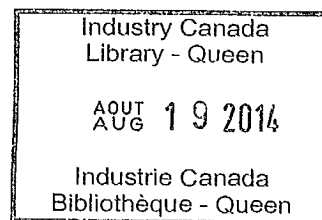


A COMPETITIVE ASSESSMENT OF THE
CANADIAN MOBILE WIRELESS INDUSTRY

Prepared for
SPECTRUM AND RADIO POLICY
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Wall Communications Inc.



Note that the views expressed in this report of those of Wall Comminations Inc.; they are not intended to and do not necessarily reflect the views of Industry Canada.

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EXECUTIVE SUMMARY

As part of the background work related to the development of the policy framework for licensing additional spectrum for third generation (3G) mobile phones, Industry Canada commissioned this Study which assesses the state of competition in the Canadian mobile wireless industry. The Study is intended to provide the Ministry with a better understanding of the market forces impacting the mobile wireless industry and to assist in evaluating the potential impact of different policy provisions on future spectrum licensing.

Three methodological approaches are examined which provide the various competition measures employed in this Study: Porter's Competitive Analysis, the Competition Law Approach and the CRTC Approach. These approaches are not mutually exclusive and share a common grounding in economic principles. However, each approach focuses on slightly different factors and attributes of competition and forms the pool from which we have chosen the measures for this Study.

The specific competition measurements employed in this Study are grouped into 5 categories: Product-related measures, Price-related measures, Entry/exit conditions, Market share/rivalry, and Other measures. For purposes of comparison, the four largest wireless service providers will be examined. *The Study finds that the Canadian mobile wireless industry displays a relatively high degree of competitiveness, although certain conditions need to be monitored to ensure that the highly competitive nature of the industry continues.*

Product-related Measures

The scope and variety of services, packages, features and coverage indicate a strongly competitive state with respect to product (or non-price) related competition.

Most Canadian consumers enjoy a wide variety of choices in how they can receive mobile telephone service. From pre-paid options to numerous number-of-minute packages, from handset and service features, from combination packages of anytime minutes, long distance and calling features, all the way to highly customized packages, the Canadian market offers numerous product/service choices. While there are still regions of the country that do not have terrestrial wireless service available, the vast majority of the Canadian population can access a mobile wireless service, usually with a choice of at least two suppliers.

Price-related Measures

The wide variety of choices in non-price related mobile service characteristics is echoed in price options. Similar to the (non-price related) options available in service packages and features, Canadian consumers have numerous choices in price-points for mobile wireless service.

Prices have been falling over time (particularly after the entry of the PCS licensees) and compare favourably with prices in the United States. The lack of supra-normal returns (or any profitability) in the industry provides further substantive evidence of the vigorous price competition in the market.

Entry/Exit Conditions

The mobile wireless industry is a difficult industry to enter. While the technology to provide service does not present a particularly imposing barrier (since numerous vendors are available to supply network and other equipment and until fairly recently, they acted as key financiers as well), and although the costs of networks and other costs will limit the number of firms able to finance entry, the key barrier concerns the scarcity of spectrum, and the licensing process to allocate that spectrum. In short, no one enters the market until such time as the Department decides to release new spectrum, and until they have successfully applied to and received permission from the Department¹.

A second key entry/exit barrier concerns the foreign ownership limits which currently apply to Canadian telecom carriers.

Market Share/Rivalry Measures

The industry has changed from two competing entities (up until the mid-1990's) to the current number of four. The end result has been a related decrease in any firm's given market share. The industry trend in market share and concentration is, therefore, moving in a preferable direction.

Two significant changes have seen the acquisition of one of the newest entrants (Clearnet) by an incumbent (Telus), but also the departure of one firm (Telus) from the largest competitor (Stentor).

¹ Of course, the Department has been instrumental in bringing the mobile industry into existence, and in helping achieve a competitive environment. The finding that spectrum scarcity and the licensing process create a barrier to entry is not intended as a criticism of the Department, but rather as a statement of one entry consideration which has a bearing on the competitive status of the industry.

There are now three roughly equal-sized firms and one smaller firm. While the relative concentration in the mobile wireless industry might be considered cause for concern in some circumstances, the licensing requirement really places the power of determining how many competitors exist in the hands of the government. There are no indications of market power abuse resulting from the high levels of industry concentration, although continued monitoring should be maintained.

The competitors continue to match or outdo each other in offerings and promotions, while at the same time trying to introduce distinctiveness into their own offerings, demonstrating a relatively high degree of rivalry.

Other Measures and Considerations

There are indications that economies of scale may exist in the market, but not that the appropriate industry structure is less than the current number of firms. That is, while economies may exist, they do not appear to be harmful to competition.

The existence of vertical integration, particularly between wireline and wireless partners, has the potential to undermine (to some extent) the competitiveness of the industry. It may also permit some firms to enjoy legitimate cost advantages. Ongoing monitoring should be maintained.

Mandated resale of analogue service on existing networks for the PCS entrants provided immediate coverage benefits to them. One firm (Microcell) has voluntarily opened up its digital PCS network to resale, although the market take-up has been limited. More recently, the announcement of Bell and Telus to allow resale on each others digital networks can both bolster competition (e.g. in areas where a carrier hasn't built out) but could also theoretically lead to a greater level

of market cooperation than is beneficial to other competitors or to consumers. Ongoing monitoring is advisable.

The ability to access and the cost of capital varies from competitor to competitor. This situation can affect the ability of some carriers to compete as effectively as others. In addition, it may be important to building the next generation of service networks. Ongoing monitoring is recommended.

Other Policy Considerations

Given that the state of competition in the Canadian mobile wireless industry is currently satisfactory, the scope for additional policy measures must focus more on future concerns. As noted above, there are a number of areas that could benefit from review or ongoing monitoring by the Department. These include the dual regulation of the industry by the CRTC and Industry Canada, foreign ownership rules, the behaviour of integrated wireline/wireless operators and the conditions of network sharing arrangements.

In addition, there are a number of other measures that have been suggested by analysts and industry observers or which have been adopted in other countries. For example, the approach of both U.S. and U.K. regulators has evolved to an ongoing monitoring of competition in their respective industries. In addition, both regulators will identify fairly specific areas of concern (e.g. international roaming rates) and conduct detailed examinations on a case-by-case basis, if required.

This approach combines regular periodic reviews of the state of competition with a pragmatic ability to quickly investigate an issue or problem if necessary. We believe this approach would also work well in Canada.

While there has been some discussion in the U.S. that spectrum caps may undermine healthy competition, there is no evidence at this point of a similar

concern in Canada. Spectrum caps, in our view, prevent potentially harmful concentration in the industry. However, the absolute cap on spectrum amounts may need to be increased when the Department releases more spectrum for 3G or to ensure provision of services when countries internationally agree upon use of particular spectrum frequencies.

1. BACKGROUND AND OBJECTIVES

1.1 Background: Regulatory Context and Historical Description

The management and licensing of radio spectrum in Canada is the responsibility of Industry Canada ("the Department"). The Radiocommunications Act provides the statutory framework for these responsibilities, although Canadian carriers are also subject to the requirements of the Telecommunications Act.

In discharging its responsibilities in 1983, the Department issued licenses (under a comparative selection process) to provide cellular telephone services to Rogers Cantel Inc. and the incumbent local telephone companies. Rogers received 25 MHz of spectrum on a national basis, while each incumbent telco received 25 MHz for their regional operating territories. A variety of conditions were attached to the licenses, including spectrum amount, term of license, coverage requirements, a six-month "head-start period" for the new entrant and interconnection agreements from the incumbents.

For its part, the CRTC did not contemplate regulating cellular services until the early 1990's. The Commission ultimately chose to forebear from exercising certain of its powers with respect to cellular services (while exempting all other mobile wireless telecommunications services).²

In the meantime, the Department also issued licenses for four potential Public Cordless Telecommunications Service (PCTS) providers (944 MHz) in 1992. The Commission noted in its 1994 Decision "PCTS and other new services such as enhanced specialized mobile radio systems, will provide substitutes for cellular service in some circumstances".³

² Telecom Decision CRTC 94-15, Regulation of Wireless Services.

³ Ibid. Pg. 8

In addition, Personal Communications Service (PCS) licenses (2GHz) were awarded in 1995. Two new entrants (Clearnet PCS Inc. and Microcell Networks Inc.) were each granted 30 MHz of spectrum for use nationally. Rogers Cantel was granted 10 MHz for national use, while the incumbent local telephone cellular operators were each granted 10 MHz for use on a regional basis.

At the time the licenses were issued, the Department placed a cap on the amount of spectrum that could be held by any individual entity (or its affiliates). The cap of 40 MHz in total applied across cellular telephony, PCS, and similar services such as Enhanced Specialized Mobile Radio (ESMR).

In addition, a 30 MHz spectrum block and a 10 MHz spectrum block in the 2 GHz range were held in reserve as a means of providing the Department some ability to respond to further changes in the market.

The Department also imposed several conditions on each PCS licensee, including coverage requirements, R&D spending requirements and, for licensees who also held cellular licenses, a requirement for mandatory analogue cellular resale to other PCS licensees as well as roaming requirements.

In 1996, the CRTC revisited its Decision on the regulation of wireless services, concluding that "based on service attributes rather than underlying technology mobile wireless telecommunications services properly fall within two categories of service for the purpose of determining the appropriate regulatory treatment:

- i. Mobile voice wireless telecommunications services that are connected to the public switched telephone network, such as cellular services, PCS, ESMR and satellite-based mobile services (public switched mobile voice services); and

- ii. All other mobile wireless telecommunications services (other wireless services)."⁴

The Commission decided to refrain from exercising certain of its powers for public switched mobile voice services providers other than by in-house dominant service providers. For in-house dominant service providers (i.e. the incumbent telcos), regulation was retained. In addition, the Commission required the Mobility Canada companies and Cantel to file on the public record any agreements with their affiliated PCS carriers.

For other mobile wireless services, the Commission also decided to refrain from exercising certain powers, except for in-house dominant carriers.

In 1997, the Commission issued its decision on Local Competition, setting out the conditions by which a carrier could become a Competitive Local Exchange Carrier (CLEC).⁵ In order to gain certain privileges of being a CLEC (such as forbearance from Sections 25, 29 and 31 and subsections 27(i), (5) and (6) of the Telecommunications Act), CLECs were required to, among other things, provide equal access to IX service providers and to provide reciprocal technical connections to other LECs, including the filing of relevant tariffs and agreements as appropriate.

Also in 1997, the Commission readdressed the issue of mandatory resale and sharing of cellular services.⁶ In particular, earlier concerns about the adverse effects of mandatory resale on the "nascent" cellular industry were determined to be no longer valid. However, while the Commission decided that the cellular industry was no longer "nascent", it also determined that "with existing and potentially new facilities-based entry in PCS, most if not all benefits that would

⁴ Telecom Decision 96-14, Regulatory Mobile Wireless Telecommunications Services, Pg. 4.

⁵ Telecom Decision 97-8, Local Competition.

⁶ Telecom Order CRTC 97-1797, December 3, 1997.

arise from mandatory resale have already been achieved".⁷ They further noted that Industry Canada, in its licensing decisions, had decided to only impose resell between PCS licensees and between cellular licensees and PCS licensees. Accordingly, the Commission did not mandate unrestricted resale and sharing of cellular and PCS services. Nor did the Commission require equal access for Wireless Service Providers.

In 1998 and 1999 upon requests by the Stentor companies respectively, the Commission granted forbearance from certain powers (which had been established in 96-14), including section 24 (in part 1, 25, 29 and 31 as well as subsections 27(1), 27(3) (in part), 27(5) and 27(6) in the provision of public switched mobile voice services.⁸

Most recently, both Clearnet and Microcell have applied for, and been granted, approval on an interim basis for General Tariffs as a part of the CLEC approval process.⁹

Industry Canada has also conducted a number of processes to examine specific spectrum issues such as spectrum caps, auctioning of spectrum, advisability of resale and roaming requirements for auction winners and reach of service definitions. While not discussed in detail in this Study, the policy and licensing conditions examined and established by Industry Canada are critical to the competitive character of the mobile wireless market:

1.2 Statement of Objectives and Requirements

As part of the background work related to the development of the policy framework for licensing additional spectrum for third generation (3G) mobile phones, Industry Canada commissioned this Study which assesses the state of

⁷ Ibid. C(36).

