

# **The price is not right: Reducing mobile telecommunications bills in Canada**

**by**  
**Eduard Sofronia**

B.A. (Political Science), Simon Fraser University, 2017

Project Submitted in Partial Fulfillment of the  
Requirements for the Degree of  
Master of Public Policy

in the  
School of Public Policy  
Faculty of Arts and Social Sciences

© Eduard Sofronia 2020  
SIMON FRASER UNIVERSITY  
Spring 2020

Copyright in this work rests with the author. Please ensure that any reproduction or re-use is done in accordance with the relevant national copyright legislation.

# Approval

**Name:** **Eduard Sofronia**

**Degree:** **Master of Public Policy**

**Title:** **The price is not right: Reducing mobile telecommunications bills in Canada**

**Examining Committee:** **Chair:** Dominique Gross  
Professor

**Joshua Gordon**  
Senior Supervisor  
Assistant Professor

**John Richards**  
Internal Examiner  
Professor

**Date Defended/Approved:** April 21, 2020

## Ethics Statement

The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

- a. human research ethics approval from the Simon Fraser University Office of Research Ethics

or

- b. advance approval of the animal care protocol from the University Animal Care Committee of Simon Fraser University

or has conducted the research

- c. as a co-investigator, collaborator, or research assistant in a research project approved in advance.

A copy of the approval letter has been filed with the Theses Office of the University Library at the time of submission of this thesis or project.

The original application for approval and letter of approval are filed with the relevant offices. Inquiries may be directed to those authorities.

Simon Fraser University Library  
Burnaby, British Columbia, Canada

Update Spring 2016

## **Abstract**

Over the past decade, the Canadian mobile telecommunications service market has grown at an exceptional rate, ultimately overtaking landlines as the dominant form of telecommunication. Mobile telecommunications has therefore become an essential service in the lives of most Canadians. However Canadian consumers continue to face some of the highest mobile service prices in the developed world. This study seeks to identify the principal causes of continued high mobile telecommunications prices in Canada, and to suggest potential policy solutions to lower service costs for consumers. This study involves a combination of expert interviews, secondary research, and case study analysis of the Australian, U.S. and Saskatchewan mobile markets. This study identifies high levels of market concentration as a principal cause, and recommends that mandated MVNO access be implemented to address high prices in the Canadian mobile service market.

**Keywords:** mobile telecommunications; mobile price; Canadian; cell phone; mobile policy; MVNO

## **Acknowledgements**

I would like to thank my supervisor Dr. Joshua Gordon for his guidance on this project. I would also like to thank Dr. Nancy Olewiler for her support and encouragement, as well as the rest of the faculty and staff at the School of Public Policy who have made the last two years both instructive and pleasant.

I would like to give a special thanks to my interviewees, for their time and invaluable expertise, which was critical to the completion of this project.

Finally I would like to thank my friends, for their support and loyalty throughout the years, as well as my parents and grandparents, without which none of this would be possible.

# Table of Contents

Approval .....	ii
Ethics Statement .....	iii
Abstract .....	iv
Acknowledgements .....	v
Table of Contents .....	vi
List of Tables .....	x
List of Figures .....	xi
List of Acronyms .....	xii
Glossary .....	xiii
<b>Chapter 1. Introduction .....</b>	<b>1</b>
<b>Chapter 2. Background .....</b>	<b>3</b>
2.1. Mobile Market Characteristics .....	3
2.1.1. Mobile Market Structure .....	3
2.1.2. User Characteristics .....	4
2.2. Regulatory Structure .....	4
2.3. Existing Policy Measures .....	5
2.3.1. Spectrum Auctions .....	5
2.3.2. Wireless Code .....	6
2.4. Problem Illustration .....	7
2.4.1. International Price Comparison .....	7
2015 OECD Digital Economy Outlook Report .....	7
2015 Nordicity Price Comparison .....	9
2.4.2. Average Revenue Per User .....	11
2.4.3. Distributional Consequences .....	12
2.5. Public Opinion .....	12
2.6. Stakeholders .....	13
<b>Chapter 3. Methodology .....</b>	<b>14</b>
3.1. Literature Review .....	14
3.2. Case Studies .....	14
3.3. Expert Interviews .....	15
3.4. Analysis of CRTC Hearing Submissions .....	15
<b>Chapter 4. Literature Review and Case Studies .....</b>	<b>16</b>
4.1. Literature Review .....	16
4.1.1. Foreign Competition .....	16
4.1.2. Introducing MVNOs .....	17
4.1.3. Price Caps .....	18
4.2. Case Studies .....	19
4.2.1. Case Study 1: Saskatchewan .....	19

Overview .....	19
Price .....	20
Market Share.....	20
Spectrum Licensing Incentives for MVNOs or Small Firms.....	21
Foreign Ownership Regulation.....	22
Price Caps.....	22
4.2.2. Case Study 2: U.S.....	23
Overview .....	23
Price .....	24
Market Share.....	24
MVNOs and Small Firms.....	25
Foreign Ownership Regulation.....	25
Price Caps.....	26
4.2.3. Case Study 3: Australia.....	26
Overview .....	26
Price .....	28
Market Share.....	28
Foreign Ownership .....	29
MVNO and Small Carriers.....	29
Price Controls.....	30
4.2.4. Case Study Analysis Summary.....	32
<b>Chapter 5. Expert Interviews .....</b>	<b>33</b>
5.1. Interviewees.....	33
5.2. Interview Findings.....	33
5.2.1. The State of The Canadian Mobile Telecommunications Market .....	33
5.2.2. Comparing the Canadian and Australian Markets .....	34
5.2.3. Mandated MVNO Access.....	34
Stakeholders: .....	35
CRTC .....	35
Incumbents.....	35
Public Acceptance.....	35
5.2.4. Price Caps.....	35
Stakeholders: .....	36
CRTC .....	36
Incumbents.....	36
Small Firms and New Entrants.....	36
Public Acceptance.....	36
5.2.5. Foreign Competition.....	37
Stakeholders: .....	37
Incumbents.....	37
Public Acceptance.....	38
5.3. 2019-2020 CRTC Wireless Consultations.....	38
5.3.1. CRTC Position .....	38

5.3.2.	Big Three Position.....	38
5.3.3.	Small Firms and Industry Groups.....	39
<b>Chapter 6.</b>	<b>Policy Options.....</b>	<b>40</b>
1)	Mandating MVNO Access.....	40
2)	Caps on Cellular Bills.....	40
3)	Facilitating Entry of Foreign Firms.....	41
<b>Chapter 7.</b>	<b>Criteria and Measures.....</b>	<b>42</b>
7.1.	Effectiveness.....	42
7.1.1.	Cost Reduction for Consumers.....	42
7.1.2.	Service Innovation and Service Quality.....	42
7.1.3.	Speed of Cost Reduction.....	43
7.2.	Administrative Complexity.....	43
7.3.	Stakeholder Acceptance.....	43
7.4.	Public Acceptance.....	43
7.5.	Criteria and Measures Summary.....	44
<b>Chapter 8.</b>	<b>Evaluation of Policy Options.....</b>	<b>45</b>
8.1.	Option 1: Mandated MVNO Access.....	45
8.1.1.	Effectiveness.....	45
	Cost Reduction.....	45
	Service Quality and Innovation.....	45
	Cost Reduction Speed.....	45
8.1.2.	Administrative Complexity.....	46
8.1.3.	Stakeholder Acceptance.....	46
	Incumbent Support.....	46
	Support by Small Firms and New Entrants.....	47
	CRTC Support.....	47
8.1.4.	Public Acceptance.....	47
8.2.	Option 2: Price Caps.....	48
8.2.1.	Effectiveness.....	48
	Cost Reduction.....	48
	Service Quality and Innovation.....	48
	Cost Reduction Speed.....	48
8.2.2.	Administrative Complexity.....	48
8.2.3.	Stakeholder Acceptance.....	49
	Incumbent Support.....	49
	Support by Small Firms and New Entrants.....	49
	CRTC Support.....	49
8.2.4.	Public Acceptance.....	49
8.3.	Option 3: Foreign Competition.....	50
8.3.1.	Effectiveness.....	50
	Cost Reduction.....	50
	Service Quality and Innovation.....	50



Cost Reduction Speed .....	51
8.3.2. Administrative Complexity.....	51
8.3.3. Stakeholder Acceptance .....	51
Incumbent Support.....	51
Support by Small Firms and New Entrants .....	51
CRTC Support.....	52
8.3.4. Public Acceptance.....	52
8.4. Summary of Policy Evaluation .....	53
<b>Chapter 9. Recommendation .....</b>	<b>54</b>
<b>References .....</b>	<b>56</b>
<b>Appendix A. Complete Price Comparison Data.....</b>	<b>65</b>
Complete OECD 2015 Price Comparison Study Data .....	65
Complete 2017 Nordicity Price Comparison Data .....	66
<b>Appendix B. Additional Case Study Information.....</b>	<b>67</b>
1) Saskatchewan .....	67
Market Size .....	67
Regulatory Structure .....	67
Discussion .....	67
2) U.S.....	68
Market Size .....	68
Regulatory Structure .....	68
3) Australia .....	69
Market Size .....	69
Regulatory Structure .....	69
Fixed Line Price Controls .....	70

## List of Tables

Table 1:	Mobile Service Basket Price Comparison Saskatchewan vs. Canada (CAD, PPP 2017).....	20
Table 2:	Saskatchewan Mobile Telecom Market Composition 2013-2018, Select Years.....	21
Table 3:	Mobile Service Basket Price Comparison 2016 (2017 PPP CAD), US vs. Canada .....	24
Table 4:	US Mobile Telecom Market Structure 2013-2016.....	25
Table 5:	Mobile Service Basket Price Comparison 2016, (2017 CAD PPP) Australia vs. Canada.....	28
Table 6:	Summary of Case Study Findings .....	32
Table 7:	Summary Table of Criteria and Measures .....	44
Table 8:	Evaluation of Policy Option 1: Mandated MVNO Access.....	47
Table 9:	Evaluation of Policy Option 2: Price Caps .....	50
Table 10:	Evaluation of Policy Option 3: Foreign Competition.....	52
Table 11:	Summary of Criteria Scoring for Policy Options.....	53

## List of Figures

Figure 1:	Combined Low End Mobile Service Prices (2014 USD, PPP Adjusted) Select OECD, 2014.....	8
Figure 2:	Combined High End Mobile Service Prices (2014 USD, PPP Adjusted) Select OECD, 2014.....	9
Figure 3:	Combined Low End Mobile Service Prices (2017 CAD, PPP Adjusted) Select Countries, 2016.....	10
Figure 4:	Combined High End Mobile Service Prices (2017 CAD, PPP Adjusted) Select Countries, 2016.....	11

## List of Acronyms

ACCC	Australian Competition and Consumer Commission
ARPU	Average Revenue Per User
AWS	Advanced Wireless Spectrum
CRTC	Canadian Radio-television and Telecommunications Commission
FCC	Federal Communications Commission
ISED	Innovation, Science, and Economic Development Canada
MNO	Mobile Network Operator
MVNO	Mobile Virtual Network Operator

## Glossary

Churn Rate	The annual percentage rate at which customers stop subscribing to a service (subscriber turnover rate)
Flanker Brand	A new firm established by an incumbent firm designed to offer services in a lower market segment
MNO	A wireless service provider that controls the physical infrastructure necessary to provide their services.
MVNO	A service provider that does not own its own network infrastructure. These providers enter into contracts with MNOs to offer service over their network.
Spectrum	Segments or frequencies of the electromagnetic spectrum that mobile signals travel over.

# Chapter 1. Introduction

Mobile wireless services in Canada have seen immense growth in the past two decades. As of 2017, it is a \$24.5 billion industry. From 2013 to 2017 the mobile services market grew at a rate of 4.9% annually, making it the fastest growing telecommunications sector in Canada (CRTC, 2019). The number of mobile subscribers is also growing, at a relatively fast rate of 3.1%, reaching 31.7 million subscribers as of 2017 (CRTC, 2019).

Despite this growth, the wireless telecommunications (mobile) market in Canada remains heavily concentrated in the hands a few large operators (Bell, TELUS, and Rogers). These operators account for 90% of the industry's revenues (Thakur, 2012). The competition level that currently exists in this market has not produced extensive consumer choice, and has resulted higher prices for comparable services relative to most other developed countries (Thakur, 2012). Canada's prices and average revenues per user (ARPU) have consistently ranked among the highest in the OECD (Middleton, 2016; Nordicity, 2016).

While regulators are mandated to rely on market forces to regulate this industry, in practice Canada's mobile market remains relatively restricted, particularly to foreign entrants. In 2008, attempts by Industry Canada to increase competition in the Canadian mobile market culminated in a major spectrum-licensing auction, which allowed some new entrants into the market. Despite this, new entrants have made few inroads, leaving the market heavily concentrated.

The policy problem I will be addressing in this paper is that consumer prices for mobile telecommunications services in Canada are high when compared to other major developed countries. The ultimate purpose of this paper is to provide potential policy solutions for this problem. In order to do this, chapter 2 provides the context necessary to understand this issue, including the role of regulators and the structure of the mobile market. Chapter 2 also presents a price comparison between Canada and other countries. Chapter 3 explains the methodology for the paper. Chapters 4 and 5 examine the nature of the policy problem, using a jurisdictional scan and expert interviews respectively. Chapter 6 lays out the policy options, chapter 7 indicates the criteria and

measures involved in my policy evaluation, and chapter 8 undertakes a policy evaluation of my policy options. Chapter 9 concludes with my policy recommendation, which is to mandate greater MVNO access to incumbent telecom networks.

## **Chapter 2. Background**

### **2.1. Mobile Market Characteristics**

#### **2.1.1. Mobile Market Structure**

The mobile telecommunications sector is currently the largest and fastest growing telecommunications sector in Canada. From 2000 to 2012, the wireless telecommunications industry has nearly quadrupled in terms of revenue, growing at a rate of 4.9% annually since 2013. As of 2013, mobile services have surpassed landlines as the dominant type of phone service in Canada (Winseck, 2014).

As of 2017, total revenues in the sector were valued at \$24.5 billion. The Big Three captured 91.8% of revenues, with 8.2% divided among smaller or regional operators (Freedom Mobile, SaskTel and Videotron). The Big Three control 90% of the market in all but 4 provinces (Saskatchewan, Ontario, Quebec and Newfoundland). Of those provinces, only in Saskatchewan (62%) and Quebec (16%) do other firms control more than a negligible proportion of the market (CRTC, 2019).

The Big Three have been able to maintain their market dominance by differentiating service offerings. They use a combination of primary brands (TELUS, Rogers, Bell) and flanker brands (Fido, Koodo etc.) in order to diversify their market offerings. As of 2017, 20.9% of the market (included within the 91.8% total market share) was controlled by the flanker brands of the Big Three. This is over twice as much as the 8.2% that is controlled by independent brands like Freedom Mobile, SaskTel and Videotron (CRTC, 2019).

These flanker brands target the “value” market segment, competing directly against the small independent providers. The Big Three have used this strategy successfully, increasing their market share from 17% in 2014 to 20.9% in 2017. From 2016 to 2017, other providers actually saw a 6.5% loss in revenues at the expense of Big Three flanker brands due to mergers and acquisitions (CRTC, 2018). Acquisitions of independent operators and MVNOs by the Big Three have been a consistent feature of the Canadian market. These acquisitions have contributed to the lower levels of market competition (Clark, 2019); Evans, 2015).



### **2.1.2. User Characteristics**

Mobile telephony has quickly displaced landlines as the preferred telecommunications medium for most Canadians. As of 2017, 90% of households now use mobile telecommunications, while only 63% use landlines. Additionally, 36% of households now use mobile telecommunications exclusively (CRTC, 2019). Another important trend is the increase in data use among consumers. The number of Canadian mobile users with data plans has increased substantially, from 62% in 2013 to 83% in 2017. Additionally, average monthly data usage per subscriber has doubled between 2013 and 2017 (CRTC, 2018).

Canada had a low average churn rate (subscriber turnover rate) of 1.3% in 2017, down from 1.6% in 2013. These low churn rates suggest that there may be limited competition between mobile companies because users do not see an incentive to switch providers (CRTC, 2018).

## **2.2. Regulatory Structure**

Regulatory responsibility for Canadian mobile wireless telecommunications is divided between Innovation, Science and Economic Development Canada (ISED) (formerly Industry Canada) and the Canadian Radio-television and Telecommunications Commission (CRTC) (Shepherd et al. 2014). ISED is responsible for establishing some aspects of mobile telecommunications policy. It also fulfills regulatory functions, including allocating electromagnetic spectrum. It achieves this through awarding spectrum licenses to mobile operators (Thakur, 2012).

The CRTC has a number of important regulatory functions. These functions include issuing licenses for international telecommunications services, promoting compliance with regulations, approving tariffs in the telecommunication sector, and providing telecom-related public information. Its two most important functions are encouraging competition in the telecommunications market, and ensuring Canadian consumers have adequate choices in telecom services (CRTC, 2018).

The CRTC's mandate is defined by the 1993 *Telecommunications Act*, the primary legislative document governing the mobile telecom sector (CRTC, 2018). The

CRTC is responsible for interpreting and implementing the contents of the Act (Luu, 2016). The CRTC's mandate is defined in Section 7 of the Act, which lists several objectives of Canadian telecommunications policy. These objectives include: ensuring reliable and affordable telecommunications services, enhancing efficiency and competitiveness, promoting ownership and control of Canadian mobile carriers by Canadians, and most importantly, fostering competition through a reliance on market forces (Telecommunications Act, 1993).

