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New Rules for the Game

Rebooting Canada's competition regime for the digital economy

BY MICHAEL CRAWFORD URBAN

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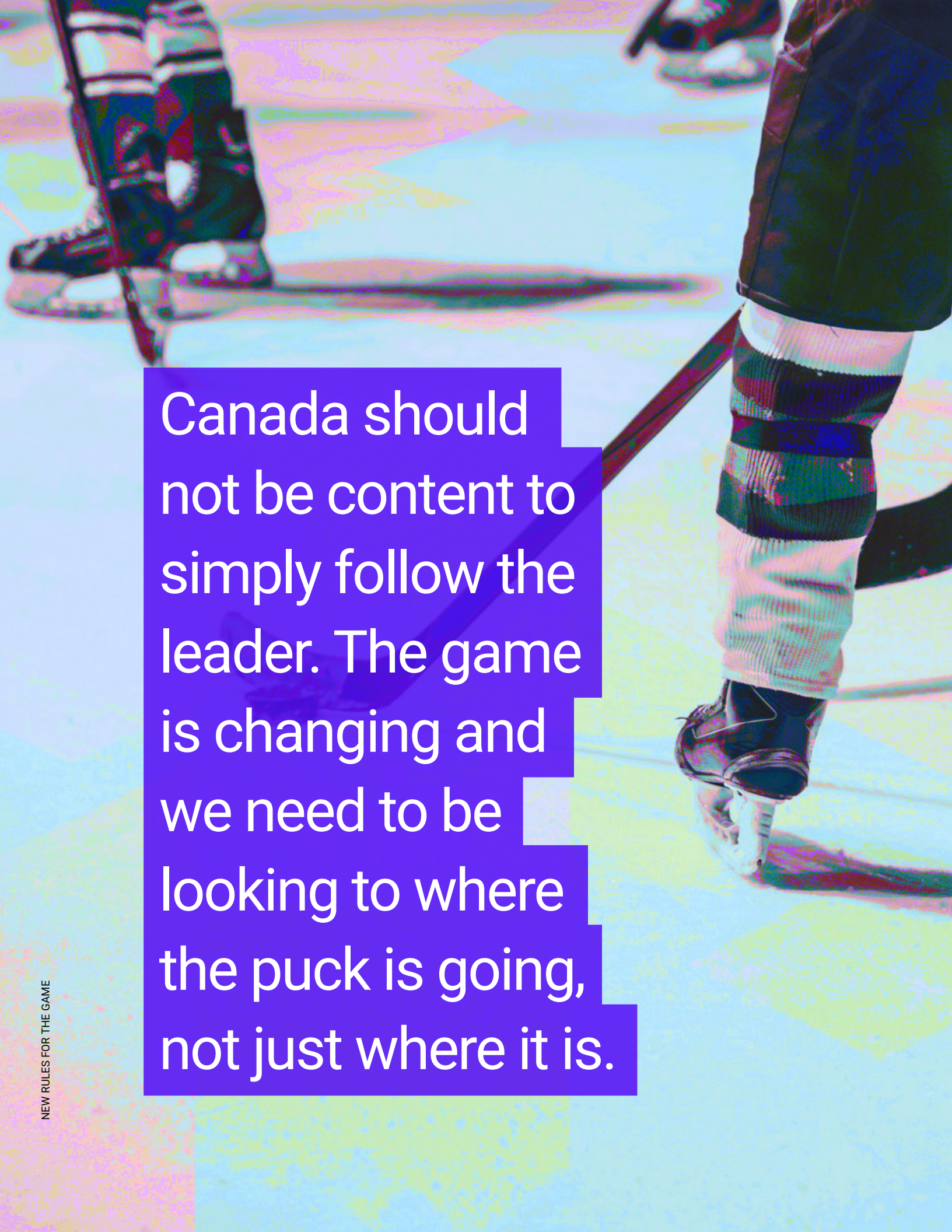


Canada should not be content to simply follow the leader. The game is changing and we need to be looking to where the puck is going, not just where it is.

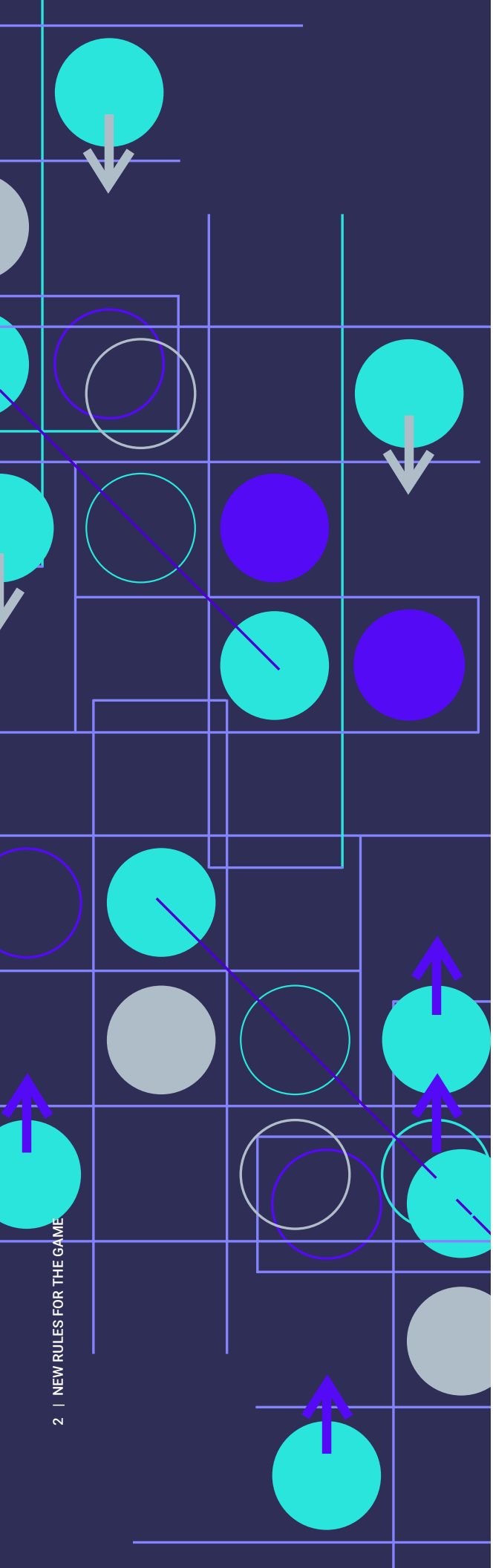
EXECUTIVE SUMMARY

It is becoming increasingly clear that the economic transformations unleashed by the digital revolution are having an important impact on corporate consolidation and commercial competition in the global economy. New "superstar" digital firms like Google, Amazon and Facebook have, in the space of only a decade or two, grown to be some of the largest and most powerful firms in the world. In this short space of time, these firms have disrupted and are disrupting a growing number of industries and have re-shaped not only how business is conducted, but how billions of individuals live their daily lives.

Over the same time period, many economic indicators, both at the national and global levels, suggest that economic dynamism and the intensity of commercial competition is declining in many markets. The coincidence of these developments, as well as growing bodies of evidence, have led a number of commentators, scholars, policymakers and regulators to suggest that these developments are connected and that they are beginning to negatively impact the global pace of innovation.

In this report, we examine the evidence for this argument and evaluate the threats to innovation posed by declining competition, both present and potential. After briefly surveying the history of competition policy in Canada, we identify a series of phenomena including network effects and switching costs, pre-emptive "shoot-out" and "data-exclusion" acquisitions, and "nowcasting", which have been identified by many as impeding competition and harming innovation. Building on this analysis, we also highlight a number of potential threats to the competitive landscape such as the emergence of ubiquitous dynamic pricing, manipulative virtual assistants and algorithmically-powered tacit collusion between firms.

Having described the nature of these impediments and threats – and the negative impacts that they will likely have on Canada's productivity growth and economic well-being – the bulk of this report focuses on setting out 26 policy recommendations aimed at countering them. These recommendations, and the analysis which undergirds them, are designed to provide government and civil society actors with an understanding of how they can take action to improve competition in the digital economy. These recommendations, which we believe will also have significant and positive spillover impacts in areas such as privacy and consumer protection, are organized into four categories focused on:



» Canada's data regime

» Algorithmic regulation

» Amendments to Canada's *Competition Act* and related legislation

» Government capacity

We recognize that the global nature of the Internet and the relatively small size of Canada's market mean that many of the pro-competitive steps that need to be taken will require significant international action and cooperation. But we also maintain that this should not stop Canada's governments and civil society actors from acting along a number of fronts where they can make significant contributions to solving these problems either on their own or alongside small groups of like-mined actors. In fact, in many cases, Canada could significantly improve competition in the digital economy by simply supporting and catching up to what leading jurisdictions like the European Union (EU) and California have already done.

Ideally, however, Canada will not be content to simply follow the leader. The game is changing and we need to be looking to where the puck is going, not just where it is. Especially in areas where technologies like artificial intelligence (AI) and Big Data are creating new markets with qualitatively novel characteristics, significant research is needed now to develop the understandings, tools and new rules that will be required to respond when the problems of tomorrow become the problems of today. By investing in research into things like individual data control technology, "tacit collusion incubators" and building greater in-house technical capacity, Canada's Competition Bureau and Canada's governments and civil society can help to prepare Canada and the world for the even greater competitive challenges that surely lie just over the horizon.

1 INTRODUCTION

It is uncertain whether any incentive plan to stimulate the growth of domestic technology and innovation, or to make corporations expand aggressively into foreign markets, can deliver significant success when applied to companies in which the drive to do these things has not already been forced to emerge because of exposure to a real stimulus from the economic environment.

— V.O. Marquez[1]

The year 2018 will be remembered as the year of the "techlash". From the Cambridge Analytica scandal,[2] to the first pedestrian fatality caused by an autonomous vehicle,[3] to the European Union's (EU's) record-breaking €4.34 billion fine against Google,[4] the world's attention has been seized by revelations about the darker side of the once greatly admired global technology firms. And 2018 was by no means a one-off. If anything, developments in early 2019, like Germany's finding that Facebook's business model violates its competition laws,[5] the EU fining Google an additional €1.49 billion for abusive advertising practices[6] and the announcement of a new task force by the US Federal Trade Commission (FTC) focused on monitoring anti-competitive practices in the technology industry,[7] suggest that this digital disquiet is only growing.[8]

Behind these eye-catching headlines lies a more fundamental concern over the significant market power that a small number of "superstar" digital firms have managed to achieve in such a

1 Quoted in Nicholson, P. 2018. "Facing the Facts: Reconsidering Business Innovation Policy in Canada." *IRPP Insight 22*. pg 35.
2 Ingram, D. 19 March, 2018. "Factbox: Who is Cambridge Analytica and what did it do?" *Reuters*. https://www.reuters.com/article/us-facebook-cambridge-analytica-factbox/factbox-who-is-cambridge-analytica-and-what-did-it-do-idUSKBN1GW07F
3 Levin, S. and Wong, J. 19 March, 2018. "Self-driving Uber kills Arizona woman in first fatal crash involving pedestrian." *The Guardian*. https://www.theguardian.com/technology/2018/mar/19/uber-self-driving-car-kills-woman-arizona-tempe
4 Reuters. 18 July, 2018. "Google hit with record $5-billion fine by EU in Android antitrust case." *The Globe and Mail*. https://www.theglobeandmail.com/business/article-google-said-to-be-fined-record-5-billion-by-eu-over-android-2/
5 Dreyfuss, E. 7 February, 2019. "German Regulators Just Outlawed Facebook's Whole Ad Business." *Wired*. https://www.wired.com/story/germany-facebook-antitrust-ruling/
6 Lomas, N. 20 March, 2019. "Google fined €1.49BN in Europe for antitrust violations in search ad brokering." *TechCrunch*. https://techcrunch.com/2019/03/20/google-fined-1-49bn-in-europe-for-antitrust-violations-in-search-ad-brokering/
7 Bowen, J. and Royal, A. 13 March, 2019. "FTC Launches a New Task Force Dedicated to Monitoring the Tech Industry for Anti-Competitive Practices." *Data Privacy Monitor*. https://www.dataprivacymonitor.com/marketing/ftc-launches-a-new-task-force-dedicated-to-monitoring-the-tech-industry-for-anti-competitive-practices/
8 So too do the growing number of reports on this topic including: House of Lords Select Committee on Communications. 9 March, 2019. "Regulating in a digital world." *House of Lords Paper* 299. and Furman, J. Coyle, D. Fletcher, A. McAuley, D. Marsden, P. March 2019. *Unlocking digital competition: Report of the Digital Competition Expert Panel*. Government of the United Kingdom.

short period of time.[9] Globally, commentators, academics and policymakers are increasingly linking the increasing market power of these firms with a host of allegedly anti-competitive actions, such as predatory acquisitions that are inhibiting innovation[10] and abuses of market dominance that threaten users' privacy[11] and unfairly disadvantage competitors.[12]

These allegations illuminate a number of weaknesses in existing competition regimes – including barriers to innovation that are being left unchallenged and consumer harms that are being allowed to accumulate. Looking to the future, it is concerning that these weaknesses, which have yet to be dealt with, seem minor compared to the more daunting challenges that new developments in fields such as artificial intelligence (AI) and Big Data may soon pose.

This report begins by analyzing these existing and emerging concerns and then shifts focus to examine a number of potential responses that Canadian regulators, policymakers and decision-makers ought to consider. In so doing, we hope to answer a key question asked by the Government of Canada when it launched its National Digital and Data Consultations in 2018, namely: "How can we encourage transparency, fairness and competition" in the digital marketplace while simultaneously "safeguarding the rights of Canadians?"[13]

Some of this analysis is focused on Canada's Competition Bureau, the most well-known actor in Canada's larger competition framework. But because much of our analysis deals less with enforcement and the law as it currently stands, and more with questions of policy and changes that ought to be made to a variety of laws and regulations, the range of our analysis and recommendations will be appreciably wider and will touch on a much broader spectrum of issues and institutions. We refer to this wider assembly of laws, institutions and understandings as Canada's "competition regime". In particular, our analysis and recommendations will focus on how the treatment of data by Canada's legal and regulatory framework needs to catch up with its commercial exploitation. Additional recommendations touch on steps Canada can take to begin crafting a response to the emergence of AI, potential amendments to the *Competition Act* and upgrades to the Government of Canada's technical capacity and technological expertise.

9 The term market power refers to "the ability of firms to profitably cause one or more facets of competition, such as price, output, quality, variety, service, advertising, or innovation, to significantly deviate from competitive levels for a significant period of time". Competition Bureau. No Date. *Big data and Innovation: Implications for Competition Policy in Canada: Draft Discussion Paper*. The Government of Canada. http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/vwapj/Big-Data-e.pdf/$file/Big-Data-e.pdf pg 14.

10 The Economist. 2 June, 2018. "American tech giants are making life tough for startups." *The Economist*. https://www.economist.com/business/2018/06/02/american-tech-giants-are-making-life-tough-for-startups

11 Guynn, J. 2 June, 2015. "Google faces EU complaint from app developer." *USA Today*. https://www.usatoday.com/story/tech/2015/06/02/google-antitrust-complaint-european-union-android-app-disconnect/28355381/

12 Manthorpe, R. 14 February, 2018. "Google's nemesis: meet the British couple who took on a giant, won... and cost it £2.1 billion." *Wired*. https://www.wired.co.uk/article/fine-google-competition-eu-shivaun-adam-raff

13 See https://www.ic.gc.ca/eic/site/084.nsf/eng/00007.html

2 THE EVOLUTION OF COMPETITION

Many of the digital challenges confronting Canada's competition regime stem from an intersection between certain novel features of the digital economy and much older disagreements over the very purpose of competition law and policy.

