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ACHIEVING THE FOUR-DAY WORK WEEK

Essays on Improving Productivity Growth in Canada

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Contents

Executive Summary

Surveys of Canadians have shown a strong desire for reduced work hours with a four-day work week being a highly prized goal. This is hardly surprising given that leisure time is a valuable good for most people.

To be sure, a four-day work week would be less desirable if it meant reduced pecuniary compensation. However, this would be the case unless labour productivity increased commensurately with a reduction in hours worked. In competitive markets, the compensation paid to workers will reflect the value of the output they produce. Therefore, if hours of work are reduced, workers must produce more per hour to maintain the same value to their employers.

Some advocates of a reduced work week argue that a reduction in hours worked should, by itself, contribute to improved labour productivity because better rested and more invigorated workers will be more productive. However, the limited empirical evidence on this issue does not support this optimistic assessment. Indeed, available evidence provides stronger support for the view that less continuous time at work, beyond a point, slows the rate at which employees, especially younger workers, learn how to do their jobs better. Indeed, if employees were more productive, on average, spending approximately 20 percent less time on the job, one would expect that profit-oriented companies would have already made the four-day work week ubiquitous.

This volume identifies and discusses a set of initiatives that promise to improve Canada's labour productivity growth rate. In broad terms, the initiatives identified should promote faster productivity growth by encouraging more investment in physical and human capital and by stimulating innovation and entrepreneurship. Steven Globerman's introductory chapter provides an overview of the factors that have been linked to productivity growth. It emphasizes the importance of policies that improve the incentives, as well as the financial and operational capabilities, of individuals and organizations to start businesses that provide new goods and services, as well as those that embody new methods of producing and distributing goods and services. The chapter also shows that if labour productivity in Canada grows at approximately 2 percent per year from 2018-2030, the average Canadian worker could enjoy a four-day work week while actually

earning a higher inflation-adjusted income compared to the start of the period. While a 2 percent per year growth in labour productivity represents almost a doubling of Canada's recent growth rate, it is about equal to its longer-run historical rate.

Chapter 2 by Trevor Tombe and Chapter 3 by Vincent Geloso discuss the important role that potential and actual competition play in strengthening the incentives of organizations to improve productivity. Tombe highlights the perverse effects of inter-provincial barriers to trade on Canada's productivity performance. Such barriers discourage productivity improvements by protecting less efficient locally owned businesses from competition provided by suppliers located in other provinces, as well as by limiting the size of the available domestic market for Canadian companies, which restricts Canadian firms from capturing available economies of scale. Geloso documents widespread government-imposed barriers to the entry of foreign-owned competitors in prominent industries such as telecommunications and finance. The threat of entry by more efficient firms is a powerful discipline confronting incumbent firms, while actual entry will result in the displacement of organizations that fail to engage in continuous innovation and productivity improvement. Hence, eliminating entry barriers, primarily imposed by the federal government to protect incumbent domestic firms against foreign competition, is an important initiative that should improve labour productivity growth.

In Chapter 4, Laura Jones highlights how regulatory red tape as it is applied to product markets adversely affects the productivity performance of small and medium-sized firms. While some amount of regulation is clearly justifiable using a social benefit-cost calculus, a substantial amount of regulation imposes efficiency losses that exceed any plausible social benefits. Regulatory red tape requires firms to divert productive resources that would be more efficiently employed in developing new products, training their workers, investing in capital equipment, and reorganizing how they do business, all of which would contribute to faster productivity growth. In Chapter 5, Robert Murphy identifies some major legal and regulatory barriers to labour mobility. While such barriers are frequently defended on the grounds that they protect workers from the market power of large employers or that they protect consumers from unqualified suppliers of goods and services, they are often unwarranted barriers to competition that protect incumbent groups of workers who have successfully lobbied for a privileged status maintained by governments or regulators. Such barriers inhibit the specialization of labour as dictated by productivity advantages and, especially in the case of barriers to immigration by highly educated professionals, discourage innovation and new firm start-ups.

Steven Globerman (Chapter 6) and Russell Sobel (Chapter 7) discuss the main factors influencing innovation and entrepreneurial activity, respectively. While the literature identifies quite a few factors, Globerman highlights limited domestic and foreign competition as being particularly important in the Canadian context, as well as relatively high marginal personal tax rates, and taxes on capital gains. While Canada does very well in terms of scientific achievements and is home to well-regarded research universities, there is a major gap between advances in scientific knowledge and the commercialization of those advances. Canada can be characterized as having a "top-down," government-directed innovation process that is at odds with a process in which competitive market forces largely determine the allocation of financial, physical, and human capital to innovative activities. Sobel also identifies the discouraging effect that high marginal tax rates can have on risk-taking and start-up activities. He also cites regulations and, indeed, a broader public policy environment that tends to diminish the value of private sector entrepreneurs. At the same time, Sobel supports government efforts to encourage increased immigration of highly educated individuals who are disproportionately engaged in entrepreneurship.

In Chapter 8, Douglas Cumming and Sophia Johan discuss how regulatory restrictions on "crowdsourcing" to fund start-ups are more severe in Canada than in countries such as New Zealand, Australia, and the United Kingdom and provide evidence that the restrictions have had a depressing effect on start-up business activity in Canada. Alex Whalen and Jake Fuss (Chapter 9) describe how Canada's tax structure, particularly high marginal tax rates on personal income, discourages capital investment, especially in risky ventures, which in turn slows the rate of productivity growth. The authors of the two chapters highlight the importance of the willingness of businesses to invest risk capital and how financial regulations and the tax structure condition the availability of investment capital in innovative and entrepreneurial ventures.

Finally, Jack Mintz (Chapter 10) and Livio Di Matteo (Chapter 11) address the growth of public sector spending which, beyond a point, crowds out private sector investment in productivity-enhancing investments. Di Matteo's review of the literature suggests that when total government spending significantly exceeds around 30 percent of GDP, real economic growth slows, and it slows consistently as that share increases. While some government spending does contribute to improved productivity and faster real economic growth, continued increases in the size of government are accompanied by spending that redirects resources from more productive private uses to less productive public uses. Mintz discusses credible restraints that can be imposed on the growth of government

spending in the form of fiscal rules. In effect, fiscal rules tie the hands of legislators who are under constant lobbying pressures from a variety of constituents to spend public funds in ways that benefit those constituents.

The most fundamental message of the chapters in this volume is that improving Canada's productivity growth performance is crucially important to enhancing the standards of living of Canadians—including achieving a four-day work week.

Chapter 1

Introduction: Getting to a Four-Day Work Week Through Faster Productivity Growth

Steven Globerman

A recent study from the Angus Reid Institute found that a majority of Canadian adults feel it's a good idea to make a 30-hour work week standard in Canada (Globerman, 2020). This finding is hardly surprising. Leisure time is valuable, and most people prefer more of it to less. A more interesting line of questioning might have asked respondents how much monetary compensation they would be willing to forego in order to negotiate a four-day work week with their employers, rather than their current five-day work week. In the absence of increases in labour productivity, businesses operating in competitive markets could not afford to reduce work hours by approximately 20 percent while continuing to offer employees the same levels of compensation.[1]

Globerman and Emes (2020) report that the average annual number of hours worked per worker in Canada in 2018 was about 80 hours (or 4.5 percent) less than in 2000. Over that same period, average annual compensation (adjusted for inflation) increased by about 13 percent. This finding suggests that while Canadian workers certainly value more leisure, they also value a higher material standard of living. Therefore, it is a reasonable inference that Canadian workers would be unambiguously better off if they could work four days a week rather than five days a week while earning at least the same (or an even higher) level of compensation associated with a five-day work week.

Achieving the feat of making higher incomes while working fewer hours will require Canadian workers to be more productive, since the

[1] More will be said about the empirical relationship between changes in compensation and changes in labour productivity later in this essay.

amount that employers in competitive markets will be willing to pay workers will increase only if the value of output produced by per hour of work also increases. Simply put, if the average Canadian worker chooses to work fewer hours, the value of the output produced per hour worked must increase commensurately if average compensation per worker is to remain constant in inflation adjusted dollars.[2]

Globerman and Emes (2020) estimate that decreasing hours worked from a 40-hour, 5-days-per-week schedule to a 32-hour, 4-days-per-week schedule would have entailed a reduction of approximately 341 annual hours worked during 2018 for the average Canadian worker. Given this reduction, if inflation-adjusted compensation increases by 2 percent per annum from 2018-2030, the average Canadian worker could move to a 4-day workweek by 2030 and enjoy a real average annual income that would be about 1.5 percent higher than the real average annual income earned in 2018.[3] This, in turn, implies that labour productivity would need to increase by about 2 percent per annum if this labour market outcome is to be achieved.

As suggested by the data reported in table 1, a 2 percent per annum increase in labour productivity would represent a substantial acceleration in Canada's productivity performance compared to its more recent performance. Indeed, it would represent almost a doubling of the rate of growth of labour productivity achieved over the period 2010-2016, but a more modest 33 percent increase compared to the 2010-2014 period. While a 2-percent per annum increase in labour productivity therefore appears to be a reach given recent productivity growth rates, it is relevant to point out that Canada's annual rate of growth of labour productivity over the long period from 1961-2012 averaged two percent (Baldwin, Gu, Macdonald and Yan, 2014). This is certainly not to say that achieving a durable increase in productivity growth will be easy. Rather, it is to say that it would be a serious public policy mistake to accept Canada's recent productivity growth performance as immutable and underestimate the

[2] While the precise relationship between increases in productivity and increases in compensation has become somewhat controversial, the available evidence for Canada identifies a strong linkage between labour productivity growth and real wage growth over time (see Gu, Macdonald, and Yan, 2014).

[3] These calculations were made pre-Covid-19. Given the marked negative impact the pandemic has had on full-time employment and real wages in 2020, the increase in real average annual compensation required to offset the assumed reduction in average hours worked might be slightly different than the estimated 2 percent per annum. Nevertheless, the point remains that increases in real wages are required to offset any reduction in hours worked if total compensation is to remain unchanged.

Table 1: Labour Productivity Growth in Canada's Business Sector

1997-2010	2010-2014	2010-2016
1.3	1.53	1.05

Source: Gu and Wilcox, 2018.

benefits of moving back to a productivity growth path that Canadians, for many years, took to be quite achievable.

Restoring Canada's labour productivity growth performance back to its long-run trend will require a variety of public policy initiatives starting with government officials acknowledging the importance of improving labour productivity to the economic and social well-being of Canadians. While much has been written about initiatives to improve productivity growth rates, and while no simple formula has been identified, there is some agreement among economists on at least a few steps that should be taken to achieve the goal of faster productivity growth. Perhaps most important is to promote innovation and entrepreneurship along with the capital investment that is complementary to innovation and entrepreneurship (Gold, 2016).

As is true for productivity growth more generally, there is no simple formula to promote innovation and entrepreneurship. In particular, innovation reflects complicated social and economic interactions that economists are far from fully understanding.[4] Nevertheless, there are some basic public policy initiatives that are broadly seen as helpful to encouraging innovation and entrepreneurship and, therefore, crucial to encouraging faster productivity growth. The various essays in this volume identify and discuss a number of important such initiatives.

While it can be fairly said that the Canadian government has tried to promote innovation and entrepreneurship from a "top-down" perspective, a strong argument can be made that government efforts to do so have had predictably unfavourable results.[5] Rather, the process of improving productivity growth would be better served by removing government-imposed barriers to innovation and entrepreneurship. Such barriers take a

[4] For a comprehensive discussion of the complexity of the innovation/entrepreneurial process, see Cross (2020).

[5] Cross (2020) and Globerman and Emes (2019) argue this point forcefully.

variety of forms including the large and continually growing size of government which, in turn, increases competition with the private sector for critical inputs such as capital and skilled labour.

The government competes away financial and other inputs from the private sector directly through taxation, and indirectly by borrowing money, which increases the cost of capital for private businesses. Relatively high tax rates, especially on capital gains, reduce the willingness of businesses to invest in innovative ventures by diminishing the after-tax rewards to risk-taking. When accompanied by government rhetoric excoriating successful entrepreneurs for failing to pay their "fair share" of taxes, high marginal tax rates contribute to a culture where commercial success is punished, rather than rewarded. In such circumstances, would-be Canadian innovators and entrepreneurs have an incentivize to leave Canada for other locations, particularly the United States, where commercial success begets both greater financial rewards and social approval.[6]

Government regulations and other restrictions on competition suppress the commercialization of new technology, either by direct fiat or by creating a business environment where poor productivity performance is not punished by the loss of business to more innovative rivals.[7] While some regulations are justifiable using a social benefit-cost framework, there is also substantial red tape that obliges companies to use resources, including management time, that could be deployed more beneficially to raise Canadians standards of living if invested in commercializing new technology.

Certification requirements and related regulatory obstacles to labour market mobility are typically justified as protecting consumers from underqualified and even dangerous providers of services. In many cases, the obstacles are more accurately understood as barriers to entry that protect incumbent providers from more efficient competitors. Similarly, financial regulations that require extensive disclosure of information on the part of start-up companies seeking to raise capital impose entry costs that effectively protect incumbents from the threat of entry by new firms.

A wide range of industries in Canada enjoy legal protection from competition, both from internal and external sources. For example, provincial governments have restrictions that limit or block the importation of goods and services from other provinces, while the federal government

[6] Cross (2020) highlights the importance of cultural attitudes towards commercial success as an influence on innovation and entrepreneurship and compares attitudes in Canada unfavourably to those in the US.

[7] From their extensive review of the relevant literature, Bloom, Van Reenan, and Williams (2019) conclude that competition typically increases innovation, especially in markets that initially have low levels of competition.

imposes tariffs on a range of products and limits foreign direct investment across a range of industries from commercial banking to telecommunications and broadcasting. Tariff and non-tariff barriers harm productivity by weakening competitive discipline on incumbent domestic firms, as do legal barriers to inward foreign direct investment. Given the relatively small domestic market, interprovincial barriers to trade discourage specialization of production by limiting the size of the domestic market available to Canadian companies. The resulting sacrifices of economies of scale and efficiency gains associated with learning-buy-doing have been shown to be important reasons for Canada's productivity gap relative to US producers (Head and Ries, 1997).

The impact of the Covid-19 pandemic on future productivity growth rates in Canada or, indeed, in other countries, is uncertain but potentially profound. Certainly, a significant portion of existing physical capital assets in sectors such as commercial real estate, retailing, and transportation are arguably less productive in their current uses going forward, and possibly permanently so, as a consequence of the pandemic. Likewise, the demand for human capital in specific activities such as travel and retail management and consultancies will likely be lower in the future, while it will be higher for other types of human capital in activities drawing on, for example, artificial intelligence and supply chain logistics.

It is inadvisable for government bureaucrats to direct the allocation of capital and labour in response to the changes that have been set in motion or, perhaps, accelerated by the Covid-19 crisis. Top-down economic planning is a particularly bad idea in periods of rapid economic change. The discrete changes that seem to be occurring strengthen the basic argument of Cross (2020) and others that government-imposed restrictions on private markets to allocate productive resources should be reduced to permit the emergence and growth of businesses that are better suited to prosper commercially in the "new environment," while allowing businesses that are poorly suited to leave the marketplace and allow their inputs to be used more efficiently in other activities and businesses.

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Chapter 2

Towards a More Productive and United Canada: The Case for Liberalizing Interprovincial Trade

By Trevor Tombe

Canada may be one country, but it is not one economy. Thousands of individually modest but collectively significant barriers to investment, trade, and migration create artificial walls between our 13 provincial and territorial economies. And this comes at great cost to our productivity and to our living standards.

Of course, all federations struggle to balance regional autonomy with national unity. And some degree of interprovincial political and economic friction is unavoidable. But in Canada—one of the world's most decentralized countries spanning vast geographic distances—these challenges are particularly acute.

This has always been so. At Confederation, lack of infrastructure initially kept buyers and sellers apart. Trade between provinces at the time barely exceeded 2 percent of GDP, I estimate, compared to over 25 percent for trade between Canada and the world. But as railways were completed and our expansive geography settled, policy barriers to trade became much more relevant. Sometimes such artificial barriers were explicitly protectionist.

"The growing demand for provincial protectionism must not be under-rated," warned the Royal Commission on Dominion-Provincial Relations in 1940, adding, "it is beyond dispute that… local protectionism does tend to hamper national economic life" (Canada, 1940: 63-64).

Nearly 80 years later, their words remain relevant.

Even when not explicitly protectionist, provincial policy can inhibit the free flow of goods, services, and labour. Examples abound. In agriculture, there are inspection and labelling requirements to ship certain food products between provinces, and provincial marketing boards for certain

products (i.e., supply management) prevent free trade between provinces. For beer and wine, the provincial monopolies over the wholesale distribution of alcohol means biased procurement, pricing, and marketing decisions by these agencies often favour local breweries and wineries. More generally, biased government procurement means local construction firms and suppliers may be favoured on infrastructure projects, even if they are higher cost than out-of-province firms.

