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A Policy Analysis of Net Neutrality

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Executive Summary

Recent instances of Internet service providers (ISPs) allegedly restricting access to specific web sites, as well as “shaping” Internet traffic to discourage peer-to-peer file transfers has strengthened calls by many Internet user groups for the government to implement regulations designed to ensure “net neutrality.” While there is no single accepted definition of net neutrality, the notion that ISPs should treat all content, sites, and platforms on the Internet equally captures the spirit of many of the calls for regulation.

This report examines and evaluates arguments for regulating the behavior of ISPs from the perspective of proponents of net neutrality regulations. The main concern focuses on so-called access tiering. Tiering involves ISPs charging different prices to individual content and applications providers for different qualities of service or otherwise “discriminating” against specific providers. For example, faster download speeds would result in the ISPs charging content and applications providers higher prices to that use the faster speeds. Net neutrality proponents worry that access tiering will result in reduced innovation rates by making it more difficult and expensive for new content providers to offer their content on the Internet in competition with established providers. They are also concerned that ISPs may use access tiering or other initiatives to discriminate in favor of their own web site content and applications. This concern is enhanced by a perception that the ISP sector is highly concentrated in relevant geographic markets such that market competition cannot be relied upon to discourage discriminatory behavior on the part of ISPs that, in turn, can be expected to discourage the continued growth of new content and services available on the Internet.

While the ISP sector is fairly concentrated, evidence suggests that it is appropriately characterized as workably competitive. That is, actual and potential competition in the sector is sufficiently strong as to force individual ISPs to seek and offer independently produced content and applications to their subscribers. Discrimination in favor of one’s own content and software can be expected to lead to a loss of subscribers that will likely outweigh any revenue advantage gained from such discrimination. Furthermore, workable competition ensures that ISPs have little incentive to engage in restricting access to independent web sites for the purposes of earning monopoly profits. While ISPs have, to date, not been charging customers directly for access to specific web sites, much as cable companies do for program channels, the possibility exists in the future. Exclusive access to specific sites through individual ISPs might emerge as a form of competition. Such exclusivity in an envi-

ronment of workable competition is more likely to enhance innovation than discourage it.

The analysis in this report concludes that implementing net neutrality regulation in Canada would be ill-advised. However, concerns will continue to be raised about specific actions taken by ISPs that, in turn, oblige policy makers to have a mechanism in place to address those concerns. The suggestion in this report mirrors the conclusion of Industry Canada's Telecommunications Policy Review Panel. Namely, complaints about the behavior and practices of ISPs should be addressed on a case-by-case basis employing the criteria underlying the Competition Act. In broad terms, contentious actions should be evaluated from the standpoint of whether or not they are consistent with economic efficiency.

To be sure, some actions may not correspond to abuses of market dominance in the way such actions are identified by competition policy experts. For example, an ISP might block access to specific content for ostensibly non-commercial reasons such as concerns about criminal behavior being abetted. In such cases, as well, it seems advisable to deal with particular concerns raised on a case-by-case basis. Furthermore, it is appropriate to evaluate apparently discriminatory actions taken by ISPs with respect to the broad criterion of whether discriminating against a particular web site or group of subscribers enhances the value of the Internet for society as a whole, as would certainly be the case if usage that threatened to degrade the quality of service for the "average" Internet user were tolerated by ISPs.

1. Introduction

The issue of "net neutrality" is emerging as a prominent focus of debate in the ongoing evolution of Canadian broadcast and telecommunications regulatory policy. Specifically, there has been increasing concern on the part of some observers that Internet Service Providers (ISPs) are impeding access to specific web sites or curtailing specific types of usage. Many believe strongly that the Internet should be universally available for all possible uses and that access to content and applications should not be interfered with, particularly by service providers. Related to this belief is a view that censoring or controlling the flow of information carried on the Internet will discourage innovation and productivity growth in the economy and, perhaps of greater importance to some, threaten freedom of speech and expression, thereby undermining the competitive process.

Several recent incidents have strengthened the concerns identified above. For example, during a labor dispute in July 2005, Telus blocked subscriber access to a web

site that supported the Telecommunications Workers Union, an action that blocked hundreds of other web sites in the process. Telus argued that content on the web site in question raised privacy and security issues for some of its employees. It also argued that its subscriber contract granted it the right to block content. However, critics charged that the blockage affected customers of other ISPs that used Telus' physical network to carry their customers' Internet traffic. As another example, Rogers has been identified as engaging in "traffic shaping" on its network. That is, the company is alleged to limit specific uses of its network, including file sharing applications (Geist, 2007). A similar complaint was levied against Comcast, a cable distributor in the United States. Specifically, Comcast was alleged to be blocking file sharing activities, although the company denied blocking access to any web sites or online applications, including file sharing (Jones, 2007).

Concerns about ISPs shaping traffic on the Internet or blocking access to specific sites has led to calls for government regulation to ensure that ISPs do not restrict traffic carried on their networks or otherwise act as "censors" of content and applications available to subscribers. Indeed, the federal Green Party became the first political party in Canada to address net neutrality in its party platform. Specifically, the party called for legislation prohibiting ISPs from discriminating due to content while freeing them from liability for content transmitted through their systems. It also argued against ISPs allowing corporations the ability to pay for preferential treatment and faster service for carriage of their data (for a full discussion, see Ruffolo, 2007).

Appropriate "rules of the road" for the Internet was also briefly addressed by the Telecommunications Policy Review Panel established by Industry Canada. Specifically, the panel confirmed the right of Canadian consumers to access publicly available Internet applications and content by means of all public telecommunications networks that provide access to the Internet. However, it stopped short of calling for specific regulations to codify "bright line" constraints, or explicitly prohibited behaviors, and requirements to guarantee this right, as many proponents of net neutrality would wish. Rather, the panel expressed a belief that market competition will, in most cases, ensure that network operators and ISPs will have little or no incentive to interfere with customer access, and that specific instances raising concerns about restricted access or discriminatory treatment can and should be handled on a case-by-case basis (Industry Canada, 2006).

The projected rapid growth of Internet usage, particularly involving high bandwidth-using applications, ensures that the policy environment surrounding the activities of ISPs and operators of broadband communication networks will be the subject of attention and discussion, perhaps even the focus of political debate. Proponents of net neutrality have staked out positions that effectively call for imposing new regulations on Canada's communications carriers. Such positions are antithetical to the ongoing deregulation of the telecommunications industry, as well as to calls for mov-

ing towards deregulation of the broadcasting sector. As such, it is important to assess carefully the net neutrality argument for regulation, particularly given the obvious benefits to consumers that can be ascribed to deregulation of the telecommunications sector over the past two decades and the inefficiencies associated with regulation, including regulation ostensibly designed to promote competition (Crandall, Hahn, Litan and Wallsten, 2003).