While Canada's first competition law (the *Anti-Combines Act* of 1889) actually pre-dates its more celebrated US analogue (the *Sherman Anti-Trust Act*, passed in 1890), the US was clearly the early leader in the development of this area of jurisprudence and policy. Initially, US "antitrust" law and policy sought to achieve two primary aims, namely to protect consumers from monopolistic prices while simultaneously protecting small businesses from potentially "ruinous" competition from larger rivals.[14]

Naturally, these two aims came into conflict, but this conflict was managed fairly successfully in the first two-thirds of the 20th century. Beginning in the 1970s, however, a new "Chicago school" approach to competition law and policy took hold. This approach emphasized achieving economic "efficiency" which it assumed would result in lower prices when these efficiencies were passed along to the consumer.[15] Because Chicago school theory essentially assumes that market power does not ultimately harm consumer welfare because any abuses of market power will be corrected by competition, concerns about the market power produced by the corporate consolidation often generated in the search for efficiencies are largely discounted.[16]

Canada has followed a similar path in privileging "efficiency" as a central objective for Canadian competition law and policy. In fact, Canada seems to have gone even further down this

14 Antitrust law also had a strong political dimension, namely as an effort to inhibit the consolidation of political power that excessive consolidation of economic power was understood to permit. See Wu, T. 2018. *The Curse of Bigness: Antitrust in the New Gilded Age*. New York: Columbia Global Reports. For a variety of reasons, this perspective has not been as important a factor in Canada. Thus, in this report, the political aspects of corporate consolidation and technological inhibition of competition are not the primary focus of analysis, though this is not to say that they are unimportant.

15 More specifically, US antitrust regulators have come to focus on maximizing "consume welfare" which they measure almost exclusively by using the narrow instrument of prices paid by customers for goods and services. Grace, C. 10 September, 2018. "What is the best way to improve competition in modern capitalism?" *The Economist*. https://www.economist.com/open-future/2018/09/10/what-is-the-best-way-to-improve-competition-in-modern-capitalism

16 Dayen, D. 9 November, 2015. "Bring Back Antitrust." *American Prospect*. http://prospect.org/article/bring-back-antitrust-0

path and made efficiency an actual defence in merger review – it remains only one of numerous factors for consideration in the US.[17] So, while Canada's *Competition Act* is designed to stop mergers that would prevent or lessen competition substantially, it also includes an exemption for mergers that have brought or are "likely to bring about gains in efficiency that will be greater than, and will offset, the effects of any prevention or lessening of competition that will result…"[18] This clause has led one group of Canadian competition law experts to conclude that "Canada now has the strongest efficiency defense of mergers among OECD countries."[19]

To be fair, this Canadian emphasis on efficiency, which was viewed as the cutting edge of economic thought when it was adopted in the 1980s, likely also derives significantly from a second motivation beyond a focus on lower prices. With a large, but sparsely populated, geography and located next to a much more populous and culturally similar neighbour, there is a long tradition in Canada of nurturing a small number of national firms as a way of ensuring independent Canadian ownership and producing firms with the economies of scale necessary to service the entire country.[20] Too much competition, this argument holds, would undermine these firms' ability to accumulate the

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capital necessary to make the significant investments needed to provide nationwide service. Without these national firms, the argument continues, many Canadians would be left without critical products and services while many others would be served by US-based firms and slowly drawn into a US-centred economic orbit.[21] The robust efficiencies defence in the *Competition Act* represents only one part of a larger system of tools – which also includes limits on foreign ownership in certain industries – that advance this objective.

17 To invoke the efficiencies defence in Canada, merger parties must establish that efficiencies are likely to occur; are brought about by the merger or proposed merger; are greater than and offset the anti-competitive effect; and would not likely be attained if any remedial order under section 92 of the *Competition Act* were made. See https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/03420.html

18 See Section 96(1) of the *Competition Act*.

19 Boyer, M. Ross, T. Winter, R. December 2017. "The rise of economics in competition policy: A Canadian perspective." *Canadian Journal of Economics / Revue canadienne d´economique 50*(5). 1489–1524. pg 1491.

20 For example, see Economic Council of Canada. 1969. *Interim report on competition policy*. Ottawa: Government of Canada.

21 Pelletier, M. 16 July, 2018. "Why Canada's history of industry consolidation is good for investors, but bad for consumers." *National Post*. https://business.financialpost.com/investing/investing-pro/why-canadas-history-of-industry-consolidation-is-good-for-investors-but-bad-for-consumers

Competition is not a sufficient condition for innovation always and everywhere, but it is almost certainly one of a small number of prerequisites for a robustly innovative economy.

3 BARRIERS TO INNOVATION

Whatever validity the motivations for giving efficiencies such importance in Canada's competition regime, the characteristics of digital commerce suggest that this approach needs to be reconsidered.

While Canada's Competition Bureau has recognized the importance of competition for innovation – even going so far as to explicitly link competition and innovation in the title of its 2016-2017 annual report[22] – the Bureau's ability to advance innovation is hindered by the legal and regulatory framework within which it operates. Indeed, the term "innovation" appears only twice in the text of Canada's *Competition Act* and in neither case is its encouragement identified as a purpose of the act.[23] Unfortunately, this imparts a fairly static view of the market and the benefits of competition to the act. For example, a merger between two competitors that incrementally increases efficiency through economies of scale and that, by extension, could theoretically lead to lower prices, would likely, all else equal, be seen as positive.

The problem with this approach comes into focus when a dynamic lens is applied. While a merger between two firms that led to increased efficiencies might make sense if growth in scale or scope were the only ways to achieve efficiencies, the reality is that this is not always, or perhaps even usually, the case.[24] Innovation, while perhaps not in as linear or predictable a fashion, is also capable of increasing efficiency and lowering prices by increasing productivity. The federal government seems to understand the importance of innovation and is seeking to promote it in a variety of ways ranging from its Innovation Supercluster Initiative[25] to Canada's Inclusive Innovation Agenda.[26]

22 Competition Bureau. 2017. *Strengthening competition to drive innovation*. Government of Canada. https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04328.html

23 The two times "innovation" is referenced in the *Competition Act* (Section 90.2.G and 93.G) are identical – "the nature and extent of change and innovation in any relevant market" and are listed as one of a number of potential features of a market that the Competition Tribunal may take into consideration when determining whether an agreement or merger may alter the level of competition in that market. Thus, as far as the *Competition Act* is concerned, the innovativeness of a market is something that impacts its competitiveness, not the other way around.

24 Furman et al. (2019, 13).

25 Innovation, Science and Economic Development Canada. 4 April, 2018. *Innovation Superclusters Initiative*. The Government of Canada. http://www.ic.gc.ca/eic/site/093.nsf/eng/home

26 Innovation, Science and Economic Development Canada. June 2016. *Canada: A Nation of Innovators*. The Government of Canada. https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00009.html For a helpful discussion of business innovation in Canada, see Nicholson, P. 2018. "Facing the Facts."

Competition is not a sufficient condition for innovation always and everywhere,[27] but it is almost certainly one of a small number of prerequisites for a robustly innovative economy.[28] Moreover, while the relationship is not always direct, it is fairly clear that a lack of competition represents a damper on innovation (even if too much competition can also hinder it in the short term).[29] Indeed, the federal government's own Competition Policy Review Panel concluded in 2008 that "*competition is the strongest spur to innovation and value creation*, leading to a higher standard of living for all Canadians."[30] In a discussion paper focused on the role of Big Data in competition, Canada's Competition Bureau itself suggests that the *Competition Act* "starts from the assumption that reliance on competitive market forces is the best means of ensuring an innovative, efficient, and prosperous economy."[31] Similarly, a 2018 review of business innovation policy in Canada found that "competition is usually the most potent incentive to induce an innovative response from business" and that competition policy should "be seen as a key element of a comprehensive innovation policy".[32]

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Indicators of concern

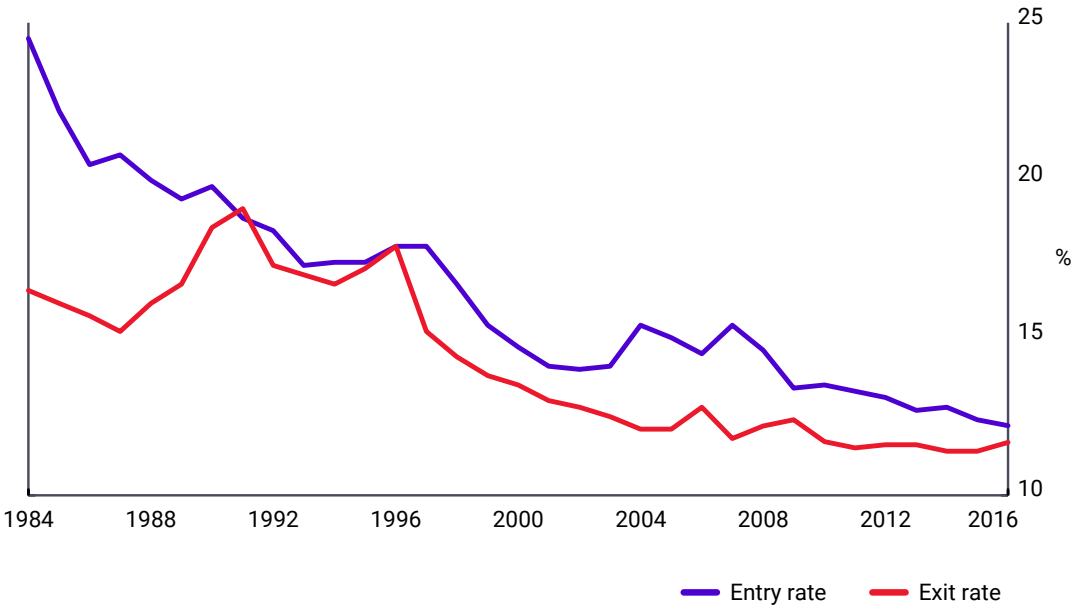
Of course, government and regulators already know this and might suggest that their approach already tries to balance a reasonable amount of innovation-producing competition with the regime's other goals, such as the aforementioned need for national firms capable of serving all Canadians. Unfortunately, indicators suggest that the balance they are striking is not performing as well as it might.

Business dynamism – the rate at which new firms are born and old firms die – is one indicator used as a proxy measure for the level of competition in an economy, and business dynamism in Canada is falling (see Figure 1).[33]

27 Indeed, it is well recognized that certain limitations on economic competition, such as patents, copyrights and trademarks can provide valuable incentives to help spur innovation.
28 See Mazzucato, M. 2013. *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. London: Anthem Press. pg 34-37.
29 See Nicholson, P. 2018. "*Facing Facts*" pg 31 footnote 62: After conceding that too much competition can hinder innovation he states: "But by far the more frequent concern of public policy is with too little competition, not too much." For other examples of work pertinent to this discussion, see Porter, M. 30 May, 2002. *Competition and Antitrust: A Productivity-Based Approach*. Harvard Business School. http://www.hbs.edu/faculty/Publication%20Files/053002antitrust_06eae678-b707-457c-b139-18c38e45e786.pdf pg. 4; Aghion, P. Bloom, N. Blundell, R. Griffith, R. Howitt, P. May, 2005. "Competition and Innovation: An Inverted-U Relationship." *The Quarterly Journal of Economics 120*(2) 701-728; Hasmi, A. 2013. "Competition and Innovation: The Inverted-U Relationship Revisited." *The Review of Economics and Statistics 95*(5) 1653-1668; and Lambertini, L. Poyago-Theotoky, J. Tampierid, A. 2017. "Cournot competition and 'green' innovation: An inverted-U relationship." *Energy Economics 68*. 116–123.
30 Wilson, L. Edwards, N. Jenkins, P. Hudon, I. Levitt, B. June 2008. *Compete to Win: Final Report*. Ottawa: Government of Canada. pg 3. Our italics.
31 Competition Bureau. 2017. *Strengthening competition to drive innovation.* pg 2.
32 Nicholson, P. 2018. "Facing Facts" pg 31.
33 Tapp, S. 29 October, 2015. "The 'start-up slow-down': Why is the Canadian economy losing its dynamism?" *Policy Options*. http://policyoptions.irpp.org/2015/10/29/the-start-up-slow-down-why-is-the-canadian-economy-losing-its-dynamism/ see also St-Amant, P. and Tessier, D. March 2018. "Firm Dynamics and Multifactor Productivity: An Empirical Exploration." *Bank of Canada Staff Working Paper 2018-15*. https://www.bankofcanada.ca/wp-content/uploads/2018/03/swp2018-15.pdf

FIGURE 1

Aggregate entry and exit rates of new firms in Canada (1984-2016)

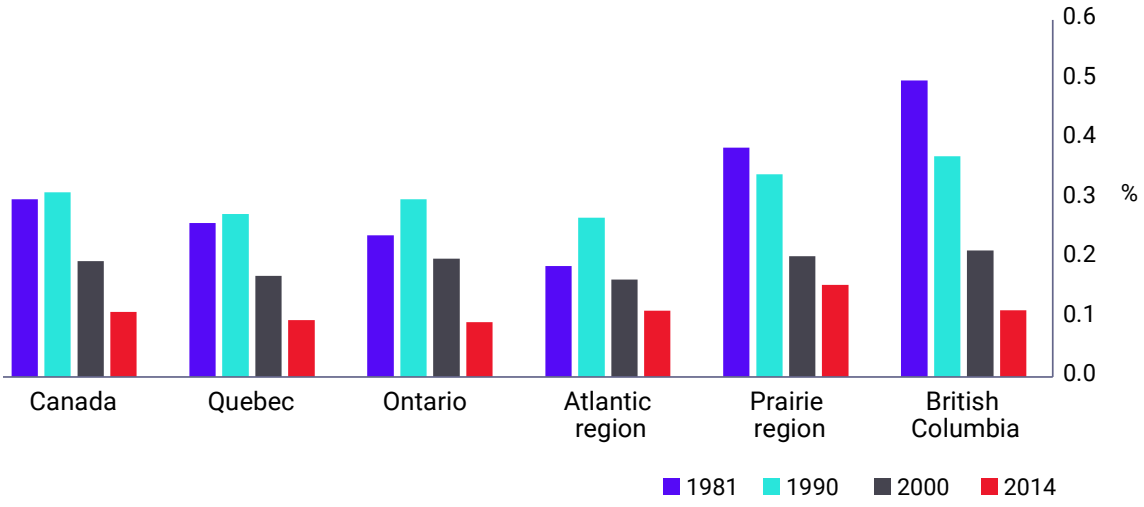


Source: Leduc, S. 3 October, 2017. *Seeking Gazelles in Polar Bear Country*. Remarks to the Sherbrooke Chamber of Commerce. https://www.bankofcanada.ca/wp-content/uploads/2017/10/remarks-031017.pdf pg 3.

Entrepreneurship, another measure of an economy's vitality, has also been falling in recent years in Canada (see Figure 2).

FIGURE 2

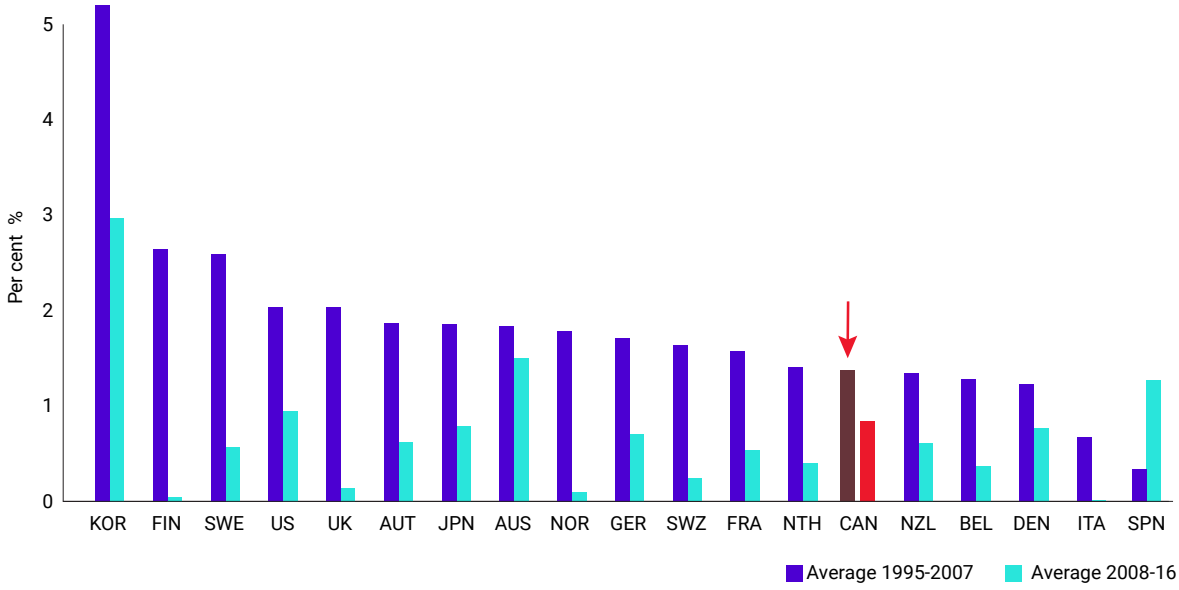
Entrepreneurship in Canada in 1981, 1990, 2000 and 2014



Source: Leduc, S. 3 October, 2017. *Seeking Gazelles in Polar Bear Country*. Remarks to the Sherbrooke Chamber of Commerce. https://www.bankofcanada.ca/wp-content/uploads/2017/10/remarks-031017.pdf pg 3.