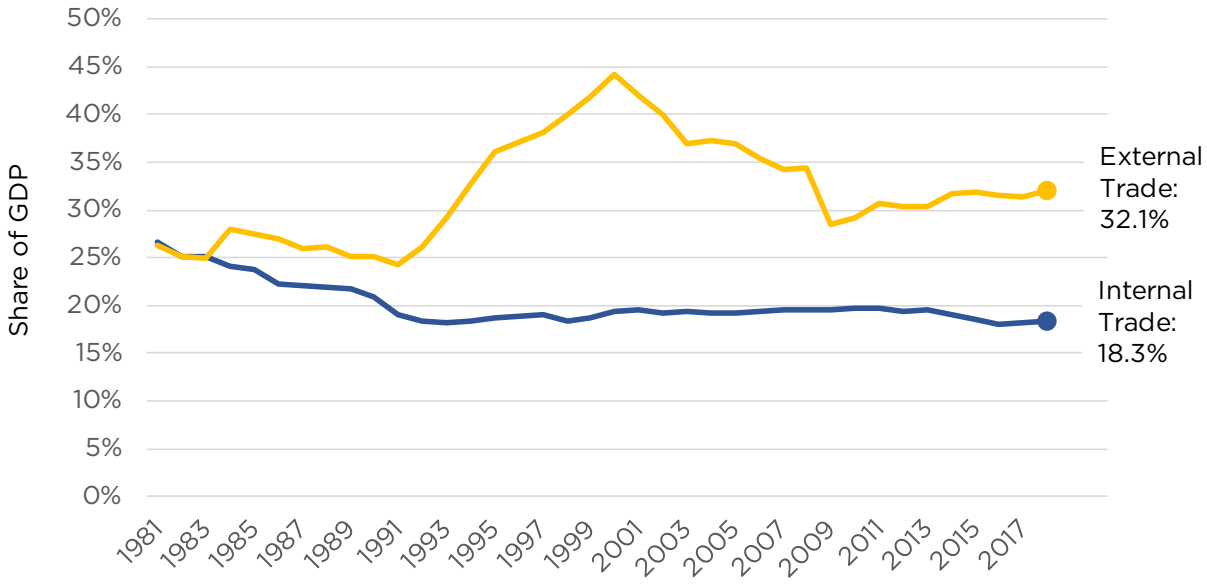
And some trade barriers cascade throughout nearly all sectors of economic life. For trade in goods, differences in trucking regulations across provinces makes shipping across Canada costly. Differences in what tires can and cannot be used, what axle weight limits are, and so on, all add to costs. This results in fewer shipments and higher prices for almost all goods we buy. And for trade in services, provincial standards and certification of professions and skilled trades can also inhibit trade. In Manitoba, to highlight a particularly stark example, one cannot offer legal services without maintaining a physical office in the province. Hiring an out-of-province lawyer—even if they are better suited, higher quality, or lower cost—is therefore made more difficult. Financial and securities rules also vary across provinces. Even French language laws represent a barrier.

Making matters worse, such restrictions can also hinder worker mobility. If credentials from one region are not recognized by another, then Canadians will face costs of retraining or recertifying if they move from one province to another. Denturists are not free to move into Quebec without recertifying, for example, nor are podiatrists into Alberta, dental hygienists into Newfoundland & Labrador, social workers to Ontario, and so on. Fewer people will therefore relocate, even if expected wages are higher.

These barriers to trade, investment, and employment are not merely irritants. They decrease trade flows, increase prices, and lower overall productivity. The first effect is clear in the data, which I display in figure 1. While international trade has grown, thanks to a proliferation of free trade agreements, internal trade has stagnated at 18 percent of GDP in recent years and is nearly ten percentage points below its 27 percent share in 1981. Put another way, internal trade is roughly half as important to the overall economy today as international trade is. Four decades ago, the two were similar.

As for prices, recent research by myself and Lucas Albrecht, published in the *Canadian Journal of Economics*, finds that the effect of interprovincial trade barriers adds between 7.8 and 14.5 percent to prices of goods and services that we buy each day (Albrecht and Tombe, 2016). Other research from a team at Statistics Canada finds the price effect on goods alone (that is, excluding services) approaches 7 percent (Bemrose,

Figure 1: Internal and International Trade as a Share of GDP, 1981 - 2018



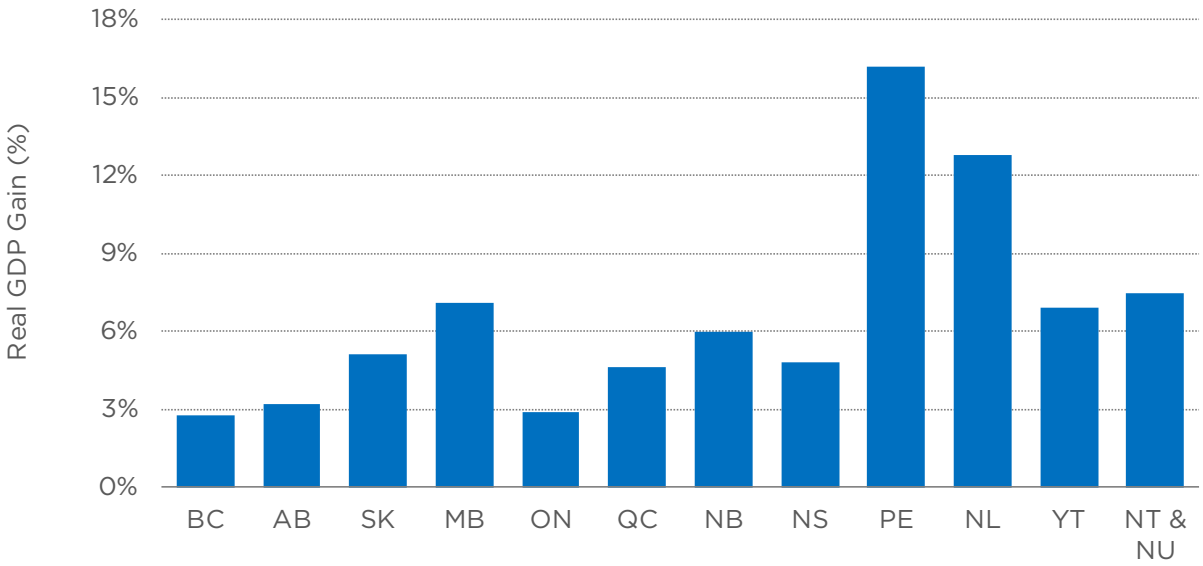
Source: Own calculations from Statistics Canada data table 36-10-0222-01.

Brown, and Tweedle, 2017). For comparison, the same model applied to the US finds internal trade costs there are nil. Costs of living are consequently higher in Canada as a result. Interprovincial trade barriers add, in effect, more than the cost of the GST to cross provincial borders—yet most of us do not realize it because the costs are hidden; consumers are not aware of the lower price they would pay without these barriers.

Finally, Canada's overall productivity is also harmed by interprovincial trade barriers. The reason is straightforward: allowing regions to specialize in what they are relatively good at, and import what they are not, boosts economic productivity. Barriers to trade inhibit this specialization and therefore lower productivity. If such barriers were eliminated, trade flows would increase, productive firms would expand, prices would decline, and real incomes would rise. The cumulative effect on productivity is large.

For a sense of scale, since internal trade accounts for roughly one-fifth of GDP in Canada today, each one percentage point reduction in the cost of engaging in that trade is directly worth 0.2 percent of GDP. Taking the Statistics Canada estimates of trade costs of nearly 7 percent as given, this implies aggregate economic costs of 1.4 percent of GDP, or over $32 billion per year. But the gains do not stop there. What is produced by one

Figure 2: Gains from Eliminating Non-Geographic Internal Trade Barriers for Goods



Source: Alvarez, Krznar, and Tombe, 2019: Table 7.

business is often used by others as inputs into producing yet some other good or service. These input-output connections mean the direct gains from lower trade costs are amplified by indirect gains elsewhere. Canada's economy is a web of interrelated activities and, taking this into account, the gains from lower trade costs are roughly double the direct gains alone. Amplifying the gains further still, lower trade costs expand the volume of trade, increasing its importance for the economy, and reduced regulations facilitate the movement of workers across locations and sectors which allows productive firms to expand.

Taking all this into account to estimate the overall effect of internal trade barriers on productivity does require some sophisticated analysis, but luckily there is a wealth of research that does just that. The most recent estimates from the IMF suggest that Canada's overall productivity could increase by 3.8 percent if internal trade barriers on goods were eliminated (Alvarez, Krznar, and Tombe, 2019). This is large. It represents an aggregate increase in Canada's economy of nearly $90 billion per year—that is over $2,300 per person or over $6,000 per household.

These results also suggest lower income regions would gain more than higher income ones. I illustrate this in figure 2. Among the five provinces with the lowest average household income, for example, gains from

lower trade costs average 5.4 percent—significantly higher than the overall average. The territories also gain more. This not only brings equity benefits but dampens the need for fiscal redistribution through federal revenue and spending programs. Recent work by myself and Professor Jennifer Winter suggests federal transfers across provinces are between $1 billion and $4 billion higher due to the disproportionate effect that interprovincial trade costs have on poorer regions (Tombe and Winter, 2020 forthcoming).

These gains are significant and would help meaningfully shrink the productivity gap between Canada and the United States as reflected in differences in per capita income levels. In 2019, for context, US GDP per person was equivalent to $77,740 (in PPP (purchasing power parity)-adjusted Canadian dollars)—over one-quarter higher than Canada's. Worse, US labour productivity is over one-third higher than Canada's, and this has increased from the one-quarter higher level that prevailed in 2000. Internal trade costs in Canada are undoubtedly an important factor behind this large and growing productivity gap.

Of course, liberalizing trade is easier said than done, but governments have many options for reform. Provinces could agree to harmonize their regulatory rules, or a single province could move on its own and recognize out-of-province credentials and standards. There has been some important recent progress, but much work remains.

Consider the Canadian Free Trade Agreement (CFTA) between the federal, provincial, and territorial governments. It came into force in July 2017 and seeks to develop "a comprehensive set of rules that will help achieve a modern and competitive economic union for all Canadians" (Committee on Internal Trade, 2020). It represents a real commitment to improved internal trade. The Canadian Federation of Independent Business rightly recognized Canada's trade ministers with its Golden Scissors award to celebrate the agreement's potential.

At a high level, the agreement is straightforward. It establishes a wide variety of working groups to deal with labour mobility, financial services, government procurement, alcoholic beverages, and more. The hope is that each will help ratchet Canada slowly but steadily towards easier internal trade. So far, it has led to a deal to harmonize construction codes by 2025 to make it easier for builders and suppliers to do business across the country. This alone may yield economic gains of up to $1 billion by 2028. It has also moved towards harmonizing rules for wide-base single tires, which can help lower trucking costs. It has helped eliminate federal grade and quality inspections for apples, potatoes, and blueberries (which can differ from provincial inspections). It guided provinces to adopt common standards within occupational health and safety rules for items like head, foot, and eye protection, first aid kit contents, and life jackets,

among others. It moved us towards harmonized corporate registration and reporting requirements. And energy efficiency standards for various home appliances from washing machines and dryers to microwaves and refrigerators will soon be identical across the country.

Such efforts are valuable, and however small the gains from the individual changes, they compound upon one another and gradually move us closer to free internal trade. The CFTA is perhaps the most significant development for internal trade in Canadian history. But it is far from perfect. Its piecemeal approach is *very* slow. And the recent COVID-19 pandemic prompted many governments to return to protectionist instincts—promoting local production of various products, for example. The CTFA should therefore not substitute for other options available to governments.

More limited deals with only certain provinces, for example, can push further and faster than the CFTA. British Columbia and Alberta, later joined by Saskatchewan and Manitoba, formed the New West Partnership Agreement to harmonize regulations, standards, and certifications in many areas. This agreement goes beyond the CFTA in many ways and other provinces could join or reach their own bilateral deals.

But the gold standard to liberalize trade involves provinces moving unilaterally. Alberta, for example, moved in summer of 2019 to drop many of its self-imposed exemptions under the CFTA. It did this in exchange for nothing from any other government. It recognized the need for leadership, but it also recognized that most of the gains from internal trade come from making imports cheaper rather than expanding exports. I estimate that roughly two-thirds of the gains from lower internal trade costs for Alberta can be achieved by unilaterally eliminating barriers. Provinces can go further and recognize all standards, certifications, regulations, and so on, issued by any other province as automatically valid in lieu of its own. This would restrict each government's individual power but ease internal trade substantially (and do so quickly).

There's reason for optimism. Substantial progress in recent years, and growing public appreciation of the challenge, creates momentum governments can build on. Efforts in the CFTA can be enhanced and more unilateral moves encouraged. But as provincial autonomy is closely guarded, and always has been, constant effort and goodwill is required to bring Canada's disparate economies closer together. Though it is hard work, our goal should be nothing less than freedom to trade, to invest, to move, and to work. The resulting benefits for Canada's economy are too great to ignore.

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Chapter 3

Barriers to Entry and Productivity Growth

By Vincent Geloso

If one seeks to improve living standards, there is no way around it: one must seek policies that improve productivity. Faster productivity growth means faster economic growth because productivity growth liberates resources, time, and labour for other purposes. The unparalleled increase in living standards since the start of the industrial revolution came from continuous efforts to more productively employ and combine available resources. There is, however, a paradox. While no one disputes that increasing productivity is the way to improve living standards, no one is able to predict *where* (i.e., in which economic sector) productivity will rise. Productivity growth often comes from unexpected sources as a result of entrepreneurs tinkering with existing ideas or exploring new ideas about how to produce. Knowing which entrepreneur will succeed is not easy (likely impossible) to predict beforehand.

Why free entry matters

As such, one of the key conditions for insuring productivity growth is freedom for entrepreneurs to try new and different methods of production or delivery. If there are no legal barriers to entry, economic growth will be faster for two reasons. The first is that entrepreneurship will be greater (Bennett, 2020; Hall, Lacombe, and Pokharel, 2016). This alone is important for economic growth as some studies conclude that one-third to one-half of the cross-national differences in growth rates is explained by differences in entrepreneurship rates (Sobel, Clark, and Lee, 2007; Carree and Thurik, 2010). The second reason is that free entry creates an incentive to innovate (i.e., find new ways to increase productivity). Because there is free entry, incumbent firms must constantly be on their toes as new rivals

may emerge both from within their industry and from outside through the invention of substitute goods. These incumbent firms include those that secured large market shares because of efficient practices (Demsetz, 1973). Free entry means that even firms that are alone in their markets cannot abuse consumers. If they do, say, by raising their margins between prices and costs, they invite entry within their industry, or they incite innovators to create substitutes. Free entry is thus associated with greater innovation, and historical evidence shows that this is true, even if incumbent firms have large market shares (Baumol, 2002).[8]

Unfortunately, governments across the world impose significant barriers to entry and Canada is no exception (Chowdhury, Audretsch, and Belitski, 2019). By barriers to entry, I refer to legal dispositions restricting, directly or indirectly, the ability of new firms to contest incumbent firms. Such dispositions take a great many forms: outright monopoly grants, expensive licensing requirements, restrictions on the nationality of investors, subsidies to established players, privileged access to government contracts, etc. All these dispositions are meant to serve a single purpose: protect incumbent firms from being contested by new firms (Gutiérrez and Philippon, 2019).

These barriers to entry hinder productivity growth for a very simply reason: firms feel no need to discipline themselves (Rouanet, 2020). This lack of competitive pressure limits the desire (the need, really) to try out new strategies or new methods for producing or delivering their good or service. What would be the point? The profits of incumbent firms are secured by the absence of rivalry or threat of rivalry. The result is that firms are less dynamic, which leads to slower productivity growth. Moreover, firms that are protected from competition actually expend considerable resources to make sure that the barriers are maintained. This means that resources are allocated to the protection of profits from competition by political means (Tollison, 1982; Krueger, 1974; Tullock, 1967). In essence, this politicization of economic activity allows incumbent firms to avoid failure, which is to their private benefit, but which comes at a high social cost: resources being used for non-productive ends, less innovation now and slower productivity growth later.

[8] For the historical evidence, see Delorme, Frame, and Kamerschen, 1997; and DiLorenzo, 1985. For historical evidence specific to Canada, see Geloso, 2020; and Geloso, and Belzile, 2018.

The economic cost of barriers to entry

The empirical literature on economic freedom, economic growth, and entrepreneurship is pretty clear on this topic. Economic freedom is a good proxy variable for barriers to entry because it captures some of the regulations that restrict entry, as well as subsidies and tariffs that protect incumbent firms. A 2014 survey of all the scientific articles using economic freedom as a determinant of socio-economic outcomes such as productivity growth and economic growth suggests a broadly positive association: greater economic freedom yields faster economic growth (Hall and Lawson, 2014; see also Lawson and Murphy, 2018). By virtue of approximation, this is akin to saying that fewer barriers to entry (i.e., higher economic freedom) leads to faster productivity growth (i.e., faster economic growth). The literature on economic freedom also finds a positive association of that variable with entrepreneurial activity (Sobel, Clark, and Lee, 2007). This is to be expected as barriers to entry are meant to reduce the rate of business creation all else being equal. However, as entrepreneurial activity is also tied positively to economic growth, the empirical literature on economic freedom confirms that barriers to entry reduce growth (Wiseman and Young, 2013). In other words, barriers to entry prevent entrepreneurial efforts at developing innovations that, in turn, speed up productivity growth.[9]

Measures of barriers to entry that are less comprehensive but more targeted than economic freedom point in the same direction. For example, the OECD produces an index of product market regulation which is meant to capture the intensity of regulatory barriers in numerous industries (Conway, Janod, and Nicoletti, 2005; Koske, Wanner, Bitetti, and Barbiero, 2015). Essentially, that index measures how many regulatory hurdles a new firm has to clear before entering the market. This index has been found to have a negative relationship to productivity growth—especially when the regulations affect key inputs that are used by multiple other industries (Bourlès et al., 2013). Another OECD index, which measures the regulatory restrictiveness against foreign investments, also points in the same direction. By limiting the ability of foreign firms to enter local markets, the more restrictive regulations against foreign investors reduce productivity growth substantially (Basu, Chakraborty, and Reagle, 2003; Golub, 2009).

[9] See also Russell Sobel's "Enhancing Productivity Growth through Encouraging Entrepreneurship" in the present volume. Sobel provides a rich literature review of the connections between entrepreneurship and productivity growth.

How substantial are the barriers to entry that Canada imposes?

Canada could stand to benefit considerably by removing entry barriers. The OECD's Product Market Regulation index ranks Canada the third most regulated economy out of 36 economies in the OECD in 2018 (OECD, 2020a). For its part, the FDI restrictiveness index shows Canada in roughly the same position as one of the worst offenders in terms of erecting barriers to entry: Canada has the fourth highest level of restrictions out of 37 countries in 2019 (OECD, 2020b).

However, as pointed out above, these OECD measures are only indirect measures of barriers to entry. Economic freedom, for its part, only captures some of the barriers to entry. Numerous other types of barriers to entry are not easily measurable for standardized international comparisons. In order to circumvent these limitations, we calculate the share of the economy protected from competition from the most restrictive regulations. This produces a Canadian-specific measure of the extent of protection against competition granted to Canadian firms which, in turn, allows us to get an idea of the gains to be had from removing such barriers.

