COMPETITION IN THE CANADIAN MOBILE WIRELESS TELECOMMUNICATIONS INDUSTRY

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I. Introduction

The purpose of this paper is to examine several issues arising from the report of the Telecommunications Policy Review Panel and the Industry Canada spectrum auction framework consultation paper regarding the state of present and future competition in the Canadian mobile wireless telecommunications services market.[1] In particular, this paper will: (1) comment on both the assessments that have that have been made regarding the relative and absolute competitiveness of the Canadian mobile wireless industry and the general assessment methodology involved; (2) comment on the assessments that have been made regarding the role that a fourth network operator might have played or might play in increasing competition in the mobile wireless market and; (3) assess the merits of arguments that regulatory preferences and/or explicit or implicit subsidization in the form of concessionary spectrum and access pricing should be employed in order to induce additional mobile wireless network operator to enter the market.

The paper concludes that the decision to enter the mobile wireless market or any other new market should be made on the merits rather than being induced by regulatory favours or concessions. New entrants should expect to pay competitive prices – no more and no less - for the inputs and facilities they require. The paper further concludes that the sanctions and remedies available under the *Competition Act* and the *Telecommunications Act* are sufficient to provide a reasonable assurance that the price of spectrum and the access prices of any essential facilities in the hands of the incumbents will be competitive and that the imposition of blanket *ex ante* obligations and restrictions on incumbents would be counter-productive.

Road map

The balance of section I summarizes the conclusions reached in report of the Telecommunications Policy Review Panel and the Industry Canada spectrum auction framework consultation paper regarding both the state of competition in the mobile wireless services market and public policies relating to it. Section II addresses methodological problems encountered in making international comparisons of the structure and performance of national mobile wireless markets. It concludes that while these comparisons make for good after-dinner speeches, they are of little use for public policy purposes. Section III examines issues relating to the state of competition in the Canadian mobile wireless market. These issues include the dynamic nature of competition, the role a fourth carrier might play and the competitive effects of multi-market firms. Section IV examines the remedies for exclusionary conduct that are available under the *Competition Act* and under section 27(2) of the *Telecommunications Act* and finds that they are sufficient. It further concludes that the imposition of ex ante

[1] Telecommunications Policy Review Panel Final Report 2006 (Industry Canada, Ottawa, March, 2006) Available at: http://www.telecomreview.ca/epic/site/tprp-gecrt.nsf/en/h_rx00054e.html
"Consultation on a Framework to Auction Spectrum in the 2 GHz Range including Advanced Wireless Services" (Industry Canada, February, 2007). Available at:
http://strategis.ic.gc.ca/epic/site/smt-gst.nsf/vwapj/aws-consultation-e.pdf/$FILE/aws-consultation-e.pdf

restrictions and obligations would be redundant and counter-productive. Section V summarizes the fundamental conclusions of the paper.

I.1 Reasoning and recommendations of the Telecommunications Policy Review Panel.

The Telecommunications Policy Review Panel compared the Canadian mobile wireless industry with wireless industries in other countries and found it wanting in terms of penetration (take-up), use, technology roll-out and pricing. The Panel conceded, however, that historic comparisons with Europe and Asia are of little value. It maintained, nevertheless, that comparisons with the United States are instructive and concluded that relative to its U.S. counterpart, the Canadian industry has under-performed in terms of take-up, use and pricing.[2] The Panel opined further that the U.S. mobile wireless market has been more competitive in several respects than the Canadian market and that this may have been a cause of the performance gap it discerned:

> The smaller number of mobile providers in Canada — and the fact that all three national wireless service providers are also owned by large telecommunications service providers that also provide wireline services — may mean that there is less competition in the Canadian wireless market than in the U.S. market, which consequently has resulted in higher prices, less innovation, lower uptake and lower rates of usage.
>
> After reviewing this evidence, the Panel concludes that Canada's mobile wireless industry lags behind its major trading partners on a number of key measures. This finding reinforces the Panel's belief that because of the growing importance of this segment, Canada should develop a more efficient and vibrant wireless industry.[3]

It is not clear what the Panel meant when it argued that Canada should develop a more efficient and vibrant wireless industry. There is not much in its report that speaks to either the absolute or the relative efficiency of the Canadian wireless industry. Nor does the Panel expand on what becoming more vibrant might entail. The term is open to a variety of interpretations. It is reasonable to infer that the Panel thought the mobile wireless market in Canada could be more competitive in some respects and that an additional facilities-based competitor or quasi-facilities-based competitor might provide this additional competition. The Panel's recommendations regarding the wireless industry can be interpreted as attempts to make the entry of an additional competitor easier. This paper addresses the question of how far public policy should go to facilitate new entry into this or, for that matter, any other industry.

The Panel's recommendations regarding the wireless industry are relatively modest. They involve the facilitation of potential regulatory intervention in facilities-sharing

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[2] Telecommunications Policy Review Panel Final Report 2006, pp.1-19-1-20.
[3] Telecommunications Policy Review Panel, p.1-21.

disputes and a possible return to the use of spectrum caps. With respect to facilities sharing the Panel recommended:

> The CRTC should be empowered to regulate and promote the sharing of antenna towers used for telecommunications purposes, resolve disputes regarding tower access, and enforce its regulations in an effective and timely manner.
>
> The CRTC should be empowered to prohibit wireless carriers from entering into exclusive arrangements for locating telecommunications antennas on rooftops …[4]

With respect to spectrum policy, the Panel recommended:

> Industry Canada should develop a new spectrum policy to provide clear direction to the CRTC in exercising its new authority to manage and regulate Canada's radio spectrum. The new policy should take into account the work completed by Industry Canada as part of its ongoing spectrum policy framework review, and should ensure that the following areas are addressed:
>
> (a) availability of adequate spectrum to meet demand for deployment of fixed and mobile broadband networks across Canada,
>
> (b) availability of licensed and license-exempt spectrum for the U-CAN program recommended in this report,
>
> (c) reliance on market-based approaches to spectrum management as much as possible,
>
> (d) establishment of market-based exclusive spectrum rights (i.e. ability to buy, sell and lease spectrum holdings) and elimination of barriers to the development of secondary markets in spectrum,
>
> (e) recovery and "refarming" of previously assigned spectrum that is unused or underutilized in order to accommodate new services,
>
> (f) review of current license fees to correct fee imbalances that may exist among service providers, separating where practical cost-recovery fees from those fees charged for the use of a limited public resource, and applying market-based pricing for non-auction licenses,
>
> (g) streamlining and standardization of licensing processes, and
>
> (h) continued use of regulatory mechanisms such as spectrum caps (aggregation limits) where spectrum is scarce in order to provide an opportunity for new entrants to acquire spectrum and for Canadians to have an expanded choice of service providers.[5]

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[4] Telecommunications Policy Review Panel, p.1-21.
[5] Telecommunications Policy Review Panel, p.12-12.

As is often the case, the devil is in the detail. Tower sharing is a common practice in the wireless industry but regulatory intervention in what is otherwise a commercial transaction raises the question of whether tower sharing on concessionary terms might be mandated in order to induce new entry. Similarly, spectrum set asides for new entrants may result in spectrum being sold to new entrants at prices that are below its value in a competitive market, again, in order to induce entry.

While public policy can always induce the entry of one or, indeed, many additional competitors if the subsidy or implicit subsidy to them is large enough, subsidizing new or, for that matter, existing competitors is inefficient. That is, it is not a good use of resources and is not beneficial to the economy as a whole. This does not mean that there is nothing that governments can do to facilitate additional competition. Governments can encourage additional competition in the mobile wireless market or, indeed, in any other market by pursuing policies that reduce barriers to entry resulting from restrictive government regulations of various kinds or from exclusionary practices on the part of incumbent firms. Remedies include elimination of entry-inhibiting regulations and judicious enforcement of existing competition laws. These remedies are available to apply to all markets.

I.2 The Industry Canada spectrum auction framework consultation paper

Much of the Industry Canada consultation paper is devoted to the discussion of policy issues associated with fostering a competitive wireless market. The use of the word "fostering" might be taken to imply that Industry Canada is of the view that the mobile wireless market is presently not competitive or not sufficiently competitive. In this, the consultation paper appears to have been influenced considerably by the Telecom Policy Review Panel report. It cites three of the Panel's recommendations as being of particular relevance:

> On March 22, 2006, the Telecommunications Policy Review Panel released its final report, which contained over 120 recommendations aimed at improving Canada's telecommunications policy and regulatory framework and ensuring that Canada has a strong, internationally competitive telecommunications industry. Some recommendations that are particularly relevant to this consultation include:
> 5-9 (a) availability of adequate spectrum to meet demand for deployment of fixed and mobile broadband networks across Canada;
> 5-9 (c) reliance on market-based approaches to spectrum management as much as possible;
> 5-9 (h) continued use of regulatory mechanisms such as spectrum caps (spectrum aggregation limits) where spectrum is scarce in order to provide an opportunity

> for new entrants to acquire spectrum and for Canadians to have an expanded choice of service providers.[6]

The consultation paper goes on to recite two competition-promoting principles that have guided Industry Canada in the past in the assignment of spectrum via auction. The first relates to the use of participation restrictions (set asides):

> With regard to restricting participation, it is the view of the Department that an entity that currently provides telecommunications services should be restricted from holding certain licences if:
> (a) that entity possesses significant market power in the supply of one or more telecommunications services in a region covered by the licence to be auctioned;
> (b) a new entrant is likely to use the licence to provide services in competition with that entity's existing services; and
> (c) the anti-competitive effects of that entity acquiring a licence are not outweighed by the potential economies of scope arising from the integration of the spectrum in question into that entity's existing network.[7]

The second competition-promoting principle relates to the use of spectrum aggregation limits (spectrum caps):

> With regard to applying spectrum aggregation limits, it is the view of the Department that when multiple licences for the use of spectrum in a given geographic area are auctioned, and these can be used to provide closely substitutable services, limits on the amount of spectrum that any single bidder is allowed to acquire may be required to ensure competitive markets. Spectrum aggregation limits may be imposed in the following circumstances:
> (a) a bidder that acquires an amount of spectrum beyond a certain level would not face effective competition from providers of closely substitutable services provided by firms that use infrastructure other than the spectrum being auctioned; and
> (b) the anti-competitive effects arising from the acquisition of an amount of spectrum beyond a certain level by a single bidder would not be offset by lower costs or higher valued services resulting from having a single entity hold this amount of spectrum.[8]

The consultation paper then touches on the present state of competition in the mobile wireless market, referring briefly to the respective monitoring roles of the CRTC and the Competition Bureau in this regard. It cites a number of findings in the CRTC Telecommunications Monitoring Report regarding the structure of the wireless industry but ignores explicit statements made by the CRTC regarding the intensity of competition

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[6] Industry Canada, "Consultation on a Framework to Auction Spectrum in the 2GHz Range including Advanced Wireless Services" (February, 2007), p.14. Available at: http://strategis.ic.gc.ca/epic/site/smt-gst.nsf/vwapj/aws-consultation-e.pdf/$FILE/aws-consultation-e.pdf
[7] Industry Canada, 2007, pp.14-5.
[8] Industry Canada, 2007, p.15.

in the industry. The consultation paper also presents a view of the oversight role played by the Competition Bureau and concludes that any decisions made by the Bureau would not be relevant to Industry Canada's assessment of the need for additional competition. It signals what this assessment is, noting that in a market with a few competitors and significant barriers to entry, the discipline of competition and potential competition may not be sufficient to protect consumer interests. It then poses the question of whether the state of competition in the mobile wireless market in Canada is such that the competition-promoting benefits of imposing set-asides and/or spectrum aggregation limits would likely exceed the costs of inducing inefficient entry:

> Given expressed interest in this spectrum and the preceding discussion, an important consideration is whether it is appropriate to take measures intended to enable entry in a situation where the government controls access to the spectrum needed for market entry. The unavailability of spectrum also constitutes a barrier to market entry.
>
> In the past, policy measures designed to assist market entry by promoting access to spectrum, such as spectrum aggregation limits, have been used to enhance the variety and quality of services and other benefits for consumers, thus increasing the level of competition in the marketplace and promoting positive trends for consumers.
>
> In the responses to the AWS consultation, views were expressed that it may be possible for some of the incumbent carriers to dominate the market by purchasing all or a majority portion of the spectrum being auctioned. Such an outcome could have the effect of lessening potential competition by preventing market entry of new AWS service providers and may be contrary to the public interest.[9]

The position of the consultation paper is that circumstances are such that policy measures intended to enable new entry are, at least, worth discussing. To this end, the consultation paper poses a series of specific public policy questions on which it seeks comment.

