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An Assessment of Market Power in the Provision of Wireless Telecommunications Services in Canada

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	IV
1. INTRODUCTION.....	1
1.1. TASK AND QUALIFICATIONS.....	1
1.2. MARKET POWER	1
1.3. INSTRUMENTS OF COMPETITION.....	3
1.4. REPORT SUMMARY.....	4
2. MARKET DEFINITION.....	6
2.1. FOCUS OF INQUIRY.....	6
2.2. PRODUCT MARKET DEFINITION	7
2.3. GEOGRAPHIC MARKET DEFINITION.....	8
3. PARTICIPANTS IN THE RELEVANT MARKET	11
4. MARKET SHARES	13
5. MARKET STRUCTURE.....	17
5.1. COST STRUCTURE AND BARRIERS TO ENTRY.....	17
5.2. COMPETITION AT A POINT IN TIME	20
5.2.1. Complex Pricing	20
5.2.2. Customer Switching	23
5.3. COMPETITION OVER TIME.....	25
6. EVIDENCE OF PRICE COMPETITION.....	27
6.1. PRICE COMPETITION	27
6.2. INDIRECT INDICATORS OF PRICE COMPETITION	30
6.2.1. Share Volatility	30
6.2.2. Targeted Brands.....	30
6.2.3. Increased Use of Post-Paid Plans.....	31
6.2.4. Survey Evidence	33
6.2.5. Regulatory Agency Comments on the State of Competition	34

7. EVIDENCE OF INVESTMENT-BASED COMPETITION 35

 7.1. INVESTMENTS IN NETWORK INFRASTRUCTURE 35

 7.2. DELIVERY OF NEW SERVICES TO CONSUMERS 36

8. COORDINATED EFFECTS 38

9. CONCLUSION 41

EXECUTIVE SUMMARY

This report provides the authors' examination of whether any existing provider of wireless services in Canada is able to exercise significant market power, either on its own or in coordination with other providers of wireless services. We have employed the analytical tools that are standard in competition policy for this purpose.

A Canadian wireless provider would have "significant market power" if it is able profitably to set the price of its services substantially above the competitive level for a sustained period of time. When addressing this question, it is important to look not only at prices but also other dimensions of competitive rivalry. Wireless companies (like firms in many industries) attempt to obtain a competitive advantage in the marketplace by enhancing the quality and functionality of their products and services through a costly process of investment in product development and implementation. High fixed costs and complex pricing are the norm in the industry, so the competitive model is one that departs from "perfect competition" and instead involves firms selling (or expecting to sell) at prices above marginal cost in order to cover their fixed costs. To capture the dynamic aspect of the industry when evaluating the extent of competition, we look not only at prices but also at other direct indicators of investment and new product introductions in the sector.

We begin our analysis by identifying the set of services and the geographic area within which Canadian wireless providers compete, based on considering the alternatives that consumers would view as reasonably good substitutes. Given the manner in which wireless services are available and marketed to Canadian consumers, we define the relevant market for assessing the vigor of competition to be that of wireless services, including voice and data capability, in Canada.

Next we examine indicia of competitive rivalry within the defined market that are commonly used in competition assessments. One such indicator is market share. A high market share is a necessary but not sufficient condition for a finding of market power. Yet, there is no simple rule to identify when a firm's market share is in fact "high". The cost structure of the wireless industry is such that we would not expect to have very large numbers of competing firms. Thus, in Canada we have three national providers of wireless services—Bell Canada, Telus Communications, and Rogers Wireless—and a few regional providers. None of the national providers has a share that significantly exceeds the Competition Bureau's safe harbour threshold of 35%, which is used as an initial screen to determine the existence of market power in merger and other antitrust matters.

Once firms have invested in facilities to provide wireless services they have strong incentives to compete intensely to gain additional subscribers, as the cost of serving one additional customer is very low relative to the significant fixed and sunk investments required to offer service at all. We see this in the evidence that shares of new subscribers among the three national wireless providers have fluctuated considerably over time.

Competitive rivalry is further evidenced in declining average revenue per minute over time, substantial increases in the average minutes of use and high levels of customer satisfaction. The national providers have responded to the entry of mobile virtual network operators with introductions of their own lower-priced or specialty brands to target the particular customer segments. As well, providers have launched a number of plan options with large buckets of available minutes of use. Both the Canadian Radio-television and Telecommunications Commission and the Competition Bureau have characterized the wireless industry in Canada as highly competitive. Finally, there is evidence of considerable investments in network capability and new service offerings by Canadian wireless providers.

We also consider whether the three national wireless providers would have the incentive and ability to exercise significant market power by acting cooperatively. While there are few companies among which such hypothetical coordination might take place, there are considerable hurdles that would need to be overcome to make any attempt at coordination be successful. First, the continuing changes in technology that have made new services available to consumers, and the rapid growth in the number of consumers subscribing for wireless services, would give each firm a strong incentive to “cheat” on any cooperative agreement. Second, it is particularly difficult to sustain a cooperative arrangement in the face of rapid actual and potential growth in demand when this growth is coupled with technological changes that are implemented by different firms at different points in time. Third, pricing conditions are not transparent, and competition is substantially based on non-price characteristics such as service quality, making monitoring and disciplining of any hypothetical attempt at a collusive arrangement unwieldy, if not impossible. As a result, such coordination is highly unlikely.

In summary, using the well-established analytical framework embodied in Canadian competition law, we find that no single wireless firm in Canada has significant market power. As well, we find that cooperative arrangements among the existing wireless providers to exercise significant market power jointly are highly unlikely. Thus, given the issues being examined in Industry Canada’s consultation process, we find no clear evidence for concerns regarding the state of competition in the Canadian wireless market.

1. INTRODUCTION

1.1. TASK AND QUALIFICATIONS

As experts in the economics of competition policy, we have been retained by Bell Canada to determine whether any single provider of wireless telecommunications services in Canada has significant market power. We understand that a finding that significant market power exists may influence Industry Canada's policy in its upcoming auction of the rights to certain frequencies for the eventual provision of advanced wireless services (AWS), including data applications. In particular, Industry Canada may determine it appropriate to implement policies that would assist entrants in obtaining access to AWS spectrum while correspondingly constraining any existing provider's access to spectrum for the provision of AWS if that provider has significant market power.¹

We make use of the standard analytical tools used in competition policy to determine whether any current provider of wireless services in Canada has significant market power. We have studied and evaluated competitive conditions using these same methods in numerous industries, including the communications sector, on behalf of the Canadian Competition Bureau and private parties. Details on our credentials to undertake a competitive analysis of this nature are provided in the Appendix together with our curricula vitae. The analytical approach used in this report is the standard one adopted by competition authorities not only in Canada, but also in Europe, the United States, and Asia-Pacific countries. Fundamentally, it involves a process of specifying precisely the market that is to be analyzed, discussing pertinent features of that market, and evaluating indicators of the degree of competition in the market. When we carry this procedure out in this case, using standard tools of economic analysis, we find that no single wireless provider in Canada today has significant market power, and that providers would not have the ability to jointly exercise significant market power in a coordinated fashion.

1.2. MARKET POWER

A firm will possess market power when it has the ability to profitably sell its services (or products) at a price above the competitive level.² The extent to which a firm has market

¹ Policies that might be implemented to assist entrants include setting aside frequencies so that only new entrants can bid on these, using spectrum aggregation limits to prevent any entity from holding more than a certain amount of spectrum, and mandating roaming to require major carriers to offer roaming to new entrants. See Industry Canada, *Consultation on a Framework to Auction Spectrum in the 2 GHz Range including Advanced Wireless Services*, February 2007, pp. 21-25.

² Michael Trebilcock, Ralph A. Winter, Paul Collins, and Edward M. Iacobucci, *The Law and Economics of Canadian Competition Policy*, University of Toronto Press, 2002, p. 78.

power can be directly measured if the own-price demand elasticity facing that firm is known. The own-price demand elasticity facing the firm measures the responsiveness of the firm's customers' purchases to increases in the firm's own price. If customers can easily switch to other products or services in the face of a small increase in price, and if other firms are able to supply these customers readily, the firm will face "elastic" demand. Where a firm's own-price demand elasticity is high—customers have many alternatives available to them, either from competing firms supplying the same service or from firms offering alternative services that customers consider nearly as attractive—market power will necessarily be small and the firm under question will be unable to profitably charge a price above the competitive level. Economists sometimes speak of "perfectly competitive" markets, in which the resulting price is equal to the marginal cost of producing the last unit of output.³

A firm will have "significant market power" if it is able to set the price of its products or services substantially above the competitive level for a sustained period of time. The focus on significant market power is important because the ability to set prices above the marginal cost of providing them is present to some degree in most competitive markets. That is, most markets are not "perfectly competitive" in the sense used by economists. The basic assumptions of the perfectly competitive model include homogeneous products, infinitesimally small firms, perfect information, and small fixed costs per firm. Because these assumptions do not apply in the majority of real markets, we do not consider the fact that prices may be above marginal cost to be evidence of significant market power.

In many industries, firms have large fixed costs which are incurred to provide products and services to consumers. If prices in these industries were constrained to equal marginal cost—as they would be in a world of perfect competition—no firm would be able to remain in business, and no new firms would ever choose to provide the subject products and services. Sources of high fixed costs are numerous, and include deployment and maintenance of costly infrastructure in network industries, as well as the costs of developing and implementing new products and services discussed further below. Prices may also exceed marginal cost because consumers regard products as differentiated, and the existence of preferences for specific attributes tends to reduce the intensity of price competition. In such circumstances, when some customers have strong preferences for specific product (or service) attributes, this will allow the firms providing those products to price above marginal cost. As a result, there are numerous reasons why it is inappropriate to expect prices to equal marginal cost in many industries.

³ An index of market power that is often used measures the amount by which a firm is able to set price above marginal cost. This mark-up is inversely related to the firm's own-price elasticity of demand, and therefore the higher the firm own-price elasticity of demand the lower the mark-up the firm can charge over its marginal cost.

1.3. INSTRUMENTS OF COMPETITION

Although price is the traditional focus of competition analysis, it is not the only dimension along which firms compete. For example, firms in many industries attempt to obtain a competitive advantage relative to their rivals by enhancing the quality and functionality of their products and services, typically through a costly process of investment in product research and development. Consider for example a wireless handset, which may have sold for a nominal retail price of \$200 in both 2000 and 2007, but as the more recent model embodies vastly greater power and functionality the price cannot accurately be regarded as unchanging. To take account of these changes, it is important, particularly in telecommunications industries, to focus on “quality-adjusted” prices that seek to compare products of similar quality. A static competition analysis focusing on nominal prices would tend to overlook the critical dynamic nature of investment-based competition that has unfolded over time, and that has resulted in tremendous gains for consumers.

Because we often lack the detailed information needed to quality-adjust prices in a rigorous and systematic way, it is common practice to consider the extent to which technological progress and quality changes have occurred by looking at direct indicators of investment activity and the extent to which new product introductions are an important determinant of competitive rivalry among firms.⁴ Doing so in connection with an examination of competition in the pricing dimension allows us to give due consideration to the range of determinants of market success. For example, if we observe that firms are competing on price while also undertaking investments in product enhancements, we can reasonably conclude that quality-adjusted prices are falling and, correspondingly, consumers are reaping substantial benefits.

A corollary of the above discussion is that in an industry in which technological progress is rapid, it would be incorrect to infer that a firm has significant market power simply because it appears to be earning large “profits” at a point in time. When considering competition through innovation, it is important not to confuse the improvement in earnings by the innovating firm with the profits associated with significant market power. Instead, the firm is earning a return on its investments, which economists refer to as a “quasi-rent”.⁵ The existence of quasi-rents is not analogous to market power, yet the two are often confused, particularly if analysts look to firm profits at a single point in time as a means of measuring the extent of market power. Professor Franklin Fisher has summarized the issue in the following way:

Looking at the industry during the period just after the innovation is made, one sees the world beating a path to the door of the mousetrap

⁴ Economists have estimated what are referred to as “hedonic” pricing models in an effort to measure the effect of individual product characteristics on value. These empirical models allow for the measurement of quality-adjusted prices and changes in these prices over time. Considerable data is needed in order to accurately estimate these prices, however, and this data will not be available in all cases.