FIGURE 3

Average annual growth rate of labour productivity in selected OECD countries (1995-2016)



Source: Nicholson, P. 2018. "Facing the Facts: Reconsidering Business Innovation Policy in Canada." *IRPP Insight 22*. pg 14.

Simultaneously, Canada's productivity growth, which is the ultimate goal of innovation policy and ought to be one of the drivers of competition policy, continues to be low relative to earlier times (see Figure 3),[34] something that is especially worrying given the need for productivity growth will only increase as Canada's population continues to age.[35]

While it would be wrong to ascribe this situation solely to *Canada's* competition regime[36] – not only are there non-competition factors involved but, in the digital economy, many of the problems that are competition-related are global in scope[37] – the current regime is likely not doing enough to counter these trends, at least insofar as the digital economy is concerned.

34 The Canadian Press. 12 December, 2017. "Growth in Canada strong, but productivity still low, BoC deputy says." *The Globe and Mail*. https://www.theglobeandmail.com/report-on-business/economy/growth-in-canada-strong-but-productivity-still-low-boc-deputy-says/article36469790/ Some economists argue that these productivity indicators are being artificially depressed by the fact that GDP per hour worked does not capture the full value of many digital services (such as free-to-the-user Internet searches). Our perspective in this analysis is that this argument has not yet been sufficiently validated to merit disregarding productivity measures, though it is worth keeping in mind.

35 Sharpe, A. September, 2008. "Three Policies to Increase Productivity Growth in Canada." *Canadian Priorities Agenda Brief 8*. http://irpp.org/wp-content/uploads/assets/research/canadian-priorities-agenda/productivity-growth-in-canada/sharpe-sept-2008.pdf

36 Business dynamism is also falling in the US, for example, as well as in other developed countries. Wooldridge, A. 15 September, 2016. "The rise of the superstars." *The Economist*. https://www.economist.com/special-report/2016/09/17/the-rise-of-the-superstars The IMF has also just reported that competition in the digital economy appears to be slowing worldwide. See Díez, F. and Duval, R. 3 April, 2019. "How to Keep Corporate Power in Check." *IMFBlog*. https://blogs.imf.org/2019/04/03/how-to-keep-corporate-power-in-check/

37 Bradsher, K. and Bennhold, K. 23 January, 2019. "World Leaders at Davos Call for Global Rules on Tech." *The New York Times*. https://www.nytimes.com/2019/01/23/technology/world-economic-forum-data-controls.html

Impediments to competition

There are a number of ways in which the transition to a data-intensive digital economy is likely contributing to a decline in competitive intensity. The first concerns the high barriers to entry that have emerged in many of the largest digital markets. Digital platform firms that provide services like social networking or marketplaces for goods and services benefit from tremendous positive network effects – the phenomenon by which a product or service gains additional value or utility as its usage increases – which create significant barriers to entry for potential competitors. Essentially, users of social networks want to be where their friends already are and online buyers and sellers want to be where the most sellers and buyers already are. Once a large group of users are ensconced in a particular network, the positive network effects associated with that network and their use of it make switching to another network costly for users. These high "switching costs", and the stickiness they create, present important barriers to entry for new firms because they make it difficult to attract users away from incumbents.

The hindrance to competition presented by network effects is compounded by the fact that the firms that run these platforms generally control the data that users have created on the platform. Users of social networks or online marketplaces who wish to move to a new platform typically cannot easily transfer the data they have created on that platform to a new one. If they do decide to switch platforms, usually, they must build up their "identity" on this new platform from scratch. Especially for users whose commercial success is tied to their online identity, such as short-term accommodation hosts and the reviews and ratings of their service posted on the platform, this strongly dis-incentivizes switching platforms and presents another important barrier to entry for potential platform competitors.

Additionally, the innovative products and services offered by a small number of digital firms have enabled them to disrupt a host of existing industries and helped propel these firms to incredible financial success in a very short period of time. They are now using the financial resources which this success has provided them with to build competitive "moats" around their businesses and systematically ensure that they are not themselves disrupted in turn. Technologists and investors now talk of a "kill zone" in the areas adjacent to the services and products offered by the big technological incumbents.[38] Investors are hesitant to back start-ups in these areas because they fear that incumbents will either pressure these firms into an early sale of the company in a "shoot-out

High switching costs, pre-emptive shoot-out acquisitions, data exclusion acquisitions and nowcasting – contribute to a situation where corporate consolidation is increasing and it is becoming increasingly hard for new firms to emerge to challenge established incumbents.

38 They are also hiring expensive lawyers to erect novel legal barriers for potential competitors. Doctorow, C. 7 January, 2019. "Cory Doctorow: Disruption for Thee, But Not for Me." *Locus*. https://locusmag.com/2019/01/cory-doctorow-disruption-for-thee-but-not-for-me/

acquisition" or, if their acquisition is rebuffed, will develop a similar competing service that forestalls the start-up's growth.[39] In fact, in the past 10 years, the five largest digital firms have acquired over 400 other firms globally. None of these acquisitions have been blocked and few have even been scrutinized by competition authorities.[40]

More novel are the acquisitions that are taking place that have the aim of securing new sources of data.[41] Data has become a valuable resource which firms are using to create and maintain competitive advantages. The way in which Google's dominance in search is fortified by the fact that this dominance provides it with the lion's share of the search data needed to further improve its service, provides an excellent example of data's importance in this regard. Because of this importance, firms are now using acquisitions to secure access to data – or to deny access to competitors or potential competitors. Consequently, policymakers and competition regulators, who have much greater experience with factors such as price and market share, are struggling with the new question of how best to take "data share" into consideration, for example, when weighing mergers and acquisitions where significant sources, or likely future sources, of data are involved.[42]

39 The Economist. 2 June, 2018. "American tech giants are making life tough for startups." Google and Facebook have been acquiring other firms at a pace of more than two a month for years. Pasquale, F. Summer, 2018. "Tech Platforms and the Knowledge Problem." *American Affairs II*(2) https://americanaffairsjournal.org/2018/05/tech-platforms-and-the-knowledge-problem/

40 Furman et al. (2019, 12).

41 The Economist points to the purchase of the Whether Network by IBM as a purchase designed to secure its data. The Economist. 6 May, 2017. "Data is giving rise to a new economy." *The Economist*. https://www.economist.com/briefing/2017/05/06/data-is-giving-rise-to-a-new-economy

42 The Economist. 6 May, 2017. "The world's most valuable resource is no longer oil, but data." *The Economist*. http://www.economist.com/news/leaders/21721656-data-economy-demands-new-approach-antitrust-rules-worlds-most-valuable-resource

In a more straightforwardly concerning development, platform firms are also beginning to use the data to which they have access "to quickly identify and squelch nascent competitive threats in a process called 'nowcasting'."[43] In one academic paper, nowcasting is described as a radar that enables platform firms to track and respond to the potential emergence of competitors well before they are able to pose a threat.[44] In another, US antitrust scholar Lina Khan details how Amazon "has used 'insights gleaned from its vast Web store to build a private-label juggernaut that now includes more than 3,000 products.'"[45] In other words, Amazon is alleged to have tracked the growth in popularity of third-party products sold in its marketplace, which it was able to identify and understand at a highly granular level through the data it collected via its platform, and to have responded by beginning to produce these products themselves.[46] While regulators in North America have taken no action on this front, the European Commission began a probe into Amazon's behaviour in September 2018.[47]

All of these factors – high switching costs, pre-emptive shoot-out acquisitions, data exclusion acquisitions and nowcasting – contribute to a situation where corporate consolidation is increasing and it is becoming increasingly hard for new firms to emerge to challenge established incumbents, thus reducing the competition they face.[48]

Behind these active strategies, however, lies a more fundamental shift in the competitive landscape that may require changes to the paradigm under which competition authorities are operating. Specifically, data is atypical in that, unlike many other assets, the data one holds often becomes more valuable when additional increments are acquired.[49] The implication of this natural tendency is that markets in which data figures prominently are biased towards greater corporate concentration even before the strategies just reviewed have their effect. Or, in other words, the playing surface may be inherently tilted in one direction before the game has even started.

43 Stucke, M. and Grunes, A. September, 2015. "Debunking the Myths Over Big Data and Antitrust." *University of Tennessee College of Law Legal Studies Research Paper Series 276*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2612562

44 Stucke and Grunes (2015, 8). See also The Economist. 2 June, 2018. "American tech giants are making life tough for startups."

45 Khan, L. 2017. "Amazon's Antitrust Paradox." *The Yale Law Journal 126*(3). 710-805. https://www.yalelawjournal.org/note/amazons-antitrust-paradox pg 782.

46 Khan (2017, 781-782).

47 White, A. 19 September, 2018. "Amazon Probed by EU on Data Collection From Rival Retailers." *Bloomberg.* https://www.bloomberg.com/news/articles/2018-09-19/amazon-probed-by-eu-on-data-collection-from-rival-retailers Similar examples would be Facebook's Facebook Research and Google's Screenwise Meter apps. See Constine, J. 21 February, 2019. "Facebook pays teens to install VPN that spies on them." *TechCrunch*. https://techcrunch.com/2019/01/29/facebook-project-atlas/

48 That digital "superstar" firms have been able to benefit tremendously from regulatory and taxation arbitrage also plays an important role in enabling these firms to use their resources to erect significant barriers to entry for potential competitors. For more information on these strategies, and the competitive problems they create, see Johal, S. Thirgood, J. Urban, M. with Alwani, K. Dubrovinsky, M. 30 July, 2018. *Robots, Revenues & Responses: Ontario and the Future of Work*. The Mowat Centre. https://mowatcentre.ca/robots-revenues-responses/

49 Typically, the acquisition of an asset is understood to follow a pattern in which the more of an asset one has, the less benefit each marginal increment of that asset provides. Conversely, data does not seem to follow this pattern of declining marginal utility. Aggarwal, S. 2018. "Treasure of the Commons: Global Leadership through Health Data." *Data Governance in the Digital Age: Special Report*. Medhora, R. ed. Centre for International Governance Innovation: 36-43. pg 36-37. See also Posner, E. and Weyl, G. 2018. *Radical Markets: Uprooting Capitalism and Democracy for a Just Society*. Princeton: Princeton University Press. pg 224-230.

Once one accepts that users are purchasing online services with the data they create and the attention they provide, the next logical question is whether users are receiving fair market value for this data and attention.

4 CONSUMER HARM

A potential rejoinder to these concerns is that even if this is all true, it's churlish to complain given that many digital firms are offering valuable new services for "free" or are offering old services at significant discounts compared to the non-digital incumbents that they are disrupting. Especially if the primary purpose of a competition regime is to advance consumer welfare – especially when "consumer welfare" is interpreted narrowly to mean efficiencies and the low prices they are assumed to produce[50] – it seems odd to argue that a system that has provided much cheaper (or free) services is actually delivering suboptimal results.

Before responding directly to this argument,[50] it is important to first take a step back and be clear about the policy objective that should be in focus. The purpose of a competition regime is to optimize economic benefits for society, not to simply produce satisfactory results. In other words, it should not matter if getting "free" services is better than paying for them or if saying "free" services are suboptimal seems ungrateful; what matters is whether society is getting the best deal possible from the current regime. And while "free" services like search and social networking may seem like good deals at the moment, this does not necessarily mean that they are good deals in the long run or that the system could not be improved to yield even better deals.

The problem with "free"

To begin, it's important to unpack the idea that services like online search or social networking are actually free. While it may be true that no money changes hands between the user and the platform, in reality users are bartering for these services with their data and their attention. This data, mostly used to target advertising but increasingly also used for training machine learning algorithms, is valuable to these firms. Facebook estimated that its North American users generated an average of $39 in advertising revenues in 2015. An independent analysis done in 2017 pegged this value at

50 Washington Bytes. 5 October, 2018. "The Future Of Antitrust: Do Higher Profits Merit The Retirement Of The Consumer-Welfare Standard?" *Forbes*. https://www.forbes.com/sites/washingtonbytes/2018/10/05/the-future-of-antitrust-do-higher-profits-merit-the-retirement-of-the-consumer-welfare-standard/#5a06331e7af6

This lack of proper pricing also likely means that data is not being allocated efficiently across the economy meaning that, theoretically, it is not being used in the way that would most benefit society.

$82.[51] Google, apparently, tells investors each user is worth $720 per year.[52]

Once one accepts that users are purchasing online services by selling the data they create and the attention they provide, the next logical question is whether users are receiving a fair price for this data and attention. Here, there are serious reasons for doubt. The level of dominance enjoyed by many of the firms in these sectors means that these platforms often enjoy a "monopsony" or "oligopsony" position.[53] Markets that feature a monopsonist or oligopsonists tend to result in lower prices for sellers than competitive markets for the same reasons that monopolists are able to charge higher prices to buyers: market power.

Twisted incentives

This combination of opaque pricing of user-generated data with monopsonistic/oligopsonistic markets is likely creating a situation in which data is not being priced efficiently (i.e. users are not getting the correct economic price for their data). If true, this lack of proper pricing also likely means that data is not being allocated efficiently across the economy meaning that, theoretically, it is not being used in the way that would most benefit society.

Additionally, the price that data sellers receive for their data should not be the only dimension of analysis. Especially in markets where products and services are "free," competition on the non-price aspects of a service, such as privacy protection and customer service, become critical. For example, as platform firms disrupt established industries, and as a single or a small group of digital firms come to dominate a sector, the Terms of Service (ToS) agreements that these firms require users to accept in order to use their services take on central importance. Complaints about these agreements, which the vast majority of users do not read and cannot understand, are not new. But, given the oligopolistic/oligopsonistic position of many of the platform firms – and the unequal balance in bargaining power between platforms and users that this creates – and the barriers to entry

51 Clinton, D. 9 April, 2018. Your Data Is Worth Less Than You Think. *Loup Ventures*. http://loupventures.com/your-data-is-worth-less-than-you-think/. Other analyses have arrived at higher values: Wibson. 19 Janaury, 2018. "How Much Is >Your< Data Worth? At Least $240 per Year. Likely Much More." *Medium*. https://medium.com/wibson/how-much-is-your-data-worth-at-least-240-per-year-likely-much-more-984e250c2ffa. All prices USD unless otherwise noted.

52 Ezrachi, A. and Stucke, M. 2016. *Virtual Competition: The Promise and Perils of the Algorithm-driven Economy*. Cambridge, Massachusetts: Harvard University Press. pg 235. The fact that the economic exchange by which this data is acquired is untaxed is also concerning from a competition perspective. See Johal, S. et al. (2018). It is not clear to us that a workable solution to the taxation challenge of in-kind data exchanges or barter transactions has yet been identified. Thus, incorporating such a solution into a competition-enhancing framework is not something that is attempted in this report.