The first question is whether competition in the mobile wireless market is presently and is likely to remain so weak relative to what is realistically attainable that special measures are required to assist new entrants:

> In consideration of the present circumstances, the Department seeks comments on whether there is need for measures intended to enable market entry in the AWS spectrum auction.[10]

The second question is whether spectrum should be set-aside for new entrants to bid on and, if so, how much and under what conditions:

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[9] Industry Canada, 2007, p.21.
[10] Industry Canada, 2007, p.22.

> The Department seeks comments as to whether a certain amount of spectrum should be set aside for new entrants. Comments should include a precise description of those who should or should not be entitled to bid.
>
> Comments are sought on the amount of spectrum that could potentially be set aside. Comments should include whether a single block should be set aside or if the set-aside could be broken up into 2 or more blocks.
>
> Comments should stipulate how such provisions would be in the public interest, and provide supporting evidence or rationale.
>
> Comments are sought on the implementation of the set-aside post auction and the duration of and the duration of any conditions of licence specific to the set-aside that may affect the licence such as divisibility and transferability.[11]

The third question is whether spectrum caps should be imposed on wireless providers and if so, at what level and for how long:

> The Department seeks comments as to whether an auction spectrum aggregation limit should be placed on the amount of spectrum that can be acquired by a single wireless service provider and its affiliates. Comments should include the amount of spectrum for the auction spectrum aggregation limit, to which bands it should apply and the duration.[12]

The fourth question is whether incumbent mobile wireless providers should be required to provide roaming services to competing carriers and, if so, what services should be included:

> The Department invites comments on mandating incumbent mobile wireless operators to offer roaming services – to both competing and non-competing Canadian carriers – to foster the development of competitive wireless communication services.
>
> Comments are invited on the extent to which the lack of mandated roaming could be a barrier to entry into the wireless market.
>
> Comments are sought on what services should be included in any mandated roaming and to what specific frequency band(s) roaming should apply.
>
> Comments are sought on the mechanisms that would best implement the policy objectives regarding roaming.[13]

[11] Industry Canada, 2007, p.22.
[12] Industry Canada, 2007, p.23.
[13] Industry Canada, 2007, p.25.

Initial reaction to the approach taken by Industry Canada in its consultation paper

It is clear that Industry Canada does not regard the assessments by the CRTC and the Competition Bureau of the state of competition in the Canadian mobile wireless market as particularly relevant, let alone dispositive. Nor does it appear to regard the general protection afforded the competitive process by the *Competition Act* as sufficient. In this, it appears to misunderstand the merger assessment criteria as they would have been applied by the Competition Bureau in the Microcell case and to understate the role the abuse of dominance provisions of the *Competition Act* could play in preventing both anti-competitive spectrum purchases and anti-competitive access pricing by incumbents. These issues are discussed later in this paper.

The consultation paper also makes very loose use of the term barriers to entry. In particular, it appears to regard all costs of doing business as barriers to entry. This issue is discussed below, both in this section and later in this paper.

It also appears that Industry Canada regards the cost of promoting inefficient entry as being smaller than the cost of the alternative which, in its view, is the inefficient "hoarding" of spectrum by incumbents. The consultation paper sees inefficient entry as readily being remedied by *ex post* acquisitions of under-performing entrants while spectrum, once awarded, is difficult to reallocate. In this, Industry Canada may have seriously underestimated the costs of restricting incumbents from competing, the costs of inefficient entry, the reorganization costs that are incurred when entrants fail to meet their financial expectations and the general adverse effect on investment incentives that would result from a government back-in in the form of the subsidization of the entry of new competitors.

The consultation paper labels spectrum as a barrier to entry. This is correct in the trivial sense that spectrum is an essential input, necessary if wireless service is to be offered. But there are many different inputs that are required by a firm offering wireless service. This does not make them barriers to entry.

Spectrum can be termed scarce if the demand for it exceeds the supply at a zero price. In this case, the price of spectrum can be expected to rise until the demand for it is equal to the supply of it. The price at which a competitive spectrum market clears is equal to the opportunity cost of spectrum, the value of spectrum in its best alternative use. Most, probably all of the inputs required by a wireless provider are scarce in the sense that they have a positive market price and opportunity cost.

The fact that an input is required to do business and that a positive price must be paid for it does not make it a barrier to entry. Under some circumstances, a required input can become a potential source of a barrier to entry if it is indivisible (you must buy a lot of it even if your business is small) and if its cost is sunk (its cost cannot be recovered by selling it to someone else). If it is divisible and can be resold, spectrum does not qualify as a potential source of barriers to entry.

Of course, it is possible for the government to "facilitate" entry by selling spectrum to new entrants at a price below its competitive scarcity value. This is no different than having the government pay part of the cost of an entrant's equipment or vehicles or salary bill except that below-market spectrum is a hidden subsidy. Hidden or explicit, subsidies are widely understood to reduce the efficiency of the economy by drawing resources from higher valued to lower valued uses.

It is conceivable that incumbents may take advantage of the fact that spectrum is fixed in supply at any given time either to "corner" (pre-empt) the market for it or at least to bid up its price beyond its competitive scarcity value (raising rivals' cost) in order to forestall entry. Indeed, the determination of whether any or all of the incumbents in the mobile wireless market would find it in their interest to engage in anti-competitive foreclosure of the supply of spectrum and whether there is any reason why the sanctions available under the *Competition Act* are not sufficient to deter them from doing so is, or should be central to the consultation process.

Similar issues arise with respect to access by entrants to incumbents' facilities. An efficient access price covers incremental cost plus compensation for contribution foregone. Efficient entry would be deterred if the required compensation for contribution foregone included foregone supra-competitive profits. The key questions are, again, whether incumbents could successfully hold out for supra-competitive access prices and, if so, whether there is any reason why the sanctions and remedies available under the *Competition Act* and the *Telecommunications Act* are not sufficient to deter them from attempting to do so.

The Industry Canada consultation paper seriously misreads the economic costs and benefits from the implicit or explicit subsidization of new entrants into the mobile wireless market. The relevant question to be resolved by the consultation process is whether there is a reasonable likelihood that a new entrant would face supra-competitive prices for spectrum or access to facilities. The first and essential issue in this regard is whether the state of competition in the mobile wireless industry is such that incumbents would likely find it feasible and profitable to raise potential rivals' costs either by bidding up the price of spectrum beyond its competitive scarcity value or by setting facilities' access prices at supra-competitive levels. The second issue is whether there are reasonable grounds to believe that the sanctions presently available under the abuse of dominance provisions of the *Competition Act* are not sufficient to deter incumbents from pursuing this strategy if it were otherwise feasible and profitable. The third issue is what additional policy measures would be required to supplement those already available in the Competition Act in the event that they are found to be insufficient.

II. Analyzing the Relative Competitiveness of the Canadian Mobile Wireless Telecommunications Market

The structure and performance of an industry can be assessed in either relative or absolute terms. A relative assessment compares country to country differences in various

aspects of industry structure and performance. An absolute assessment is concerned with such aspects of industry conduct as collusive or exclusionary behaviour, product quality and safety standards and business practices. Public policy is typically more concerned with absolute performance standards. Customers complaining of poor service or over-billing tend not to be mollified when informed that things are worse in some other countries. Relative assessments are also very difficult to do properly and vulnerable to misuse for advocacy purposes. This is discussed below.

II.1 The basic economic structure of the mobile wireless market in Canada

The 2006 CRTC Telecommunications Monitoring Report lists three national mobile wireless network operators, the Bell Group, TELUS Communications Company (TCC) and Rogers Wireless Incorporated (RWI), two regional wireless providers, MTS Allstream and Sasktel, and two mobile virtual network operators (MVNO's), Primus Telecommunications Canada and Virgin Mobile Canada.[14] Primus entered the market in 2004. Virgin, jointly owned by Bell and the Virgin Group of the UK, entered the market in 2005.[15] TCC and RWI compete nationally, the Bell Group competes in all provinces but Manitoba and Saskatchewan. Sasktel and MTS compete in Saskatchewan and Manitoba respectively.

While there are good arguments for defining the geographic market for mobile wireless telecommunications services as national (national carriers providing national service with national pricing), the Competition Bureau has, in the past, been of the opinion that relevant geographic markets are provincial or regional. The respective national market shares of the three national network operators are roughly similar although they differ considerably from province to province. The three network operators also differ in the wireless technologies they employ with Rogers using GSM and the Bell Group and TELUS using CDMA. Although there has been considerable convergence, the parent companies of the national mobile wireless carriers have their roots in different lines of business with Rogers being in cable television and Bell and TELUS being in wireline local exchange services.

The structure of the mobile wireless market has evolved over time. From 1985 until 1996 there were two competitors, Rogers Cantel and Mobility Canada. In 1996, they were joined by two new entrants, Microcell and Clearnet. In 2000, TELUS left Mobility Canada and acquired Clearnet resulting in a market with three major competitors and one smaller competitor. In 2004, Rogers acquired Microcell, leaving three roughly equal-sized competitors in the market. In its discussion of its decision not to challenge this acquisition, the Competition Bureau stated that it was satisfied that the market would remain vigorously competitive. Since that time, there is nothing in the Bureau's public statements to indicate that the industry has been the subject of any formal investigations of alleged anti-competitive conduct.

[14] CRTC Telecommunications Monitoring Report: Status of Competition in Canadian Telecommunications Markets, July, 2006, p.78.
[15] There are in fact, many other MVNO's operating in Canada. They include, PC (President's Choice) Mobile, Sears Connect, PetroCanada Mobile, 7- Eleven Wireless, Videotron and others.

The mobile wireless telecommunications industry is not subject to price or rate of return regulation. The CRTC began the process of forbearing from the regulation of mobile wireless telecommunication in 1994 and completed it in 1998.[16] The CRTC forbears from regulating a telecommunications market when it is satisfied that the market in question is competitive. As it has stated in its monitoring reports and in its decisions, it continues to be satisfied that the mobile wireless market is competitive. Regulation of wireless telecommunications carriers has not been entirely forborne. The CRTC continues to exercise its powers and perform its duties to ensure non-discriminatory access to wireless telecommunications networks under sections 27(2) and 27(4) of the *Telecommunications Act.*[17]

Wireless spectrum is managed by Industry Canada. Spectrum was assigned in 1995 and in 2001 by means of a spectrum auction. A spectrum cap, which limited the amount of spectrum an individual market participant could hold, was instituted at the time of the 1995 spectrum decision. Its purpose, according to Industry Canada, was to assist new entrants (Microcell and Clearnet) in acquiring sufficient spectrum to compete effectively. The cap was raised in 1999 to allow existing carriers to acquire additional spectrum in the 2001 auction. In the 2001 auction, spectrum was mostly acquired by existing carriers. Following a consultation announced in 2003, the spectrum cap was eliminated in August, 2004. The rationale for the policy change was that the industry had matured and that consumers had a range of voice and data services available to them and that in the near future considerably more spectrum would be available to the industry.[18]

The Canadian mobile wireless telecommunications industry clearly passes the practical test of being workably competitive. Whether its much larger U.S. counterpart is or has been more intensely competitive in some respects is another matter. International comparisons of the intensity of competition are difficult to make and the relationship between the intensity of competition and individual market characteristics difficult to establish. These issues are addressed below.