The three most important barriers to entry erected by governments in Canada are a) those against foreign businesses; b) state-owned monopolies and; c) explicit regulations limiting competition. Examples of restrictions against foreign firms can be seen in the air transportation and telecommunications industries. The Canada Transportation Act restricts foreign ownership in Canadian airlines while also prohibiting non-Canadian carriers from providing services between Canadian cities. Telecommunications firms with more than 10 percent market share cannot have more than 20 percent of the voting shares owned by non-Canadians. Examples of state-owned monopolies include alcohol retail, domestic mail, and urban transit, while examples of other protections include dairy farming quotas, intercity busing (where licenses come with monopoly rights over certain routes in some provinces), taxis, and limousines. In table 1, the first three rows show the lower-bound estimate of the protection afforded to Canadian firms: some 22.1 percent of the economy is protected to a substantial degree from competition (Geloso, 2019).

This estimate is a conservative. Some other important restrictions against competition, such as occupational licensing, are harder to measure but are nonetheless relevant. Table 1's second-to-last row includes the few other industries that lend themselves to inclusion without any methodological problems (such as double-counting them under the labels of other categories such as state-owned monopolies). This brings the total share of the economy protected from competition up to 30.6 percent. And this is

Table 1: Share of the Economy Heavily Protected from Competition

	Share of the economy protected
a) Restrictions against foreign firms	19.90%
b) State-owned monopolies (not included in previous row)	1.60%
c) Explicit protections (not included in previous rows)	0.75%
d) Total	22.10%
e) Total + Harder to measure protections (conservative assessment)	30.60%
f) Total + Harder to measure protections (conservative assessment, removing the health and education sectors)	35.10%

Source: Geloso, 2019.

Note: State-owned monopolies in row b) may appear too small. This is because some state-owned monopolies, such as in the energy sector, are already included in row a) through restrictions against foreign times. As such, we cannot count them twice. However, this does mean that these state-owned monopolies benefit from even greater barriers to entry – not only are they protected from domestic competition; they are also protected from foreign competitors.

still too conservative as we must bear in mind that it is difficult to arrive at reliable estimates of the share of the health care and education markets (where governments are heavily involved) that are protected from competition.[10] Because actual and potential competition in these latter two sectors cannot be easily measured, we recalculate the share of protections for the economy minus these two sectors. This creates a conservative estimate of 35.1 percent of the economy being protected from competition to some high degree.

Essentially, these numbers indicate that *more* than 1 in 3 dollars of economic output are shielded from competition. For more than one third of the economy, the incentives to more productively employ and combine resources, to innovate, and to develop new ideas are suppressed. This is a

[10] Properly identifying the portions of the health sector (e.g., ophthalmology and cosmetic care) and education sector (e.g., tutoring, private schools, private technical colleges, and home schooling) where competition is present is a challenge for researchers. Certainly, these are two sectors where important gains in productivity could be achieved. Under the extremely conservative assumption that two-thirds of those sectors are protected from competition, they bring the total of the economy shielded from competition up to 43 percent.

considerable hindrance to Canada's ability to sustain high levels of productivity growth. It is thus unsurprising that the nation's productivity growth has been quite tepid in the last decades and well below what is observed elsewhere (Gu and Willox, 2018).

Conclusion

If we care about the living standards of Canadians, not only materially but across wider dimensions, we need to care about productivity growth. The latter, however, cannot be directed, planned, or predicted. It emerges as the result of a discovery process by entrepreneurs (Kirzner, 1973; Easterly, 2014). For this to happen, needless barriers in the way of their efforts ought to be removed—especially if those barriers are meant to protect the profits of incumbent firms. Canada is a particularly egregious offender in this matter. This, fortunately, also means that Canada can make dramatic improvements by picking low-hanging fruit. Important accelerations in productivity growth can be secured simply by removing barriers to competition.

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Chapter 4

The Drag on Productivity from Excessive Regulation

By Laura Jones

No discussion about productivity would be complete without considering the drag that excessive regulating has on productivity and economic growth. *Excessive regulation*, often colloquially referred to as red tape, stands in stark contrast to *justified regulation* where social benefits outweigh social costs.

Justified regulation serves a clear purpose, delivers reasonable benefits relative to its costs, and is administered efficiently and fairly. It includes government laws, regulations, rules, and policies that support an efficient and effective marketplace and that provide citizens and businesses with intellectual property protections and other protections that they need. Many government rules (and the administration that supports them) fall into this category.

Excessive regulation is the dark side of regulating—government rules and processes run amok. It refers to rules, policies, and poor government service that do little or nothing to serve the public interest, while creating financial costs and frustration for producers and consumers alike. Sometimes the excess is the government rule or regulation itself. Other times it is the way the government rules are administered. Often it is a combination of both.

How big a drag is excessive regulation on productivity?

Regulations that deliver little or no net social value clearly undermine productivity, because the time and money spent on understanding and accommodating them could be put to better use in any number of ways that would

Figure 1: The Effect of Excessive Regulations on the Productivity and Growth of Small- and Medium-Sized Enterprises (% response, Canada and the US)

Sources: CFIB (2012), *Survey on Regulation and Paper Burden*, n=8,562; and Ipsos Reid (2012), *Survey on Regulation and Paper Burden in the United States*, n=1,535.

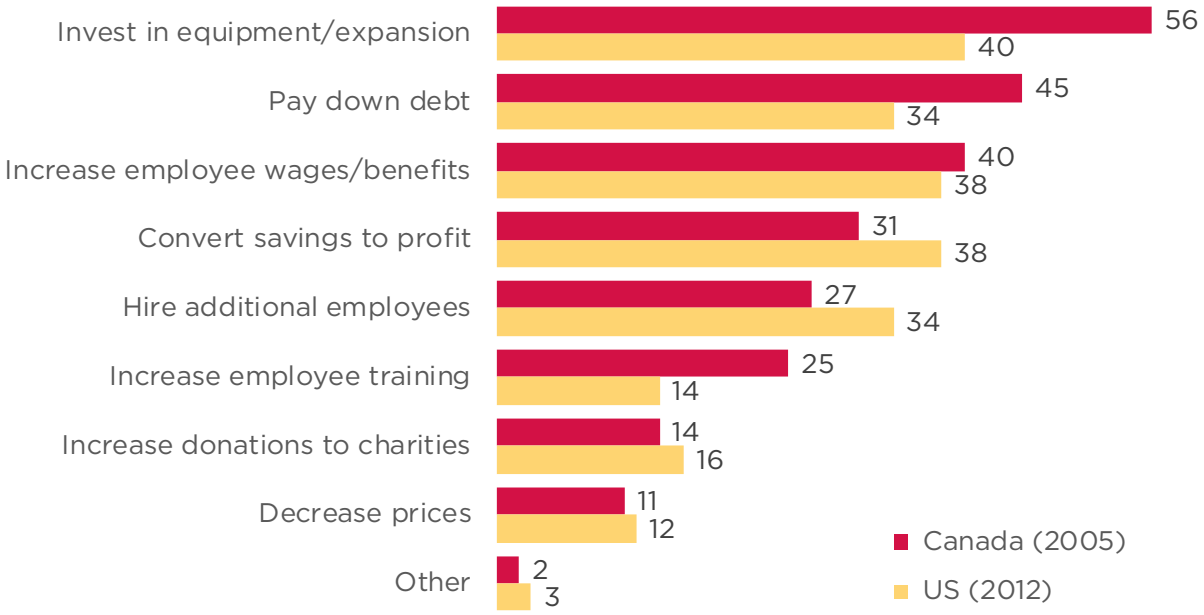
allow output to increase immediately or in the future. However, quantifying the specific impact of regulation on productivity is challenging because regulatory measurement, particularly at the macro level, is still in its infancy.

One Canadian attempt to quantify the cost of regulation and to differentiate between justified regulation and red tape suggests that the drag on productivity is substantial. Specifically, the Canadian Federation of Independent Business (CFIB) uses a survey-based approach to estimate the cost of regulation. Its latest update finds that Canadian businesses of all sizes spend $36 billion a year on regulation (Wong, 2018).

CFIB's survey asks business owners how much of the annual cost of regulation could be reduced without adversely affecting the health, safety, and environmental outcomes that regulation seeks to achieve. In other words, how much of the cost of regulation could more accurately be called red tape? The answer: roughly 30 percent or $10 billion a year. Put in different terms, eliminating red tape could free up the equivalent of 200 million hours of business owners' time or the equivalent of 103,000 full time jobs (Jones, Gormanns, and Wong, 2013).

In the CFIB surveys, roughly seven out of ten Canadian small business owners agree that excessive regulation significantly reduces productivity, while closer to six out of ten US small businesses agreed with the

Figure 2: How Businesses Would Use the Savings If Their Regulatory Costs Were Reduced (% response, Canada and the US)



Sources: CFIB (2005), *Survey on Regulation and Paper Burden*, n=7 ,391; and Ipsos Reid (2012), *Survey on Regulation and Paper Burden in the United States*, n=1,535.

same statement, suggesting that it is a big issue for small- and medium-sized firms in both countries, but it is a bigger issue for Canadian firms (see figure 1) (Jones, Gormanns, and Wong, 2013). A substantial fraction of businesses in both countries also agree that excessive regulation discourages them from growing their businesses, and almost half say that if they had known the burden of regulation, they might not have gone into business. This finding suggests that some unknown number of small firms never started because their potential owners worried about the burden of regulation.

When asked how the savings from regulatory reduction would be used, investing in new equipment/expansion, paying down debt, and increasing employee wages/benefits were the top answers for small business owners. Hiring additional employees and increasing employee training were also on the list (see figure 2). While more study is needed, these data suggest that a reduction in red tape would have immediate and future productivity benefits. Fewer resources dedicated to complying with excessive rules could free up money to increase wages and make investments in new machinery and employee training, which are key to future productivity gains.

Regulation and economic growth

A recent review of academic research that uses cross-country comparisons to evaluate the impact of economic regulation on growth finds that higher levels of economic regulation are consistently associated with lower rates of economic growth per capita, as well as lower industry, region, and firm productivity (Broughel and Hahn, 2020). The review points out that only a few studies produce a simple estimate of the cumulative or marginal effect of regulation on growth, although those that do suggest it is significant. For example, one study of 135 countries between 1993 and 2002 found that countries with a more business-friendly regulatory environment grew faster than those with more burdensome regulatory environments—improving from the worst quartile of business regulation to the best can increase annual growth by 2.3 percentage points (Djankov, McLiesh, and Ramalho, 2006).[11] One challenge to research in this area is the limited data available. Most studies can be traced back to three data sources—one that focuses on the number of steps and time it takes to start a business, one that is based on a questionnaire filled out by OECD member countries, and one that evaluates restrictions countries impose on dismissing workers and the procedures for hiring workers on temporary contracts (Broughel and Hahn, 2020).

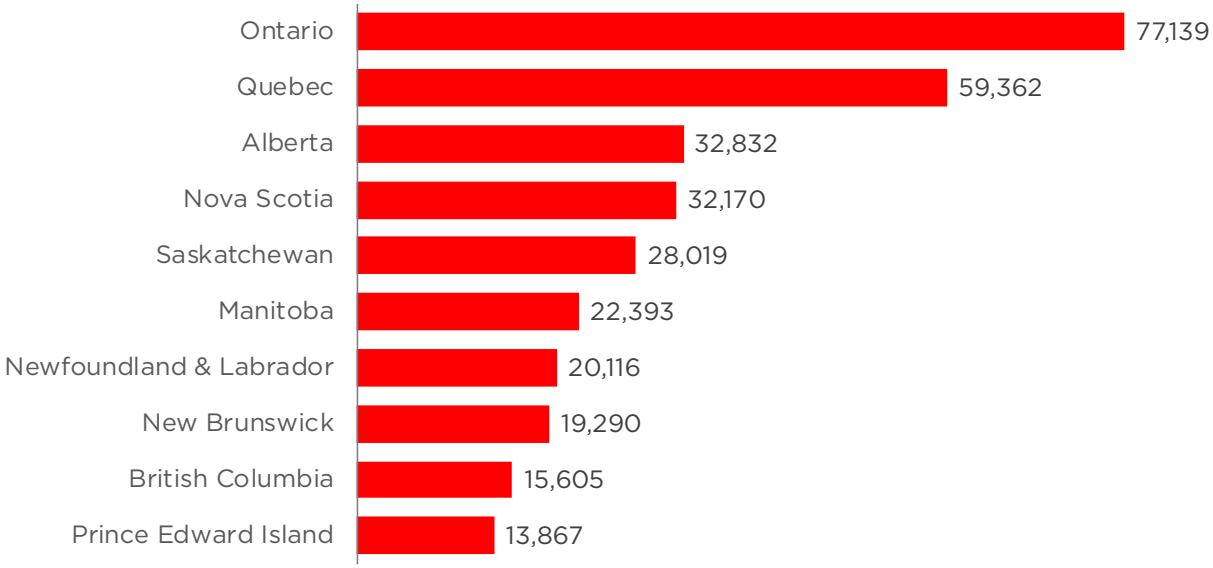
An interesting study using data specific to the US provides further evidence that red tape undermines productivity and living standards. Coffey, McLaughlin and Pietro (2016) conclude that if US regulation had stayed at 1980 levels, GDP would have been $4 trillion dollars higher by 2012, translating to a per capita income gain of US$13,000.

Inadequate scrutiny of regulatory costs

Academic studies aside, regulatory costs do not get anywhere near the real-world scrutiny they deserve. The government's annual fiscal budget is an institutionalized moment each year where spending choices and taxes are subjected to reasonably rigorous review. Fiscal excesses or spending scandals are seen as wasteful and disrespectful to taxpayers. But what of regulatory excesses? There is no annual regulatory budget exercise to parallel fiscal budgets and no culture around measuring and challenging the cumulative regulatory burden we carry as a society, which creates a drag on the growth of productivity and living standards. Changing this situa-

[11] Given that productivity is a key driver of economic growth, the finding supports an important linkage between reducing red tape and improving productivity growth.

Figure 3: Number of Regulation Restrictions for Canada's Provinces



Source: McLaughlin, Atherley, and Strosko (2018).

tion starts with better regulatory data collection and reporting, something Canadian governments have recently shown more interest in.[12]

Regulatory measurement in Canada

Several provinces, including British Columbia and more recently Manitoba, have shown leadership in tracking efforts to reduce excessive regulation using an aggregate measure called "regulatory requirements," which captures the individual actions or steps that businesses and citizens must take to comply with government rules. The Mercatus Center at George Mason University uses a similar approach to track regulatory activity in the United States and has recently published data that can be used to compare provinces (McLaughlin, Strosko, and Jones, 2019).

[12] In 2001 the British Columbia government started publishing government-wide regulatory counts. Since then, other provinces have introduced measurements, with varying degrees of comprehensiveness and consistency. There is no federal estimate of the cost or quantity of regulation that is comprehensive for Canada. For more on regulatory measurement in Canada, see Canadian Federation of Independent Business (2020).

The data show a wide variation in regulatory loads at the provincial level using "regulatory restrictions" as an indicator. Regulatory restrictions include prohibitions and obligations found in regulatory text. It excludes restrictions found in legislation and regulatory guidance documents, which are included in some other provincial regulatory requirement counts, making the Mercatus data less comprehensive. Nevertheless, the data can be used to get a sense of comparison between provinces (see figure 3). While differences in sectors and size can explain some of these differences, such as PEI having fewer regulatory restrictions than Ontario, the data support the idea that less regulation is possible without adversely affecting outcomes. A case in point is British Columbia, which has a fraction—one fifth—of the restrictions of Ontario with similarly high levels of safety and environmental protection.

Operationalizing red tape reduction: The British Columbia model

British Columbia has been a leader in regulatory measurement and transparency since 2001 when it was the first province to regularly report a measure of the regulatory burden and set a reduction target.[13] It used a methodology similar to Mercatus but counted government rules from a broader array of instruments, including government policies and forms. Its original baseline in 2001 was 330,812 regulatory requirements, and it currently sits at 166,919, representing an almost 50 percent reduction (British Columbia, 2018). British Columbia's experience further suggests that a serious overall reduction in regulatory load is possible without sacrificing the legitimate objectives of regulation, as health, safety, and environmental outcomes have remained high in the province.

Three important factors behind British Columbia's success at reducing regulatory requirements include: strong political leadership, a simple but comprehensive measure that was regularly reported, and setting a concrete target for reduction that served as a form of regulatory cap or budget for regulators.[14]

Essentially the government went on a regulatory diet, making the commitment to reduce the burden of regulation by one-third in three years (between 2001 and 2004). It then developed a measure that was regularly reported at cabinet meetings and publicly. To meet the reduc-

[13] BC's reforms have been a model or provided inspiration for many provinces and states including Manitoba, Alberta, Ontario and Kentucky and Virginia.

[14] For a detailed description of British Columbia's reforms, see Jones (2015).

tion target, the province established a policy of eliminating two regulatory requirements for every new one added.

Initially the government intended for the initiative to last three years. However, once the one-third reduction was achieved in 2004, small businesses asked the government to maintain the reduction with a new policy of requiring that one regulatory requirement be eliminated for every new one introduced. The policy has been extended several times and remains in place today. Interestingly, the number of regulatory restrictions has continued to drift downward without a requirement for it to do so, which suggests that there has been a change in culture around regulating.

British Columbia's regulatory reforms were a departure from the more typical approaches that other jurisdictions use, which include a focus on requiring or enhancing Regulatory Impact Assessments (RIA) or reforms that ask stakeholders to identify specific issues and irritants that need to be addressed. These latter approaches may slow the growth of regulation but do not appear effective at eliminating excessive regulation.

Did British Columbia's reduction in regulation affect productivity, economic growth, and living standards? This question has not been answered definitively, and it is made harder to answer because regulatory reform was part of a broader package of economic reforms happening at the same time, which included a significant tax cut. What we can definitively say is that BC's economic performance improved markedly after 2001. The province went from being one of the worst performing in the country to one of the best. BC's real GDP growth was lower than Canada's as a whole in six of the nine years between 1992 and 2000, but grew faster than Canada's every year between 2002 and 2008 (Finlayson, 2009).

The future of regulatory policy: unleashing productivity gains by reducing red tape?