53 A monopsony or oligopsony is similar to a monopoly or oligopoly except with the firm being the dominant purchaser instead of the dominant seller. See Posner and Weyl (2018, 234).

already discussed, it is unlikely that organic market competition will, by itself, spark the needed improvements to these agreements.[54]

A similar but distinct problem involves the relationship between these platforms and the applications (apps) or services which are provided "on top" of them. The owners of operating systems for desktop and mobile devices, for example, exercise tremendous control over the apps which run on these devices through control of their proprietary app stores. There are increasingly questions over whether these firms are exercising this control in a way that is pro-competitive and in ways that protect their users' interests. Indeed, it is alleged that some platform firms are allowing apps to engage in behaviour, such as unneeded and overly broad data collection, that most users would find problematic if they were fully aware of it. Simultaneously, these platforms may be blocking users from accessing apps that could hinder platforms' abilities to profit from these activities.[55]

This point opens up a wider question about the negative externalities of the digital economy. There is increasing concern that the "surveillance capitalism"[56] model of exchanging free services for data used to target advertising is having negative impacts beyond falling business dynamism and low levels of innovation. Negative impacts on mental health, especially among young people,[57] and increased political polarization and radicalization,[58] represent just two of the more notable of these data-driven externalities. These harms, while not directly relevant to a traditional price-focused competition analysis, are relevant to the extent that they result from the failures of existing competition and market mechanisms to generate adequate innovation and competition on the non-price aspects of these services such as privacy, transparency, consumer safety and ethical design.

Finally, it is also worth noting that even setting aside these more novel points, a fairly traditional concern remains. One of the critical intellectual justifications for the efficiency defence and the wider "Chicago school" approach to competition is that it will enable the larger and more efficient firms that might result to offer lower prices, thereby benefiting customers. But it is becoming increasingly clear that this argument may be incomplete. For example, research done in the US finds that mergers on average led to increases in product prices of 4.3 per cent.[59] If this is true in Canada as well, this would weaken one of the main defences for allowing significant corporate consolidation.

54 See Stucke and Grunes (2015).

55 See Ezrachi and Stucke (2016) Part IV. This point may seem to be muddied somewhat by Apple's recent move to ban the "Facebook Research" app from its app store. But even in this case, Apple did so not because the app raised privacy concerns, but because Facebook violated the terms of service of the program by which Apple gave Facebook special abilities to "sideload" apps onto the iOS platform without selling them through Apple's App Store. See Constine (2019).

56 See, for example, Zuboff, S. 2015. "Big Other: Surveillance Capitalism and the Prospects of an Information Civilization." *Journal of Information Technology 30*, 75–89.

57 Doidge, N. 2018. "Screen Time, the Brain, Privacy and Mental Health." *Data Governance in the Digital Age: Special Report*. Medhora, R. ed. Centre for International Governance Innovation: 78-85. pg 80-83.

58 Tufekci, Z. 3 October, 2018. "Russian Meddling Is a Symptom, Not the Disease." *The New York Times*. https://www.nytimes.com/2018/10/03/opinion/midterms-facebook-foreign-meddling.html and Bergen, M. 2 April, 2019. "Executives Ignored Warnings, Letting Toxic Videos Run Rampant." *Bloomberg*. https://www.bloomberg.com/news/features/2019-04-02/youtube-executives-ignored-warnings-letting-toxic-videos-run-rampant

59 Kwoka, J. with Greenfield, D. and Gu, C. 2015. *Mergers, Merger Control, and Remedies: A Retrospective Analysis of U. S. Policy*. Cambridge, Massachusetts: The MIT Press. pg 155.

5 EMERGING PROBLEMS

While many of the challenges just described are already creating difficulties for regulators and governments – to say nothing of consumers – they are likely just the tip of the iceberg. Academics and commentators have begun to identify a host of emerging challenges to competition which will require significant creativity from lawmakers and regulators to solve.

Dynamic pricing

Dynamic pricing is one innovation that is already widespread, but which threatens to further expand and evolve in problematic directions. Firms are already using algorithms and a variety of types of data including users' location, postal code, Internet browser and type of device to vary the price that they offer to consumers. In the future, as pricing algorithms become more sophisticated and personal data becomes richer and more available, firms may be able to model individuals' economic behaviour with much greater accuracy, thereby enabling dynamic pricing to become ubiquitous on the Internet.

Some may welcome this spread. After all, the use of dynamic pricing may make some markets more efficient and facilitate many transactions that would not have taken place otherwise. It will also likely mean that many individual consumers will receive marginally lower prices than they would have otherwise received.

But to understand why this development is concerning at a more general level, it is important to remember that the purpose of modeling individuals' behaviour is to enable firms to individualize their prices so as to maximize both the number of profitable sales made and the level of profit they are able to extract from each of these sales. While some have cheerfully suggested that this could result in those with a greater ability to pay simply being charged more, this is unlikely to be the norm.[60] A more likely result is that those in the greatest need, not necessarily the greatest ability to pay, will end up facing prices carefully calculated by an algorithm to be just at the limit of what an individual is able to pay right at the moment when they need something the

60 While it is true that one of the earlier manifestations of this form of personalized pricing, namely the offering of higher prices to Apple device users than PC device users overall, pricing algorithms are less likely to charge wealthy consumers significantly higher prices for the simple reason that wealthy consumers almost always have more options than less wealthy ones. See Deane, H. 2017. *Dynamic Pricing – Can consumers achieve the benefits they expect?* Consumers Council of Canada. https://www.consumerscouncil.com/dynamic-pricing-download pg 15.

most.[61] Moreover, given the lack of algorithmic transparency that currently exists and the possibility that unsupervised machine learning algorithms may discover these strategies without any human direction, detecting or forestalling such practices may be more difficult than one would initially expect.

Dynamic pricing of this sort could have significant anti-competitive impacts. If algorithms are able to model our behaviour with high levels of accuracy, they could be able to predict the maximum price that an individual would accept before bothering to turn to a competitor. This is worrying for many reasons but, from a competition perspective, it is especially problematic. If the concept of a benchmark price is destroyed by omnipresent dynamic pricing, it may become impossible to determine when an incumbent firm is pricing in a predatory manner in order to see off a potential competitor before there are able to establish themselves. Even the possibility that this might occur represents an important barrier to entry by new firms.[62] Again, third-party detection of such practices may be very difficult if algorithms continue to lack transparency to the extent that they currently do.

Virtual assistants

While the idea that algorithms will be able to predict our behaviour to such an extent may seem far-fetched, consider that this is exactly what the proliferating number of automated virtual assistants are specifically designed to do. The gradual but steady increases in the capabilities of these virtual assistants – especially their ability to predict our requests and desires – also presents a number of additional competition concerns.[63] For example, many consumers are using their virtual assistants to help them do their online shopping.[64] Given the ways in which these assistants are increasingly acting as gateways to the market and framing their users' reality, it is appropriate to question whether these assistants can be relied upon to offer products and services from competitors in a fair and balanced way. Existing precedents are not encouraging: it was essentially a simpler version of this problem that lay at the heart of the EU's complaint against Google for favouring its own comparison shopping service over its competitors.[65]

61 See Deane (2017, 25). Consider the dynamic "surge" pricing model used by ride-sourcing firms for example. CBC News. 2 January, 2016. "Uber's New Year's Eve price surge meant painful bills for revellers." *CBC*. https://www.cbc.ca/news/canada/montreal/uber-price-surge-new-years-eve-1.3387450

62 Cf. Khan (2017, 772-773).

63 Ezrachi and Stucke (2016, 191-202).

64 Jones, C. 28 February, 2018. "Alexa, I need ... everything. Voice shopping sales could reach $40 billion by 2022." *USA Today*. https://www.usatoday.com/story/money/2018/02/28/alexa-need-everything-voice-shopping-becomes-common-sales-through-amazons-alexa-others-could-reach-4/367426002/

65 Manthorpe (2018)

Additionally, given the demonstrated ability and willingness of platform firms to manipulate users' emotions[66] and engage in behavioural modification through "persuasive design"[67] the possibility that they might leverage the intimate connections they will increasingly enjoy with users – via a virtual assistant, for example – into irrational loyalty and emotional attachments to their products is not far-fetched. While such manipulative action might not be illegal under current competition law, we suggest that many users might wish it were.

Competition law is undergirded and justified by economic theories which rely on a rational profit-maximizing consumer. These theories have never been accurate descriptions of reality, but they have been accurate enough for the theoretical and legal edifice built on top of them to succeed well enough to be useful. It is not clear that this will continue to be true in a world where individuals are locked in a constant battle of wills with AIs that know them more intimately than does any human, and whose corporate masters are spending billions of dollars a year on devising methods to further undermine their customers' rationality and self-control.

66 Meyer, R. 28 June, 2014. "Everything We Know About Facebook's Secret Mood Manipulation Experiment." *The Atlantic*. https://www.theatlantic.com/technology/archive/2014/06/everything-we-know-about-facebooks-secret-mood-manipulation-experiment/373648/ and Rose-Stockwell, T. 30 April, 2018. "Facebook's problems can be solved with design." *Quartz*. https://qz.com/1264547/facebooks-problems-can-be-solved-with-design/

67 Lewis, P. 6 October, 2017. "'Our minds can be hijacked': the tech insiders who fear a smartphone dystopia." *The Guardian*. https://www.theguardian.com/technology/2017/oct/05/smartphone-addiction-silicon-valley-dystopia

Tacit collusion

At the other end of the competitive spectrum, multiple firms' pricing algorithms may independently learn that the most profitable business model for their particular industry is for them and their competitors to tacitly cartelize their market. While competitors agreeing upon such a plan is illegal, "tacit collusion" – competitors reaching a tacit understanding without explicitly communicating with each other – is likely not illegal under existing law. Ariel Ezrachi and Maurice Stucke provide examples of instances where such situations have arisen in the pre-digital age and suggest that it is all but inevitable that such situations will be reproduced by algorithms in environments characterized by rich information and dynamic pricing.[68] Again, technology firms' willingness to conspire not to "poach" each other's workers presents a worrying record of analogous cartelizing behaviour that does not augur well.[69]

Competitors reaching a tacit understanding without explicitly communicating with each other – is likely not illegal under existing law.

68 Ezrachi and Stucke (2016, Part 2).

69 Roberts, J. 3 September, 2015. "Tech workers will get average of $5,770 under final anti-poaching settlement." *Fortune*. http://fortune.com/2015/09/03/koh-anti-poach-order/

6 POTENTIAL RESPONSES

While many of these factors and threats are already known to policymakers and competition regulators, in many cases there are significant obstacles which make unilateral responses by individual governments difficult. For one, digital firms are almost invariably creatures of the Internet and thus, always potentially global in scope. This makes it hard for smaller countries like Canada to regulate them: either the firm can ignore regulation if it has no physical presence in the regulating country or it can move its operations to a jurisdiction with a more relaxed regulatory environment if it feels that it is being over-regulated. Either way, because its services are accessible via the Internet, the problematic behaviour can be very difficult to change.

This creates an international collective action problem, the solving of which will require significant international cooperation. This will be difficult given the differing approaches to competition law that exist across jurisdictions and the temptation for some countries to gain short-term advantages over others by defecting from agreements. The pressure to lower corporate taxation over the past 30 years created by arguably opportunistic low tax jurisdictions, and which has contributed to a halving of the average corporate tax rate globally, provides a warning in this regard.[70] Additionally, the fact that some countries such as China may prioritize the growth of their own firms or their scientific capabilities over their own citizens' privacy and well-being for strategic geopolitical purposes further complicates this situation.[71]

With these caveats in mind, however, there are a number of potential steps which Canadian policymakers and regulators should consider implementing, potentially in concert with groups of like-minded states, or potentially unilaterally. We have grouped these recommendations, and the analysis which underlies them, into the following four categories:

» The data regime

» Algorithmic regulation

» Amendments to the *Competition Act* and related legislation

» Government capacity

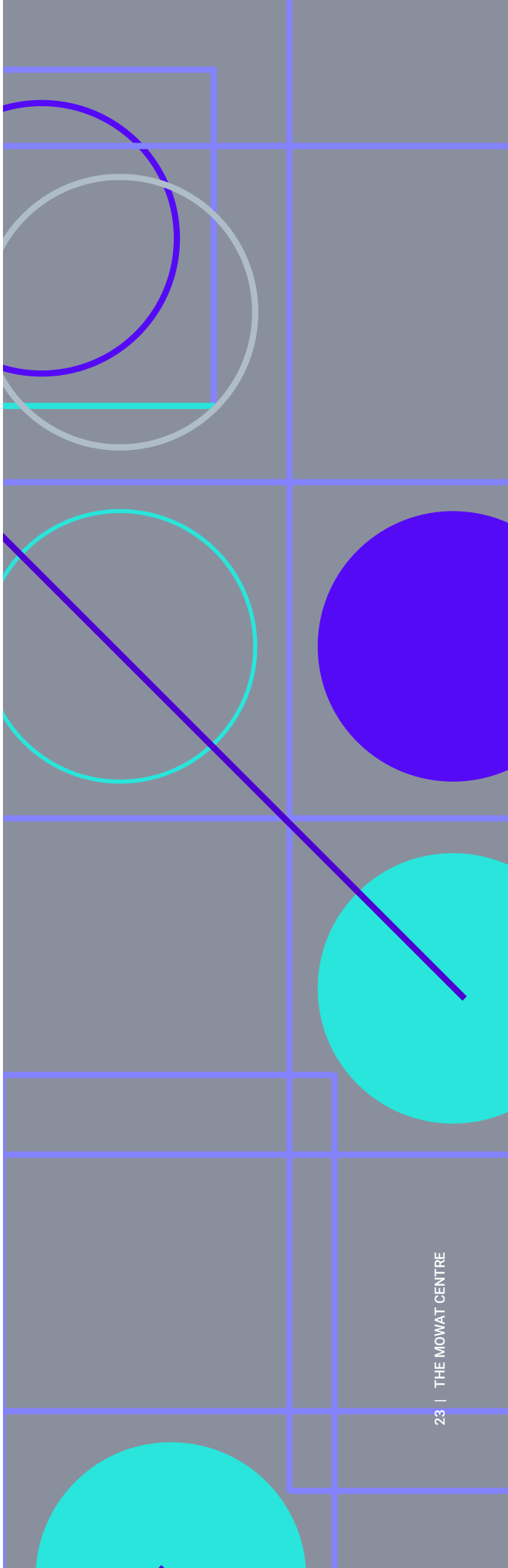
Each of these groups will be examined in one of the remaining four substantive parts of this report.

70 Stein, J. 24 July. "Across the globe, taxes on corporations plummet." *The Washington Post*. https://www.washingtonpost.com/business/2018/07/24/across-globe-taxes-corporations-plummet/?utm_term=.e05f503535c2

71 Meyer (2014).

There are significant obstacles which make unilateral responses by individual governments difficult.

Some of the steps described below fall within the traditional bounds of competition practice and policy, but some are novel or stretch beyond the boundaries normally associated with this policy area. This is a testament to how fundamentally the digital revolution is reshaping our economy and society. Moreover, many of these recommendations will have important impacts outside of the scope of competition policy; these non-competition impacts – which could be positive or negative – will also need to be taken into account by decision-makers.



Today, the conceptual contours of privacy are in flux and data has become an incredibly important commercial asset in and of itself.

7 RECOMMENDATIONS

Part 1: The data regime

One of the clearest conclusions to emerge from the foregoing analysis is that the current framework of rules and regulations governing data is in need of rebooting and that the failings of this regime are likely having a significant negative impact on competition.

The current data regime was designed in a context when data was a by-product of other activities and the main focus was on ensuring privacy protections; today, the conceptual contours of privacy are in flux and data has become an incredibly important commercial asset in and of itself. Unfortunately, the legal and regulatory frameworks which govern data have not kept pace with this evolution.[72] Consequently, the marketplace for data, as well as the legal and regulatory frameworks governing its creation, use, control and the division of the profits it generates, is significantly underdeveloped.[73]

This situation has been exacerbated by a profound technological imbalance created by, on the one hand, huge investment by technology firms in their capacity to collect and exploit this data and, on the other, a dearth of investment in the technology that individuals would need to protect and realize the benefits of their own data – at both the individual and collective level. This has led to a situation in which data firms are able to capture a disproportionate share of the benefits derived from user-generated data or data generated using public assets, such as roads.