⁸ Telecom Decision CRTC 98-18 and Telecom Order CRTC 99-991.

competition in the Canadian mobile wireless industry. The Study is intended to provide the Ministry with a better understanding of the market forces impacting the mobile wireless industry and to assist in evaluating the potential impact of different policy provisions on future spectrum licensing.

The Study is required to:

- 1) Adhere to sound and accepted economic principles;
- 2) Utilize multiple measures which assess various aspects of the competitiveness of the industry;
- 3) Provide due consideration of the specific regulatory and environmental conditions which characterize the Canadian mobile wireless industry;
- 4) Provide due consideration of the approaches adopted by the U.K. and the U.S.; and
- 5) Provide due consideration of any other relevant practical and understandable measures to foster competition.

⁹ Order CRTC 2000-830 and Order CRTC 2000-831.

2. METHODOLOGY

The following section describes the methodological issues related to measuring competition in the mobile wireless industry. In addition to the methods described for constructing competition measures, the methodology also involves the gathering of relevant data. This has been accomplished by referencing key industry documents (such as policy papers, regulatory decisions and corporate annual reports) as well as by accessing appropriate websites (e.g. the website of each mobile wireless carrier). Finally, interviews were conducted with key executives of each of the mobile wireless carriers to ensure comprehensiveness and accuracy of the facts and findings of the Study, although company representatives are not responsible for and may not necessarily agree with the statements, findings and conclusions of this Study.

2.1. Economic Concepts and Principles

Economics, as a social science, does not provide definitive measures of many, if not most, of the concepts it embraces. "Competition" can be (and has been) defined according to a wide variety of criteria, but there is no single or simple way of assessing the state of competition in a market.

Because the concept of competition is both multi-dimensional and subject to the lack of precision which characterizes all non-physical sciences, many approaches have been proposed to assess the state of competition for a given industry or market. At the heart of each approach, however, lies a foundation of economic principles. These principles reflect a tenet that consumers are ultimately made better off if the markets that supply their goods and services are effectively competitive.

Competition tends to make markets more efficient in a variety of ways. Generally speaking, competition leads to production of the greatest amount and/or quality of a product (or service) from whatever level of resources are used to produce

it.¹⁰ Competition also leads to better choices in the relative levels of input resources used to produce a good or service, and in the relative amounts of different outputs that are produced across markets.¹¹ Finally, competition is generally expected to result in a greater degree of product improvement and innovation overtime than would occur in the absence of competition.¹²

While the technical definitions of these concepts are of secondary importance for purposes of this Study, the concepts themselves are essential since they underpin measures of competitiveness. The achievement of economic efficiency largely depends on competitive forces driving prices to cost levels, which provides the proper signals to consumers and producers.

There are three methodological approaches that will be examined in this Study: Porter's Competitive Analysis, the Competition Law Approach and the CRTC Approach. As noted above, these approaches are not mutually exclusive and share a common grounding in economic principles. However, each approach focuses on slightly different factors and attributes of competition.

2.2 General Methodological Approaches

2.2.1 Porter's Competitive Analysis

Porter's approach is premised on the notion that the long-term viability of an industry is determined by five basic forces of competition: the degree of rivalry amongst industry competitors, barriers to entry, the availability of substitute products or services, the power of parties who supply inputs (such as equipment

¹⁰ This type of economic efficiency has been termed productive efficiency or X-efficiency and refers to getting the most output from a given level of inputs.

¹¹ These types of economic efficiency are respectively referred to as allocative input efficiency and allocative output efficiency.

¹² This type of economic efficiency is often called dynamic efficiency as it relates to how quickly markets transform to use new technologies.

or services) to an industry and the degree of bargaining power which consumers hold.¹³

Rivalry amongst existing competitors stands at the center of these five forces. How intense is competition? Does it resemble a polite bridge game? Or is it more akin to a Stanley Cup playoff game? One of the key factors relates to price competition. Do rivals engage in fierce price-cutting? Or is competition generally waged on non-price factors?

The threat of new entry can bring considerable latent but effective competitive pressure to a market, unless *barriers to entry* exist. Entry conditions will determine how difficult, or costly, it is for new firms to enter a market.

The *availability of substitutes* is generally a matter of degree since most products or services are substitutable in at least some attributes. For example, two types of bottled spring water can be considered highly substitutable, a bottled water and a soft drink, partially substitutable and a bottled water and Napa Valley wine not readily substitutable. Note that all these products are liquid refreshments yet have different degrees of substitutability.

The *bargaining power of suppliers* to an industry can impact the competitiveness of an industry. If Industry X relies heavily on a single or a few key suppliers, then firms in Industry X may be limited in their pricing flexibility, or may find themselves disadvantaged if a competitor is able to gain control or influence over key supply inputs. Vertical integration can help firms diminish some supply concerns, but numerous supply alternatives provide the best means of diminishing this concern.

¹³ See Michael Porter, Competitive Strategy: Techniques for Analyzing Industries and Competitors. Free Press. New York, New York. 1980.

Finally, the *bargaining power of buyers* can be an important determining force of an industry's competitive situation. For example, smaller farmers that sell to the only agricultural produce distributor or retailer in a given region tend to have little control over the prices paid for their products. However, an industry that primarily supplies a large number of end-customers will generally not be subject to significant buyer bargaining power.

The balance of the five above-noted forces largely determines the attractiveness of any business, its competitive positioning in the market place, its profit potential and its long-term survivability. It should be noted that these forces are not fixed for all time: they are dynamic and will change, not only due to the influence of external factors, but also as a result of pressures brought to bear from the individual strategic initiatives of industry participants.

2.2.2 Competition Law Approach

Parliament has provided a statutory basis for the conduct of competition in Canada. *The Competition Act* is intended to "maintain and encourage competition in Canada in order to promote the efficiency and adaptability of the Canadian economy, in order to expand opportunities for Canadian participation in world markets while at the same time recognizing the role of foreign competition in Canada, in order to ensure that small and medium-sized enterprises have an equitable opportunity to participate in the Canadian economy and in order to provide consumers with competitor prices and product choices".¹⁴

The stated intent of the *Act* encompasses a variety of objectives, all of which are not necessarily consistent. For example, the goal of expanding Canadian participation in world markets could conceivably arise as a result of greater domestic industry concentration, and therefore at the expense of less domestic competition.

¹⁴ *The Competition Act*, R.S.C. 1988, 1.1.

This so-called "efficiency defense" of a proposed merger states that a merger may be warranted if "the merger or proposed merger ... has brought about or is likely to bring about gains in efficiency that will be greater than, and will offset, the effects of any prevention or lessening of competition".¹⁵ It should be noted, however, that some critics (including Porter) oppose this view. Porter's research suggests that domestic rivalry is a key element of achieving international competitiveness, even in the relatively small Canadian economy.

In order to assess the degree of competition in a market, it is necessary to identify specific measures that can indicate the state of competition. The Bureau has adopted the following evaluative criteria:¹⁶

1. Market shares and industry concentration;
2. Foreign competition;
3. Substitutes;
4. Barriers to entry;
5. Change and innovation; and
6. Other relevant factors.

Each of these criteria is discussed briefly.¹⁷

Market Shares and Industry Concentration

Market share measures can be based upon dollar sales (i.e. revenues), unit sales (i.e. volume of output units – such as minutes of use) or productive capacity. Concentration in an industry is typically measured by choosing the

¹⁵ *The Competition Act*, 1988, C. 96(1)

¹⁶ While the Competition Bureau has adopted these evaluative criteria specifically in relation to examining whether a merger will or is likely to result in a substantial lessening of competition in a market, most of the criteria are also relevant for examining the state of competition in a given market.

¹⁷ A more complete discussion is contained in Campbell, *op. cit.*, pages 104 – 148.

combined market share of a pre-determined number of firms. Two preferred measures are the four-firm concentration ratio (or the market share of the four largest firms) and the Herfindahl - Hirschmann Index (measured as the sum of the squares of market shares of all sellers in a market).

Foreign Competition

Measuring the level (or potential) of foreign competition is in many ways a mirror-exercise to assessing domestic competition. In addition to determining the number and size of foreign competitors, other issues such as impediments to foreign entry are also relevant, and would include tariff impediments as well as other non-tariff regulatory, licensing, or related impediments.

Substitutes

While we have identified substitutability as a key factor in defining relevant markets, it is also of fundamental importance in the determination of the degree of competition in a market. The same types of measures of substitutability (e.g. functional interchangeability, buyer switching costs) remain relevant.

Barriers to Entry

Barriers to entry have, in part, been addressed under foreign competition. However, entry barriers can also be defined and assessed with respect to domestic market. Types of barriers could include cost advantages (or disadvantages), sunk costs, regulatory control over entry and minimum efficient scale relative to total market size.

Change and Innovation

One means of determining how competitive a market is relates to the degree of innovation occurring in that market, either as an indicator of healthy competition, or as a means of introducing new competitors through technological advancement.

Other Relevant Factors

Other relevant factors can include the potential for collusion among competitors, a history of anti-competitive conduct or intent, excess industry capacity, countervailing buyer power, degree of regulatory oversight, degree of vertical integration and significant differences in the financial strength of competitors.

2.2.3 CRTC Approach

The CRTC and its predecessors have historically regulated telecommunications services in Canada, with a particular emphasis on ensuring that prices are “just and reasonable” and that no carrier shall “unjustly discriminate or give an undue or unreasonable preference toward any person, including itself, or subject any person to an undue or unreasonable disadvantage”.¹⁸ With the passing of the *Telecommunications Act* in 1993, specific provisions made it possible for the CRTC to forbear from certain regulations where to do so would be consistent with Canadian telecommunications policy objectives. In fact, the policy objectives in the 1993 *Act* included the objective “to foster increased reliance on market forces for the provision of telecommunications services and to ensure that regulation, where required, is efficient and effective”.¹⁹

¹⁸ *The Telecommunications Act*, S.C. 1993 S.27.

¹⁹ *Ibid.* S. 7(f)

In keeping with the *Act's* objectives and the Commission's powers to do so, the Commission decided to forbear from the regulation of toll services provided by incumbent telephone companies in 1997.²⁰ In making its determination, the Commission found that toll services are, or will become, subject to a level of competition sufficient to protect the interests of users.

In coming to this conclusion the Commission utilized a definition of relevant service market which considered both demand and supply factors. The demand factors included:

- The ability of customers to switch to other service suppliers;
- The availability of practicable substitutes; and
- The ease with which customers are able to switch between the products or services offered by competitors.

The supply considerations included:

- The supply expansion responses of firms to price increases;
- The ability of competitors to enter the market; and
- The presence of barriers to entry.

Market Shares

The Commission chose minutes of traffic as the measurement unit for its market share test. In addition, they noted that it was inappropriate to adhere to a particular market share as a basis for determining whether to forbear. In other

²⁰ Telecom Decision CRTC 97-19, Forbearance – Regulation of Toll Services Provide by Incumbent Telephone Companies. The framework for the forbearance tests was first enunciated in Telecom Decision CRTC 94-19, Review of Regulatory Framework (September 16, 1994).

words, they chose not to select a specific market share number or ratio as being determinative of sufficient competition to warrant forbearance.

Demand Conditions

In its review of demand conditions, the Commission considered the ability and willingness of customers to switch to another supplier or to reduce consumption in response to a price increase by the dominant supplier, the availability of economically feasible and practical substitutes, the costs to consumers of switching suppliers and whether the product is an essential input (to other service providers).

Supply Conditions

The Commission considered supply expansion responses of firms to price increases or other developments affecting the relevant market. The rationale provided by the Commission was the easier it is for rivals to expand output in response to a price increase by the dominant firm in the market, the lower is the dominant firm's market power.

In examining supply conditions, the Commission looked at both switching and transmission facilities.

Market Entry

Indicators of market entry conditions which were utilized by the Commission included whether entry has occurred in the past, whether current attempts are being made to enter, whether firms which market related products or firms from other geographic markets have considered expanding into the relevant market.

Barriers to Entry

Among the barriers that were considered by the Commission are the presence of essential bottleneck facilities that competitors cannot duplicate, regulations or policies preventing entry by competitors, lengthy construction periods and high sunk costs.

Rivalrous Behavior

Behavioral attributes examined by the Commission included price trends, rigorous aggressive marketing activities and the extent to which competitors expanded the scope of their business activities in terms of products, services and geographic boundaries.

2.3 Other Competitive Considerations

For the most part, the concepts and measures that have been considered up until now primarily relate to the level of effective competition in a given market at a given point in time or over a relatively limited period of time. A broader policy examination of competition should also include the sustainability of competition. That is, what is the prognosis for competition over the longer term, not just the status today or over the near term?