⁵ See Trebilcock et al. (2002), pp. 54-57, for a discussion of rents, including quasi-rents.

inventor. One sees the mousetrap inventor making profits. One sees the mousetrap inventor alone in the field. One ought not, however, to conclude therefore that he has a monopoly of mousetraps. Indeed, what really matters, in some sense, is whether he has a monopoly of technical progress in the industry. Similarly, when prices come down after the imitators enter, it would be wrong to conclude that the monopolist is engaging in “predatory pricing” in order to maintain his market share. Rather, what one would be seeing would be competition seriously at work.⁶

The implication of this from a practical perspective is that in an innovative industry we should not attempt to infer significant market power on the basis of “high” prices or profits at a given point in time.

1.4. REPORT SUMMARY

With these qualifications to the characterization of “significant market power” in mind, in the remainder of this report we evaluate whether any current wireless provider has significant market power. As noted above, if we could measure the own-price elasticity of demand facing each wireless provider, it would help us directly determine the extent to which that provider has any market power, significant or otherwise. As it is often not possible to directly measure the own-price elasticity of demand, we typically seek the answer to this query through an alternative set of analytical steps.

The first step is to determine the relevant market in both the product and geographic dimensions within which the firm competes. We consider that the relevant product market for use in our analysis is comprised of mass market wireless services, including voice and data functionality, provided over a handheld device. The relevant geographic market is all of Canada, although our analysis would be largely unchanged if a narrower geographic market is used. This analysis is described in Section 2.

Section 3 offers more detail on the three national providers of wireless services, as well as other market participants, to set the stage for the rest of the report. In Section 4 we consider market share, which is the standard indicator of current (and past) competitive success. We find that the three major national providers of wireless service, Bell Canada (Bell), Telus Communications (Telus), and Rogers Wireless (Rogers), have largely symmetric market share holdings. Further, market shares as measured on a subscriber addition basis have not been stable over time, but instead have changed frequently. These findings suggest customers have readily switched providers and that each provider faces competitive discipline from the other major firms.

⁶ Franklin M. Fisher, “Diagnosing Monopoly,” *Quarterly Review of Economics and Business*, Vol. 19, 1979, 7-33, p. 12.

In Section 5 we discuss specific aspects of the market structure of the wireless industry that factor into our subsequent analysis. In particular, high fixed costs and complex pricing are the norm in the industry, so the competitive model is one that departs from perfect competition and instead involves firms selling (or expecting to sell) at prices above marginal cost in order to cover their fixed costs. Accordingly, we look for direct indicators of competition that would be consistent with this type of competitive market structure.

Price and non-price competition are considered in Sections 6 and 7, respectively. We find ample evidence of both forms of competition, arguing against the existence of significant market power: price trends are such that substantial gains have been transferred to consumers over time, while firms have also engaged in a great deal of investment in order to enhance their services to make them more attractive in relation to those offered by other providers.

In Section 8 we discuss whether the existing wireless providers might be able to coordinate their actions in a manner that would allow them to jointly exercise significant market power. We believe market conditions are such that this outcome is not likely. This is apart from the fact that if undertaken explicitly such conduct would be illegal, and that there are regulatory safeguards already in place to prevent such activity. Finally, Section 9 concludes.

2. MARKET DEFINITION

2.1. FOCUS OF INQUIRY

Any inquiry into market power must begin with a definition of the markets at issue. Only after defining markets can the existence or extent of market power be evaluated, since without defining the market accurately it is impossible to know whether a firm operating in that market will be able to exercise market power or whether competition by other products or firms will prevent an exercise of market power.

Market definition is implemented by examining both product and geographic dimensions. Competition authorities typically define relevant product markets to include the set of products and services that are considered to be sufficiently close substitutes to each other from the buyer's perspective, such that if the price of the product or service was raised, buyers would turn to substitute products in large enough numbers to make any exercise of market power unprofitable. Relevant geographic markets enclose the locations from which suppliers of the identified products can serve customers such that buyers view these as close substitutes to each other. Analogous to the conceptual exercise undertaken when delineating relevant product markets, we ask what would happen if the price of the relevant product at a particular location were raised. If buyers would turn to more distant suppliers for the relevant product in large enough numbers to make any exercise of market power unprofitable, these more distant suppliers are included in the relevant geographic market.

Market definition should be driven by the question of interest. Here, that question is whether any provider of wireless services in Canada has the ability to exercise significant market power, acting either unilaterally or coordinating with rivals. We will then consider wireless service (including data capability) as a possible product market, and all of Canada as a potential relevant geographic market.

Delineating markets can be complicated when products are differentiated and have a variety of attributes that different consumers may value in different ways. As a result, it may not be possible (or helpful) to distinguish between those products that are "in" and those that are "out" of the relevant market, particularly if products outside the relevant market are thought of as not competing with those that are within the market. In such circumstances, it is more helpful to treat market delineation as a question of degree, so that within the market as properly defined, products compete relatively intensely against each other. Products outside the defined market may offer some competitive constraint as well, but not enough to prevent an increase in price if all the producers of the products within the market were to act collectively (hypothetically) to raise price.⁷ The difficulty of defining the market in the case of differentiated products is one of the reasons why competition law in some jurisdictions calls

⁷ This is known as the "hypothetical monopolist test" in the economics of competition policy.

for the adoption of market boundaries that are consistent with “commercial common sense” in addition to those that can easily be demonstrated with the quantitative tools of economists.⁸

2.2. PRODUCT MARKET DEFINITION

The potential product market that is proposed is wireless service, including voice and data capability. This is a sensible candidate market to begin with as it would be a market in which the winners of the spectrum auctions for AWS frequencies would operate, and in light of the fact that such frequencies are well suited to data uses such as wireless broadband Internet or streaming audio and video.

Voice and data services are often bundled by providers and demanded by consumers of wireless services. Wireless technology has converged in such a way that wireless infrastructure (including base stations and switching capabilities) are constructed to be able to handle data as well as voice traffic, and modern handsets have voice as well as at least some data functionality.⁹ With the continuing rollout of third generation (3G) technology as a result of investments in network infrastructure, consumers are obtaining ever-increasing access to wireless data functionality. From a technological perspective, these services are typically provided jointly. Voice and data services also provide complementary benefits from the perspective of the consumer. Recent studies have found that a significant proportion of wireless phone customers use their phones for data purposes, including text messaging, downloading, video calling, and like services.¹⁰

Today, most basic wireless subscription plans provide voice access by default, with data access available in addition. And while there is no meaningful sense in which the availability of wireless data services by competitive sellers could discipline the pricing of wireless voice offered by a hypothetical sole seller, because data services are ubiquitously available as an add-on, it is appropriate to consider the joint voice-data bundle as a single product for convenience. To put it slightly differently, since voice and data services are invariably sold together, the price of each component would affect consumers' choice of whether to

⁸ For example, Section 3(1A) of the New Zealand Commerce Act defines a market as “a market in New Zealand for goods or services as well as for other goods or services that, as a matter of fact and commercial common sense, are substitutable for them.”

⁹ Not all handsets provide all data capabilities, but consumers are able to select a handset that provides the capabilities they expect to use during the course of a service contract.

¹⁰ Decima Research, “Usage of Wireless Communications in Canada”, April 2006, Prepared for the Canadian Wireless Telecommunications Association.

purchase a subscription to the combination product; therefore, the market is effectively for the combination product.¹¹

Although there are other services that provide similar functionality, such as fixed (wireline) voice and Internet access, these are not sufficiently close substitutes to be included in a definition of the relevant market from the perspective of a wireless phone user. An important and perhaps critical feature for consumers of wireless services is mobility. Consumers that value mobility are willing to pay more for a device and a subscription that enables them to communicate from different locations than for a stationary service that is otherwise similar. This is demonstrably true in Canada, where prices for wireline service have historically been low compared to wireless services. Thus, although there are certain customers or situations for which low-priced wireline access could be seen as substitutable, for the most part wireline would not offer a significant constraint on the pricing of wireless services.

Competition regulators have reached the same conclusion after considering this issue: the Competition Bureau considered whether wireline telephony was an effective substitute for wireless service when it examined the potential competitive effects of the acquisition of Microcell Telecommunications Inc. by Rogers Wireless Inc., and rejected the inclusion of wireline service in the relevant market.¹² We note, however, that this discussion does not imply the converse, i.e., that wireless service is not considered a substitute by users of wireline telephone services. Examining whether wireless would be included in a wireline product market would entail a separate analysis that is not required for current purposes.

The relevant product market can therefore be defined as mass market wireless service, including data capability.

2.3. GEOGRAPHIC MARKET DEFINITION

Turning to the geographic market, we ask whether a sole provider serving only a region of the country would be able to impose a price increase in that location only or whether the availability of supply from outside of the region would discipline the provider's pricing. One possibility is to start by considering markets at the provincial level. This is the geographic market arrived at by the Competition Bureau in a previous analysis of this issue. As the Bureau indicated in its review of the 2004 Rogers-Microcell merger, pricing tends to differ by

¹¹ See Fisher (1979), p. 14, who writes (in connection with ski boots and bindings as an example): "To the extent that certain boots are associated with certain bindings ..., the real competition takes place between binding-boot combinations. It would be wrong to consider the market for boots alone, even if boots are sold without bindings, if there is a substantial business in binding-boot combinations and the price of the boot affects the choice of the combination."

¹² Competition Bureau, *Technical Backgrounder – Acquisition of Microcell Telecommunications Inc. by Rogers Wireless Communications Inc.*, April 12, 2005, available at <http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e> (viewed May 21, 2007).

province or locality, and the identity of available providers may also differ by location.¹³ The Bureau also observed that “there is no persuasive explanation that explains why a provincial hypothetical monopolist could not raise price profitably.”¹⁴ The Bureau reasoned in reviewing that transaction that these factors tended to support markets defined at the provincial level.

As we discuss in the next section, there are three providers with national networks, Bell, Rogers, and Telus, as well as several regional providers, some of which are quite large. In addition, several mobile virtual network operators (MVNOs) offer wireless plans that involve resale of access under a network owner’s infrastructure. Thus, in most parts of the country a customer will normally have access to subscriptions offered by one or more of the national providers, as well as any regional provider and MVNO that may exist; notable exceptions to this general rule are Saskatchewan and Manitoba, where Bell does not have a facilities-based presence. If the customer chooses to purchase wireless service from a national provider, he or she will be able to make calls anywhere in Canada that the provider has a network without incurring roaming charges.¹⁵ The availability of service from a national provider would then tend to discipline the pricing of any regional providers, and would support the proposed national market definition. For example, a customer located in Vancouver could purchase wireless service as though he or she lived in Toronto. That customer would be assigned a Toronto number, and might be exposed to long distance charges for certain calls but depending on the customer’s calling needs and the structure of the long distance plans available from the Toronto provider, it might pay to do this.¹⁶

There are additional reasons why a national geographic market is appropriate. Competitive conditions in most provinces are very similar, with the three national carriers having some sort of presence along with regional providers and MVNOs. Even if a particular national carrier does not have a large current presence in a province (as is the case for Bell in parts of Western Canada), the carrier has the capability to expand its customer base given the infrastructure that is in place and it would undoubtedly do so if prices exceeded competitive levels in a given province on a sustained basis. There is, therefore, a case to be made for aggregating provincial markets for convenience, which is helpful also because much of the data we use in our analysis is presented at the national level.¹⁷ The Bureau likewise

¹³ Competition Bureau (2005).

¹⁴ Competition Bureau (2005).

¹⁵ We understand that Bell and Telus currently have a mutual roaming arrangement that allows the customers of each to roam on the other’s network where necessary without incurring any additional charges (see <http://www.bce.ca/en/news/releases/bc/2001/10/17/6459.html>, viewed May 22, 2007).

¹⁶ We accept that depending on the structure of long-distance charges it may be the case in some instances that national providers would be unable to discipline the pricing of a purely regional hypothetical monopolist.

¹⁷ See Gregory J. Werden, “Assigning Market Shares,” *Antitrust Law Journal*, Vol. 70, 2002, pp. 67-104.