II.2 Limitations of international comparisons of market structure

Measures of market structure are crude and provide an incomplete picture of the competitive environment of an industry. The relationship between market structure and the intensity of competition is noisy and non-linear. Individual performance measures

[16] Telecom Decision CRTC 94-15, Regulation of Wireless Services, http://www.crtc.gc.ca/archive/eng/Decisions/1994/DT94-15.htm#top

[17] Section 27(2) could be applied, for example, in a case in which incumbents granted each other access to towers but refused to grant access to a new entrant.

[18] Gazette Notice DGTP-010-04, Department of Industry, Radiocommunication Act, Notice No. DGTP-010-04 - Decision to Rescind the Mobile Spectrum Cap Policy. (http://strategis.ic.gc.ca/epic/site/smt-gst.nsf/en/sf05645e.html)

often have little to do with the intensity of competition and, in any case, vary from country to country for a variety of reasons, many of which are difficult if not impossible to quantify and thus to take into account. Naïve international comparisons invite abuse and are a poor basis for public policy analysis.

The number of competitors in a market is a poor measure of market concentration and an even poorer measure of market structure

Great significance appears to have been attached to having four rather than three competing mobile wireless carriers in Canada. The number of competitors in a market is a poor measure of market concentration, market structure and market power. The HHI (Herfindahl-Hirschman Index), which is defined as the sum of the squares of the market shares of the firms competing in a given market, is a widely used measure of market concentration. It increases as the number of competitors decreases and as their respective market shares become more unequal.[19] It reaches a maximum value of 10,000 when the market is a monopoly. It can be lower with three equally matched competitors than with four or more competitors some of whom have relatively small market shares. As can be seen from Table 1, Canada's national HHI for mobile wireless telecommunications services is lower than the HHI's of some countries with four carriers and is almost identical to the Netherlands which apparently has five.

The HHI can also be expressed as a fraction and inverted to yield what is known as a numbers equivalent.[20] This is the number of equal-sized competitors that would yield the observed HHI. As Table 1 indicates, Canada is closely bunched with a large number of other countries with a numbers equivalent around three. Hong Kong, the U.S. and the U.K. are much less concentrated while Norway, New Zealand and Switzerland are much more concentrated.

As Table 1 also shows, the largest two mobile wireless carriers in Canada have a lower share of the Canadian market than do the largest two carriers in markets with four carriers. In the simplest terms, the fourth and sometimes even the third carrier in a number of national markets have relatively small market shares and, unless their shares have increased significantly in the recent past and/or show serious promise of doing so in the future, they should be regarded as minor competitive forces.

Vertically integrated firms may not be the only competitors in the market. While they depend on their vertically integrated rivals either for inputs, facilities or outlets, single stage or partially integrated competitors can be an independent competitive force leading to lower prices, greater product variety and better service.[21] In the mobile wireless market, non-integrated competitors are called MVNO's. In its assessment of the

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[19] Dennis Carlton and Jeffrey Perloff, Modern Industrial Organization, Addison Wesley, 2005, p.255.
[20] Morris Adelman, "Comment on the H concentration measure as a numbers equivalent" Review of Economics and Statistics 51, 1969, pp.99-101.
[21] Andrew Eckert finds, for example, that the presence of independent gasoline retailers increases the competitiveness of local gasoline markets. See "Retail Price Cycles and the Presence of Small Firms," *International Journal of Industrial Organization,* 21 February, 2003, pp.151-70.

acquisition of Microcell by Rogers, the Competition Bureau concluded that competition from MVNO's has had a positive effect in other jurisdictions and this could be expected in Canada.

Of course, seller concentration is only one aspect of the structure of a market. The degree of market power associated with a given level of seller concentration depends on a variety of factors including: the stability of concentration (variability of market shares); barriers to entry and expansion (mobility barriers); the nature of the product (service, durable, nondurable, homogeneous, differentiated); the elasticity of demand for the product (which depends on the quality and ubiquity of substitutes); the growth rate of demand; the size and sophistication of customers and; the regulatory environment. These factors may also vary from country to country.

The implication of the foregoing is that network carrier counts are not good measures of market concentration and that there is much more to market structure than concentration. Rankings of the competitiveness of national markets for mobile wireless telecommunications on the basis of network carrier counts are not meaningful.

Table 1: Concentration of Developed Country Mobile Wireless Markets

Country	Number of Carriers	2 Firm CR	HHI	Numbers Equivalent
Norway	2.0	100.0	5508	1.8
New Zealand	2.0	100.0	5016	2.0
Switzerland	3.0	81.8	4627	2.2
Ireland	3.0	83.3	3986	2.5
Finland	3.0	82.1	3874	2.6
France	3.0	82.6	3808	2.6
Portugal	3.0	79.9	3659	2.7
Belgium	3.0	77.0	3654	2.7
Japan	3.0	77.6	3632	2.8
Denmark	4.0	77.4	3593	2.8
Spain	3.0	76.4	3577	2.8
Sweden	4.0	78.6	3566	2.8
Canada	3.0	68.9	3400	2.9
Netherlands	5.0	73.4	3396	2.9
Singapore	3.0	71.8	3372	3.0
Australia	4.0	76.4	3364	3.0
Austria	5.0	74.0	3350	3.0
Italy	4.0	72.4	3135	3.2
Greece	4.0	72.4	3106	3.2
Germany	4.0	72.5	3082	3.2
UK	5.0	49.1	2257	4.4
US	4.0	51.5	2016	5.0
Hong Kong	5.0	44.6	1606	6.2

Source: Merrill Lynch Global Wireless Matrix 3Q06.
The category “Other” has a significant market share in some countries. In the calculation of the HHI, this category is assumed to contain enough equal-sized carriers to yield an average share just under the share of the smallest carrier identified by name.

In general, the relationship between the various indicators of market structure on one hand and prices or price-cost margins on the other, is weak and discontinuous

The available indicia of market structure are crude and incomplete. Moreover, common measures of market structure such as market concentration should not be treated as causing prices or price-cost margins. Rather, they are caused by the same underlying (and difficult to measure) factors that drive prices and margins. To the extent that there are empirical regularities in the relationship between market structure and performance, they are not strong, not robust and not linear. That is, over large ranges, changes in market structure appear to have little or no effect on prices or margins and when they do, the effect is modest and highly variable. In some cases, a little competition can go a long way. This has led industrial organization economists to question the value of attempts to link measures of market performance to measures of market structure:

> … many industries appear to depart considerably from perfect competition, yet the degree of this departure apparently is not strongly related to industry concentration (the share of sales made by the largest firms in the industry), which presumably reflects the structure of the industry.[22]

International comparisons of the structure of mobile wireless markets face additional difficulties

Market structure is difficult to measure properly and, in any case, tends not to bear a strong relationship to measured market performance. International comparisons of market structure involve further difficulties and international comparisons of the structure of mobile wireless markets are still more hazardous.

Market structure can vary from country to country for many reasons. Comparing the mobile wireless industry from country to country is not the same as comparing, say, the oil refining industry from country to country. Oil refining costs and technology are pretty standard and refiners pay international prices for crude oil. Telecommunications industries are different. Costs presumably depend on the spectrum allocation regime as well as on geography, topography, population and population density. For this reason, it does not appear to make sense to compare Canada with Hong Kong, Belgium or the Netherlands. Similarly, demand depends on the quality and pricing of substitutes, on after-tax household income, among other factors, all of which differ internationally. Demand also depends on the level of sales, value added and other taxes levied by national and sub-national governments on wireless telecommunications. Demand also depends on the form in which the product is marketed and in the case of wireless telecommunications, this also varies from country to country with pre-paid SIM cards being much more important in some countries than in others.[23]

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[22] Dennis Carlton and Jeffrey Perloff, Modern Industrial Organization, p.245

[23] This also raises a measurement issue in that each purchaser of a SIM card may be counted as a subscriber.

History matters. Telecommunications industries have been treated in the past as public utilities and remain so to varying degrees, depending on the country. The weights attached by regulators to economic efficiency and social objectives vary from country to country. Markets in many countries continue to be served, at least in part, by government enterprises who may rank social objectives above commercial considerations and whose investment decisions are linked only tenuously, if at all, to the opportunity cost of capital. Telecommunications technology and investment decisions may be made in pursuit of industrial policy objectives in some countries. Telecommunications industries have also differed internationally with respect to foreign ownership and participation restrictions.

While Canada may be more closely comparable with the U.S. than it is with most other countries, the U.S. remains a poor comparator for Canada. U.S. markets are routinely less concentrated than their Canadian counterparts. The reason is simple. The number of competitors that can survive in a market depends on two factors, first, the size of the market and, second, the minimum efficient scale of production (MES). MES is generally defined as the scale at which most of the economies of large scale operation have been realized. In industries in which economies of scale are significant and the product involved is not readily exportable, the Canadian market supports fewer efficiently scaled competitors and is therefore more concentrated than the U.S. market. If there are also product-specific scale economies, the larger U.S. market would support greater product variety as well as more competitors.

Economies of scale may continue to be realized, albeit at a lower rate, at scales beyond MES. This implies that while there is a threshold scale below which survival is unlikely, the advantages of large size are not exhausted once that threshold is reached. This may imply an ongoing tendency to consolidation. It may also explain why there are not only more competitors in the U.S. market but also why individual competitors are larger in the United States mobile wireless market than in Canada.[24] Their greater scale of operation makes it more feasible for them to conduct large scale promotional campaigns and to roll-out new technologies and services faster. In sum, it would not be surprising to see a U.S. market "perform better" in these dimensions than the same market in Canada.

II.3 Limitations of international market performance comparisons

Performance measures used in international comparisons of mobile wireless markets include penetration rates, minutes of use per subscriber, revenue per minute and average revenue per subscriber. Critics of the mobile wireless industry in Canada have employed selective international comparisons of various performance measures to support arguments that the Canadian industry is not vibrant and is perhaps insufficiently competitive. Critics have placed particular emphasis on the relatively low penetration rate in Canada. Put another way, it is seen by some as cause for concern that mobile wireless telephony has diffused more slowly in Canada than in most other countries.

[24] This is clearly the case. According to the Merrill Lynch Wireless Matrix, as of the third quarter of 2006, Verizon had 56.7 million subscribers and Cingular had 58.7 million. In comparison, Rogers had 6.7 million, the Bell group, 6.4 million and TELUS 4.9 million.

The many causes of observed international differences in wireless penetration rates have been amply documented.[25] Pre-paid wireless subscriptions are much more common is Europe than in Canada. Pre-paid subscribers may buy a number of SIM (subscriber identification module) cards resulting in penetration rates in excess of 100 percent in several European countries. Second, in contrast to Canada and the United States, virtually all other OECD countries use a calling party pays pricing system, meaning that mobile wireless subscribers do not pay for their incoming calls thereby reducing their cost. Third, Canadians have had the benefit of unlimited free local wireline calling in contrast to Europe where local calls are often metered.

The Telecommunications Policy Review Panel acknowledged that performance comparisons with most other countries are of limited relevance but insisted that the performance of the U.S. industry (including its relatively higher penetration rate) is an appropriate benchmark for Canada. The difference between U.S. and Canadian mobile wireless penetration rates has been attributed by some to a U.S. "head start."[26] Taking a broader perspective, however, we observe that diffusion of new technologies is faster in most industries in the U.S. than in Canada.