Many of the factors that are relevant to a current competition status examination are also relevant to a longer-term assessment. We would note in particular, however, the following factors that we believe are most critical to the sustainability of competition.

Financial Depth and/or Commitment

While the importance of "deep pockets" has been debated in academic circles for some time, there seems to be general agreement among actual industry participants that financial strength and commitment are important determinants for the longevity of competition. Perhaps the closest analogy can be found in the game of poker, where a player's financial inability to match a bet can result in his or her exit from the game, even if they hold exceptionally good cards.

In economic theory, the existence of perfect (or near-perfect) capital markets should eliminate this concern. A key question therefore relates to the status and functioning of capital markets.

Minimum Efficient Scale

Minimum efficient scale (MES) is closely related to the concept of economies of scale.²¹ In fact, MES denotes the point where all economies of scale are realized. Its relevance to sustainability relates to the size of the overall market relative to the size of a firm that achieves MES. If the point at which MES is reached is greater than half the total market size, achieving long-term competitiveness may not be possible.

Technological Change

Technological change holds out the potential to increase competition in a market, particularly if it increases substitutability from outside of the boundaries of a given market. Put another way, if existing market rivals control the scope and pace of technological change that could lead to greater substitutability, then they may be able to introduce technological advancement in a way that minimizes the threat

of disrupting their market position. In certain cases, a smaller rival may have a greater incentive to disrupt markets through technological (or other) change since it would have more to gain than larger competitors. On the other hand, a smaller firm may have more difficulty developing (or purchasing) new technologies in order to stay competitive.

Barriers to Entry

While barriers to entry have been discussed in more general terms, it is worth noting some additional barriers that need to be reviewed. These include the ability and cost to access appropriate antenna sites and the time it takes to apply for and receive approval for regulatory measures and/or commercial access to private antenna sites or other critical facilities.

²¹ See F.M. Scherer, Industrial Market Structure and Economic Performance. Chicago, Rand McNally 1970. Pages 74-75.

3. MEASURES

In keeping with methodological discussion of the previous section, the specific competition measurements employed in this Study are grouped into 5 categories: Product-related measures, Price-related measures, Entry/exit conditions, Market share/rivalry, and Other measures. For purposes of comparison, the four largest wireless service providers will be examined. The Aliant, MTS and SaskTel mobile services are not discussed separately, although as a generality, services offered by these carriers typically resemble the Bell offerings and as such, the fundamental conclusions regarding the industry are not altered by consideration of these companies.

It should also be noted that service provider service conditions and descriptions are believed accurate as of August, 2001. Specific terms and conditions of service can change very quickly in the industry.

3.1 Product-related Measures

Product-related measures of competitiveness typically address quality and non-price features of a service.

3.1.1 Service Choices

Each of the four largest service providers offers a range of service packages and related accessories. Choice parameters include the number of local monthly minutes in a package, calling features, enhanced services, evening/weekend unlimited calling, analogue versus digital, long distance minutes and handsets.

3.1.1.1 Monthly Anytime Minute Packages

Amongst the four wireless service providers, 12 different packages of various “anytime” minutes are offered. “Anytime” minutes can be used at any time of the day or night or on any day of the week. The lowest minute package is offered by Telus (50 minutes per month) while Bell offers the largest (2500 minutes per month). The only anytime minutes package offered by all four competitors is 200 minutes/month, although 3 providers offer a 400 minutes/month package.

Bell and Telus offer the largest number of packages (i.e. 6), with Bell providing the package of most minutes (2500) while Telus offers a package of the fewest minutes (50). Both Rogers and MICROCELL offer 4 packages of anytime minutes.

Table 3.1: Service Packages of Anytime Minutes/Month

	BELL	ROGERS	MICROCELL	TELUS
Minutes/month				50
		150		150
	200	200	200	200
	400	400	400	
				500
	600			
			700	
	800			
		900		
			1000	1000
	1500			1500
	2500			

Source: Company websites, CSR's, Wall Communications Inc.

3.1.1.2 Monthly Packages with Evenings/Weekends and Other Options

Most service providers offer the option of purchasing the ability to make unlimited weekend and/or evening calls for an additional charge. Rogers offers 12 different *Your Plan* packages that (after the purchase of a Base Plan) include various combinations of anytime, weekday, weeknight and weekend minutes. Three of these packages include unlimited weekend minutes and four packages include unlimited weeknight and weekend minutes. Four packages are straight "anytime" minute packages and one package offers just weekend and weeknight minutes (i.e. 300 minutes). The *Your Plan* packages allow customers to add calling feature options and long-distance services for a separate charge.

In addition, Rogers offers 10 *Value Packages* which bundle pre-selected combinations of minutes and features and which require at least a one-year service contract. For example, the lowest cost *Value Package* bundles 100 weekday/weeknight minutes along with unlimited weekend minutes as well as call forwarding, call waiting and conference calling.

Bell offers two types of local airtime package: *Realtime* and *Solo*. *Realtime* offers six packages ranging from 150 minutes to 2500 minutes as well as the *Realtime Weekender* which bundles 150 anytime minutes with unlimited local weekend calling, 100 anytime wireless Internet minutes for two months and 100 weekend long distance minutes.

Solo (which is offered as either a monthly or a pre-paid service - see also section 3.1.3.2 on pre-paid) offers three monthly packages of 50 weekday minutes, 250 min./500 min./ unlimited nights and weekends, two-way text messaging (limited to the first three months and for a specific message allowance), and a choice of two features from call display, mobile browser or message center express.

MICROCELL offers four monthly airtime packages, and offers the option of purchasing unlimited weekend minutes or weeknight/weekend minutes.

Telus offers ten different service packages varying in features and minutes, some of which include unlimited weeknights and weekend calls and some of which offer unlimited weeknight/weekend calling at an additional charge.

The degree of customization available to consumers by choosing from across the four providers appears to be relatively high. In fact, a relatively wide number of choices are available from each individual service provider, some more so than others.

Table 3.2: Package Variety

	BELL	MICROCELL	ROGERS	TELUS
Anytime Package(s)	YES	YES	YES	YES
Evenings/weekends	YES	YES	YES	YES
Evenings			YES	
Weekends	YES	YES	YES	YES
Bundled (combination of WD, WN, WE, features)	YES	YES	YES	YES

Source: Company websites, CSR's, Wall Communications Inc.

3.1.1.3 Calling Features and Enhanced Services

All service providers bundle calling features in at least some packages and/or offer features on an optional basis. All four providers include call waiting and conference calling in some or all of their packages. Most providers in their packages include call forwarding and detailed billing. Other features included by

some providers include a basic messaging service, roadside emergency assistance and text messaging.

All service providers offer Information/browser services, wireless modem, and text messaging, typically in digital service areas. A comparison of prices is provided in Table 3.12 and 3.13.

3.1.1.4 Long Distance

All service providers offer stand-alone long-distance packages on either a Canada-wide or Canada-U.S. basis. Bell offers 6 different Canada-wide options from 150 to 2000 minutes per month. Rogers offers four Canada-wide plans varying from 150 to 1500 minutes.

Bell offers four Canada-U.S. long-distance add-on packages of between 200 and 1600 minutes per month. Rogers has 3 packages between 250 and 1500 minutes per month. MICROCELL offers a 200-minute option and Telus offers a 150 minute or 400 minute Canada-U.S. service. In addition, all providers offer Canada-wide or Canada-U.S. long distance by the minute.

All providers offer international long distance service, usually by the minute depending on which country is being called.

Some packages also bundle long distance minutes with local minutes and additional features. Bell offers a \$25 monthly package that includes 150 local minutes, 100 Canada-wide long-distance minutes and three calling features. Telus offers a similar package with the 100 long distance minutes provided on the weekend.

Table 3.3: Long Distance

	BELL	MICROCELL	ROGERS	TELUS
Canada-wide	6 packages (150–2000 mins.)	(see below)	4 packages (150-1500 mins.)	(see below)
Canada-U.S.	4 packages (200-1600 mins.)	1 package (200 mins.) Can-Can, Can-U.S.	3 packages (250-1500 mins.)	2 packages (150,400 mins.) Can-Can, Can-U.S.
International	YES	YES	YES	YES

Source: Company websites, CSR's, Wall Communications Inc.

3.1.1.5 Analogue versus Digital²²

Telus Mobility (in BC and Alberta), Bell Mobility (and its Wireless Alliance partners) and Rogers AT&T Wireless offer analog cellular service using AMPS technology in the 800 MHz band on their own networks. MICROCELL offers a resale service with roaming on the Bell Wireless Alliance networks.

All service providers offer digital service using technologies such as TDMA, CDMA, GSM and iDEN. Time Division Multiple Access (TDMA) divides frequency bands available to the network into time slots, with each user having access to one time slot at regular intervals. Code Division Multiple Access (CDMA) uses a spread spectrum technology to separate users by assigning the digital codes within the same broad spectrum. Global System for Mobile communications (GSM) is the most prevalent digital system around the world. GSM's air interface is based on narrowband TDMA technology and is the only technology that provides incoming and outgoing data services. IDEN is a

²² See www.geckobeach.com.

modified TDMA technology pioneered by Motorola that also allows two-way radio functions.

In British Columbia and Alberta, Telus customers can use their AMPS (analog cellular), 800 MHz CDMA network, 1900 MHz CDMA network (mostly Clearnet equipment outside of Vancouver and Victoria in B.C.) and the 800 MHz iDEN network. Service is offered in Saskatchewan and Manitoba through resold Mobility service. Ontario and Quebec use Clearnet and Mike services (digital). Nova Scotia customers use Clearnet PCS services.

Bell Mobility offers AMPS analog technology (800 MHz) and CDMA services in both the 800 and 1900 MHz bands in Ontario and Quebec and roaming elsewhere (including BC and Alberta through roaming on Telus). Because of variations in CDMA frequency choices amongst other Mobility service providers, Bell Mobility users in provinces other than Ontario and Quebec (e.g. BC and parts of Alberta, Nova Scotia) may have difficulties using digital services if their handsets are not dual frequency CDMA.

Rogers AT&T uses TDMA technology in the 800 MHz band across Canada as well as the 1900 MHz band in Ontario, Quebec and Vancouver to provide digital service. Digital service is available in BC, Ontario and Quebec wherever the company also has analog service. Rogers has announced a switch to GSM technology for this year.

Microcell only offers digital (GSM) service directly, but does provide analog on a resale basis. Their digital PCS is available in all major centers in BC, Alberta, Ontario, Quebec and Newfoundland. Analog roaming (through Bell and its Wireless Alliance) is available elsewhere.

3.1.1.6 Handsets

Among the four providers, 36 different digital (or digital/analogue) handsets are available. Each service provider offers a choice of at least 6 different handsets. While providers often use the same equipment vendors, the handsets are usually not the same, varying on the basis of technology (i.e. CDMA, GSM, etc.) or on the basis of handset features.

Each provider offers several dual or tri-mode handsets and dual-band handsets. Telus also offers its *MIKE* handset and service, which is targeted to a particular group of customers. Each provider offers at least one WAP-enabled telephone handset, and usually more than one.

3.1.1.7 Shared Multi-phone Packages

Three of the service providers offer packages targeted to multiple users in a business or other community of interest. Bell offers *Realtime Family* for 2 to 4 phones and shared-minute packages of 100, 300, 500, 700 or 1000 minutes (although it is not available in B.C. or Alberta at this time). MICROCELL offers a shared-minute service for 5 or more phones that is targeted more towards small businesses than families. They support this service with On-line administrative services such as billing and group account management. Telus offers its MIKE service that is targeted to businesses (4 different WORK minute/message plans), travelers (3 different TRAVEL plans) as well as other plans. The MIKE packages are geared for basic phone or Direct Connect two-way radio use, multi-function users and frequent travelers. On-line administrative support is also available.

3.1.2 Coverage

All four service providers offer service across Canada. Bell through its Bell Wireless Alliance (BWA) agreement with Aliant, MTS and SaskTel can provide service to approximately 94% of the Canadian population²³. While Bell offers some services in parts of B.C. and Alberta, not all services are available there. Rogers service is available to 93% of Canadians. MICROCELL, through its roaming arrangement with the BWA is available to 94% of Canadians. Their own all-digital network reaches 56% of Canadians. Telus, through its primary digital networks in Alberta and B.C. and its recently acquired Clearnet networks, can reach 73% of Canadians. Coverage of the Canadian population from both analogue and digital for Telus is expected to be considerably higher than 73%, but this number is not reported by Telus. In addition, as noted below, Telus and Bell have recently announced an agreement to share digital networks in each others' territories.