Section 16(3) of the Act imposes foreign ownership restrictions on the telecommunications market. The Act mandates that Canadians must hold at least 80% of a mobile company's market share, and that 80% or more of its board of directors must be composed of Canadians, for it to be eligible to operate in Canada (Middleton, 2011); Telecommunications Act, 1993). These foreign ownership rules were amended in 2012 to apply only to companies with more than 10% market share, based on total Canadian revenues (Fasken, 2018). This means that while the market is now more permeable, the Big Three are still protected by these foreign ownership regulations.

## **2.3. Existing Policy Measures**

Government policy in Canada has attempted to reduce mobile service prices through two main methods. The first is increasing competition in the mobile services market, and the second is reducing consumer switching costs and increasing consumer mobility (Luu, 2016).

### **2.3.1. Spectrum Auctions**

Given that electromagnetic spectrum is limited in supply, it is allocated to firms through spectrum auctions (McMillan, 1994). Up until 1999, Canada used an administrative process to allocate spectrum, until ISED decided that Canada should move to a market-based spectrum auctioning process (Taylor, 2013). However, unlike the U.S and Australia, Canada only tepidly embraced this new system. By 2009, the U.S had held 70 spectrum auctions, and Australia had held 35, while Canada had only held 7 (Taylor, 2013).

The most significant auction held in Canada was the 2008 Advanced Wireless Spectrum (AWS) auction of 1700MHz and 2100MHz bands. This spectrum was suitable particularly for smartphones and wireless devices (Taylor, 2013). The goal of the auction was to improve competition in the mobile services market (Middleton, 2011). The auction set aside 45MHz of spectrum exclusively for new entrants (Taylor, 2013). This resulted in the entry of several new companies into the mobile market in 2009 and 2010, (Middleton, 2011). The auction succeeded in establishing Videotron as the fourth mobile carrier in Quebec. However, only Mobilicity and WIND Mobile managed to build out national networks (Middleton, 2011). By 2015, Mobilicity had gone bankrupt, and was bought out by Rogers, while WIND Mobile was bought out by Shaw becoming Freedom Mobile (Clark, 2019). A number of other spectrum licensing auctions have been held since 2008, including in 2014, 2015, 2018 and 2019. However, none of these auctions have been successful in increasing the market shares of new entrants (Industry Canada, 2019).

### **2.3.2. Wireless Code**

In 2013 the CRTC established the Wireless Code, a mandatory code of conduct for mobile services providers in Canada. The Wireless Code was designed to reduce prices indirectly through a number of policy changes. It placed limits on early cancellation fees for mobile service plans and reduced contract periods from three to two years. It also forced mobile service providers to end the practice of locking wireless devices, which had previously prevented consumers from using them with competing brands (CRTC, 2013). These measures were designed to increase consumer mobility, increasing consumer demand elasticities, and ultimately reducing prices (Luu, 2016). Additionally, the Wireless Code set limits on data roaming charges and data overcharge rates (CRTC, 2013). Furthermore, although customers can still sign contracts of more than 24 months, they can no longer be charged cancellation fees for terminating their plans after 24 months (CRTC, 2018).

## **2.4. Problem Illustration**

### **2.4.1. International Price Comparison**

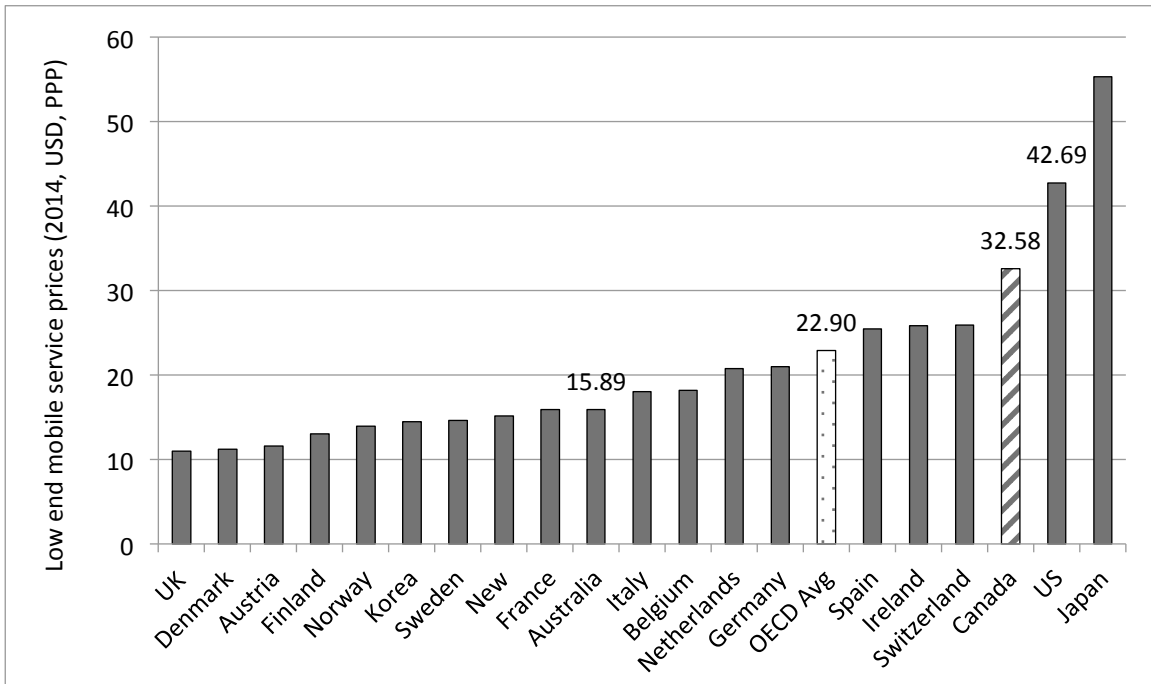
Canada consistently exhibits some of the highest prices for mobile services in the developed world. These trends are reflected in comprehensive data from two major sources: the 2015 OECD Digital Economy Outlook report, and the 2017 Nordicity Price Comparison Study of Telecommunications Services in Canada and Select Foreign Jurisdictions, commissioned by the CRTC. Both of these sources compare prices across 5 different mobile service “baskets”. Although the baskets used are different, the overall trends remain the same in both studies.

#### ***2015 OECD Digital Economy Outlook Report***

This report outlines mobile telecommunications service prices across 33 countries. For the purposes of this paper I have included only 20 developed countries that are more directly comparable to Canada. The report compares prices across five different service baskets: 30 calls and 100MB of data, 100 calls and 500MB of data, 300 calls and 1GB of data, 100 Calls and 2GB of data, and 900 Calls and 2GB of data (OECD, 2015). For the purposes of this paper, I have combined data for the two lowest baskets, representing low-end service options, and for the two highest baskets, representing high-end service options. Complete data for all five baskets can be found in Appendix A.

Looking at the 2014 OECD data for combined low-end service options (Figure 1), Canada has the third highest prices in this category (below Japan and the U.S.). Canada’s prices were \$10 above the OECD average of \$22.90 for this category. While this is lower than the U.S. and Japan, who have average low-end service prices of \$42.69 and \$55.30 respectively, Canada is still well above most other OECD countries. Canada’s low-end service prices are also more than twice as high as those observed in countries such as Australia, which has an average low-end service price of \$15.89.

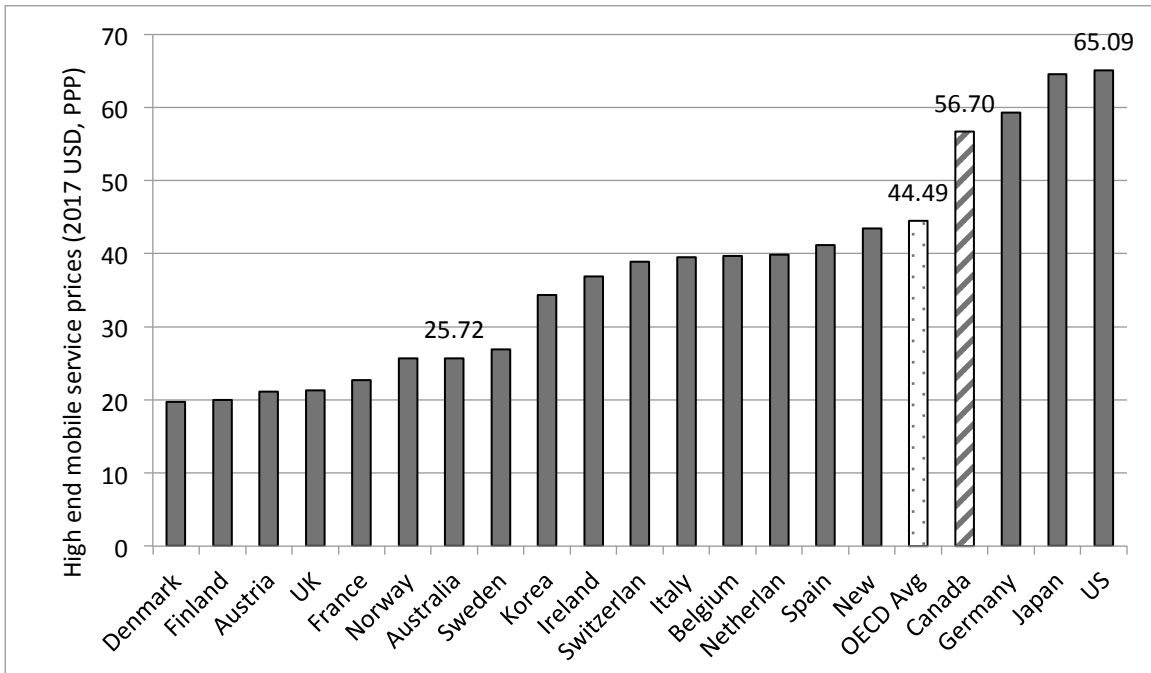
**Figure 1: Combined Low End Mobile Service Prices (2014 USD, PPP Adjusted) Select OECD, 2014**



(OECD, 2015)

Looking at the data for combined high-end services (Figure 2), Canada has the fourth highest prices in this category (below Japan, Germany and the US). Canada's prices are around \$12 higher than the OECD average for this category. While Canada's prices here are lower than the US (\$65.09), Canada's prices are well above most other OECD countries, and over double Australia's prices (\$25.72).

**Figure 2: Combined High End Mobile Service Prices (2014 USD, PPP Adjusted) Select OECD, 2014**



(OECD, 2015)

The correlation coefficient between low and high-end prices is 0.83, which indicates a strong correlation between high and low-end prices.

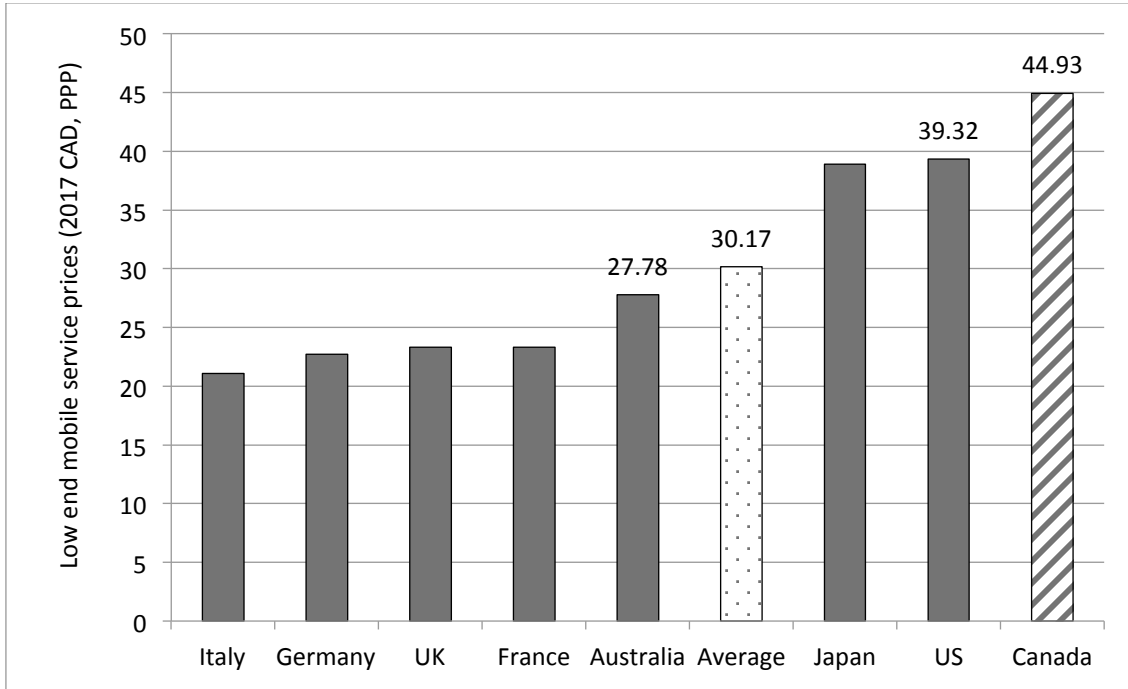
### **2015 Nordicity Price Comparison**

This report compares mobile telecommunications prices between Canada and 7 other major developed economies, although using different baskets than the OECD dataset. The report compares prices across five different service baskets. The baskets used are: 150 minutes, 450 minutes and 300 SMS, 1200 minutes 300 SMS and 1GB of data, unlimited minutes and SMS with 2GB of data, and unlimited minutes and SMS with 5GB of data. Note that prices in this report are in 2017 Canadian Dollars. For the purposes of this paper, I have combined data for the two lowest baskets, representing low-end service options, and for the two highest baskets, representing high-end service options. Complete data for all five baskets can be found in Appendix A.

Figure 3 compares the prices for the combined low-end baskets. Canada has the highest prices in the low-end service category at \$44.93 CAD. Canada is still well above

the average of \$30.17 CAD, and has prices significantly higher than Australia, whose prices in the low-end service category are \$27.78 CAD.

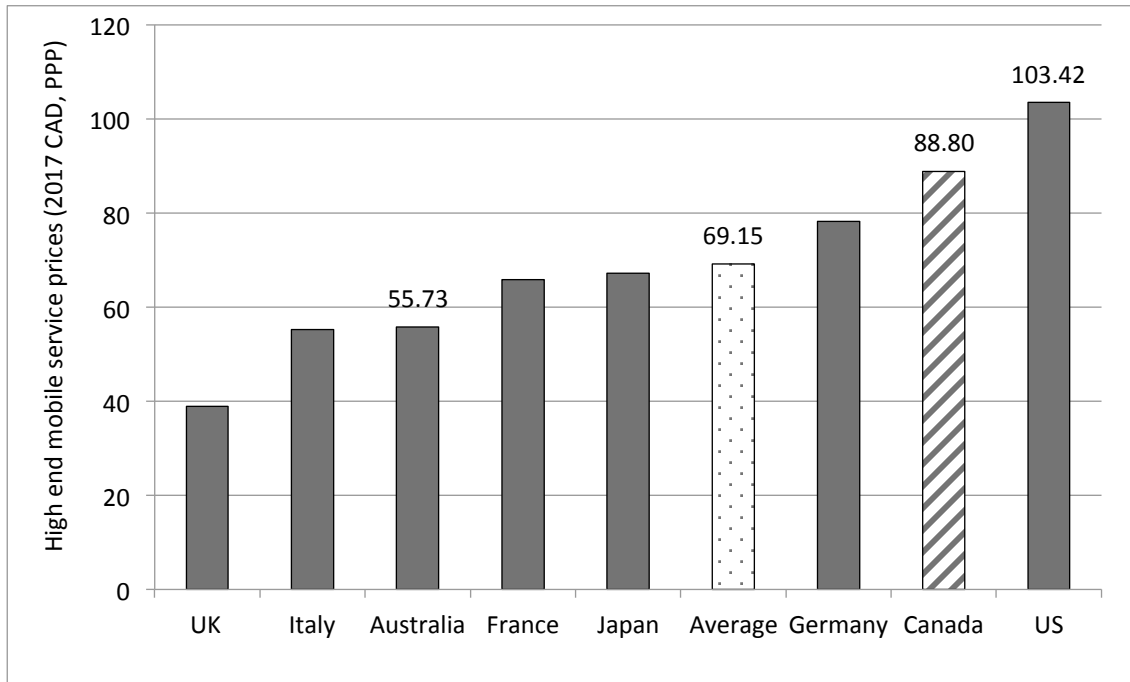
**Figure 3: Combined Low End Mobile Service Prices (2017 CAD, PPP Adjusted) Select Countries, 2016**



(Nordicity, 2017)

Figure 4 compares the prices for the combined high-end service baskets. Canada has the second highest prices in the high-end service category at \$88.80 CAD. Canada is still well above the average of \$69.15 CAD, and has prices significantly higher than Australia for comparable services, whose combined prices in the high-end service category, is \$55.73 CAD.

**Figure 4: Combined High End Mobile Service Prices (2017 CAD, PPP Adjusted) Select Countries, 2016**



(Nordicity, 2017)

The correlation coefficient between high and low-end prices is 0.67, which indicates a relatively strong correlation between the two. The correlation coefficients between the OECD and Nordicity datasets are relatively high as well, with a correlation coefficient of 0.79 for the low service baskets, and a correlation coefficient of 0.77 for the high-end service baskets. This suggests that the trend of high prices in certain countries over others holds across the two datasets.