The existing data regime is also flawed in a second, more fundamental way. Unlike many other assets, data is a "non-rivalrous" good. A non-rivalrous good is an asset the use of which by one person does not limit the ability of another to use it.[74] This is different from many other types of assets that competition policy

72 Scassa, T. 2018. "Considerations for Canada's National Data Strategy." *Data Governance in the Digital Age: Special Report*. Medhora, R. ed. Centre for International Governance Innovation: 6-11.

73 Consider the discussion of how data is brokered in the sale of digital advertising, for instance: The Economist. 23 May, 2019. "Big tech faces competition and privacy concerns in Brussels." *The Economist*. https://www.economist.com/briefing/2019/03/23/big-tech-faces-competition-and-privacy-concerns-in-brussels

74 Ciuriak, D. 2018. "The Economics of Data: Implications for the Data-driven Economy." *Data Governance in the Digital Age: Special Report*. Medhora, R. ed. Centre for International Governance Innovation: 12-19. pg 12. See also MIT Technology Review Insights. 7 April, 2016/. Data's Identity in Today's Economy. *MIT Technology Review*. https://www.technologyreview.com/s/601207/datas-identity-in-todays-economy/ for a discussion of some of data's other interesting characteristics.

usually considers. If one of the policy objectives of competition policy is to encourage innovation, this is a critical point because it suggests that a competition regime which supports widespread exclusive control of data can represent a significant drag on the innovation potential of an economy. Why encourage exclusive control over data, especially user-generated data, so that one company can use it to innovate (and profit) when non-exclusive alternatives would enable multiple innovators to produce more innovation (and potentially more profit in aggregate) from the more intensive use of the same underlying data?[75]

Some argue that reducing the exclusive control of data by firms may reduce incentives to innovate. This may or may not be true. As is discussed below, Britain, which requires financial firms to share customer data with competitors upon request, has emerged as a hotbed of financial innovation arguably because of the increased competition to innovate that this requirement has sparked.[76] While further empirical investigation is needed to arrive at firmer conclusions, it should also be noted that such a move would not necessarily reduce the ability of firms to create intellectual property from their use of data and profit from their exclusive control of this intellectual property. Moreover, at least insofar as user-generated data or data generated through the use of public assets, it's not clear that firms should ever have had exclusive control over this data in the first place.[77] Finally, the fact that, unlike most other assets, data that you already possess can become more valuable as you acquire more of it, also means that data may need special consideration in competition analyses.[78]

The aim of the analysis and recommendations that form the remainder of this sub-section is to describe a renovation of the existing data regime that would shift the digital economy towards more innovation, greater competition and a more equitable distribution of the benefits it creates. To accomplish this, it seeks to ensure an optimal allocation of data across the economy and to counter some of the anti-competitive features that are both inherent to data as an asset class and those that more accidentally define the current version of the digital economy, all while ensuring sufficient user control and privacy.

Data control and data rights

One way to promote more competition in the digital economy would be to weaken the control that platform firms have over the data generated by users and strengthen the ability of users to exercise more control over the data they generate. Doing so would help spur competition by reducing some of the obstacles to competition presented by network effects and high switching costs because it would make it easier for users to move their own data around between platforms.

75 Breznitz, D. 2018. "Data and the Future of Growth: The Need for Strategic Data Policy." *Data Governance in the Digital Age: Special Report*. Medhora, R. ed. Centre for International Governance Innovation: 66-73. pg 66-67.
76 Furman et al. (2019, 6).
77 Darabi, A. 22 May, 2018. "Amsterdam and Barcelona are handing citizens control of their data." *apolitical*. https://apolitical.co/solution_article/amsterdam-and-barcelona-are-handing-citizens-control-of-their-data/
78 See Posner and Weyl (2018, 224-230).

Some important steps have already been taken in this direction. The EU's General Data Protection Regulation (GDPR) requires companies to provide individuals with a copy of all the data they have collected from them upon request. While not yet fully realized, this change should theoretically make individuals' data more portable between services.[79] Similarly, since January 2018, the EU's Payment Services Directive – known as PSD2 – has required European banks to share customer data with competitors if the customer requests such sharing.[80] These initiatives could even be expanded so that users have the right to access data a firm has collected from them and have that data deleted if they no longer want the firm to have it.[81]

It is worth noting, however, that even the boldest steps taken in this direction, like PSD2, are not magic bullets and have not yet yielded significant changes everywhere.[82] In fact, "FinTech" innovation is growing most in jurisdictions like the UK where regulators and industry groups have built on top of PSD2 and have gone further towards supporting and

Digital firms' reliance on data harvesting business models means that genuine competition on non-price features like privacy is often not in their interest, meaning that they are unlikely to proactively spark robust competition in these areas.

requiring data portability and interoperability between firms.[83] This has included, for example, the creation of mandatory application program interface (API) specifications – APIs are the intermediary software which allows different applications to communicate with each other – as well as standardized formats and coding languages for APIs.[84]

Unfortunately, Canada is nowhere near being ready to implement even limited data portability of the variety created by PSD2.[85] Not only will legislative and regulatory changes be required, but so too will be significant advances in the development of data standards and the personal technological infrastructure needed for individuals to be able to transfer, download, store, upload and control their own data.[86] This does not mean, however, that Canada should not start taking the steps needed to make this sort of interoperability possible.

79 Much will depend on how courts interpret the GDPR. For example, Uber and some of its drivers are currently embroiled in a dispute about how much data Uber is required to provide. It argues that a limited disclosure focused primarily on location data is sufficient. Conversely, the drivers argue that this limited disclosure, which does not include log-on and log-off times and drivers' ratings, for instance, is not sufficient. See The Economist. 20 March, 2019. "Uber drivers demand their data." *The Economist*. https://www.economist.com/britain/2019/03/20/uber-drivers-demand-their-data

80 Robinson, E. and Henning, E. 22 October, 2017. "European Banks Forced to Open the (Data) Vault." *Bloomberg*. https://www.bloomberg.com/news/articles/2017-10-23/european-banks-will-have-to-share-data-with-their-rivals

81 Ezrachi and Stucke (2016, 227). This is already theoretically possible under GDPR in some instances, but this ability has not yet been well defined by jurisprudence.

82 The Economist. 13 March, 2019. "Competition, not break-up, is the cure for tech giants' dominance." *The Economist*. https://www.economist.com/business/2019/03/13/competition-not-break-up-is-the-cure-for-tech-giants-dominance

83 Furman et al. (2019, 6).

84 Thomas, H. Kimber, A. Brown, W. 6 March, 2019. "How regulation is unlocking the potential of open banking in the UK." *EY*. https://www.ey.com/en_gl/banking-capital-markets/how-regulation-is-unlocking-the-potential-of-open-banking-in-the-uk

85 Scassa, T. 29 January, 2019. "Is Canada Ready for Open Banking?" *Centre for International Governance Innovation*. https://www.cigionline.org/articles/canada-ready-open-banking

86 See Girard, M. 16 January, 2019. *Big Data Analytics Need Standards to Thrive: What Standards Are and Why They Matter*. Centre for International Governance Innovation. https://www.cigionline.org/publications/big-data-analytics-need-standards-thrive-what-standards-are-and-why-they-matter and Alwani, K. and Urban, M. May, 2019. *The Digital Age: Exploring The Role of Standards for Data Governance, Artificial intelligence and emerging platforms.* CSA Group. https://www.csagroup.org/article/digital-economy/

» RECOMMENDATION 1

Pass legislation that clearly sets out certain fundamental controls that users must be provided with over the data they generate on online platforms. This would include, but not necessarily be limited to, the ability to view, correct, download and transfer any data collected as well as have it deleted by the services that collect it.[87]

» RECOMMENDATION 2

The Government of Canada should devote significant effort and resources to supporting the creation of data standards and personal technological infrastructure designed to enable greater personal control of data and portability of data between digital services. This would include the development of open standards for data, personal data storage technology, APIs and methods to enable data to be "programmed" with user preferences regarding the conditions of its use that persist with the data as it moves along value chains.[88]

87 Cf. Wolfe, D. February, 2019. "A Digital Strategy for Canada: The Current Challenge." *IRPP Insight 25*. pg 15. and the concept of data ownership presented therein and Martin Tisne's similar idea, which he presents in the form of a bill of data rights, and in which he includes a right to be free from manipulation. Tisne, M. 14 December, 2018. "It's time for a Bill of Data Rights." *MIT Technology Review*. https://www.technologyreview.com/s/612588/its-time-for-a-bill-of-data-rights/

88 For some examples of this "smart data" idea see Alwani and Urban (May 2019, 43) and Urban, M. 11 December, 2018. *Abandoning Silos: How innovative governments are collaborating horizontally to solve complex problems*. The Mowat Centre. https://mowatcentre.ca/abandoning-silos/ pg 22. The DECODE project, currently being piloted in Amsterdam and Barcelona is an interesting early example of such a system in action. See Darabi (2018).

Reforms to ToS agreements

One of the ways that data harvesting firms currently tilt the playing field in their own favour is through overbroad ToS. Currently, firms use ToS to regularly give themselves permission to collect enormous quantities of user-generated data and data on users – often unconnected to the service being offered – and permission to use this data in highly unconstrained ways.

The fact that there has been such limited competition between digital firms on non-price aspects of digital services, such as ToS, suggests a significant market failure in need of an external fix. ToS are often purposefully constructed to be long and difficult to understand, making it unlikely that users will read them. Perhaps more importantly, users know that reading ToS is largely a waste of time because firms often reserve the right to change the ToS at any time without notice. Furthermore, users do not have the opportunity to negotiate with the service provider over the terms of the ToS. Users must choose between accepting the ToS or not being able to use the service. Given the centrality of digital tools to participation in our economy and society, in many cases this is becoming less of a genuine choice.[89] Indeed, as one commentator noted, clicking "I agree" when confronted with a ToS agreement is more often "an act of surrender" than of consent.[90]

89 Breznitz (2018, 67).

90 Scassa, T. 7 June, 2018. "Enforcement powers key to PIPEDA reform." *Policy Options*. http://policyoptions.irpp.org/magazines/june-2018/enforcement-powers-key-pipeda-reform/

Reducing these negative externalities requires countering the source of this market failure which, in this case, is the fact that the leading firms' business models rely on pervasive data harvesting.[91] Digital firms' reliance on data harvesting business models means that genuine competition on non-price features like privacy is often not in their interest, meaning that they are unlikely to proactively spark robust competition in these areas. And because the nature of the digital market has made it relatively easy for firms to defend the leading positions they have occupied since before many of these concerns became widespread, it has become clear that expecting new entrants to force change by successfully challenging this business model is misguided. If competition on these problematic non-price aspects is to be kindled successfully, it will likely require governments and regulators to take steps to alter the shape of the market to better incentivize such competition.[92]

Some important steps have already being taken in this direction. Germany's Federal Cartel Office, the country's competition regulator, has recently found that Facebook is abusing its dominance of the social networking market by requiring users to agree to unfair ToS that allow "practically unrestricted collection" of their data as the price for using Facebook's service. Accordingly, the regulator has prohibited Facebook's current practices going forward.[93]

Additionally, California recently passed the *Consumer Privacy Act* which is designed to address this market failure by prohibiting businesses from declining service to users who do not consent to having data not directly necessary to the operation of the service from being tracked and stored.[94] As a concession to the industry, the law includes an exception to this rule for companies that, in addition to offering a "free" advertisement supported – i.e. data harvesting supported – form of the service, also offer a comparable paid version of the service that does not track and store their data.[95] In other words, if a firm wants to continue harvesting data, they must offer users the ability to pay a reasonable price to use a version of their service that does not rely on pervasive data harvesting.

This is a critical step forward because it provides users with a genuine choice over whether they want their data tracked. Additionally, the transparent pricing of data that this should encourage should help develop the market for user data and act as a spur to more robust competition in this market, a critical requirement for its effective allocation across the economy.[96] Critically, however, it does not go far enough.

91 For example, see Ezrachi and Stucke's (2016, 179-180) description of the Brightest Flashlight Free app which purported to be an app that simply turned a smartphone into a flashlight but, unbeknownst to most users, also collected their location data and sold it to advertisers.
92 Haggart, B. 2018. "The Government's Role in Constructing the Data-driven Economy." *Data Governance in the Digital Age: Special Report*. Medhora, R. ed. Centre for International Governance Innovation: 20-25. pg 22
93 Dreyfuss (2019). Facebook is appealing the ruling.
94 Roettgers, J. 29 June, 2018. "California's New Privacy Law Could Have Big Impact on Tech, Media." *Variety*. https://variety.com/2018/digital/news/california-ab-375-1202861680/
95 Lapowsky, I. 28 June, 2018. "California Unanimously Passes Historic Privacy Bill." *Wired*. https://www.wired.com/story/california-unanimously-passes-historic-privacy-bill/ Note, the cost of this purchased service must be reasonably related to the value provided by a user's data in the advertising supported form.
96 Breznitz (2018, 68). Establishing a market price for data is also a critical step towards enabling government to tax services purchased through what are essentially data "barter exchanges". Not only could this help provide a new revenue stream for governments in an era when their revenues are being eroded by shifts in the digital economy, it would also help to move the commercial playing field back towards balance as it would reduce the difficult to justify tax advantages that many digital firms enjoyed *vis-à-vis* firms in other sectors. For more discussion of this, see Johal, S. et al. (2018, 63).

In many cases, versions of digital services that do not track users' data are already available but remain marginal and largely unknown to most consumers. Simply requiring firms to create a paid version of an already existing service that does not track user data, but is not advertised well by the firm, and may very well be purposefully designed to be uglier or clunkier, will likely not have the desired outcome.[97] Similarly, it is a commonplace in software design that the default settings for an application are critical because the vast majority of users will never use anything other than the default settings. In order for these rule changes to have the intended effect, the different versions of these services should be incorporated into a single offering and the choice between the high and low privacy versions presented as a choice between options within the same service with the paid version selected as the default setting.

In many cases, versions of digital services that do not track users' data are already available but remain marginal and largely unknown to most consumers.

The effectiveness of such an approach could be further boosted by the implementation of a tax on digital advertisements targeted at and served to consumers on the basis of personal data, as has recently been suggested by Nobel Laureate Paul Romer. While this idea has a variety of other potential benefits, from a competition perspective such a tax could be applied progressively as a means of counter-balancing some of the problematic advantages enjoyed by some large established digital firms and encouraging innovative alternatives to business models based on the harvesting of personal data.[98]

» RECOMMENDATION 3

Pass legislation prohibiting digital service providers from declining service to a customer who objects to any collection, use, transfer, sale, or retention of their data beyond what is strictly necessary for the functioning of the service in question. This legislation should include an exemption for firms that offer a comparable paid version of their service at a reasonable price that is directly connected to the value to the firm of the foregone data. If firms offer one of these exempted versions, however, it should be required that the two versions of the service be integrated and the paid version of the service must be the default version while the advertising supported version must be actively opted into by the user.

97 Consider the CRTCs essentially failed attempt to force cable television providers to provide a "skinny basic" cable option and how "vertically integrated phone, internet and TV operators have — by design — made the CRTC-mandated starter cable TV packages unattractive to most Canadians." Vlessing, E. 20 November, 2017. "Canada's Effort to Stem Cord-Cutting Has Been an Epic Fail." *Hollywood Reporter*. https://www.hollywoodreporter.com/news/canadas-effort-stem-cord-cutting-has-been-an-epic-fail-1059580

98 Romer, P. 6 May, 2019. "A Tax That Could Fix Big Tech," *The New York Times*. https://www.nytimes.com/2019/05/06/opinion/tax-facebook-google.html In Canada, such an approach could also potentially help remove some of the unbalanced tax treatment of digital advertising on foreign owned digital platforms that appears to have significantly harmed the Canadian media industry. See Public Policy Forum. January 2017. The Shattered Mirror: News, Democracy and Trust in the Digital Age. *Public Policy Forum*. https://shatteredmirror.ca/ pg. 83-85.

RECOMMENDATION 4

Study the feasibility of implementing a tax on digital advertisements targeted at and served to consumers on the basis of personal data. Include consideration of whether to apply the tax progressively and the advertising revenue thresholds at which the tax rate would increase.