All four service providers are focusing on expanding their digital networks, both through building out and (for providers with both analogue and digital networks) by migrating high-use customers from analogue to digital. While some analogue expansion continues where it is economic, the potential of higher-value added services which digital can provide creates an incentive to concentrate on digital.

Rogers and Bell are available in more smaller towns and remoter areas than the other two providers. While they do not overlap perfectly, both Rogers and Bell/BWA have typically built out their networks based on population density. This has led to frequent commonality in service areas. Even in those areas that are served by a single supplier, the service offerings fundamentally tend to exhibit the same features and pricing as that offered in larger centers (subject to differences between analogue and digital service).

²³ Telus Mobility is not currently a member of the BWA.

Table 3.4: Coverage (as at Dec. 31st, 2000)

	BELL	MICROCELL	ROGERS	TELUS
Description	Ont., Quebec, B.C., Alta. (elsewhere through BWA)	Major cities and traffic corridors (Canada wide via roaming)	Canada-wide	B.C. and Alta. fully, major centers and corridors across Canada
% of Pop Served	94% total (with BWA)	56% digital	93% total 83% digital	73% digital ²⁴
# of Subs	2,340,000	922,527	2,514,000	2,156,200
Penetration	8.2%	3.2%	8.8%	7.5%
% of Customers Served digital	N/A	100%	N/A	57%

Source: Company websites, CSR's, Wall Communications Inc.

As a general observation, Bell Canada (and its service alliance partners) has greater service coverage in Eastern Canada than Rogers, Telus or Microcell. In the West, Telus has a larger service coverage area than any of its competitors. In both cases, Rogers has the next largest territorial coverage in each region. While specific numbers are not made publicly available, industry observers suggest that Bell (in its eastern operating area) may cover roughly 10% more geographic territory and 5% more coverage by population than Rogers. In the West, Telus may display similar margins over Rogers.

On October 17, 2001, Bell and Telus announced extended roaming and resale agreements in each other's primary operating territories.²⁵ The ten-year agreement significantly lowers roaming charges on each other's digital networks.

²⁴ Telus reports only digital coverage – total analogue and digital coverage will be higher.

²⁵ The Ottawa Citizen, Oct. 18, 2001.

In theory, this agreement will allow additional competition to occur more quickly, particularly in rural and small to medium-sized communities.²⁶

3.1.3 Contract Terms

3.1.3.1 Duration

Most service providers offer a choice of contract length, with the exception of MICROCELL that only requires a month-to-month contract. Bell, Rogers and Telus each offer month-to-month in some packages, but also require (or reward) either a one-year or a two-year contract. Bell also offers a three-month term for some packages while Telus offers a three-year contract.

Table 3.5: Term of Contract

	BELL	MICROCELL	ROGERS	TELUS
Monthly	YES	YES	YES	YES
3 month	YES			
1 year	YES		YES	YES
2 year	YES		YES	YES
3 year				YES

Source: Company websites, CSR's, Wall Communications Inc.

3.1.3.2 Pre-paid

All service providers offer a pre-paid service. Each provider offers between 4 and 6 models of handset with their pre-paid service. Bell offers local anytime

²⁶ Infrastructure sharing agreements have also occurred in Germany after that country's regulatory agency announced the allowance of such arrangements in June, 2001. Deutsche Telecom and BT as well as Telefonica and E-Plus have announced 3G network sharing agreements.

airtime at a price per minute while the others offer various number of minute packages. Bell offers 2 other pre-paid packages that provide unlimited night calling or unlimited night and weekend calling. Rogers offers a package of Canada-wide long distance minutes for an additional charge.

Table 3.6: Pre-paid Non-Price

	BELL	MICROCELL	ROGERS	TELUS
# Phones	4	6	3	6
Unlimited evening package	YES	YES		
Unlimited weekend package	YES			
Eve/weekend package	YES	YES		
Anytime minute package		YES	YES	YES
Canada-wide LD package			YES	

Source: Company websites, CSR's. Wall Communications Inc.

3.1.3.3 Penalties

Rogers, Telus and Bell all have penalties for early cancellation of contracts. Rogers charges \$20 per month for remaining months up to a maximum of \$200 for a 1-year contract and \$200 for a two-year contract. Telus charges a \$300 penalty. Bell charges an early cancellation fee of \$99. MICROCELL has no penalties because they go by month to month.

3.1.4 Customer Ability to Switch Suppliers

3.1.4.1 Churn

Churn indicates the turnover of the customer base expressed as a monthly percentage. A 2 % churn rate equates to losing 24% of your customers annually or the equivalent of losing all of your customers roughly every four years. From a competitive perspective, very low churn rates could indicate that it is very costly for customers to switch suppliers, or that there is very little differentiation between service providers or packages. High churn rates can be an indication of a market in flux, perhaps with extreme (i.e. not necessarily healthy) competition.

Churn rates in the 1% to 3% range are typical for North American wireless providers.

Table 3.7: Churn Rates

	BELL	MICROCELL	ROGERS	TELUS
2000	1.5%	2.2%	2.4%	2.0%*
1999	1.8%	2.1%	1.9%	1.7%*

Source: Annual Reports, Wall Communications Inc., Dundee Investment Research *(blended rate between Telus and Clearnet, only 3 months in 2000).

3.1.4.2 Costs of Switching

The ability to readily switch suppliers will depend on the costs associated with leaving one supplier for another. As noted earlier, each wireless carrier offers some packages that don't require a lengthy contract (i.e. a month to month arrangement). Customers wishing to avoid potential switching costs therefore can elect one of these packages.

MICROCELL only goes on a month-to-month basis. Cancellation fees are associated with the term contracts that are offered by the other carriers. Some suppliers also offer incentives to sign service contracts for phone service, or for

calling features or supplemental services. While these do create impediments to switching, customers do have the option of taking a month-to-month arrangement.

Another potential switching cost can relate to handset costs. Unlike analogue phones that could roam on either Mobility Canada or Roger's networks, digital phones typically use different and incompatible technologies. Even in those instances where the technology is the same across providers, suppliers typically SP-lock²⁷ their phones to prevent switching. Since handsets are typically not transferable across suppliers (without modifications), purchasing a more expensive phone will create an inducement to stay with a supplier. For example, Rogers offers customers the ability to use their own phones (from Rogers, Telus or Clearnet) in the Rogers pre-paid service, but the phone must be reprogrammed for \$75.

Again, however, customers have numerous choices of month to month plans as well as pre-paid service plans, thereby allowing customers considerable latitude in choosing their own desired degree of commitment to any given supplier.

3.1.5 Market Definitions

The core element of the mobile wireless market is voice telephony. However, beginning with the origins of Canadian mobile service in the mid 1980's, data services have slowly continued to become a more important revenue source. However, as of 2000, data services still comprised a very small part of overall revenues. For example, Rogers reported 440,000 messaging and data subscribers (essentially paging) and 2,514,000 wireless voice subscribers in 2000.²⁸ Respective monthly revenues were roughly \$5 million versus \$116

²⁷ This feature locks the handset to only work with a specific Service Provider.

²⁸ Rogers Wireless Communications Inc., 2000 Annual Report.

million for voice subscribers. While non-voice services provided to voice customers generate some revenues today, they are still reportedly a very small fraction of overall service revenues.

In the area of handsets, Telus has reported that they are generating higher margins for digital handsets (which can provide non-voice services), although their migration strategy is to reduce stand-alone paging customers by converting them to digital telephony handsets.²⁹

Scotia Capital Markets has estimated that mobile data revenues will represent 4% of industry revenues in 2002/2003.³⁰

Another consideration in examining market definitions involves the distinction between digital and analogue service. The CRTC has examined the issue of whether these markets should be considered distinct, finding that in fact all voice services comprise a single market (for regulatory, and therefore competitive, purposes).

"The Commission has concluded that based on service attributes rather than underlying technology, mobile wireless telecommunications services properly fall within two categories of services for the purpose of determining the appropriate regulatory treatment: (i) mobile voice wireless telecommunications services that are connected to the public switched telephone network, such as cellular services, PCS, ESMR and satellite-based mobile services (public switched mobile voice services) and (ii) all other mobile wireless telecommunications services (other wireless services)."³¹

²⁹ Telus Annual Report 2000.

³⁰ Scotia Capital Markets, "Canadian Wireless Industry" Nov. 1999, Pg. 4.

³¹ Telecom Decision CRTC 96-14, "Regulation of Mobile Wireless Telecommunications Services", Pg. 4. December 23, 1996.

Finally, while the analog versus digital distinction is still of relevance in certain coverage areas (i.e. where only an analog network exists), the majority of mobile telephony customers are typically marketed services on the basis of price and features, with the underlying technology a secondary consideration.

In conclusion, while the mobile market can be defined on the basis of several characteristics, we believe that voice telephony remains the most important defining characteristic today. However, data/non-voice services are expected to grow much more quickly than voice services in the future so at some point the appropriate market definition for competitive assessment may need to be re-addressed.

3.2 Price-related Measures

3.2.1 Price Comparisons of Service Packages

3.2.1.1 Low Costs Monthly Packages

Each service provider offers a "low-cost" package. The Bell and Rogers packages are \$25 per month while the MICROCELL and Telus packages are \$20 per month. Each of the packages offers 200 anytime minutes except the Rogers package that provides 100 minutes per month.

MICROCELL and Telus charge for additional minutes at a rate of \$.20 per minute while Bell and Rogers charge \$.25 per minute.

For long distance within Canada or from Canada to the U.S., MICROCELL charges \$.10 per minute. The other service providers charge \$.25 per minute, with Bell charging \$.35 per minute if the call is on an analog service. Bell does provide 100 minutes of in-Canada weekend long distance calling without

including the minutes in the 200-minute allotment, but the minutes are subject to regular long distance charges. Telus offers a rate of \$.50 per minute if the call originates in the U.S. Roaming charges (while in the U.S.) are \$.95 per minute for both Rogers and Telus, while MICROCELL charges \$.20 per minute. MICROCELL offers a 50% discount on international long distance for \$5 per month.

MICROCELL offers 4 calling features in its lowest cost package and Rogers offers 3 features while the other providers do not include any features.

MICROCELL and Telus offer an unlimited weekend/weeknight-calling package for \$25 per month. Bell and Rogers include unlimited weekend calling, while MICROCELL offers unlimited weekend calling for \$15.

MICROCELL offers its package on a month-to-month basis while Rogers offers its package on either a 1-year or 2 year term. Telus offers its package on a monthly, 1 year, 2 year or 3 year term.

Bell also offers a low cost *Solo* plan for \$25 per month which provides 250 minutes of evening and weekend minutes, 50 weekday minutes, two-way text messaging, 100 messages/month for first 3 months, a choice of 2 of call display, mobile browser 100 min/month or message center express. Additional minutes are \$.30 per minute and LD rates for Canada are \$.25 for digital, \$.35 for analog and for Canada-U.S. \$.35 per minute.

Rogers also offers a basic *Your Plan* service that costs \$10 per month and \$10 for 150 anytime minutes, with additional minutes charged at \$.25 per minute. Additional packages of minutes can be purchased at \$10 for 50 anytime minutes, \$14 for 100 anytime minutes or \$22 for 200 anytime minutes.

When comparing the low cost packages, there are slight, but meaningful, variations between all four packages. The Bell and Rogers plans are more similar while the MICROCELL and Telus plans tend to be more similar. Because various features are included in some packages and not in others, there is no clear-cut "best value" package, particularly when coverage and brand security are considered. The "best deal" therefore depends in part upon what elements customers value the most.

We believe the array of packages translates into substantive customer choice (i.e. the choices available allow customers to maximize their own satisfaction levels). If the packages offered had been substantially identical, we would have inferred a high degree of "market coordination" amongst suppliers, but this is not the case.