## 2.4.2. Average Revenue Per User

In addition to having some of the highest mobile service prices in the developed world, Canada also exhibits some of the highest average revenues per user (ARPU). A 2018 study by Tefficient, a Swedish-based research firm, concluded that Canada is an outlier among developed countries when it comes to ARPU. Of 34 countries, Canada had an ARPU of approximately \$40 (USD 2017), with only the US and Switzerland exhibiting comparable values at around \$38 each. Canada's measure was significantly higher than countries like Australia, which had an ARPU of approximately \$27 (Tefficient, 2018). Of the 34 countries, Canada also had some of the lowest levels of



data usage. This means that overall, Canada had the highest ARPU for some of the lowest levels of data use in the developed world (Tefficient, 2018).

### **2.4.3. Distributional Consequences**

Mobile service costs in Canada also have distributional and equity implications. Income quintiles in Canada are disproportionately affected by high cell phone service costs. Broken down by quintile, the lowest quintile paid 3.2% of their annual income, the second lowest quintile paid 1.9%, the middle quintile paid 1.8%, the second highest paid 1.4%, while those in the highest income quintile paid only 0.9%. Although people in the lowest quintile spent nearly a third less on their cell phone bills per year when compared with the highest quintile, they paid three times more than the highest quintile as a percentage of their annual income (CRTC, 2019). Average household spending on mobile services also increased more over time for the lowest income earners. While other quintiles had an average increase of about 9% on their monthly cell phone bills from 2013 to 2017, the bottom quintile had an increase of 13.2% over the same time span (CRTC, 2019).

## **2.5. Public Opinion**

Public opinion data suggests that while Canadians are somewhat satisfied with their current mobile services, they are aware that the value of their services is inferior to other countries. In a recent survey commissioned by the CRTC in 2020, 35% of Canadians surveyed were very satisfied with their mobile services, while only 16% were somewhat dissatisfied, or very dissatisfied with their services. However, only 46% of Canadians surveyed thought they got good value for money from their mobile plans, and 66% of respondents thought Canada had worse prices than other countries, with only 4% saying Canada had better prices. Of those dissatisfied, 65% were dissatisfied due to service costs, and 35% were dissatisfied with data prices. These responses suggest that while Canadians may be able to afford the higher prices, they feel prices are higher than they should be. Canadians are also distrustful of flanker brands and small providers, with 47% not willing to switch to a flanker brand, and only 41% willing to do so (CRTC, 2020).

While there is no existing Canada-wide data that tests public opinion on telecommunications policy, British Columbia issued its own online survey in 2019 to test

public views on mobile telecommunications. In this survey, 79% of respondents either disagreed or strongly disagreed that they received good value for money on their mobile plans, and only 9% agreed or strongly agreed. Additionally, 86% of respondents thought the costs of their cell phone services were unreasonable, while only 6% thought they were reasonable. The survey also tested broad policy options that could be used to reduce mobile service costs. The top options were increasing retail competition and innovation at 58% approval, implementing government regulation of prices at 50% approval, and increasing choices for low and mid-use cell phone plans at 47% approval (Government of British Columbia, 2019).

## **2.6. Stakeholders**

This paper seeks to address the high costs of mobile services faced by Canadian consumers. Therefore, the primary stakeholders in this policy area are consumers, who are affected by the lack of competition and service choice in the mobile services market. Other stakeholders of concern are the incumbent wireless telecommunications companies (Rogers, TELUS and Bell) and their subsidiary flanker brands, which benefit from high prices at the expense of Canadian consumers (Middleton, 2011). Because these firms benefit from the existing policy status quo, they would be resistant to significant policy change.

Other important stakeholders being considered are new market entrants and small firms. After the 2008 AWS spectrum auctions, new entrants were able to enter the market, but many subsequently failed. These firms still have a very small market share relative to incumbents, and this market share may further decrease if market consolidation continues. New entrants face significant challenges due to limited brand recognition and difficulty in competing with the service bundles being offered by the established firms. These firms also have an interest in increasing their market share and competitiveness vis-à-vis the Big Three service providers, and would therefore likely be more supportive of reform.

## **Chapter 3. Methodology**

### **3.1. Literature Review**

The first methodology I use is a literature review of potential policy options that can address high mobile telecommunications prices in the Canadian market. My primary source of data is existing literature, obtained through library research. The literature review seeks to examine the benefits and drawbacks of potential policy interventions. The policy options of interest are mandating MVNO access to incumbent networks, mandatory price caps for mobile services, and introducing foreign competition to the Canadian market.

### **3.2. Case Studies**

The second methodology I use is a case study analysis. My primary sources of data are telecommunication reports, and existing literature obtained from library research. I have chosen two foreign comparison cases; Australia as the foreign jurisdiction with lower prices than Canada, and the US as the foreign jurisdiction exhibiting higher prices than Canada. I have chosen these two jurisdictions due to their similarity to Canada in geographic size and level of economic development. I also explore Saskatchewan as an internal case study, and attempt to understand why it exhibits lower prices than most of the rest of Canada. Ultimately, this section seeks to identify the factors that may be causing higher or lower prices in each jurisdiction, and what can be learned from these factors that can be applied to the Canadian case. In particular, the features I look at are the openness of markets to foreign participation, the use of price caps or other regulation, the level of competition and market concentration in each jurisdiction, as well as the robustness of their MVNO markets.

The major limitation of this research approach is that regulatory structures are difficult to compare between jurisdictions. Therefore, it may be difficult to conclusively determine which features specifically result in lower consumer prices. Additionally, as much of the data will be qualitative, it may be more open to interpretation than quantitative methodologies.

### **3.3. Expert Interviews**

As my third methodology, I use data from five semi-structured expert interviews. These qualitative interviews help identify the potential causes of the issue of high mobile telecommunications prices in Canada, as well as potential suggested reforms or policy recommendations that can be used to address this issue. In addition the interviews help gather information that is used to evaluate some of these policy options. The primary limitation of this methodology is the subjectivity of the data collected from interviews.

### **3.4. Analysis of CRTC Hearing Submissions**

The final methodology I use is an analysis of the submissions to the recent 2019-2020 CRTC review of mobile wireless services. This review was initiated in 2019 by the CRTC in order to investigate the state of competition in the mobile retail market, as well as to explore opening up the Canadian market to wholesale MVNO access. As part of the review, the CRTC called stakeholders such as the Big Three, industry groups representing small firms, and others, to offer their views on potential regulation of the mobile telecom market (CRTC, 2019). I use these submissions to analyze the positions of the CRTC, the Big Three, and potential new entrants and small firms, on proposed policies that are aimed at addressing competition and pricing in the mobile market.

## Chapter 4. Literature Review and Case Studies

### 4.1. Literature Review

#### 4.1.1. Foreign Competition

There are several conflicting assessments of the state of competition in the mobile telecommunications market in Canada. Some scholars argue that competition is inadequate or ineffective. Others argue that the mobile services market in Canada is more competitive than in many other countries, and that increasing competition in this market may be counterintuitive.

Middleton (2011) argues that Canada has higher mobile service prices than most other OECD countries. While there is competition in the Canadian wireless market between the Big Three, this competition has neither produced innovative services, lower prices, nor improved consumer choice (Middleton 2011). She argues that the lack of international carriers operating on the Canadian market has prevented meaningful price changes (Middleton, 2011). Middleton argues that the foreign ownership restrictions that are present in the *Telecommunications Act*, as well as the high up-front capital costs that are needed to build mobile infrastructure, limit the ability of new entrants to establish a foothold in the Canadian market. Introducing international wireless operators in Canada would bring in new technology, capital, marketing knowledge, and management practices, producing greater competition and lowering service prices (Middleton, 2011).

Thakur (2012) shares Middleton's views on the state of mobile service competition in Canada, and characterizes the Canadian mobile services market as oligopolistic. Thakur argues that, despite the CRTC's commitment to promoting mobile wireless competition through the use of market forces, genuine competition has not been achieved (Thakur, 2012). The three primary consequences of this lack of competition are higher prices, lower service use, and less innovation. The reduced level of innovation includes new products and services being introduced at a lower rate (Thakur, 2012).

In contrast, Church and Wilkins (2013) argue that Canada does not have a competition issue in the mobile sector. They argue that competition is inherently limited by the technology needed to provide telecommunications services (Church and Wilkins,

2013). Wireless telecom services require both high fixed and sunk capital costs to acquire or build the necessary infrastructure, and the economies of scale for services to be delivered efficiently (Church and Wilkins, 2013). The consequence of this is twofold. First, services require high markups and high gross margins to account for the large upfront capital costs. Secondly, due to the economies of scale necessary, there will be a natural limit to how many wireless carriers can participate in the market (Church and Wilkins, 2013). Based on the fact that other major economies also typically have three to four major firms, Church and Wilkins conclude that Canada does not have a competition issue (Church and Wilkins, 2013).

Furthermore, they argue that increasing competition in the short run will not be sustainable in the long run. This is because increasing competition will squeeze profit margins, and in the long run carriers will either exit or consolidate, in order to reduce competition and return to profitable margins. Therefore, consumers may gain in the short run due to lower prices, but over time the market will re-consolidate. This has been observed in historical examples in Austria, Australia and the U.K. (Church and Wilkins, 2013). There are several negative consequences to facilitating the entry of foreign firms in order to increase competition. First, reducing the scale of incumbent operators will raise their marginal costs of production, resulting in higher prices in the long run. Secondly, if incumbent operators do not get the spectrum they need, the quality and coverage of their networks may suffer because spectrum was allocated inefficiently to firms with lower economies of scale (Church and Wilkins, 2013).

#### **4.1.2. Introducing MVNOs**

Shin and Bartolacci (2007) argue that MVNOs are an effective way to reduce prices because they allow firms that do not have the physical infrastructure, or the high levels of capital needed to build a mobile network to still compete on the mobile telecom market. Essentially, this allows firms to create business models that reflect their financial capabilities. This flexibility increases the level of competition, reducing prices (Shin and Bartolacci, 2007).

Based on an economic analysis of opening up the South Korean mobile telecommunications market to MVNOs, Kim and Seol argue that it is beneficial to open up markets to MVNOs because it results in price competition with MNOs, resulting in

lower prices. (Kim and Seol, 2007). This occurs due to an increase in service-based competition between incumbent MNOs and MVNOs or a “price war” (Garrido and Whalley, 2013). These “price wars” occur because MNOs have to respond to the lower prices that are offered by new entrants by reducing their prices in order to maintain their market share (Kim and Seol, 2007).

### **4.1.3. Price Caps**

Another policy option discussed in literature that can reduce mobile service prices is the introduction of price caps on mobile services. In wireless telecom services where multiple services are bundled as packages, a price cap would typically let an operator choose a set of prices for specific services so that an index of the prices of those different services doesn’t surpass a certain price level. (Braeutigam and Panzar, 1993).

Critics of price caps argue that they result in firms producing similar, homogenized plans, with little variation in price, or differentiation between service bundles (Geist, 2019). Additionally, it is difficult for regulators to choose the correct price cap. If the price cap is set too high above the average cost, price caps lead to inefficiencies and deadweight loss. However, if they are set too low below the average cost, firms may not be able to recover their costs (Braeutigam and Panzar, 1993). Also, because in a wireless market there are different products (bundles) at different prices, mobile operators can use nonlinear pricing or “price rebalancing” (Xavier, 1995) (charging less for “bigger” service bundles and more for “smaller” service bundles on a per-unit basis). This would actually lower consumer surplus because consumers would be charged relatively more for “smaller” service bundles, even though there is a cap on prices (Braeutigam and Panzar, 1993),

Other scholars such as Xavier argue that, despite concerns about price rebalancing, price caps are functional if judged purely on the basis of price reduction (Xavier, 1995). He finds that the prices of telecom services fell in every jurisdiction where price caps have been applied (Xavier, 1995). They are particularly effective in service markets where there is an absence of strong competition. In these markets, prices fall very close to the maximum allowed by the price cap. Prices falling substantially below the price cap threshold typically indicates that some other competitive pressure or

changes in technology produced price drops (Xavier 1995). Even though prices can drop due to other factors, Xavier finds that price caps also effectively prevent price *increases* where they would have otherwise occurred due to changes in the market (Xavier, 1995).

## **4.2. Case Studies**

### **4.2.1. Case Study 1: Saskatchewan**

#### ***Overview***

Competitive pressure resulting from the presence of a fourth regional carrier is the primary reason for lower prices in Saskatchewan (MacPherson, 2017). Statements made by the Competition Bureau indicate that the pricing difference between Saskatchewan and the rest of Canada cannot be explained by other factors such as demographics, demand, or service quality, and can only be explained by the presence of a strong regional carrier (MacPherson, 2017). The effects of competitive pressure are also evident in consumer behaviour. In provinces such as Saskatchewan, where competition is more robust and prices are lower, consumers are much less likely to switch providers than in other parts of Canada (Competition Bureau, 2019).

The Competition Bureau found two causes of lower prices in Saskatchewan compared to the rest of Canada. First, in the rest of Canada the Big Three use “coordinated behaviour” such as signalling price changes to each other through timed promotions, to soften competition between each other and produce higher prices (Competition Bureau, 2019). The major firms essentially set prices that avoid pricing retaliation from the other major firms. Secondly, A phenomenon called multi-market exposure occurs in the rest of Canada. Multi-market exposure occurs when firms compete across several different jurisdictions. Essentially, because the Big Three compete in several different (provincial) markets, they can choose not to compete aggressively in one market in order to avoid competitive retaliation in a different market. This effect dampens competition in Canada. Both of these factors are disrupted when firms encounter a regional firm operating in one jurisdiction that does not have the same interests in limiting competition, as in the case of SaskTel in Saskatchewan (Competition Bureau, 2019).



## Price

Saskatchewan has consistently exhibited lower market prices than the rest of Canada across almost all mobile service baskets since at least 2008 (ISED, 2018). Comparing Saskatchewan to the rest of Canada in 2017, in four out of five service baskets, Saskatchewan has noticeably lower mobile service prices. Only in the lowest service basket are prices relatively equal. If we observe average prices across all five baskets, average prices in Saskatchewan are approximately 17% cheaper than prices in Canada as a whole.

**Table 1: Mobile Service Basket Price Comparison Saskatchewan vs. Canada (CAD, PPP 2017)**

Jurisdiction	Basket 1 (150min)	Basket 2 (450min, 300 SMS)	Basket 3 (1200min, 300 SMS, 1GB)	Basket 4 (Unlimited Nationwide, Unlimited SMS, 2GB)	Basket 5 (Unlimited Nationwide, Unlimited SMS, 5-9GB)	Average
<b>Saskatchewan</b>	<b>30.57</b>	<b>35.91</b>	<b>62.88</b>	<b>68.75</b>	<b>74.06</b>	<b>54.43</b>
<b>Canada</b>	30.53	40.95	70.7	81.61	104.49	65.56

(Nordicity, 2017)

## Market Share

Saskatchewan's market structure is unique when compared to the rest of Canada. Aside from Quebec, it is the only province in Canada that has a fourth major carrier holding a significant market share. However, unlike Quebec, whose fourth carrier holds only around 15% of the total market share (CRTC, 2018), Saskatchewan's fourth mobile telecom firm holds a majority of the market share. Data presented in Table 2 shows that the Big Three in Saskatchewan collectively hold only 40% of the mobile market share, while "Other" firms hold 60% (CRTC, 2019). In this case, the "Other" category essentially represents SaskTel's market share, with other small firms making up negligible proportions of that category (CRTC, 2019).

**Table 2: Saskatchewan Mobile Telecom Market Composition 2013-2018, Select Years**

Provider	Market Share (%) by Year			
	2013	2016	2017	2018
Bell	32	36	38	21
TELUS				14
Rogers				5
Other	68	64	62	60

(CRTC, 2017) (CRTC, 2019)

Although SaskTel still dominates the mobile market in Saskatchewan, its market share has been steadily eroding over time. As observed in Table 2, SaskTel’s market share has decreased from 68% in 2013, to 60% in 2018 (CRTC, 2018).

### ***Spectrum Licensing Incentives for MVNOs or Small Firms***

The 2014 mobile broadband auctions for 700MHz and Advanced Wireless Services (AWS-3) are the most recent spectrum auctions to be significantly relevant to the mobile market in Saskatchewan. Prior to this auction, in 2012, Industry Canada held several consultations with major mobile telecom firms, including SaskTel, in order to shape spectrum allocation. In these consultations, Industry Canada tested opinions on measures that could be used to promote competition. The measures tested included spectrum set-asides for small firms, and spectrum caps on incumbent firms (Industry Canada, 2012). During the consultations, Industry Canada proposed to eliminate set-asides for small firms trying to acquire AWS-3 spectrum. For the 700MHz spectrum, Industry Canada promoted the continuation of spectrum caps. Some of these caps were applicable to all licensees, while others were applicable to larger wireless providers (Industry Canada, 2015).

Saskatchewan’s major firms are divided on the level of regulation needed in spectrum auctions. During the consultation, SaskTel disagreed with Industry Canada’s suggestion to eliminate set-asides for small firms in the AWS-3 auction, while the Big Three supported this measure (Industry Canada, 2015). However, SaskTel did suggest that reserves should be implemented, but only for carriers who had no national market power (Industry Canada, 2015). For the 700MHz auction, SaskTel supported the

continuation of spectrum acquisition caps, while the Big Three opposed them (Industry Canada, 2015).

After the consultations, Industry Canada ultimately decided to maintain caps on 700MHz spectrum for all provinces including Saskatchewan, but decided against set asides for new entrants in the AWS-3 auction in Saskatchewan and Manitoba (Industry Canada, 2015). This was done because Industry Canada deemed the current spectrum distribution and level of competition in these provinces to be adequate (Industry Canada, 2015).