How we think about regulation may be changing for the better. Not only is there more recognition that regulating without constraint is a drag on productivity and economic growth, but there is less tolerance on the part of millennials for outdated processes involving fax machines and waiting in line for things that could be done online, and there are more regulatory reform initiatives rooted in measurement. However, there are reasons for pessimism, too. For example, the regulatory processes around big projects have expanded. Specifically, timeframes for federal project reviews of energy infrastructure have lengthened and are longer than would be expected for similar projects in jurisdictions with comparable standards outside of Canada (Drance, Cameron, and Hutton, 2019). Clearly the

additional process adds expense to these projects. Exactly what additional benefit is being delivered is much less clear.

Recent events may accelerate the desire to reduce unnecessary regulation as COVID-19 will leave a trail of lower growth and larger fiscal deficits in its wake. Governments on the hunt for low-cost ways to increase productivity and stimulate the economy will find reducing unnecessary regulation to be a powerful tool. Leveraging this tool requires political leadership, a commitment to measurement, and a change in mindset that recognizes that not all regulation is the same. Justified regulation makes sense; excessive regulation is not worth its cost.

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Chapter 5

The Importance of Labour Market Mobility to Productivity Growth

By Robert P. Murphy

Introduction

Virtually all Canadians support higher living standards for workers. Unfortunately, many "pro-labour" government policies actually *reduce* employment and wage rates. By loosening or eliminating certain regulations affecting labour markets, policymakers could promote flexibility in labour contracts, leading to improved productivity growth, higher wages, and faster job creation. In this essay, I discuss the productivity-improvement rationale for more flexible labour markets.

Theoretical framework

The only way to raise living standards for workers over time is to raise their productivity; the value of output that the average worker produces in a certain period of time must increase. Worker productivity is influenced by obvious factors such as innate skills and education, as well as background conditions such as the region's endowment of natural resources, and the quality of tools and equipment. It is also influenced by labour laws and regulations that limit the flexibility of market forces to determine labour compensation and employment levels.

This essay summarizes some of the empirical literature showing the connection between flexible labour markets, productivity performance, and government policies. Before proceeding, I should explain the relevance of two particular empirical observations. First, if inflation-adjusted wages increase, that is evidence that worker productivity has increased

since profit-maximizing employers won't pay more to workers unless they believe those workers will produce more for the firm.

Second and less obvious, lower unemployment rates are also evidence of higher worker productivity, other things equal. For an individual worker, the less frequent and/or the shorter the duration of spells of unemployment during his or her career, the more time is spent "on the job," acquiring human capital and hence boosting productivity. For society as a whole, the lower the unemployment rate, the greater the fraction of the labour force that is actually going to work and producing output. That means, of course, that the average productivity of workers—when measured as total economic output divided by the total workforce—goes up, since the average person in the labour force is actually working and producing more rather than being "between jobs."

For these reasons, empirical studies showing that specific government policies promote faster wage and employment growth or lead to lower unemployment rates are also indirectly showing that those policies are promoting labour productivity growth.

High minimum wage policies hurt low-income workers

Minimum wage legislation is perhaps the most obvious example of an ostensibly "pro-labour" government policy that in reality hurts many of its intended beneficiaries. As discussed by Murphy, Lammam, and MacIntyre (2016), the minimum wage is a blunt instrument that doesn't effectively target low-income workers. As of 2012, 87.5 percent of Canadians earning the minimum wage lived in households *above* the Low Income Cut-Off (LICO) threshold, while 83.4 percent of workers from households falling *below* the LICO threshold earned more than the minimum wage.

Even if minimum wage legislation increased the compensation of some low-income individuals while not reducing employment, it would still arguably be a net loss for all low-income workers. Since most workers in relatively poor households already earn above the minimum wage, the latter will not be helped by the policy and might actually be hurt to the extent that minimum wage policies make food and other consumer goods more expensive for them to buy.

As a separate problem, forcing employers to pay a minimum wage could reduce employment for those (mostly young) workers affected. Specifically, by artificially raising the initial hourly wages that must be paid to inexperienced workers, minimum wage policies make it riskier for an employer to take a chance on such applicants, thereby making it harder for

young workers to get entry-level positions and acquire the human capital that improves their workplace skills. Up through the 1980s, virtually all empirical studies confirmed the harmful effects of minimum wage policies on the employment of low-skilled workers. This consensus was challenged in the 1990s by some US researchers relying on new statistical techniques. Notwithstanding, dozens of US studies since then have endorsed the original findings.

Canadian studies—which are considered more reliable than their US counterparts, in part because there is wider variation in provincial minimum wages than among US states—confirm the original consensus. The Canadian literature generally estimates that a 10 percent increase in the minimum wage reduces employment among young workers (ages 15 to 24) by 3 to 6 percent (Murphy, Lammam, and MacIntyre, 2016). To reiterate, higher unemployment rates tend to reduce labour productivity over time, because workers can only gain experience that enhances their productivity when actually *on the job*—not when between jobs.

To avoid undesirable impacts, at the very least policymakers should *refrain* from additional hikes in minimum wage levels; it would be even better to eliminate them. A more effective policy to help the working poor would be some version of a refundable tax credit (which was originally implemented in Canada as the Working Income Tax Benefit, or WITB, but now an expanded version is called the Canada Workers Benefit or CWB). Although the details are important, economists generally agree that a tax credit aimed at low-wage workers is a way to boost their incomes without reducing an employer's incentive to hire, and is thus a better instrument for helping them than minimum wage laws.

"Right to Work" policies promote employment and wage growth

In the United States, individual states are either "right-to-work" or not.[15] In a right-to-work (RTW) state, unions cannot compel non-union members to pay union dues if they work at a company with a union contract.

Although economists disagree on the theoretical impact that RTW status has on wage rates, it is generally accepted that RTW states have more flexible labour markets, which, in turn, should promote employment and hence productivity growth. Table 1 provides some empirical measures of economic performance of RTW and non-RTW states from 2001 to 2013.

[15] The discussion in this section reproduces material from Murphy, Emes, and Eisen (2016).

Table 1. Key economic indicators, RTW vs. non-RTW (USA), 2001-2013

Indicator	Non-RTW	USA	RTW
Private non-farm employment growth	8.2%	11.7%	17.4%
Growth in real private sector output	20.3%	23.8%	30.3%
Growth in real manufacturing output	19.5%	25.2%	35.4%
Change in number of firms (2001-2012)	-0.8%	1.6%	5.6%
Growth in real personal income	15.3%	19.6%	27.7%

NOTE: "RTW" are states that had RTW legislation enacted in or before 2001.

Source: Eisenach (2015) relying on BEA and Census Bureau data.

Table 1 demonstrates a strong *correlation* between a state's RTW status and various measures of economic performance, although it doesn't prove *causation*.[16] Reed (2003) finds very strong positive wage impacts from RTW, arguing that most previous studies either focused only on *union* wage rates and/or didn't adequately control for the possibility that states with low initial wages might be more likely to adopt RTW. These findings suggest that RTW status allows more flexible labour markets and, in the long run, allows employers and workers to match up more efficiently, thereby boosting productivity and average wages. While there is mixed evidence on whether RTW status increases average worker pay, there is more of a consensus that RTW increases employment, particularly in manufacturing (e.g., Holmes, 1998).

Relaxing occupational licensing boosts labour productivity

Occupational licensing requirements are another clear example of regulations that interfere with labour markets and reduce productivity, particularly when "unqualified" workers would in the worst case merely be annoyances—such as dog groomers or hair stylists. Although licensing requirements supposedly protect the public from shoddy providers, in practice they restrict legitimate competition. As a consequence, excluded workers are forced into occupations where their productivity is lower, hence reducing overall economic output (Friedman and Kuznets, 1945).

16 Indeed, some studies conclude that the superior performance of RTW states is due to other factors; see Moore (1998) for a review.

Policymakers could therefore boost productivity by reducing or eliminating occupational licensure requirements, particularly in areas where there is little potential harm except unsatisfied customers. As a simple first step, the various Canadian provinces could enact reciprocity agreements, so that (say) an electrician who is certified to work in one province doesn't need to complete redundant certification requirements to take a job in a different province.

Increased immigration, with a focus on STEM applicants, boosts labour productivity

Immigration barriers obviously impede the flow of workers to where their productivity is highest; there are millions of potential workers around the world who would earn higher incomes in Canada than in their native countries. A relaxation of immigration barriers would allow some of these workers to relocate to Canada, where—coupled with better infrastructure, other skilled workers, and more capital—successful immigrants would see a tremendous boost to their productivity and hence earnings.

Yet the more interesting question is whether a relaxation of immigration barriers would enhance the productivity of *existing Canadian workers*. In theory, more immigration leads to two competing effects on Canadian wage rates. On the one hand, if there is no reorganization of production, an increase in the supply of labour should reduce wage rates as more workers enter the market.

On the other hand, more immigration could lead to an enhanced "division of labour," whereby a larger population allows workers to specialize in those areas where they are most productive. In particular, if highly skilled or entrepreneurial immigrants start new businesses in Canada, this would boost the productivity of Canadians whom they hire, raising living standards not just for the immigrants, but for the native-borne as well.

Globerman (2019) reviews both theory and evidence regarding high-skilled immigration to Canada. He finds that while highly educated immigrants may have a modest negative impact on the incomes of their native-born, highly educated peers, they raise the wages of other Canadians (for whom the immigrants' skilled labour is a complement, not a substitute). Furthermore, there is evidence that highly educated immigrants increase the rate of return on domestic capital investment, and boost job creation by being innovative and entrepreneurial.

To be sure, immigration barriers are not merely an economic policy, but reflect other considerations that are beyond the scope of this essay. Even so, if policymakers wish to boost labour productivity generally, they

should consider relaxing immigration restrictions, particular on highly educated workers in the STEM fields.

The economic benefits of labour market flexibility

The previous sections in this chapter focused on specific examples of government policies interfering with labour markets. This section concentrates on the general concept of labour market flexibility. The Fraser Institute publishes an annual index of the Economic Freedom of North America (Stansel et al., 2019), and one of its components measures Labour Market Freedom. This measure is constructed from three statistics for each jurisdiction: (1) full-time minimum wage income as a percentage of per capita personal income, (2) the share of government employment to total employment, and (3) union employment as a share of total employment. The *lower* a given jurisdiction scores on these metrics compared to its peers, the *higher* its rating for Labour Market Freedom.

According to Dean Stansel, "Annual changes in EFNA [Economic Freedom of North America] labor market freedom scores (from 2000 to 2015) are positively correlated with subsequent annual changes in employment," and likewise are positively correlated with "wages and salaries… in the following year (from 2001 to 2016)." Furthermore, "those annual changes in freedom are negatively correlated with unemployment rates… the following year" (Stansel, 2018: 21).

Stansel (2018) reviews other studies and finds that the *total* economic freedom score on the EFNA index is correlated with desirable economic performance. While some studies find that labour market freedom is not as important as the other two major components of the index (namely, government spending and taxation), Garrett and Rhine (2011) conclude that a good score on labour market freedom "was more strongly associated with employment growth" than were good scores on government spending or taxation (Stansel, 2018: 18). This general pattern seems to hold up at a global level (Feldman 2005; 2009).

To sum up, both theory and a wealth of empirical evidence suggest that more flexible labour markets make it easier for employers and good job candidates to find each other, thereby boosting employment and average pay in the long run. Furthermore, eliminating arbitrary restrictions on who is allowed to work in specific occupations means that workers can best exploit their specific skills. The result is higher labour productivity and higher wage rates.

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Chapter 6

Promoting Productivity Growth by Encouraging Innovation

By Steven Globerman

Introduction

It is well established empirically that technological change is the main driver of total factor productivity[17] growth over time (Crafts, 2008). Technological change, in turn, can be characterized as a process by which new scientific and engineering concepts are developed, initially embodied in new products, production processes, and organizational forms and procedures, and subsequently widely adopted and used by private and public sector organizations.

The various stages of the technological change process have sometimes been compartmentalized into the invention, innovation, and diffusion stages. Invention corresponds to the formal or informal creation of new knowledge. Innovation encompasses the development of "practical" ways to use new knowledge, including producing and testing "beta" versions, as well the initial introduction and use of refined versions of the beta model. Diffusion refers to the widespread use of the innovation, either by existing firms or by new start-ups.

While the technological change process is sometimes presented as linear, in fact, there is typically feedback from diffusion to invention, i.e., the use of a new product or process leads to insights that, in turn, lead to improvements in the innovation being adopted.[18] Indeed, the improve-

[17] Total factor productivity, in simple terms, is the ratio of the value of output produced to the value of all inputs used to produce the output.

[18] For a discussion of the interaction between invention, innovation, and adoption, as well as some evidence on the importance of even modest (or incremental) changes to

ments can be thought of as "follow-on" innovations that, in turn, promote increased adoption of the innovations in question. Entrepreneurship and intrapreneurship[19] also promote the use of innovative processes and products by making the innovations widely available (directly or indirectly) through marketing them directly to potential users or by using them in-house to improve efficiency.

Numerous studies and reports by scientific commissions have identified Canada's innovation gap.[20] To be sure, a slowdown in innovation has been identified as a widespread source of the multi-decade slowdown in productivity growth that characterizes all developed economies. Gordon (2017) is perhaps the most well-known proponent of the view that society has already exploited the potential ideas that lead to major innovations. Bloom, Jones, Van Reenan, and Webb (2020) offer a more nuanced position. They argue that the costs of discovering and developing new ideas that underlie innovation have increased substantially since at least 1930. However, others such as Brynjolfsson and McAfee (2014) and Mokyr (2013) dispute the notion that society faces a more limited potential for innovation.

While basic scientific breakthroughs clearly expand the opportunity set for major innovations, there will continue to be opportunities for secondary innovations that are an important source for ongoing productivity improvements. Furthermore, relatively small countries such as Canada are unlikely to be major contributors to advances in basic science along a wide range of disciplines. Rather, the main opportunities for small, open economies lie in leveraging scientific advances into commercial innovations and using and marketing those innovations.

This chapter briefly assesses Canada's recent performance in innovation relative to other developed economies and discusses policies that might improve Canada's performance. There exists a wide range of factors that influence innovation performance at the national level, and it is beyond the scope of this relatively focused essay to address all of the relevant factors. Hence, the essay focuses on factors that seem to be particularly important contributors to Canada's relatively poor innovation perform-

existing best practices for productivity growth, see Globerman and Lybecker (2014).

19 Entrepreneurship is typically equated with start-up organizations that develop and commercialize innovations to produce new products and/or to produce existing products more efficiently. Intrapreneurship is usually equated with departments within existing organizations that develop innovations either for internal use by those organizations or for more widespread commercialization. For a discussion of entrepreneurship and intrapreneurship and their role in promoting productivity growth, see the essay by Sobel in this volume.

20 For a review and update of this evidence, see Globerman and Emes (2019).

ance over decades, notwithstanding numerous federal government programs aimed at stimulating innovation activity.

Overview of Canada's innovation performance

A general definition of innovation encompasses the implementation of a new or significantly improved product or process, a new marketing method, or a new organizational method. As Globerman and Emes (2019) note, while studies have used numerous available measures of innovation, no single measure is definitive or without flaws. This is an argument for using so-called league tables, which combine an array of measures that are directly or indirectly representative of national innovation performance.

There are two primary and publicly available league tables that rank the innovation performance of countries. One is the World Economic Forum's *Global Competitiveness Index*. The second is the *Global Innovation Index* produced by a consortium of universities.[21] This essay's tables 1 and 2 report data from these two sources that identify Canada's innovation performance relative to other countries. Specifically, they report Canada's ranking relative to other countries based on the criteria used by the two league tables. They also report Canada's overall numerical score relative to the score of the "leading" country, as well as Canada's score relative to the United States.[22]

Although the two league tables use somewhat different criteria and different methodologies to measure innovation performance, both show Canada being well down the league rankings. While the *Global Competitiveness Index* shows a slight improvement in Canada's standing in 2019 compared to earlier years, the *Global Innovation Index* reports, if anything, a declining performance in 2019 compared to earlier years. The main point to take away from tables 1 and 2 is that Canada has performed relatively poorly on innovation compared to other countries over a sustained period.

A ranking of the top technology clusters among major metropolitan areas provides yet another indicator of Canada's relatively poor innovation performance. It is well established that innovation activity tends to be geographically concentrated in specific metropolitan areas (Filipowicz, Globerman, and Emes, 2019). The *Global Innovation Index* (2019) provides a ranking of the top 100 metropolitan areas in the world based on the criterion of being an "innovation cluster." Among all Canadian metro-

[21] Globerman and Emes (2019) discuss the methodologies used to produce these two surveys.

[22] The leading country in both surveys can vary from year to year.

Table 1: Canada's Relative Performance on the Innovation Pillar of the Global Competitiveness Index

	Canada's rank	Canada's score relative to leader	Canada's score relative to US
2007-2018 Average	18	0.817	0.837
2019	16	0.853	0.88

Source: For 2007-2018: Globerman and Emes (2019)

For 2019: World Economic Forum, Global Competitiveness Report, 2019.

Table 2: Canada's Relative Performance on Overall Innovation Capability

	Canada's rank	Canada's score relative to leader	Canada's score relative to US
2011-2018 Average	14	0.832	0.931
2019	17	0.866	0.873

Source: For 2007-2018: Globerman and Emes (2019)

For 2019: Dutter, Lanvin and Wunsch-Vincent, eds., Global Innovation Index, 2019

politan areas only Toronto with a ranking of 39 makes it into the top 50 areas listed. At a rank of 51, Montreal is just outside the top 50. The only other Canadian metropolitan area to break into the top 100 is Vancouver—ranked number 72.

Improving Canada's innovation performance

As noted earlier, the Canadian government has, over time, established numerous programs to fund innovation-related activities. The available data and information suggest that the government's efforts have been largely unsuccessful. The obvious question one might ask is what Canada, or for that matter any other country, should do to improve its innovation performance.