Table 3.8: Low Cost Monthly Package Comparison

	BELL	MICROCELL	ROGERS	TELUS
Name	Realtime Weekender	20/200	Starter Unlimited Weekends	Talk 20
Base price	\$25	\$20	\$25	\$20
Minutes	200	200	100	200
Additional minutes	\$.25	\$.20	\$.25	\$.20
Canada LD	\$.25/\$.35	\$.10	\$.25	\$.25
Can-U.S. LD (from Canada)	\$.25/\$.35	\$.10	\$.25	\$.25
Roaming (U.S.)	\$.60/min to \$1.00/min U.S.	\$.20/min	\$.95/min	\$.95/min
Calling Features	None	5 included	3 included	None
Unlimited WN/WE	N/a	\$25	N/a	\$25
Unlimited WE	Included	\$15	Included	N/a
International LD	N/a	\$5/month for 50% discount	N/a	N/a
Term	1 yr/2 yr	Monthly	1 yr/2 yr	Monthly, 1 yr, 2 yr, 3 yr

Source: Company websites, CSR's, Wall Communications Inc.

3.2.1.2 Largest Local Monthly Package

Service providers offer a variety of packages of minutes. Typically, the average price per minute falls as the number of minutes in the package increases.

Bell offers the largest number of minutes in a local monthly package with 2800 minutes at a price of \$249 per month. (They also offer an 800-minute package for \$89 and a 1500-minute package for \$159). By comparison, the next largest

package is offered by Telus with 1500 minutes for \$150 per month. MICROCELL and Rogers each charge \$100 per month for 1000 and 900 minutes respectively.

Three of the vendors include 3 calling features with their largest package while one vendor offers 5 calling features. Unlimited weekend/weeknight local calling can be added to all of the packages except that offered by Bell. Rogers and Telus charge \$15 per month and MICROCELL charges \$25 per month.

On an average price per minute, the suppliers have very similar prices around the 1000-minute mark (i.e. within a penny a minute difference). However, a penny a minute at 1000 minutes could mean a total extra cost of \$10 per month.

It appears that consumers have a wide variety of large minute packages available (i.e. 700, 750, 800, 900, 1000, 1500 and 2500 minutes). Two suppliers offer packages of 1000 minutes and two suppliers offer packages of \$1500 minutes. We would also note that consumers also can purchase extra minutes in any given month if necessary (albeit at somewhat higher average per minute rates).

Table 3.9: Largest Local Monthly Package

	BELL	MICROCELL	ROGERS	TELUS
Base Price	\$249/month	\$100/month	\$100/month	\$150/month
Local Minutes	2500	1000	900	1500
Price per Min.	\$.10	\$.10	\$.11	\$.10
Calling Features	3	5	3	3
Unlimited WE/WN	N/a	\$25	\$15	\$15

Source: Company websites, CSR's, Wall Communications Inc.

Table 3.10: Average Price per Minute – Various Packages

	BELL	MICROCELL	ROGERS	TELUS
200 Minutes	\$.125	\$.10	\$.15	\$.10
400 Minutes	\$.1125	\$.10	\$.125	
700 Minutes		\$.10		
900 Minutes			\$.1111	
1000 Minutes		\$.10		\$.10
1500 Minutes	\$.106			\$.10
2500 Minutes	\$.10			

Source: Company websites, CSR's, Wall Communications Inc.

3.2.1.3 Low Cost Long Distance Packages

Three vendors offer very similar low cost Long Distance plans, offering 150 minutes of Canada to Canada or U.S. destinations for \$30 a month.

MICROCELL offers a significantly lower low cost plan of 200 minutes for \$15, but this package requires a customer to first buy a basic local package. Other long distance packages are available from some of the suppliers.

Table 3.11: Low Cost Long Distance Packages

	BELL	MICROCELL	ROGERS	TELUS
Base Price	\$30	\$15	\$30	\$30
Minutes	150	200	150	150
Av. Cost per minute	\$.20	\$.075	\$.20	\$.20
Scope	Can-U.S.	Can-U.S.	Can-U.S.	Can-U.S.
Calling Features		5		3
Additional Minutes	\$.30	\$.10	\$.30	\$.25

Source: Company websites, CSR's, Wall Communications Inc.

3.2.1.4 Billing Time Unit

Generally most cellular phone companies charge from the instant the SEND button is pressed until the END button is pressed. This means that users pay while a call is ringing or if a line is busy. MICROCELL is an exception in that charges apply only to talk time.

Table 3.12: Billing Time Unit (Local Minutes)

	BELL	MICROCELL	ROGERS	TELUS
Per Minute (Digital)				
Per Minute (Analogue)	YES		YES	YES
Per Second (Digital)	After 1 st Minute	YES	After 1 st Minute	YES
Per Second (Analogue)		YES		

Source: Company websites, CSR's, www.geckobeach.com, and Wall Communications Inc.

Slight variations exist from company to company, with digital service typically being charged by the second (sometimes after the first minute) and analogue being charged by the minute (with one exception).

3.2.1.5 Voice Features

Monthly charges for voice features vary across providers, ranging from no-charge to six or seven dollars per month. A chart that illustrates the range of prices for four typical services is provided below.

Table 3.13: Illustrative Voice Feature Pricing

	BELL	MICROCELL	ROGERS	TELUS
Basic Voice Mail	\$4	\$2	\$4	\$3
Advanced Voice Mail	\$6	\$4	\$7	\$5
Caller ID	\$4	\$3	\$3	\$3
Call Forwarding	Usually included	No Charge	No Charge	\$2

Source: Company websites, CSR's, Wall Communications Inc. (Note: Other features are available at various prices)

3.2.1.6 Data Features

Although charges vary across providers for data features, there is a similarity in pricing patterns. It should be noted that wireless web phone services provide access to the worldwide web, with no limitations on accessing any website which is connected to the web. Internet access allows a user to hook their computer up to the Internet through their handset, while wireless web allows the user to access the Internet directly through the handset.

Table 3.14: Data Feature Pricing

	BELL	MICROCELL	ROGERS	TELUS
Text Messaging	\$.10 per message or \$10/month	\$.10 per message	\$5 per month	\$.10 per message or \$5/month
Internet Access		No Additional Charge	\$6 per month	\$5 per month
Wireless Web (on Phone).	\$.25 per Minute	No Additional Charge	\$6 per month	\$5-\$15/ month

Source: Company websites, CSR's, Wall Communications Inc.

3.2.1.7 Pre-Paid Service

Pre-paid pricing plans are relatively similar across providers, although more significant variations occur in charges for long-distance calls. However, consumers do enjoy considerable choice amongst pre-paid packages.

As noted by an industry research report, which estimated 23% of Canada's mobile subscribers are currently prepaid:

"Like it or not, prepaid is here to stay. We think the success of prepaid in Canada reflects the aggressiveness of prepaid offers, which in turn is a reflection of the general intensity of competition in our market. We expect prepaid to continue to garner a large share of growth under any realistic scenario."³²

Table 3.15: Pre-paid Plan Pricing

	BELL	MICROCELL	ROGERS	TELUS
Unit/rate	\$.35/min	\$10(\$.33/min)	\$10(\$.33/min)	\$10(\$.40/min)
		\$25(\$.33/min)	\$25(\$.33/min)	\$25(\$.33/min)
		\$50(\$.33/min)	\$50(\$.33/min)	\$50(\$.29/min)
Expiry (days)			30,90,180	30,60,60
Can/U.S. LD	\$.35	\$.10	\$.66	\$.25
Features	ID, Text (ltd.)	VMail, ID	VMail, ID	VMail, Waiting

Source: Company websites, CSR's, Wall Communications Inc.

3.2.2 Pricing: Canada versus the U.S.

Comparisons of pricing across regions will depend in part on the basket of services and features that are chosen for comparison. In other words, conclusions can change depending on what is being compared. If certain features (e.g. long distance charges) are lower in one region, then their higher weighting will bias the outcome in favor of that region.

³² Merrill Lynch, June 29, 2001, Pg. 9.

With this caveat in mind, comparisons between Canada and the U.S. tend to reveal that Canadian mobile telephone prices are somewhat lower than the U.S., and many other countries. A 1999 Yankee Group study suggested that mobile telephony prices in Toronto were a weighted average of 17 cents (U.S.) per minute, compared to more than 30 cents (U.S.) per minute in Chicago, New York, Los Angeles, Boston and Miami.³³ This is buttressed by a recent Merrill Lynch report that suggests that ARDU in Canada averaged \$30 U.S. in the first quarter of 2001 compared to \$57 U.S. for the United States.³⁴ A limited survey carried out by Wall Communications also revealed prices in Canada that were as low or lower than comparable U.S. rates.

Table 3.16: Canada/U.S. Mobile Price Comparison (August, 2001)

	AT&T Wireless Metro Caller	Voice Stream Neighborhood	Sprint	Telus	Bell	MICROCELL
Price	\$40 (U.S)	\$40 (U.S.)	\$40 (U.S.)	\$50+\$25	\$45	\$40+\$25
Local Anytime Minutes	400	600	350	500	400	400
Weekend & Night Mins.	2000	2000 (weekend only)	2150	Unlimited	Unlimited (weekend only)	Unlimited
Extra Mins. (\$ U.S.)	\$.25	\$.25	\$.40			
Extra Mins. (\$ Can.)	\$.38	\$.38	\$.60	\$.20	\$.25	\$.20
Price per any time Mins. (\$U.S.)	\$.10	\$.07	\$.11			
Price per any time Mins. (\$ Can.)	\$.15	\$.11	\$.17	\$.15	\$.11	\$.16

³³ Yankee Group, 1999.

³⁴ Merrill Lynch, "Mobile Services in Canada" June 19, 2001, Pg. 4.

Source: Wall Communications Inc.

Although Average Revenue Per Month (ARPM) is not a pure measure of price, it does provide an indication of price, both historical and across providers or regions. In 2000, the ARPM in the U.S. was \$59.90 (Can.) versus \$53.00 (Can.) in Canada.³⁵ Further, ARPM in the U.S. fell from \$78.91 (U.S.) in 1988 to \$38.76 in 1999. In 2000, it increased to \$39.94 (U.S.), the first time since 1988 that ARPM has risen. The average local monthly bill actually bottomed out in 1998, and has risen in both 1999 and 2000.

By contrast ARPM in Canada has been falling since the 1980's (with a minor blip in 1998), reaching \$53 (Can.) in 2000. In 1995, ARPM was \$73.

3.2.3 Domestic Price Trends

It is widely recognized in the Canadian industry that after an early period of relative price stability prices have fallen continually throughout most of the 1990's. A major driving force was the introduction of the two new PCS licenses. Even before they were licensed, the incumbents price-reacted:

"A key reason for the precipitous drop in average monthly revenue realized in the 194-95 time frame, compared with the previous period, was the introduction of new entry-level services. ... (T)hey were price priced and positioned to anticipate the appeal of personal communications services (PCS) and lessen the competitive advantage before it was even introduced."³⁶

Once competition was introduced, further price reactions followed.

³⁵ CTIA, Industry Statistics; CWTA, Industry Statistics.

³⁶ Yankee Group, "Back to the Future?: The Canadian Wireless Evolution", Nov. 1995, Pg. 7.

"The Canadian mobile market hasn't been a very dynamic competitive environment. It was best described as a cozy duopoly....(t)his clubby environment has become somewhat less comfortable over the last year, as the number of licensed providers has doubled."³⁷

Speaking of Rogers Cantel, an analyst noted:

"The company reacted to the aggressive pricing plans of the new entrants by reducing the price points of its service plans. As a result, average revenue per month (ARPM) declined from \$58.98 in 1997 to \$54.17 in 1998".³⁸

This downward pricing trend is reflected in average revenue per subscriber per month in the last part of the 1990's.

Table 3.17: Canadian Average Revenue Per Sub/Month

	1995	1996	1997	1998	1999	2000
AR per Sub/Month	\$73	\$69	\$63	\$64	\$55	\$53

Source: CWTA, Wall Communications Inc.

3.3 Entry/Exit Considerations

3.3.1 Licensing and Regulation

Unlike most other industries, mobile wireless faces a significant natural entry barrier: radio spectrum is limited.³⁹ Because of spectrum scarcity, any new entrant must be licensed by Industry Canada. The licensing process can be both arduous and costly, with no guarantee that an applicant will succeed. Perhaps most significantly, entry (other than resale) has been limited to just four network

³⁷ Yankee Group, Feb. 1997, Pg. 4.

³⁸ Griffiths, McBurny Partners, "Wireless Signals", September 8, 1999.

³⁹ Technological advances can potentially mitigate the impact of spectrum scarcity; however, increasing demand for spectrum usage will heighten this barrier.

operators to this point in time⁴⁰. Until such time as Industry Canada chooses to release more radio spectrum, or until such time as an existing operator leases or sells some of its spectrum to a new party (subject to Departmental approval), no new network entrants can emerge. More over, the Department will generally choose the timing for new entry (if it in fact occurs), rather than the normal course where an entrant chooses the place and time for entry.