The purpose of this study is to evaluate the need for regulation of the Internet along the lines called for by proponents of net neutrality. As shall be discussed below, there are differences in how net neutrality has been defined by proponents, as well as differences in the specific regulations proposed. Nevertheless, proponents of net neutrality share a view that regulatory constraints on private sector decision-making will enhance the net economic benefits of the Internet to Canadians. This study critically evaluates and rejects this view. It concludes much along the lines of the Telecommunications Policy Review Panel that reliance on market competition is primarily called for in order to leverage the economic benefits of the Internet, and that specific concerns that arise from potential abuses of market power are best addressed through the application of well-established procedures followed under competition policy.¹

The report proceeds as follows. Section 2 broadly defines the concept of net neutrality and identifies some of the key concerns raised by proponents of net neutrality. Section 3 analyzes the market structure of Internet access service provision in Canada and concludes that it is workably competitive. Section 4 examines the implication of a workably competitive market on access to Internet content and applications. Section 5, 6, and 7 address concerns raised by net neutrality advocates on three key issues in the debate: access-tiering, vertical integration, and innovation. Section 8 presents policy recommendations that are aimed at preserving competition and efficiency by relying on existing regulatory mechanisms.

2. The Concept of Net Neutrality

An evaluation of net neutrality proposals will obviously be conditioned by the specific details of the proposals. In this regard, there are alternative definitions of net neutrality, as well as different policies proposed to facilitate net neutrality. Wu (2003: 145) offers perhaps the most concise definition of net neutrality: "... an Internet that does

1 Competition policy encompasses the procedures and activities set out in the Competition Act that are intended to address anti-competitive behavior on the part of dominant firms that threatens to undermine economic efficiency.

Figure 1: The Layered Model of Broadband Architecture

Content Layer

(e.g. individual e-mail, web pages, voice calls, video programs)

Applications Layer

(e.g., web browsing, e-mail, VoIP, streaming media, database services)

Logical Layer

(e.g., TCP/IP, domain name system, telephone numbering system)

Physical Layer

(e.g., telephone lines, coaxial cable, backbones, routers, servers)

Source: Yoo (2005, p.33)

not favor one application (say, the world wide web), over others (say, email).” The Green Party’s view of net neutrality requires the Internet to treat all content, sites and platforms equally (Ruffalo, 2007).

Sidak (2006: 354) argues that despite the considerable inconsistency and vagueness among the various definitions of net neutrality, three themes can be identified: 1) access providers should not deny or degrade access to specific content and applications accessible on the Internet or to specific hardware used to access the Internet; 2) network operators should not charge content providers, or providers of applications, fees that are conditional on the “quality of service,” a practice known as access tiering, and; 3) network operators should not vertically integrate into the production of content and applications, including advertiser-supported services.²

An assessment of these three arguments put forward by net neutrality advocates might be advanced by first briefly describing the “architecture” of the Internet. Yoo (2005) disaggregates broadband networks into four layers that cut across differ-

2 Vertical integration occurs when a company diversifies into “upstream” sectors that supply inputs to the company’s existing businesses and/or into “downstream” sectors that distribute the outputs of its existing businesses.

ent network providers.³ Figure 1 summarizes the layers. The bottom-most layer, the “physical layer,” consists of the hardware infrastructure that actually carries and routes the communications. The second layer is the logical layer comprising the protocols that route communications within the network. The third layer comprises the particular applications used by consumers. The fourth layer comprises the content or the specific data being carried. In broad terms, net neutrality proponents are concerned that “last mile providers,” i.e., those supplying the physical connection from the customer to the local exchange network (the ISPs) will use their “control” of that portion of the physical layer to reduce competition in other layers of the network, particularly content and applications, as well as to discriminate across different participants with respect to “quality” of Internet service.⁴

The broad concerns that Sidak identified (2006) are underscored by specific characterizations of net neutrality, as well as specific policy proposals. For example, net neutrality rules drafted by the Federal Communication Commission (FCC)⁵ that were attached to the merger of AT&T and Bell South required AT&T (for 30 months) to allow customers to access any content or service of their choice, while barring AT&T from providing faster service to any content or service provider (Ante, 2007). The former rule is similar to the Green Party’s call for all content, sites, and technology platforms to be treated equally so that customers have access to every form of information and every kind of application (Ruffolo, 2007). The latter provision parallels the Green Party’s argument that ISPs should not allow corporations to pay for preferential treatment and faster service for their data.

The potential focus of net neutrality regulation can also be highlighted by specific concerns that proponents of net neutrality have raised. Note that the concerns identified below have primarily been articulated in the US context, and their individual relevance is conditioned by Canadian regulatory conditions, as discussed in a later section. In the event, proponents of net neutrality have identified the following issues in one or another platform:

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- 3 The CRTC defines broadband as Internet access services operated at a speed faster than 1.5 megabits per second. Almost all Canadian households have access to broadband through various ISPs, and the majority of users have access to the Internet through broadband technologies.
 - 4 It is important to note that the four layers are thoroughly intertwined and cannot be easily separated. For example, ISPs not only supply physical infrastructure but also route communications and manage content and data. In addition, major ISPs in Canada own local exchange network switching and transmission facilities besides providing “last mile” access.
 - 5 The FCC is an independent government agency in the United States charged with regulating interstate and international communications by radio, television, wire, satellite, and cable. The various participants in the physical layer, as well as their roles, will be discussed in Section 3.

- 1 Established communications carriers that offer Internet access while enjoying market dominance (i.e., controlling a relatively large share of the market) in the physical layer of the network will not allow rivals offering competitive applications and content to use their infrastructure to facilitate competition against their own applications and content. An example is voice-over Internet (VoIP) which competes with the telephone companies' conventional voice carriage business, as well as with their VoIP services (Greenstein, 2007). This concern underlies calls for regulation subjecting established telecommunications carriers to an open-access requirement that would prohibit those providers from discriminating against independent companies seeking to offer competitive applications while using the established carrier's facilities (Lenard and Scheffman, 2005). It also underlies calls for regulating network management practices. Unacceptable practices might include blocking competitor traffic or prohibiting or restricting attachments from competitors if these provide a competitive advantage to the carrier's commercial interest. Some net neutrality advocates are willing to accept that network management to block computer viruses or restrict use of the Internet by "bandwidth hogs" is appropriate. Others object to any effort on the part of carriers to alter Internet traffic flows as unacceptable censorship.⁶
- 2 Another and related concern is that ISPs enjoying market dominance in the physical layer of the network will block entry of competitive content suppliers, or discriminate against them in terms of quality of service, such as download speed, thereby increasing the economic rents (profits above costs-of-capital) that they earn from supplying content themselves. In another version of this concern, incumbent carriers may have partners who supply content, and the carriers will steer customers to the partner and away from competitive web sites, perhaps through discriminatory pricing of access to different web sites or through slower data transfer speeds for non-preferred web sites.
- 3 A third concern is that in the absence of appropriate regulation, ISPs will discriminate across application and content providers on the basis of "quality of service" and will set prices to reflect the different quality of service provided. For example, expedited delivery of content would presumably cost more than slower delivery (so-called access tiering).
- 4 While access tiering applies to content and application providers and has been a primary focus of net neutrality proponents, there has also been