The literature offers many suggestions. The specific recommendations for promoting innovation performance broadly encompass improving the institutions that encourage innovation and increasing the supply of

Figure 1: Factors Conditioning Innovation

- Legal and political institutions
- Human capital and skills
- Domestic and foreign competition
- Financing/entrepreneurship
- ICT infrastructure
- R&D resources/performance

critical inputs to the innovation process. Figure 1 attempts to summarize the main factors that have been identified, drawing upon the criteria used in the *Global Competitiveness Index* and the *Global Innovation Index.*

Legal and political institutions

A favourable (to innovation) legal and political institutional environment encompasses a relatively strong property rights regime, especially in the context of intellectual property, and more generally, the transparent and consistent rule of law. Burdensome regulation, particularly with regard to starting and operating new businesses, as well as relatively high tax rates, discourage innovation.

Human capital and skills

While a more highly educated workforce is generally supportive of innovation and productivity growth, a higher percentage of university graduates in science and engineering disciplines is especially supportive, as is more widespread digital skills in the population.

Competition

Competition in both output and input markets encourages the introduction and adoption of new technology. Product market competition encompasses both rivalry between domestic firms and the actual or potential threat of imports and inward foreign direct investment. Internal labour

mobility and ease of hiring foreign workers are important contributors to competition in the labour market.

Financing/entrepreneurship

Since innovation is often introduced by start-up ventures, a stronger entrepreneurial culture contributes to an innovative environment. The availability of venture capital and later-stage financing for small (often start-up) and medium-sized enterprises is frequently cited as a necessary, if not sufficient, condition for promoting innovation through the activities of start-ups and incumbent small enterprises.

Information and communications technology infrastructure

A robust information and communications technology (ICT) infrastructure is increasingly critical to support the creation and use of new technology, especially given the increasingly complex and dispersed cooperative research that universities and affiliates of multinational companies carry out. An efficient ICT infrastructure also promotes competition by facilitating price discovery and an expansion of geographic markets for products and services.

Research and development financing and performance

Research and development (R&D) is obviously a critical activity underlying innovation. However, simply spending more money on R&D does not necessarily ensure an equivalent increase in innovation. In particular, if the R&D funder is a different organization than the R&D performer, a potential principal-agent problem is created. Specifically, the objectives of the funder and the performer might be misaligned. Furthermore, the funder is likely to find it difficult to monitor the activities of the performer to ensure that the latter is being efficient and effective in carrying out the R&D activity. This is likely to be challenging in the context of R&D where measurable outputs and timelines are difficult to specify in advance of funding.

Applying the criteria to Canada

The *Global Innovation Index* and the *World Competitiveness Report* provide detailed evaluations of the relative strengths and weaknesses of Canada's innovation environment relative to the broad criteria listed in figure 1. While there is some disagreement between the two surveys with respect to specific criteria, the overall assessments are fairly congruent. One notable source of agreement is with respect to limited competition in domestic markets, where Canada's ranking is well below its overall innovation ranking. Part of the explanation for limited competition is substantial non-tariff barriers in services, particularly ICT services, which includes barriers to inflows of foreign direct investment. Barriers to competition directly reduce incentives to innovate, while barriers to foreign competition in telecommunications weaken the contribution of advanced infrastructure to improved innovation.

Another prominent weakness is Canada's relatively weak rates of physical and human capital formation. With respect to the latter, the relatively limited growth of scientists and engineers is seen as a particularly relevant restraint on innovation. Relatively high business and personal income tax rates are seen as slowing the growth of capital formation, while restrictions on internal labour market mobility and difficulties in hiring skilled STEM workers from abroad exacerbate the scarcities of human capital.

A third prominent weakness is the relatively limited funding and performance of R&D in Canada's private sector. By way of illustration, in 2017, business enterprises in Canada carried out approximately 52 percent of the country's total R&D spending. In the other G7 countries, business enterprises performed, on average, about 69 percent of total R&D.[23] In contrast, about 41 percent of R&D in Canada in that year was carried out by universities compared to 18.5 percent in other G7 countries. This distribution might help explain why Canada scores quite highly on the criterion of producing scientific publications, while at the same time lagging on commercialization of R&D.

There is less agreement between the two sources on other criteria listed in figure 1. For example, while both sources agree that Canada's overall financial system is strong and that large business can access capital on reasonable terms, there is some disagreement on the ease with which start-up and incumbent small and medium-sized business can access financial capital. Also, while the *Global Competitiveness Index* highlights

[23] See Statistics Canada, Table 27-10-0360-01. The other G7 countries are France, Germany, Italy, Japan, the UK, and the US.

a need for stronger IP protection in Canada, the *Global Innovation Index* does not.

Concluding comments

Innovation is a complex phenomenon that is not amenable to easy prescriptions for success. Nevertheless, several broad conclusions can be drawn. Namely, nations are likely to have more innovative economies when their governments forebear from suppressing market competition and provide a legal, regulatory, and tax environment that encourages investment in physical and human capital, both by domestic and foreign investors. In addition, while there is an important role for government to play in funding basic research, the funding and performance of applied research and development is better left primarily to private sector decisionmakers.

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Chapter 7

Enhancing Productivity Growth by Encouraging Entrepreneurship

By Russell S. Sobel

Invention versus innovation: Defining entrepreneurship

While *invention* is the creation of a new product or process, often facilitated by the knowledge of engineering and science; *innovation* is the successful introduction and adoption of a new product or process—the economic application of inventions and new techniques in the commercial marketplace. Understanding this difference is important because while developing the capacity to discover and create is an important step, these ideas must somehow find a commercial application to subsequently influence productivity growth. Importantly, most inventions are not profitable business ideas, and very few innovations require scientific invention or discovery. Refining or altering a production process in a way that drastically increases productivity is also innovative entrepreneurship, for example.

Some historical examples may help to clarify. While the modern upright electric vacuum cleaner was *invented* by a department store janitor named James Spangler in 1908, it was his cousin William Hoover who bought the patent and started the business that successfully produced the product commercially. Another more familiar example is the case of milkshake mixer salesman Ray Kroc, the entrepreneur famous for commercially developing the process of franchising (and the McDonald's brand) based on seeing Richard and Maurice McDonald's restaurant in California. Finally, Henry Ford's innovative use of the assembly line drastically increased the productivity of automobile manufacturing even though he wasn't the inventor of the automobile. Each of these examples represents a different aspect of innovative entrepreneurship, one involving the commercial introduction of a new product that is productivity enhancing, another the introduction of a productivity enhancing business model,

and finally, a productivity enhancing change to the process of commercial production.

These innovations are the defining feature of "entrepreneurship" according to scholars such as Joseph Schumpeter (1911/1934).[24] While entrepreneurship of the form we are discussing often is embodied in the creation of a new business venture, perhaps even a spin-off from an existing business organization, it also frequently occurs within existing business firms—a phenomenon known as "intrapreneurship." The revolutionary iPhone, for example, was introduced in 2007 after being developed within the Apple Corporation, which at that time had existed for over 30 years.

A variety of authors including Schumpeter (1911/1934), Baumol (2005), and Christensen (1997) argue that most breakthrough, disruptive innovations come from new, small start-up firms, and that large existing firms are best at incremental improvements to existing products and technology. However, this does not mean that the "intrapreneurial" advances made by existing firms, particularly large firms with well-developed research and development capabilities, are unimportant to productivity growth. One example is the massive improvements in computer chip manufacturing and processing speed developed and commercialized internally within the Intel Corporation. As Baumol (2005) points out, from 1971 to 2003, the speed of Intel's processor chips increased by 3 million percent, vastly improving the productivity of every computer and an uncountable number of production machines in the world.

What should be distinguished explicitly, however, is how innovations embodied in new business startups differ simply from opening a business more generally. Take as a contrasting example a person who opens a new Subway restaurant franchise location, adding to the over 40,000 locations worldwide in over 100 countries. While the difference is clearer in theory than in practice, the types of entrepreneurial innovation that greatly enhance productivity are ones that embody new ways of doing things that are "significantly" different from existing products or processes. Thus, a more generally accepted definition of the type of entrepreneurship we are discussing involves the commercialization of a new product or process through a start-up organization.

Often this innovation-commercialization process through new business start-ups involves trial and error. As Hayek (2002 [1968]) points out, the market process is one of discovery, and it is not possible for anyone to know in advance exactly which new ideas will be commercially successful. According to Levie, Don, and Leleux (2011), the true survival rates of new

[24] New innovations often result in the old ways of doing things going by the wayside, a process known as "creative destruction" (see Schumpeter (1911/1934, 1942) and Sobel and Clemens (2020)).

businesses in advanced OECD economies tend to be around 80 percent after one year and around 50 percent after five years. For Canada specifically, they provide corresponding figures of 85.2 percent and 50.5 percent respectively.[25] Also for Canada, Monk (2000) shows that 68 percent of businesses with fewer than 5 employees fail within 5 years, and 48 percent of business with 5 to 99 employees fail within five years.

Entrepreneurship and productivity growth

There are many studies that try to empirically document the link between entrepreneurship and productivity growth. The relationship is not easy to measure precisely due to difficulties in measuring both variables individually, although it is clearly positive.

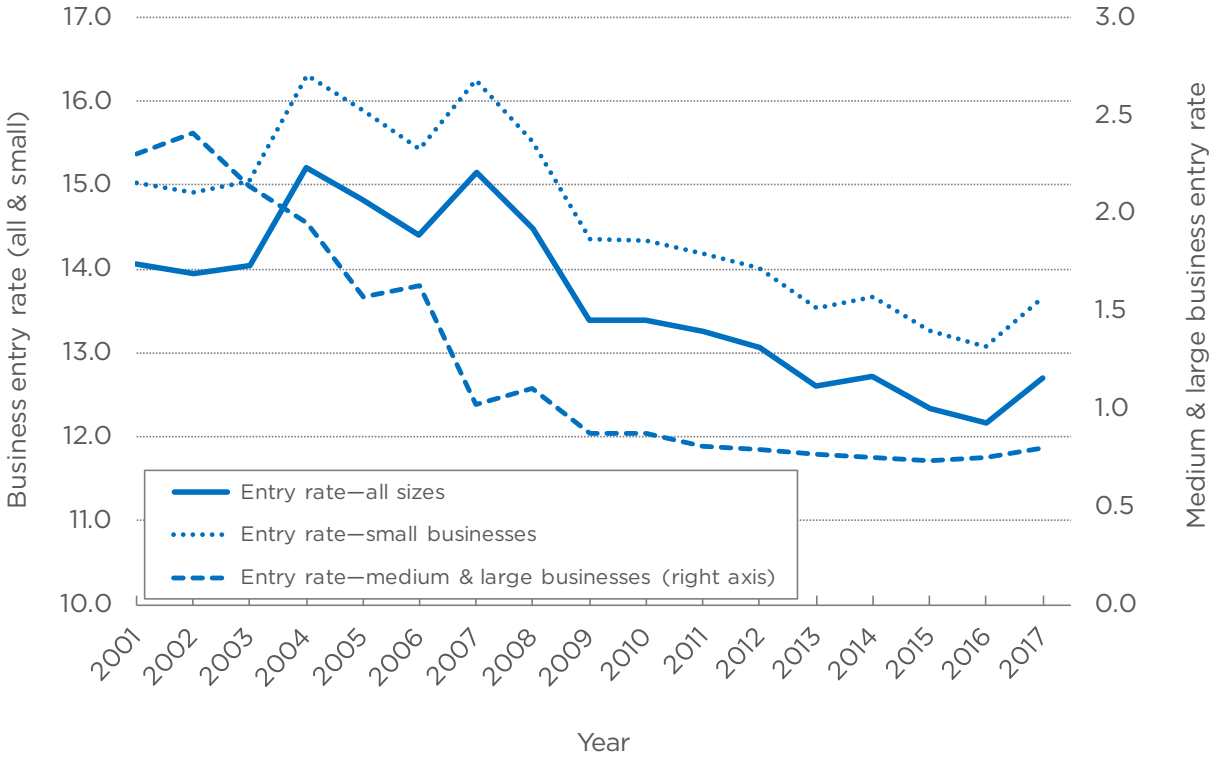
Wong (2015) contains the most comprehensive review of studies on the linkage between entrepreneurship and productivity. Wong begins by outlining and discussing the five ways entrepreneurial new firm entry impacts productivity: 1) the diffusion of new knowledge and technology to existing firms, 2) the creation of new industries, 3) competitive pressure on existing firms to innovate and complete with new entrants, 4) growth of new firms and the destruction/exit of less productive incumbent firms, and 5) failure and exit of new firms. In Wong's review of the over 40 studies on the issue, he finds that entrepreneurship is generally strongly, and positively, related to both the growth of labour productivity and total factor productivity, particularly when examining developed (OECD) countries. While no studies examine Canada specifically, even in the raw data there is a strong positive correlation of 0.76 between measures of Canadian multifactor productivity and the entry rate of new business firms with 20 or more employees.[26]

While the link between productivity growth and entrepreneurial activity is clear, the bad news is that measures show that entrepreneurial

[25] Accordingly, true start-up "business failure" rates appear to be around half to a third of the inverse of the survival rate (i.e., 100 percent minus the survival rate), depending on how failure is defined, because many new businesses are either sold, legally reorganized, or disbanded due to other reasons than a market driven failure. Interestingly, as Levie, Don, and Leleux (2011) argue, this true rate in the data is lower than the rate popularly, and casually, cited that only 50 percent survive the first year, which is based on misleading or undocumented sources, as they illustrate.

26 Defined as those with 20 or more employees per the description in the next paragraph combined with data from Statistics Canada, Table 36-10-0208-01: Multifactor productivity, value-added, capital input and labour input in the aggregate business sector and major sub-sectors, by industry <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610020801>, as of July 1, 2020.

Figure 1: New Business Entry Rate in Canada, 2001-2017



activity, measured by new business formation, has been on a downward trend in most of the developed world, including Canada. Figure 1 shows this data for Canada from 2001 to 2017.[27] Specifically, the data show the number of new business entrants per 100 active private employer businesses each year, including separately the trends for small businesses (those with fewer than 20 employees) and other medium and large businesses (20 or more employees). By 2017, both had fallen from their initial values, with the medium and large firm entry rate a meager one third of its initial 2001 level. These meaningful reductions were clearly aided by the 2008/09 recession, but the downward trend, especially for medium and large firms, began earlier and both have stagnated or continued to fall since. Obviously, the additional economic downturn associated with the COVID-19 pandemic in 2020 will drive these numbers even lower once data is available for more recent years.

27 Data for figure 1 and table 1 are from. from Statistics Canada, Table 33-10-0164-01: Business Dynamics measures, by industry, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3310016401>, as of July 1, 2020.

Table 1: New Business Entry Rate by Industry Sector in Canada, 2001 to 2017 change

Industry classification by sector	Sector size (percent of all businesses)	Entry rate 2001	Entry rate 2017	Percent change
All private	100.0%	14.1	12.7	-10.7%
Agriculture, forestry, fishing and hunting	4.9%	11.8	9.5	-23.8%
Mining, quarrying, and oil and gas extraction	0.8%	15.6	11.2	-38.6%
Utilities	0.1%	12.8	11	-16.8%
Construction	14.3%	14.1	12.5	-13.0%
Manufacturing	4.4%	9.6	7.1	-35.2%
Wholesale trade	4.3%	10.3	6.1	-69.4%
Retail trade	9.5%	11.2	9.2	-21.8%
Transportation and warehousing	6.9%	15	13.9	-8.6%
Information and cultural industries	1.2%	15.7	11.4	-37.4%
Finance and insurance	3.2%	13.2	13.5	2.2%
Real estate and rental and leasing	5.2%	13.3	12.9	-3.3%
Professional, scientific and technical services	14.7%	16.7	12.9	-29.7%
Management of companies and enterprises	0.6%	15.6	8.7	-78.5%
Administrative and support, waste management and remediation services	4.8%	16.3	11.7	-39.9%
Arts, entertainment and recreation	1.8%	13.3	10.1	-31.9%
Accommodation and food services	6.9%	14.5	11	-31.8%
Other services (except public administration)	9.9%	13.7	8.7	-57.9%
Unclassified businesses	6.5%	51.6	36.8	-40.0%

It is important to note that these reductions in entrepreneurship measured by new business entry are not isolated to just one or a few major industrial sectors. Table 1 shows the entry rates for 2001 and 2017, and the percentage change by industrial sector, along with data showing the importance of each sector in the economy (percentage of all businesses that are in that sector). Again, these are the number of new business entrants per 100 active private employer businesses in the year indicated. Every sector, with the exception of finance and insurance, has seen reductions in new firm entry. The reduction in new business entry in the largest industrial category, "professional, scientific and technical services," which com-

prises almost 15 percent of all firms and is obviously an industry closely related to productivity, was almost 30 percent over the period.

While a variety of factors are behind this trend of declining entrepreneurship rates in Canada, including demographic changes, policy reforms to promote entrepreneurship can help to reverse this trend.[28] One of the most compelling aspects of the literature on the relationship between productivity growth and entrepreneurial activity is that the strong positive relationship between them seems to clearly depend on the quality of a country's economic policies and institutions as the findings of Wong (2015), van Praag and Versloot (2007), and Bajona and Locay (2009) show. Less-developed economies and those that contain higher degrees of government central planning tend to have higher rates of "necessity" and "unproductive" entrepreneurship. In these economies, the lower rewards and overall difficulty of starting and operating a private business lead to many individuals having to engage in household production or lobbying and rent-seeking to survive.[29] The studies mentioned above generally use the Economic Freedom of the World (EFW) index by Gwartney, Lawson, Hall, and Murphy (2019), as it measures of the degree of reliance on market economic institutions.[30] On the opposite side of the spectrum, economies with strong market institutions have the strongest relationships between entrepreneurship and productivity growth, even for what might be considered mundane industries such as retail food and services (see Toh and Thangavelu, 2017).

Policy recommendations

Based on this literature, it is possible to develop a set of policy recommendations that can help increase the rate of innovative entrepreneurship and intrapreneurship that will raise productivity and prosperity.

[28] See Sobel (2018) for more information on these trends.

[29] See Sobel (2008, 2015) and Baumol (1990) for additional information on unproductive entrepreneurship and its link to economic freedom and institutions.

[30] A country's economic policies and institutions, as measured by the Economic Freedom of the World (EFW) index, fall into five overall area groups: the size of government; legal system and property rights; sound money; freedom to trade internationally; and regulation.