The Department has also used spectrum caps to limit the size of any given firm. The cap currently limits any operator to 55 MHz of spectrum. This can make exit from the industry more difficult in that existing operators (who could be potential purchasers of a mobile operator) may be unable to bid for a firm because of the spectrum cap. This would not necessarily be a significant barrier but for the compounding factor of foreign ownership limits.

Because entry must be controlled in addressing the allocation of scarce public airwaves (through the licensing process), a very powerful mechanism (i.e. ease of entry) to prevent non-competitive behavior is absent from the mobile wireless industry.

Finally, a more minor, but not necessarily unimportant, entry deterrent may exist due to the split regulation between the Department and the CRTC which creates a disadvantage for wireless carriers versus wireline carriers. A related concern involves a perception in the wireless industry that much of the Canadian telecom regulatory framework has been constructed with a "wireline" focus, to the detriment of the wireless industry.

3.3.2 Cost Barriers

The financial commitments necessary to build and operate mobile wireless network are substantial. The capital costs (generally fixed in nature) for the

⁴⁰ In the 2000 2GHz auction, W2N also acquired some limited spectrum. It has not yet built a

Canadian industry total billions of dollars. In the last six years, Canadian licensees have spent over \$8 billion dollars in capital expenditures.

Table 3.18: Capital Expenditures (\$ billions)

	1995	1996	1997	1998	1999	2000
Capital Expenditures	.7	1.1	1.9	1.4	1.3	1.7

Source: CWTA, Industry Statistics

Mobile wireless service providers must also pay sizeable license fees. Given that more spectrum, rather than less will likely be required in the future, these payments are likely to rise.

Table 3.19: Wireless License Fees (2000) (\$ millions)

	Bell	Rogers	MICROCELL	Telus
Annual Payment	720	394	N/A	356

Source: Annual Reports

The costs of sales and marketing can also be relatively high. The costs of acquiring subscribers (COA) can include a subsidy for the handset, marketing, advertising, and sales commissions. Sales commissions alone can be in the \$35 - \$150 range.⁴¹ Total COA is estimated to be in the \$400 range, although individual company situations can vary.⁴²

While perhaps not a major cost item, gaining access to appropriate antenna sites can in some instances be difficult, especially for the newer licensees. It takes time to apply and receive municipal and other approvals. In certain cases, the best (i.e. least expensive and best located) sites may already have been claimed

network, nor is it offering commercial mobile telephone voice services at this time.

⁴¹ Dundee Investment Research, Pg. 14.

⁴² Ibid. Roger's COA in 3Q 2000 was reportedly \$534. See also Scotia Capital Markets, Pg. 30.

by the original cellular firms. Obtaining suitable sites can prevent or increase the cost of entry into some geographic markets.

Looking ahead, the costs to build out 3G networks (and associated license fees for new spectrum) could cause cost levels to remain high for the foreseeable future, even though most service providers have largely built out their networks.⁴³

3.3.3 Technological Barriers

Much of the technology of the industry is embodied in the network. As such, equipment vendors, competing with each other, tend to ensure that technological advances are widely available.

However, to the extent that an operator wishes to adopt a new technology (such as Rogers move to GSM or the industry's move to 3G), the costs of acquiring new technology can be a significant factor. Network costs for a 2G service have been estimated at roughly \$1.200 (Can.) per sub, with an estimate of about \$750 (Can.) additional per sub for a 3G network.⁴⁴

Costs of spectrum for 3G have been in the \$800 - \$900 per sub range based on auctions in the U.K. and in Germany. It is, however, unclear what the costs would be in Canada.

3.3.4 Foreign Ownership Limits

Canadian foreign ownership limitations for telecom carriers present a significant entry/exit barrier. The rules can be summarized as follows:

⁴³ Microcell is less advanced than other operators. In addition, Bell and Telus may also ultimately build out their networks in each other's primary service territories, even though they have signed a network sharing agreement.

⁴⁴ Dundee, Pgs. 40-41.

- (i) Canadians must own a minimum of 80% of the voting shares in facilities-based carriers;
- (ii) At least 80% of the board of directors must be Canadian;
- (iii) An investor company is "Canadian" if 66 2/3 of the voting shares are held by Canadians; and
- (iv) The corporation must not be otherwise controlled by persons that are not Canadians.

There are several ways in which foreign ownership rules impede entry. The rules tend to increase the cost of capital to Canadian firms and therefore the attractiveness of entry into the Canadian market⁴⁵. For example, Canadian firms are forced to utilize less equity financing and increase their reliance on high yield debt financing. This is particularly critical for new entrants, which account for an increasing share of capital spending relative to incumbent carriers.

International comparisons indicate that countries with heavier ownership restrictions tend to exhibit lower telecom investment per capita than less restrictive countries. While Canada has performed reasonably well on the investment front, it has recently begun to fall behind relative to countries such as the U.S., Australia, Japan and certain European Union countries.

It is also clear that the growth of the Internet and demands for wireline and wireless high-speed services will tax the capacity of existing networks. The coming surge in on-line service demands will require substantial network upgrades, by both incumbents and new entrants. Most Canadian telephone and electronic information distribution companies are currently contemplating or planning the next stage of investment.

⁴⁵ For a more complete discussion, see A Policy Study of the Canadian Telecommunications Foreign Ownership Regime, Wall Communications Inc. January 28, 2000.

In other words, a new major phase of capital investment is required by the Canadian telecom industry, both to maintain competitive positioning in existing markets as well as to allow Canadian companies to capitalize on newly emerging opportunities. The foreign ownership rules work against achieving this investment, not only due to the higher cost of capital, but also because finding and obtaining capital from the more limited Canadian sources or having to seek financing outside the country slows the process down.

Most importantly, the rules prevent a particular class of entrant (i.e. foreign-owned) from fully participating in the Canadian market. Given the presence of several vigorous mobile operators in the U.S. and elsewhere, the Canadian environment loses out on the competitive discipline which their entry would provide.

3.4 Market Share/Rivalry Measures

3.4.1 Current Market Shares

Currently the market contains three roughly similar sizes firms and one smaller firm. No single firm has a clear-cut market-share advantage over any other firm.

Table 3.20: Shares by Subscribers (2000)

	BELL/BWA	MICROCELL	ROGERS	TELUS
Share (Market with Bell only)	30%	12%	32%	27%
Share (Market with BWA)	35%	11%	29%	25%

Source: Company Annual Reports, Wall Communications Inc.

Table 3.21: Shares by Revenue (2000)

	BELL	MICROCELL	ROGERS	TELUS
Share (Revenue)	27%	9%	27%	37%

Source: Company Annual Reports, Wall Communications Inc.

3.4.2 Share Trends

In the early years of cellular there were only two Canadian suppliers: Rogers and the incumbent telephone companies (which were allied as members of Stentor). The incumbent telephone companies included Bell and its associated companies, B.C.Tel, Telus, MTS and SaskTel. The incumbent telephone companies captured just over half of the market in 1986 (53%). Over the next four years, Rogers grew in share to more than half the market (51%). However, in 1991, the incumbents surged to a 55% share.

The incumbents continued to increase their market share against Rogers, reaching 60% by 1996. In that year, the newly licensed PCS companies began to earn some share. They continued to grow up until 1999. By 2000, Telus was a merged company combining Telus (Alberta) and B.C.Tel (British Columbia). With the break-up of Stentor, Telus became a competitor to the Bell companies.

By 1999, MICROCELL and Clearnet combined had captured 16% of the market. However, Telus purchased Clearnet in 2000, thereby removing one independent company from the market, but creating a significant-sized new competitor. The Bell-affiliated companies had been losing share after 1996 to the PCS companies, and experienced a significant reduction in national share in 2000 with the formation and breakaway of Telus.

Table 3.22: Market Share by Subs (1986-2000)

	BWA(or equivalent)	MICROCELL	ROGERS	TELUS	CLEARNET
1986	53%		47%		
1987	53%		47%		
1988	51%		49%		
1989	50%		50%		
1990	49%		51%		
1991	55%		45%		
1992	55%		45%		
1993	57%		43%		
1994	58%		42%		
1995	59%		41%		
1996	60%	.05%	40%		.1%
1997	59%	2%	37%		2%
1998	56%	5%	33%		6%
1999	52%	8%	31%		8%
2000	35%	11%	29%	17%	8%

Source: CWTA, Wall Communications Inc.

While market shares in the future will be subject to numerous factors, and is therefore difficult to predict, one investment firm suggests the following scenario:

"We believe that over longer periods of time, no network can gain a significant and sustainable competitive advantage based on products or services due to the commodity like nature of the service. In Canada, there are regional preferences however, and we believe that the market share for new subscribers will be split according to these preferences over a longer period of time. Telus will continue to dominate the West, Bell in the Prairies, Bell and Rogers in Ontario, Bell and Microcell in Quebec and Bell in the Atlantic provinces."⁴⁶

3.4.3 Behaviour Regarding Promotions, Marketing and Related

Descriptive and anecdotal evidence from industry analyst reports, CSR's and other phone company representatives indicates that industry-wide promotional

⁴⁶ Pg. 9.

and marketing efforts, including significant price reductions, became pronounced after the entry of Microcell and Clearnet. These efforts appear to have greatly increased the penetration rate of wireless phones in Canada, and also led to very low prices by international standards. Recent press reports indicate that the wireless phone companies may ease up on their promotional efforts and price battles so as to generate more positive financial results for shareholders, and to improve their ability to raise capital.

Recent behavior in the market has tended to emphasize promotions, which offer additional features, or lower prices for specific features for a limited time period. A customer must sign up by a specific date (and the customer must be a new subscriber) and the promotion has a limited duration (e.g. 6 to 12 months).

It appears that this type of pricing behavior has largely replaced straightforward price reductions: "Pricing pressure intensified during the first half of 2001, mainly via promotions (rather than changes to the basic minute bundles)".⁴⁷

3.4.4 Size Distribution of Firms by Subscribers

The market in 2000 is similar to the market in 1996 in terms of number of firms. Over time, however, the size distribution of firms has been getting closer. With just two firms in the 1980's of roughly equal size, the industry had evolved by 1996 to a point where one firm was 50% larger than the other. In 1996, the two new PCS entrants were marginal in terms of size.

Three roughly equal sized firms and one smaller firm now characterize the industry. The fact that no single firm has a significant market-share advantage is conducive to a more competitive environment. Further, the increase in number of competitors from two (in the 1980's) to four in 2000 is also more conducive to competition.

⁴⁷ Merrill Lynch, op. cit. Pg. 16.

3.4.5 Concentration Ratios

As noted earlier, concentration ratios can provide an indication of the potential for non-competitive behavior. These measures are frequently used by the Canadian Competition Bureau to examine the possible effects of a merger or acquisition.

The standard four-firm concentration ratio is extremely high in the Canadian mobile wireless industry (i.e. virtually 100%). However, we do not believe that this ratio is a proper indicator of the competitive nature of the industry. The existence of only four firms in the industry is due for the most part to decisions made by Industry Canada, and therefore does not reflect the workings of a free-entry/exit market.

The number of competitors in a market and their relative size (which can be measured by concentration ratios) can be related to profitability. As noted by an investment analyst, "the number of competitors (or intensity of competition) is a large determinant of profitability".⁴⁸

The analyst goes further, however, to suggest that the number of players in a market place significantly affects the industry's profitability. Nobel Prize game theorist Reinhardt Selten is noted as proving "mathematically" that five is the number of competitors where tacit cooperation between competitors breaks down. In other words, four competitors are too few to ensure a properly functioning competitive market.⁴⁹

Dundee speculates that the Canadian market has slightly less than four full competitors (i.e. they suggest the smallest Canadian network operator is only a

⁴⁸ Dundee, *op. cit.*, Pg. 27.

⁴⁹ Dundee also refers to empirical studies by McKinsey that supports this theory, but does not provide any specific publication references.

half a competitor⁵⁰), and that tacit cooperation is therefore likely or at least possible:

“With 3 ½ players, the Canadian wireless industry has the ability and conditions necessary to provide stable pricing according to Selten’s theory. With penetration levels still increasing and resulting in good growth rates going forward, the Canadian wireless players can tacitly cooperate and operate as an oligopoly.”⁵¹

We have extreme reservations regarding the casual application of theoretical work (such as Selten’s) to a real-world situation (such as the Canadian mobile industry). To begin with, Selten’s predictions are dependent on specific institutional assumptions regarding commitment possibilities in a quota cartel, which are clearly not satisfied in the mobile wireless market.