6 For a discussion of the opposition that the US cable company Comcast faced in delaying peer-to-peer traffic when it caused congestion to its network, see Burrows, 2007a.

some concern expressed about ISPs charging retail customers different prices based upon differing quality of service. To be sure, most advocates of net neutrality do not object to ISPs charging higher prices to customers for, say, faster download speeds. Nevertheless, some have expressed a specific concern that any such differential pricing by quality of service will result in lower-income residential subscribers receiving “degraded” service compared to business and higher income subscribers (Lessig and McChesney, 2006).⁷ Another and separate worry is that ISPs enjoying market power in the physical layer will price discriminate across subscribers where price differences do not reflect differences in costs associated with alternative qualities of service.

These various concerns highlight the underlying main points at issue in the net neutrality debate. One is the extent to which the physical layer of the Internet is characterized by market dominance on the part of incumbent suppliers. A second is whether the behaviors that the net neutrality proponents are concerned about are likely to arise even if incumbent suppliers enjoy market power.⁸ A third is whether the behaviors of concern increase or decrease economic welfare. That is, do they contribute to higher or lower real incomes of Canadians by affecting economic efficiency? The report now turns to consider these issues. We first evaluate whether market power concerns are applicable to the physical layer of the Internet.

3. Market Structure

Concerns about market power in the Internet’s physical layer usually rest upon the observation that many Internet subscribers are limited to buying their Internet service from either their local cable company or their local telephone company. Internet revenues were \$5 billion in 2006 out of total telecommunications revenue of \$36.1 billion (CRTC, 2007).⁹ Internet revenues consist of payments for Internet access, Internet transport, and Internet applications. Internet access is the provision of an IP

7 This “equity” concern is similar to arguments that allowing private purchase of health care services will result in a “two-tier” health care system where poorer individuals are condemned to lower quality medical services.

8 Market power can be viewed as the ability to profitably charge and maintain anti-competitive prices or otherwise profitably engage in behavior that is inconsistent with firm behavior in competitive markets.

9 Total telecommunications revenue consists of both wireline (local and access services, long distance services, Internet, data, and private lines) and wireless revenues.

(Internet Protocol) connection to an end-user, which allows the end-user to communicate with Internet hosts and other end-users. Internet access service involves establishing a data connection between a modem at the end-user location and the ISP (the last mile provider). From the ISP's physical point of presence, traffic will be carried on a local exchange network and, in many cases, a long-haul (backbone) network to create intra-city and inter-city linkages among ISPs (for further details, see CRTC, 2007: 60).

In the physical layer of the Internet, non-facilities-based ISPs act as the intermediary between the owners of the telecommunications networks over which Internet traffic flows, and business and residential subscribers to the Internet. The larger ISPs use their own last-mile physical infrastructure and also operate local exchange networks. Most ISPs charge a flat monthly rate to subscribers for access to the Internet, although some impose a per-hour charge above the threshold flat rate. Besides access, most ISPs also offer value-added service applications such as email, web hosting, data centres, and security services, among others.¹⁰ Of total Internet revenues in 2006, slightly over 80 percent is accounted for by retail Internet access services and transport services (CRTC, 2007: 61).¹¹

Internet transport service essentially involves the carriage of Internet traffic on local and long-distance networks. In effect, it is the wholesale segment of the physical layer. Long-distance Internet transport is provided over Internet backbone facilities that carry aggregated traffic across inter-city linkages. Large telecommunications carriers are the primary owners of the transmission capacity over which Internet traffic flows (CRTC, 2007). While large facilities-based ISPs provide retail end-users with access to the Internet, they also supply other ISPs with access to the networks that connect ISPs to each other. The larger ISPs own their own physical facilities that provide the "last mile" connection between subscribers and the ISP.¹² Smaller ISPs generally lease such facilities from facilities-based ISPs.

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- 10 Typically, many Internet application services are bundled together with Internet access services, although there are stand-alone application services sold in the market. This description of Internet services is taken from the CRTC *Telecommunications Monitoring Report* (2007).
 - 11 Retail Internet access services include the provision of Internet access services to residential and business subscribers.
 - 12 These facilities primarily refer to dial-up access servers or switches, and Digital Subscriber Lines (DSL), fiber, coaxial cable, cable modem, satellite, and fixed wireless connections (CRTC, 2007). For a more extensive discussion of the wholesale and retail segments of the Internet, see Archibald (2003).

Internet access services

Table 1 reports Internet access service revenues in the retail market by type of provider. Incumbents are incumbent telephone companies that provide local exchange services. These companies provide high-speed access to the Internet through digital subscriber (DSL) telephone lines. Cable broadcasting distribution undertakings (BDUs) provide Internet access services mainly through coaxial cable and cable modem connections. The “Other” category consists of major telephone companies operating outside their traditional geographic territories, and non-facilities-based ISPs who primarily use the wholesale data services of incumbent telephone companies or cable companies to supply access to the Internet. Utility companies also supply Internet access through wired and wireless connections.

Table 1: Internet Access Revenue by Type of Provider, 2006 (\$ millions)

	Revenues	Market Share
Incumbents	1,724.7	42.4%
Cable BDUs	1,790.8	44.1
Other ISPs	549.8	13.5

Source: CRTC (2007), table 4.4.3, p.66.

As table 1 shows, the combined Canadian market share of incumbent telephone companies and cable companies was slightly over 86 percent in 2006.¹³ While there are clearly alternatives to local exchange telephone companies and cable companies, the latter are the main suppliers of ISP access in Canada. Furthermore, the combined market share of these two sources of supply has been increasing with the transition away from dial-up Internet access to high-speed Internet access, as other competitors hold a disproportionately larger market share in the dial-up segment of the market. Since individual incumbent telephone companies and cable companies concentrate in specific local geographic markets, the combined market shares of incumbent local exchange carriers and cable companies in local markets are likely to be similar to the national market share.

13 This was somewhat higher than the 76.6 percent combined market share in 2003. As a group, out-of-territory operations of telecommunications service providers (TSPs), resellers, utility telecommunications companies, and other carriers have a larger share of the business market (38%) than of the residential market (7%). See CRTC (2007, figure 4.4.1, p. 67).

**Table 2: Top Four Retail Internet Companies' Revenues, 2005
(\$ millions)**

	Revenues	Market Share
Four largest companies	2,312.5	63.3%
Others	1,339.6	36.7

Source: CRTC (2006), table 4.4.4.