1. Consider the incentives (and disincentives) influencing entrepreneurial innovation

One of the most noted scholars in entrepreneurship, Kirzner (1973, 1997), stressed that profit provides incentives to engage in entrepreneurial discovery and innovation. The higher the potential rewards, the more experimentation and commercialization will take place. When high tax rates lower the return to entrepreneurial initiatives, this lowers innovation—so entrepreneurship (and thus productivity) can be increased by reducing the marginal tax rates on both small businesses and corporations. Strong protection of intellectual property through patents, trademarks, and copyrights also helps to generate higher rewards, which are temporarily protected from competition, and thus help to create larger "prizes" that incentivize the investments needed to discover and commercialize new ways of doing things.

2. Profits, losses, taxes, and subsidies: Create a level playing field

The profit and loss system is a quick and efficient mechanism that gives feedback to entrepreneurs as to whether their idea is valuable enough to consumers to cover the resource cost of production. Taxes and subsidies that distort the profit and loss system reduce the efficiency by which this mechanism operates. To promote entrepreneurship and productivity growth, government should try not to unduly interfere in the profit and loss signals of private markets through distortionary and selective taxes and subsidies. Government should also avoid interfering with the normal competitive process that discovers the efficient size and scope of firms, and level of industry concentration. Anti-trust policy, for example, which breaks up or constrains the growth of firms attempting to become more efficient in scale or scope or through acquisition of small firms with innovative ideas, risks imposing unintended and negative secondary effects on productivity growth.[31] Ensuring markets are open for competition, our next point, is the key factor to ensure that markets work relatively efficiently, even if they are concentrated, and this is a much better strategy than breaking up large firms through anti-trust laws.

[31] Bourne (2020) points out that in modern technology-based economies, rising industry concentration tends to be associated with robust productivity growth.

3. Lower barriers to ensure competitive markets

One of the key hurdles that affects entrepreneurs are regulations and other barriers that make it costly or more difficult to start a new business, particularly one that might compete with existing firms. As Calcagno and Sobel (2014) show, government regulations, permitting processes, and taxes with high compliance costs often function as fixed costs that make it difficult for small firms to open. Larger incumbent firms with tax and legal departments tend to have the upper hand. But since small firms are a key part of the entrepreneurial process, lowering these barriers, especially through policies that waive some of these obstacles for new firms (regulatory "sandboxes") can promote entrepreneurship.[32] A recent study by Geloso (2019) found that roughly one third of the Canadian economy is shut off from powerful competitive forces through barriers to entry. Making these markets open for competition by reducing the barriers to entry that were pointed out in that study can promote entrepreneurship and productivity growth. Geloso's chapter in this volume reviews his evidence on this subject and provides additional insights along these lines.

4. Reduce barriers to trade and exchange across borders

Freedom to trade and exchange, both within a country internally and across international borders, is essential for the development of economies of scale and the dissemination of ideas. As the father of economics, Adam Smith, pointed out, specialization is limited by the extent of the market. When producers can sell to a larger marketplace, they can increase specialization, and thus productivity. In large consumer markets, for example, small specialty stores are able to succeed. These same specialty stores would likely not be able to survive in a small town. When firms can find ways to reach out to larger marketplaces, and penetrate the markets of other states, provinces, or nations, and sell to a global marketplace, they can specialize more finely and increase the division of labour and productivity.

Similarly, the threat of international competition not only disciplines firms, but allows consumers and workers to benefit from productivity enhancements throughout the world and incorporate them into their daily lives and into the goods and services they produce for others. Thus, lowering domestic and international barriers to trade can increase entrepreneurship and productivity.

[32] See Knight (2019) for an introduction to regulatory sandbox design policy issues.

5. Be open to new ideas and immigrants

Immigrants disproportionately (to their share of the population) start new businesses.[33] Furthermore, as Zelekha (2013) shows based on data across 176 countries, these positive effects are magnified as the flow of immigrants grows. Immigrants bring new ideas helping to create an environment conducive to the discovery and commercialization of new combinations of resources and technology. Innovation often occurs when individuals from different backgrounds come together and share ideas. Sobel, Dutta, and Roy (2010), for example, find that a variety of measures of innovative entrepreneurship including business startups, patents, and venture capital in an area are all increased as the degree of cultural diversity grows. Helping to lower the barriers to the mobility of individuals in ways that increase immigration and cross-fertilization of ideas can foster entrepreneurial innovation.

6. Celebrate, respect, and don't discourage entrepreneurs and successful businesspeople

Prior to the 1700s, the most well-respected people in society were usually military, political, or religious leaders who obtained their riches through conquest, government power, and violence. An intellectual revolution subsequently occurred in which the "bourgeoisie"—the commercial class of traders, businesspeople, and owners of capital who earn their income through voluntary trade, entrepreneurship, and innovation—also began to be respected and honored. McCloskey (2006) argues this was the start of the "Great Enrichment"—the birth of a commercial society in which people were free to trade, innovate, and compete; and in which becoming wealthy from doing so was considered noble. This change in social structure has produced the longest sustained period of wealth creation in human history—one that is still ongoing.

Even in today's society, some people still wish to vilify successful businesspeople and entrepreneurs, view their rewards as unearned, and levy high taxes on capital, wealth creation, and business income. To promote entrepreneurship, we must instead work to ensure a society in which these individuals are celebrated for their contributions—one in which children aspire not just to be doctors or lawyers—but also to be successful entrepreneurs. While much of this is cultural, it is also reflected in the

[33] See Kerr and Kerr (2016) and Fairlie and Lofstrom (2015) for overviews, and Fairlie, Zissimopoulos, and Krashinsky (2010), Fairlie, Zissimopoulos, Krashinsky, and Kumar (2010), and Razin and Langlois (1996) specifically for Canada.

public policies we adopt regarding how heavily we regulate businesses and tax capital, wealth, and business income.

Conclusion

The rate of new business formation and entrepreneurship has been on a sustained downward trend in Canada. Given the close link between entrepreneurship and productivity growth, the consequences are clear. Policy changes that help to better encourage the initiation and expansion of new business ventures can help to reverse this trend, leading to faster productivity growth and greater prosperity for all citizens. Entrepreneurship can also be encouraged by ensuring that a career as a successful entrepreneur or business owner is viewed as worthwhile and respected way to contribute to progress and well-being.

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Chapter 8

Entrepreneurial Finance and Productivity in Different Institutional Contexts: Lessons from Equity Crowdfunding

Douglas Cumming and Sofia Johan

To finance growth, entrepreneurial firms need external financing. While bank finance is the most common for entrepreneurial firms,[34] many firms do not have sufficient collateral and/or stable cash flows to enable them to obtain or maintain debt finance. Equity finance has traditionally been available from angel investors and venture capitalists (VCs). But the presence of angels and VCs does not imply that the market for entrepreneurial finance is complete or without gaps of underserved entrepreneurs with good ideas and scant capital. In most countries around the world over the last decade, the biggest change to the landscape of equity finance for entrepreneurs has been the introduction of equity crowdfunding (Cumming and Johan, 2019).

There is substantial evidence consistent with the view that equity crowdfunding facilitates productivity growth. Equity crowdfunding deepens capital markets for startups, particularly at the most nascent stage of entrepreneurial firm development, thereby lowering costs of entry for startups. As such, equity crowdfunding is an important instrument for introducing and spreading new technology, which improves productivity. Empirical evidence is supportive. For example, large sample evidence is consistent with the view that crowdfunding improves small firm growth (Eldridge, Nisar, and Torchia, 2019; Stevenson, Kuratko, and Eutsler, 2019), enables the development of smart cities (Carè, Trotta, Carè, and Rizzello,

[34] See Cosh et al. (2009) for UK evidence, and Robb and Robinson (2014) for US evidence.

2018), and enables firms to get to the next level in subsequent capital raises (Signoria and Vismara, 2018).[35]

Given the importance of equity crowdfunding to entrepreneurial finance and productivity, in this chapter we address two interrelated questions. First, is there a sufficient supply of equity crowdfunding in Canada? We address this question by examining comparative evidence across Canada, Australia, New Zealand, the UK, and the US. Second, what might explain the comparative supply of equity crowdfunding in Canada relative to other jurisdictions?

To begin, it is important to understand the institutional context in which equity crowdfunding operates in Canada. Securities regulation in Canada is fragmented by province. Each province has its own securities commission and its own set of securities laws and enforcement regime. Equity crowdfunding is of course no different, with different sets of rules in different provinces. Equity crowdfunding exemptions were introduced in Canada in the different Canadian provinces in 2016 after lengthy discussions over the preceding few years.

A key difference between the rules in the different provinces is whether or not financial statements need to be audited or not in conjunction with the use of an equity crowdfunding exemption. Under the "Start-Up Crowdfunding Exemption" model adopted in British Columbia, Saskatchewan, Manitoba, Quebec, New Brunswick, and Nova Scotia, financial statements are optional**,** and if they are included then they may be audited or unaudited, and use either IFRS or PE-GAAP (NCFA, 2016).[36] Under the "Integrated Crowdfunding Exemption" model adopted in Manitoba, Ontario, Quebec, and New Brunswick, audited financial statements are required if the issuer raised $750,000 or more under all prospectus exemptions, or if the issuer is a reporting issuer. If the issuer raised between $250,000 and $750,000, then unaudited IFRS financial statements are required along with a review report. If the issuer raised less than $250,000, then unaudited financial statements are required.

[35] Cumming and Johan (2019) discuss the relation between equity crowdfunding and other sources of entrepreneurial finance and whether or not they are complements or substitutes. To date, there is some evidence of possible friction between the use of different sources, and other evidence of a complementary role. Overall, more research on the topic is needed.

[36] Note: IFRS refers to the International Financial Reporting Standards, or the set of rules to make financial statements comparable around the world, including fair value measurement (IFRS, Undated). PE-GAAP refers to Private Enterprise Generally Accepted Accounting Principles, which has fewer disclosure requirements such as the exclusion of management compensation (Lebow, 2010).

Industry commentators have noted that the audited financial statement requirement is regulatory overkill due to the direct costs it imposes on the company. For example, *Crowdfund Insider* stated

> There is also little to no interest by issuers in using the integrated crowdfunding exemption to raise capital. **No one is using it.** In fact, you would need to be a crazy person to use it if you were a tech startup or non-reporting issuer. The rule requires issuers to provide financial statements which are… audited…" [emphasis in original] (Alois, 2016, July 27)

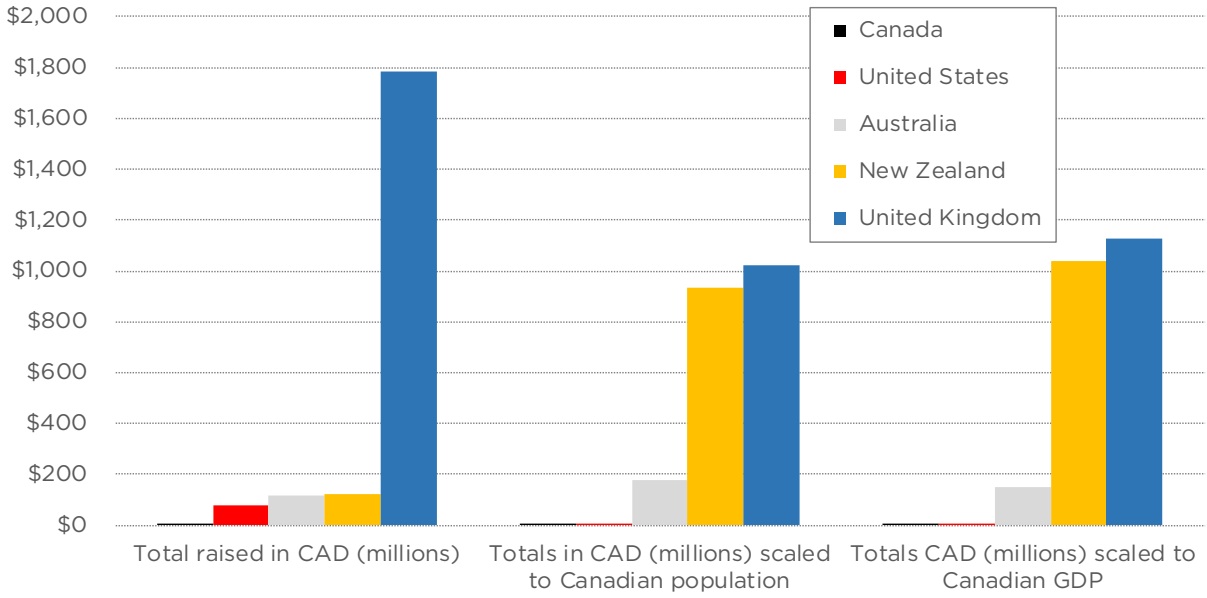
Regulatory fragmentation is an additional problem. Each of the different Canadian provinces has its own regulator, rather than a single one at the national level (Rose, 2019, June 26). On February 27, 2020, the Canadian Securities Administrators (CSA) proposed to harmonize the existing set of rules under proposed *National Instrument 45-110 Start-Up Crowdfunding Registration and Prospectus Exemptions (NI 45-110)* (CSA, 2020, February 27). On July 30, 2020, the Ontario Securities Commission introduced an interim order to reduce some of the restrictions in Ontario and come closer to harmonizing with the crowdfunding rules in other Canadian provinces. A notable change has been the items that accompany an offering document under start-up crowdfunding: "6.5 Indicate whether the issuer has financial statements available. If yes, include the following statement, in bold type:

> **Information for purchasers: If you receive financial statements from an issuer conducting a start-up crowdfunding distribution, you should know that those financial statements have not been provided to or reviewed by a securities regulatory authority or regulator. They are not part of this offering document. You should ask the issuer which accounting standards were used to prepare the financial statements and whether the financial statements have been audited. You should also consider seeking advice of an accountant or an independent financial adviser about the information in the financial statements.**" (CSA, 2020, February 27)

These changes appear to be worthwhile. Crowdfunding in Canada has largely been taking place in jurisdictions that offer the Start-up Crowdfunding Exemption model, particularly British Columbia, but 2020 has seen the beginning of deals in Ontario with the push towards harmonization and a lower regulatory burden (Kirkwood, 2020, January 27).

How does the size of Canada's equity crowdfunding market compare to its counterparts in the US, UK, Australia, and New Zealand? Figure 1

Figure 1: Total Raised Equity Crowdfunding, 2016-2019



Sources: *Canada*: Stikeman Elliott (2020, August 4); *United States*: data search at Crowd Data Track (https://crowddatatrack.com/); *Australia*: Statista (Undated a); *New Zealand*: Kavanagh and Muir (2017) and Craig and Muir (2019, April 25) (and 2019 data assumed same as 2018 data for New Zealand, due to absence of 2018 estimates and based on information from Schwartz (2019)); *United Kingdom*: Statista (Undated b), and Alois (2019, July 25).

provides data from 2016-2019. This four-year aggregated period is used here, as equity crowdfunding markets were first operational in 2016 in Canada and the US. These countries are similar insofar as they all follow the UK common law tradition[37] and have similar regulatory (World Bank, 2020) and securities regulatory structures (La Porta et al., 2006). However, they could not be more different in their approach to equity crowdfunding regulation and the outcomes.

Figure 1 shows that Canada has the smallest market overall, on a GDP- and a population-adjusted basis, with only $3.5 million raised under retail equity crowdfunding over 2016-2019.[38] By comparison, in the US, $79.2 million was raised with equity crowdfunding over 2016-2019. The

[37] These countries follow common law rules, with exceptions in Louisiana in the US, and Quebec in Canada.

[38] Unless otherwise indicated, all amounts here are expressed in Canadian dollars.

size of the US market is much larger than that in Canada, and the regulatory limits for raising capital in the US are much less stringent than in Canada. In the US, promotors can raise $US1,070,000 in a 12-month period with crowdfunding (inflation adjusted each year) (US SEC, 2020), while in Canada under the start-up crowdfunding exemption, the limit is $250,000 per offering, and $500,000 every 12-month period (and only 2 offerings per 12-month period) (NCFA, 2016). These limits in Canada are unusual, as in other countries such as the UK and Australia, the average capital raise in equity crowdfunding is normally $300,000 or more, and the larger offerings raise over $1 million (Cumming and Johan, 2019). In Israel, a successfully equity crowdfunded company—ReWalk—raised over $1.3 million on OurCrowd, and within a year and a half after crowdfunding, Rewalk successfully listed on NASDAQ in the US. Such success would not have been possible under the restrictions currently in place in Canada and the US as the ReWalk crowdfunding campaign raised more than what is allowed in Canada and the US.

In Australia, equity crowdfunding has existed since the mid-2000s (Cumming and Johan, 2019), while legislation introduced in 2017 formalized its existence. The size of the equity crowdfunding market in Australia in 2016 was $10.51 million, and with the regulatory change, it jumped to $31.7 million in 2017 and reached $34.0 million in 2019. Commentators have applauded the formalization of the crowdfunding market, but at the same time criticized the restrictions on capital raising for issuers (Nehme, 2017, March 22).

New Zealand, by contrast (Schwartz, 2019), has no mandatory disclosure, no individual investment limits, and no restrictions on equity crowdfunding. The results are striking. Equity crowdfunding began in New Zealand in 2014. Over 2016-2019, individuals and businesses in the country raised a total of $122.9 million in equity crowdfunding. New Zealand's crowdfunding market is 269 (300) times larger than Canada's on a per-population (per GDP) basis.

Equity crowdfunding has been available in the UK since 2011. The UK is the leading equity crowdfunding market in the world, with a total of $1.8 billion raised in equity crowdfunding over 2016-2019. The size of the UK market is partly related to light touch regulation, but perhaps is due more to the high reputation of world-leading platforms like CrowdCube and Seedrs. Empirical work is highly consistent with the view that platforms that carry out more due diligence are much more likely to have successful entrepreneurial crowdfunding, and attract more investors (Cumming and Johan, 2019). Moreover, the UK offers significant tax incentives that allow investors to offset their crowdfunding investments against their tax liabilities (Rose, 2019, June 26).

Equity crowdfunding rules are important as they can prevent fraud. But the frequency of crowdfunding fraud as a percentage of crowdfunding campaigns is very low (well under 1 percent) relative to the frequency of fraud among publicly traded companies as a percentage of publicly traded companies (around 2 to 7 percent per year) depending on the year and exchange.