### ***Foreign Ownership Regulation***

Saskatchewan shares the same foreign ownership regulation as the rest of Canada, as described in Section 16(3) of the *Telecommunications Act*. However, because the regulation applies on the basis of total national revenues, it applies only to the Big Three, but not to small firms or to SaskTel (Buchanan, 2012), which has less than 10% of the national revenue and therefore can be technically foreign-owned, if it were privatized.

In 2017, privatization was attempted through the Saskatchewan Party government's attempt to introduce Bill 40, which would have allowed for crown corporations such as SaskTel to be partially privatized up to 50%, opening up SaskTel to potential foreign investment (Hunter, 2016);(CBC, 2017). Ultimately however, the bill was repealed in 2018 after intense opposition by organized labour and the NDP (CBC, 2018), and SaskTel remains a crown corporation.

### ***Price Caps***

As the CRTC regulates mobile telecommunications services in Canada nationwide, there is currently no price control regime for mobile telecommunications services in Saskatchewan either (CRTC, 2020). The official position of the CRTC is to not intervene to set retail rates for communications services under its purview. It only does so for special cases in Northern Canada, such as prices for services provided by Northwestel in that region (CRTC, 2019).

## 4.2.2. Case Study 2: U.S.

### *Overview*

The U.S. currently exhibits higher mobile telecom prices than most of the developed world, including Canada. A major cause of these higher prices is the lack of availability of mobile infrastructure. This is the result of U.S. mobile telecom policy focusing on spectrum reallocation, rather than on investment into mobile infrastructure (Woroch, 2020). While spectrum is relatively accessible in the U.S., firms require significant capital investment to build or to access the physical infrastructure needed to deploy this newly acquired spectrum. These high infrastructure costs are ultimately offloaded onto U.S. consumers, resulting in higher prices (Bergmayer et al., 2017).

The desire of firms to limit the use of data services also drives high prices in the U.S. (Statt, 2018). Data networks have a limited capacity, and firms therefore have an incentive to limit the oversolicitation of their data services by consumers. Telecom firms in the U.S. have reacted by increasing the cost of unlimited data plans, and by adding hidden data caps to existing unlimited data plans. In practice this means that “unlimited” plans experience reduced network speeds beyond a certain data cap (Statt, 2018). Telecom firms are also increasing miscellaneous administrative fees added onto U.S. consumer bills (Statt, 2018).

Finally, high levels of concentration have occurred in the U.S. market because the Department of Justice (DoJ) and the FCC approved a series of mergers between major telecom firms (Faccio and Zingales, 2017). Due to the breakup of AT&T in 1984, and a series of spectrum auctions, the US telecom market was initially relatively fragmented until the early 2000s (Faccio and Zingales, 2017). However, the FCC and DoJ allowed three major mergers to occur during the decade: Bell Atlantic and GTE which formed Verizon in 2000, AT&T’s merger with Cingular Wireless in 2004, and Verizon’s merger with Alltel Corporation in 2008 (Faccio and Zingales, 2017). This resulted in a heavily concentrated telecommunications industry. This reduction of competition resulted in prices remaining relatively high when compared to markets in other OECD economies (Faccio and Zingales, 2017).

## Price

The U.S. exhibits higher market prices than Canada across almost all mobile service baskets, except the lowest service baskets available. Comparing prices by basket between the U.S. and Canada, in four out of five service baskets, the U.S. has noticeably higher mobile service prices. If we observe average prices across all five baskets, prices in the U.S. are approximately 4.6% higher than prices in Canada.

**Table 3: Mobile Service Basket Price Comparison 2016 (2017 PPP CAD), US vs. Canada**

Jurisdiction	Basket 1 (150 Min)	Basket 2 (450 Min and 300 SMS)	Basket 3 (1200 Min, 300 SMS 1GB Data)	Basket 4 (Unlimited Min, SMS, 2GB Data)	Basket 5 (Unlimited Min, SMS, 5GB Data)	Average
<b>US</b>	<b>27.00</b>	<b>51.64</b>	<b>73.00</b>	<b>89.50</b>	<b>117.33</b>	<b>71.69</b>
<b>Canada</b>	41.08	48.77	74.67	81.05	96.55	68.42

(Nordicity, 2017)

## Market Share

The United States, like Canada has a relatively concentrated mobile telecommunications industry. While there are four major dominant carriers in the U.S. (Verizon Wireless, AT&T, Sprint, and T-Mobile), in practice the two major carriers are Verizon and AT&T. As 2016 these two carriers collectively hold almost two thirds of the market at 63%, while Sprint and T-Mobile only hold 14.1% and 15.2% respectively. Additionally, Sprint has lost market share over time. As a result, Sprint is likely to merge with T-Mobile after the FCC approved a merger proposition in October 2019 (FCC, 2019), which would further concentrate the U.S. market (Wallis, 2019).

As of 2016, the four major carriers in the U.S. hold 98.8% of the total market share, up from approximately 96% in 2013. Other smaller or regional service providers held only 1.2% of the market share as of 2016 (FCC, 2017). This figure has decreased by more than half since 2013, when it was 2.9%, as the U.S. market has further consolidated.

**Table 4: US Mobile Telecom Market Structure 2013-2016**

Provider	Market Share (%) by Year			
	2013	2014	2015	2016
Verizon	36.2	36.2	33.9	33.8
AT&T	31.8	32.5	30.4	30.9
Sprint	15.7	15.1	14.1	14.1
T-Mobile	13.4	14.8	13.9	15.2
Other	2.9	1.4	1.3	1.2

(FCC, 2017)

### ***MVNOs and Small Firms***

As of 2017, the U.S. MVNO market was valued at USD \$18.42 billion (Grand View Research, 2018). Currently more MNVOs operate in the U.S. than in any other country at 147 (OECD, 2014). MVNOs account for approximately 7% of the U.S. mobile market (AEIdeas, 2019).

Currently, the FCC has not sought to incentivize MVNO growth, or to pass regulation that can help increase their market share (Dippon, 2007). This is because the FCC has consistently considered competition to be effective and functional in the U.S. mobile market. Therefore, the FCC has considered it not to be in the public interest to assist MVNOs through regulation (Dippon, 2007).

The FCC however, does incentivize small firms to gain market share by reserving spectrum for them at spectrum auctions. For example, in the 600MHz spectrum auction in 2017, which repurposed broadcast television spectrum (FCC, 2019), the FCC set aside a 5% reserve for “non-dominant” telecom firms (Woroch, 2020). Additionally, the FCC offered discounts in the form of bidding credits of up to 25% to smaller service providers (Woroch, 2020).

### ***Foreign Ownership Regulation***

While under formal legislation, foreign ownership regulations for U.S. mobile firms exist; in practice there is some flexibility to the rules at the discretion of the FCC. Foreign ownership of wireless telecommunications in the U.S. is covered as part of Section 310 of the 1934 *Communications Act*. This act requires the FCC to review foreign investment in a number of fields, including spectrum licensing and leasing. The

two most substantial restrictions in the act are Section 310(b)(3), which prohibits foreign individuals, corporations and governments from owning more than 20% of the capital stock of wireless carriers, and Section 310(b)(4) which mandates a 25% restriction for investment by foreign individuals, governments and corporations in U.S. entities that directly or indirectly control U.S. wireless carriers (FCC, 2014).

These rules were updated in 2012 when the FCC determined that it would not apply foreign ownership regulations, so long as foreign ownership was in the public interest (FCC Report, 2012). In 2013, the FCC codified existing de-facto rules and practices pertaining to foreign ownership. These rules mandate that wireless carriers have to seek approval from the FCC if foreign ownership of their firms exceeds the thresholds established in Section 310 of the *Communications Act* (FCC Report, 2013). However, in practice, the FCC currently believes that foreign ownership *above* these thresholds is beneficial for competition, and therefore in the public interest. Because of this, the FCC allows foreign ownership beyond official thresholds (Eggerton, 2018). Therefore, in practice, foreign ownership of mobile telecom companies is relatively high in the United States. For example, German telecom company Deutsche Telekom AG owns 66% of T-Mobile (The Star, 2015), while Japanese holding company SoftBank Group owns 80% of Sprint (Softbank, 2013).

### ***Price Caps***

Price caps were once used in the pre-mobile telecommunications industry in the U.S. beginning in 1989 (Kenton, 2019). However, after 2003, reliance on price controls in this sector decreased as the FCC began to deregulate the telecommunications services industry (Sappington and Weisman, 2010). Currently, the FCC does not apply price cap regulation to mobile wireless telecommunications services in the United States (FCC, 2020).

### **4.2.3. Case Study 3: Australia**

#### ***Overview***

Australia exhibits both strong mobile service competition and low consumer prices. Consumers of mobile services in Australia benefit from robust competition in both

in the MNO market (ACCC, 2016), and increasingly, in the MVNO market, which has disrupted the ability of the larger MNOs to charge higher prices (Morgan, 2019). In a 2016 report, the ACCC concluded that, as a result of robust competition, consumer prices for mobile telecommunications in Australia have decreased by 52.6%, at an average rate of 4.2% annually between 1997 and 2016. Price competition has also led to price discounts being offered by different providers. These discounts include features such as bonus data, “first free month” plans, bonus international calls, and unlimited texting (ACCC, 2017).

Robust MVNO competition has not only decreased prices, but has also increased the *quality* of services for Australian consumers, as well as increased service innovation. Competition has led to increased amounts of data being included in mobile plans, and to new, innovative features being offered. These features include: data sharing (sharing data across family members), data rollover (ability to use unused data the following month), and free subscriptions to media services such as Netflix and Spotify (ACCC, 2016). Additionally, the major firms in Australia compete to offer better service performance and network coverage by investing into new infrastructure (ACCC, 2017).

Although Australia’s prices are significantly lower than Canada’s, there are still factors that cause affordability issues. These factors include limited network coverage, and a lack of regional competition. Due to the fact that Australia is a large and sparsely populated country, it has varied levels of coverage by different mobile network operators. Because of Telstra’s unique status as a former state monopoly in the Australian telecom sector, it remains the *only* carrier for approximately 13% Australia’s surface area (Department of Communications, 2017). This lack of competition in these areas ultimately affects the level of affordability, because it allows Telstra to charge more for both voice and data services (Department of Communications, 2017). However, consumers do benefit from the competition that is present in the national market, which ultimately affects pricing, even in regions with limited coverage (ACCC, 2017). Additionally, due to the robust MVNO market in Australia, customers now have access to cheaper MVNO alternatives that were not previously available, such as Boost Mobile, which operates off of the Telstra network.



## Price

Australia has some of the lowest telecommunications prices in the developed world, being in the bottom third of OECD countries when it comes to prices (OECD, 2014). Despite similar levels of market concentration, Australia has significantly lower prices for mobile telecommunications across *all* service bundles when compared to Canada, with some bundles being more than half the price of Canadian bundles. Australia exhibits significantly lower prices than Canada, with the average bundle price being 42% lower than Canada (Nordicity, 2017).

**Table 5: Mobile Service Basket Price Comparison 2016, (2017 CAD PPP) Australia vs. Canada**

Jurisdiction	Basket 1 (150 min)	Basket 2 (450 min and 300 SMS)	Basket 3 (1200 Min, 300 SMS 1GB Data)	Basket 4 (Unlimited Min, SMS, 2GB Data)	Basket 5 (Unlimited Min, SMS 5GB Data)	Average
<b>Australia</b>	<b>28.19</b>	<b>27.36</b>	<b>30.91</b>	<b>44.78</b>	<b>66.67</b>	<b>39.58</b>
<b>Canada</b>	41.08	48.77	74.67	81.05	96.55	68.42

(Nordicity, 2017)

Prices in Australia have also steadily decreased over time. According to a report by the Australian Department of Communications and the Arts, prices for mobile services decreased by approximately 20% between 2006 and 2015 (Department of Communications, 2017).

## Market Share

The Australian mobile telecom market is relatively concentrated, being dominated by three major companies: Telstra, Optus, and Vodafone (Nagy, 2019). According to the latest available data from the Australian Competition and Consumer Commission (ACCC), as of 2016, these three firms collectively control 89% of the Australian mobile services market (ACCC, 2018). The remaining 11% of the market is collectively held by several smaller firms (ACCC, 2018).

The table below shows the market shares of mobile telecom firms in 2015, and 2016. Telstra is especially dominant, controlling 41% of the Australian mobile market. This is because Telstra was once the sole public telecommunications company in

Australia, and only began to face market competition in the early 1990s, when Telstra was privatized (Abbott & Cohen, 2014).

**Table 6: Australia Mobile Telecom Market Structure, 2015-2016**

Provider	Market Share (%) by Year	
	2015	2016
Telstra	45	41
Optus	27	29
Vodafone	18	19
Other	10	11

(CIE, 2015), (ACCC, 2018)

### ***Foreign Ownership***

Foreign ownership in Australia is governed by two pieces of legislation. The first is the *Foreign Acquisitions and Takeovers Act* of 1975. The most important provision in this act is the national interest test (Government of Australia, 2016). This test is applied by the Foreign Investment Review Board, and takes into consideration a number of factors, including national interests at large, national security, and the criminal background of a potential foreign investor (Government of Australia, 2016). However, in practice restrictions on foreign ownership are rarely invoked (FCC, 1997). The second source regulation comes from the *Telstra Corporation Act* of 1991, which stipulates that 35% of aggregate Telstra privatized equity can be owned by foreign interests (Department of Infrastructure, n.d.), and that individual foreign investors can only hold 5% of the privatized equity (Utz, 2010).

In practice, the level of foreign ownership in Australia is relatively high. Optus has been a wholly owned subsidiary of Singtel, a Singaporean telecommunications company (Singtel, n.d.), while Vodafone Australia is a 50:50 joint venture between Hutchinson Telecommunications, a Cayman Islands multinational headquartered in Hong Kong and Vodafone Group Plc, a multinational headquartered in the UK (Vodafone, n.d.). As of 2020, Telstra reports that 22% of its shares are owned by foreign investors (Telstra, n.d.).

### ***MVNO and Small Carriers***

Australia has a higher than average level of MVNO-based competition (Dehiri and Williams, 2019). MVNOs in Australia provide a wide range of package options, price

points, and innovative services, and have had success targeting niche areas of the Australian market (Dehiri and Williams, 2019). MVNOs currently have a market share of 13% in Australia, and up to 20% of the market share in urban areas (Venture Insights, 2019). The MVNO market in Australia is quite extensive, with around 51 MVNOs currently operating (Mobile Network Guide, n.d.). Despite the success of MVNOs in Australia, supporting MVNOs is not a priority of Australian regulators, and MVNO access is therefore not mandated directly (Commpete, 2018).

The ACMA in Australia also currently does not set-aside spectrum at auctions for small operators (Utz, 2010). However, the ACMA does attempt to encourage the entry of new firms by trying to evenly distribute spectrum. It does so by capping how much spectrum a firm can buy at any given auction. For example in the 3.6GHz band spectrum auction in 2018, no firm could acquire more than 60MHz of spectrum in metropolitan areas, and no more than 80MHz of spectrum in rural and regional areas (Department of Infrastructure, 2018).

However, the ACCC does recognize that a major barrier to new entrants to the mobile market is the acquisition of sufficient spectrum (ACCC, 2018). Therefore, the ACCC concluded in a 2018 report that it is appropriate to deploy spectrum allocation limits in order for new entrants to acquire enough spectrum to compete with incumbent firms (ACCC, 2018). The ACCC deemed this in the interest of consumers, and in line with its goals of increasing competition, which in turn would reduce prices and improve service quality (ACCC, 2018). The ACMA recommended varied acquisition rules for different firms in different locations. In the metropolitan areas of Sydney and Melbourne, they recommended a cap of 45MHz, while in other metropolitan areas they recommended a 60MHz cap (ACCC, 2018). Additionally they recommended specific limits for more dominant incumbent firms. For example, they set a lower limit for Telstra in other metropolitan areas at 25MHz, and prevented Optus from acquiring spectrum in all metropolitan areas (ACCC, 2018).

### ***Price Controls***

In Australia, the Australian Minister for Communications can implement price controls on telecommunications services at any time, if it is deemed to be in the public interest (Borgese et al. 2019). Australia has never had price controls for mobile

telecommunications services. However, it did have a price control regime for fixed landline services telecommunications services until March 2015 (ACCC, n.d.).