Technological infrastructure

One of the obstacles to individuals asserting their rights *vis-à-vis* their data has been the lack of needed technological infrastructure. In fact, the limited infrastructure that does currently exist, such as the digital identity systems that allow us to "Sign-In with Google" or "Log In with Facebook" only further strengthens the hold of these firms over users' data and can help enable the anti-competitive "nowcasting" described earlier.

Governments have long recognized that there is a special role for government to play in the provision of public infrastructure or in the regulation of utilities. This recognition is due to the fact that equal access to neutral platforms like roads and power grids are essential to the equitable participation by all individuals in a community's economy and society. While certainly possessing unique features, comparable digital technologies, such as digital identities, ought to be understood as falling within a similar vein.[99]

Representatives from the federal and provincial governments, alongside leaders from the private sector, are already working to create such an infrastructure through the Digital ID & Authentication Council of Canada (DIACC).[100] Unfortunately, progress on this front seems quite slow. Completing this work, whether it be through the provision of a government issued digital ID or the setting of robust standards for third-party-provided IDs, could represent an important spur to improved non-price competition in the digital marketplace and serve as an essential platform for many of the other steps described below.

» RECOMMENDATION 5

Support the creation, either by government or by a not-for-profit entity, of a digital identity standards framework for citizens and pass legislation requiring that digital service providers, including government, accept identities that meet the standards set out in this framework for "log in" purposes.

The creation of an infrastructural digital identity for citizens could be made even more valuable if it were combined with another technology, namely personal data storage. If data is an asset that has a value, individual citizens should have the ability to track, store and realize the value of their own data in the data marketplace.

99 Estonia's e-government system is one example of a government that has already travelled quite far in this direction. See Urban (2018, 11-16).

100 See Rab, L. 16 May, 2018. "Canada's Digital Economy Relies on a Foundation of Digital Identity." *DIACC*. https://diacc.ca/2018/05/16/the-economic-impact-of-digital-identity-in-canada/ and Parmenter, N. 13 February, 2019. "Canada needs a robust digital ID system." *Policy Options*. http://policyoptions.irpp.org/magazines/february-2019/canada-needs-robust-digital-id-system/

Firms like Google and Facebook currently use the provision of their digital identities as a means of tracking users' activities on the Internet and collecting data. If governments were to support the provision of digital identities to individual users, the obvious next step would be to link these identities with a service that would allow individual users to collect their own data and store and control it. This could be accomplished in a variety of ways and there are already a number of initiatives underway that are designed to provide such a service, such as the MIT-based Solid initiative led by Sir Tim Berners-Lee.[101] The main advantage of such a system from a competition perspective would be how it could help enable the porting of data between platforms – thereby encouraging more competition between them for users – and the possible development of alternative decentralized business models and decentralized applications – dApps – capable of competing with existing centralized services.

» RECOMMENDATION 6

Support and encourage the creation of personal data storage and control options for Canadians by either a not-for-profit or a set of high-regulated commercial actors. This would include the setting of high standards for privacy and security.

Another essential technology required to realize this new paradigm of individual data control is the development of digital agents capable of interacting with digital services and websites and navigating users through the process of giving informed consent to these terms (e.g. negotiating ToS, the use of cookies and compensation for users' data). The idea behind these digital agents is that they could be programmed in advance by users' with their default preferences regarding data-sharing, privacy, security, compensation for data, etc. Associated with a user's digital identity, data storage service or integrated into their web-browser as a plug-in, these agents would automate users' assertion of the new digital rights framework created by the control measures already outlined. While they would likely take quite simplistic forms initially – indeed, forerunner software that fulfills some of these functions such as add blockers or apps like Disconnect[102] already exists – such agents could grow into a critical element of individuals' navigation of the digital realm.[103] The automation of many onerous functions, such as the interpretation and negotiation of ToS agreements, by these agents could help empower users and catalyze increased competition between platforms on the terms of these agreements.

101 See https://solid.mit.edu The "digital wallet" being developed by the aforementioned DECODE project is another example. See https://decodeproject.eu/

102 See https://disconnect.me/

103 See Jones, H. 3 November, 2018. "Accelerating The Future Of Privacy Through SmartData Agents." *Forbes*. https://www.forbes.com/sites/cognitiveworld/2018/11/03/accelerating-the-future-of-privacy-through-smartdata-agents/#5c34e8973d79 for more information on the "SmartData" digital agents project being developed in this vein.

» RECOMMENDATION 7

Support and encourage the creation of digital agents compatible with individuals' digital identities and personal data storage technologies. Users should be able to enter their preferences in areas including ToS, privacy, security and compensation for data into these agents which would then automatically negotiate with digital services providers on users' behalf. If a service required consent to terms that deviated from a user's preference, this would be signalled to the user and would require them to provide specific consent to that condition.

Given the current climate of fiscal restraint and the significant challenges that government in Canada faces in digitizing its own services, let alone developing new ones, it makes sense that government should seek to support the development of these infrastructural digital technologies by the private sector and civil society as opposed to developing them in house. Nonetheless, in order to ensure that the public interest is served by these technologies, government will have an important role to play in defining a regulatory environment for these tools and technical standards to which they will need to adhere.

In order to ensure that the public interest is served by these technologies, government will have an important role to play in defining a regulatory environment for these tools.

» RECOMMENDATION 8

Support the development of standards for digital identities, personal data storage, and digital agents that ensure privacy and security for citizens and pass legislation mandating progressive adherence to these standards for digital service providers over time.

Finally, the use of these three infrastructural technologies could still be stifled or frustrated if dependable ways of interacting with digital services were not developed. Thus, there is an important role for technical standards to play in order to ensure compatibility across the digital realm. Critical to the successfully deployment of these standards, however, will be the ability for individuals' digital agents to recognize and interpret digital product quality marks or labels of attestation that signal adherence to specific standards. Thus, the development of "machine-readable" standards and labels will be critical.[104]

104 "Machine-readable" standards are standards which can be reliably indicated digitally and reliably interpreted by automated processes. For more information, see Alwani and Urban (May 2019, 15, 21, and 42).

» RECOMMENDATION 9

Support the development of machine-readable standards for digital services and associated kitemarks and labels of attestation regarding, for example, the use of cookies by websites, the provisions contained in ToS agreements, the use of dynamic pricing, etc.[105] Once these standards have been developed, pass legislation requiring digital service providers to adhere to these standards and display these marks and labels so that consumers' digital agents are able to reliably interpret digital service providers' terms and automatically negotiate with them on the basis of users' preferences.[106]

» RECOMMENDATION 10

Support and encourage the development and widespread adoption of this new data regime through its incorporation into government procurement processes and by adherence to it in government operations.

105 Work on a standard which could serve as the basis for such a system is already underway in the work on ISO/IEC 24751 by Jutta Treviranus and the Inclusive Design Research Centre at OCAD University. See Treviranus, J. 30 October, 2018. "Sidewalk Toronto and Why Smarter is Not Better*." *Medium.* https://medium.com/datadriveninvestor/sidewalk-toronto-and-why-smarter-is-not-better-b233058d01c8

106 One way of managing such a system of marks and labels could be to employ distributed ledger technology. See Alwani and Urban (May 2019, 15 and 42) and Urban, M. with Pineda, D. 16 August, 2018. *Inside the Black Blocks: A policymaker's introduction to blockchain, distributed ledger technology and the 'Internet of Value.'"* The Mowat Centre. https://mowatcentre.ca/inside-the-black-blocks/ p. 43-48.

Data intermediaries

While giving individuals greater control over their own data is an important step towards spurring more and fiercer digital competition, it may face significant resistance and delay, the technology may prove difficult to develop, or these steps may simply prove insufficient given the enormous size of the existing digital giants. Alternatively, the advanced state of corporate consolidation in the digital economy may blunt the competitive impact of these changes unless additional measures are also taken.

Moreover, as some commentators have signalled, focusing too much on steps that essentially commodify individuals' data may inadvertently create a new set of problems, such as a new form of inequality where privacy is for the rich while the rest of us are forced to sell our data just to make ends meet.[107] Indeed, spurring optimal levels of competition while simultaneously working to advance equity will require empowering not only individual users, but also enabling collective action by users.

One idea for enabling collective action is to allow the creation of data "unions", "co-ops" or intermediaries. To understand how these organizations might work, consider how they could increase the level of compensation received by users in exchange for the user-generated data that they currently provide to digital platforms for no monetary compensation. Currently, one of the obstacles to providing users with compensation for this type of "data labour" is that the amounts involved would likely be quite small for the

107 Public comments by Teresa Scassa at the Ontario Information and Privacy Commissioner's *Privacy Day - Smart Cities: Building in Privacy and Ensuring Public Trust,* 24 January 2019, Toronto.

average user.[108] This means that individual users have limited motivation, and next to no ability, to use the potential withdrawal of their data as leverage for bargaining with firms. Perhaps most importantly, doing anything would involve significant bother and only limited potential gains. But, if users were able to band together and bargain collectively with these firms, and have this bargaining backed up with the ability to engage in collective action, this might change.

While compensation for individual users likely remain low, data intermediaries could potentially negotiate much better non-price conditions for their data labour in areas like data security, limits on data collection and sharing, and perhaps even greater payment or revenue sharing for users who engage in particularly valuable data generation.[109] At the very least, it could enable users with a means of collectively pushing back against the firms currently exploiting their data "labour" through actions like data boycotts or strikes. Moreover, because of the resources that could be brought to bear through collective action, much of this action could be automated, reducing the hassle involved for individual users.

From a competition perspective, the more efficient pricing of data that would likely result from the creation of effective data intermediaries could create a much more competitive and efficient market for data which would in turn drive better allocation of data between firms. In some situations, if technological advances allow it, it may even make sense for data intermediaries to act as a broker between the user and the firm using their data. This would enable the firm to access the data, while the data union would retain possession of it and the ability to protect and exploit it commercially on behalf of the user who would maintain control of it and licence it to the intermediary on their own terms.[110] It may even be possible, should personal data storage and other decentralizing technologies develop sufficiently, for the data intermediaries not to hold any data themselves either and to only facilitate access to individuals' data stores. Ultimately, the vertical unbundling of data collection and data exploitation, and the establishment of a competitive market for access to bulk data that this could entail, would likely produce a more economically efficient allocation of data.

» RECOMMENDATION 11

Pass legislation enabling the creation of not-for-profit or cooperative entities capable of acting as data intermediaries between citizens and digital service providers. This should include recognition of a right for citizens to have data intermediaries engage in collective bargaining with digital service provides on their behalf regarding issues such as compensation for use of their data, privacy and data security.

108 Posner and Weyl estimate that an average Internet user could expect to be paid somewhere between a few hundred and a few thousand dollars per year for their "data labour". They also point out, however, that some users with specific interests, skills, characteristics, or simply a willingness to spend a lot of time online, could potentially earn significantly more. Posner and Weyl (2018, 246-249).

109 Posner and Weyl (2018, 242).

110 As Jutta Treviranus (2018) points out, this could be especially important for groups of individuals with niche needs such as those suffering from uncommon illnesses, rare consumer needs or specialized hobby enthusiasts who may not be able to attract commercial attention unless they organize as a group.

Mandatory data-sharing/ licensing

An alternative, or potentially complementary, approach that focuses more narrowly on re-arranging the data market into a more pro-competitive format lies in the creation of a new set of data-sharing requirements for organizations that collect data. Under this proposal, large firms – an appropriate size threshold would have to be devised – would be required to make the data they acquire available in de-identified bulk format to firms that fell below this threshold on a mandatory licensing basis. This would enable smaller firms to access and use this data to help drive innovation. This may become especially important for smaller countries like Canada where the limited availability of data is already reportedly constraining the growth of data-hungry AI firms.[111] It may also be an attractive alternative to the taxing of data as a means of ensuring that flows of value denominated in bits and bytes instead of dollars and cents are still contributing optimally to the public interest.[112]

While still very much in development – there are significant concerns about privacy as well as technical barriers around data formatting and standardization that would need to be resolved[113] – such an approach could help unlock more of the innovative potential that access to data entails.[114] It is also not as novel as it may seem on first blush: data-sharing between insurance companies is already required in Germany,[115] for example, as is the sharing of financial information in the EU under the terms of the aforementioned PSD2 regulation.

Still, such an approach will present major technical challenges[116] and may not be appropriate in all situations, so its development should not be rushed. For example, it may be necessary to exclude foreign-owned and controlled firms from this arrangement unless acceptable levels of reciprocal data-sharing, to say nothing of sufficient privacy protection, can be negotiated with their home governments. Similarly, data collected by governments will likely need its own approach, as will data collected by commercial firms on behalf of government or data generated through the use of public assets. Specific consideration of these more specialized instances are beyond the scope of this report.[117] Nonetheless, it will be important to consider the competitive impacts of whatever legal and regulatory frameworks are devised for governing these cases, and how they will interact with the wider competition regime, even if they are not the primary considerations shaping these frameworks.

111 See Alwani and Urban (May 2019, 13).
112 See Johal, S. et al. (2018, 35-36) for a discussion of how firms that provide "free" services, but which are actually being paid for in data, present a problem for tax authorities.
113 See Alwani and Urban (May 2019) and Girard (2019).
114 The Economist. 28 June, 2018. "How regulators can prevent excessive concentration online." *The Economist*. https://www.economist.com/special-report/2018/06/28/how-regulators-can-prevent-excessive-concentration-online
115 The Economist. 6 May, 2017. "Data is giving rise to a new economy."
116 Grace (2018).
117 For some initial thoughts, see Wylie, B. and McDonald, S. 9 October, 2018. "What Is a Data Trust?" *Centre for International Governance Innovation*. https://www.cigionline.org/articles/what-data-trust and McDonald, S. 5 March, 2019. "Reclaiming Data Trusts." *Centre for International Governance Innovation*. https://www.cigionline.org/articles/reclaiming-data-trusts

» RECOMMENDATION 12

Develop legislation requiring firms having a market share in excess of a certain threshold, and that collect user-generated data and other user data, license access to a duly de-identified proportion of the data they collect to firms having a market share below a certain threshold at a reasonable price. This legislation should include necessary privacy protections such as standards for de-identification and exceptions for data associated with or generated by small or vulnerable groups that might be harmed or put at risk by such data licensing.

Part 2: Algorithmic regulation

As AI and machine learning algorithms become increasingly ubiquitous, sophisticated and powerful, the question of whether and how to regulate their design and use will become more pressing. From a competition perspective this presents at least two important problems: dynamic pricing and biased virtual assistants.

Dynamic pricing

As noted earlier, the main concerns that arise from the practice of dynamic pricing in the context of competition policy are algorithmically-enabled predatory pricing and tacit collusion. Part of the solution to these potential problems may lie in the more robust measures designed to enable individual control of data described earlier. Nonetheless, it is unlikely that enabling users to take greater control of their data will suffice to eliminate this problem, especially considering that, for most users, the ability to get a better price will likely persuade them to share data with firms – even if this undermines the more abstract, and ultimately pro-consumer, collective objective of ensuring competitive markets. Some form of regulatory action is thus likely necessary. Given that dynamic pricing is already ubiquitous in many industries, however, any approach that relies on some form of pre-clearance of an algorithm is likely unrealistic. Instead, the most effective measures will likely focus on transparency.

The key for governments and regulators looking to banish algorithmically-enabled predatory pricing from the marketplace lies in the development of two capabilities, namely competition authorities' ability to engage "market studies" and their ability to detect instances of predatory pricing.

Start with market studies. In this context, market studies refer to proactive information gathering exercises in which a competition authority possesses the ability to compel the release of information from firms to the authority in markets determined to be structurally vulnerable to problematic behaviour, such as predatory pricing, even when no wrongdoing is suspected. Canada's competition regulator does not currently possess this power, even though most other competition authorities in advanced economies do.[118]

» RECOMMENDATION 13

Pass legislation to provide the Competition Bureau with explicit powers to conduct market studies of markets that are deemed structurally susceptible to predatory pricing, including the ability to compel the release of information in cases where no wrongdoing is suspected.