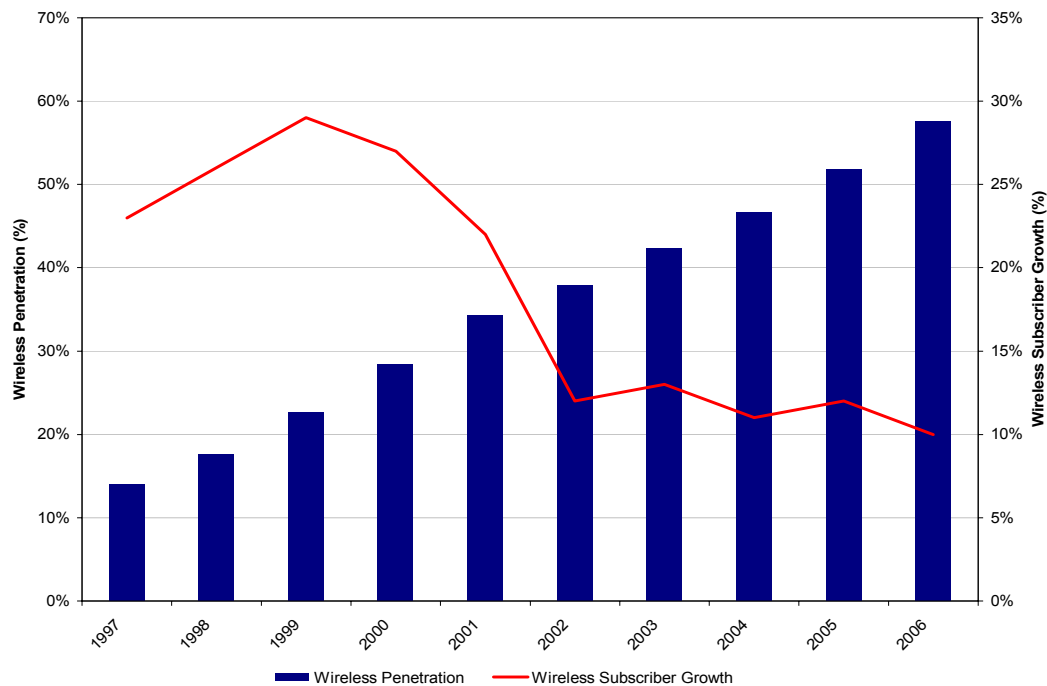
observed that the distinction between provincial and national markets is of little practical importance in evaluating the competitive circumstances in the industry.¹⁸ It is true that by proceeding on a national basis we may overstate the current competitive significance of the national providers in certain provinces where they have a limited presence (such as Saskatchewan and Manitoba) and understate it in other provinces, but we believe this compromise is acceptable as our concern is ultimately with the overall presence or absence of significant market power on the part of the large carriers. In the following discussion, we therefore adopt a Canada-wide geographic market.

¹⁸ Competition Bureau (2005).

3. PARTICIPANTS IN THE RELEVANT MARKET

A variety of national and regional licensed wireless carriers provide wireless voice and data services to Canadian consumers, along with numerous resale partners. The digital networks of these providers reach 97% of the Canadian population, with coverage reaching nearly 100% in urban areas.¹⁹ According to Wall Communications, by the end of 2005 approximately 90% of Canadians could select wireless service from among three service providers.²⁰ At the end of 2006, Canadian wireless phone subscribers numbered 18.6 million, representing a national wireless penetration rate of approximately 58%.²¹ Subscriber growth and the penetration rate have increased rapidly since the introduction of digital wireless services in the late 1990s, as shown in Figure 1 below.

Figure 1: Wireless Penetration and Subscriber Growth in Canada, 1997-2006



Source: Wall Communications (2006), Merrill Lynch (2007).

¹⁹ Wall Communications Inc., A Study on the Wireless Environment in Canada, September 29, 2006, Prepared for the Canadian Wireless Telecommunications Association, p. 17.

²⁰ Wall Communications (2006), p. 36.

²¹ Merrill Lynch, "Global Wireless Matrix 4Q06, Shaky Markets, Solid Fundamentals," March 28, 2007.

There are three major national providers of wireless services: Bell, Rogers, and Telus. Each of these is a division of a larger company that is diversified into other telecommunications and broadcasting activities. Bell and Telus are affiliated with the incumbent providers of wireline services in Eastern and Western Canada, respectively, while Rogers is an affiliate of a cable television provider. According to each of their annual reports, Rogers' network serves 94% of Canadians;²² Telus' network covers 92% of the Canadian population;²³ and Bell's network serves 95% of the population in Ontario and Quebec and approximately 90% of the population in Atlantic Canada and the major cities in the provinces of Alberta and British Columbia.²⁴ Bell's network coverage does not extend to Saskatchewan and Manitoba. These provinces have wireless networks provided by their own incumbent wireline service providers (SaskTel and MTS Allstream). SaskTel and MTS Allstream have roaming arrangements with the national providers, so that (for example) a SaskTel customer would be able to use his or her phone in Ontario over the Bell network.

The national providers do not all use the same wireless technology to deliver services to consumers. Bell and Telus (as well as SaskTel and MTS Allstream) use a technological standard based on code division multiple access (CDMA) called CDMA2000, while Rogers uses the GSM standard (including GPRS, EDGE, and HSDPA). CDMA technology is used in North America and parts of Asia, while GSM is the main standard that is used in Europe. These technologies are not compatible with each other, so a Bell subscriber cannot generally use his or her phone when traveling in Europe. Similarly, a Rogers subscriber cannot switch to Bell or Telus with the same device.

MVNOs include companies such as Virgin Mobile, Vidéotron, President's Choice, and 7-Eleven. No standard industry definition for an MVNO exists, but there are a couple of key characteristics shared by all MVNO players.²⁵ The first is that the MVNO does not directly own spectrum, but instead enters into an agreement with a licensed wireless carrier (also known as the Host Network Operator) to use its facilities. MVNOs are consequently limited in their offerings and fee structure by the underlying network and the need to obtain access to that network. Second, the MVNO operates under a brand name through which it sustains client relationships and therefore it is not a pure reseller. The MVNO business model is a low-cost means of entering markets with developed wireless infrastructure as it allows the MVNO to enter without having to incur the expenses associated with entry as a facilities-based provider. Apart from marketing and promotional expenses, the costs incurred by the MVNO are restricted to those needed to maintain daily operations.

²² Rogers Communications Inc., *2006 Annual Report*.

²³ Telus, *2006 Annual Report*.

²⁴ Bell Canada Enterprises, *2006 Annual Report*.

²⁵ See "MVNOs (Mobile Virtual Network Operators): Everybody's Business," White Paper Series – Volume 1, Next Gen Networking Services & Infrastructure, ThinkEquity Partners LLC, September 21, 2005, pp. 5-6.

4. MARKET SHARES

The standard metric that is typically used to summarize firms' competitive position in analyses of market power is market share. There is no simple rule that identifies the market share at which a firm has market power, let alone significant market power. That being the case, there can be shares below which market power is highly unlikely. For example, the Competition Bureau uses a share of 35% as a "safe harbour" in merger transactions, noting: "the Commissioner generally will not challenge a merger on the basis of a concern related to unilateral exercise of market power when the post-merger market share of the merged entity would be less than 35 percent."²⁶

Ultimately, while market power requires a high market share, a high market share alone need not indicate market power. A wide range of market characteristics must be considered as part of any assessment of the likely competitive response to any attempt by a single firm to substantially raise price. Even a market with only two symmetrically positioned sellers can be highly competitive if certain market conditions are met. Similarly, if barriers to entry are absent then any attempt by a firm to raise its price above the competitive level will be unsuccessful even if that firm has a very substantial market share.

Market share evidence may, however, help us to assess the capacity of competitors to discipline any attempt to exercise market power. In calculating market shares there are often a number of options that can be used to compare firms, including output, sales revenue, production capacity, or control over critical assets or reserves (as in cases involving natural resources) of existing firms; any or all of these may be relevant depending on the situation. In cases where rivals can quickly and easily expand production in response to a small increase in price, market shares based on current sales may not be a useful indicator of the power any particular firm has within the market on a long-run or sustainable basis. In such cases, it is better to measure market share based on either control over productive assets or capacity if there is a well-established capacity common denominator across firms.²⁷ However, shares based on current sales may still be informative. Current sales shares help us understand competitive trends in the market and comparing these shares over time we obtain a sense of the nature of competitive rivalry. If a single firm consistently has a high share of current sales, this fact may suggest a more mature market in which firms may not be engaged in aggressive competition to win over each other's customers.²⁸ If we see current

²⁶ Merger Enforcement Guidelines, September 2004, ¶ 4.12.

²⁷ Werden (2002).

²⁸ The observation that a single firm consistently holds a high share does not always suggest a mature market and less aggressive competition, however. Instead, it may simply indicate superior performance on the part of the firm with the high share in meeting the demands of customers. Active and aggressive competition may still exist within such a market, with one firm succeeding more frequently than its rivals.

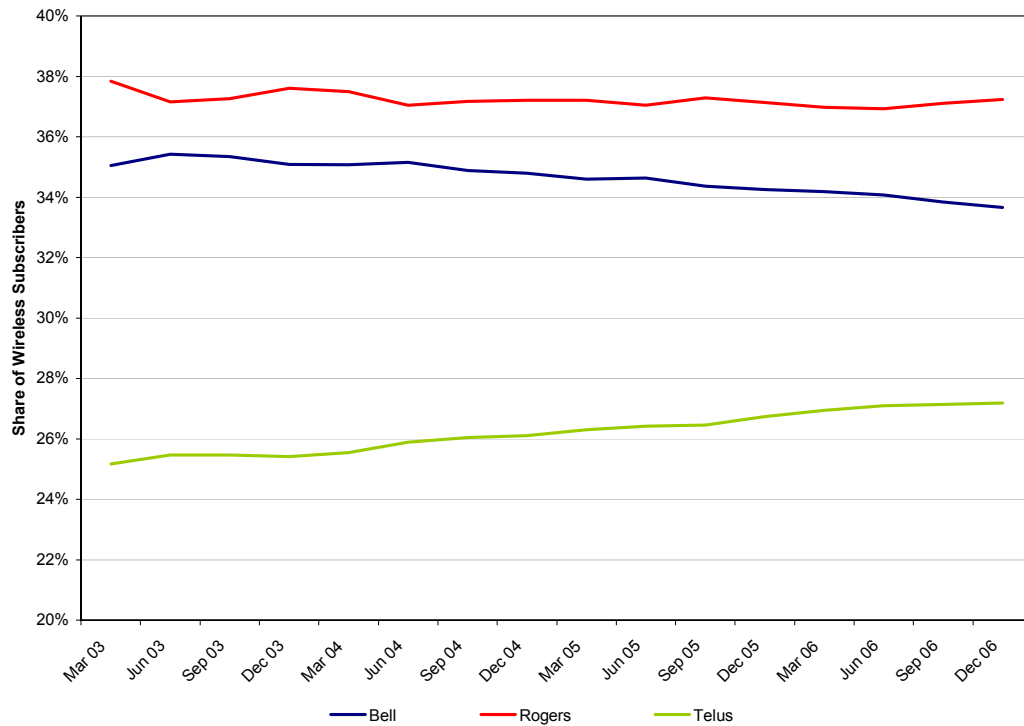
sales shares fluctuating from period to period, this is indicative of active competition among producers.

As we discuss in further detail below, the wireless industry is an example of a case where “output” (in the sense of subscribers) can be added quickly provided the network infrastructure is in place to serve such customers. Thus, in areas where all providers can serve new customers using their own facilities, each carrier will be equally interested in winning the customer’s business and it may be appropriate to assign symmetric shares based on the capacity to serve that incremental customer of $1/n$ each, where “ n ” is the number of firms with network infrastructure in place. With respect to Canada’s three national providers, we expect that this symmetric situation holds for the vast majority of the Canadian population.²⁹

Another measure of capacity that can be used in order to construct average shares on a national basis is the existing subscriber base. Capacity in the wireless industry is scalable over the medium term, and providers make investments in network capacity depending on their actual and expected subscriber base. Service providers with a large subscriber base tend to have a correspondingly large capacity (but not a great deal in excess of what would be required during peak periods of usage). Figure 2 presents shares based on existing subscribers in Canada over the March 2003 to December 2006 period.