#### 4.2.4. Case Study Analysis Summary

**Table 6: Summary of Case Study Findings**

	<b>Saskatchewan</b>	<b>Australia</b>	<b>U.S.</b>
<b>Market Structure</b>	<ul style="list-style-type: none"> <li>- 4 Major Carriers</li> <li>- Concentrated</li> <li>- SaskTel (crown corp.) dominates market (~60% market share)</li> </ul>	<ul style="list-style-type: none"> <li>- 3 Major Carriers</li> <li>- Concentrated</li> <li>- Telstra Dominates Market (45% share)</li> </ul>	<ul style="list-style-type: none"> <li>- 4 Major Carriers</li> <li>- De-facto duopoly at national level (Verizon and AT&amp;T have 63% marker share)</li> </ul>
<b>Foreign Ownership</b>	<ul style="list-style-type: none"> <li>- Open small firms under 10% market share (Includes SaskTel if privatized)</li> <li>- Restricted for larger firms (80% voting shares/board of directors must be Canadian)</li> </ul>	<ul style="list-style-type: none"> <li>- Open to foreign ownership</li> <li>- Only Telstra has ownership restrictions</li> <li>- Other major firms foreign owned</li> </ul>	<ul style="list-style-type: none"> <li>- De facto open to foreign ownership</li> <li>- Foreign ownership of major firms high (66% of T-Mobile, 80% of Sprint)</li> </ul>
<b>MVNOs</b>	<ul style="list-style-type: none"> <li>- No mandated MVNO access to networks</li> </ul>	<ul style="list-style-type: none"> <li>- High MVNO competition (13% market share)</li> <li>- 51 MVNOs operate in market</li> </ul>	<ul style="list-style-type: none"> <li>- Extensive MVNO market (7%)</li> <li>- 147 MVNOs (more than any other country)</li> <li>- No MVNO incentives</li> </ul>
<b>Small Carriers</b>	<ul style="list-style-type: none"> <li>- No set asides for small carriers</li> <li>- Spectrum acquisition caps in place</li> </ul>	<ul style="list-style-type: none"> <li>- Spectrum not set aside for small operators</li> <li>- Spectrum caps at auctions to promote competition</li> </ul>	<ul style="list-style-type: none"> <li>- Set asides for small firms at auctions</li> </ul>
<b>Price Controls</b>	<ul style="list-style-type: none"> <li>- No price controls in mobile market</li> </ul>	<ul style="list-style-type: none"> <li>- No price controls in mobile market</li> </ul>	<ul style="list-style-type: none"> <li>- No price controls in mobile market</li> </ul>
<b>Price</b>	<ul style="list-style-type: none"> <li>- Lower than Canadian Average by \$11.13</li> <li>- \$54.43 Average plan price</li> </ul>	<ul style="list-style-type: none"> <li>- Lower than Canada by \$28.84</li> <li>- \$39.58 Average plan price</li> </ul>	<ul style="list-style-type: none"> <li>- Higher than Canadian average by \$3.27</li> <li>- \$71.69 Average plan Price</li> <li>- Lower prices for some basic plans</li> </ul>
<b>Highlights</b>	<ul style="list-style-type: none"> <li>- Presence of fourth carrier results in lower prices</li> <li>- Fourth carrier disrupts coordination between incumbents</li> </ul>	<ul style="list-style-type: none"> <li>- Robust MVNO and MNO competition driving low price</li> <li>- Competition increasing service quality and innovation</li> <li>- Affordability issues in remote areas (offset by MVNOs)</li> </ul>	<ul style="list-style-type: none"> <li>- High infrastructure costs driving high prices (offloaded onto consumers)</li> <li>- Firms attempting to limit data use (increases data cost)</li> <li>- Market concentration and decreased competition due to merger approvals</li> </ul>

## **Chapter 5. Expert Interviews**

### **5.1. Interviewees**

I interviewed five candidates as part of this study. Four of the interviews were academics, including Dr. Michael Geist (University of Ottawa, Faculty of Law) and Dr. Brynn Winegard (York University, Schulich School of Business) and two anonymous academics. In addition, I interviewed Paul Budde, a former advisor to the UN Broadband Commission.

### **5.2. Interview Findings**

#### **5.2.1. The State of The Canadian Mobile Telecommunications Market**

Interviewees were in agreement that the leading cause of high mobile prices in Canada is the oligopolistic structure of the Canadian mobile services market. This market structure has persisted due to a number of factors. First, the strong lobbying efforts of the Big Three have limited the effectiveness of past policy interventions, such as foreign ownership rule changes not affecting the Big Three and being passed after the attractiveness of the Canadian market to new entrants had already diminished. While the CRTC has attempted to increase competition through other mechanisms such as spectrum auctions, new carriers have been unable to compete due to the high capital costs needed to enter the market. Secondly, the Big Three continue to coordinate prices between each other, limiting competition. Finally, consumers do not trust new, unfamiliar brands, and prefer the Big Three as “safer” options. This has allowed the Big Three to hold on to their market share over time.

Because of these factors, serious competitive pressures from other firms have not emerged in the Canadian mobile services market. The Big Three have therefore not been incentivized to lower their prices. This is evidenced by the fact that in provinces where there are more than three major carriers in Canada (Saskatchewan, Manitoba and Quebec) prices are noticeably lower than the rest of Canada. Interviewees therefore generally favored increasing competition as a solution this policy problem.

### **5.2.2. Comparing the Canadian and Australian Markets**

Both Paul Budde and the Second Anonymous Academic pointed to Australia as an example of a jurisdiction with affordable mobile prices relative to Canada. The ACCC initially took quite a forceful approach in liberalizing the Australian market, despite resistance from Telstra. The ACCC relied on foreign firms to bring about the desired levels of competition in the Australian market. In order to bring in foreign competition, the ACCC mandated that Telstra give access to foreign firms until they were able to build their own physical infrastructure, and reallocated spectrum to foreign firms at spectrum auctions. The ACCC has also intervened to prevent mergers of major firms such as the recent proposed merger between Vodafone and TPG. Once strong competition was established, the ACCC took a hands-off approach to the market. This has resulted in a market with many more independent MVNOs than Canada's, which have increased the level of competition and produced lower prices.

### **5.2.3. Mandated MVNO Access**

Interviewees were somewhat divided on the effectiveness of mandated MVNO access as a policy option. Some interviewees suggested that mandating MVNO access now would be too late to have a substantial impact. However, even interviewees who voiced scepticism recognized that MVNO access would be effective to some extent. Dr. Geist and Paul Budde consider this option the most realistic short-term way to significantly increase competition in the Canadian market. This is because once MVNOs enter and offer plans on the lower end of the market; the market will adjust quickly to produce new prices, based on these cheaper services. Additionally MVNOs have the advantage of incentivizing innovation because MVNOs typically target niche areas of the market, such as immigrants, who typically need more international minutes. MVNO access would ultimately have effect over the short to medium term. This is because although competitive pressures will start immediately, it will take time for MVNOs to gain enough market share. It will also take time for consumers to become aware of new options and switch to these new providers.

This option would require the CRTC to protect MVNOs by setting the rules and conditions for the contracts between incumbents and MVNOs. If rules are set inappropriately, the incumbents can stifle MVNO growth by setting unfair contracts. This

option would be relatively easy to implement because there is currently an existing mandated access regime for fixed Internet services that both incumbents and the CRTC are familiar with. This option can be implemented by essentially carrying over an existing regulatory regime onto a new network type, and would therefore likely only require a small increase in staff at the CRTC. This policy would likely be phased in over approximately one and a half years.

### ***Stakeholders:***

#### ***CRTC***

Based on recent statements over the past year, it is clear that the CRTC supports this measure. Implementation will likely be decided on after the current wireless consultation hearings conclude this year.

#### ***Incumbents***

The Big Three act as one of the major barriers to this policy option. These firms commit significant lobbying resources in order to push back against this policy. As part of their negotiation tactics, they have even threatened not to build 5G networks if mandated MVNO access is implemented.

#### ***Public Acceptance***

Dr. Brynn argues that the effectiveness of MVNO access may be limited because Canadian consumers are reluctant to move new, unknown providers, and typically prefer larger incumbents, based on their value preferences for familiarity and security.

### **5.2.4. Price Caps**

None of the interviewees considered this to be their preferred option. While this policy would lower prices almost immediately, all of the interviewees agreed that it has significant drawbacks. First, price caps would produce service homogenization in the market because every carrier would set prices at the maximum allowable limit, resulting in very similar services. This in turn would result in reduced incentives for innovation and competition. Secondly, price caps may result in significant enough revenue losses, which would lead to a reduction in service quality as firms try to lower the costs of



providing services. Therefore, although consumers may be paying lower prices, services may be of lower quality as a result of this policy. Quality issues that consumers may experience include call throttling, reduced roaming, and hidden data caps.

Secondly, it is a much more cumbersome policy to implement administratively. This policy option would require additional staff because individuals with expertise in price controls would be needed in order to examine service baskets and determine appropriate price caps. Furthermore, additional staff would be needed to ensure compliance and enforcement. An increased level of bureaucracy is therefore likely needed for this policy.

### ***Stakeholders:***

#### ***CRTC***

The CRTC typically favours market options when dealing with policy issues such as this. It would prefer a policy that did not require the additional regulatory work and administrative capacity to implement. It would also prefer a policy that was more in line with the *Telecommunications Act* mandate to rely on market forces when regulating the telecommunications industry.

#### ***Incumbents***

Incumbent firms have publically stated that they disagree with price controls and most other forms of regulatory intervention into the mobile market.

#### ***Small Firms and New Entrants***

Price controls would also likely prevent new entrants from entering the market. New firms and foreign firms have a greater incentive to enter the market or invest where there is greater opportunity to make profit.

#### ***Public Acceptance***

Most interviewees predicted that the public would likely find this policy initially favourable. Dr. Brynn projects that Canadian consumers would likely be receptive to price controls, as they are aligned with Canadian consumer trust of government

regulation. However, as price is not a high salience issue, there would also likely not be much pressure from Canadian consumers on government to impose such a measure either.

### **5.2.5. Foreign Competition**

Interviewees disagreed about how effective introducing foreign competition into the Canadian market would be. The First Anonymous Interviewee argued that option would be the most effective at increasing competition and reducing prices. This is because telecom is a very capital-intensive industry, and only large firms have the capital that is needed to develop physical infrastructure. The interviewee argued that the effectiveness of this policy is evident in data that shows that jurisdictions that have more large established firms also have lower prices.

However, Dr. Geist and other interviewees believe that this policy would come too late to be practical in the Canadian case. Since the changes to foreign ownership rules in 2014, foreign ownership regulation is no longer a major issue in Canada. However, no major foreign firms have attempted to seriously enter the market, suggesting that large firms simply do not consider it worth it to enter the Canadian market, because of the significantly lower growth potential in the market today.

Implementing this policy would be relatively straightforward. It would require that foreign ownership and foreign investment regulation be further loosened. This would be combined with additional spectrum set asides, and limited mandated access to incumbent networks, but would likely not require much additional staff or resources. The CRTC would likely take an incremental approach to implementing this policy, and would not open competition completely all at once. This means the policy may be slower acting.

#### ***Stakeholders:***

##### ***Incumbents***

Most interviewees thought that incumbents would consider this policy a major market intervention, and would therefore oppose it. Incumbents would likely mobilize

significant lobbying resources to prevent or stall implementation. Implementation would likely proceed only with sufficient political will and public pressure.

### ***Public Acceptance***

Dr. Brynn projects that Canadians would likely be somewhat resistant to this policy because Canadians are relatively more tolerant of protectionism than the average global consumer, particularly when it comes to large domestic firms that employ many Canadians. Other interviewees added that this makes public perception more easily influenced by public communications from unions and industry groups, who will attempt to publically argue that this policy will result in job losses for Canadian workers.

## **5.3. 2019-2020 CRTC Wireless Consultations**

### **5.3.1. CRTC Position**

In 2019 the CRTC initiated Consultation CRTC 2019-57, after concerns that the level of retail market competition in Canada remains low, and is therefore not meeting the needs of Canadians. Concern increased after the CRTC had to intervene in the market on several occasions, the most prominent of which was the creation of the Wireless Code (CRTC, 2019). Additionally, the CRTC is concerned that the competitive landscape of this industry has not developed as expected, and that a sustainable MVNO market has not been able to develop independently. Because of this, as of the beginning of this consultation, the CRTC supports mandating MVNO access until a robust MVNO market is established (CRTC, 2019). Mandated access would be implemented for a limited time, and be subject to a phase out period once the CRTC deems the market robust enough.

### **5.3.2. Big Three Position**

Based on their intervention submissions to the CRTC consultation, all three of the major incumbents argue that Canada has robust mobile competition, and that current levels of market concentration are not problematic (Bell, 2019);(Rogers, 2019);(TELUS, 2019). Therefore, all three firms oppose any form of regulatory intervention into the mobile market. They oppose retail regulation (such as price caps), which they see as

contrary to the CRTC goal of relying on market-based competition (TELUS, 2019), as well as policies such as spectrum set asides for smaller firms, which they see as an attempt by the CRTC to unfairly engineer market outcomes (Bell, 2019). They also do not see it as necessary or beneficial to introduce mandated MVNO access (Rogers, 2019), as it would reduce investment into future physical network (5G) development (Bell, 2019) (TELUS, 2019).

### **5.3.3. Small Firms and Industry Groups**

Industry groups representing small firms supported mandated MVNO access. The Canadian Network Operators Consortium (CNOC), an organization representing over 30 small independent Canadian telecommunications providers, some of which are MVNO operators, was very open to mandating MVNO access. CNOC argues that mandating MVNO access is the best solution to the weak competition present in the Canadian market (CNOC, 2019). CNOC argues that MVNOs would have a positive impact on competition by targeting niche areas of the market with more affordable offerings, which will force incumbent wireless carriers to respond with more affordable plans (CNOC, 2019). CNOC predicts that if wholesale terms, conditions and rates are set appropriately, MVNOs can capture up to 15% of the Canadian mobile market (CNOC, 2019). CNOC does not support any other regulatory measures, including retail regulation, because they believe that retail regulation would not address inadequate competition, which they identify as the main cause of high prices (CNOC, 2019).

Another industry group representing 21 independent rural Canadian telecommunications providers, the Independent Telecommunications Providers Association (ITPA), also supports mandating MVNO access. The group argues that this policy is the only near-term policy option that would allow small telecom firms to compete on the Canadian market (ITPA, 2019). The ITPA believes MVNO access would ultimately allow them to successfully enter the mobile market. The ITPA also insists that MVNOs eligible for this policy *must* be Canadian firms exclusively (ITPA, 2019).

## **Chapter 6. Policy Options**

### ***1) Mandating MVNO Access***

This policy option aims to increase competition by incentivizing the entry of MVNOs into the Canadian market. A large barrier of entry for firms is the large amount of capital investment that is needed build physical infrastructure. An alternative to this is to open the market to MNVOs. These wireless service providers do not own their own network infrastructure. Instead, they enter the market in partnership with MNOs. MNVOs can buy wireless services wholesale from MNOs, and then resell services at a lower rate. Currently, many MNVOs in Canada are owned by one of the Big Three, meaning that competition is not as extensive as the diversity of brands suggests, so consumers do not get significantly lower prices. Encouraging MNVOs to enter the Canadian market circumvents the issue of high capital costs as a barrier to market entry. The CRTC would have to mandate MVNO access to the mobile networks of the incumbent firms that own physical infrastructure. This option allows for the development of competition without having firms build physical mobile networks. The CRTC would have to set appropriate terms, rules, conditions and rates for the wholesale contracts between incumbents and MVNOs so that the incumbents do not set wholesale contracts in ways that impede the ability of MVNOs to compete on the market.

### ***2) Caps on Cellular Bills***

This policy option involves the development of a system of price regulation that would require mobile telecommunications companies to offer affordable plans that are priced below a certain threshold (Geist, 2019). In order to implement such a policy, the CRTC must develop an appropriate price cap system based on existing prices, bundles, plans and other market characteristics. Due to telecom services being typically bundled as packages, price caps would work by letting operators choose a set of prices for specific services in such a way that a standard index of prices of those bundled services does not exceed a certain level (Braeutigam and Panzar, 1993). Firms would then be required to offer price-capped plans at the price level determined by that index. The CRTC would be the institution responsible for setting up the regulatory regime that would implement this policy option. The regulatory responsibilities of the CRTC would include

building the regulatory framework, creating enforcement mechanisms, and building the expertise necessary to develop appropriate price caps.

### **3) *Facilitating Entry of Foreign Firms***

Currently, foreign firms find it difficult to enter the Canadian market due to the high up-front capital costs that are needed to develop mobile network infrastructure, and due to the foreign ownership restrictions in the *Telecommunications Act*. While foreign ownership limits were lifted in 2012 for firms making up less than 10% of the mobile market, they were not lifted for the Big Three firms. Since these rules have been lifted, no well-established foreign firm has entered the Canadian market. Further loosening foreign ownership restrictions and incentivizing the entry of more foreign firms, can increase the level of competition in the market, resulting in lower consumer prices. This would be achieved through a combination of interventions by the CRTC. First, the CRTC would require the gradual reduction, and ultimate elimination of the foreign ownership rules that apply to the large incumbent carriers. This would allow a foreign firm to obtain a controlling stake in major Canadian operators. Secondly, the CRTC would have to set aside spectrum for foreign firms, so that they are able to enter the market and establish market share. Thirdly, the CRTC would have to mandate access to incumbent mobile networks for foreign firms for a limited time (approximately 3-5 years), until these firms gain a significant enough market share and are able to build their own physical networks. The ultimate goal of this policy is to restructure the market so that that a fourth (foreign) national carrier, or several foreign regional carriers, gain a market share that is large enough to disrupt the ability of the Big Three to coordinate prices.

## **Chapter 7. Criteria and Measures**

This section outlines the criteria and measures that are used to evaluate each policy option. All options are rated by using specific criteria and measures. Measures are then translated into three potential ratings, which correspond to a numerical value: LOW = 1, MEDIUM = 2, and HIGH = 3, with “HIGH” always being the highest possible rating for that particular criterion. Each value can then be modified by a weight, if applicable for that criterion.

### **7.1. Effectiveness**

#### **7.1.1. Cost Reduction for Consumers**

This criterion evaluates how effective the policy option will be at decreasing consumer prices for mobile telecommunications services. It is measured by the projected percentage change in consumer prices as a result of the policy in question. This criterion is also a proxy measure for the increased welfare benefits that consumers are expected to gain from reduced mobile service costs. This criterion is the primary measure of effectiveness of this policy. Therefore, it will be weighed more heavily than other evaluation criteria.

