radio-television and Telecommunications Commission, "Telecom Decision CRTC 2013-36," January 31, 2013, *available at* https://crtc.gc.ca/eng/archive/2013/2013-36.htm.

Canadian Radio-television and Telecommunications Commission, "Telecom Regulatory Policy CRTC 2021-130," April 15, 2021, *available at* https://crtc.gc.ca/eng/archive/2021/2021-130.htm.

Charit Katoch and Michael Piaskoski, "Passive Infrastructure," Rogers, March 17, 2022, available at https://about.rogers.com/news-ideas/passive-infrastructure-2/#:~:text=Seeking%20more%20effective,without%20any%20obstacles.

Competition Bureau Canada, "Merger Enforcement Guidelines," October 6, 2011, *available at* https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/03420.html.

Competition Bureau Canada, "Telecom Notice of Consultation CRTC 2019-57 – Further Comments of the Competition Bureau, January 20, 2022, *available at* https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04510.html.

Freedom Mobile, "Life is a Big Gig, Live it with Freedom: Freedom Mobile Gives Canadians 10 GB for only $50", October 17, 2017, *available at* https://www.globenewswire.com/news-release/2017/10/17/1284666/0/en/Life-is-a-Big-Gig-Live-it-with-Freedom-Freedom-Mobile-Gives-Canadians-10-GB-for-only-50.html.

Global News, "Freedom Mobile to Start Offering iPhone X and iPhone 8 Models," November 22, 2017, *available at* https://globalnews.ca/news/3875605/freedom-mobile-iphone-x-iphone-8/.

Government of Canada, Competition Act (R.S.C., 1985, c. C-34)

Government of Canada, Framework Relating to Transfers, Divisions and Subordinate Licensing of Spectrum Licenses for Commercial Mobile Spectrum; June 28, 2013, *available at* https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10653.html.

Memorandum Opinion and Order, Declaratory Ruling, and Order of Proposed Modification, In the Matter of Applications of T-Mobile US, Inc., and Sprint Corporation for Consent to Assign or Transfer Control of Licenses and Authorizations, FCC, WT Docket No. 18-197, November 5, 2019, *available at* https://docs.fcc.gov/public/attachments/FCC-19-103A1.pdf.

Mobile Syrup, "Freedom is enabling LTE for customers with grandfathered 3G plans", November 7, 2017, *available at* https://mobilesyrup.com/2017/11/07/freedom-enabling-lte-customers-grandfathered-plans/.

New York et al. v. Deutsche Telekom et al., United States District Court, Southern District of New York, 19 Civ. 5434, Decision and Order, February 11, 2020, p. 132.

Quebecor Annual Information Form – 2021, p.5-6, *available at* https://www.quebecor.com/documents/20143/223037/QI_Notice2021_EN.pdf/b927da2d-c1de-e8a6-9226-735bc605ed30?t=1648756160113 – (Quebecor AIF– 2021).

Rogers Communications Inc. Press Release, "Rogers and Shaw Come Together in $26 billion transaction, creating new jobs and investment in Western Canada and accelerating Canada's 5G rollout", 15 March 2021, *available at* https://about.rogers.com/news-ideas/rogers-and-shaw-to-come-together-in-26-billion-transaction-creating-new-jobs-and-investment-in-western-canada-and-accelerating-canadas-5g-rollout/.

Rogers, "Rogers Introduces Infinite Wireless Data Plans With No Overage Charges," June 12, 2019, *available at* https://about.rogers.com/news-ideas/rogers-introduces-infinite-wireless-data-plans-no-overage-charges/.

Scotiabank Equity Research Alert, "Shaw Mobile: 'Where Do I Sign Up for This?" July 30, 2020, p. 1

Shaw Mobile, available at https://www.shawmobile.ca/en-CA

The Globe & Mail, "Quebecor launches discount wireless brand 'Fizz', September 13, 2018, available at https://www.theglobeandmail.com/business/article-quebecor-launches-discount-wireless-brand-fizz/.

ACADEMIC PUBLICATIONS

A. Colin Cameron and Pravin K. Trivedi (2005), *Microeconometrics: Methods and Applications, 1st Ed.,* Cambridge University Press.

George Stigler, "A Theory of Oligopoly (1964),." *Journal of Political Economy* 72, **1**(1):44-61, Reprinted as Chapter 5 in George Stigler (1968), *The Organization of Industry*. Homewood, IL: Richard D. Irwin, 39–63.

Jeremy I. Bulow and Paul Pfleiderer (1983) "A Note on the Effect of Cost Changes on Prices," *Journal of Political Economy*, **91**(1):182-85.

Joseph Farrell and Carl Shapiro (2010), "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," *The B.E. Journal of Theoretical Economics*, **10**(1):1-39.

Joseph Farrell and Carl Shapiro (2021), "Special Issue: The 2010 Horizontal Merger Guidelines after Ten Years,"Review of *Industrial Organization* **58**(1):1–11.

Nathan Miller and Gloria Sheu (2021), "Quantitative Methods for Evaluating the Unilateral Effects of Mergers," *Review of Industrial Organization*, **58**(1):143-177.

Paul Klemperer (1987), "The Competitiveness of Markets with Switching Costs," *The Rand Journal of Economics*, **18**(1):138-150.

Paul L. Yde and Michael G. Vita (1996), "Merger Efficiencies: Reconsidering the 'Passing-On' Requirement," *Antitrust Law Journal*, **64**(3):735-47.

Paul L. Yde and Michael G. Vita (2006), "Merger Efficiencies: The 'Passing-On' Fallacy," *Antitrust* **20:**59-65, at 62-63.

Yongmin Chen and Marius Schwartz (2016), "Churn vs. Diversion: An Illustrative Model," *Economica*, **83**(332):564-583.

LEGAL FILINGS

Affidavit of Nathan H. Miller

PRODUCED DOCUMENTS

RBCL00005_000006406

ROG00841348

SJRB-CCB00665009

SJRB-CCB00896520

VID00296438

VID00320438

VID00379276

VID00379338

PRODUCED DATA

RBKC00001_000000015.csv

Specification 25 a-e (w CLV COA Breakdowns) - May 17

2022.xlsx SUBSCRIBER_SUMMARY (Litigation Production)

Wireless_Jul2021_to_Apr2022_v2.xlsx

Wireless_May_Jun_2021.xlsx

Wireless_Regional_Jul2021_to_Apr2022_nolink.xlsx

Wireless_Regional_May_June_2021.xlsx

WLS_DIM_PLAN

WLS_DIM_SERVICE

WLS_WLE_BUNDLE