In effect, Internet access in relevant geographic markets is essentially supplied by a duopoly, or two major sellers. The four major suppliers in Canada are Bell Canada, Telus, Rogers Communications, and Shaw Communications, accounting for slightly over 67 percent of retail Internet revenues in 2006 (table 2). The bulk of the remaining share of revenue is accounted for by smaller regional local exchange carriers and cable companies. The inference one might draw is that Internet service access is characterized by relatively high market share concentration. That is, market share is concentrated in the hands of a very few firms. Nevertheless, it would be a mistake to infer from the market share data that there is limited competition in the provision of Internet service access. Indeed, the evidence on the behavior of ISPs suggests that the sector is workably competitive.

Workable competition

The textbook definition of perfect competition requires numerous buyers and sellers, no barriers to entry and exit, price flexibility, and perfect information and foresight by buyers and sellers.¹⁴ Sellers are “price takers” meaning that they accept market prices and do not have the power to charge higher prices without losing all of their sales. It is widely recognized that this textbook definition of perfect competition is too stringent to apply to any “real-world” markets. In particular, many markets are characterized as having relatively few sellers and with some sunk costs associated with new firm entry.¹⁵ Nevertheless, those markets can have “sufficient” competition among existing firms, along with a meaningful threat of entry by new firms, such that

14 Barriers to entry refer to factors that make it difficult for new firms to enter a market, such as large “upfront” investments in capital equipment. Price flexibility means that prices respond quickly to changes in market conditions.

15 Sunk costs refer to expenditures that cannot be recovered in the future through the sale of the purchased input(s) in question.

the behavior and performance of incumbent firms approximates what would be expected if the markets in question were perfectly competitive.

The search for a practical definition of competition led to the concept of “workable competition.” To be sure, more “traditional” models of competition among a small number of suppliers might also be invoked to describe much the same competitive behavior; however, while perhaps less theoretically precise, the concept of workable competition encompasses a broad set of rivalrous actions that results in outcomes similar to those predicted from traditional economic models of imperfect competition.

If competition is workable, the behavior and performance of market participants are close enough to the competitive ideal to lead most observers to conclude that the relevant market is working “satisfactorily.”¹⁶ The original notion of workable competition, introduced by John Maurice Clark, characterized workable competition as rivalry in selling goods whereby the prices each seller can charge are effectively limited by the ability of the buyer to buy from a rival seller or sellers for the same product. This rivalry necessitates an effort by each seller to equal or exceed the attractiveness of the offerings of other market participants. A more recent definition of workable competition by Joseph Stiglitz characterizes workable competition as rivalry among firms to supply the needs of consumers and producers at the lowest price with the highest qualities (see Kelly, 2007).

The Telecommunications Policy Review Panel noted in its report that as a result of strong competition between telephone companies and cable companies, Canada is ranked first among OECD countries in terms of cable Internet penetration. Canada has also been a world leader in the deployment of broadband Internet (Industry Canada, 2006). Lenard and Scheffman (2006) in remarking on the situation in the United States note that even though most broadband access is provided by the local cable company or the local telephone company, the two types of provider have been pricing aggressively in competing for market share. They point to substantial price reductions, as well as investments in fiber and other capacity as evidence of robust competition between the two suppliers.¹⁷

Many observers see wireless technology as facilitating a major potential source of new competition for local exchange carriers and cable companies in the provision of Internet service access (Greenstein, 2007).¹⁸ Clearly, there are substantial capital

16 This perspective on workable competition is found in Kelly (2007).

17 Yoo (2005) also asserts that DSL and cable modem providers engage in a spirited competition for new customers.

18 Yoo (2005) lists a host of new technologies waiting in the wings for deployment, including satellite broadband, fixed terrestrial wireless, WiFi, and third-generation mobile wireless.

costs associated with deploying wireless communications networks, and the portion of those costs that are sunk constitutes a barrier to entry. Nevertheless, one would not expect telephone and cable companies to ignore the wireless threat. Indeed, non-competitive pricing and related behavior on the part of existing suppliers should make consumers more willing to buy from new suppliers, thereby reducing the risks of entry perceived by new suppliers. Business subscribers, in particular, have both the willingness and the financial capacity to support the entry of new input suppliers in order to make the relevant market more competitive.

Regulation

Canada maintains two separate laws that govern the carriage of telecommunications and broadcasting content which are administered by the Canadian Radio-television and Telecommunications Commission (CRTC). The Telecommunications Act deals with the provision of telecommunications services, including Internet access services, by “common carriers.” The Broadcasting Act deals with the distribution of broadcasting content by stations, networks, and firms in the cable industry.¹⁹ Under existing regulations, ISPs are not subject to telecommunications regulation. Specifically, the CRTC does not explicitly regulate retail Internet services provided by telecommunications carriers; however, the CRTC does regulate wholesale Internet services including the prices charged by incumbent telephone and cable companies to non-facilities-based ISPs to access their infrastructure.²⁰ Furthermore, in 1998, the CRTC determined that cable distribution undertakings had to provide open access to their facilities to enable third party ISPs to provide high-speed cable services (CRTC, 2007).

In short, the local exchange portion of the physical layer of the Internet is regulated such that the underlying market structure of this segment of the physical layer is not relevant. Specifically, regulation ensures that incumbent providers of access services cannot foreclose access to their facilities to independent ISPs. Nor can they charge non-competitive or unacceptably high prices as defined by regulators. Therefore, in assessing the implications of the structure of the market for Internet access and services, what primarily matters is competition among ISPs. As discussed above,

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- 19 Although the cable telecommunications industry is subject to the Telecommunications Act for certain non-broadcasting carriage activities such as provision of Internet access services, its carriage activities and network infrastructure remain substantially regulated under the Broadcasting Act (see Industry Canada, 2006).
- 20 The CRTC will forebear from regulating access to the local network by independent ISPs if the regulator determines that the local market in question is sufficiently competitive to justify regulatory forbearance.

a strong argument can be made in this regard that this segment of the physical layer of the Internet is workably competitive.

We now turn to the question of whether the behaviors giving rise to concern on the part of net neutrality proponents are likely to arise even if incumbent suppliers enjoy market power.