#### **7.1.2. Service Innovation and Service Quality**

This criterion evaluates the extent to which the given policy facilitates improved service quality and innovation. Policies are evaluated on the extent to which they achieve this. While some policies may decrease prices, they may also result in a decline in service quality, and may actually disincentive future service innovation. Other policies may reduce prices, and also *improve* quality and innovation. This is important because, if a policy decreases prices but also decreases quality, then consumers may not actually benefit as much as the price change suggests.

### **7.1.3. Speed of Cost Reduction**

In addition to evaluating the magnitude of cost reductions, the speed of cost reductions is also important to consider. This criterion is a secondary, but important measure of effectiveness. Because some policy interventions will reduce costs more quickly than others, and will take more or less time to implement and become operational, it is important to also estimate how soon cost reductions will be observed by consumers. The projected time frame in years in which the policy will reduce prices is what will be used to evaluate this criterion.

## **7.2. Administrative Complexity**

This criterion evaluates the level of institutional complexity that will be required to implement the given policy option. Some options may necessitate entirely new regulatory institutions to be created in order to make and enforce the rules and regulations that affect the mobile telecommunications market. Some options may require the reorganization of existing institutions or institutional relationships, while others will require little or no institutional change at all. The simpler the institutional arrangement needed to implement the option the higher the rating of the policy.

## **7.3. Stakeholder Acceptance**

This criterion evaluates the level of stakeholder resistance to each of the policy options. Stakeholders that will be considered are the CRTC, which will be responsible for implementing and enforcing each option, incumbent telecom companies, who have significant lobbying power and can act as a barrier to policies, and new entrants to the telecom market who may benefit from, and therefore favour particular policy options. The less resistance to this policy by the stakeholders, the higher it will be rated. Incumbents will be attributed greater weight, as they can act as a barrier through lobbying efforts.

## **7.4. Public Acceptance**

This criterion measures the level of public favourability toward each policy option. Since the public (as consumers) is the primary beneficiary of this policy intervention, the level of public favourability is important to measure, especially considering that this will



affect the political feasibility of each option. The more supportive toward a policy the public is projected to be, the higher the policy will be rated in this category. Projections will be made using both public opinion survey data and consumer behaviour projections.

## 7.5. Criteria and Measures Summary

**Table 7: Summary Table of Criteria and Measures**

Criteria	Description	Measure	Rating/Score
<b>Effectiveness</b>			
Cost Reduction for Consumers (x2)	Extent to which policy will reduce costs to consumers	1-5% reduction 5-15% reduction 15%+ reduction	LOW = 1 MEDIUM = 2 HIGH = 3
Service Quality and Innovation	To what extent the policy facilitates improved service quality and innovation	Reduces service quality or innovation Does not affect service quality or innovation Improves service quality and innovation	LOW = 1 MEDIUM = 2 HIGH = 3
Speed of Cost Reduction	How soon cost reductions will be felt by consumers	Over 5 years 2-5 years Less than 2 years	LOW = 1 MEDIUM = 2 HIGH = 3
<b>Administrative Complexity</b>			
Institutional complexity required for implementation	Simplicity of institutional arrangement required to implement the policy	Requires new institution to be created Requires reorganization of existing institutions and resources No new institution required, minimum staff resources required	LOW = 1 MEDIUM = 2 HIGH = 3
<b>Stakeholder Acceptance</b>			
Incumbent Telecom Companies	Extent to which the policy is resisted by the stakeholder	Opposed	LOW = 1
New Market Entrants and Small Firms (x0.5)		No strong opinion	MEDIUM = 2
CRTC (x0.5)		Supportive	HIGH = 3
<b>Public Acceptance</b>			
Level of Public Favorability	Extent to which the policy option is favored by the public	Opposed No strong opinion Supportive	LOW = 1 MEDIUM = 2 HIGH = 3

## **Chapter 8. Evaluation of Policy Options**

### **8.1. Option 1: Mandated MVNO Access**

#### **8.1.1. Effectiveness**

##### ***Cost Reduction***

This policy would result in an increase in service-based competition. This increased competition will result in lower prices for consumers. MVNOs typically target the lower end of the mobile market, forcing incumbent MNOs to respond and provide lower prices, in order to attempt to preserve their market share. While it is difficult to predict the exact magnitude of cost savings, we can use Australia as an example of a market with a robust MVNO ecosystem to project the level of price reduction that could occur on the Canadian market. Currently prices Australia are about 41% lower than Canadian prices, although this price difference is likely the product of number of factors, including a robust MVNO market. Taking a conservative estimate that price reductions would amount to half of the percentage difference in price between Canada and Australia, we would expect to observe approximately a 20% reduction in price. Based on this projection, mandated MVNO access receives a HIGH rating for this criterion.

##### ***Service Quality and Innovation***

Mandated MVNO access would likely result in greater service quality and innovation in the Canadian mobile telecom market. MVNOs typically target the lower end of the market as well niche market segments, and offer other unique and innovative packages and services. This puts pressure on the market, and forces greater service innovation and improvements in service quality from the incumbent firms. Therefore this policy receives a HIGH rating.

##### ***Cost Reduction Speed***

Once implemented, the market would normally be expected to adjust quickly to competition and produce lower prices. In practice, it would likely take time to observe

price changes, because it would take customers some time to become aware of prices and switch to lower cost options. Since some customers are on fixed-term contracts lasting several years, and others do not do market research, it would likely take several years (1-2 years) for prices to adjust. Additionally it would likely take some time for MVNOs to gain a significant enough market share to noticeably affect prices. Therefore this policy receives a MEDIUM rating.

### **8.1.2. Administrative Complexity**

This policy has both administrative advantages and disadvantages when it comes to implementation. There is an already existing regulatory regime in the fixed-line Internet service market that is easily transposable to the mobile telecom market, making the administrative capacity needed to develop the policy relatively small. This aspect of implementation would be relatively administratively simple. However, additional resources would be needed to build the expertise necessary to set contracts between MVNOs and MNOs that ensure that MVNOs can remain competitive, and for the enforcement these contracts. Because some additional administrative resources are needed for additional expertise and enforcement, but not for policy development, this policy receives a MEDIUM rating for this criterion.

### **8.1.3. Stakeholder Acceptance**

#### ***Incumbent Support***

All three of the major mobile telecommunications incumbents strongly oppose this policy. Based on their interventions at the 2019-2020 CRTC mobile wireless consultation, all of the Big Three strongly oppose this option, and argue that mandating MVNO access is not justified based on the current levels of competition. Furthermore, the Big Three argue that implementing this policy would impede on their ability to roll out 5G infrastructure. They are prepared to commit significant lobbying resources in order to prevent this policy from being implemented, and are therefore a major barrier to its implementation. Due to the strong opposition from the Big Three, this policy option receives a LOW rating.

## **Support by Small Firms and New Entrants**

Small firms and new entrants directly support this policy option, as evidenced by submissions to the 2019-2020 CRTC consultation by industry groups such as CNOC and ITPA, which represent small regional telecom firms. Some of these firms are currently in the MVNO market already, while others intend to enter the market, and see mandated MVNO access as an opportunity to diversify their telecommunications service offerings. Because small firms and new entrants see this policy option as a potential opportunity, they generally support its implementation. Therefore this criterion receives a HIGH rating.

## **CRTC Support**

This is currently the option favoured by the CRTC. At the 2019-2020 CRTC consultation, the CRTC was concerned that the current level of competition in the mobile market is not meeting the needs of Canadians. Therefore the CRTC preliminarily supports mandating MVNO access in this market for a limited time, until a robust MVNO market is developed, subject to the results of the current hearing. This option therefore receives a HIGH rating in this category.

### **8.1.4. Public Acceptance**

Looking the data from the recent 2019 British Columbia survey on mobile telecommunications, increasing retail competition was the most supported category of solutions for reducing mobile service costs, under which a policy like mandated MVNO access would fall under. However, given that Canadian consumers are generally less enthusiastic about, and even distrustful of small firms and flanker brands, support for this policy option would likely be more limited. Mandated MVNO access therefore receives a MEDIUM rating.

**Table 8: Evaluation of Policy Option 1: Mandated MVNO Access**

Effectiveness			Administrative Complexity	Stakeholder Acceptance			Public Acceptance
Cost Reduction (x2)	Innovation/Quality	Reduction Speed	Institutional Simplicity	Incumbents	Small Firms (x0.5)	CRTC (x0.5)	Public Favorability
HIGH = 6	HIGH = 3	MED = 2	MED = 2	LOW = 1	HIGH = 1.5	HIGH = 1.5	MED = 2

Total Score for Option 1 is 19

## **8.2. Option 2: Price Caps**

### **8.2.1. Effectiveness**

#### ***Cost Reduction***

The cost reduction produced by this option will be directly determined by what the CRTC deems to be the appropriate price level. The CRTC could conceivably set a price cap that would reduce prices by 20% or more, although there are consequences for service quality and innovation, as discussed below. Based purely on cost reduction, this option receives a HIGH rating.

#### ***Service Quality and Innovation***

Because firms are forced to mandate price reductions, there would be a corresponding decline in service quality, as firms lose revenue due to mandated price caps, and are forced to lower the cost of providing services by lowering quality. This can potentially result in more dropped calls, data caps, and other declines in quality. Additionally, this policy would likely also result in reduced incentives for innovation and competition. Price caps would cause a homogenization of service offerings around the price cap, resulting in similar services across different firms. This would ultimately reduce the incentive for service innovation and competition. Therefore this option receives a LOW rating.

#### ***Cost Reduction Speed***

Once the appropriate price cap is determined by the CRTC, which would require some time due to market research being necessary, this policy will act immediately. This is because once price caps are implemented by the CRTC, firms have to comply with them right away, or face penalties for non-compliance. Therefore this option receives a HIGH rating for this criterion.

### **8.2.2. Administrative Complexity**

Building a price regulation system would require significant expertise in order to review things such as pricing data, and service baskets and plans. Additionally it would

require the expertise necessary to set appropriate price caps. Resources and staff would also be needed to enforce this policy. At a minimum, building an effective price control scheme would therefore require additional staffing resources, and a reorganization of institutional resources at the CRTC. Therefore this option receives a MEDIUM rating for this criterion.

### **8.2.3. Stakeholder Acceptance**

#### ***Incumbent Support***

Based on interventions at the recent 2019-2020 CRTC consultation, the Big Three specifically oppose any form of retail regulation, which would include price caps. Therefore, this policy receives a LOW rating.

#### ***Support by Small Firms and New Entrants***

Small firms and new entrants would also oppose this policy. Based on the interventions of industry groups such as CNOC and ITPA at the recent CRTC consultation, these groups support market-based mechanisms for regulating the mobile market. Small firms and new entrants likely see this option as potentially interfering with their ability to compete in the mobile market, and may be viewed as potentially reducing their profitability. Therefore, this policy receives a LOW rating.

#### ***CRTC Support***

The CRTC is not opposed to implementing retail regulations, and has implemented them in the past when it was deemed necessary. It is therefore likely that the CRTC could implement this policy if there was sufficient political will and public support. Based on the *Telecommunications Act* mandate, the CRTC would likely have a preference for using market mechanisms over price caps. However, the CRTC does not currently oppose or support this policy. Therefore this policy option receives a MEDIUM rating.

### **8.2.4. Public Acceptance**

Based on the 2019 B.C. survey, in which 50% of respondents considered government regulation of mobile prices their preferred option, I project that Canadians

would likely have a relatively high level of support for this policy option. Based on data from expert interviews, it is likely that Canadians would initially be in favour of this policy because it is easily understandable, easily communicable, and can act relatively quickly. This policy therefore receives a HIGH rating.

**Table 9: Evaluation of Policy Option 2: Price Caps**

Effectiveness			Administrative Complexity	Stakeholder Acceptance			Public Acceptance
Cost Reduction (x2)	Innovation/Quality	Reduction Speed	Institutional Simplicity	Incumbents	Small Firms (x0.5)	CRTC (x 0.5)	Public Favorability
HIGH = 6	LOW = 1	HIGH = 3	MED = 2	LOW = 1	LOW = 0.5	MED = 1	HIGH = 3

Total Score for Option 2 is 17.5

## 8.3. Option 3: Foreign Competition

### 8.3.1. Effectiveness

#### *Cost Reduction*

Provided that a fourth carrier were successfully established, and had an adequate market share, this option would result in high cost reductions for Canadian consumers. While it is difficult to determine the exact magnitude of cost reduction that would result from this policy, we can use price differences between provinces that have a fourth regional carrier, such as Saskatchewan, and the rest of Canada, to estimate the potential magnitude of cost reduction. Based on the current price differences observed within Canada, an estimated price reduction would be approximately 17% for this policy. This policy therefore receives a HIGH rating.

#### *Service Quality and Innovation*

If a large foreign carrier were established as the fourth carrier in Canada, it would be able to introduce product and service diversity in the Canadian market, increasing the level of competition and diversity of services. Foreign firms can introduce services and bundles that are not currently available on the Canadian market. This would increase the overall service quality in the Canadian market, and would incentivize innovation from incumbent firms, who would have to compete with the greater service diversity and innovation. This policy therefore receives a HIGH rating.

### ***Cost Reduction Speed***

Cost reduction speed depends on the speed at which foreign firms are able to secure enough of a market share to impact the Canadian market. It is likely that the CRTC will take an incremental approach to removing barriers to foreign entry, which could take several years. However, this can be quickened by the use of additional set-asides at spectrum auctions, as well as by mandating access for a limited time to incumbent networks. Ultimately it would still take firms at least 1-2 years to build enough of a market share for consumer to see a fall in prices. This policy therefore receives a MEDIUM rating.

### **8.3.2. Administrative Complexity**

This policy option would require changes to foreign ownership and foreign investment regulation, but would likely not require the creation of new institutional arrangements, or the reorganization of existing institutions. This option would likely require only an increase in CRTC staff, to deal with adjusting the regulation and rules concerning the use of incumbent infrastructure. Therefore, it receives a HIGH rating.

### **8.3.3. Stakeholder Acceptance**

#### ***Incumbent Support***

The Big Three oppose any form of government intervention into the mobile market. The Big Three would likely see this as a major intervention into the market, and would deploy significant lobbying resources to prevent implementation. The Big Three would also likely instigate fears about the potential Canadian job losses that could result from the entry of foreign firms into the Canadian market. Therefore, this policy receives a LOW rating.

#### ***Support by Small Firms and New Entrants***

Existing small firms and potential new entrants would also oppose this policy, as they see it as a potential source of external competition in a market that they either want to enter, or be more competitive in. For instance, the ITPA, which represents some firms currently wanting to enter the Canadian mobile market, opposes the entry of foreign



MVNOs, and believes that mandated MVNO access should apply only to Canadian firms. By extension, small firms and new entrants would oppose policies that incentivize foreign competition in general. Therefore this policy receives a LOW rating.

### ***CRTC Support***

The CRTC has adjusted foreign ownership rules in the past, when it was deemed to be in the interest of Canadian consumers, meaning that this is a tool that the CRTC is willing to use, if necessary. Furthermore, the CRTC has also used spectrum set asides to ensure a certain level of competition in the market in the past. Therefore it could use any of these tools to facilitate foreign competition if it so chooses. Currently however, the CRTC neither supports nor opposes this policy. It therefore receives a MEDIUM rating.

### **8.3.4. Public Acceptance**

Based on the 2019 B.C. survey data, 47% of respondents considered increased choice in cell phone plans, which foreign competition would provide, as the best solution to high mobile service prices. However, public opinion on this issue will almost certainly be influenced by the lobbying and communication efforts of both the Big Three and, more importantly, of unions and groups representing workers, who would raise concerns about the loss of Canadian jobs. Based on these efforts, public support for this policy would likely not be high, and opposition may also develop. Therefore this policy option receives a LOW rating.

**Table 10: Evaluation of Policy Option 3: Foreign Competition**

Effectiveness			Administrative Complexity	Stakeholder Acceptance			Public Acceptance
Cost Reduction (x2)	Innovation/Quality	Reduction Speed	Institutional Simplicity	Incumbents	Small Firms (x0.5)	CRTC (x0.5)	Public Favorability
HIGH = 6	HIGH = 3	MED = 2	HIGH = 3	LOW = 1	LOW = 0.5	MED = 1	LOW = 1

Total Score for Option 3 is 17.5

## 8.4. Summary of Policy Evaluation

**Table 11: Summary of Criteria Scoring for Policy Options**

Criteria	Description	Option 1: Mandated MVNOs	Option 2: Price Caps	Option 3: Foreign Competition
<b>Effectiveness</b>	Price Reduction (x2)	HIGH = 6	HIGH = 6	HIGH = 6
	Innovation/Quality	HIGH = 3	LOW = 1	HIGH = 3
	Reduction Speed	MED = 2	HIGH = 3	MED = 2
<b>Administrative Complexity</b>	Ease of Implementation	MED = 2	MED = 2	HIGH = 3
<b>Stakeholder Acceptance</b>	Incumbents	LOW = 1	LOW = 1	LOW = 1
	Small Firms (x0.5)	HIGH = 1.5	LOW = 0.5	LOW = 0.5
	CRTC (x0.5)	HIGH = 1.5	MED = 1	MED = 1
<b>Public Acceptance</b>	Public Favorability	MED = 2	HIGH = 3	LOW = 1
<b>Total</b>		<b>19</b>	17.5	17.5

## Chapter 9. Recommendation

Based on the results of this analysis, my recommendation is for the CRTC to implement Option 1, and mandate MVNO access to incumbent mobile telecom networks. While this would be the preferred policy option in the current Canadian mobile telecom market, it does have some drawbacks. First, the major incumbents strongly oppose this policy option. They will commit significant lobbying resources in order to prevent this policy option from being implemented. It is also likely that this will stall the implementation of this policy, and the incumbents will use negotiating tactics, such as threatening to not build out the upcoming 5G network, in order to slow down implementation, or to negotiate more favourable terms. This may prevent MVNOs from attaining a significant enough market share to produce the effective competitive pressures necessary to lower prices. However, this is a weakness shared by all of the policies considered in this report, as the incumbents would oppose any policy that significantly alters the status quo.