Diffusion rates for most new product and process technologies differ from country to country. U.S. diffusion rates of both new consumer and new producer technologies are generally faster, often much faster than diffusion rates in Canada. For example, OECD data show that 34.9 percent of U.S. households owned a digital television set in 2002 versus 26.9 percent in Canada.[27] Similarly, studies of the adoption rates of advanced manufacturing technologies find that adoption in Canada is typically slower across all technologies in Canada. Managers of Canadian manufacturing plants cite cost, the lack of financial justification, the need for market expansion and the lack of technical support as impediments to adoption more frequently than do managers of U.S. manufacturing plants.[28]

Numerous commentators have argued that Canadian industry in general has been under-investing in new technology, in part, because of the low value of the Canadian dollar (until relatively recently) and in part because of high marginal effective tax rates on new investment. Richard Harris has argued that Canadian spending on machinery and equipment, including high tech IT equipment has been among the worst, relative to GDP, of the OECD countries and has been much worse than in the US.[29] Jack Mintz has

[25] Wall Communications Inc., "An Examination of Issues raised in the Telecommunications Policy Review Panel's March 2006 Report regarding the Canadian Mobile Wireless Services Industry" (Prepared for the Canadian Wireless Telecommunications Association, September, 2006) pp.7-8

[26] Ibid., pp.9-11.

[27] OECD, Communications Outlook 2005, Tables 7.2 and 7.5.

[28] John Baldwin and David Sabourin, "Technology Adoption: A Comparison Between Canada and the United States" Statistics Canada, 11F0019MPE no.119, 1998.

[29] Richard G. Harris, "Is there a case for exchange rate induced productivity changes?" http://www.bankofcanada.ca/en/res/wp/2000/harris.pdf

shown that Canada has one of the highest marginal effective tax rates on new investment of all developed countries.[30]

It is therefore not surprising that, as is the case with most new technologies, the diffusion of wireless mobile telephony has been slower in Canada than in the United States. Part of the explanation is generic, that is, common to all industries; lower after-tax household incomes, diseconomies of small scale, unfavourable tax treatment of investment and a low dollar. Part of the diffusion gap can be traced to specific characteristics of the mobile wireless market in Canada, as will be discussed in the next section of this paper.

Discussions of comparative performance also make use of international price comparisons. Prices can differ from country to country to country for a variety of reasons among the most important of which is likely to be cost differences. Actually, countries do not price mobile wireless services, individual companies do. Pricing can vary within countries implying that country prices should be expressed as a range (a confidence interval) reflecting this underlying variation. Product quality may also vary from country to country. Results of price comparisons may also depend on which exchange rate is chosen.

International price comparisons in the mobile wireless industry face additional problems. The market is characterized by various forms of non-linear pricing implying that every subscriber pays a different average price and typical subscribers are likely to vary from country to country. The typical or modal subscriber may also differ from the average subscriber. Bundled pricing is also becoming increasingly important. When services are bundled, the price of any one service in the bundle is arbitrary. Summary unit revenue measures such as average revenue per user (ARPU) or per minute have serious inadequacies as price proxies. ARPU can vary with the extent and timing of use. Revenue per minute also varies with use. Examination of specific price packages may make more sense but there remain questions about how typical the package chosen is and the extent to which it constitutes a true reflection of the value proposition involved.

A report prepared by Wall Communications for the Canadian Wireless Telecommunications Association lists the many possible margins on which the price of wireless telecommunications services can differ from provider to provider and from country to country:

> Mobile wireless service prices comprise numerous rate elements including up-front handset and set-up costs, base monthly recurring charges, local, roaming and long distance per minute charges or overage charges (subject to time of day variations), optional feature charges (such as voice mail and call display) and data charges (text or multimedia messaging and Internet access), among others. As well, there are pre-paid and post-paid pricing options available, along with a variety of promotional offers to attract new customers and retain existing customers. Consequently, comparing overall service prices between services providers within a market can be difficult and, moreover,

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[30] Duanjie Chen and Jack Mintz, "How to become more seductive: Make Canada More Investment-Friendly" C.D. Howe Institute, January, 2005 http://www.cdhowe.org/pdf/ebrief_11.pdf

> comparing prices across countries can be even far more difficult still. In the latter case, adjustments for currency differences also come into play.[31]

Notwithstanding the pitfalls, international price comparisons have been made. The results appear to be ambiguous, varying from study to study, depending on the price measure used and the service package chosen. International price comparisons involving Canada are discussed in detail in a report prepared by Wall Communications for the Canadian Wireless Telecommunications Association. The report concludes that mobile wireless services prices in Canada compare favourably with other OECD countries in general and, with the exception of high volume plans, also with the United States.[32]

II.4 Simple correlations between various structure and performance indicators are not useful: a multivariate approach is required

Selective pair-wise comparisons between Canada and other countries are not good analysis. Attempts to explain country to country differences in indicators of the performance of national mobile wireless industries should, at least, attempt to take all relevant explanatory factors into account. They should also recognize the implications of their inability to do so.

One attempt to explain differences in national penetration rates in a multivariate context has been made by Quigley and Sanderson.[33] They find that, other things being equal, penetration rates are lower in countries with a low or zero marginal price of a wireline minute and are higher in countries with lower wireless revenue per subscriber (ARPU). This supports the view that the diffusion of wireless has been slower in countries, such as the U.S. and Canada, with unlimited local wireline calling.

Although Quigley and Sanderson attempt to standardize for other factors that may influence national penetration rates, there are some important factors that they either didn't or couldn't take into account. The most obvious of these are the proportion of prepaid subscribers and the payment regime. Countries with a greater incidence of prepaid subscriptions have both higher observed penetration rates and lower average minutes of use resulting in a lower ARPU. Thus, ARPU may be caused by the penetration rate rather than cause it. As discussed above, the payment regime for wireless in both Canada and the United States requires the mobile party to pay for incoming calls (Mobile Party Pays or MPP) while other countries adhere to a Calling Party Pays (CPP) regime. It is generally argued that while a CPP regime leads to greater wireless penetration, the MPP regime is the more efficient. In essence, under a CPP

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[31] Wall Communications, "A Study on the Wireless Environment in Canada" (Prepared for the Canadian Wireless Telecommunications Association, September 29, 2006) p.39

[32] Wall Communications, September, 2006, p.45.

[33] Neil Quigley and Margaret Sanderson, "Going Mobile – Slowly: How Wireline Telephone Regulation Slows Cellular Network Development" C.D. Howe Institute Commentary No.222, December, 2005.

regime, mobile providers may extract high termination rents from wireline callers but then dissipate these rents in the competition for new wireless subscribers.[34]

Quigley and Sanderson emphasize the role that the regulation of wireline local exchange services by the CRTC has played in retarding the diffusion of mobile wireless in Canada relative to the U.S. They argue that U.S. wireline rates have been higher than Canada's, giving U.S. consumers a greater incentive to "cut the cord."

> When the retail price of wireline access is low because of regulation, consumers with only wireline or with both wireline and cellular service will account for a large fraction of total consumers. Consumers with a wireline subscription will be less willing to give this up in response to a small improvement in cellular quality. There will be greater use of cellular but little cutting of the cord. If wireline access were free, there would be no reason ever to stop using it. The result is a smaller additional profit and therefore a diminished incentive to invest (compared to the no-regulation case).[35]

The availability and quality of other substitutes for mobile wireless may also be relevant. For example, Canada ranks fourth (a shade behind the U.S.) of twenty OECD countries listed in the OECD Telecommunications Outlook in payphones per capita.[36] The availability of a ubiquitous, reliable pay telephone network in Canada could be another factor that has slowed wireless penetration. Similarly, Canada ranks second among OECD countries in cable and DSL broadband access per capita. This would reduce the need for households to have a second telephone, either wireline or wireless.[37]

As suggested above, there may also have been supply-side impediments to investment, leading to a slower roll-out in Canada. Canadian mobile wireless carriers are much smaller than their Canadian counterparts. Capital investment is accorded less favourable tax treatment in Canada than in the U.S. The depreciation of the Canadian dollar would have made imported wireless equipment more expensive relative to household income in Canada than in the United States. A dilatory Canadian regulatory process may also have been a factor.

The possibility that wireless competition may have been more aggressive in the United States than in Canada at times during the last twenty years cannot be ruled out. Indeed, there are probably very few markets that are not at least somewhat more competitive in the United States than in Canada. From 1986 to 1997, there were effectively two national wireless competitors in Canada, Rogers and Mobility Canada, with the latter accounting

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[34] Robert Crandall and Gregory Sidak, "Should Regulators Set Rates to Terminate Calls on Mobile Networks?" Yale Journal on Regulation 21, 2004, pp.1-46

[35] Quigley and Sanderson, op.cit. p.15. It should also be noted that the regression Quigley and Sanderson report does not attribute any role for international differences in wireline revenue per subscriber in explaining international differences in diffusion rates. There are not enough observations to conduct a proper statistical test for the sources of Canada-U.S. differences in penetration rates.

[36] OECD, Communications Outlook, 2005, Table 8.4.

[37] OECD, Communications Outlook 2005, Figure 5.5

for as much as 60 percent of the market. During that period, the U.S. wireless market was much less concentrated relative to the Canadian market than is now the case. When new entry did occur in Canada, one entrant, Microcell, ran into serious financial difficulty.

It is important to understand that the current state of play in the mobile wireless market in Canada reflects the accumulation of decisions and events that have occurred over the past twenty-plus years. If this state of play is regarded as unsatisfactory in some respects, this cannot be laid at the door of the industry as it is presently structured.[38] It might be the case that, had alternative courses of action been adopted in the past, the industry might have evolved differently.[39] This does not imply that alternative policies that might have made sense ten years ago necessarily make sense today.

In any event, what is past is past. The issue is the state of affairs now. From a public policy point of view, the question is not whether the Canadian mobile wireless market could theoretically be more competitive. If there are business opportunities, there is every reason to expect either incumbents or new entrants to pursue them. Although various analysts have suggested a new entrant would find it tough sledding, that is essentially a judgement for potential new entrants to make. The public policy question is whether the prices paid by new entrants for spectrum and for access to incumbents' facilities should be competitive or whether they should be concessionary. Is there a case for subsidizing or effectively subsidizing new competitors?

III. Analysis of the State of Competition in the Canadian Mobile Wireless Market

The Canadian mobile wireless industry appears to be in a unique position. Most industries come to the attention of policy makers if there is evidence of anti-competitive conduct, shoddy products, unsafe work places or shady business practices. None of this is true of the mobile wireless industry. Instead, the industry is accused of being deficient in certain respects relative to selected counterpart industries in other countries. This was discussed in Section II above. This section focuses on the current structure of the mobile wireless market in Canada and any predilection it might have for anti-competitive activity.

III.1 Looking forward rather than looking back: Competition is a Dynamic Process

Rapid change is the rule in the mobile wireless telecommunications industry – from both a technological and a marketing perspective. In analyzing the state of competition, it is important to take a dynamic rather than a static approach, that is, to analyze where

[38] In econometric terms, the Quigley-Sanderson model has no lag structure, that is, it does not allow past industry characteristics to affect the current penetration rate.

[39] There is nothing in the analysis of the Telecommunications Policy Review Panel to indicate that the industry diverged from its longer term trajectory (with respect to uptake, for example) during the relatively brief period it had two smaller competitors and then one smaller competitor. This question merits proper statistical analysis.

competition is going to come from in the future. The drivers of future competition may be considerably different, even in the relatively near future than they were five years ago. Public policy should not be fighting old battles or settling old scores.