The second capability that needs to be developed is the ability of competition authorities to detect predatory pricing when it occurs. This involves two steps. The first foundational step would be to require greater general transparency of firms using pricing algorithms. One option might be to require firms that are using algorithmic dynamic pricing to explicitly inform users that they are doing so when users are shown a price, or to require that firms market their products using a benchmark

118 Mancini, J. 10 January, 2019. "Market studies: Time for Canada's Competition Policy Framework to Catch Up." *C.D. Howe Institute*. https://www.cdhowe.org/intelligence-memos/james-mancini-market-studies-time-canada%E2%80%99s-competition-policy-framework-catch

price and only reduce the price once a user has been shown the benchmark price and has then explicitly agreed to allow the firm to vary the price on the basis of the data that the firm has collected from them.[119]

» RECOMMENDATION 14

Pass legislation requiring greater transparency with customers from firms regarding when they are engaging in dynamic pricing.

The second step would be for regulators to develop technical capacities that would enable them to interrogate a pricing algorithm to determine if it is designed to, or capable of, engaging in predatory pricing. This would involve developing a "predatory pricing incubator" in which the information being provided to a pricing algorithm could be controlled and competition authorities could test the response of the algorithm to different sets of market conditions to determine if the algorithm will engage in predatory pricing.[120] It is unrealistic to expect that all pricing algorithms be subjected to such testing before they are deployed. Thus, the use of such an incubator will likely need to be limited to instances when the regulator is conducting market studies or when it is investigating a complaint.

» RECOMMENDATION 15

Support the development by competition regulators and partners of a "predatory pricing incubator".

The final challenge presented by dynamic pricing for competition authorities lies in the potential for pricing algorithms to interact in a marketplace and independently learn that they can maximize their profits through "tacit collusion" as described earlier. The solution to this problem is similar to the one for predatory pricing, but even more difficult. This is because it is not clear that "tacit collusion" is even illegal. Thus, government's first task in preventing the harms of tacit collusion is to define it and make it illegal.

» RECOMMENDATION 16

Pass legislation defining and prohibiting tacit collusion between autonomous algorithmic agents.

The second task is to develop the capacity to identify instances of tacit collusion or the warning signs that indicate algorithms are engaging in the learning and signalling processes needed to enable it. Doing so will require additional research in this area and, eventually, the ability to conduct market studies in sectors where tacit collusion is suspected or where market structure is viewed as particularly likely to enable its emergence.

119 Ezrachi and Stucke (2016, 227).
120 See Stucke, M. and Ezrachi, A. 2017. *Two Artificial Neural Networks Meet in an Online Hub and Change the Future (Of Competition, Market Dynamics and Society)*. Oxford Legal Studies/ University of Tennessee. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2949434 pg 43-53 for a discussion of a similar idea in the context of algorithmic tacit collusion.

» RECOMMENDATION 17

Support research on how best to identify tacit collusion between dynamic pricing algorithms.

» RECOMMENDATION 18

Pass legislation to provide the Competition Bureau with explicit powers to conduct market studies where there is reason to believe that tacit collusion may be occurring or where markets are structured in ways that could encourage its development.

In much the same way that competition authorities would need to be able to identify whether algorithms were in fact engaging in predatory pricing through the use of an incubator, the development of an analogous tool for detecting an algorithm's propensity to engage in tacit collusion by subjecting it to a variety of competitive scenarios and assessing its reaction will also be important.[121]

» RECOMMENDATION 19

Support the development by competition regulators and partners of a "tacit collusion incubator".

Finally, one reviewer of this report noted that the lack of clarity around who would be liable for an instance of tacit collusion by a firm's pricing algorithm represents a key obstacle to preventing it from occurring. This problem would be especially acute if a machine learning algorithm was not programmed to collude tacitly, but instead determined that doing so was the optimal method of generating profits on its own initiative. But it is also important to remember that the use of pricing algorithms capable of engaging in such actions is not a requirement for firms. Rather, it is a choice that will be made by corporations which may bring them significant profits and for which they should be held responsible.

» RECOMMENDATION 20

Once legislation defining and prohibiting tacit collusion has been passed, the Government of Canada should pass additional legislation that identifies the firms responsible for deploying any pricing algorithm, or any firm engaging another to do so on its behalf, found to be engaging in tacit collusion as responsible for this collusion and liable for any penalties. This legislation should also include guidance for setting penalties for such actions.

121 Stucke and Ezrachi (2017, 42-42).

Virtual assistants (and their platforms)

The popularity of virtual assistants such as Amazon's Alexa, Apple's Siri and Google's Assistant is increasing quickly. For many, these devices, which represent one of the key ways in which AI is interacting with human beings, are proving highly helpful in navigating and taking advantage of the growing number of digital services available. Despite their helpfulness or, more accurately, because of it, these tools pose important challenges for competition authorities. This is because of how they are increasingly acting as gateways to – and gatekeepers for – the digital marketplace. For example, as these assistants become increasingly common, consumers are also increasingly using them to do their shopping. In fact, shopping done using a virtual assistant climbed 34 per cent in 2018 relative to 2017.[122]

Clearly, firms like Amazon would prefer that when users of Alexa need to locate and purchase goods or services, they use Alexa to locate and purchase them from Amazon. But should Amazon program Alexa to give preference to its products or services, or the products and services that another firm has paid Alexa to promote without notifying the customer of this arrangement, this would undermine competition.[123] The EU's finding that Google used its search platform to promote its own comparison shopping service at the expense of competitors provides a useful, if concerning, analogy.[124] Similarly, concerns that are analogous to those raised in the context of debates around net neutrality, such as the possibility that providers of virtual assistants could use their control over these gatekeepers to extract rents from firms who wanted to ensure visibility,[125] also apply.

If implementing a wider fiduciary duty is not practical, more targeted legislation or regulation that requires that an algorithm yield certain specific results in specific instances might be.

This problem of unfair preferment runs to an even deeper level with virtual assistants than in either of these two cases, however. This is because, unlike search engines or Internet service providers, virtual assistants are specifically designed to interact with users in ways that mimic human interaction. Thus, users are likely to develop much deeper and potentially even trusting relationships with these anthropomorphic services. Consequently, users may not exercise the appropriate level of skepticism when evaluating the advice or offers presented to them by their virtual assistants and be much more vulnerable to anti-competitive manipulation and dynamic pricing.[126] It is this novel form of interaction which makes these assistants so dangerous from a competition

122 Jones (2018).

123 This is especially the case when one realizes that Alexa will often deliver search results verbally and that users are unlikely to wait long enough for Alexa to "scroll" past many, if any, preferred or promoted options. See Jones (2018).
124 Manthorpe (2018).
125 Finley, K. 9 May, 2018. The Wired Guide to Net Neutrality. *Wired*. https://www.wired.com/story/guide-net-neutrality/
126 See Ezrachi and Stucke (2016, 191-202). and Vogel, A. and Wright, N. 10 May, 2019. Alexa, What Is a Conflict of Interest?: Digital assistants are both friend and sales robot. *Slate*. https://slate.com/technology/2019/05/alexa-amazon-voice-assistant-conflict-interest-regulation.html

perspective. Competition authorities, and the economic and legal theories, concepts and tools which structure their analyses, are simply not equipped to evaluate how these assistants, and the new kinds of relationships they will build with users, may impact users' decision-making.

There are a variety of regulatory steps that, at least theoretically, could be taken to try and ensure that the algorithms that will increasingly define the marketplace are actually working to offer a price to consumers while simultaneously respecting their privacy and other critical considerations. One potential response that has gathered significant support, and which purportedly has the advantage of recognizing the new form of relationship into which users are entering with online firms, is the idea of "information fiduciaries". The central idea behind this suggestion is to assign firms that operate technologies like virtual assistants certain fiduciary duties similar to the duties assigned to professionals like doctors, lawyers and accountants. These duties would include, for example, acting in a trustworthy way and acting in the best interests of the individuals being served.[127]

While the idea of "information fiduciaries" has attracted significant support, it is not clear that it is necessarily the best approach. Critics have identified a number of tensions within the idea which may make it unworkable.[128] Nevertheless, the main impulse behind the idea, namely, that firms that operate technologies like virtual assistants should not be allowed to put their interests ahead of those using the technologies – at least in certain important and specific instances – is promising. If implementing a wider fiduciary duty is not practical, more targeted legislation or regulation that requires that an algorithm yield certain specific results in specific instances might be. For example, a digital assistant could be prohibited from giving preferential treatment to its firm's own product in a search when a competitor's similar product was also available. These specific duties, and there may be many of them, could be assembled into a "code of conduct" against which regulators could hold firms accountable.

Ultimately, however, it would be wrong to focus this code of conduct solely on virtual assistants. Technological neutrality is critical to ensuring that legislation and regulation, which are difficult and take a lot of time and effort to change, are not quickly rendered obsolete by the development of a clever new technology which recreates the same dynamic, but in a different context or form. Indeed, the fact that platforms like Amazon and Google have already been criticized for preferring their own goods and services over competitors' shows that concern over the potential abuses of virtual assistants is only a more developed form of an already important problem that requires attention. While the justification of imposing this code of conduct on platforms may be distinct,[129] the ultimate goal – namely a competitive marketplace – remains the same.

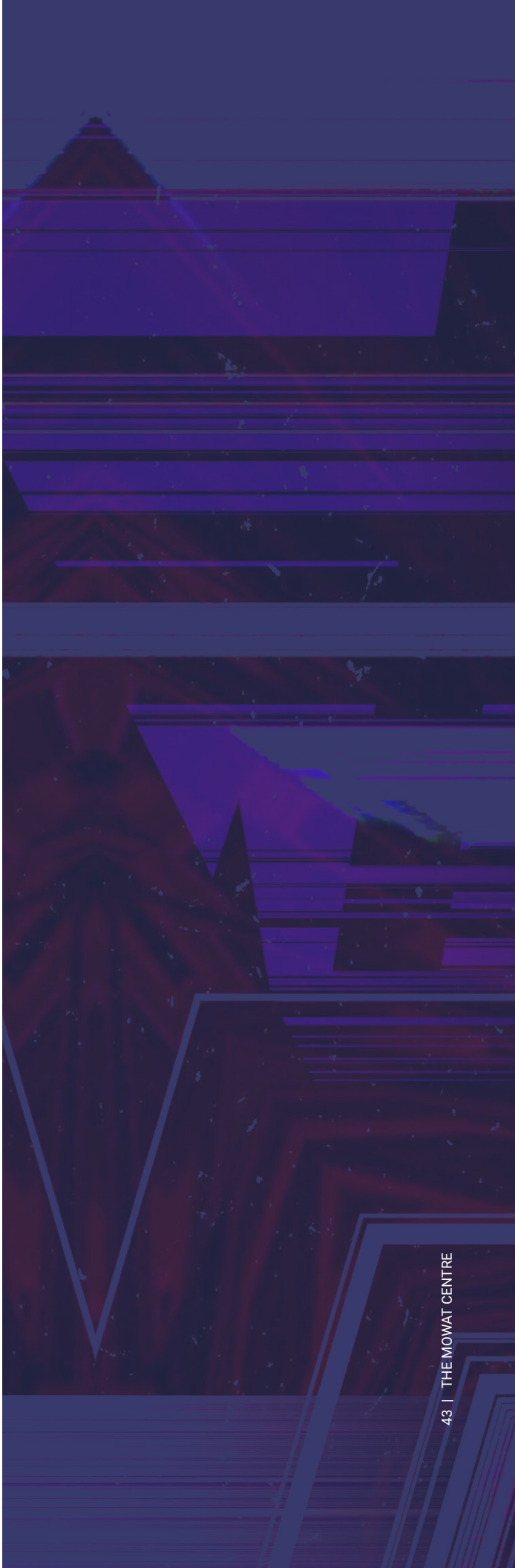
127 Balkin, J. and Zittrain, J. 3 October, 2016. "A Grand Bargain to Make Tech Companies Trustworthy." *The Atlantic*. https://www.theatlantic.com/technology/archive/2016/10/information-fiduciary/502346/

128 Khan, L. Pozen, D. Forthcoming. "A Skeptical View of Information Fiduciaries." *Harvard Law Review 133*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3341661

129 The argument for imposing a code of conduct on platforms is more traditional and somewhat technical. It has also been ably mounted in other contexts – namely by Khan (2017) and Furman et al. (2019) – and thus is not repeated here.

RECOMMENDATION 21

The Government of Canada should develop a "code of conduct" for digital platform firms and entrench this code in legislation or regulation. This code would include, but would not be limited to, a requirement that the digital platform firms and the services that they offer, such as search, identity services, marketplaces and virtual assistants, do not unfairly favour their own goods or services over a competitor's.[130] Other requirements, such as a prohibition against operating a marketplace and also selling in that marketplace, firms owing a duty of care to customers or firms owing a duty to act in the customers' best interest, should also be considered and added if doing so is found to be desirable.



130 C.f. the Code of Conduct proposed by Furman et al. (2019).

Part 3: Amendments to the *Competition Act* and related legislation

The idea of providing Canada's Competition Bureau with the ability to proactively engage in market studies in certain areas has already been discussed as an important pro-competitive step that could be taken. This is not the only change to the *Competition Act* and related legislation that should be considered, however. Two additional changes in particular stand out.

First, as noted earlier, Canada's *Competition Act* is an outlier among advanced economies in the degree to which it privileges efficiencies as a justification for mergers and acquisitions. Considering how important a competitive marketplace is to innovation, and the centrality of innovation as an objective of Canada's wider competition regime, it is worth balancing this existing focus on efficiency with the encouragement of innovation as a fifth purpose of competition recognized explicitly by the act.[131]

» RECOMMENDATION 22

Add the encouragement of innovation as a fifth purpose of competition recognized in Section 1.1 of the *Competition Act.*

Second, given the large and growing importance of data as an asset, and the public interest in ensuring access to that data that is as open as is appropriate,[132] it may also be productive to include "data share" – i.e. the distribution and concentration of data holdings in an industry – as one of the "Factors to be considered" when evaluating "Mergers" or "Agreements or Arrangements that Prevent or Lessen Competition Substantially".[133]

» RECOMMENDATION 22

Add the distribution and concentration of data holdings in an industry to the list of "Factors to be considered" when evaluating "Mergers" or "Agreements or Arrangements that Prevent or Lessen Competition Substantially" in the *Competition Act*.

Many of the actions discussed in the preceding section might arguably be better described as consumer protection or privacy policies as opposed to competition ones. Importantly, the fact that they do not align with the traditional understanding of what constitutes competition policy should not be taken as a reason to dismiss them. Rather, the fact that the digital revolution has created conditions in which competition policy and other areas of governmental responsibility, such as consumer

131 One could argue that this is unnecessary as the encouragement of innovation would increase the efficiency of the economy, which is identified as a purpose in Section 1.1. The fact that efficiency does not seem to have been interpreted in this way up to this point, however, suggest that an explicit mention of innovation as a separate objective might be a better way of achieving this goal.

132 Grace (2018).

133 Action along these lines is already happening in Germany. See The Economist. 6 May, 2017. "Data is giving rise to a new economy."

protection, have become interconnected should highlight the importance of responding to them by taking a wider perspective that transcends traditional departmental silos and barriers.[134] While the division of jurisdiction between the federal and provincial governments make taking action of this sort more difficult than it would be elsewhere, there is still scope for Canada to take action in this area.

» RECOMMENDATION 23

Pass legislation enabling greater cooperation between the Competition Bureau and the federal Office of the Privacy Commissioner and provincial equivalents.

The greater transparency and non-price competition that many of the recommendations in this report are aimed at achieving would almost certainly have prevented or vastly reduced the scope of the problematic activities in question.