Secondly, Canadian consumers seem to have a low trust in flanker brands and small firms. Despite not being satisfied with price, Canadian consumers *are* satisfied with their service quality, and may be reluctant to try services from small, unknown brands. This may result in fewer Canadians switching to MVNOs than expected, and may dampen the ability of MVNO-based competition to drive prices down. However, as Canadian consumers become more familiar with new brands and services, this effect is expected to diminish. Additionally, a lack of awareness by Canadian consumers with respect to available new services and brands, in addition to the time it may take for MVNOs to establish themselves on the market, may mean it will take a some time see price reductions.

Despite these drawbacks, mandated MVNO access remains the most favourable and most realistically attainable current available policy option for several reasons. First, this policy option is currently favoured by the CRTC, and by key industry groups representing small firms and new entrants, who also have modest, but not insignificant, means to lobby for this policy. The favourability of this policy to both of these stakeholders make it much more likely to be implemented. Secondly, there is already

institutional capacity and experience with mandated access in the fixed-line Internet service market, meaning that this policy can be easily implemented with relatively minor resource commitments. Additionally, it is able to introduce competition and competitive pressure to the mobile service market without the need for firms to have the substantial capital needed to build out physical network infrastructure. Finally, MVNO presence in the Canadian market would foster greater service innovation. This is because MVNOs target niche areas of the market, and offer bundles and services not previously available. This exerts pressure on the incumbents to improve services and innovate as well. MVNO access would therefore not only reduce prices, but also increase service quality and diversity.

For this policy option to be implemented effectively, the CRTC must set rules and conditions for the contracts between incumbents and MVNOs in a way that allows MVNOs to have adequate returns and remain competitive. If contracts are set unfairly, or favour incumbents too heavily, this may result in MVNOs being unable to compete, and cause them to exit the market, which would weaken the effectiveness of this policy. If contract rules are properly set by the CRTC, then mandated MVNO access is currently the best option for reducing mobile telecommunications prices in Canada, and is the recommendation of this study.

## References

- 1993 Telecommunications Act, 1993 Telecommunications Act1–75 (1993).
- Abbott, M., & Cohen, B. (2014). A Survey of the Privatization of Government-Owned Enterprises in Australia since the 1980s. *Australian Economic Review*, 47(4), 432–454. doi: 10.1111/1467-8462.12072
- ACCC. (n.d.). Telstra retail price control arrangements. Retrieved from <https://www.accc.gov.au/regulated-infrastructure/communications/accc-role-in-communications/telstra-retail-price-control-arrangements#price-controls>
- ACCC. (2016). Competition in the Australian telecommunications sector. Retrieved from [https://www.accc.gov.au/system/files/ACCC Telecommunications reports 2014–15\\_Div 11 and 12\\_web\\_FA.pdf](https://www.accc.gov.au/system/files/ACCC%20Telecommunications%20reports%202014-15_Div%2011%20and%2012_web_FA.pdf)
- ACCC. (2017). Communications Sector Market Study Draft report, 1–190. Retrieved from <https://www.accc.gov.au/system/files/Communications%20Sector%20Market%20Study%20Draft%20Report.pdf>
- ACCC. (2018). Communications Sector Market Study Final Report, 1–176. Retrieved from [https://www.accc.gov.au/system/files/Communications Sector Market Study Final Report April 2018\\_0.pdf](https://www.accc.gov.au/system/files/Communications%20Sector%20Market%20Study%20Final%20Report%20April%202018_0.pdf)
- ACCC. (2018). Allocation limits advice for the 3.6 GHz spectrum allocation Public version. Retrieved from [https://www.accc.gov.au/system/files/ACCC advice to Minister Fifield on 3.6 GHz allocation limits.pdf](https://www.accc.gov.au/system/files/ACCC%20advice%20to%20Minister%20Fifield%20on%203.6%20GHz%20allocation%20limits.pdf)
- ACMA. (2020). What we do. Retrieved from <https://www.acma.gov.au/what-we-do>
- AEIdeas. (2019, November 15). Retrieved from <https://www.aei.org/technology-and-innovation/mobile-virtual-network-operators-and-competition-in-mobile-markets-lessons-from-canada/>
- Bell. (2019). Telecom Notice of Consultation CRTC 2019-57, Review of mobile wireless services. Retrieved from <https://services.crtc.gc.ca/pub/ListeInterventionList/Documents.aspx?ID=278744&en=2019-57&dt=fu&lang=e&S=C&PA=t&PT=nc&PST=a>
- Borgese, A., Kongats, A., Thompson, J., & Vos, M. (2019, November 27). Australia: Telecoms, Media & Internet 2020. Retrieved from <https://iclg.com/practice-areas/telecoms-media-and-internet-laws-and-regulations/australia>
- Braeutigam, R. R., & Panzar, J. C. (1993). Effects of the Change from Rate-of-Return to Price-Cap Regulation. *The American Economic Review*, 83(2), 191–198. Retrieved from <https://www.jstor.org/stable/2117663>

- Buchanan, G., Morgan, C. S., & Intven, H. (2012, May 3). Canadian Government Relaxes Telecom Foreign Ownership Restrictions and Sets Rules for 700 MHz Spectrum Auction. Retrieved from <https://www.mccarthy.ca/en/insights/articles/canadian-government-relaxes-telecom-foreign-ownership-restrictions-and-sets-rules-700-mhz-spectrum-auction>
- CBC. (2017, April 26). Saskatchewan government passes Bill 40 allowing partial sale of Crowns. Retrieved from <https://www.cbc.ca/news/canada/saskatchewan/sask-party-passes-bill-to-sell-off-crowns-1.4087682>
- CBC. (2018, May 28). No partial privatization for Sask. Crown corps after Bill 40 repealed. Retrieved from <https://www.cbc.ca/news/canada/saskatchewan/bill-40-repeal-crown-corporations-1.4681071>
- CBC. (2019, October 26). Why the solution to your high cellphone bill could be a move to Saskatchewan. Retrieved from <https://www.cbc.ca/radio/costofliving/shopping-for-candy-and-cell-phones-and-will-you-even-be-able-to-buy-them-at-the-bay-in-ten-years-1.5332657/why-the-solution-to-your-high-cellphone-bill-could-be-a-move-to-saskatchewan-1.5335478>
- Church, J., & Wilkins, A. (2013). Wireless Competition in Canada: An Assessment. *SSRN Electronic Journal*. doi: 10.2139/ssrn.2327339
- CIE. (2014). Telstra's retail price controls . *Centre for International Economics*, 1–94. Retrieved from [https://www.communications.gov.au/sites/default/files/CIE Final Report - Telstra's retail price controls.pdf?acsf\\_files\\_redirect](https://www.communications.gov.au/sites/default/files/CIE%20Final%20Report%20-%20Telstra's%20retail%20price%20controls.pdf?acsf_files_redirect)
- CIE. (2015). Australia's telecommunications market structure. *Centre for International Economics*, 1–28. Retrieved from [https://www.communications.gov.au/sites/default/files/Vodafone - Attachment E.pdf?acsf\\_files\\_redirect](https://www.communications.gov.au/sites/default/files/Vodafone%20-%20Attachment%20E.pdf?acsf_files_redirect)
- Clark, S. (2019, October 21). Canadian Party Policies on Cell Phone Plan Reform (Election 2019). Retrieved from <https://www.whistleout.ca/CellPhones/Guides/federal-election-cell-phone-plan-policies>.
- CNOC. (2019). Intervention of Canadian Network Operator's Consortium Inc. Retrieved from <https://services.crtc.gc.ca/pub/ListeInterventionList/Documents.aspx?ID=278695&en=2019-57&dt=fu&lang=e&S=C&PA=t&PT=nc&PST=a>
- Compete. (2018). ACCC Discussion Paper into the declaration of the Mobile Terminating Access Service –August 2018 Submission by Compete. Retrieved from [https://www.accc.gov.au/system/files/Compete Submission to the MTAS Declaration Inquiry Discussion Paper.pdf](https://www.accc.gov.au/system/files/Compete%20Submission%20to%20the%20MTAS%20Declaration%20Inquiry%20Discussion%20Paper.pdf)
- Competition Bureau. (2017, February 15). Competition Bureau statement regarding Bell's acquisition of MTS. Retrieved from <https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04200.html>

- Competition Bureau. (2019, May 15). Review of Mobile Wireless Services. Retrieved from <https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04431.html>
- Competition Bureau. (2019, August 7). Delivering Choice: A Study of Competition in Canada's Broadband Industry. Retrieved from <https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04470.html>
- CRTC. (2013). Telecom Regulatory Policy CRTC 2013-271. Retrieved from <https://crtc.gc.ca/eng/archive/2013/2013-271.htm>.
- CRTC. (2017). Communications Monitoring Report 2017: Telecommunications sector overview. Retrieved from <https://crtc.gc.ca/eng/publications/reports/policymonitoring/2017/cmr5.htm#t5515>
- CRTC. (2018). Communications Monitoring Report 2018, 1–270. Retrieved from <https://crtc.gc.ca/pubs/cmr2018-en.pdf>
- CRTC. (2018, May 11). Our Mandate, Mission and What We Do. Retrieved from <https://crtc.gc.ca/eng/acrtc/acrtc.htm>.
- CRTC. (2019). Communications Monitoring Report 2019, 1–86. Retrieved from <https://crtc.gc.ca/pubs/cmr2019-en.pdf>
- CRTC. (2019). Telecom Notice of Consultation CRTC 2019-57. Retrieved from <https://crtc.gc.ca/eng/archive/2019/2019-57.htm>
- CRTC. (2019, August 15). Internet - Our Role. Retrieved from <https://crtc.gc.ca/eng/internet/role.htm>
- CRTC. (2020, January 13). Telephone Survey on Mobile Wireless Services in Canada. Retrieved from <https://crtc.gc.ca/eng/publications/reports/por/ph/por.html>
- CRTC. (2020, February 6). Mobile Phones. Retrieved from <https://crtc.gc.ca/eng/phone/mobile/>
- Dehiri, A., & Williams, G. (2019, May 14). MVNO landscape: Global perspectives and New Zealand Applications. Retrieved from [https://comcom.govt.nz/\\_\\_data/assets/pdf\\_file/0025/146680/RDC-MVNO-landscape-14-May-2019.PDF](https://comcom.govt.nz/__data/assets/pdf_file/0025/146680/RDC-MVNO-landscape-14-May-2019.PDF)
- Department of Infrastructure. (n.d.). A competitive telecommunications regime for Australia. Retrieved from <https://www.communications.gov.au/policy/policy-listing/competitive-telecommunications-regime-australia>
- Department of Infrastructure. (2018, July 11). Spectrum auction limits promote competition. Retrieved from <https://www.communications.gov.au/departmental-news/spectrum-auction-limits-promote-competition>

- Dippon, C. (2006). United States: The Economics Of Mobile Virtual Network Operators. *Perspectives in Telecommunications*. Retrieved from [http://www.mondaq.com/unitedstates/x/47468/Telecommunications Mobile Cable Communications/The Economics Of Mobile Virtual Network Operators](http://www.mondaq.com/unitedstates/x/47468/Telecommunications+Mobile+Cable+Communications/The+Economics+Of+Mobile+Virtual+Network+Operators)
- Eggerton, J. (2018, June 19). T-Mobile Seeks FCC OK for 100% Foreign Ownership of merged Company. Retrieved from <https://www.multichannel.com/news/t-mobile-seeks-fcc-ok-100-foreign-ownership-merged-company>
- Evans, P. (2019). Here's everything you need to know about today's wireless spectrum auction and why you should care. *CBC News*. Retrieved from <https://www.cbc.ca/news/business/600-mhz-wireless-spectrum-auction-1.5051455>
- Faccio, M., & Zingales, L. (2017). Political Determinants of Competition in the Mobile Telecommunication Industry. *National Bureau of Economic Research*, 1–50. doi: 10.3386/w23041
- Fasken. (2018, March 22). Canadian Ownership Rules in Telecom and Broadcasting. Retrieved from <https://www.fasken.com/en/knowledge/2018/03/ottawa-newsletter-canadian-ownership-rules-in-telecom-and-broadcasting/>
- Faulhaber, G. R., Hahn, R. W., & Singer, H. J. (2012). Assessing Competition in U.S. Wireless Markets: Review of the FCC's Competition Reports. *Federal Communications Law Journal*, 64(2), 318–369. doi: 10.2139/ssrn.1880964
- FCC. (1997). *Fcc Record: A Comprehensive Compilation of Decisions, Reports, Public Notices, and Other Documents of the Federal Communications Commission of the United States* (6th ed., Vol. 12). Federal Communications Commission.
- FCC. (2006, August 9). About Auctions. Retrieved from <https://www.fcc.gov/auctions/about-auctions>
- FCC. First Report and Order (2012). Washington D.C. Retrieved from <https://www.fcc.gov/general/foreign-ownership-rules-and-policies-common-carrier-aeronautical-en-route-and-aeronautical>
- FCC. Second Report and Order (2013). Washington D.C. Retrieved from <https://www.fcc.gov/general/foreign-ownership-rules-and-policies-common-carrier-aeronautical-en-route-and-aeronautical>
- FCC. (2014, November 20). Foreign Ownership Rules and Policies for Common Carrier, Aeronautical En Route and Aeronautical Fixed Radio Station Licensees. Retrieved from <https://www.fcc.gov/general/foreign-ownership-rules-and-policies-common-carrier-aeronautical-en-route-and-aeronautical>
- FCC. (2017, September 27). Mobile Wireless Competition Report (20th Annual). Retrieved from <https://www.fcc.gov/reports-research/reports/mobile-wireless-competition-reports/mobile-wireless-competition-report-20th>



- FCC. (2017, September 27). 20th Mobile Wireless Competition Report Quick Facts. Retrieved from <https://www.fcc.gov/20th-mobile-wireless-competition-report-quick-facts>
- FCC. (2019, November 5). FCC Approves T-Mobile/Sprint Transaction with Conditions. Retrieved from <https://www.fcc.gov/document/fcc-approves-t-mobilesprint-transaction-conditions>
- FCC. (2020, February 18). Price Cap Resources. Retrieved from <https://www.fcc.gov/general/price-cap-resources>
- Foreign Acquisitions and Takeovers Act 1975, Foreign Acquisitions and Takeovers Act 1975 (2016). Retrieved from <https://www.legislation.gov.au/Details/C2016C00308>
- Government of British Columbia. (2019, November 19). Cellphone Billing Transparency: What We Heard. Retrieved from <https://engage.gov.bc.ca/govtogetherbc/impact/cell-phone-billing-results/>
- Garrido, E., & Whalley, J. (2013). Competition in wholesale markets: Do MNOs compete to host MVNOs? *Telecommunications Policy*, 37(11), 1124–1141. doi: 10.1016/j.telpol.2013.03.005
- Geist, M. (2019, September 24). Can Price Caps or Virtual Competitors Solve Canada's Wireless Pricing Problem? Retrieved from <http://www.michaelgeist.ca/2019/09/can-price-caps-or-virtual-competitors-solve-canadas-wireless-pricing-problem/>.
- Holst, A. (2019, August 2). Total number of mobile subscribers Canada 2010-2018, by mobile service provider. Retrieved from <https://www.statista.com/statistics/460099/total-number-of-mobile-subscribers-by-provider-canada/>.
- Hunter, A. (2016, August 24). Start the bidding at \$4.1B, Premier Brad Wall indirectly puts pricetag on SaskTel. Retrieved from <https://www.cbc.ca/news/canada/saskatchewan/bidding-4-1-billion-premier-wall-price-on-sasktel-1.3734443>
- Industry Canada. (2012, March 14). Policy and Technical Framework Mobile Broadband Services (MBS) — 700 MHz Band Broadband Radio Service (BRS) — 2500 MHz Band.
- Industry Canada. (2015, October 2). 700 MHz Auction (2014). Retrieved from [https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h\\_sf10598.html](https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf10598.html)
- Industry Canada. (2019). Auction of Spectrum Licences in the 3500 MHz Band. Retrieved from [https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h\\_sf11519.html](https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf11519.html).
- ISED. (2018, August 29). Price Comparisons of Wireline, Wireless and Internet Services in Canada and with Foreign Jurisdictions - 2018 Edition. Retrieved from <https://www.ic.gc.ca/eic/site/693.nsf/eng/00169.html#a08>