Schumpeterian Competition

Schumpeterian competition comes from new technologies. Given the rapid rate of technological change in the telecommunications industry in general and in wireless markets in particular, policy-makers should take account of the extent to which new competition will or could come from new technologies and/or business models rather than from the subsidized replication of existing competitors.[40] *The Economist* quotes industry observers as predicting that:

> "Voice will very rapidly cease to become a major revenue generator for all telecoms operators, fixed and mobile." [41]

Schumpeterian competition is already coming from wireless VoIP providers including Vonage, Skype Wireless, Google Talk, Yahoo Dialpad and others.[42] Some predict that this will take "a big chunk" of wireless industry business.[43] Wi-Fi telephones can be used to make calls using Skype or other services either from home or open-access WiFi networks that do not require browser-based identification (free hot spots).[44] With Skype In and Skype Out, residential customers can substitute entirely away from both landline service and from wireless calls made from home or from free hot spots. Vonage offers a similar service.[45] While still a small fraction of mobile handset sales, sales of WiFi handsets totalled $535 million (US) worldwide in 2006.[46] Dual mode handsets that can access either cellular or WiFi networks are the fastest growing segment of the market.[47] Some observers suggest that incumbent wireless carriers will have no choice but to offer them even though they will cut severely into their minutes. The alternative is to lose subscribers entirely to wireless VoIP providers.[48] Others predict that Rogers will offer a dual mode handset in Canada before the end of 2007.[49]

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[40] "A world of connections: A special report on telecoms" The Economist, April 27, 2007
[41] "The meaning of free speech" The Economist, September 15, 2005 http://www.economist.com/research/articlesBySubject/displayStory.cfm?story_ID=4400704&subjectid=349005
[42] http://www.whichvoip.com/cgi-bin/search.pl?q=cnd_all+publish_yes&db1t=3&s=156
[43] Tim Wilson "Wireless could provide VoIP push" Network World Canada April 14, 2006 http://www.itworldcanada.com/a/Wireless-and-Mobile-Computing/aff60e17-78a1-4eb0-9bdf-4b3cbf05f9d9.html
[44] http://www.belkin.com/skype/howitworks/ See also http://tools.netgear.com/skype/
[45] http://www.vonage.ca/products.php?lid=nav_products
[46] http://www.cellular-news.com/story/21624.php
[47] http://www.cellular-news.com/story/21624.php http://www.informationweek.com/1123/wifi_chart.jhtml
[48] Michael Martin, "Carriers can't ignore Wi-Fi" Network World Canada, February 3, 2006 http://www.itworldcanada.com/a/Wireless-and-Mobile-Computing/8fc75e44-666a-45b9-9671-9c7827fc49bc.html
[49] Michael Martin, "Expect a wave of wireless in 2007" Network World Canada January 19, 2007 http://www.itworldcanada.com/a/Wireless-and-Mobile-Computing/4b2a2e50-1ee3-48d3-9fcf-fabe6e7bb354.html

Future sources of wireless infrastructure include electrical distribution utilities. Toronto Hydro Telecom (THT) began operating a WiFi network ("a blanket WiFi hot zone") encompassing 235 city blocks in downtown Toronto in September, 2006. It will begin charging access fees in March, 2007. THT is aiming to build out to its entire municipal jurisdiction within three years.[50] WiFi hotspots in Ottawa and district are provided by Telecom Ottawa, among others.[51] Many communities are considering building WiFi or hybrid networks or have already built them. Fredericton, New Brunswick is covered by a municipal WiFi network with 1200 access points that offers free access.[52] Other electrical distribution utilities are going to have to build wireless networks to read residential smart meters. These have the possibility of exceeding the footprint of existing cellular providers.[53]

> Ontario's electricity smart meters could jump-start plans for a sprawling meshed IP network that will connect the entire province wirelessly, initially by Wi-Fi and, as the technology becomes more widely embraced, ultimately by Wi-Max.[54]

Changing business models

Business models may also change in a variety of other ways. Innovation is being driven by rapid improvements in handset functionality. Minutes of airtime may become a commodity and mobile virtual network operators (MVNO's) could play an increasing role. MVNO's have moved from selling "discount" packages to catering to a variety of market segments with companies such as Disney, ESPN and MTV emerging as MVNO's. Infrastructure-based companies may be at a comparative disadvantage in anticipating and responding to changes in fashions and tastes.[55] In Britain, for example, BT has spun off its wireless mobile business and has become a reseller of airtime.[56] In Canada, there are indications that Virgin Mobile, an MVNO allied with Bell, has done much better in terms of attracting new subscribers than some observers expected. MVNO's such as PetroCanada Mobile, 7-Eleven Mobile and PC Mobile may also view mobile wireless services as complementary to their other product lines, leading them to price them more aggressively, even as loss-leaders.

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[50] Mark Els "Visionary fibre guy turns Toronto wireless" NetworkWorld Canada, September 3, 2006 http://www.intergovworld.com/article/df62f5510a01040800f0541dc04dfef6/pg1.htm

[51] http://www.telecomottawa.com/wireless/service.htm See also http://www.simplysurf.net/index.htm

[52] Nestor Arellano, "Tale of two cities – WiFi gap between Fredericton and Toronto" ITWorldCanada.com (25 Jan 2007)

[53] http://www.hydroonenetworks.com/en/community/projects/smart_meters/default.asp# http://www.chatham-kent.ca/partners/ck+energy/news+releases/Smart+Meter+Press+Release.htm

[54] Mark Els "Meters to drive Wi-Fi" Network World Canada, September 16, 2005

[55] As one blogger put it when commenting on the alliance between Telus and Amp'd, "…Rogers, Bell and Telus don't have much edge no matter how hard they try." http://evans.blogware.com/blog/_archives/2006/7/4/2083799.html

[56] "Swamp things" The Economist September 21, 2006 http://www.economist.com/research/articlesBySubject/displayStory.cfm?story_id=7943222&subjectid=349005

Trend to consolidation

If anything, national markets for mobile wireless telecommunications services are becoming more concentrated.[57] For example, there are now four national mobile wireless carriers in the U.S. as compared to six, in 2002. The HHI has risen from 1,326 to 2,076 and the HHI equivalent number of equal-sized competitors has fallen from 7.5 to 4.8.[58] This consolidation may reflect increases in the economies of scale and scope in marketing, infrastructure and technology acquisition. In addition to consolidation within mobile wireless markets, there is apparent consolidation across telecommunication markets. Multi-market firms, (including wireless/wireline firms) appear to be the rule. *The Economist* notes, for example, the increasing interest in cable companies, already able to offer bundles of television, high speed internet and telephone, moving into wireless either by direct entry or by acquiring a MVNO.[59]

The dynamics of substitution

Not so long ago, wireless telephones as weak substitutes for wireline. Indeed, the two were viewed by some as complements rather than substitutes. As the quality and functionality of wireless telecommunication improved, it came to be viewed as an increasingly close substitute for wireline.[60] Rather than simply substituting between wireless and wireline at the margin, increasing numbers of wireline customers are "cutting the cord." Others are leaving the incumbent local exchange carrier (ILEC) for alternate wireline providers.

This new dynamics has led the federal government to issue an order varying the CRTC's criteria for forbearing the regulation of wireline local exchange markets. The new criteria allow forbearance of regulation of residential wireline local exchange markets if there are at least three independently owned facilities-based telecommunications service providers, two of which must be fixed line providers, offering local telephone services throughout the market involved.

The general point is that competition from substitute products can wax and wane over time as technology changes. The present situation is one of increasing competition between wireline carriers and between wireless and wireline carriers.

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[57] "Big is beautiful" The Economist, March 9, 2006; "The teachings of the Virgin" The Economist, January 19, 2006.
[58] Market shares taken from the Merrill Lynch Wireless Matrix. "Other" competitor category assumed to have enough equal-sized competitors to yield an average share lower than the lowest listed competitor.
[59] "The teachings of the Virgin" The Economist, January 19, 2006.

[60] This is the central argument of Quigley and Sanderson, 2005.

Barriers to entry

A barrier to entry is defined a cost that must be incurred by a new entrant but is not or was not incurred by incumbents.[61] The key here is that it is not the cost of entry or the cost of doing business that is a barrier to entry but differences between incumbents and potential entrants in the cost of entry or the cost of doing business that gives rise to an entry barrier. A manifestation of barriers to entry is the ability of incumbents in a market to earn sustained (long-run) supra-normal profits without attracting new competitors. Of course, this also requires that competition among incumbents be weak. If competition among incumbents is strong, they will be unable to exploit any advantages they might have over potential entrants.

The cost and demand characteristics of an industry may be such that a large, specialized (sunk) investment is required for entry. The necessity of making a large (relative to the size of the market), specialized investment in order to enter a market may give rise to a barrier to entry if the investment involved would be forfeit if the entrant fails to garner a sufficient (and likely significant) share of the market. Put another way, it creates an asymmetry between incumbents and potential entrants in that the former, having already made the requisite sunk investment, have lower avoidable costs than the latter (who have not yet done so).

Outside the realm of pure theory, the height of any barrier entry and the ability of an incumbent firm to profit from it depend on the circumstances. The theory usually assumes a single or dominant incumbent and a static technology. If there are multiple incumbents, they would have to have both common of interests and an ability to coordinate their actions. If technology is not static, entrants may be able to leapfrog incumbents. In addition, changes in technology may require significant ongoing new investment effectively putting incumbents on the same footing as new entrants. Entrants also may bring different resources to the table. They may already have an organization, a brand name and some or all the requisite infrastructure. In some cases, the entrant may simply be adding another product line. Product line extension brings with it the ability to make multi-product offerings (such as a "quadruple play") may give potential entrants significant advantages over incumbents.

In sum, the fact that some inputs required to do business are expensive, does not, in itself, constitute a barrier to entry. When there are barriers to entry, their importance depends on the circumstances. They are less likely to be important when there are multiple incumbents with varying characteristics and interests when technological change is rapid and when potential entrants are established firms with a presence in related markets. To the extent that incumbent firms are able to take advantage of the existence of barriers to entry to engage in exclusionary behaviour and would otherwise find it profitable to do so, remedies exist under both the *Telecommunications Act* and the *Competition Act*. These remedies are discussed in detail in Section IV of this paper.

[61] Carlton and Perloff, supra, n.17, p.77.

III.2 The Competition Bureau's analysis of the effect on competition of the reduction in the number of national carriers from four to three

The acquisition of Microcell by Rogers in 2004 reduced the number of national network carriers from four to three, the situation that exists today. The Bureau published a detailed description of its analysis of the consequences of this transaction for competition and potential competition in March 2005.

The Industry Canada consultation paper has characterized the Bureau's analysis as implying only that the Rogers-Microcell merger did not substantially increase market power in the mobile wireless market and leaving open the possibility that the market could be much more competitive. This is a mischaracterization. The Competition Bureau's analysis implies that the departure of the fourth national carrier (Microcell) would not make the market substantially less competitive and would not prevent it from becoming more competitive. In essence, in the Bureau's estimation, the fourth carrier (Microcell) was not making the market substantially more competitive and would not have made it substantially more competitive in the future. The clear implication is that at a minimum, a fourth carrier would have to be a much stronger competitor than Microcell was if it is to have a substantial effect on competition.