Crowdfunding markets function in ways predicted by economic theory. Empirical evidence from a very large number of studies shows that when there is better voluntary disclosure, investors invest more; when voluntary disclosure is absent, investors tend to not invest at all (Cumming and Johan, 2019). The presence of regulation tends to limit choice for investors without changing the underlying decisions that investors make. To date, apart from the comparative evidence in figure 1, no systematic study links specific crowdfunding regulations to crowdfunding market size. There is, nevertheless, empirical evidence that relatively more fintech investment takes place in jurisdictions with less regulatory oversight (Cumming and Schwienbacher, 2018), that inefficient crowdfunding platform policies can dampen crowdfunding activity across countries (Rossi et al., 2019), that better securities laws and trust facilitate crowdfunding (Rau, 2017), and that inefficient and more stringent crowdfunding regulation stifle crowdfunding market development (Hornuf and Schwienbacher, 2017).

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Chapter 9

Increasing Productivity Through Tax Reform

By Alex Whalen and Jake Fuss

The structure and rates of taxation are important in any discussion of productivity in Canada because the various types of taxes, as well as tax rates, affect economic behavior in different ways. Three prominent types of taxes in Canada are business taxes, capital taxes, and personal income taxes, and each of these is related to productivity. It is worthwhile to begin by considering the efficiency of these different types of taxes.

Taxation efficiency levels are important for productivity because taxes impose economic costs by altering the behaviour of individuals and businesses.[39] For instance, personal income taxes reduce after-tax wages, thereby affecting how much people are willing to work (Veldhuis and Clemens, 2006; Palacios and Harischandra, 2008). Similarly, taxes on businesses increase the prices of goods, services, and business inputs, which can distort efficient production decisions. By changing the incentives and resulting behaviour of individuals and businesses, taxes can have adverse effects on private sector productivity by reducing savings, investment, the supply of labour, entrepreneurship, and innovation (Veldhuis and Clemens, 2006).

To be sure, some taxes impose greater economic costs on society than others. The cost of various types of taxes can be quantified by using a mechanism known as marginal efficiency cost (MEC). Specifically, the MEC of taxes calculates the efficiency cost of raising one additional dollar of revenue from a particular tax. A number of studies on MECs demonstrate that due to their incentive effects, taxes on corporate income (CIT)

[39] Administrative costs associated with imposing and collecting taxes also employ productive resources. These costs are included in the marginal efficiency cost of taxes, which is discussed below.

and personal income (PIT) are much less efficient and impose higher costs on society than consumption and payroll taxes (Baylor and Beauséjour, 2004). Further, research has shown taxes on capital (i.e., capital gains taxes) to be among the most economically damaging and least efficient types of taxation (Veldhuis and Clemens, 2006).

Ferede and Dahlby (2019) use a similar concept called the marginal cost of public funds (MCF) to illustrate the welfare loss (i.e., loss in economic efficiency) when Canadian governments use taxes to raise an additional dollar of revenue. Their analysis finds that in all provinces the MCF for taxes on corporate and personal income are higher than the MCF for consumption taxes. For instance, raising an additional dollar of tax revenue for CIT and PIT in Quebec is found to cost society $3.46 and $3.06, respectively. Meanwhile, the MCF for sales taxes is only $1.92. Simply put, some of the most economically damaging taxes in society are those imposed on incomes and capital of businesses and individuals.[40]

These insights suggest that it is beneficial for Canada to rely less than it currently does on costlier taxes such as capital gains, CIT, and PIT. In fact, moving away from the most damaging types of taxes is an efficient way to improve economic and productivity growth.

Business taxes

As business taxes are so economically harmful, it is worth looking more closely at the relationship between business taxes and productivity. Particularly important is how business taxes affect investment, which is a major factor influencing labour productivity in Canada.

Labour productivity is a function of capital investment (Rao, et. al), which is influenced by corporate tax rates. For instance, a study published by the National Bureau of Economic Research evaluated the relationship between corporate taxes and investment across 85 countries. It noted that "corporate tax rates have a large and significant adverse effect on corporate investment and entrepreneurship," and concluded simply that "corporate taxes matter a lot" (Djankov, et al., 2008).

In recent decades, Canada has experienced poor productivity growth, which research suggests may be due to "an economic environment that penalizes, rather than promotes, capital investment" (Veldhuis and Clemens, 2006). Other empirical evidence supports this statement. In particular, there is a strong, long-term positive relationship between in-

[40] Obviously, government spending also has economic effects that differ given how tax revenues are spent. For this discussion, we assume that that government spending programs are independent of how tax revenues are raised.

vestment in machinery and equipment and productivity growth in Canada (CBOC, 2020). Further, research from the OECD has demonstrated a link between weak investment growth and weak productivity growth across member countries (Ollivaud, et. al., 2016).

Recent research ranks Canada poorly in labour productivity, placing it 12th out of 17 comparable countries (CBOC, 2020). Part of this poor performance is related to Canada's unfavourable business tax competitiveness, which discourages capital investment, thereby harming productivity growth.

As recently as 2017, Canada's corporate tax rates were below the weighted average of OECD countries. However, as authors Phillip Bazel and Jack Mintz reveal in their annual tax competitiveness report, Canada's business taxes are now higher than the average (Bazel and Mintz, 2020). Among OECD countries, Canada had the 10th highest corporate income tax rate in 2019 at 26.2 percent—higher than the United States, Sweden, Norway, and Denmark (Bazel and Mintz, 2020).

In recent years, the United States has pursued aggressive reductions in corporate income taxes and has implemented other tax reforms. For example, reforms enacted in January 2018 led to a dramatic reduction in the US federal general corporate tax rate—from 35 percent to 21 percent. Perhaps as a response to US changes, other OECD countries, including France, India, Norway, and Sweden, have also pursued recent corporate tax reductions (Bazel and Mintz, 2020). Canada has not responded in a similar fashion, and as such finds itself far less competitive on business taxation than it was three years ago.

Canada is a small open economy, and Canadian corporations will decide where to invest based in part on domestic versus foreign tax rates. Relatively high business taxes in Canada can therefore be expected to discourage domestic investment as companies choose instead to invest outside of Canada, other things constant. Given the important relationship between taxes and investment on the one hand and investment and productivity on the other, Canada's waning competitiveness on business taxes is raising deep concern about its productivity prospects. One study by Harvard economist Robert Barro estimated that corporate tax reductions in the United States between 1968 and 2013 increased total factor productivity (i.e. overall productivity growth as opposed to simply labour or capital) by about 4 percent cumulatively over that time (Barro, 2019). Should that historical trend continue with the recent US tax reductions, Canada will find its productivity performance lagging even further behind that of the US. Consequently, lowering business taxes is an important first step to enhancing Canada's productivity performance.

Capital taxes

Capital gains taxes also affect investment and productivity. Canada presently ranks in the middle of the pack among OECD countries in the taxation of its capital gains (Bedard, 2017). Some countries, including Switzerland and New Zealand, have eliminated capital gains taxes entirely, and research has shown that reducing capital gains taxes could have positive effects on productivity (Bedard, 2017; Clemens and Globerman, 2018).

Specifically, capital gains taxes create perverse incentives that are damaging to economic growth. For example, they provide an incentive for people to retain existing investments to avoid paying taxes when alternative and more productive investments may be available (Clemens et al., 2017). Productivity would improve if, rather than holding on to existing investments in order to avoid paying capital gains taxes, investors and entrepreneurs sold them and reinvested the proceeds in more productive investments.

Moreover, capital gains taxes have an adverse effect on entrepreneurship and innovation, both of which are critical to productivity (Clemens et al., 2017; Clemens and Globerman, 2018). Entrepreneurs take on risk by investing their own time and capital to create new products, services, and technologies with hopes of profiting from their investment. Capital gains taxes diminish the reward that entrepreneurs and investors expect to receive from the sale of businesses whose values have increased over time. By discouraging innovative entrepreneurship, capital gains taxes contribute to slower productivity growth.

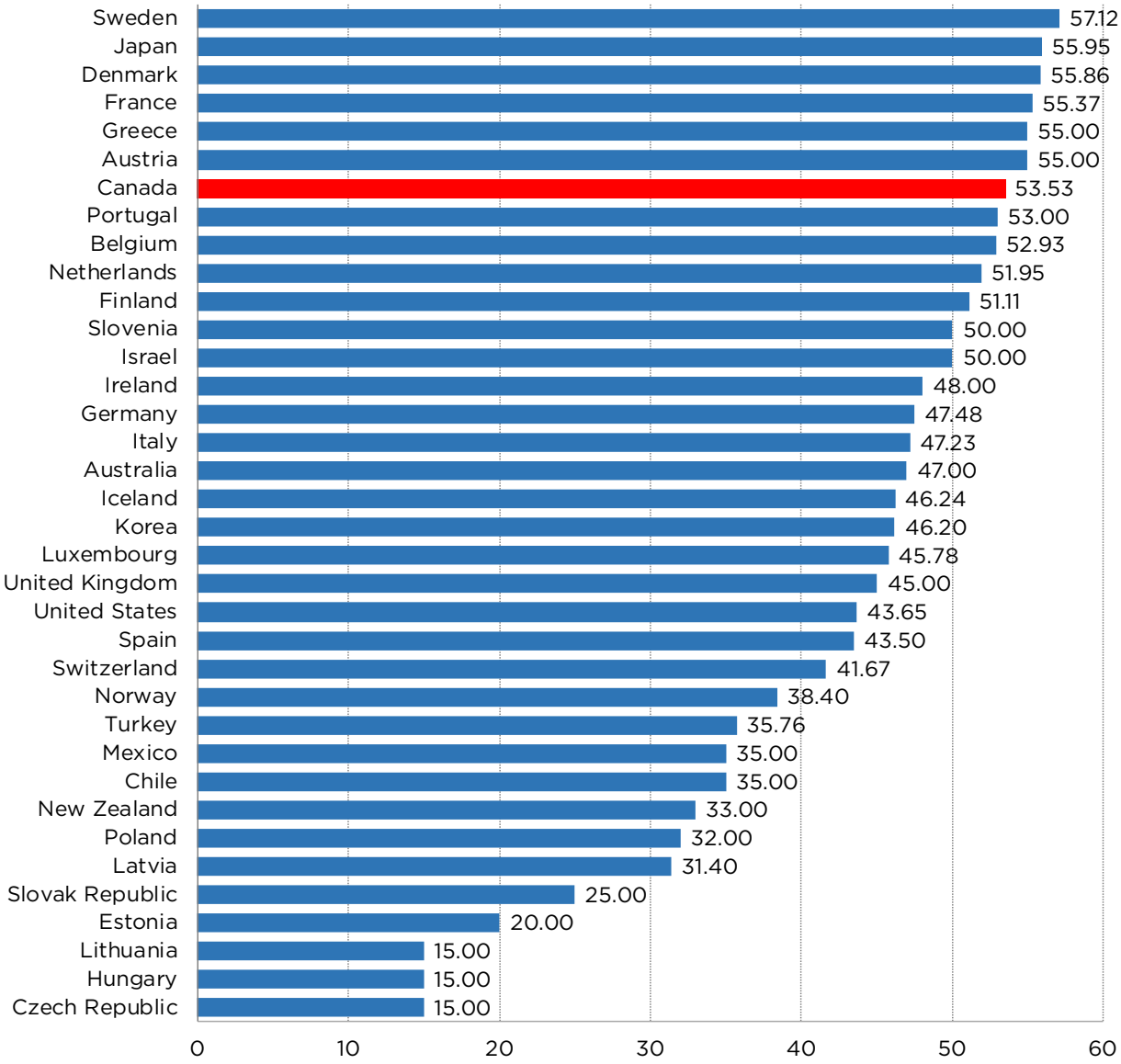
The Liberal government of former Prime Minister Jean Chrétien and Finance Minister Paul Martin clearly understood the costs associated with capital gains taxes. In his 2000 budget speech, Finance Minister Martin emphasized that "A key factor contributing to the difficulty of raising capital by new start-ups is the fact that individuals who sell existing investments and reinvest in others must pay tax on any realized capital gains" (DOF, 2000). The Chrétien Liberals recognized that Canada's tax system needed to ensure businesses had access to capital. A key aspect of achieving this objective was to reduce taxes on capital gains.

Overall, research suggests that reducing capital gains tax rates is a strong policy option for improving Canada's poor productivity record.

Personal income taxes

Canada also has uncompetitive personal income tax rates which is having a negative effect on productivity growth. Since 2009, tax hikes at the

Figure 1: Top Combined Statutory Marginal Income Tax Rates in OECD Countries, 2018



Notes

1) The graph shows the highest combined statutory personal income tax rate that is applied on earned income, taking into account that some personal income taxes may be deductible from the base of other personal income taxes, but before any other tax deductions. The top statutory tax rates are the combined rates of the national and subnational governments.

2) For countries with subnational and/or local personal income tax rates, the OECD calculates the combined rate by either taking an average of the subnational/local rates or selecting a jurisdiction that OECD considers representative. In Canada's case, the "representative" jurisdiction is Ontario; in the case of the United States, it is Detroit, Michigan.

Source: Hill et al., 2020.

federal and provincial levels have increased personal income tax rates in every province. In particular, the Trudeau government raised the income tax rate on entrepreneurs, professionals, and business owners from 29 percent to 33 percent in 2015.

As a result, out of 61 jurisdictions in Canada and the United States, nine Canadian provinces are among the top 10 least competitive tax jurisdictions in the top combined (i.e., federal plus the provincial/state) PIT rate (Hill et al., 2020). Put differently, 48 of the 51 US jurisdictions have lower top personal income tax rates than every Canadian province. Further, Canada had the seventh-highest top combined tax rate among 36 OECD countries in 2018 (Hill et al., 2020).

Further, Canada's tax rates are uncompetitive across a wide range of income levels. In 2019, all 10 provinces were among the top 10 least competitive tax jurisdictions at $300,000, $150,000 and $50,000 in income (Hill et al., 2020). Similarly, eight provinces were among the top 10 least competitive tax jurisdictions at the $75,000 income level.

These high marginal income tax rates put Canada at a competitive disadvantage in attracting and retaining highly skilled workers and entrepreneurs—the people who drive innovation and job creation. Moreover, high PIT rates can deter people from starting, expanding, or relocating businesses in Canada. Research shows that Canada is losing many of its best and brightest innovators to the United States and other countries around the world due to its high tax rates. For instance, Globerman (2019) notes that Canada fares poorly compared to the United States in attracting the most productive and highly educated immigrants that are trained in the science, technology, engineering, and math (STEM) disciplines.

High marginal tax rates on personal income also create disincentives to work, save, and invest—activities that are key to productivity advancement and long-run economic growth. Canadians are discouraged from engaging in these productive economic activities because high taxes lower their after-tax pecuniary reward when they work an extra hour, invest in their education, or save and invest their money. Notably, a 2008 study shows that high marginal tax rates reduce growth both for the economy as a whole and for personal incomes (Palacios and Harischandra, 2008). Additional research from the OECD found that high PIT rates also impede long-run productivity growth by deterring entrepreneurial activity (Vartia, 2008).

Former Prime Minister Paul Martin acknowledged these economic principles when he emphasized the importance of personal income tax relief in increasing "incentives for Canadians to learn, work, save and invest" while creating the conditions for strong economic growth (Canada, 2004: 159).

Lowering marginal tax rates on personal income in Canada would encourage growth in productivity by improving economic incentives.

Specifically, Canadians would retain more of the financial benefits created when they work, invest, or start a business. Reducing personal income taxes would also improve Canada's competitiveness and make the country more attractive for highly skilled workers and educated immigrants. As the world continues to shift more towards a dynamic, knowledge-based economy, attracting more highly skilled workers is a crucial step for Canada to enhance its productivity.

Conclusion

Clearly, the levels and structure of taxation in Canada are important considerations for addressing the country's much-needed productivity growth. Generally speaking, Canada is uncompetitive with other OECD countries on business taxes, capital gains taxes, and personal income taxes. Research also demonstrates that Canada's reliance on these types of taxes is harmful because it imposes a high cost on society. Were it to lower its taxes on business, capital gains, and personal income, the country could shift away from the most economically damaging types of taxes while efficiently improving productivity growth. If Canadian policymakers wish to enhance the country's dismal record on productivity growth, they should not discount the importance of tax reform.

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Chapter 10

Putting Government on a Financial Diet: The Role of Statutory Fiscal Rules

By Jack M. Mintz

The COVID-induced recession has led to unprecedented federal and provincial spending. As of September 2020, the 2020-21 federal deficit is approaching $380 billion with the provinces so far accumulating $85 billion in deficits.[41] Excluding municipalities, general government deficits could be as much as $465 billion or roughly 20 percent of Canada's GDP.

Although most of the new spending is temporary to help households and businesses deal with the pandemic recession, debt accumulating at the existing rate over several years could result in Canada's gross public debt burden becoming a threat to its financial stability and growth prospects. High debt undermines productivity when private investment is crowded out by government financing requirements. Investors may lose confidence in holding a country's debt if they believe that the government may renege on its debt obligations – this can lead to currency devaluation and higher credit spreads on bonds.

These risks, however, can be attenuated by the adoption of a fiscal rule by both federal and provincial governments. To be effective, a statutory fiscal rule embedded in legislation or a constitution should be enacted once the economy recovers. Certain other adjustments should be made to ensure both the stability and effectiveness of the rule to encourage fiscal

[41] This deficit figure includes the federal deficit of $343 billion from the federal government's *Snapshot* announced in July 2020 and subsequent announcements totalling $39 billion. We will not know the final deficit number until the end of the fiscal year, March 31, 2021.

discipline. The discussion below will focus on why public debt matters, followed by an argument as to why a statutory fiscal rule is most appealing.

Why is public debt a problem?

Some argue that debt does not matter since its only cost is carrying charges as infinite-lived governments simply roll over debt forever. Further, if the nominal GDP growth rate is more than the bond interest rate, then public revenues will rise faster than carrying charges, enabling public debt to fall relative to GDP. Moreover, capital expenditures provide benefits not only to the current population but also future populations so debt finance is appropriate. Finally, according to modern monetary theory, governments can print money without causing inflation—effectively government faces no intertemporal budget constraint in the long run under this argument.