- Industry Canada. (2015, July 10). Licensing Framework for Residual Spectrum Licences in the 700 MHz and AWS-3 Bands. Retrieved from <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11055.html#s4.4>
- ITPA. (2019). Review of Mobile Services Telecom Notice of Consultation CRTC 2019-57. Retrieved from <https://services.crtc.gc.ca/pub/ListeInterventionList/Documents.aspx?ID=278756&en=2019-57&dt=fu&lang=e&S=C&PA=t&PT=nc&PST=a>
- Jackson, E. (2019). Why Canada's next 5G spectrum auction could be even bigger. *Financial Post*. Retrieved from <https://business.financialpost.com/telecom/whycanadas-next-5g-spectrum-auction-could-be-even-bigger>
- Kenton, W. (2019, September 12). Price-Cap Regulation. Retrieved from <https://www.investopedia.com/terms/p/price-cap-regulation.asp>
- Kim, B. W., & Seol, S. H. (2007). Economic Analysis of the Introduction of the MVNO System and its Major Implications for Optimal Policy Decisions in Korea. *Telecommunications Policy*, 31(5), 290–304. doi: <https://doi.org/10.1016/j.telpol.2007.03.002>
- Leins, T. (2019, September 30). The Changing Face of the U.S. MVNO Market. Retrieved from <https://blog.telegeography.com/the-changing-face-of-the-u.s.-mvno-market>
- Luu, C. (2016). Strengthening competition in network sectors and the internal market in Canada. *OECD Economics Department Working Papers*, (1322). doi: <https://doi.org/10.1787/5jlswbxnfdxs-en>.
- MacPherson, A. (2017, February 16). Regional carriers such as SaskTel keep mobile wireless prices low, competition watchdog says. Retrieved from <https://thestarphoenix.com/business/local-business/regional-carriers-such-as-sasktel-keep-mobile-wireless-prices-low-competition-watchdog-says/>
- McMillan, J. (1995). Why auction the spectrum? *Telecommunications Policy*, 19(3), 191–199. doi: 10.1016/0308-5961(94)00021-j
- Middleton, C. (2011). Canada's Telecommunications Policy Environment. *Telecommunications Journal of Australia*, 61(4), 1-69. Retrieved from <https://digital.library.ryerson.ca/islandora/object/RULA:5258/datastream/OBJ/view>.
- Mobile Network Guide. (n.d.). Mobile Virtual Network Operators in Australia. Retrieved from [https://mobilenetworkguide.com.au/virtual\\_operators\\_information.html](https://mobilenetworkguide.com.au/virtual_operators_information.html)
- Morgan, R. (2019, March 7). Mobile Virtual Network Operators taking market share from Mobile Networks . Retrieved from <http://www.roymorgan.com/findings/7902-growth-mobile-virtual-network-operators-december-2018-201903072137>

- Nagy, W. (2019, July 2). Australia telecoms market report 2019. Retrieved from <https://www.analysismason.com/Research/Content/Country-reports/Australia-country-report-RDRP0/>
- Nordicity. (2017). 2017 Price Comparison Study of Telecommunications Services in Canada and Select Foreign Jurisdictions, 1–105. Retrieved from [https://www.ic.gc.ca/eic/site/693.nsf/vwapj/Nordicity2017EN.pdf/\\$file/Nordicity2017EN.pdf](https://www.ic.gc.ca/eic/site/693.nsf/vwapj/Nordicity2017EN.pdf/$file/Nordicity2017EN.pdf)
- OECD, & The World Bank. (2006). *Oecd Trade Policy Studies Liberalisation and Universal Access to Basic Services Telecommunications, Water and Sanitation, Financial Services, and Electricity*. OECD Publishing.
- OECD. (2015). OECD Digital Economy Outlook 2015, 1–284. doi: <https://dx.doi.org/10.1787/9789264232440-en>
- Provincial Auditor of Saskatchewan. (2017). SaskTel—Purchasing Fibre Optic Network Upgrade and Other Network Hardware. Retrieved from [https://auditor.sk.ca/pub/publications/public\\_reports/2017/Volume\\_1/13\\_SaskTel\\_Goods and Services Proc.pdf](https://auditor.sk.ca/pub/publications/public_reports/2017/Volume_1/13_SaskTel_Goods and Services Proc.pdf)
- Rayner, T. (2017, December 26). Why cell phone plans are so expensive. Retrieved from <https://www.androidauthority.com/cell-phone-plans-expensive-806443/>
- Rogers. (2019). Review of Mobile Wireless Services. Retrieved from <https://services.crtc.gc.ca/pub/ListeInterventionList/Documents.aspx?ID=278736&en=2019-57&dt=fu&lang=e&S=C&PA=t&PT=nc&PST=a>
- Sappington, D. E. M., & Weisman, D. L. (2010). Price cap regulation: what have we learned from 25 years of experience in the telecommunications industry? *Journal of Regulatory Economics*, 38(3), 227–257. doi: 10.1007/s11149-010-9133-0
- Shin, D. H., & Bartolacci, M. (2007). A study of MVNO diffusion and market structure in the EU, US, Hong Kong, and Singapore. *Telematics and Informatics*, 24(2), 86–100. doi: 10.1016/j.tele.2005.11.003
- Singtel. (n.d.). Our Subsidiaries. Retrieved from <https://www.singtel.com/about-Us/company/our-subsidiaries>
- SoftBank Corp. (2013, August 6). Additional Purchases of Sprint Corporation Shares. Retrieved from [https://group.softbank/en/corp/news/press/sb/2013/20130806\\_01/](https://group.softbank/en/corp/news/press/sb/2013/20130806_01/)
- Statt, N. (2018, July 20). Cellphone bills are getting more expensive after two years of declines. Retrieved from <https://www.theverge.com/2018/7/20/17595822/cellphone-plans-att-verizon-price-increase-cost>
- Taylor, G. (2012, February 1). Communications Law. Retrieved from <https://www.thecanadianencyclopedia.ca/en/article/communications-law>

- Taylor, G. (2013). Oil in the Ether: A Critical History of Spectrum Auctions in Canada. *Canadian Journal of Communication*, 38(1). doi:10.22230/cjc.2013v38n1a2600
- Tefficient. (2018). Unlimited moves the needle – but it's when mobile addresses slow fixed internet that something happens. Retrieved from <https://tefficient.com/wp-content/uploads/2018/07/tefficient-industry-analysis-1-2018-mobile-data-usage-and-revenue-FY-2017-per-country-10-July-2018.pdf>
- Telstra. (n.d.). Frequently asked questions Foreign shareholding. Retrieved from <https://www.telstra.com.au/aboutus/investors/frequently-asked-questions/foreign-shareholding>
- Telus. (2019). Telecom Notice of Consultation CRTC 2019-57 Review of mobile wireless services. Retrieved from <https://services.crtc.gc.ca/pub/ListeInterventionList/Documents.aspx?ID=278757&en=2019-57&dt=fu&lang=e&S=C&PA=t&PT=nc&PST=a>
- Thakur, D. (2012). Market competition and the distributional consequences of mobile phones in Canada. *Technological Forecasting and Social Change*, 79(2), 223-230. doi:10.1016/j.techfore.2011.04.013
- The Saskatchewan Telecommunications Act, The Saskatchewan Telecommunications Act1–47 (1978).
- The Star. (2015, May 21). Deutsche Telekom to consider partner for T-Mobile US: CEO. *The Star*. Retrieved from <https://www.thestar.com.my/tech/tech-news/2015/05/21/deutsche-telekom-to-consider-partner-for-tmobile-us-ceo/>
- U.S. Mobile Virtual Network Operator (MVNO) Market Size, Share & Trends Analysis Report By Type (Discount, Telecom, M2M), By Operational Model, By End Use, And Segment Forecasts, 2018 - 2025. (2018). Retrieved from <https://www.grandviewresearch.com/industry-analysis/us-mvno-market>
- Utz, C. (2010). Telecommunications Regulation. *Lexmundi Publication*.
- Venture Insights. (2019, July 5). Australian MVNO market overview – no longer just about price. Retrieved from <https://www.ventureinsights.com.au/product/australian-mvnos/>
- Vodafone. (n.d.). About Vodafone Hutchison Australia. Retrieved from <https://www.vodafone.com.au/about/company>
- Wallis, A. (2019, June 24). The Wireless Carrier Market: A Two-Horse Race Retrieved from <https://seekingalpha.com/article/4271824-wireless-carrier-market-two-horse-race>
- Winseck, D. (2014). *Mobile Wireless in Canada: Recognizing the Problems and Approaching Solutions*. Canadian Media Concentration Research Project. <https://www.deslibris.ca/ID/244295>

Woroch, G. (2019). Spectrum Concentration and Performance of the U.S. Wireless Industry. *Review of Industrial Organization*, 56, 73–105. Retrieved from <https://link-springer-com.proxy.lib.sfu.ca/article/10.1007/s11151-019-09695-5>

Xavier, P. (1995). Price cap regulation for telecommunications: How has it performed in practice? *Telecommunications Policy*, 19(8), 599–617. doi: 10.1016/0308-5961(95)00040-d

## Appendix A. Complete Price Comparison Data

### Complete OECD 2015 Price Comparison Study Data

**Table A.1: Mobile Telecommunications Price Comparison (2014 USD, PPP), Select OECD, 2014**

Jurisdiction	Basket 1 30 Calls + 100MB	Basket 2 100 Calls + 500MB	Basket 3 300 Calls + 1GB	Basket 4 100 Calls + 2GB	Basket 5 900 Calls + 2GB
Australia	12.51	19.26	19.56	25.72	25.72
Austria	11.56	11.56	11.56	19.37	22.82
Belgium	13.62	22.70	45.12	28.37	51.07
<b>Canada</b>	<b>28.40</b>	<b>36.76</b>	<b>48.72</b>	<b>56.70</b>	<b>56.70</b>
Denmark	9.92	12.57	21.48	15.57	23.84
Finland	10.10	15.90	19.90	15.9	24.16
France	9.07	22.69	22.69	22.69	22.69
Germany	14.49	27.44	47.59	59.26	59.26
Ireland	21.09	30.58	31.63	36.91	36.91
Italy	18.04	18.04	22.82	27.45	51.61
Japan	49.05	61.54	63.96	61.54	67.50
Korea	10.84	18.07	27.71	25.3	43.37
Netherlands	14.94	26.61	35.32	39.86	39.86
New Zealand	12.04	18.33	33.22	37.12	49.71
Norway	8.14	19.71	19.71	25.66	25.66
Spain	19.32	31.55	41.21	41.21	41.21
Sweden	10.89	18.32	21.45	26.95	26.95
Switzerland	18.70	33.09	33.09	38.91	38.91
UK	10.32	11.6	20.64	19.35	23.22
US	39.94	45.44	52.04	62.74	67.44
<b>OECD Average</b>	<b>17.72</b>	<b>28.07</b>	<b>37.79</b>	<b>37.76</b>	<b>51.22</b>

(OECD, 2015)

## Complete 2017 Nordicity Price Comparison Data

**Table A.2: Mobile Telecommunications Price Comparison (2017 CAD, PPP adjusted), Select Countries, 2016**

Jurisdiction	Basket 1	Basket 2	Basket 3	Basket 4	Basket 5
	150 min	450 min and 300 SMS	1,200 min, 300 SMS 1GB Data	Unlimited min, SMS, 2GB Data	Unlimited min, SMS, 5GB Data
Australia	28.19	27.36	30.91	44.78	66.67
<b>Canada</b>	<b>41.08</b>	<b>48.77</b>	<b>74.67</b>	<b>81.05</b>	<b>96.55</b>
France	22.49	24.17	38.08	61.60	70.12
Germany	17.15	28.28	56.20	68.12	88.23
Italy	17.70	24.41	34.79	49.42	61.02
Japan	29.06	48.78	89.72	60.11	74.12
U.K.	20.84	25.79	30.13	35.55	42.22
US	27.00	51.64	73.00	89.50	117.33
<b>Average</b>	<b>25.44</b>	<b>34.90</b>	<b>53.44</b>	<b>61.27</b>	<b>77.03</b>

(Nordicity, 2017)

## **Appendix B. Additional Case Study Information**

### **1) Saskatchewan**

#### ***Market Size***

As of 2017, Saskatchewan accounted for approximately 3% of Canada's mobile wireless market. This translates to a market size of approximately \$840 million. As of 2016, Saskatchewan also had the second highest mobile wireless penetration rate in Canada at 82%, behind only Alberta at 84% (CRTC, 2017).

#### ***Regulatory Structure***

Saskatchewan shares the regulatory structure of the rest of Canada, with one notable difference. Saskatchewan has a crown corporation called Saskatchewan Telecommunication (SaskTel), which is governed by *The Saskatchewan Telecommunication Act* (Taylor, 2012). The act, among other things, establishes SaskTel as a crown corporation, delineating how SaskTel is to be structured and operated. It defines the principal purpose of SaskTel as being to construct, maintain and operate a telecommunications system in Saskatchewan, and to provide connection and intercommunication with, and between, different telecommunications systems (Saskatchewan Telecommunications Act, n.d).

#### ***Discussion***

Much of the Competition Bureau's analysis on the issue of regional carriers in Saskatchewan, Quebec and Manitoba came during its approval of the sale of MTS in Manitoba to Bell. In a 2017 report, the bureau found that mobile service pricing in Saskatchewan, Quebec and Manitoba was significantly lower than the rest of Canada. Although they approved the sale of MTS in Manitoba, the Competition Bureau recognized that the sale of its regional carrier would lead to substantially higher prices and fewer options for Manitobans (Competition Bureau, 2017). By extension, this indicates that the prices of services in Saskatchewan would also likely substantially increase without intervention, in the event that SaskTel was purchased by one of the Big Three. In order to mitigate price increases, the bureau approved the MTS sale



conditionally, mandating that Bell not increase mobile telecommunications prices for one year (Competition Bureau, 2019), and that Bell sell six retail stores, 24,700 subscribers and 40MHz of spectrum to another regional provider in Manitoba, Xplornet, and to allow Xplornet to use Bell's tower infrastructure for five years (Competition Bureau, 2017). This resulted in prices not increasing substantially in Manitoba (Competition Bureau 2019). The report therefore also indicates that intervention to maintain competitive pressures is needed to dampen prices in the absence of regional competition.

## **2) U.S.**

### ***Market Size***

As of 2016, the U.S mobile telecommunications market was valued at approximately \$189 billion. The U.S. market actually saw a 2% decrease in revenue from 2015, a decrease of approximately \$3.4 billion (FCC, 2017). Mobile service penetration rates doubled from 42% in 2011 to 81% as of 2016 (FCC, 2017).

### ***Regulatory Structure***

The Antitrust Division of the Department of Justice (DoJ) broadly governs competition in a number of sectors in the United States, including the telecom market. It is responsible for ensuring that actions occurring in a market do not lessen competition or create monopolies. Parties that wish to merge or consolidate in the U.S. telecom market must notify the DOJ. A merger may proceed unless it is challenged by the DoJ in federal court (OECD, 2014).

More importantly for this policy field, the *Communications Act* of 1934 establishes the Federal Communications Commission (FCC) as the main telecommunications regulator in the United States. The FCC is responsible for spectrum licensing and allocation (OECD, 2014). The agency has conducted spectrum auctions since 1994, when the U.S. switched from a command and control system to an auction system for spectrum licensing (FCC, 2006).

The mandate of the FCC also includes reviews of whether or not the public interest is served by spectrum transactions and sales. Included in this mandate are reviews of competitiveness issues, reviews of whether or not the public interest is served

by spectrum transactions, and reviews of whether mergers between firms, and sales of domestic firms to international companies are in the public interest (OECD, 2014). Since 2014, the FCC examines spectrum concentration issues on a case-by-case basis to determine whether or not they are in the public interest (OECD, 2014). In practice, no purchase or merger of telecom companies can proceed without FCC approval. The FCC is therefore responsible for the telecom market structure to some extent, and is responsible for ensuring that competition in the telecom market is maintained, and that market changes are in the interest of consumers (OECD, 2014).

### **3) Australia**

#### ***Market Size***

As of 2019, Australia has a \$37.6 billion telecommunications industry, and is expected to grow at a rate of 1.4% over the next five years (Borgese et al. 2019). Cell phone ownership rates (mobile penetration) were 89% as of 2018, which has increased from 84% in 2016.

#### ***Regulatory Structure***

There are several institutions responsible for the regulation of the telecommunications industry in Australia. The mandate of the Australian Communications and Media Authority (ACMA) is to regulate communications and media in order to maximize economic and social benefits for Australians (ACMA, 2020). The ACMA is responsible for telecommunications licensing regulation. In addition it is responsible for regulating the non-competitive aspects of the telecom industry, such as the development of industry codes of practice (Borgese et al. 2019).

The Australian Competition and Consumer Commission (ACCC): Is responsible for regulating and promoting competition in the telecommunications sector, in addition ensuring to consumer protection (Ward et al. 2020). It may intervene in the industry to ensure competitive practices are maintained.. (Borgese et al., 2019). Mobile telecommunications in Australia is governed under the 1997 *Telecommunications Act*, which outlines the rights and obligations of telecommunications service providers, and outlines telecommunications licensing (Borgese et al, 2019). The Australian Minister for

Communications ultimately informs the regulatory guidelines that are implemented by the various regulatory agencies

### ***Fixed Line Price Controls***

Price controls were initially introduced for Telstra in 1989, because at the time it was the only telecommunications provider in the country (CIE, 2014). The price cap regime remained in place for Telstra once the Australian telecommunications industry was liberalized. The idea behind this was that capping the dominant telecom firm would ensure that prices for the industry as a whole would not exceed a certain threshold (OECD/World Bank, 2006). The goal of the price cap regime was to ensure the affordability of telecom services, particularly for low income individuals, and to ensure that price levels remained relatively uniform across the country, especially for consumers living in rural communities with limited infrastructure (OECD/World Bank, 2006).