²⁹ Wall Communications (2006, p. 36) notes that as of the end of 2005 “close to 90% of the population had three digital providers” to choose from.

Figure 2: Share of Existing Wireless Subscribers, March 2003-December 2006



Source: Merrill Lynch (2007)

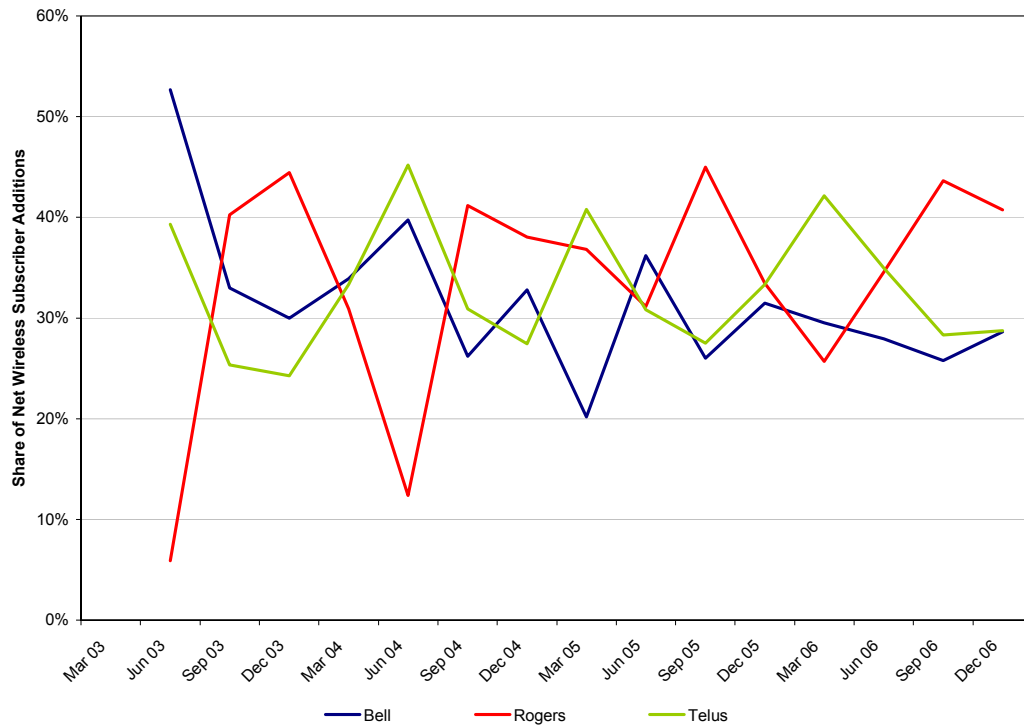
Figure 2 shows a relatively stable pattern of national market shares for the three national providers, all of which are similar in share from a national perspective. Rogers has been in the lead during the entire time period and had a share of 37% at the end of 2006. In second place was Bell, with a Canadian share of 34%, while Telus had a share of 27%. These shares have fluctuated little since 2004.

The individual national wireless providers' shares in Canada are not high by international standards; there are many examples of countries in which there are three or fewer providers of substantial size.³⁰

In contrast to the relative stability of shares of total subscribers, Figure 3 reports the share of new subscribers over the same time period. This has been extremely volatile.

³⁰ See e.g., Merrill Lynch (2007).

Figure 3: Share of New Wireless Subscribers, March 2003-December 2006



Source: Merrill Lynch (2007)

Looking at 2006, Rogers has gone from a new subscriber share of 26% in the first quarter to a share of 41% at the end of the year, while Telus has gone in the other direction. More recent data shows that Bell has also faced challenges attracting new subscribers. In the first quarter of 2007, Bell's net subscriber additions were essentially negative, as it lost subscribers to other providers.³¹

Summarizing the market share evidence from both an existing and new subscriber perspective, only Rogers has a share that is greater than one-third of the market. As market share alone is insufficient to determine the existence of market power, in the following sections, we explore in more detail the structure of the market and further indicators that can be used to refine the assessment of market power.

³¹ "BCE Inc.: A Challenging Start to 2007," UBS Investment Research, May 3, 2007, p. 3.

5. MARKET STRUCTURE

The Canadian market for wireless service has many of the typical characteristics of markets in information and computing industries. These characteristics have an impact on the structure of the market and are essential to consider in any analysis of market power. We consider first the cost structure of the industry, especially as this has a bearing on barriers to entry and competitive behaviour among incumbent providers. We then turn to a discussion of specific aspects of competition in the wireless market in both the “static” dimension (where we discuss price discrimination and switching costs) as well as the “dynamic” dimension (involving ongoing investment and new service introduction among providers). We find that the Canadian market for wireless service is one in which substantial fixed and sunk costs are required for operation, and therefore competitive prices must (on average) exceed marginal cost. Common to such markets, pricing tends to be complex and customer-specific and providers are continually making investments in order to offer new services in competition with the other providers.

5.1. COST STRUCTURE AND BARRIERS TO ENTRY

Barriers to entry and expansion are often defined as costs that must be incurred by an entrant that will place it at a competitive disadvantage against an incumbent provider. Where entrants and incumbents must make similar investments in fixed and sunk assets, this may affect the cost of entry and expansion, but these costs are not true barriers to entry.³² Furthermore, the only barriers to entry that are of interest in competition analysis are those that prevent socially desirable entry. If an entrant would have to incur a large cost to enter a market but the social benefit of that entry (for example through reduced prices in the market) does not outweigh the cost of entry, then the so-called barrier to entry is only of interest to the thwarted competitor but not for the process of competition itself. Similarly, if entry would result in incumbents failing to earn an adequate return on their investments in equipment or innovation, the lack of entry is of no concern from a competition perspective.

Where there are significant fixed and sunk investments required to offer service, such as in the deployment of network assets for telecommunications and other network markets, the cost of serving one additional customer—the marginal cost—is typically very low. In such cases, output can be easily expanded given the existence of the underlying network infrastructure. As a result, the mere fact that significant fixed and sunk costs exist does not translate into market power for any given incumbent if rival firms have already made investments required to offer service or can interconnect to another provider’s facilities.

³² Costs are sunk if they cannot be recovered in the face of unsuccessful (i.e. unprofitable) entry. Not all fixed costs are sunk. Fixed costs are costs that do not vary with output. An example of a fixed but not sunk cost is a warehouse. Should entry prove to be unprofitable and the firm is forced to exit the warehouse may be leased for alternative purposes and hence it does not represent a sunk investment.

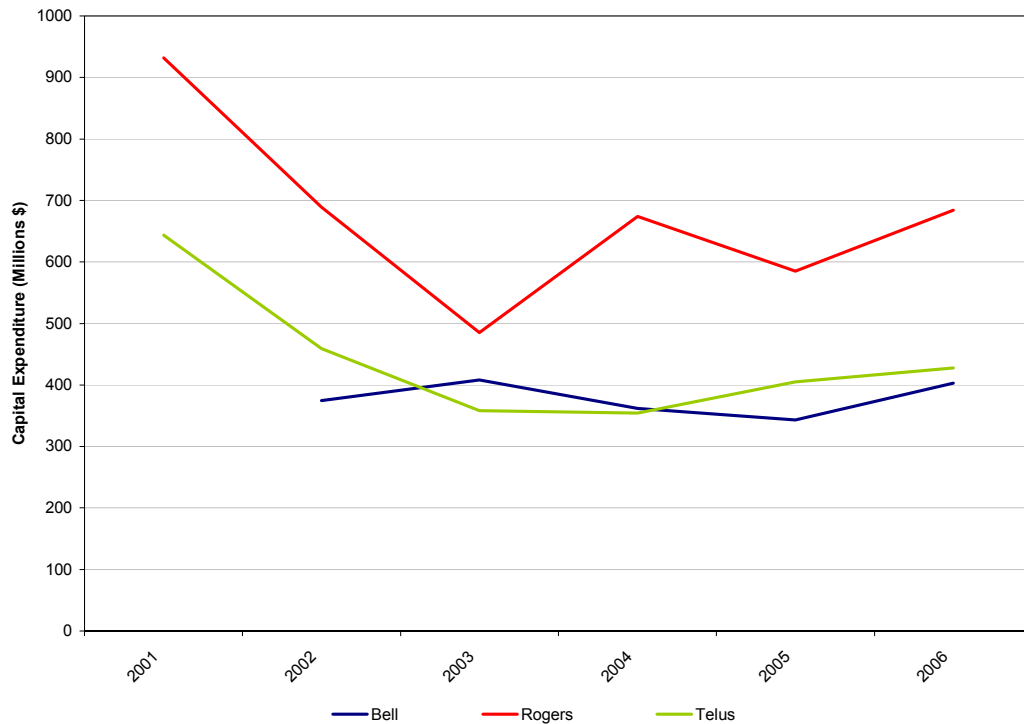
As in many telecommunications markets, the fixed and sunk costs necessary to enter as a facilities-based provider of wireless services are high. A provider must obtain access to wireless spectrum in order to offer services, which involves bidding in auctions such as the auction for AWS currently under consideration, and then negotiating the terms of the licence to the spectrum. Once a spectrum licence is secured, a facilities-based provider would face numerous other costs, which can usefully be divided into two categories: necessary network-related capital expenditures and costs of non-network assets.³³ Network-related expenses include expenditures on core network infrastructure (including radio towers, base stations, and mobile switching systems) as well as interconnection fees with other providers. Non-network costs include costs of implementing billing systems, operational systems and support structures, software, and real estate. These expenditures are necessary to build a national footprint, and their sum can easily amount to several billion dollars per carrier.³⁴ After these initial outlays, there are further expenses associated with the day-to-day operation of the company. These include general and administrative expenses (credit checks, collections and executive staff), sales and marketing costs (advertising, promotions and acquisition costs) and technical support (customer care and staff).

Investments in infrastructure are not a one-time event. Service providers are continually upgrading their networks to add new functionality that is compatible with the technological standard that is in place. This is a further source of fixed cost (although it is not a barrier to entry as incumbents and entrants would all face these ongoing infrastructure upgrade costs). Recently, carriers have made very large expenditures in order to enhance the data capacity of their digital networks as well as to extend their networks to areas that had previously not received coverage. While we describe the nature of these investments and the results from the perspective of consumers in greater detail below, their aggregate annual dollar value is presented for each national provider in Figure 4.

³³ ThinkEquity Partners (2005), p. 22.

³⁴ ThinkEquity Partners (2005), p. 22.

Figure 4: Capital Expenditures by National Wireless Providers, 2001-2006



Source: Merrill Lynch (2007)

While fixed and sunk costs of initial network deployment are important to note because of their effects on entry, it is also significant to consider the effects of the industry cost structure on market conduct for those facilities-based carriers that have already made these initial investments. Firms choose to participate in a market with high fixed costs only if they expect to be able to earn an adequate return above variable costs on each sale—otherwise, firms will exit the market. Accordingly, prices must exceed variable costs by an amount sufficient to make ongoing operations worthwhile. These prices will not attract additional facilities-based entry when a potential entrant considers that in light of the nature of post-entry competition it is not likely to be able to recoup its initial sunk investment. By international standards, the Canadian market for wireless services is relatively small and subscribers relatively spread out.³⁵ With a relatively small market, the number of providers that arise in an economic equilibrium in Canada may differ from the number of providers arising in other countries.

³⁵ The Wall Communications study points out that there is a greater concentration of urban areas in the U.S. and population density in U.S. cities tends to be higher than Canadian cities. Wall Communications (2006), p. 15.

5.2. COMPETITION AT A POINT IN TIME

There are important characteristics of the wireless market that have an effect on how we understand competition at a point in time, and that differ from the characteristics of markets for simpler products. These include complex differential systems of service pricing, and sales under contracts. Such pricing structures frequently arise when firms compete in markets characterized by substantial fixed costs of operation.