Further, more recent theoretical work suggests that in a Cournot model (which was utilized by Selten’s) four firms will produce competitive (or Walrasian outcomes).⁵² More importantly, the authors of recent theoretical work readily recognize that real-world conditions are essential in determining market behavior:

“We do not claim that there exists a unique number of firms which determines a definite borderline between non-cooperative and collusive markets irrespective of all institutional and structural details of markets.”⁵³

In any event, we do know that increasing the number of competitors from two to four has had a significant impact on the competitive status of the Canadian mobile wireless market based, resulting in much more price competition as well

⁵⁰ This assumption seems bizarre and completely unwarranted.

⁵¹ Dundee, op.cit., Pg. 29.

⁵² Huck, S., H. Normann and J. Dechssler, “Two are Few and Four are Many: Number Effects in Experimental Oligopolies”, Discussion Paper 12, Bonn Graduate School of Economics, March, 2001.

⁵³ Ibid., Pg. 2. The assumptions of the theoretical work include linear costs and homogeneous outputs, which are questionable in the mobile wireless market.

as service package choices. It should also be noted that in some cases, a greater number of wireless providers in a market can lead to poorer customer service.⁵⁴

3.5 Other Measures and Considerations

3.5.1 Scale and Scope Economies

Scale economies occur when the average unit cost of production decreases as the level of output is increased. This could occur, for example, in the mobile wireless industry if the average cost of a telephone call decreased as more telephone calls were produced (or made).

Since mobile telephone calls are not standardized (or homogeneous) and data on relevant costs is difficult to obtain, other indicators are often used to determine the existence of scale economies. The relatively high capital costs incurred in the mobile wireless industry provide one indication of scale economies. The average ratio of capital expenditures to revenue over the 1995-2000 period is 36%. Other than the blip in 1997, the capex to revenue ratio has typically been in the 30 – 40% range, which is relatively high.⁵⁵

Table 3.23: Industry Capital Expenditures as % of Revenue

	1995	1996	1997	1998	1999	2000
Capex/Rev	32%	38%	59%	34%	29%	30%

Source: CWTA and Wall Communications Inc

⁵⁴ See "A Call For Help", *Forbes*, September 17, 2001. One industry spokesperson has stated that "The U.S. industry is a freak of nature, an artificial creation with more competitors than the economic reality justifies".

⁵⁵ Investment relative to revenue in the total Canadian telecom industry is typically in the 20% range.

Adding up capital costs over the period and dividing by the number of subscribers in the industry provide another perspective.⁵⁶ This analysis indicates that Capex per sub peaked in 1998 and has been declining since then (i.e. the further addition of subscribers will tend to lower per subscriber costs on average).

Table 3.24: Cumulative Capital Cost/Sub

	1995	1996	1997	1998	1999	2000
Cumulative Capex	\$.7B	\$ 1.8B	\$ 3.7B	\$ 5.1B	\$ 6.4B	\$ 8.1B
Subs	2.6M	3.4M	4.2M	5.3M	6.9M	8.8M
CC/Sub	\$269	\$529	\$881	\$962	\$927	\$920

Source: CWTA and Wall Communications Inc

Scope economies arise from joint production or the provision of complementary products. It is likely that the production of voice and data services over digital mobile networks enjoy a degree of economies of scope, although the data to test this empirically is not available.

3.5.2 Vertical and Horizontal Integration

Integration between various types of telephone companies has become prevalent in North America. In Canada, both Bell and Telus have wireline operations. Bell is also affiliated with satellite, international telecommunications, and broadcasting business lines. Rogers is integrated with cable television and was at one time involved in long distance wireline telephony. Microcell, through ownership ties, was affiliated with international fiber telecom, and is currently affiliated with international wireless activities. The most important type of integration to a wireless carrier is arguably an affiliation with wireline activities.

To the extent that integrated companies can gain cost advantages over competitors, certain operators may be better positioned to compete. But there

⁵⁶ Even if capital expenditures are depreciated at 10% a year, the results remain essentially the

may be additional benefits related to regulatory treatment of integrated versus non-integrated carriers. For example, some observers have claimed that Bell was relatively indifferent about the CRTC's recent levy of 4.5% of revenues on wireless carriers as a contribution payment to basic telecom service in high-costs serving areas since Bell wireline service is a major beneficiary of contribution payments.⁵⁷ The impact of the levy on other wireless carriers was considerable.

The standard economist concerns about the potential for upstream or downstream price abuse do not seem warranted with respect to mobile/wireline integration since the relations are more horizontal than vertical. However, because linkages between the industries exist (e.g. contribution flows) and because the services of currently distinct telecom service markets may become more substitutable in the future, ongoing monitoring and further attention may be warranted.

3.5.3 Impact of Technological Change

The spectre of competition-enhancing technological change can add a degree of competitive pressure to a market. This is particularly true when new entrants can adopt the technological change.

In the case of the Canadian mobile wireless industry, as noted earlier, new entry is severely limited due to spectrum allocation and licensing considerations. As such, technological change has made its mark from within the industry, rather than from outside (i.e. the evolution from analog to digital, the move from 2G to 2.5G and 3G). This is likely to continue for the foreseeable future.

While the faster adoption of new technologies will tend to benefit one (or more) existing competitors, the ability of a given competitor to acquire and implement

same.

⁵⁷ CRTC Decision 2000 -745.

new technologies may ultimately be more a cost consideration than anything else (i.e. are all competitors equally able to finance the acquisition and deployment of new technologies).

3.5.4 Resale Requirements and Conditions

As part of the licensing of new PCS entrant, Industry Canada required existing mobile carriers to allow the new entrants to utilize their analogue networks to extend service into unbuilt regions.

Since all four main licensees have been required (as part of the comparative licensing process to allocate spectrum) to build out their networks and achieve coverage targets according to specific timetables, the requirement to permit resale using incumbent analogue networks may only need to be a transitional measure. Once all licensees have built out their own networks, mandated resale, theoretically at least, may not be critical. This may not be true in practice, however, if some providers are unable to build out their own networks.

More over, the recent announcement by Bell and Telus to extend current roaming and resale agreements between the two companies over their digital PCS networks creates a fundamental change in the resale environment.⁵⁸ The agreement covers voice and data services at 1.9 GHz and 800 MHz, as well as "the next generation of wireless technology, such as the evolution to 3G or the CDMA 2000 path, including 1XRTT deployment".⁵⁹

Since specific details on the agreement are unavailable to the public, the implications for the competitive status of the industry remain unclear. On the one hand, it could allow greater service competition (especially more service provider choice for consumers) in rural areas. On the other hand, it may offer substantial cost and/or other market power benefits to the two wireline-integrated carriers.

⁵⁸ Bell Press Release, Oct. 17, 2001.

⁵⁹ Ibid.

Close monitoring of the details and the implications of the agreement will be required.

It should also be noted that Microcell's business and operating model explicitly opened up its network for resale by third parties. Although this opportunity for third-party resale looked promising for more competition initially, very few third parties have signed on.⁶⁰ Given the relatively low service prices in the Canadian market and the lack of profitability the reluctance of third party entrants is perhaps not surprising.

3.5.5 Access to and Cost of Capital

The ability of each mobile service provider to access capital varies significantly. This situation has become aggravated with the recent retrenchment of capital markets.

"This year's plunge in telecom equity and debt prices reflects the new market consensus" that the telecom sector is over capitalized. ... (t)his increases the risk for highly leveraged emerging players and capital costs for stronger companies".⁶¹

While telecom companies in general are feeling the crunch of tight capital markets, mobile wireless companies may be particularly vulnerable. Investment spending in mobile may be less discretionary than other telecom sectors, especially as carriers move to rollout data services.

Canadian foreign ownership rules are another barrier to accessing capital. These restrictions, while increasing the costs of capital for all telecom players,

⁶⁰ SimPro PCS and Cityfone PCS have both entered into agreements with Microcell, but both offer relatively limited coverage and are small relative to network-based service providers.

⁶¹ Merrill Lynch, June 29, 2001, Pg. 13.

are relatively more onerous to smaller companies who must rely on more debt financing and do not have the credit ratings of larger competitors.

Larger, diversified entities, such as BCE, can raise capital as part of a corporate-wide initiative and deploy funds to specific divisions or operating companies, whereas more narrowly functioning companies like Microcell do not have the same latitude.

Some analysts have speculated that the shortage of capital and equity markets make non-wireline integrated operators more susceptible to takeover or bankruptcy.⁶² In any event, current capital market conditions clearly are placing greater pressure on certain mobile operators, which is at the very least distracting to their competitive efforts.

3.5.6 Expected Future Capital Requirements

As noted earlier, industry capital requirements have been significant in the last five to six years, and have averaged 36% of revenue per year.

Table 3.25: Canadian Wireless Industry Capital Expenditures (billions \$)

	1995	1996	1997	1998	1999	2000
Cap. Ex.	\$0.7	\$1.1	\$1.9	\$1.4	\$1.3	\$1.7

Source: CWTA and Wall Communications Inc.

The extent to which the pace of investment continues will depend on several factors, including the timing of the release of new spectrum for 3G and the perceived demand for new data services. While the timing of new spectrum release may be largely out of the hands of mobile operators, choices regarding

⁶² Merrill Lynch, Pg. 14.

network extensions and upgrades are not (although they will be subject of course to capital availability and costs, demand growth, etc.).

The benefits of investing in mobile data could be greater for telco-affiliated mobile carriers, as: they already have ownership of wireline portals; they have a disproportionate share of and ability to sell to corporate markets; and they utilize CDMA which may offer better data speeds than competing platforms.⁶³

There is widespread acknowledgement in the industry that future prospects will revolve around expanding into the mobile data business. As such, the longer-term requirement to invest in the provisioning of these services appears unchanged, even if capital markets and the general state of the economy may have tempered short-term objectives.

⁶³ Merrill Lynch, op. cit., Pg. 21.

4. MEASUREMENT CONCLUSIONS

The previous section identified and examined multiple tests and measures of competitiveness in the Canadian mobile wireless industry. The purpose of these individual measures is not to determine which, if any, mobile operator is "most competitive", but rather to assemble meaningful evidence on the degree to which the Canadian market can be considered "competitive". The conclusions stemming from the many individual measures are provided below.

A letter grade is used to indicate relative need for concern regarding the factors affecting competitiveness in each category. As such, the grades do not necessarily reflect specific market behaviour or actions by competitors, regulators, policy-makers or any other party. The grades reflect the consultant's view of where there is or is not a need to closely monitor conditions to ensure that, overall, the industry remains competitive.

4.1 Product-related Measures

The scope and variety of services, packages, features and coverage indicate a strongly competitive state with respect to product (or non-price) related competition.

As described earlier, most Canadian consumers enjoy a wide variety of choices in how they can receive mobile telephone service. From pre-paid options to numerous number-of-minute packages, from handset and service features, from combination packages of anytime minutes, long distance and calling features, all the way to highly customized packages, the Canadian market offers numerous product/service choices. While there are still regions of the country that do not have terrestrial wireless service available, the vast majority of the Canadian

population can access a mobile wireless service, usually with a choice of at least two suppliers.

WALLCOM ASSESSMENT: A

4.2 Price-related Measures

The wide variety of choices in non-price related mobile service characteristics is echoed in price options. Similar to the (non-price related) options available in service packages and features, Canadian consumers have numerous choices in price-points for mobile wireless service.

Prices have been falling over time (particularly after the entry of the PCS licensees) and compare favourably with prices in the United States. The lack of supra-normal returns (or any profitability) in the industry provides further evidence of the vigorous price competition in the market.

WALLCOM ASSESSMENT: A

4.3 Entry/Exit Conditions

The mobile wireless industry is a difficult industry to enter. While the technology to provide service does not present a particularly imposing barrier (since numerous vendors are available to supply network and other equipment and until fairly recently, they acted as key financiers as well), and although the costs of networks and other costs will limit the number of firms able to finance entry, the key barrier concerns the physical scarcity of spectrum. As a fundamental input for the production of mobile telephone calls, the limited amount of spectrum means that (under current technologies) only a limited number of entrants can be accommodated.