4. Access to Content and Applications

Perhaps the most prominent and consistent rationale offered for regulation by proponents of net neutrality is the concern that such regulation is needed to ensure that ISPs do not deny people access to certain web sites or applications. For some supporters of regulation, any restrictions on end user access to specific web sites or applications are unacceptable infringements on the free flow of information and should not be allowed.²¹ Others are willing to make exceptions in cases where the use of the Internet is focused on criminal or other “socially undesirable behavior” or where the integrity of the Internet is threatened by specific types of usage-related threats, e.g., viruses.²²

While the debate surrounding the need for regulation to ensure access to all content on the Internet has tended to focus on freedom of speech, there are also economic ramifications that should be recognized. Indeed, an argument proposed by supporters of net neutrality against restrictions on access to specific content imposed by ISPs is that it will discourage the introduction of new content or other innovation. For example, ISPs might restrict access to sites that are competitive with sites from which they derive revenue. If this is perceived to be a serious risk, potential content innovators may be discouraged from spending time and money to create and promote new content.

As noted above, the provision of Internet services can be characterized as workably competitive, and in a workably competitive environment, suppliers have strong incentives to acquire inputs that will make their products more attractive to consumers. Therefore, it seems unlikely that restrictions on access will be imposed on subscribers in order to protect sunk cost investments in supplier-owned or affili-

21 As one author put it: “... the web is far too important to entrust the free flow of information to the shifting whims of a few big companies” (see Wildstrom, 2007).

22 For example, Wu (2003, p. 145) suggests that operators should have the freedom to “police what they own,” or “act reasonably to control the local broadband network.”

ated content when more commercially attractive content is available from independent suppliers.²³

By way of contrast, it has been suggested that specific restrictions on access might actually enhance the commercial viability of independent suppliers of content, thereby encouraging innovation. For example, AT&T is reported to be in talks with NBC Universal and Walt Disney about embedding a “content-recognition” system into AT&T’s Internet transmission apparatus. The technology would be used to guard against illegal distribution of those companies’ shows and films. While critics argue that deployment of the technology would threaten users’ privacy, freedom of speech, and equal access, NBC and Disney executives argue that content recognition safeguards would encourage them to offer more content online (see Burrows, 2007a). Presumably, NBC Universal and Disney would compensate AT&T for “protecting” their intellectual property, presuming that the content recognition system worked satisfactorily. However, it is questionable whether individual content suppliers would find it profitable to distribute content using individual ISPs exclusively. Nevertheless, the AT&T example underscores the point that restrictions on specific Internet traffic can potentially promote the introduction of new content and applications.

5. Access Tiering and Differentiated Retail Pricing

In its broadest form, access tiering encompasses the prioritization of content and applications by ISPs whereby different qualities of service in relevant dimensions of service are supplied to content and application providers at differing prices (Taylor, 2007). Proponents of net neutrality maintain that ISPs should be prevented from prioritizing quality of service. Rather, the Internet should treat all forms of traffic indiscriminately with respect to the routing, queuing, or dropping of data traffic. The rationale offered is that permitting access providers to discriminate with respect to quality of service, and charge prices that reflect differences in the quality of service, will reduce incentives to innovate and invest in infrastructure and will also allow carriers to leverage their ownership of alleged bottleneck access facilities into anti-competitive advantages in activities other than providing access, e.g., applications (Taylor, 2007). The next section of this report will focus on the likelihood of large car-

23 Wu (2003) suggests that there is a possibility of network operators banning classes of applications or equipment in ignorance of their long-run interests in having an efficient network. That is, incumbent network operators become set in their ways. He provides survey evidence of a variety of restrictions that network operators have imposed on customers, but he offers no direct evidence that those restrictions were “irrational.”

riers trying to extend market power enjoyed in one segment of the network to other segments. In this section, the focus is on the linkages between access tiering, efficiency, and fairness.

The primary function of a pricing system is to signal to market participants the relative economic values of using scarce resources in alternative activities and to encourage responses on the part of buyers and sellers that reallocate resources away from lower-valued activities to higher-valued activities. The key notion here is that resources are scarce. This simply means that if more of the resource in question is used for a specific activity, less of that resource is available for use in other activities, and, as a consequence, the latter activities will need to be curtailed to some extent. The importance of prices to promoting the efficient use of resources is rendered moot if resources are not scarce.

It is obviously the case that Internet capacity is not unlimited; however, there is some disagreement surrounding the extent to which capacity constraints are being encountered by Internet users. For example, a large Canadian ISP, Videotron, claims that it does not see a “capacity crunch” happening. However, Videotron has reportedly put bandwidth caps on some of its customers who are particularly intensive users of bandwidth, while Bell Sympatico has apparently curbed usage by its customers for sharing files in peer-to-peer networks (Rocha, 2007). The point here is that the perceived need to ration access to the Internet on the part of Canadian ISPs is ostensibly a response to capacity scarcity at the margin; however, non-price rationing is an inefficient method of allocating scarce resources, since it is not guided by the relative values that consumers place on usage of those resources.

In a workably competitive market, charging differing prices to individual content and applications providers will reflect differences in the costs imposed on ISPs by individual providers. For example, if specific applications use more bandwidth capacity than others, it is economically efficient for prices charged to application providers to reflect the incremental costs imposed by greater bandwidth usage. Failure to do so encourages bandwidth usage whose cost exceeds its economic value.

Some industry analysts believe that improvements in technology can be counted on to ensure that “adequate” Internet capacity will always be available, even in the absence of access tiering. Others have highlighted the large financial investments that will be required by access providers in order to “bridge the gap” between demand and capacity.²⁴ While a failure to make the requisite investments might not materialize in a complete collapse of the Internet, it might constrain the implementation of new Internet services and applications, particularly those that are bandwidth-intensive (Nemertes, 2007). It might also lead to a degradation of

24 For example, Nemertes Research (2007) estimates that the necessary financial investment in the United States ranges from US\$42 to US\$55 billion.

speed-of-service over access lines which, in turn, could reduce the number of Internet subscribers. Since the economic value of a network increases as a function of the number of its users, other things constant, service degradation can be expected to reduce the Internet's economic value.

Potential inefficiencies inherent in net neutrality regulations are highlighted by Litan and Singer's (2007) evaluation of regulatory prohibitions against access tiering by proponents of net neutrality. They argue that a network without tiered quality of service would be costly to consumers for the following reasons: 1) access providers would be forced to standardize access; 2) consumers who value enhanced quality of service would be forced to settle for less; 3) consumers who are happy with a relatively low quality of service may find that they have to pay more for unwanted higher qualities of service, and; 4) network costs will be higher, making network service more expensive, on average, for all consumers. Litan and Singer also argue that requiring service providers to offer a standardized quality of service will reduce incentives to innovate. In particular, it will discourage innovations focused on "quality of service-intensive" applications.²⁵

As noted earlier, some proponents of net neutrality worry that differentiating retail prices to reflect differences in quality of service to subscribers will lead to lower income groups receiving "inferior" Internet services. As in the case of access-tiering, differentiating prices according to cost-related usage characteristics can contribute to more efficient use of the Internet by discouraging usages whose costs to suppliers exceed their benefits to consumers.²⁶ The "conventional wisdom" is that a small group of users is consuming a lot of bandwidth (Rocha, 2007). If these intensive users were not charged more for access than those who are much less intensive users, prices would provide little incentive for intensive users to conserve on what are likely to be low-value uses of Internet access, at the margin. In addition, flat-rate pricing would result in relatively low-volume users subsidizing relatively high-volume users (Wallsten, 2007). Given a reduction in low-value usage, capacity would be freed up for higher-valued uses, thereby mitigating the need for additional investment to ensure that all users have undiminished quality of service.