5.2.1. Complex Pricing

A number of different components collectively impact the price that each consumer pays for wireless service, and in general it is difficult to arrive at an accurate summary of the prices faced by consumers. Factors affecting the complexity of pricing include the bundling and customization of plans and options, switching and recruiting incentives, and the wide variety of promotional offers that are available at different times. These pricing strategies can generally be regarded as examples of differential retail pricing or “price discrimination”. Price discrimination practices are commonly used by firms competing in industries characterized by high recurring fixed costs of operation, of which telecommunications is a classic example.³⁶

Two major types of price discrimination through bundling exist in the wireless market: (a) bundling across telecommunications services, including wireless services; and (b) bundling of various wireless services to form a wireless service package. Both types of bundling are prevalent in the wireless market, especially among the national players.

Bundling across telecommunications services exists when a company provides a variety of services such as television, Internet access, wireless and landline at a single price, if purchased together. According to a recent IDC Canada consumer survey, 62% of Canadian consumers tend to prefer bundles when purchasing telecommunications services.³⁷ In Canada, bundles are offered by major carriers such as Bell and Rogers along with some MVNOs such as Primus Canada. The discount offered for purchasing in a bundle varies with the number of products selected and, depending on the provider, may be expressed as a percentage discount or a fixed dollar amount off the total cost of the separately purchased components. Bundling enables providers to reduce customer switching, attract new subscribers, and reduce operating expenses.³⁸ The bundling of numerous products complicates the wireless pricing structure by making pricing dependant on the number of products chosen by an individual subscriber. It is then difficult to determine the wireless price

³⁶ See William J. Baumol and Daniel G. Swanson, “The New Economy and Ubiquitous *Competitive Price Discrimination: Identifying Defensible Criteria of Market Power*,” *Antitrust Law Journal*, Vol. 70, 2003.

³⁷ See http://www.comparecellular.com/newsstory_details.asp?id=2019&l (viewed May 22, 2007).

³⁸ http://www.wirtel.co.uk/article_eu_2005q2_002_convergys.htm (viewed May 22, 2007).

component of the bundle, as the proportion of the bundling discount to be allocated to each specific service may be unknown.

Wireless service plans are themselves typically bundles of services offered for a single aggregated price. Many providers offer basic add-ons such as voice mail, call display, call waiting, conference calling, call forwarding and other features at either a specified cost per option or as a bundled package price. MVNOs tend to offer these options as part of their basic package while the national providers tend to offer these services as a bundle purchased in addition to their basic plans. As preferences differ across wireless subscribers, providers are also offering more complex add-ons such as inter-carrier calling, unlimited evenings and weekends starting at varying times with different associated prices, free incoming calls, various family, couple and business specific plans, as well as plans exclusively catering towards specific handsets such as Blackberrys and PDAs.

The recent rollout of 3G technology in Canada adds yet another layer of complexity to the wireless pricing structure. 3G options such as wireless TV, MP3, graphic downloads, video conferencing, Internet access, and chat options are provided to customers with various cost structures. Companies provide these services in the form of specific bundles on a fixed price per month basis as well as a pay-per-item basis. For example, Rogers and Telus both currently have a \$20 plan allowing customers to download an unlimited number of songs per month; however they also provide the option of downloading a single song for a cost of \$2.99 and \$2.00 per song, respectively.

The following table provides some further examples of bundled wireless service plans.

Table 1: Examples of Service Bundles

Company	Offer Type	Details	Price
Telus	Plan	Flexible Share Plan (combo of Share 20 Plan + Share 15 plan), 150 minutes, unlimited nights and weekends, sharing of unused minutes, unlimited calls between share plan members, call waiting, call forwarding and conference calling	\$35/month
Telus	Add-on	Caller ID, Voice Mail 10, Unlimited text, picture or video messages, Unlimited browsing at over 100 selected sites, Unlimited email via Web browser, Unlimited My Email sent and received messages and Unlimited Instant Messenger	\$15/month
Rogers	Add-on	Communicate Value Packs (includes various combinations of Voicemail, Enhanced Voicemail, Name Display, WhoCalled™, 125 Sent Text Messages, 2,500 Sent Text Messages, 1,000 Sent Picture/Video Messages, \$5 mobile Internet Plan)	\$10-\$20/month
Rogers	Plan	Mega Time: 1000 evenings & weekends (9pm-7am), 150 weekday minutes, unlimited network calling	\$25/month
Virgin	Plan	L: 200 minutes, voice mail, call display, call forwarding and call conferencing	\$20/month

Each company aims to differentiate its services and typically provides numerous incentives and promotions to encourage customers to join. Promotions are provided in many forms and

vary across companies. Basic promotions, which are common among the national providers, include features such as free intra-carrier calling, a select number of free monthly bonus minutes, unlimited local or evening and weekend calling, free extended hours for evening and weekend plans, a certain amount of free long distance minutes, select number of text messages, graphic and ring tone downloads. In addition to these promotions, companies also have a number of unique offers exclusive to the company. Telus has a rewards program called "PERKS" which provides customers which perks such as discounts, free goods and other options with a number of their partners. For example, for the month of May 2007 Telus PCS clients on a monthly rate plan were entitled to free ice cream or frozen yogurt.³⁹ Likewise, Primus Canada, in collaboration with Air Miles, provides customers with 1 bonus reward mile for every \$5 of monthly Primus spending.⁴⁰

Most companies also provide added incentives to purchase products or services online. For example, Virgin provides all customers with a \$25 dollar credit as well as free shipping if products or services are purchased online. Similarly, Rogers provides customers with \$50 gift certificates to Future Shop, American Express or a selection of restaurants for certain online purchases. Promotions are not only applicable to rate plans but also apply to wireless peripherals such as handsets and other phone components.

Many of these promotions and benefits are available only if the customer is under a specific contractual agreement. Sometimes the rate plan itself is available only under a contract. These agreements vary from one year to a maximum of three years. Generally, the longer the agreement the greater are the benefits available to the subscriber. Such benefits are not usually applicable for the whole period of the contract but rather for a limited time. Bell, Telus and Rogers tend to provide benefits on the rate plan as well as the handset if the consumer enters into a contract, whereas MVNOs may provide only a discount on the handset (e.g., Primus) or may not have contracts at all and provide no discount on the phone or plan (e.g., Virgin).

Finally, there are other benefits which are available on a per-customer basis. For instance, new customers switching from one provider to another can often get additional promotions in the form of credit, discounts and/or free phones. Bell provides up to \$200 in credits for customers switching their wireless, Internet and television services over from another provider. These types of benefits are not standard or documented and therefore it is hard to incorporate these discounts when determining the net price paid for wireless service. Similarly, when service or billing errors occur, companies often provide additional benefits (such as free service for a month) to compensate for the mistake in order to retain a customer's business, which further complicates the pricing structure.

³⁹ See http://www.telusmobility.com/on/perks/thismonth_perk.shtml (viewed May 22, 2007).

⁴⁰ <http://www.primus.ca/en/residential/rewards/RewardPrograms.htm> (viewed May 22, 2007).

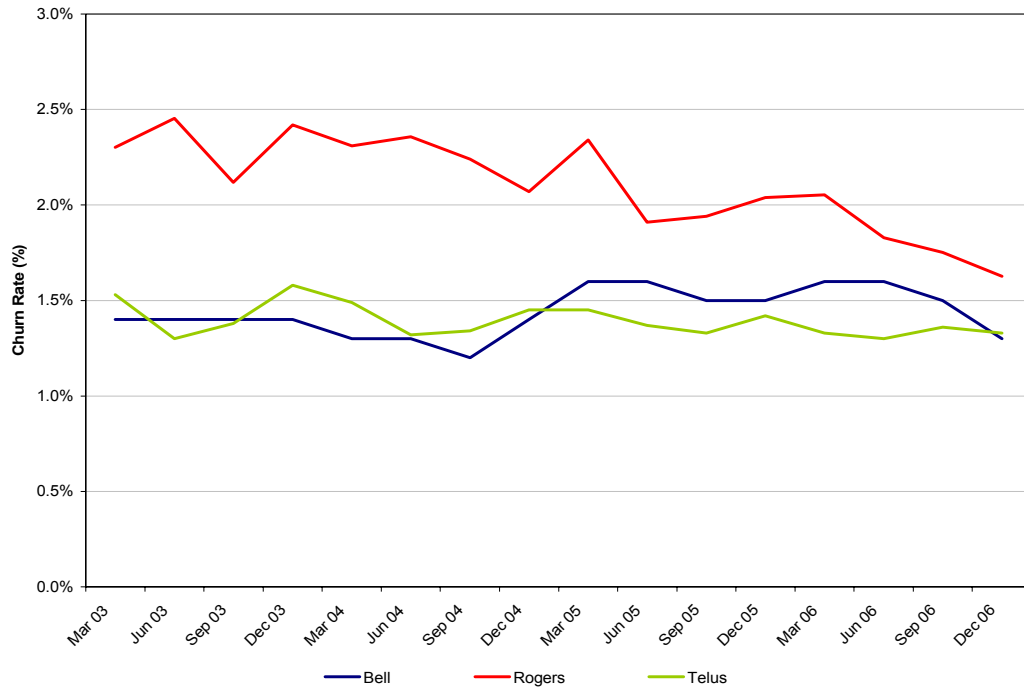
5.2.2. Customer Switching

Consumers of wireless services normally sign up with a provider for a period of one year or more. Entering into a contract reduces the out-of-pocket cost of the handset to the consumer, sometimes by 100%, and serves to guarantee a certain level of revenue to the provider during the period of the contract. In this sense customers under a contract are not free to switch providers unless they are willing to incur the cost of terminating the contract.⁴¹ Yet this does not mean that providers are accorded market power during the term of the contract. Service providers remain bound to the contract terms agreed to by the customer. If a service provider attempted to exploit customers under contract, existing customers may switch providers and new customers or those between contracts are likely to choose an alternative provider. In this way, competition would discipline any temptation to take advantage of customers under contract.

In any event, customers do switch providers, and providers have a great interest in understanding and measuring the scope of this phenomenon. “Churn” rates represent the proportion of contractual customers or subscribers who leave a provider during a given time period. Data from various sources indicate that for the three national wireless companies, monthly churn rates have been lower in recent years. Figure 5 shows churn rates based on data from Merrill Lynch for Bell, Rogers and Telus from March 2003 to December 2006.

⁴¹ To break a contract, contact with sales representatives at Bell, Rogers and Telus revealed that each company has similar policies. Each requires a termination fee of \$20 per month for the remaining months on the contract. Bell has a \$100 minimum fee and a \$400 maximum fee, Rogers has a maximum fee of \$400, and Telus has a minimum fee of \$100, with no maximum fee.

Figure 5: Monthly Subscriber Churn, March 2003-December 2006



Source: Merrill Lynch (2007)

Wireless number portability came into effect in Canada as of March 14, 2007. This allowed mobile phone users to keep their existing phone number when moving between providers, allowing subscribers to take advantage of the best offers on the market without fearing missed calls or having to distribute new contact information. Number portability reduces customer switching costs. There has been some speculation that wireless churn rates would increase drastically with number portability in place as customers will start switching between companies on a whim. This is not the view of market analysts, however.⁴² As noted above, there are fees involved in ending an existing contact if the customer is subject to one, and customers (except those that are extremely dissatisfied) are not expected to begin switching in drastically greater numbers just because it is now easier.

As number portability is relatively new in Canada, the effects on wireless carriers are hard to predict at this time. While some industry analysts believe that wireless providers will have to compete intensely to gain and retain their customers,⁴³ recent survey evidence also reveals that although number portability may provide customers with a sense that switching is an

⁴² See www.teleclick.ca/2007/03/wireless-number-portability-comes-into-effect/ (viewed May 22, 2007).

⁴³ See www.teleclick.ca/2007/03/wireless-number-portability-comes-into-effect/ (viewed May 22, 2007).

option which they may take advantage of at some point, most respondents do not have any immediate expectation that they will switch providers.⁴⁴

5.3. COMPETITION OVER TIME

Price competition is only one of the methods used by wireless carriers to compete. As noted in the introduction, firms compete using a variety of instruments, some of which (such as prices) are short-term in nature, and some of which affect longer-term competitive trends. A focus only on competition at a point in time does not reveal the competitive rivalry that unfolds between firms over time. This process of rivalry—in which firms develop and introduce new products and services in an effort to attain a position of market leadership and win customers away from other firms—has been called “dynamic competition”.⁴⁵ Dynamic competition involves the creation of new products and potentially also new markets, along with the replacement or obsolescence of older products. It also implicitly or explicitly involves entry and exit by firms—there is no guarantee that today’s successful firms will be able to offer the product attributes demanded by tomorrow’s consumers.