It is the responsibility of the Department to allocate the available spectrum. No one enters the market until such time as the Department decides to release additional spectrum, and until potential entrants have obtained spectrum, and applied to and received a license from the Department⁶⁴.

A second key entry/exit barrier concerns the foreign ownership limits which currently apply to Canadian telecom carriers.

Together, the lack of physical availability of spectrum, and the existing restrictions on foreign ownership, create significant entry barriers into the Canadian mobile wireless industry.

WALLCOM ASSESSMENT: D

4.4 Market Share/Rivalry Measures

The industry has changed from two competing entities (up until the mid-1990's) to the current number of four. The end result has been a related decrease in any firm's given market share. The industry trend in market share and concentration is, therefore, moving in a preferable direction.

Two significant changes have seen the acquisition of one of the newest entrants (Clearnet) by an incumbent (Telus), but also the departure of one firm (Telus) from the largest competitor (Stentor).

⁶⁴ Of course, the Department has been instrumental in bringing the mobile industry into existence, and in helping achieve a competitive environment. The finding that spectrum scarcity and the licensing process create a barrier to entry is not intended as a criticism of the Department, but rather as a statement of one factor which has a bearing on the competitive status of the industry.

There are now three roughly equal-sized firms and one smaller firm. While the relative concentration in the mobile wireless industry might be considered cause for concern in some circumstances, the limited amount of spectrum which is available and the minimum amount required by an operator to provide service effectively implies that only a limited number of competitors can exist (at least under existing technologies). There are no indications of market power abuse resulting from the high levels of industry concentration, although continued monitoring should be maintained.

The competitors continue to match or outdo each other in offerings and promotions, while at the same time trying to introduce distinctiveness into their own offerings.

WALLCOM ASSESSMENT: B +

4.5 Other Measures and Considerations

There are indications that economies of scale may exist in the market, but not that the appropriate industry structure is less than the current number of firms. That is, while economies may exist, they do not appear to be harmful to competition.

The existence of vertical integration, particularly between wireline and wireless partners, has the potential to undermine (to some extent) the competitiveness of the industry. It may also permit some firms to enjoy legitimate cost advantages. Ongoing monitoring should be maintained.

Mandated resale of analogue service on existing networks for the PCS entrants provided immediate coverage benefits to them. One firm (Microcell) has voluntarily opened up its digital PCS network to resale, although the market take-

up has been limited. More recently, the announcement of Bell and Telus to allow resale on each others digital networks can both bolster competition (e.g. in areas where a carrier hasn't built out) but could also theoretically lead to a greater level of market cooperation than is beneficial to other competitors or to consumers. Ongoing monitoring is advisable.

The ability to access and the cost of capital varies from competitor to competitor. This situation can affect the ability of some carriers to compete as effectively as others. In addition, it may be important to building the next generation of service networks. Ongoing monitoring is recommended.

WALLCOM ASSESSMENT: B

5. ADDITIONAL POTENTIAL POLICY RESPONSES

As noted in the previous section, there are a number of areas that could benefit from review or ongoing monitoring by the Department. These include the dual regulation of the industry by the CRTC and Industry Canada, foreign ownership rules, the behaviour of integrated wireline/wireless operators and the conditions of network sharing arrangements.

In addition, there are a number of other measures that have been suggested by analysts and industry observers or which have been adopted in other countries. These are examined, beginning with approaches adopted in the U.S. and the U.K.

5.1 Review of U.S. and U.K. Approaches

The scarcity of radio spectrum (and therefore the need to find an appropriate means of allocating spectrum) has led many other countries, including the U.S. and the U.K., to adopt a licensing approach.

In the U.S., regulation and policy-making for the wireless industry resides with the Federal Communications Commission (FCC). The FCC has adopted a number of measures to encourage and ensure competition, including a regional approach to licensing, the use of spectrum caps and a form of ongoing monitoring of the state of industry competition.

While the FCC in its sixth and most recent Report on the State of Competition has concluded that "in the year 2000, the wireless industry continued to experience increased competition and innovation"⁶⁵, not all observers view the industry's condition as satisfactory.

⁶⁵ FCC, Sixth Annual Report on the State of Competition in the Wireless Industry, June 20, 2001.

“A confluence of factors – chiefly a deluge of new users and ill-advised government meddling – has conspired to create a business that is infamous for shoddy service, poor coverage and outright hostility toward its own customers”.⁶⁶

The reason for the poor state of affairs, critics have charged, is the FCC has allowed “*too much*” competition:

“Most cities have room for three, maybe four, competing carriers, and that is how many serve overseas markets such as Japan and almost every European country. In the U.S. six national carriers compete for business, and many regions have a seventh or eighth choice, each with patchy coverage by foreign standards”.⁶⁷

As a result, it has been argued that competition has driven prices to such low levels that overuse of existing capacity occurs (creating network congestion and dropped calls). Further, low prices have put wireless operators in a precarious financial position where they have been unable or unwilling to raise the necessary capital to build out in step with rising demand.

The FCC spectrum cap policy (introduced in 1994) was in part a reaction to a situation where duopolistic regional markets were leading to price increases, rather than the price decreases normally associated with healthy competition.⁶⁸ While spectrum caps have ensured that no one company could grow too large, some critics believe they do not permit companies to provide the quality of service that consumers are demanding and that they are an attempt by government to “manage” competition to the point of determining the “right”

⁶⁶ Forbes, “A Call for Help: The Cell Industry Bleeds Red Ink and Provides Crummy Call Quality”, September 17, 2001.

⁶⁷ Ibid.

⁶⁸ The spectrum cap is defined as 45 MHz of the 190 MHz available in a single market.

number of competitors in the market. The counter-argument is that without caps the industry would quickly collapse back to a highly concentrated, non-competitive industry.

Concerns over the state of the industry have led the FCC to consider re-examining the need for price caps.⁶⁹ It is expected that, if the cap is lifted, the most heavily populated urban markets will experience consolidation among competitors.

The U.K mobile industry is also regulated by a single agency. Oftel has, like the FCC in the U.S., begun to monitor the state of competition in the industry. They recently released their second report since 1999.⁷⁰ Similar to Canada, the U.K. first licensed two cellular companies and then added two more entrants after a few years. They have just recently licensed a fifth network operator.

The most recent report reflects the agency's view that the industry is naturally divided between wholesale markets (network operators) and resale markets (service providers). The U.K. approach also utilizes specific regulatory requirements for mobile operators depending on whether an operator is capable of exercising market influence or if they have significant market power.⁷¹

In general, Oftel has concluded that competition is healthy. Evidence cited by Oftel includes falling prices, evidence of competition on quality of service, an overall high and stable level of customer satisfaction and favorable comparisons against other European benchmarks.

However, certain areas appear to provide less than clear evidence of vigorous competition. These areas include prices for international roaming and mobile to

⁶⁹ Y. Iwatani, Reuters News Service, Chicago, August 26, 2001. "U.S. Wireless Acquisitions May Rise if Limits Lifted".

⁷⁰ Oftel, "Effective Competition Review: Mobile", February, 2001

mobile calls, the magnitude of entry barriers, potentially levels of profitability and a lack of easy-to-understand consumer information.

In a recently announced examination, Oftel intends to consider removing certain regulatory measures if it is found that the above-noted concerns are not material.

The view of Oftel that the industry is naturally divided between wholesale and resale components may offer the agency a unique means of addressing barriers to entry. With four network operators currently licensed and operating and a fifth recently licensed, the regulator appears to be concentrating on ensuring that retail operators get access to underlying networks at fair and reasonable terms, and that ultimately competition among network operators will result in fair pricing and treatment.⁷²

Currently, the two largest network operators have license requirements to allow national roaming for competitors like the new 3G licensee, Dolphin. In addition, some operators are prohibited from taking any action (e.g. through agreements with mobile handset manufacturers or otherwise) to make it more difficult than it would otherwise be for their telephony customers to access the portals of their choice via mobile handsets.

The approach of both the U.S. and U.K. regulators has evolved to an ongoing monitoring of competition in their respective industries. In addition, both regulators will identify fairly specific areas of concern (e.g. international roaming rates) and conduct detailed examinations on a case-by-case basis, if required.

⁷¹ For example, Vodafone and BTCellnet are currently designated as having "significant market power" and must therefore not unduly discriminate in the provision of interconnection services.

⁷² It should also be noted that all five network operators use GSM technologies which creates further ease of entry and exit for retailers.

This approach combines regular periodic reviews with a pragmatic ability to quickly investigate an issue or problem if necessary. We believe this approach would also work well in Canada.

5.2 Other Policy Measures and Considerations

Spectrum Caps

While there has been some discussion in the U.S. that spectrum caps may undermine healthy competition, there is no evidence at this point of a similar concern in Canada. Spectrum caps, in our view, prevent potentially harmful concentration in the industry. Nor does there appear to be the same magnitude of congestion problem occurring in areas like the U.S. The auctioning of additional spectrum last year in Canada has helped alleviate any immediate problems.

However, spectrum caps do have drawbacks. As new spectrum is identified for international purposes, then Canadian carriers must be able to acquire spectrum in certain designated frequencies. A cap can make that acquisition problematic. In addition, it appears that the absolute cap on spectrum amounts may need to be increased when the Department releases more spectrum for 3G. A cap would still exist, but all licensees would be entitled to larger amounts.

Reserving Spectrum for New Entrants

Some observers have suggested that if the Department auctions off new spectrum, a portion should be set aside solely for purchase by new entrants. The rationale underlying this notion is that it would ensure that "smaller, less financially capable" entrants are not squeezed out by larger players that have a much greater financial capability to bid on spectrum.

This measure seems to defeat one of the underlying purposes of an auction, that being to ensure that the most efficient operators will bid the highest prices for spectrum.

While we do not see any merit in setting aside "new entrant" spectrum at this time (primarily because the market appears to be operating in a healthy, competitive manner for the most part), we believe there may be some merit in withholding some spectrum from the market. This provides an ongoing leverage for the Department which could be used in circumstances where the competitive vigor of the industry diminishes. By holding back a minimal (but sufficient for enabling a new competitor) amount of spectrum, the Department is always in a position to boost competition relatively effectively, if not quickly.

There are clearly costs of this measure (i.e. idle spectrum). These would need to be considered carefully in assessing this measure.

Mobile Virtual Network Operators

A mobile virtual network operator is an organization which provides mobile telephony services to its customers but does not have an allocation of spectrum. As noted earlier the U.K. has embraced this approach and many other European countries have taken regulatory positions roughly similar to the U.K. on this matter.

In Canada, one firm (Microcell) has voluntarily gone the route of wholesale supply. To this point, at least three resellers have begun operation.⁷³ However, take-up does not appear to be as popular as first thought and the third-party resellers remain quite small.

⁷³ These include SimPro, Cityphone and Connectel, although MICROCELL is also technically a reseller of Microcell.

There does not appear to be any compelling reason at this point to impose mandatory access by third-parties to wireless networks, but it is an area which might be monitored.

Interconnection Agreements

We believe that mandatory requirements for interconnection arrangements among wireless operators should only be considered if the market fails to provide consumers with services at reasonable prices and terms. However, encouragement of voluntary arrangements may be desirable.

The industry association (CWTA) is currently working with its members to implement interconnection agreements for the provisioning of SMS services.

Number Portability

Number portability has long been considered an important condition for telecom competition, particularly in the wireline world, but also in wireless. Australia introduced wireless number portability in September of this year with the hope that it will increase competition among the country's three mobile wireless operators.⁷⁴

Number portability has clear benefits to consumers (e.g. lower switching costs). However, it can be a costly measure for operators to implement, while at the same time increasing the potential for churn.

⁷⁴ Wireless Now, September 6, 2001.

Given that competition is healthy in Canada, there appears to be no need to force WNP on carriers at this point. Ongoing monitoring on the state of competition should, however, be maintained.

Easing Access to and Lowering the Cost of Capital

While the cost of capital is an ongoing industry concern, it is not unique to the mobile wireless industry. Nor is it likely the industry's most pressing concern. The industry's current unprofitable status will not be altered by an ability to borrow more money or to borrow at slightly lower costs. However, if there are policy-induced reasons why one firm can access lower-cost capital, then perhaps those policies should be changed. There is, for example, some pressure to review foreign ownership laws, purportedly for this reason.

The industry needs to develop its revenue side, probably with new, higher-margin services. To the extent that competition in new services may suffer due to a company's inability to raise capital, then finding a way to ease capital pressures may become a more immediate concern. Currently, however, there does not appear to be any additional role for the Department in this area.