The Competition Bureau found that the departure of a fourth national carrier (Microcell) would not make the market substantially less competitive. Nor would it prevent the market from becoming substantially more competitive. The implication is that the fourth carrier in the form of Microcell, was not having and was not likely to have a substantial effect on the vigour of competition. Note that the Bureau did not say that the market was uncompetitive and that the departure of Microcell would not make things substantially worse. Indeed, it concluded that competition was vigorous and would remain so with or without the fourth carrier:

> After carefully examining the impact of the proposed merger on competition in the mobile wireless industry, the Bureau concluded that it would not substantially lessen or prevent competition in this market. As a result, an application to the Competition Tribunal challenging this transaction was not warranted.
>
> There were a number of factors behind the Bureau's finding that there would continue to be vigorous and effective competition remaining following the merger, some of which included the introduction of a variety of new plans that combine minutes of use, handsets, service features and prices; the ability of competitors to add new customers, and; the willingness of Bell Mobility, Rogers and TELUS Mobility to respond to price changes by others and to go after each others' territories. This finding is consistent with several decisions involving forbearance from regulation in the mobile wireless market in Canada by the CRTC where it determined that these markets are competitive.[62]

[62] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e

The Bureau concluded that the departure of the fourth carrier would not give any of the remaining three carriers the power to implement price increases unilaterally. It is important to understand that this conclusion is not confined to absolute price increases. It also applies to relative price increases, that is, to forestalling price decreases that would have occurred had the merger in question not taken place. Correctly interpreted, the Bureau's analysis implies that, acting unilaterally, none of Rogers, TELUS or Bell would have the power either to increase prices or to prevent price decreases that would have occurred had Microcell remained in the market:

> … post-merger, there will be three mobile wireless operators who are vigorous and effective competitors. Rogers does not possess sufficient market power to impose and sustain a significant and non-transitory price increase above levels that would otherwise exist in absence of the merger because rivals would likely respond in an effort to enhance their customer bases. The Bureau concluded that innovative product and service offerings will continue to be available to consumers at competitive prices.[63]

With respect to interdependent (tacitly collusive) behaviour, the Bureau followed the standard approach of determining whether the characteristics of the mobile wireless market are such as to facilitate interdependence or to frustrate it. Explain characteristics of markets vulnerable to interdependent behaviour. The Bureau found that the mobile wireless market had some important characteristics that were more likely to frustrate rather than facilitate interdependence. These characteristics include: (i) rapidly changing technology and product offerings; (ii) complex product offerings and pricing and; (iii) technological, cost and product line asymmetries. In essence, interdependent behaviour was deemed to be unlikely whether a fourth carrier was in the market or not:

> Some important and necessary conditions for coordinated behavior were found to exist in the mobile wireless market. Market concentration is high and, as noted above, there are high barriers for new facility-based entry.
>
> However, the Bureau's analysis determined that there were other important conditions present that diminish the likelihood of effective coordination from developing. As noted, the mobile wireless services market is in a period of rapid growth which is likely to continue for a number of years as Canada's penetration rate for mobile telecommunications rises. There is a greater impetus for wireless providers to capture as much market share when the market is growing in an effort to secure long term customer loyalty. As a result, there is a significant disincentive for industry participants to act in a coordinated fashion.
>
> Markets with rapid and frequent product or service innovations are less conducive to coordinated behaviour. It is much harder to act in a coordinated fashion when competitors worry that their rivals might be ready to launch the next new "killer application". This is further compounded in this market because of the differences

[63] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e

> in the underlying technological platforms. It was the Bureau's view that this is a dynamic industry which is still evolving rapidly. There is a high degree of technological change and innovation, as reflected by the number of new product and service launches over the past number of years.
>
> A further factor that was considered important in the Bureau's review was the history and nature of competition between the remaining competitors in this market and in other markets. Evidence suggested that the majority of competitive price reactions by a competitor in the mobile telecommunications market were prompted by the actions taken by Rogers, Bell or Telus, as opposed to actions taken by Microcell. This conclusion is reinforced by the nature of competition between these competitors in other telecommunications and broadcast distribution markets.[64]

The existence of resellers (MVNO's) also reduces the vulnerability of the market to interdependence. While MVNO's are dependent to some extent on facilities pricing, the packaging and merchandising competition they bring to the market further reduces the likelihood of interdependent pricing by vertically integrated suppliers. The Competition Bureau concluded that competition from MVNO's has had a positive effect in other jurisdictions and this could be expected in Canada:

> According to the Bureau's analysis, resale will have a positive, but limited impact on competition. Resellers' pricing plans are, and will continue to be, dependent on the underlying network fees which are set by their suppliers/competitors.
>
> However, new product and service offerings, as well as aggressive marketing by resellers have increased competitive pressures in other jurisdictions.[65]

MVNO's operating in Canada at present include Virgin Mobile (allied with Bell), Primus Telecommunications, PC (President's Choice) Mobile, Sears Connect, PetroCanada Mobile, 7- Eleven Wireless, Videotron and Amp'd.

The Bureau found further that, even if coordinated behaviour would have been more likely in the absence of a maverick, Microcell would not have fulfilled that role. While Microcell had introduced attractive price and service offerings in the past, the requirements of keeping up with the rapid technological change in the market left it ill-equipped to do so in the future:

> The Bureau's findings on the question of Microcell's past role and its likely future role as a maverick recognized that Microcell had, in the past, introduced competitively aggressive price and service offerings. However, Microcell faced significant challenges going forward in implementing its current business plan.

[64] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e
[65] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e

> While Microcell had some limited cost advantages due to its smaller network, the impact of this was diminishing due to the need for it to significantly expand the density of its existing coverage. It lacked product offerings in other markets that would have allowed it to offer bundles and it was absent from segments of the market that would have provided additional revenue to help finance the costs of network improvements. At the same time, the Bureau took into account that substantial evidence suggested that the relevant markets post-merger are unlikely to support coordinated effects, which is an important element of a case involving a maverick. In light of these findings, the Bureau concluded that, to whatever extent Microcell may have played the role of a maverick in the past, it was unlikely to be able to do so in the future given the very significant constraints it faced.[66]

The Bureau concludes, in essence, that interdependent behaviour in the mobile wireless market in Canada is not a serious concern and if it were, a fourth carrier with the characteristics of Microcell would not allay that concern. This is not to rule out the possibility that a fourth carrier could make the market more competitive. It is simply to say that this fourth carrier would have to be a stronger competitor than Microcell was or had the potential of being. Of course, this begs the question of why a strong potential competitor would need access to some of the relevant inputs on concessionary terms.

There are good reasons to believe that a fourth carrier induced by access to required inputs on concessionary terms to enter the market would not likely increase competition substantially. Indeed, it could well make competition less intense, hurting rather than benefiting consumers. There is an adverse selection issue here. Firms lining up for subsidies are typically not the best competitors or potential competitors in the market. Indeed, their comparative advantage may be in government relations. Indeed, concessionary input prices are either a windfall for an entrant who would have been willing to pay the competitive price or they will attract a competitor who would not have entered if obliged to pay competitive prices for its inputs.

Inducing entry on concessionary terms could well hurt consumers if it brings into being a competitor that is in need of on-going regulatory protection. This may lead to the promulgation of rules designed to give the new entrant a "breathing space." Given the ongoing need for substantial investment to stay abreast of technological change in this industry, demands for further concessions would be likely. The requirement that the incumbents hold an umbrella over the new entrant also softens competition among incumbents. This softening of competition would be aggravated if some or all incumbents were subject to binding spectrum caps and thus had no prospect of taking market share from each other. To the extent that it succeeds, a subsidized new entrant may crowd out or delay competition that would have emerged from new technologies or business models. If it fails, there are costs to consumers as well as costs to the economy in terms of employee dislocation and specialized investments written off.

[66] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e

III.3 The role of multi-product firms

The argument that competition in Canada is weaker because the three major wireless providers also have wireline businesses, while not entirely without merit, is not compelling. The essence of the argument is that a firm with a monopoly of two substitute products would take their substitutability into account price each of these products higher than would similarly-placed single product monopolists. In the context of the Canadian wireless mobile market, the argument would be that wireline telephone companies would price their wireless offerings so as not to cannibalize their wireline business. A variety of factors militate against this type of behaviour.

First, the wireline business of Rogers, a major competitor in the wireless market was, until recently, in cable television. Historically, it would have had had no interest in pricing wireless so as to preserve wireline telephony. The Competition Bureau noted the incentive that Rogers has to attract customers from wireline:

> Indeed, the Bureau viewed RWCI's absence from the wireline market as providing an incentive for it to continue to offer some of the more aggressive marketing features from Microcell in an effort to move customers away from the traditional services offered by incumbent local exchange competitors.[67]

Second, the wireline (local exchange) businesses of Bell and TELUS are confined to specific regions of the country while they compete for wireless business in all regions. Any concern they might have about cannibalizing their wireline business, should not affect their incentive to compete for out-of territory wireless business. Quigley and Sanderson cite some evidence to the effect that Bell and TELUS have been somewhat more aggressive out-of-territory:

> … both Bell and TELUS offer more attractive cellular plans in areas outside of their wireline service territory. TELUS offers its Ontario cellular customers a 200-minute-anytime plan for the same price as its 175-minute-anytime plan in Alberta. Bell offers to Alberta cellular subscribers an "Extreme $30" plan that includes 100 weekday minutes and 100 Canadian long distance minutes in addition to unlimited nighttime, weekend and incoming calls. No similar plan is available in Ontario. Instead, Bell offers its Ontario cellular subscribers the "All-in-one Nights & Weekends $30" plan with a special bonus of 50 weekday minutes available on a limited time basis, but it charges for long distance and for incoming calls. By offering less attractive cellular prices within their wireline territories, both Bell and TELUS are presumably trying to limit the cannibalizing of their wireline service by their cellular service. This would be unnecessary if cellular and wireline were not substitutes.[68]

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[67] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e

[68] Quigley and Sanderson, 2005, p.9

Third, the price of basic wireline local exchange services has been and remains regulated by the CRTC. This makes it impossible to raise the prices of basic wireline and wireless in tandem as a theoretical monopolist of two substitute products would do. To the extent that wireless and wireline are substitutes, the inability to raise the price of wireline limits the profit potential of wireless price increases. On the other side, to the extent that the regulation of wireline prices limits the profitability of wireline, it also limits the incentive to price wireless so as to protect it.

Fourth, the local exchange services business of Bell and TELUS is now subject to competitive threats from a variety of sources, the most important of which are (cable) facilities-based wireline competitors. Similarly, demand for second lines lines fell considerably with the introduction of DSL technology. Pricing wireless so as to protect a wireline business would not now prevent or slow its continued erosion if it ever did.

Fifth, given that (marginal) price per minute of wireline local exchange use in has always been zero in Canada, switching from wireline to wireless at the margin would not reduce wireline profits and thus would not be an issue. Wireless pricing becomes an issue in the wireline market only if it is low enough to induce wireline users to “cut the cord” entirely.

Sixth, it is difficult to imagine that wireless providers in other markets do not have other telecommunications businesses. It appears that a large fraction of the U.S. market is served by wireless carriers that are also wireline carriers. It appears that wireless carriers are generally owned by multi-market telecommunications firms. In the United States, Cingular was jointly owned by AT&T and Bell South. Verizon Wireless is a partnership between Verizon and Vodaphone. The same appears to be true of Europe. The trend worldwide is to convergence and consolidation.

Seventh, it is difficult to believe that any new participant in the mobile wireless telecommunications market in Canada would not be leveraging other Canadian telecommunications assets, most likely including (cable-based) wireline telephony and broadband internet access.

III.4 Recent Assessments

The CRTC in its Telecommunications Monitoring Report and in recent decisions has concluded that the mobile wireless market in Canada is competitive, even robustly competitive.