Competition in the wireless service market, like most telecommunications markets, is dynamic and is based on costly investments in network technologies. This has been amply evident since the introduction of digital (second generation or “2G”) service in Canada in the 1990s, when four firms made very significant investments to build their digital networks. At that time, the Canadian providers made a choice between two competing platforms: a TDMA-based standard that included GSM (with later enhancements such as GPRS and EDGE); and a CDMA-based standard known as IS-95 (which has been upgraded to CDMA2000 in many locations).⁴⁶ These technology choices determined the options that were available for providers in terms of later network enhancements. Because GSM has become the *de facto* standard of choice in Europe, providers such as Rogers that have deployed GSM technology have benefited from a steady stream of infrastructure and device enhancements developed for the large fraction of carriers around the world that operate GSM networks. The CDMA-based carriers (Bell and Telus) have thus far had access to technology upgrades that have provided similar functionality, although the path to the next generation of technology for CDMA-based carriers is less clear.

Subsequent to the rollout of basic 2G digital service, all providers have made incremental investments in their networks to improve data download speeds for customers in order to provide full 3G services. 3G provides download speeds ranging from 144 Kbps to 2 Mbps

⁴⁴ TNS Canadian Facts (2007), p. 11.

⁴⁵ See further discussion in Andrew Tepperman and Margaret Sanderson, “Innovation and Dynamic Efficiencies in Merger Review,” paper commissioned by the Competition Bureau, 2007.

⁴⁶ Wall Communications (2006), pp. 31-32.

and above, thus approaching data delivery speeds comparable to home or office broadband connections. It is expected that mobile data-related services will be the key drivers of 3G adoption. Consumer applications currently in existence and making use of improved rates of mobile data delivery include video calling, music downloads, and full Internet access. Around 30% of the population, mostly in urban areas, had access to some form of 3G service in 2006.⁴⁷ Currently, about two-thirds of the Canadian population has 3G service available to them, with carriers continuing further roll-out and planning for future generations of service technology.

⁴⁷ Wall Communications (2006), p. 18.

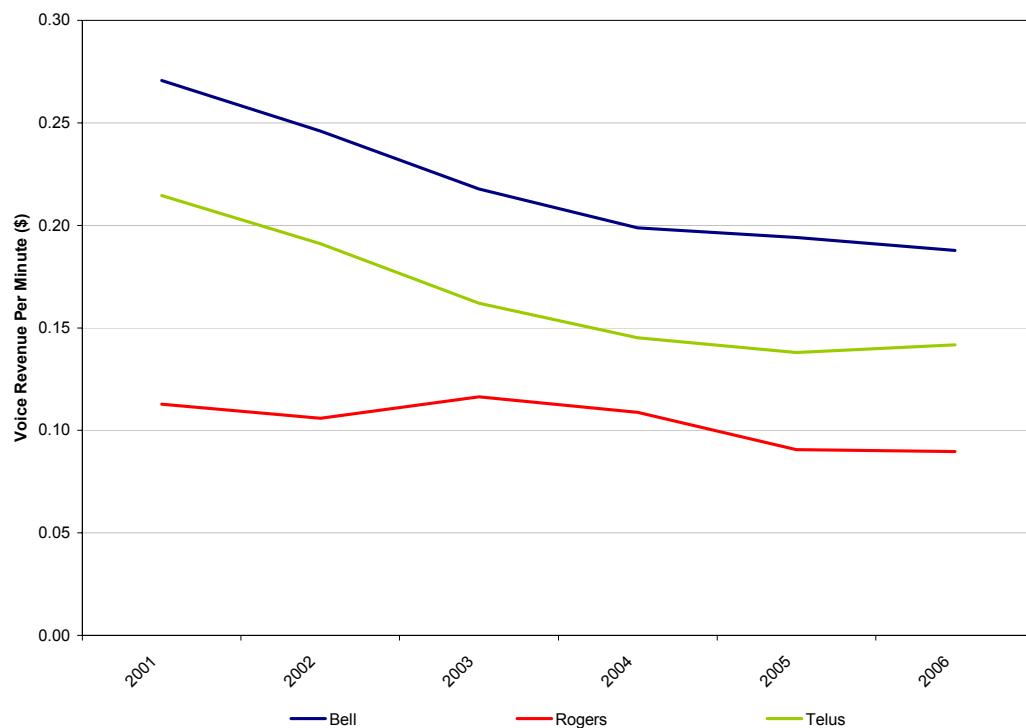
6. EVIDENCE OF PRICE COMPETITION

In this section, we look to various sources of data on pricing in order to explore the nature of competition among the major service providers. We find evidence that all providers are engaged in similar practices that are indicative of static or short-run competition (i.e., competition using short-run instruments such as pricing).

6.1. PRICE COMPETITION

Average revenue per minute (ARPM) in Canada has declined by a substantial degree over the last five years. Figure 6 shows ARPM for voice service by provider over 2001 to 2006. The figure shows a clear decline during this time period for all providers, consistent with competition among providers.

Figure 6: Average Revenue per Minute of Voice Usage, 2001-2006

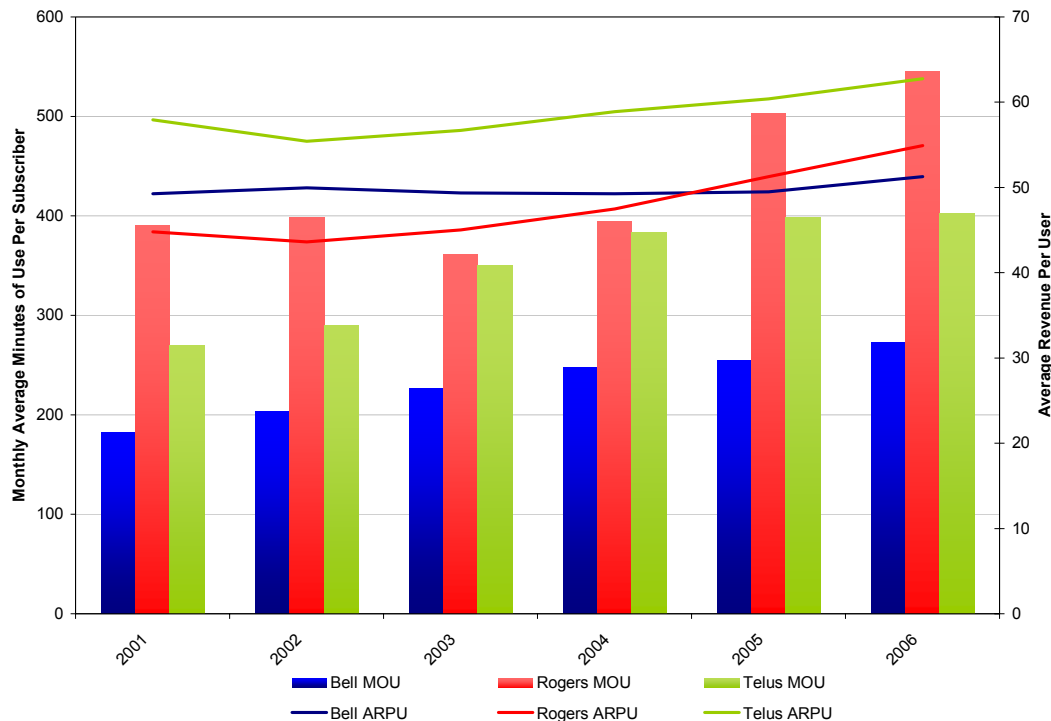


Source: Merrill Lynch (2007)

Apart from the declining trend in ARPM, another apparent finding from Figure 6 is what appears to be a difference in pricing among providers. For example, Rogers would appear to have a relatively low ARPM in comparison to the other carriers. This is due to the fact that providers tend to have similar average monthly costs for their service plans, but Rogers subscribers tend to consume more minutes of use relative to subscribers to the other

companies, and therefore the ARPM is lower for Rogers' subscribers. Figure 7 shows average minutes of use per month for subscribers as well as average revenue per user (ARPU) for each of the national providers' plans over 2001-2006.⁴⁸

Figure 7: Average Minutes of Use and ARPU, 2001-2006



Source: Merrill Lynch (2007)

As shown in Figure 7, there is a general trend toward greater minutes of use per user for each provider. Indeed, Canada has experienced an increase in the average number of minutes used by each subscriber of almost 50% from 2001 to 2006.⁴⁹ Rogers and Telus customers use 475 minutes per month on average, as compared to 273 minutes by Bell customers. The ARPU associated with Bell and Rogers tend, however, to be quite similar, which accounts for the divergence in ARPM among providers shown previously in Figure 6.

Figure 7 also shows an increase in ARPU over 2001-2006. This increase is not the result of rising prices (as Figure 6 showed, ARPM has declined over time), but instead reflects increased usage over time, as represented in Figure 7. As another example of increased

⁴⁸ ARPU is equal to the amount of revenue received for subscription services over a period of time (such as a month) divided by the number of users.

⁴⁹ Merrill Lynch (2007).

wireless usage, approximately 8% of households that currently have access to a wireless phone have in fact replaced their traditional telephone line with a wireless phone and a study commissioned by the Canadian Wireless Telecommunications Association (CWTA) reports that 17% of Canadian households that either currently have a wireless phone or plan to have one in the next 12 months are likely to replace an existing wireline service with a wireless service.⁵⁰

ARPU has also risen over time as a result of the explosion of new options and the rollout of new features. We have seen the introduction of a variety of new service offerings by all three national wireless companies. Companies are now offering more than just voice services, and are introducing technologies previously not available to Canadian customers, as described in greater detail below. The additions of these features have increased options for customers, and consumers are willing to pay more for them. There are also other concrete examples of an increased take-up of new functionality:

- (a) According to the CRTC 2006 Monitoring Report, the “Data and Others” component of wireless and paging revenues experienced a 37% increase from 2004 to 2005. This was the highest growth of any of the components.⁵¹
- (b) Merrill Lynch reports that the percentage of ARPU arising from data sources increased tenfold from 2001 to 2006.⁵² In 2001, data services made up only a tiny fraction of ARPU while in 2006 data use accounted for 10% of ARPU.
- (c) Increased data usage can be observed by the jump in the number of mobile-originated text messages in Canada. Mobile phone customers sent more than 4.3 billion person-to-person text messages in 2006, almost triple the 1.5 billion messages sent in 2005. Text message volumes peaked in December 2006 at more than 560 million in that month alone, which represents more than 18 million per day for Canadian subscribers.⁵³

Our focus thus far on measures of average revenue may miss other sources of price competition. One of these is in the form of handset subsidies provided by carriers to customers. Wireless providers buy an enormous number of wireless devices from handset manufacturers such as Nokia, Motorola, and RIM. The prices paid by the carriers for these devices are often far higher than the prices customers actually pay. In many cases a customer signing a service contract is able to receive a large discount on the cost of a

⁵⁰ See http://www.cwta.ca/CWTASite/english/whatsnew_download/may16_06.html (viewed May 22, 2007).

⁵¹ *CRTC Telecommunications Monitoring Report*, July 2006, p. 81.

⁵² Merrill Lynch (2007).

⁵³ See http://cwta.ca/CWTASite/english/whatsnew_download/mar05_07.html (viewed May 22, 2007).

handset (up to 100%), and even in the middle of a contract a customer may be able to acquire a new handset for a reduced price.⁵⁴ With the addition of new service offerings such as MP3 downloads and video conferencing, there are a greater number of discounts and promotional offers related to phones supporting these features. According to Wall Communications, handset subsidies are a major component of the cost of customer acquisition, and these costs totaled between \$375 and \$400 per subscriber in 2005.⁵⁵

Handset subsidy rates in Canada are high relative to those in other countries. The average cost of acquisition per customer was greater than USD\$350 for the three national wireless carriers in Canada in 2006, whereas an analysis of a subset of non-Canadian companies including KPN E-Plus, T-Mobile and O2 in Germany, KPN Mobile in the Netherlands, T-Mobile in the United States and T-Mobile and O2 in the UK yielded an average cost of less than USD\$200.⁵⁶ One would have to take into account these differences in handset subsidies in making international comparisons of the net costs of wireless service to subscribers, for example by subtracting the handset subsidy from the discounted sum of other service-related expenditures.