The concern that cost-based retail pricing harms low-income subscribers who cannot afford to pay significantly higher prices was noted earlier. A broader complaint is that it will result in a "two-tier" system of Internet access where large business users and relatively wealthy residential users enjoy a very high quality of service,

25 Christopher Yoo makes a related argument that a "network diversity" policy that allows network owners to pursue different approaches to routing Internet traffic might better serve innovation (Wu and Yoo, 2006).

26 Different speeds are offered by ISPs in Canada at different prices. Higher speed connections are more costly and more likely to attract intensive users.

perhaps including access to a wider variety of content, while small business subscribers and lower-income residential users make do with a relatively low quality of service. As in the case of health care, conditioning access to high quality services indirectly upon ability to pay is unacceptable to some when it comes to Internet services (Lessig and McChesney, 2006).

There seems little doubt that any movement away from strict non-differentiated pricing will contribute to differences in the quality of service, broadly defined, across groups of subscribers. However, this outcome is not incompatible with all subscribers, including low income subscribers, enjoying higher qualities of service. For example, if differentiated retail pricing helps prevent Internet brownouts, all subscribers will benefit. Differentiated retail pricing might also generate more revenue for ISPs that, in turn, can be used for investments that improve quality of service for all subscribers.

6. Vertical Restrictions

Concerns about ISP initiatives that condition access to content and applications available on their networks, as well as the pricing of access and usage of those networks, are often linked to a perspective that broadband access is not sold in a workably competitive market. Rather, there is a fear that ISPs will exercise market power and restrain competition through those initiatives.

An earlier section of this paper argued that competition among ISPs is workable, while access to the local network is effectively regulated. Even if large, facilities-based ISPs possess market power, it is unclear that they would find it profitable to engage in the abuses of dominance that concern proponents of net neutrality regulations. Even a broadband monopolist has the incentive to behave efficiently with respect to transactions along its “vertical” value chain. For example, under most circumstances, a monopolist supplier will benefit from having applications and content markets that maximize the value of the physical layer. Specifically, providing access to the most desirable content and applications at competitive prices would contribute to increased demand for physical access to the Internet and, therefore, to the price that the monopolist could profitably charge for such access. Moreover, if the monopolist carrier discriminates against competitive application and content suppliers, or charges above competitive prices for access to those applications and content, it enhances the possibility of new competitors entering the physical layer by offering easier or cheaper access to the independently supplied applications and content against which the incumbent discriminates.

There are potential exceptions to the argument made in the preceding paragraph. One is when the ISP monopolist is subject to price regulation, while the applications and content available to subscribers are not subject to price regulation. In this case, the ISP monopolist is presumably prevented by regulation from charging the profit-maximizing monopoly price for access to Internet applications and content. A “second-best” pricing policy, from the perspective of the monopolist, is to price above the competitive level for services that are complements to the price-regulated service, presuming that the monopolist shares in the revenues from applications and services. Equivalently, it might pay the monopolist to exclude independent supply of applications and content from the network in order to drive subscribers to consume applications and content owned by the monopolist which, in turn, are priced above competitive levels. While theoretically correct, the caveat is not relevant since retail Internet access is not currently subject to price regulation. (These arguments are discussed in detail in Lenard and Scheffman, 2006.)

An ISP monopolist might also choose to discriminate against independently supplied applications and content if participation in those layers of the network facilitates price discrimination. In effect, the monopolist might find it profitable to engage in a form of tied selling, whereby access to the Internet is priced competitively, while applications and content are priced above-competitive levels. In this case, the monopolist would extract its monopoly profits primarily from users of applications and content who are willing to pay more for those services than are other subscribers to the Internet. Tied selling is a potentially attractive pricing strategy when the monopolist is unable to identify consumers who value Internet usage relatively highly prior to their acquisition of Internet access. By charging monopoly prices for consumption of applications and content, the monopolist effectively charges more to consumers who place higher valuations on the Internet, since the relative contributions of individual subscribers to the economic rents earned by the monopolist will be directly related to their relative usage of Internet applications and content.

The relevance of this caveat is related to concerns about tied selling more generally. Its implications for the net neutrality debate are also related to whether price discrimination is good or bad from a policy perspective. It is sufficient to note here that pricing according to the intensity of Internet usage can be accomplished directly by making Internet access pricing dependent upon characteristics such as amount of time spent accessing the Internet, data transfer volumes, data transfer speeds, and so forth (this is already the case in Canada). These are characteristics that are readily measurable by the ISP. As such, it seems a second-best method of price discrimination for an ISP to invest in web sites and content in order to tie sales of Internet access to those web sites and sources of content if the ISP can supply preferable (to subscribers) web sites and sources of content from independent suppliers.

A third, well-discussed potential reason for a monopolist to impose vertical restrictions is if those restrictions make entry more difficult in the monopolist's primary market. In the case at hand, a monopolist ISP might want to discourage the growth of independent sources of Internet content in order to oblige potential ISP competitors to invest in their own Internet content. In this case, entry as an ISP competitor will be more expensive, since entry at the ISP stage will also oblige significant expenditures on content in order to attract subscribers. Alternatively, entry at the ISP stage will have to be coordinated with other firms entering to supply content. The need for simultaneous entry of new firms at different stages of the industry's value chain makes entry at any individual stage less likely.²⁷

The basic notion underlying the "entry barrier" rationale for vertical restrictions is that the monopolist ISP can effectively discourage the entry of content suppliers by refusing to allow its subscribers access to independently supplied content. This notion is simply implausible in the context of Canadian ISPs. Most content available on the Internet is not "Canada-specific." Indeed, much of it is created with the intention of reaching an international audience. Hence, a lack of demand on the part of subscribers to the Canadian ISP monopolist will have very little impact on the incentive of independent creators to produce content for supplying other ISPs. Indeed, a substantial portion of the content on the Internet is produced for distribution through other media besides the Internet. This further mitigates the significance of the behavior of a hypothetical Canadian ISP monopolist in terms of restricting the growth of independent sources of content supply. In short, it would simply not be a rational strategy for a Canadian ISP monopolist to attempt to increase the costs of entry facing competitors by trying to suppress the availability of independently owned Internet content.