> … In *Application by Microcell regarding alleged contraventions of section 27(2) of the* Telecommunications Act *by Rogers Wireless and Bell Mobility*, Telecom Decision CRTC 2003-26, 28 April 2003, the Commission considered that the wireless market was characterized by rivalrous behaviour and was robustly competitive. The Commission considers that this assessment continues to be valid with respect to the current state of competition in the wireless market. In this regard, the Commission notes that in its *Report to the Governor in Council: Status*

of Competition in Canadian Telecommunications Markets, October 2005, the Commission reported that the wireless market continued to display strong growth and to be competitive.[69]

Wall Communications finds descriptive and anecdotal evidence to the effect that price rivalry may be less rigorous than it was prior to the acquisition of Microcell by Rogers, but that promotions and marketing efforts are still relatively aggressive but with an emphasis on features, service, bundling, packaging and short-term bonus offers rather than specific price points.[70]

The Telecommunications Policy Review Panel concluded that the Canadian mobile wireless telecommunications industry should be more vibrant and more efficient. While the word vibrant is a commonly used adjective, it is not at all clear what a vibrant industry is. The Panel did not say the industry is uncompetitive. Nor did it say explicitly that competition could be significantly more intense although it has been taken in some quarters to have implied that.

On the basis of the various assessments of the state of competition discussed above, it is difficult to make a persuasive case for policy measures having the intent or effect of providing new entrants to spectrum or facilities on concessionary terms. There is a role for public policy, however, in ensuring that new entrants do not face additional hurdles in the form of anti-competitive exclusionary behaviour by incumbents. This is discussed in the next section of this paper.

IV. Existing Policy Tools for Ensuring Continued Competitive Behaviour in the Mobile Wireless Market

The *Competition Act* is a statute of general application. It provides remedies for anti-competitive behaviour of all sorts in all industries. These include potentially anticompetitive mergers, abuse of dominant position (including exclusionary conduct) and horizontal and vertical restrictions on competition. There are serious disadvantages to a mixed regime, partially under competition law and partially regulated by the CRTC, Industry Canada or others.

In its submission to the Telecom Policy Review Panel, the Competition Bureau argued against partial forbearance by the CRTC:

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[69] CRTC Telecom Decision 2006-33, Part VII application by Superior Wire Inc. against TBayTel alleging unjust discrimination, para.29. May 25, 2005
http://www.crtc.gc.ca/archive/ENG/Decisions/2006/dt2006-33.htm

[70] Wall Communications Inc., "A study of the wireless environment in Canada" (prepared for the Canadian Wireless Telecommunications Association, September 29, 2006) p.76

> … once regulated companies are no longer found to have market power, reliance on the general provisions of the *Competition Act*, rather than sector-specific regulation under the *Telecommunications Act* would be more appropriate.[71]

The Bureau went on to argue that it was better suited than the CRTC (or, by implication, other potential regulators) to deal with anti-competitive behaviour:

> … allegations of denial of access to essential facilities, predatory pricing of unintegrated competitors and anticompetitive price discrimination could be pursued under the abuse of dominance provisions of the Competition Act and might also raise claims under section 27(2) of the Telecommunications Act. In the Bureau's view such complaints concern the activities of a company that is abusing its dominant position in the marketplace in an anticompetitive fashion and would best be handled by the Competition Bureau with its expertise in carrying out a competition analysis.[72]

The Industry Canada consultation paper appears to misunderstand both the concept of barriers to entry and the role the Competition Bureau can play in disciplining exclusionary behaviour by incumbents. This has led it to suggest consideration of a policy of providing selected inputs to potential competitors at concessionary prices as a remedy for a perceived lack of vibrancy in the mobile wireless market.

As has been explained at length above, spectrum itself is not a barrier to entry. It is an input required to operate a wireless network. If it is scarce (demand for it exceeds the supply at a zero price) it will have a positive price or scarcity value. This scarcity value reflects its opportunity cost, that is, its value in its best alternative use. The fact that spectrum must be purchased by a firm wishing to offer wireless telecommunications services does not make it a barrier to entry any more than the necessity of paying salaries to engineers and accountants makes them a barrier to entry. When a firm pays less than the opportunity cost of spectrum or any other input, either the firm involved is receiving a windfall or the input involved is not being put to its highest valued use.

The concern about spectrum is not that it is a barrier to entry but that, like any essential input that is less than infinitely elastic in supply, it might be hoarded by incumbents and its price increased above its scarcity value in order to deter new entry. The strategies of foreclosing the supply of an essential input and raising rivals' cost are well-known examples of abuse of dominance for which a remedy is readily available under the abuse of dominance sections of the *Competition Act*.

In addition to remedies provided under the *Competition Act*, a remedy for exclusionary behaviour also exists under the *Telecommunications Act*. The CRTC continues to exercise regulatory authority over wireless telecommunications with respect unfair

[71] Telecommunications Policy Review Panel, Comments of the Commissioner of Competition: Telecommunications Policy Review, August 15, 2005, para.94.
[72] Telecommunications Policy Review Panel, Comments of the Commissioner of Competition: Telecommunications Policy Review, August 15, 2005, para.95.

discrimination and undue preferences under sections 27(2) and 27(4) of the *Telecommunications Act*. This would apply, for example, in cases in which an incumbent provided access to its facilities to some competitors but not to others.

IV.1 Remedies for exclusionary behaviour under the Competition Act

Sections 78-79 of the Competition Act can be used to prevent exclusionary behaviour by incumbent mobile wireless providers as an abuse of dominance or joint dominance. The pre-emption of scarce facilities or inputs in order to deter entry or weaken an entrant is an illustrative anti-competitive act listed in paragraph 78 (1)(e) of the Act. According to the Abuse of Dominance Guidelines:

> Paragraph 78(1)(*e*) identifies the pre-emption of scarce facilities or resources required by a competitor as an anti-competitive act. For example, the dominant firm(s) may be able to bid up the price of a scarce input to the point where entry is unprofitable. Such a strategy may be profitable to the dominant firm(s) despite the higher price it also pays for the input, because it avoids the dissipation of profits that entry would bring. Alternatively, the dominant firm(s) may raise its rival's costs by pre-empting low cost inputs, forcing the rival to use higher cost inputs. Even if this strategy did not result in the exit of the rival, it could be profitable for the dominant firm if it resulted in the rival being a less effective competitor, allowing the dominant firm to increase its own prices. Pre-emption could also take the form of acquisition or control of the supply of a necessary input in production, such as production sites or facilities that are not easily replicated.[73]

The Guidelines further state that the Competition Bureau considers a refusal to allow competitors access to an incumbent's facility a potentially anti-competitive act:

> Although not specifically listed in section 78, refusing to allow a competitor access to an incumbent's facility, or imposing restrictive terms of access, can constitute an anti-competitive act.[74]

The Competition Bureau's enforcement guidelines the possibility of market dominance can arise when one firm has as little as a 35 percent of a relevant market or if a group of firms acting jointly hold as little as a 60 percent share. To this point, contested abuse of dominance cases have involved market shares of 80 percent or more.

> … In *Laidlaw*, the Tribunal observed that a market share of less than 50 percent would not give rise to a prima facie finding of dominance, but this does not imply that market power could never be found below 50 percent.

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[73] Competition Bureau, Enforcement Guidelines on the Abuse of Dominance Provisions (Ottawa, July, 2001) p.21.
[74] Abuse of Dominance Guidelines, p.22

> The Bureau considers that a market share of less than 35 percent will normally not give rise to concerns that a firm has engaged, or is engaging in, a practice of anti-competitive acts that is preventing or lessening competition substantially in a market. If a firm has a 35 percent or higher market share, the Bureau will normally continue its investigation.
>
> The two cases involving joint dominance were dealt with under consent orders where the element of joint dominance was taken as a given. As a guide, the Bureau will continue its examination when the combined market share of the group of firms alleged to be jointly dominant is equal to or exceeds 60 percent.[75]

It is likely that the market shares of the incumbent wireless carriers are such that any conduct involving foreclosure or raising rivals' cost would come under the purview of Act. Depending on the circumstances, it could be viewed as an abuse of joint dominance or, given that the Bureau defined the geographic market as provincial or regional in Microcell, it could be viewed as an abuse of dominance in one or more of these markets.

The Competition Bureau has been very successful in employing the abuse of dominance provisions of the Act to prevent incumbents from foreclosing outlets or inputs to new entrants or small competitors. Its ability to do so appears to have been strengthened by the recent decision of the Federal court of Appeal in *Canada Pipe* and also by the proposed amendments to the Competition Act relating to abuse of dominance in telecommunications markets. The key questions with respect to mobile wireless are, first, whether proceedings under the *Competition Act* are sufficiently simple and expeditious and, second, whether the jurisprudence and the Bureau's enforcement policy afford sufficient protection to the competitive process.

<u>The Federal Court of Appeal Decision in Canada Pipe[76]</u>

The *Canada Pipe* case involved a loyalty program under which dealers were offered rebates for stocking Canada Pipe products exclusively. The Commissioner of Competition alleged that this program constitutes an abuse of dominance in that it had the effect of foreclosing the market to new entrants thereby entrenching Canada Pipe's dominance. The Competition Tribunal ruled that the loyalty program did not constitute an abuse of dominance largely on the grounds that the program was annual, leaving all dealers contestable by a potential entrant each year and that entry had occurred in the market and some dealers had switched loyalties.[77]

The Commissioner appealed the Tribunal's decision to the Federal Court and the appeal was upheld. The Federal Court sent the case back to the Tribunal for redetermination and this is where the matter stands at this point.

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[75] Abuse of Dominance Guidelines, p.15.

[76] *Commissioner of Competition v. Canada Pipe Ltd*. 2006 FCA 233 [2006] FCJ No.1027.

[77] *Commissioner of Competition v Canada Pipe Ltd. 2005* Comp. Trib. 3 (Competition Tribunal)

The decision of the Federal Court of Appeal in *Canada Pipe* appears to have eased the Bureau's burden of proof in two respects. First, the standard by which an anti-competitive act is to be judged is not whether there is substantial competition remaining in the market, but whether competition would have been substantially more intense in the absence of the anti-competitive acts involved. Second, according to the FCA, the determination of whether a practice is anti-competitive should be based on its intended effect on competitors which can be inferred, in turn, from its reasonably foreseeable effects. While consumer harm is relevant, there need be no direct link between the impugned practice and competition. Indeed, the FCA has ruled that a practice can be anti-competitive even though it enhances consumer welfare. In so doing the Court has seriously restricted the "legitimate business practice defence."

The FCA appears to have adopted the view that a practice is anti-competitive if it harms a competitor and lessens competition if competition would be more intense, but for the impugned act. If this is the case, it will be much easier for the Commissioner of Competition to prove abuse of dominance and the jurisprudence under the *Competition Act* will have moved much closer to the CRTC's view of what constitutes an anti-competitive act.

Proposed amendments to the *Competition Act*

These amendments apply specifically to possible abuse of dominance or joint dominance (practices of anti-competitive acts by a group of firms that jointly have market power) in telecommunications markets. They appear to have been intended to accompany the forbearance of CRTC regulation of markets for (wireline) local exchange services but they will also serve to provide additional protection to entrants into the market for mobile wireless services. These amendments provide for Administrative Monetary Penalties of up to $15 million in addition to remedial orders. They are clearly aimed at preventing exclusionary behaviour.

The Draft Information Bulletin

The draft Information Bulletin accompanying the proposed amendments to the Act explain the types of anti-competitive exclusionary behaviour in the telecommunications industry that would be covered by the abuse of dominance sections of the *Competition Act*.[78] These include various forms of foreclosure, squeezing and predatory pricing. The foreclosure provisions of the *Competition Act* relate specifically to foreclosure or effective foreclosure of sources of inputs, production facilities or outlets that is likely to have the effect of preventing or lessening competition substantially. Substantial prevention can take the form either of exclusion or marginalization of a competitor or potential competitor.