6.2. INDIRECT INDICATORS OF PRICE COMPETITION

6.2.1. Share Volatility

There are a number of additional indicators that are consistent with active price competition. One is the dramatic and volatile behaviour of market share measured on a new subscriber basis, as shown in Figure 3. If a single provider had significant market power we might expect that provider to capture a relatively constant fraction of consumers of all types, including new subscribers. Instead, we see customer additions spread across providers in an apparently nonsystematic fashion, with certain providers doing well in certain periods and poorly in others.

6.2.2. Targeted Brands

As mentioned above, recent years have seen the entry of MVNOs into what had been a space traditionally dominated by facilities-based providers. While these providers have not deployed their own network facilities, and as a result they can only discipline pricing to the extent possible given the variable cost that each incurs to secure network access, it is clear

⁵⁴ For example, as of the date of this report, Rogers offered the BlackBerry 7290 for \$49.99 with a 3 year contract as compared to \$499.99 with no contract. See www.rogers.ca (viewed May 21st 2007).

⁵⁵ Wall Communications (2006), p. 52, based on data from NBI/Michael Sone Associates.

⁵⁶ "Challenging the Myths about Canadian Wireless", CWTA Public Forum on Advanced Wireless Services Spectrum Auction, Genuity Capital Markets, April 23, 2007.

that the facilities-based providers have perceived a threat to the price-sensitive segment of their customer bases. These national providers have responded to entry by MVNOs such as Virgin by developing their own brands targeted to specific segments of the consumer population. The national carriers may perceive MVNOs to be a competitive threat to certain segments of their customer base as MVNOs are able to offer a large number of branded service lines that are tailored to specific customer groups which the national carriers may not have focused on in the past. For example:

- (a) In 2005, Bell re-launched its Solo Mobile brand. This initiative was geared towards the key youth market segment. Solo featured custom-built services and unique applications including nationwide pay-per-use push-to-talk (PTT) in either prepaid or post-paid forms. This made Bell the first Canadian wireless operator to actively market PTT to the youth segment.⁵⁷ More recently, Solo Mobile was repositioned in 2006 in the wireless market as a value brand that broadly appeals to mass-market consumers rather than being primarily geared towards the youth segment.⁵⁸
- (b) When it acquired Microcell in November 2004, Rogers also acquired the Fido brand. Rogers has maintained the Fido brand and retail distribution network separate from Rogers, believing this strategy would provide it with improved market position in the youth segment and many regions of Canada, particularly in Quebec.⁵⁹
- (c) In August 2006, Telus announced it had entered into an exclusive relationship with Amp'd Mobile for the sale and distribution of its branded services in Canada. Amp'd offers highly interactive and customized mobile entertainment, information and messaging services. The partnership enables Telus to more effectively reach the high-value young adult (18-35) market through Amp'd's differentiated, premium data and content-centric services.⁶⁰

6.2.3. Increased Use of Post-Paid Plans

As mentioned above, Canada has experienced an increase in the average number of minutes used by each subscriber. Canada currently ranks fourth behind the United States, India and Hong Kong with subscribers averaging 420 minutes per month. With the larger number of minutes used by Canadian subscribers, the proportion of post-paid plans to prepaid plans has been growing substantially, with a relatively greater number of net additions to post-paid plans. This is significant because a shift toward post-paid plans is indicative of a general

⁵⁷ Bell Canada Enterprises, *2005 Annual Report*.

⁵⁸ Bell Canada Enterprises, *2006 Annual Report*.

⁵⁹ Rogers Communications Inc., *2004 Annual Report*.

⁶⁰ TELUS, *2006 Annual Report*.

trend toward plans in which subscribers select a relatively large number of base minutes, often with unlimited usage during certain times, and for which the incremental price of usage below the cap is low (or zero). This trend is itself indicative of competition among providers serving to return benefits to consumers, as occurred in the U.S. after some carriers introduced the first “big-bucket” plans.⁶¹

Prepaid plans tend to be optimal for people who use a relatively low number of minutes per month. As subscribers use more minutes, it becomes preferable to use post-paid plans which already include a base number of minutes and which provide additional minutes at discounted rates. For instance, as described below, Rogers has the following prepaid and post-paid options:

Table 2: Wireless Service Plan Options from Rogers

Option	Plan	Minimum Cost	Cost/Min	Eve. & Wknd.	Anytime Minutes
Pre-paid Options					
Option 1	Anytime Plan (Minimum \$10)	10	0.33	0	30
Option 2	1¢ Eve. & Wknd. Plan (Minimum \$20)	20	0.39	unlimited	52
Post-paid Options					
Option 1	Mega Time: (9PM-7AM) 1000 Eve. & Wknd. & 50+50 Wkday Minutes	20	0.30	1000	100
Option 2	Mega Time: (9PM-7AM) Unltd. Eve. & Wknd. & 150+50 Wkday Minutes + Unlimited Network Calling	30	0.30	unlimited	200
Option 3	Business - 350 Wkday Minutes	40	0.25	unlimited	350
Option 4	Business - 500 Wkday Minutes	40	0.25	unlimited	500

Source: Rogers Communications Inc. (www.rogers.ca)

For a person using 50 minutes per month, it is most cost-effective to use a prepaid plan. However, as soon as the customer uses 100 or more minutes per month, one, if not all, of the four post-paid plans are better options. This is presented in summary form in Table 3.

⁶¹ See e.g., Jerry Hausman, “Mobile Telephone,” Chapter 13 in Martin E. Cave, Sumit K. Majumdar, and Ingo Vogelsang, eds., *Handbook of Telecommunications Economics*, Vol. 1, North-Holland, 2002, p. 579.

Table 3: Summary of Monthly Costs by Plan

Daytime Minutes Used	500	420	100	50
Pre-paid cost				
Option 1	\$165	\$139	\$33	\$17
Option 2	\$195	\$164	\$39	\$20
Post-paid cost				
Option 1	\$140	\$116	\$20	\$20
Option 2	\$120	\$96	\$30	\$30
Option 3	\$78	\$58	\$40	\$40
Option 4	\$40	\$40	\$40	\$40

From this, we conclude that Canada, like the U.S., is moving towards “big-bucket” plans, where users are provided with a large number of minutes. Given that the incremental cost of using these minutes is low, we expect to see greater usage, and this is what we seem to observe from the data.

6.2.4. Survey Evidence

We expect to find customer dissatisfaction if customers are faced with the exercise of significant market power. To this end, survey evidence on customer satisfaction levels provides additional evidence of the lack of significant market power. A recent national survey of 1500 wireless users conducted by the Strategic Counsel has shown that consumers are generally satisfied with Canadian wireless offerings. Over 60% expressed satisfaction with the features and technologies that are available; 68% of participants expressed satisfaction with the available choices in service providers; and 73% were satisfied with the choices available in terms of service plans and phone models.⁶² In addition, almost 60% of wireless users reported that they felt they were receiving good value for their money from their wireless providers.⁶³

Another recent survey conducted by TNS Canadian Facts found that the vast majority of wireless subscribers (87%) are either “fairly satisfied” or “very satisfied” with their provider, and of those subscribers under contract only about 19% are planning to switch providers once their contract expires.⁶⁴ As noted above, if a provider was exercising significant market power, we would expect consumers to express dissatisfaction with the quality or pricing of their services, which is not evident from these recent surveys.

⁶² The Strategic Counsel, *Wireless Users Survey*, February 2007, pp. 2-4.

⁶³ Strategic Counsel (2007), p. 3.

⁶⁴ TNS Canadian Facts, “Number Portability Public Release 2007,” pp. 6-7.

6.2.5. Regulatory Agency Comments on the State of Competition

The regulatory agencies, including the CRTC and the Competition Bureau, have each remarked on the competitive behaviour shown by wireless providers in Canada. For example, the CRTC in a recent decision characterized the Canadian wireless market as “robustly competitive”.⁶⁵ In another decision the CRTC noted:

The Commission considers that the wireless market is not the same as the wireline market, in that there is not a single dominant service provider in each operating territory. The Commission notes that in Decision 94-15, the Commission forebore from regulating the wireless market as it was found to be competitive, and has remained so. The Commission further notes that the wireless carriers have similar market share, are well established with large customer bases and are not in need of protection in order to establish a sustainable customer base.⁶⁶

Similarly, in its assessment of the Rogers-Microcell merger the Competition Bureau stated:

[P]ost-merger, there will be three mobile wireless operators who are vigorous and effective competitors. Rogers does not possess sufficient market power to impose and sustain a significant and non-transitory price increase above levels that would otherwise exist in absence of the merger because rivals would likely respond in an effort to enhance their customer bases. The Bureau concluded that innovative product and service offerings will continue to be available to consumers at competitive prices. As already noted, both Bell and Telus have recently engaged in aggressive marketing promotions targeted at current Rogers and Microcell subscribers.⁶⁷

Based on these statements, it would seem that the key regulatory bodies consider the wireless market to be relatively competitive, and certainly one in which there is not a provider with significant market power.

⁶⁵ Telecom Decision CRTC 2006-33, ¶ 30.

⁶⁶ Telecom Decision CRTC 2006-28, ¶ 100.

⁶⁷ Competition Bureau (2005).

7. EVIDENCE OF INVESTMENT-BASED COMPETITION

We turn in this section to evidence of firms engaging in rivalry by investing in and deploying new wireless technologies. This investment-based competition has been ongoing since the early days of the wireless market in Canada, and has provided consumers with benefits in the form of valued services and reduced quality-adjusted prices.

7.1. INVESTMENTS IN NETWORK INFRASTRUCTURE

The wireless market is a capital-intensive one, as we have shown above, and in order to support the rapid growth in subscriptions considerable capital investments need to be made. In the first five years after wireless was introduced in Canada, total capital expenditures for the industry ranged between \$160 million to \$627 million annually.⁶⁸ In the late 1990s, total infrastructure-related investments to support the transition to digital service accelerated to greater than \$1 billion per year, reaching \$2 billion by 2000.⁶⁹ The continual upgrading of infrastructure in line with technologies introduced in other countries such as the U.S. has been essential to Canadian carriers in attracting and keeping subscribers. Examples of recent investments in the expansion of 3G network capabilities include the following:

- (a) Rogers has launched UMTS/HSDPA (Universal Mobile Telephone System/High Speed Downlink Packet Access) next-generation wireless data technology in the Golden Horseshoe markets in Ontario and is in the process of deploying this technology in other centres.⁷⁰ Rogers HSPDA network is estimated to cover 60% of the Canadian population by year end 2007.
- (b) Telus expanded the availability of its wireless high-speed service to two-thirds of the Canadian population in 2006. Based on the CDMA2000 1x Evolution, Data Optimized (EVDO) standard, the newest 3G wireless data technology available, its wireless high-speed services have typical download speeds of 400-700 Kbps with peaks of up to 2.4 Mbps.⁷¹ Telus' EVDO network covered 65% of the Canadian population as of Q2, 2007.
- (c) Bell launched Canada's first CDMA2000 1xEVDO wireless data network in Toronto and Montreal in 2005. There are plans to continue EVDO deployment in other major

⁶⁸ Wall Communications (2006), p. 9.

⁶⁹ Wall Communications (2006), p. 9.

⁷⁰ Rogers Communications Inc., *2006 Annual Report*.

⁷¹ Telus, *2006 Annual Report*.

Canadian urban centres.⁷² Bell's EVDO network is estimated to cover 67% of the Canadian population by the end of Q2, 2007.