134 Ireland, D. and Jenkin, M. 18 June, 2018. "Embedding consumer protection in competition policy." *Policy Options*. http://policyoptions.irpp.org/magazines/june-2018/embedding-consumer-protection-in-competition-policy/

Part 4: Government capacity

It has become a commonplace to suggest that government needs to upgrade its digital skills.[135] Given its more technical and niche role, it is less common to hear calls for competition authorities to upgrade their digital expertise.[136] But the need is perhaps even greater for these organizations than for the government at large. Many of the recommendations outlined earlier in this section will, if adopted, result in significantly greater demand being made on the digital expertise of the Competition Bureau. For example, the Bureau, as currently structured, is simply not equipped to operate a "tacit collusion incubator" let alone build one. And while any move to create such a tool will necessarily involve partnering with other competition authorities, academics outside of the Bureau and other experts, the fact that the Bureau would need to significantly increase its in-house technical capacity in order to do so is unavoidable. The same can be said to greater or lesser degrees for many of the other recommendations.

» RECOMMENDATION 24

Investigate options for upgrading the digital expertise of existing Competition Bureau staff through new on-the-job training, short intensive courses, micro-credentials, additional conference attendance and educational leaves.

135 See Androsoff, R. 22 January, 2019. "Digital leadership for the modern public service: how to close the skills gap." *apolitical*. https://apolitical.co/solution_article/digital-leadership-modern-public-service/ and Johal, S. and Urban, M. 11 May, 2017. *Regulating Disruption: Governing in an era of rapid technological change*. The Mowat Centre. https://mowatcentre.ca/regulating-disruption/ for just two examples.

136 Though this too is changing, see the call in Furman et al. (2019, 5) for a digital markets unit in his report.

» RECOMMENDATION 25

Place a greater emphasis on digital expertise in the hiring of Competition Bureau staff and the appointment of Competition Tribunal members.

While recent calls for the creation of a "Parliamentary Standing Committee on Digital Issues" may spring more from concerns about the failure of firms like Facebook to adequately protect users' data or US democracy from foreign interference,[137] there is a strong argument that many of these problems could have been prevented had a better functioning digital marketplace been in place. The greater transparency and non-price competition that many of the recommendations in this report are aimed at achieving, to say nothing of its focus on achieving greater individual control of data, would almost certainly have prevented or vastly reduced the scope of the problematic activities in question.

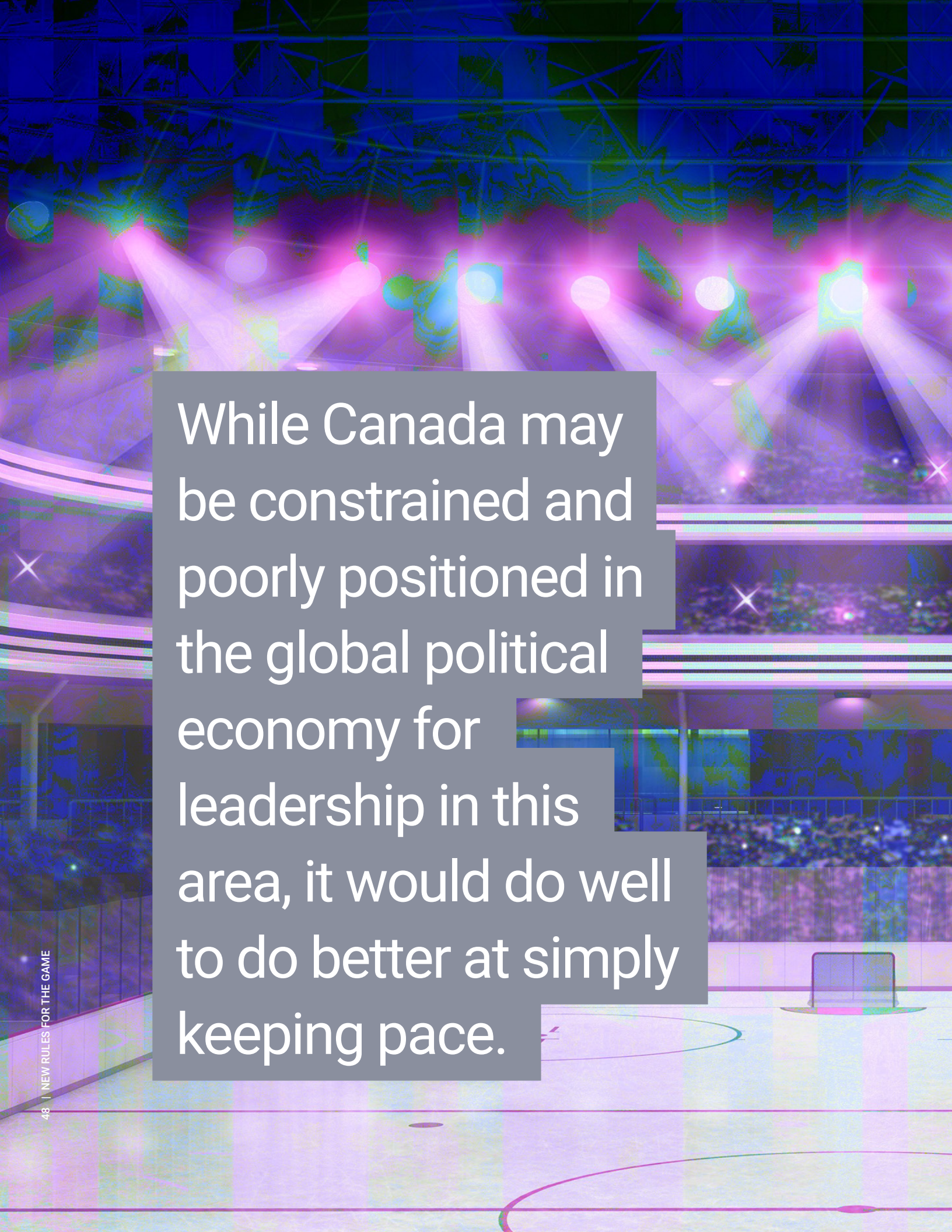
The existence of a parliamentary standing committee could help raise the visibility of many of these issues and increase the likelihood that the additional resources and scrutiny of this sector that have previously been lacking will be forthcoming.

137 Ryckewaert, L. 3 December, 2018. "House should set up permanent Commons committee on digital issues, says NDP MP Angus, after unprecedented international summit." *The Hill Times*. https://www.hilltimes.com/2018/12/03/house-set-standing-committee-digital-issues-says-ndp-mp-angus-unprecedented-international-summit/178678

The existence of a parliamentary standing committee could help raise the visibility of many of these issues and increase the likelihood that the additional resources and scrutiny of this sector that have previously been lacking will be forthcoming. Indeed, by considering the large variety of digital issues that exist together, such a committee could help to both expand the understanding of what constitutes a defendable scope for competition authorities and improve policymakers' and the general public's understanding of the pervasive interconnections between many of these problems and proposed solutions.

» RECOMMENDATION 26

Create a Parliamentary Standing Committee on Digital Governance.



While Canada may be constrained and poorly positioned in the global political economy for leadership in this area, it would do well to do better at simply keeping pace.

8 CONCLUSION

One of the insights of game theory is that by intensively analyzing the rules that define a particular system, it is often possible to identify a dominant strategy that rational individuals looking to maximize their gains ought to employ when acting in this system. This is true for the design of any structured human interaction, from markets to actual games.

As is often the case, a hockey analogy is usefully illustrative. In 2004-2005, the National Hockey League (NHL) experienced a labour dispute and lost a season of play. While the work stoppage had more to do with league finances, the preceding decade, often referred to as the "Dead Puck Era" was also a period characterized by a decline in scoring and a sense that professional hockey was becoming boring. Given that the NHL is an entertainment business, a boring on-ice product is bad because it results in lower tickets sales, lower television ratings and, ultimately, less revenue.

The key point about the "Dead Puck Era" is that no one was doing anything wrong to create this sub-optimal outcome. Individual players and teams, whose objective was to win games, were behaving rationally by pursuing strategies – such as goaltenders adopting larger equipment and the superior butterfly technique,[138] defenders using "clutch and grab" techniques to impede skilled players and teams adopting the "neutral zone trap" strategy[139] – which maximized their chances of winning. It just so happened that these strategies, which were the result of individuals acting rationally and innovating within the rule structure over time, were creating a system-wide effect that was contrary to the desired outputs for the system as a whole. The correct response, which the NHL undertook in advance of the 2005-2006 season, was to change the rules of the system in ways which incentivized the use of different strategies at the individual and team levels which would, when aggregated across the league, change the system-wide effects and produce a more entertaining product capable of

By intensively analyzing the rules that define a particular system, it is often possible to identify a dominant strategy that rational individuals looking to maximize their gains ought to employ when acting in this system.

138 Paine, N. 17 March, 2014. "Why Gretzky Had It Easy." *FiveThirtyEight*. https://fivethirtyeight.com/features/the-butterfly-effect/

139 Weiss, J. 16 July, 2010. "Neutral Zone Trap Explanation." *YouTube*. https://www.youtube.com/watch?v=dEWHTOvriHo

driving greater fan engagement and revenues for everyone.[140] For the NHL, this response has resulted in a vastly superior, and vastly more competitive, on-ice product.[141]

The digital "Dead Puck Era"

Just as with the game of hockey, our economy consists of a series of interactions structured by a set of rules. While the NHL's objective is to create games that are exciting and enjoyable to watch, the system of rules that structures our economy is designed to incentivize activities and strategies that, when aggregated across the economy, result in the highest levels of sustainable production possible, consistent with certain non-economic principles including mass employment, price stability, societal coherence, environmental sustainability, social mobility and liberal democracy. Critically, this objective-oriented design of the economy is not pre-ordained. It is the result of conscious choices and specific government actions aimed at shaping the economy so that it advances the achievement of these objectives.

The problem that the digital economy faces is similar to what the NHL faced in the "Dead Puck Era." Innovations in how individuals and firms are competing, such as the use of digital platforms and Big Data analytics to collect and hoard data, leverage networks effects and engage in "nowcasting," might be very productive (and lucrative) from the perspective of the firm employing them, but are likely blocking higher levels of innovation elsewhere in the economy. They are also likely contributing to important and negative non-economic impacts like wealth inequality.

Critically, and just as was the case in hockey, the solution to this problem does not lie in lecturing or punishing individuals or firms that are behaving rationally within an existing system of rules. Rather, the solution is to change the rules so that rational action by individuals and firms better aligns with the objectives that we as a society have for the entire economic system.[142] While it will not be able to do so alone, government will inevitably play a crucial and indispensable role in making these changes and reshaping markets and the economy to take new technological developments into account.

140 The NHL has even gone so far as to institute rules widely seen as being designed to nullify the advantage of only a handful of players – or even a single "superstar" player – as a means of improving competition and the functioning of the game overall. See, for instance, Diamos, J. 16 September, 2005. "Brodeur Feels Defanged by N.H.L.'s New Rule". *The New York Times*. https://www.nytimes.com/2005/09/16/sports/hockey/brodeur-feels-defanged-by-nhls-new-rule.html

141 Duhatschek, E. 3 October, 2014. "How the NHL has evolved a decade after the lost season." *The Globe and Mail*. https://www.theglobeandmail.com/sports/hockey/duhatschek-how-the-game-has-evolved-a-decade-after-the-lost-nhl-season/article20929379/

142 In fact, many technology firms already claim to support many of the recommendations made in this report. See Nix, N. and Brody, B. 12 September, 2018. "More Tech Groups Join Calls to Give Consumers Power Over Data." *Bloomberg*. https://www.bloomberg.com/news/articles/2018-09-12/more-tech-groups-join-calls-to-give-consumers-power-over-data

It's a digital world

Some might suggest that because Canada is a small open economy, the best solution to low competitive intensity, limited innovation and flagging productivity growth is to provide foreign firms greater access to the Canadian market.[143]

But by this argument, the borderlessness of the Internet and foreign firms' essentially unhindered access to the Canadian market should already have sparked a robust competitive response. Moreover, the fact that low levels of competition in the digital economy have become a global concern suggest that, whatever the distinct characteristics of the Canadian digital marketplace, there are qualitatively new competition challenges inherent to the digital economy.

In this global context, it is true that there is a limit to what Canada can do to encourage greater digital competition. Nevertheless, there are a number of steps it can take, either alone or in concert with like-minded countries, that could help to improve competition in digital markets and position Canada at the forefront of the governance and regulatory innovation needed at the global level.[144] In fact, Canada may not have much of a choice: it may soon be forced to update significant portions of its data regime or risk losing data interoperability with more advanced jurisdictions like the EU that may grow concerned that Canada's increasingly outdated data framework may represent a threat.[145]

Canada should seize the opportunity to renew the dynamism of its digital marketplace.

Either way, Canada should seize the opportunity to renew the dynamism of its digital marketplace. It will not be alone. Indeed, as has already been demonstrated, a number of other jurisdictions are far ahead of Canada in terms of enacting digital pro-competition efforts. Indeed, while Canada may be constrained and poorly positioned in the global political economy for leadership in this area, it would do well to do better at simply keeping pace with the current leaders.

This report has offered a number of recommendations drawn from a variety of sources that could help Canada do a better job of keeping pace. Given the untested nature of some these recommendations, and the interdependence of many of them with the wider context, we cannot say if they will all be successful. As German Chancellor Angela Merkel has pointed out, "nobody knows how to write the rules" for this new economy.[146] What we can say, however, is that we believe that the recommendations here are all worthy of genuine consideration, investigation and debate. In fact,

143 The Canadian government's unsuccessful attempt to woo Verizon, a major US-based telecom firm, to Canada fits within this perspective. CBC News. 21 August, 2013. "Competition will lead to lower wireless bills, James Moore says." *CBC*. https://www.cbc.ca/news/business/competition-will-lead-to-lower-wireless-bills-james-moore-says-1.1389094

144 See Dubois, E. McKelvey, F. Owen, T. 10 April, 2019. "What have we learned from Google's political ad pullout?" *Policy Options*. http://policyoptions.irpp.org/magazines/april-2019/learned-googles-political-ad-pullout/ for analysis of an analogous case which supports this contention.

145 Scassa (2018).

146 Bradsher and Bennhold (2019).

our hope is that one of the outcomes of the publication of this report is a much greater level of discussion of these issues in Canada.

It is also worth noting that some of the solutions suggested in our recommendations address "problems" which are not even seen as problems under the current *Competition Act*. In this vein, the Competition Bureau argues in its white paper on Big Data that "[e]nforcers should not, for example, condemn firms merely because they are 'big' or possess valuable big data. Companies that achieve a leading market position—even a dominant one—by virtue of their own investment, ingenuity, and competitive performance should not be penalized for doing so. Imposing a penalty for excellence removes the incentives to pursue excellence."[147]

They argument that "bigness" is not inherently bad is correct, but the implications of this argument should not be overdrawn. The extent to which any of the recommendations listed above "penalize" big companies, it is not because they are excellent. Rather, it is because of how their "bigness" is fostered and sustained by practices that, while perhaps not currently illegal, are not excellent from the perspective of the wider economic system and have become sufficiently harmful that something should be done about them.

The key question is not whether the things that are occurring right now are illegal under the current legal framework – the question that the Competition Bureau seems most focused on in analyses like its Big Data whitepaper. Rather, the key question is whether the current competition regime, which includes the existing legal framework but also extends beyond it, is producing optimal results for our economy and society and is likely to continue to do so into the future. The question of whether the Competition Bureau is already taking data into account correctly according to the existing legal framework is subsidiary; what really matters is whether doing so is the best way to meet the challenges of today and tomorrow.

The competition challenges facing the digital economy are only a part of the much larger social, economic, political, cultural and legal revolutions through which we are currently living. Many of the solutions suggested here will likely have salutary effects in areas beyond competition as well. In fact, some of these solutions may only be justifiable when these other effects are taken into account in combination with their pro-competitive impacts. Conversely, some may be justifiable within the narrow scope of competition policy, but could create more problems in other areas than the competition gains alone would justify. Ultimately, these trade-offs will need to be worked out and this paper does not purport to be the final word on any of these ideas. But it is a call to begin experimenting and moving forward so that the optimal combinations of these trade-offs can be discovered before it is too late.

147 Competition Bureau. 19 February, 2018. *Big data and innovation: key themes for competition policy in Canada*. Government of Canada. https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/vwapj/CB-Report-BigData-Eng.pdf/$file/CB-Report-BigData-Eng.pdf pg 5.