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[78] Draft Information Bulletin on the Abuse of Dominance Provisions as Applied to the Telecommunications Industry September 26, 2006. Available at:
http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=2180&lg=e

The central concern of the Industry Canada consultation paper is with the foreclosure of facilities and spectrum. The consultation paper appears to view ex ante mandated access to facilities and the reservation of spectrum as the only policy response to the possibility of foreclosure. The abuse of dominance sections of the *Competition Act* provide an alternative remedy if anti-competitive foreclosure does, in fact, occur. The Draft Information Bulletin defines an anti-competitive denial of access as follows:

> With a finding of market power, a denial of access is an anti-competitive act when its purpose is to exclude or impede actual or potential competitors. To infer such a purpose, it must be difficult or impossible for those competitors to substitute other inputs or to practically or reasonably duplicate the facility. The requirement that it is not practical or feasible for a competitor to duplicate the facility means that such an entrant would not find it feasible to enter or compete effectively if it had to self-supply the facility. At the same time, for the purpose to be anti-competitive, the supplier must have the necessary capacity, or have the willingness and ability to build the necessary capacity, to supply those competitors. In its examinations of denial of access complaints, the Bureau will also take into account any vertical efficiency effects of the conduct.[79]

Upon reaching a finding of anti-competitive foreclosure, the Competition Tribunal has a number of remedies at its disposal. In addition to prohibiting the repetition of the impugned conduct, it could order the divestiture of assets, presumably including spectrum. It could also order that access be granted to specified facilities. While it cannot act as an access price regulator, it can determine whether access prices offered pursuant to an order it has issued are in compliance with the order:

> In some cases, the Tribunal has explicitly ordered access to certain facilities or services. However, access will not improve competitive performance in a market if it is provided at a prohibitive price. The Tribunal has stated that it does not function as a price regulator, such as through ongoing oversight of rates or access price setting. The Bureau also does not have the legislative mandate to act as a binding price regulator in access disputes. Having said that, the level of the access price would usually be an important consideration in assessing whether a firm is in compliance with the order to provide access.
>
> Subsection 79(2) gives the Tribunal broad discretion in making orders, and in limited circumstances this has included orders specifying formulas for setting prices. However, such orders do not involve ongoing oversight and instead specify what would constitute compliance with the order. Specific disputes over what would constitute “reasonable” access prices could be resolved through third-party mediation or arbitration.[80]

A problem with cases litigated under the abuse of dominance sections of the *Competition Act* is that the process is slow and costly. While it is difficult to claim that abuse of

[79] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=2187&lg=e
[80] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=2189&lg=e

dominance proceedings under the Competition Act have been simple and expeditious in the past, there does not appear to be any reason why they could not be simpler and more expeditious and it is not as if CRTC proceedings have constituted any sort of standard in this regard. Moreover, it may not be necessary to litigate many cases. The Bureau has prevailed in the vast majority of cases it has brought to the Competition Tribunal and both the FCA decision in *Canada Pipe* and the proposed amendments to the Act further strengthen its hand.

Additional enforcement resources would also help expedite proceedings. In recognition of this, the government has allocated additional funds to the Competition Bureau to enable it to deal more quickly with competition issues arising in the telecommunications sector.[81] The Commissioner of Competition has also indicated that the Competition Bureau will be sharing expertise with the CRTC.[82]

Conclusion

The use abuse of dominance provisions of the *Competition Act* are well suited to respond concerns regarding anti-competitive denial of access and raising rivals' costs. The response is adaptive and sequential and is best suited to dealing with issues of exclusionary conduct. This is also true of proceedings under section 27(2) of the *Telecommunications Act*. There are serious dangers in imposing blanket regulatory exclusions and access requirements *ex ante*. What constitutes an anti-competitive denial of access is very much situation-dependent.[83]

IV.2 Ex post versus ex ante regulation

The conclusion reached above is that the sanctions and remedies available under the *Competition Act* and the *Telecommunications Act* are sufficient ensure that the prices of inputs and facilities required by new entrants into mobile wireless telecommunications market will be competitive. The imposition of *ex ante* restrictions and obligations on incumbents would be counter-productive. Some of the possible costs of *ex ante* regulatory restrictions and obligations are discussed below.

Ex ante restrictions are inflexible and substitute bureaucratic fiat for adaptive market responses. This inflexibility would be especially costly in the mobile wireless market

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[81] Industry Canada, Canada's New Government Accelerates Deregulation of Local Telephone Service to Benefit Canadian Consumers, Ottawa, April 4, 2007, http://www.ic.gc.ca/cmb/welcomeic.nsf/ddb0aecf65375eb685256a870050319e/85256a5d006b9720852572b400524ba5!OpenDocument

[82] Industry Canada, Commissioner of Competition Comments on Government's Decision to Deregulate Local Telecommunications Sector, Ottawa, April 4, 2007 http://www.ic.gc.ca/cmb/welcomeic.nsf/af913527c10aeb6a852564820068dc6c/85256a5d006b9720852572b30074e85e!OpenDocument

[83] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=2259&lg=e

where myriad arrangements for facilities sharing of various kinds already exist. Regulatory intervention has not been required to consummate them. Indeed, regulatory specification of means and outcomes in what would otherwise be voluntary, mutually beneficial access transactions could impede the negotiation process, reduce the efficiency of the arrangements negotiated and lead to the displacement of more efficient or potentially more efficient providers by less efficient ones. While disputes may well arise in the process of bargaining over the disposition of the gains from a mutually beneficial access transaction, the ongoing presence of a regulator may increase the incidence of these disputes and frustrate their resolution.

Given that competition in the mobile wireless market is well-established and that there is already a profusion of market-driven facilities-sharing relationships in existence, it is reasonable to start with the presumption that potential access transactions that are efficient (surplus increasing) efficient will occur. In instances where there is exclusionary conduct, the remedies and sanctions available under the *Competition Act* can be invoked. The merit of this approach is that it focuses on problems that actually occur rather than imposing blanket, counter-productive regulatory strictures on an entire set of properly functioning market processes.

Efficient use of spectrum requires that all purchasers of spectrum pay its competitive scarcity price. The abuse of dominance provisions of the *Competition Act* are sufficient to discourage attempts to push the price of spectrum above its competitive scarcity value. Additional regulatory measures in the form of *ex ante* restrictions on participation by incumbents in the spectrum market, particularly set-asides, could have a number of adverse effects. Set-asides would likely preclude all incumbents from bidding on the spectrum involved and may result in sales of spectrum at prices below its opportunity cost. This may attract bidders whose interest is in obtaining spectrum below market and flipping it in various ways. For a wireless entrant there are two possibilities. Either below market spectrum is either a windfall (because entry would have occurred anyway) or entry would not have occurred if the entrant were required to pay the competitive scarcity price of spectrum. In the latter case, entry is inefficient. Entry that is, in fact, induced by the availability of below-cost spectrum cannot, virtually by definition, provide the robust, efficient competition that would make the industry more "vibrant." Indeed, this is implied by the argument made by some that new entrants can only "afford" to compete if they are allowed to purchase spectrum on concessionary terms.[84] Such competitors are likely to require an ongoing stream of regulatory favours. Moreover, to the extent that set-asides leave incumbents spectrum-constrained, it softens competition among them by reducing their ability to take market share from each other.

Inducing entry by concessionary pricing of spectrum provides the illusion of competition but not the reality. That is, there are more competitors but competition may be less intense and the industry as a whole is less efficient. The prospect of future regulatory back-ins is likely to reduce the incentive to invest thereby resulting in an even less efficient industry in the future. An outcome in which consumer benefits are small and fixed costs are duplicated reduces productivity, reduces industry-wide efficiency and is

[84] This is different from the "winner's curse" of having over-paid for spectrum.

harmful to the economy as a whole. While this type of inefficient entrants may ultimately be "bailed out" by subsequent mergers, sunk investments would be forfeit, employee and other adjustment costs would be incurred and the merger and acquisition process itself is far from costless.

Conclusion

It is clear that in addressing concerns regarding possible exclusionary conduct, *ex post* remedies, including those available under the *Competition Act* are superior to *ex ante* restrictions and obligations. In its submission to the Telecommunications Policy Review Panel, the van Horne Institute cited evidence to the effect that *ex ante* regulation wastes information and inhibits innovation and noted that regulatory practice elsewhere is to minimize reliance on it. The Institute noted that:

> In most other industries in Canada, intervention is ex post, often through the Competition Bureau, and we are not persuaded that the telecom industry is so different that similar remedies for malpractices should not apply.[85]

IV.3 Other policies to increase efficiency in the mobile wireless market

There are other policy measures that would reduce the costs of mobile wireless carriers and open up the market to a broader range of competitors. There is a persuasive case to be made in favour of the elimination of foreign ownership restrictions in telecommunications as the House of Commons Industry Committee has recommended.[86]

In its Technical Backgrounder on the acquisition of Microcell by Rogers, the Competition Bureau concluded that foreign ownership restrictions constituted a significant barrier to entry into the mobile wireless market.

> Foreign ownership restrictions are another significant barrier to entry. Under current requirements regarding foreign ownership, a foreign-based company is limited to a minority position in any facilities-based telecommunications company. In addition to limiting the opportunities for new foreign based entry, these ownership restrictions also limit the options for Canadian based companies seeking new sources of investment capital or alternative purchasers.[87]

[85] The Van Horne Institute, Letter to the Telecommunications Policy Review Panel, August 15, 2005, para.23.
http://www.telecomreview.ca/epic/site/tprp-gecrt.nsf/en/rx00037e.html

[86] House of Commons Standing Committee on Industry, Science and Technology, " Foreign Investment Restrictions Applicable to Telecommunications Common Carriers."
http://www.parl.gc.ca/InfoComDoc/37/2/INST/Studies/Reports/instrp03/12-chap2-e.htm#4

[87] http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e

In its submission to the Telecommunications Policy Review Panel, the Competition Bureau reiterated its view that foreign ownership restrictions prevent successful global competitors from entering the Canadian market and increase the cost of capital in what is a highly capital-intensive industry and that this higher cost is ultimately passed on to consumers (a further reason for the apparent delay in the diffusion of mobile wireless telephony in Canada). The Bureau noted that almost all OECD countries now have more liberal foreign ownership regimes than Canada and that policy harmonization militates in favour of a liberalization by Canada as well and, in any case, there does not appear to be any security, sovereignty or cultural concern that foreign ownership restrictions are well-suited to address.[88]

The R&D requirement (2 per cent of sales revenue) imposed as a condition of license on spectrum holders is unnecessary and also has the effect of reducing the number of competitors the wireless market can support. The R&D requirement is, in effect, a "tax" taken off the top. It drives a wedge between the amount consumers pay for wireless services and the amount that is available to providers to cover their costs.

V. Conclusions

The decision to enter a new market should be made on the merits rather than being induced by regulatory favours or concessions. New entrants should expect to pay competitive prices – no more and no less - for the inputs they require. Industry Canada ought not to be concerned with abstruse arguments about the extent to which the mobile wireless market in Canada falls short of some competitive ideal. If the value propositions offered to mobile wireless consumers by incumbents are such as to leave profit opportunities open for new entrants, that is for them to decide. The role for Industry Canada is to determine whether there are compelling reasons why sanctions available under the *Competition Act* would be insufficient to provide a reasonable assurance that the price of spectrum and the access prices of any essential facilities in the hands of the incumbents are competitive and if they are not, to find the least intrusive way of providing the requisite additional assurance. This should not require the imposition of blanket *ex ante* obligations and restrictions on incumbents.

[88] Telecommunications Policy Review Panel, Comments of the Commissioner of Competition: Telecommunications Policy Review, August 15, 2005, paras.127-31.