A similar vertical restriction "story" to foreclose competitive entry might be told as follows. A monopolist ISP that also owns local loop facilities can increase the costs of independent entry into the ISP segment by refusing to supply access to a local network at competitive prices. Coordinated entry into both segments of the physical layer of the Internet would clearly be substantially more expensive than entry only into the ISP segment. In the Canadian context, this type of behavior seems irrelevant for at least two reasons. One is that there are alternative suppliers of local network facilities, so that the entry of new ISPs does not necessarily need to be coordinated with the entry of new suppliers of routers, switches, and transmission "pipes." Hence, if an ISP wants to sell access services in Ontario, and Bell Canada were to refuse to allow the ISP interconnection privileges to the Bell Canada local network, the ISP

27 A version of this argument is made by Tim Wu who claims that incumbents in monopoly positions have a strong incentive to block entry and innovative technologies that threaten their existing business model (Wu and Yoo, 2006).

could seek to offer its services in Ontario through interconnection with Rogers' Communications' network. A second point, as noted above, is that while both low-speed and high-speed retail Internet access services are unregulated, the CRTC regulates the provision of wholesale Internet access services. Specifically, in the case of incumbent telephone companies, the underlying facilities and services required by independent ISPs must be provided on no less favorable conditions that the incumbent provides its own ISP affiliate. Cable BDUs have also been required to provide competitive access to their underlying network facilities.

In short, concerns about vertical integration between suppliers of Internet access and suppliers operating on other layers of the Internet, or vertical restrictions imposed by ISPs, have their parallels in anti-competitive concerns about vertical integration expressed in the anti-trust economics literature. This literature emphasizes that vertical restrictions can be seen as a lower-cost way to achieve the objectives of vertical integration, and that vertical restrictions can be in the consumers' interest, as well as in the financial interest of suppliers (Cooper *et al.*, 2005). These insights arguably apply to the Internet as well. This is not to say that any and all concerns about possible anti-competitive behavior on the part of ISPs can be dismissed; however, it is to say that blanket regulations prohibiting specific practices are likely to be economically damaging in many, if not all, circumstances. The issue arising, then, is what type of public policy is appropriate to address business practices that in some circumstances may promote economic efficiency, while harming economic efficiency in other circumstances. This issue is addressed in "Policy Recommendations," section 8 of this report.

7. Innovation

Economists are typically concerned about the linkage between public policy and economic efficiency. There is an abundant literature documenting the inefficiencies created by government regulation (Hahn, 1998; Peltzman, 1998). This literature should serve as a caution against implementing regulations designed to foster the goals of net neutrality. Most studies linking regulation to economic efficiency tend to focus on the consequences of regulation for price and output. Allocative efficiency is realized when it is not possible to increase real output by increasing or decreasing the price of a product.²⁸ Studies of the telecommunications industry show that regulation has resulted in prices that are not efficient by this criterion (Globerman and Stanbury,

28 This condition will be realized when the price of a product is equal to its incremental (or marginal) cost.

1986). However, the economic debate surrounding net neutrality emphasizes the importance of innovation as a policy goal in the case of regulations surrounding the Internet.

In the technologically dynamic environment surrounding the (converging) telecommunications and broadcasting industries, dynamic efficiency is seen as being a far more significant policy target than allocative efficiency.²⁹ That is, promoting lower costs and the introduction of new features and applications by implementing new technology is seen as being of much greater long-run importance to Internet users than ensuring that the price of Internet access is equal to the incremental cost of Internet access at any point (Felton, 2006). Hence, an important aspect of the policy debate surrounding net neutrality focuses on the likely consequences of different policy proposals for innovations affecting the Internet.³⁰

In the context of concerns about the importance of stimulating innovation, the broad question raised is whether adherence to the net neutrality prescriptions identified by Sidak (2006) will encourage innovation and dynamic efficiency as focused on the Internet. Greenstein (2007) provides an extended consideration of this issue. He notes the general view of net neutrality proponents is that the Internet evolves with technology and consumer demand, and that an environment in which “experimentation” is free to take place in any layer of the Internet and with respect to any use of the Internet is one that will best promote innovation. He also evaluates objections raised about specific practices that might constrain or misdirect experiments in innovation.

One concern is that ISPs with market power that vertically integrate into the provision of content and applications will tend to favor investments in content and applications with relatively high profit margins.³¹ This, in turn, will lead to innovation efforts being focused on a relatively narrow set of features and services. In fact, it is both expected and economically rational for any firm to concentrate its capital spending on activities where profit opportunities are relatively high. Indeed, high profits should be a signal to market participants that demand is high relative to costs and that economic welfare will be improved by expanding output in those high profit activities. Moreover, as Greenstein notes, there are marked technology spillovers

29 For practical purposes, dynamic efficiency can be equated with technological change that results in lower costs and improved quality of output over time.

30 This is not to dismiss concerns on the part of net neutrality advocates that ISPs will engage in censorship that ultimately undermines freedom of speech and expression.

31 It should be noted again that *de facto* or *de jure* exclusive carriage of content by individual ISPs is hypothetical at the present time. Many industry participants question whether exclusive supply of content by ISPs will ever be profitable. Nevertheless, it is still worth considering the theoretical case, since an incumbent ISP could be a monopolist in the limiting case.

within and across firms.³² Hence, technological and economic innovations aimed at one segment of users often benefit other segments of users.

A related hypothetical concern is that an incumbent ISP may have partners who operate web sites, and that the carrier will steer traffic to the partner and away from new competitive sites. Proponents of net neutrality worry that business will become more difficult for young experimental sites that do not (or cannot) prearrange contracts with the incumbent ISP. Again, if new services are primarily introduced by new firms, barriers to entry for experimental sites will reduce rates of innovation affecting the Internet.

With respect to these concerns, however hypothetical, it should be acknowledged that exclusivity can also promote innovation. Specifically, where parties to a set of transactions must make investments that are specific to those transactions in order to promote innovation, the parties may want to bind each other to the “partnership” in order to ensure that no individual partner tries to act opportunistically. For example, if an ISP promoted a new web site that ultimately became highly popular, independent owners of the web site might be tempted to seek more favorable quality of service attributes from the ISP brandishing threats of moving to another ISP if more favorable terms were not forthcoming. On the other hand, a content innovator that successfully introduces a new content service or application is vulnerable to the ISP threatening to create its own substitute for the content or application in question, unless the content provider agreed to more favorable terms with the carrier, perhaps through access pricing. In such circumstances, *de jure* or *de facto* vertical integration might promote investments in innovation that would not otherwise be made.

Yet another possibility of concern to net neutrality advocates is that even competitive access tiering may result in prices being charged to new content or application providers who have insufficient finances to pay for the quality of service that maximizes the commercial potential of their sites. This concern would be potentially relevant if capital markets systematically failed to offer financing to potentially profitable investment opportunities. Specifically, if entrepreneurs promised to launch “superior” content sites on the Internet compared to incumbent sites, those entrepreneurs should be able to attract sufficient financing, since the sites, in turn, would be expected to generate higher revenues that compensate for the risks involved.