It has been observed that Canadian carriers did not begin to deploy 3G network facilities in a concentrated way until after U.S. carriers had done so.⁷³ To a certain extent this likely reflects a prudent desire to wait until the case for large-scale deployment could be demonstrated more concretely by increased demand for data applications. It does not suggest that investment-based competition is weak due to significant market power on the part of any one Canadian carrier. As shown above, all of the providers are now making investments in 3G network upgrades at around the same time. One obvious reason is that the technology is now mature and robust enough that it can be implemented with little fear of failure. But also, and more importantly, each carrier perceives that if it fails to deploy the necessary technology it is at risk of losing customers to carriers that offer the latest technology or that are seen as more concerned with the newest functionality. Eventually, carriers that forgo investing may be labeled non-competitive, and all customers but those with the most rudimentary demands will leave for other providers. This is the essence of dynamic competition.

7.2. DELIVERY OF NEW SERVICES TO CONSUMERS

The investments in infrastructure referred to above are of value to the extent that they are able to deliver services that consumers demand. Examples of such services include the following:

- (a) Bell experienced a \$3 year-over-year increase in postpaid ARPU. This has been attributed to higher penetration of BlackBerry customers and other heavy users subscribing to higher-priced rate plans.⁷⁴ Bell also launched Groove Client (a music download service), a music video ringtones service (which allows customers to listen to and/or watch digital music on their wireless phones) as well as a variety of video clip services (including NHL and MTV highlights, news and reports from CTV News and ROBTv).⁷⁵
- (b) Data revenues for Rogers represented 10.6% of total revenue in 2006, compared to 8.2% in 2005, representing a 54.5% year-over-year growth. This has been attributed to the rapid growth of BlackBerry use, wireless messaging, mobile Internet access,

⁷² Bell Canada Enterprises, *2006 Annual Report*.

⁷³ Wall Communications (2006), p. 37.

⁷⁴ Bell Canada Enterprises, *2006 Annual Report*.

⁷⁵ Bell Canada Enterprises, *2006 Annual Report*.

downloadable ring tones, music, games, and other wireless data services and applications.⁷⁶

- (c) Telus rebranded its portfolio of mobile entertainment, information and messaging services for consumers as SPARK, which includes the newly-launched Mobile Music, Mobile Radio, Mobile TV, multimedia messaging, etc.⁷⁷ These services are expected to run over Telus's enhanced wireless network.

The fact that all of the national providers are focusing on making available next-generation data services for consumers suggests strongly that all have a similar competitive interest and no carrier has been able to dominate such that it is the sole provider offering certain services.

⁷⁶ Rogers Communications Inc., *2006 Annual Report*.

⁷⁷ Telus, *2006 Annual Report*.

8. COORDINATED EFFECTS

The previous discussion has focused entirely on providers acting unilaterally, and based on that discussion we provided our opinion that no single provider has significant market power. In this section we turn to the related question of whether these providers would have the incentive and ability to exercise market power by acting cooperatively. We find that any hypothetical coordinated exercise of significant market power would not be feasible in this market, for a number of reasons.

We note at the outset that a cooperative exercise of market power would of course be illegal if the arrangement is an explicit one. According to one authority, “[t]he prohibition against price fixing and other forms of anticompetitive horizontal arrangements lies at the core of competition policy in virtually all sophisticated competition law jurisdictions.”⁷⁸ Yet not all cartel arrangements are explicit; in some cases it is possible for firms to act in cooperative fashion without communicating with each other. It is generally agreed that although such behaviour is contrary to social welfare, it falls outside the purview of competition law governing horizontal arrangements.⁷⁹ The ensuing discussion is general enough to cover both explicit and tacit cases of coordination.

Any individual firm faces a trade-off between cooperating in order to share the profits of a larger pie owing to the exercise of market power, and earning greater profits in the short run if its rivals attempt to raise prices cooperatively while the individual firm “cheats”, thereby gaining customers from its rivals at the higher “coordinated” price. In the face of this trade-off, a (tacit or explicit) cooperative arrangement will only exist if enough firms participate, if each participating firm finds it privately profitable to cooperate, if monitoring compliance with the arrangement is not overly difficult and if deviations from the arrangement can be credibly punished. There are market conditions which are more favourable to firms reaching agreement (explicitly or tacitly) on the terms of such coordination. These include the existence of a small number of firms; similarity of cost structures; similarity of levels of capacity; and similarity of products. Certain market conditions also may assist firms in exercising market power cooperatively by making it easier to monitor and enforce a collusive arrangement, assuming that they have been able to explicitly or tacitly arrive at one. These include the following: (i) the pricing, demand and cost conditions within the industry are readily observable for participants (“market transparency” exists); (ii) the products over which coordination takes place are relatively similar and competition based on non-price characteristics (such as product quality) is limited; (iii) transactions are not highly idiosyncratic; (iv) demand is stable; and (v) the coordinating firms are relatively symmetric in their size and cost structure.

⁷⁸ Trebilcock et al. (2002), p. 86.

⁷⁹ Trebilcock et al. (2002), p. 89. Note that consideration of cooperative effects is an important part of merger analyses done by competition authorities.

In the Canadian wireless market, it is unlikely that significant market power could be exercised through coordinated conduct by the wireless providers. It is true that there are few providers at the national (or even the regional) level, and that in a certain sense these firms are “similar” in terms of their capacities. Yet the difficulties that would be involved in enforcing any collusive arrangement to sufficiently limit the possibility of cheating are very large in this industry. First, the continuing changes in technology that have made new services available to consumers, and the rapid growth in the number of consumers subscribing for wireless services, would make the gains from “cheating” more attractive relative to cooperation. As we have seen above, although subscriber growth has leveled off to a certain extent in recent years it is still proceeding at a rate of over 10% per year. Providers have an incentive to compete intensely in order to capture these new subscribers. Canada’s wireless penetration is not at the upper end when international comparisons are made, so there remains scope for a large number of new subscribers to sign up for service.⁸⁰ Further, now that wireless number portability has been implemented, consumers can switch providers to take advantage of new offers and services, subject to any contractual obligations they may have entered into.

Second, it is particularly difficult to sustain a collusive arrangement in the face of rapid actual and potential growth in demand when this growth is coupled with technological changes that are implemented by different firms at different points in time. On this issue, we concur with comments made by the Competition Bureau: “Markets with rapid and frequent product or service innovations are less conducive to coordinated behaviour. It is much harder to act in a coordinated fashion when competitors worry that their rivals might be ready to launch the next new ‘killer application’.”⁸¹ The Canadian wireless market is undoubtedly one in which “rapid and frequent product or service innovations” exist.

Third, pricing conditions are not transparent, and competition is substantially based on non-price characteristics such as quality, making monitoring and disciplining of any attempted collusive arrangement unwieldy if not impossible. As described above, pricing differs across consumers depending on the items from the menu of possible options that are chosen by individual subscribers. When consumers purchase service plans with varying quantities of minutes, some of which are associated with per-minute charges and others which are free, it would be very complex for providers to conduct the monitoring of prices that would be necessary to ensure that any collusive arrangement held up. Associated with this, products are highly differentiated. Some consumers will be interested in purchasing service bundles with various data services included (such as music downloads and video calling) while others may be interested just in the ability to make voice calls. The former type of customer is also

⁸⁰ See e.g., Wall Communications Inc., “An Examination of Issues Raised in the Telecommunications Policy Review Panel’s March 2006 Report Regarding the Canadian Mobile Wireless Services Industry,” prepared for the Canadian Wireless Telecommunications Association, September 29, 2006, p. 36.

⁸¹ Competition Bureau (2005).

likely to have a preference for the newest handsets, which would be an additional source of variation in pricing and product characteristics.

In sum, we expect that the conditions for successful cartelization do not hold in this market. We believe the Bureau's analysis of coordinated behaviour in the context of the Rogers-Microcell transaction in 2004 remains true today: "In summary, significant factors existed pre-merger that constrained coordination (in particular, growing demand, innovation, competitive history). None of these constraining factors are in any way affected or diminished by the merger."⁸²

⁸² Competition Bureau (2005).

9. CONCLUSION

We have considered whether any provider of wireless service in Canada has significant market power, and in addition whether providers jointly have the incentive and the ability to exercise significant market power on a coordinated basis. Given our review of industry structure and the competitive dynamics of the wireless industry, there is no evidence of market failure resulting in significant market power being exercised.

The major wireless service providers compete in the Canadian market for mass market wireless service, which includes voice and data services. The national providers that compete in this market have a similar level of market presence, and there is evidence of a great deal of rivalry for new subscribers. While entry as a facilities-based provider of wireless service is costly, economics tells us that existing providers that have already incurred the substantial costs of entry will compete intensely for new customers, as well as to win the customers of rivals. We see evidence of this when we look at pricing trends within the wireless market. Providers also compete by offering new services to consumers over costly network facilities that are continually being upgraded. Finally, we find that wireless service providers would not have the ability to exercise significant market power on a coordinated basis given the numerous impediments that would tend to defeat any attempt at cooperative behaviour.

In summary, using the well-established analytical framework embodied in Canadian competition law, we find that no single wireless firm in Canada has significant market power. As well, we find that cooperative arrangements among the existing wireless providers to exercise significant market power jointly are highly unlikely. Thus, given the issues being examined in Industry Canada's consultation process, we find no clear evidence for concerns regarding the state of competition in the Canadian wireless market.

APPENDIX

CRA INTERNATIONAL

Founded in 1965, CRA International is a leading provider of economic and financial expertise and management consulting services. Working with businesses, law firms, accounting firms, and governments, CRA is the preferred consulting firm for complex assignments with pivotal and high-stakes outcomes. The firm is distinguished by a unique combination of credentials: deep vertical experience in a variety of industries; broad horizontal expertise in a range of functional disciplines; and rigorous economic, financial, and market analysis. CRA offers a proven track record of thousands of successful engagements in regulatory and litigation support, business strategy and planning, market and demand forecasting, policy analysis, and engineering and technology management. Headquartered in Boston, the firm has more than a dozen offices within the United States and nine offices in Canada, Europe, the Middle East, and the Asia Pacific region.

CRA's Competition practice has been at the company's core since its inception. CRA International offers one of the world's largest competition economics practices. CRA consultants have been involved in landmark cases before major regulatory agencies around the globe. Many CRA staff have served as high-level officials at government competition agencies around the world. CRA brings deep knowledge of local laws and regulations together with experience testifying before a wide range of courts and regulatory agencies, including Canadian courts, Canada's Competition Bureau, Competition Tribunal, Canadian Radio-television and Telecommunications Commission and Copyright Board.

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Margaret Sanderson is a Vice President and head of CRA International's Global Competition practice. She has experience analyzing the competitive effects of a wide range of business conduct (mergers, horizontal restraints, predatory pricing, and abuse of dominance and vertical restraints) and government regulatory policy. In the communications sector, Ms. Sanderson has authored (and co-authored) expert reports on competitive issues in the areas of broadcasting, Internet, telecom, satellite, and wireless, many of which have been filed with the Canadian Radio-television and Telecommunications Commission and the Competition Bureau. Ms. Sanderson is a recognized Canadian expert in competition matters. Her work in this area has covered numerous sectors including media, transportation, consumer products, finance, industrial products, natural resources and health care. Ms. Sanderson has testified before Canadian courts and regulatory authorities and has appeared before the US Federal Trade Commission. Prior to joining CRA, Ms. Sanderson directed the economic expertise applied within the Competition Bureau to enforcement cases, enforcement policy and regulatory interventions. She has published various articles on competition policy, and has presented and taught on selected topics of antitrust economics. Ms. Sanderson received her M.A. in Economics from the University of Toronto.

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Andrew Tepperman is an Associate Principal at CRA International where he specializes in competition, regulatory, intellectual property, and damages issues. His expertise in the telecommunications industry includes submitting a report (co-authored with Michael Trebilcock) on behalf of SaskTel which commented on the Canadian Radio-television and Telecommunication Commission's 2005 decision regarding regulation of voice over Internet Protocol services. Dr. Tepperman has also contributed to numerous other regulatory filings in proceedings concerning high-speed digital services, local forbearance, voice over Internet Protocol services, and wholesale access, as well as to submissions by CRA International experts for consideration by the Telecommunications Policy Review Panel. In the competition area, he has advised clients in numerous mergers as well as other competition matters. He holds a PhD in economics from the University of Toronto, where his doctoral dissertation focused on issues relating to intellectual property and research and development.