In summary, vertical restrictions in the presence of market power can encourage innovation. Of more practical relevance, worries at a conceptual level about vertical restrictions discouraging innovation in Internet content and applications seem misplaced, because strong competition among ISPs ensures that ISPs will be moti-

32 A technology spillover takes place when innovation activities in one firm provide efficiency benefits for other firms in the same or different industries.

vated to carry new content and applications that attract subscribers, since failure to do so will compromise the ISP's competitive position.

If regulations designed to promote net neutrality are a bad idea, what should the public policy stance be towards ISPs? This issue is considered in the next section of this report.

8. Policy Recommendations

An important implication of the analysis in earlier sections of this report is that blanket structural or behavioral prescriptions applied to ISPs are inappropriate. For example, while some net neutrality proponents advocate structural prohibitions against ISPs owning content suppliers, the economics' literature acknowledges that a close vertical relationship between suppliers and users of inputs often promotes innovation and economic efficiency (Teece, 1988). Many net neutrality proponents also favor behavioral regulations that prohibit access tiering or any initiatives by ISPs to treat end-users or content and application suppliers differently in any way. For reasons discussed in an earlier section, such regulations can be highly counter-productive to promoting innovation and efficiency.

It might be argued that if the ISP sector is workably competitive, public policies cannot be expected to improve upon efficiency. Hence, the appropriate public policy stance is to forebear from any interference in this market. Of course, no government could credibly commit to a policy of "non-intervention" in a specific market. Even if such a policy were codified in law, new legislation could be introduced to allow government intervention of one or another form. Nor does it seem plausible that government will abjure any and all responsibility for the performance of infrastructure capital such as the Internet. In particular, while the ISP sector is currently workably competitive, this need not always remain the case.

Abuses of market dominance in unregulated industries in Canada are addressed on a case-by-case basis under the Competition Act. In the case of the Internet, whether the prevention of abuse of market dominance is entrusted to the Director of the Competition Bureau or the CRTC, it seems appropriate to adopt the "rule-of-reason" approach to identifying abuses of market dominance as set out in the Competition Act and as implemented in cases heard by the Competition Tribunal and relevant courts. A rule-of-reason approach would address specific abuses of dominance on a case-by-case basis, where available evidence must support a reasoned conclusion that a specific action or behavior on the part of an ISP is anti-competitive and harmful to economic efficiency if action by the government is to be

taken. This is distinguished from regulation where those same actions or behaviors are forbidden in all cases by regulatory decree.

It might be objected that case-by-case applications of the principles of competition policy will result in ambiguity about what is allowable and non-allowable behavior on the part of ISPs. However, a similar concern can be raised about establishing regulations to implement net neutrality principles. There are differing definitions of net neutrality, and any set of new regulations will undoubtedly fail to anticipate all relevant issues that arise. Furthermore, regulators will be under continued political pressure to amend existing regulations in order to accommodate “special cases and social priorities.”

To be sure, concerns about ISP behavior may arise that are not abuses of market dominance in the way that term is identified by competition policy experts. For example, competitive ISPs might block access to specific content for non-commercial reasons such as worries about national security being compromised or criminal behavior being abetted. ISPs may also be concerned about damage to the network associated with specific types of usage. In these latter cases, provisions of the Competition Act are not relevant. Still, it is advisable to deal with the cases through the application of rules-of-reason. For example, if ISPs are merely following the law in blocking access to specific sites, it would presumably be deemed acceptable. If the activities of specific users of the Internet threaten to degrade the quality of service for other users of the Internet, ISPs would presumably be justified in censoring those activities.

In specific cases, it might well prove difficult for public authorities to determine when the actions of an ISP serve the “public interest” and when those actions are at odds with the public interest. Such difficulties would also contribute to uncertainty on the part of ISPs as to which specific actions are “acceptable” and which are not. Nevertheless, one should be careful not to exaggerate this prospective shortcoming of a rule-of-reason approach to addressing concerns about ISP behavior. For example, concerns about abuse of dominance require evidence that suppliers enjoy a dominant share of the relevant market. Evidence is also required that the abuses in question cannot be defended as contributing to improved efficiency. The careful implementation of one or both of these criteria is likely to offer fairly clear guidance to decision-makers about whether specific activities of ISPs are likely to be against the social interest in economic efficiency. Likewise, legal and technical experts should be able to determine in the majority of relevant cases when discriminatory activities by ISPs are consistent with legal imperatives or with protecting the technical integrity of the network.

9. Summary and Conclusions

The fundamental issue underlying the net neutrality debate is whether regulating the behavior of ISPs will lead to increased efficiency, particularly through innovation. The analysis in this report concludes that any such regulation is more likely to degrade the efficiency of the Internet. Competition among ISPs in Canada can be reasonably deemed to be “workable,” which, in turn, suggests that anti-competitive behavior is unlikely. Furthermore, specific initiatives, such as access tiering, to which proponents of net neutrality object, can be argued to encourage innovation.

While regulation of the Internet is unwarranted, objections to specific initiatives of incumbent service providers will inevitably arise and present issues for public policymakers. This report makes the argument that a case-by-case evaluation of any objectionable initiative is more desirable than blanket rules or regulations covering the initiative. It might be argued that rules and regulations establish “bright lines” that provide private sector managers with clear guidance as to the “rules of the game.” In fact, this is a simplistic view of the regulatory process. The latter is a highly political process, and political interest groups often wield greater influence over the process than consumers and innovators (Owen, 2007). As a consequence, regulatory policy is sensitive to political pressures and exigencies.

Greenstein (2007) suggests several criteria that should guide a rule-of-reason approach to evaluating any specific objectionable behavior. His suggested tests include: 1) does the incumbent carrier in question possess market power; 2) is the incumbent’s behavior likely to discourage innovative behavior; and 3) is there an indirect efficiency rationale under which a reduction of user choice is in the user’s interest—for example, might prohibiting certain uses of the Internet by specific users improve the quality of service for the majority of users. On the other hand, where prohibiting specific applications such as Voice over Internet serves no innovative purpose, cost saving, or quality improvement, the prohibition would presumably be overturned. While ambiguity will continue to surround specific actions, even with the explicit adoption of criteria such as those proposed by Greenstein, there will be “learning by doing” such that a relatively high degree of predictability might be expected to emerge over time.

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創辦於1974年，我們乃一獨立的研究及教育機構，在卡加利、滿地可、坦帕、多倫多及溫哥華均設有辦事處，並在超過七十個國家擁有國際伙伴。我們的工作得到不同人仕、機構及基金透過可免稅捐獻資助。為了保持其獨立性，本研究所不接受政府的撥款或研究合約

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