Certainly, a catastrophe like war or a pandemic requires amassing debt, but this should only be temporary. Otherwise, the above arguments for permanent deficits can be challenged. The first is to recognize that the public debt is equivalent to deferred taxation. Instead of current voters paying for current public services, they shift the cost to future voters who have no ability to influence current voting decisions. Intergenerational inequity results if future populations unfairly bear the tax burden that should have been covered by the existing population. Public capital expenditures do provide future benefits (excluding, however, white elephants like Mirabel airport in Quebec). However, future generations should only bear their portion of the expense commensurate with the benefits they receive. Otherwise, existing governments have a *deficit bias* (see Kopits, 2001) leaving the pain of taxation to future generations.

The deficit bias is related to a second issue—the lack of fiscal discipline in controlling government spending. To maximize votes, governments are willing to provide public services to their voting base with the costs pushed along to someone else to pay for them (typically high- and middle-income taxpayers or future taxpayers). Rather than developing effective and efficient programs that enhance productivity (such as in education and infrastructure), any spending directed to politically favoured priorities leads to a poor allocation of resources yielding insufficient economic benefit. This in turn reduces growth and output per working hour in the economy.[42]

[42] Various estimates have been made of the optimal size of government, which is neither 0 nor 100 percent. A well-known estimate suggests that growth is maximized when government spending is no more than 30 percent of GDP (see Afonso, Schuknecht, and Tanzi, 2005).

The third point is that interest rates over time tend to be higher than growth rates (the relationship was reversed after 2008).[43] So, if debt grows, interest expenditures eventually grow faster than the economy, leading to a debt spiral. Even when growth rates are above interest rates, it is not unusual to see a reversion back to the more typical case especially when a country is highly indebted (Lian, Presbitero, andWiriadinata, 2020). In 2020, interest rates are higher than nominal growth rates by an average of 2.1 percentage points among advanced countries. (For Canada, the difference is 5.8 percentage points, highest among all G7 countries. See International Monetary Fund, 2020: Table A23).

Fourth, the world is stochastic, not certain. People often save to cover future contingencies. So should governments. Risk leads to a higher interest rates, more so for highly indebted countries. Italy's sovereign credit spread increased by 53 basis points to 196.7 basis points from February 2020 to April 2020. Argentina, which defaulted on its debt in August 2020, saw its credit spread rise by 1247 basis points to 2978 basis points in the same period. Rating agencies take into account several factors in evaluating sovereign risk with the debt burden being one of them (gross debt divided by GDP and interest expense divided by revenues).[44]

Fifth, contrary to modern monetary theory, deficits funded by printing money typically lead to higher inflation, putting the public budget at risk. With government spending fueled by printing money, more funds are put into private sector bank accounts. Although banks holding reserves earn interest, they could relend the funds at better terms. The money multiplier may at first not result in inflation with a slack economy but eventually demand outstrips supply, causing inflation. Inflation will lead to higher public sector wage demands and indexed transfer payments, thereby expanding the budget deficit (especially since personal tax brackets are indexed for inflation). Even if the average interest rate on public debt rises from two to three percent, debt charges increase multifold depending on the growth of public debt.

Table 1 compares Canada's most recent financial position relative to that of large advanced countries including gross debt, net debt and unfunded liabilities, current account surplus, average debt term, gross financing needs, and the portion of public debt issued to non-residents.

[43] For example, the IMF discounts future pension liabilities by 1 percent, which is the long-run average of the difference between interest and growth rates. (See International Monetary Fund, 2006: Table A23.)

[44] See for example, Moody's Investor Service, 2020, Scorecard Framework. Because of rising risks, Fitch recently downgraded Canada's sovereign debt from AAA to AA+ although Moody's and Standard and Poor have maintained their same ratings.

Table 1: Financial characteristics by country as a percentage of GDP (unless otherwise noted)

	Gross public debt (June 2020)	Net public debt and unfunded liabilities (April 2020)	Private debt (2018)	Current account surplus (2021 forecast)	Average term to maturity (years)	Gross financing needs in 2020	Non-resident share of all gov't debt (2020)
Australia	60	122		-0.1	7.5	12.7	40.4
Canada	109	101	266	-3.6	5.4	22.4	22.9
France	126	151	253	0.3	7.8	19.7	58.9
Germany	77	116	154	4.7	5.9	11	54.3
Italy	166	226	166	2.8	6.8	28.3	34.6
Japan	268	217	208	3.5	8.2	45.9	12.2
UK	102	146	224	-3.7	14.8	17.8	36.1
US	141	300	212	-2.2	5.8	38.5	29.4
Advanced countries	122	212		0.1	7.1	28.7	34.9

Note: IMF data exclude government employee pension plan commitments in public deficit and debt data. Private debt includes household and non-financial corporate debt, all instruments. Unfunded liabilities are the present value of pension and health care costs 2019-2050.

Source: International Monetary Fund.

At the present time, Canada's public debt is less than many other larger economies especially after accounting for public assets and other non-funded liabilities. However, we have four vulnerabilities.

- Canada's gross public debt is now in excess of its GDP, 5th highest in the G7 and now above 1995 when Canada faced a debt crisis (interest rates and foreign indebtedness were higher at that time).
- Canada's current account deficit is one of the highest of major countries so any difficulty in raising international capital could lead to a devaluation of its currency.
- Canada has one of the lowest average terms for its public debt among central governments resulting in a greater reliance on financing its debt post-COVID recovery. Given that Canada's currency is not a safe haven like those of large economies such as the United States and Japan, Canada is facing greater risk should investors lose confidence.

- Going into the COVID recession, Canada had a high degree of private debt as share of GDP which has increased its vulnerability. Both public and private debt exceed 367 percent of GDP.

Why a fiscal rule?

A fiscal rule could be statutory (written in legislation or in the Constitution) or a non-binding target. A fiscal rule provides four benefits as discussed above: it reduces political deficit bias, helps control spending, creates investor confidence and, in federal countries, helps better coordinate macro-policies. A statutory rule, if properly designed and implemented, would signal a stronger commitment to fiscal sustainability. It could also contribute to higher economic growth and productivity by reducing indebtedness and constraining government spending that crowds out private investment. Gründler and Potrafke (2020) estimate that the adoption of statutory fiscal rules increases real per capita GDP by 18 percent in the long run.

Based on countries' experience with them, the design of fiscal rules has been improved in recent years to improve their effectiveness. A balanced budget rule is often based on cyclically adjusted deficits. The fiscal rules may also allow for averaging by letting fiscal surpluses, perhaps put in rainy-day funds, offset deficits during bad years. Since public capital expenditures often have less voter support than public consumption spending, a government will not include such expenditure in measuring the deficit (under accrual accounting now used in Canada, deficits are calculated by subtracting interest expense and depreciation only). Fiscal rules may also provide "escape clauses" whereby the rule may not apply in exceptional circumstances such as the 2020 pandemic.

Fiscal rules became especially popular after early 1990s. By 2015, over 96 countries had fiscal rules, a prominent one being the 3 percent deficit target in the European Union that has lasted for 11 years (Bandaogo, 2020). The effectiveness of various rules depends on the commitment governments make. If a government uses tricks to avoid the stringency of the rule, then the rule is not sufficiently binding and thereby far less effective. Thus, if fiscal rules are well designed, they should lead to more fiscal discipline (Caselli and Reynaud, 2020). Five criteria have been found to improve their effectiveness (European Commission, 2016):

1. A statutory or legal basis more strongly indicates a government's commitment.
2. Flexibility to revise targets such as escape clauses or parliamentary approval reduces abuse of rules.

3. Monitoring by an independent authority (e.g., a fiscal council) on a regular basis, as well as providing or endorsing forecasts, improves transparency.
4. Formal enforcement mechanisms in case of deviation from the rule, such as penalties on politicians, improves effectiveness.
5. Resilience to shocks or events outside the control of governments, such as escape clauses mentioned above, creates more stability.

There are four types of fiscal rules that governments can use; they are based on budget balances, debt, expenditure, and revenues. The most common rule, a balanced budget rule, is easiest for the public to understand. However, governments may shift expenditures and classify them as infrastructure in order to avoid deficit limits under accrual accounting. New Zealand and the United Kingdom have adopted both debt and balanced budget rules that curb this type of abuse (see Mintz and Smart, 2006).

On its own, a debt rule is more difficult to explain since it notionally implies that there is optimal debt policy. If the rule uses a maximum debt-to-GDP ratio, deficits are acceptable even during a boom. Further, a debt rule could be based on gross or net debt (the latter calculated as debt net of public assets). A focus on gross debt is preferable since assets suffer from or are prone to valuation and liquidity problems (Kopits, 2001, note 3). Consolidated government net debt is understated by subtracting CPP and QPP assets from gross debt without including future pension liabilities. In a federal state, consolidated government debt may be the focus of a debt rule since the federal government is expected to back provincial bond debt. On the other hand, the federal government cannot control fiscal decisions of sovereign provincial governments, so each government is better to have its own debt rule.

An expenditure limitation rule, such as program spending not rising faster than GDP or population and prices, is directed towards spending discipline. It can be a particularly useful rule when governments with uncontrolled spending or deficits wish to move towards a sustainable fiscal policy. Revenue rules such as devoting excess revenues to debt reduction have less clarity since the excess revenues can be easily manipulated by discretionary policies.

What should Canada do after 2020-21?

The federal government's target prior to 2020 was to hold debt from rising no faster GDP. It was a weak commitment. Net debt rose from 30 percent of GDP in 2015 to 33.8 percent by 2019. With the current jump in net debt to over 40 percent of GDP, the federal government no longer has a fiscal anchor. It has also announced that it will substantially expand spending this coming year.

Undisciplined fiscal policy will erode Canada's fiscal reputation and growth prospects. Moving back to balanced budgets after the current spending binge will be a challenge. It is therefore important to adopt an effective rule:

- Given the huge deficit being created in 2020-21, it is best to have a rule that is clear—such as moving towards a balanced budget (interim deficit targets that are ratcheted down could also be included).
- To make the rule effective, it should be legislated.
- Transparency should be improved by establishing an independent fiscal monitoring council or strengthening the Parliamentary Budget Office with periodic (quarterly) monitoring of the fiscal plan.
- Escape clauses should be adopted to make the fiscal rule more resilient to uncontrolled events. Capital spending should be partly debt-financed based on the share of benefits accruing beyond an existing multi-year electoral cycle.
- Politicians should be penalized by reductions in their salary if they fail to achieve interim fiscal targets.

Whatever develops in fiscal planning, it is critical that Canada return to the fiscal discipline that federal and provincial governments have mastered since the mid-1990s. ~~It~~ That discipline should not be ~~an unbinding~~ a non-binding commitment but instead be statutory to better control the deficit bias of our governments.

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Dr. Mintz chaired the federal government's Technical Committee on Business Taxation in 1996 and 1997 that led to corporate tax reform in Canada since 2000. He also served on numerous panels and boards at the federal and provincial levels including Vice-President and chair of the Social Sciences and Humanities Research Council, 2012–2018. He has consulted widely with the World Bank, the International Monetary Fund, the Organisation for Economic Co-operation and Development, federal and provincial governments in Canada, and various businesses and non-profit organizations in Canada and abroad. Dr. Mintz became a member of the Order of Canada in 2015 as well as receiving the Queen Elizabeth Diamond Jubilee Medal in 2012 for service to the Canadian tax policy community.

Chapter 11

Government Size and Economic Growth: An Overview

By Livio Di Matteo

Increases in output per worker over time reflect increases in the amount of complementary inputs such as natural resources, labour, and capital, as well as more productive use of all inputs. Indeed, economic growth and improvements in the standard of living hinge on increasing output per input and ultimately output per capita. As Paul Krugman noted, "Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker" (1997: 11).

The institution of government has become a key factor affecting productivity and growth with government tax and expenditure policies affecting saving, capital formation, and labour supply (Solow, 1956; Swan, 1956), as well as innovation and technological change (Romer, 1986; Barro, 1990). Government provides institutions such a rule of law and property rights that facilitate productivity and economic growth along with economic freedom, trust, low levels of corruption, and functioning bureaucracies (North, 1987,1990; Strum and De Haan, 2001).

Government in the twenty-first century has become the dominant institution of modern life affecting economic activity via spending, taxation, and regulation. The COVID-19 pandemic in particular has resulted in a ramping up of government spending activities the world over. Indeed, many countries have introduced substantial fiscal packages encompassing assorted direct household income supports, loans, guarantees, tax deferrals, and other supports along with increased pandemic spending (OECD, 2020). With a collapse in tax revenues, the spending is being financed by an expansion of government borrowing and ultimately public debt, which raises the spectre of future inflation and higher taxes.

While government spending on programs is important, it remains that notwithstanding the current need for pandemic spending, more and larger government is not always associated with better outcomes. Moreover, the current resurgence in government spending does not auger well for future global economic growth prospects given the international evidence that has documented slower growth rates with larger public sectors over the course of the last 150 years.

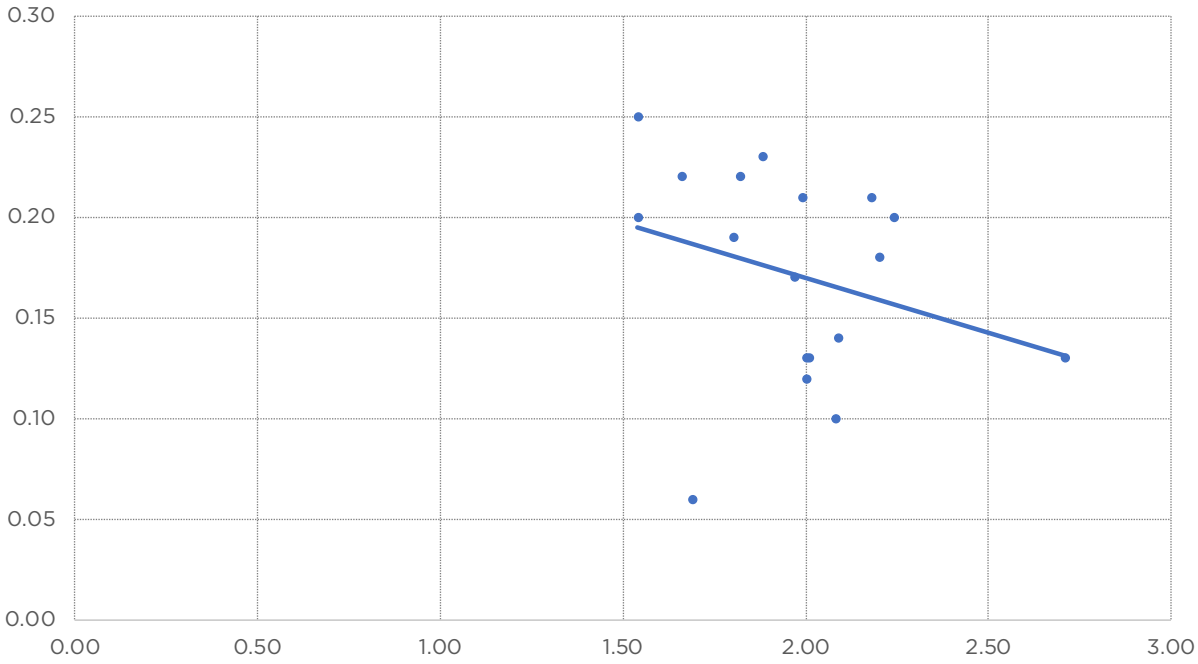
While good government promotes growth, poor government or excessively large government can reduce productivity and thereby harm economic growth. Large government can harm productivity growth in a variety of ways including by taxing and reducing the return to entrepreneurship and innovation, by discouraging capital investment and creating disincentives to work, by excessive regulation that increases costs of economic transacting, and by fueling inflation or otherwise distorting the price mechanism. Unlike the private sector, government spending decisions are not made in response to market incentives based on the highest productive return to investment. Therefore, more government spending can sometimes lead to worse social and economic outcomes (Di Matteo, 2013).

A simple plot of average real per capita GDP growth rates against public sector sizes for 17 highly developed countries[45] over the period from 1870 to 2016 shows an inverse linear relationship between economic growth and public sector size (see figure 1). From 1870 to 2016, central government expenditures as a share of GDP averaged 17 percent with an average growth rate of real per capita GDP of 2 percent. However, the average public sector size was highest in the United Kingdom at 25 percent (with an associated growth rate of 1.5 percent) and lowest in Switzerland at 6 percent (with growth at 1.7 percent). There is of course considerable variation around this linear trend, but the figure serves as an illustration of a basic inverse relationship between real economic growth and public sector size.

The manner in which government affects economic growth is complex, as government activities can also affect economic production positively, in part by providing societal benefits such as public goods and the rule of law, as well as by public investments in physical and social capital. However, when examined more carefully, this relationship is not linear but has been documented as hump shaped. As the state first develops and grows, its infrastructure and institutional spending complements private-sector growth, contributing to a positive relationship between public sector size and growth. However, as spending rises, along with taxes required

[45] Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK, and USA.

Figure 1: Government Size (G/GDP) versus Real Per Capita GDP Growth (%), Selected Countries, Average, 1870 to 2016, With Linear Trend



Data source: Di Matteo and Summerfield (2020), Table 1: The Shifting Scully Curve: International Evidence from 1871 to 2016.

Original data source: Jordà, Schularick, and Taylor (2017). Y is the one-year percentage change in real GDP, per-capita and ppp adjusted. G is the central government expenditure share of GDP. Missing values occur for various countries at the start of the panel and during the world wars.

to finance the spending, there are adverse productivity effects on the economy and a slowing of growth rates.

One particular formulation of this relationship is known as the Scully Curve (sometimes also called the Barro, Armey, Rahn and Scully (BARS) Curve), which defines the optimal economic growth-maximizing size of government as the peak of a hump-shaped curve (Scully 1989, 1991, 1994, 2000). Scully (1991), using a cross-section of 103 countries in 1980, found that a government size of about 19 percent of GDP, measured as the tax-to-GDP ratio expressed as a percentage, maximized economic growth rates. Di Matteo (2013), using data for over 180 countries from 2000 to 2011, identified that the maximum annual real per capita GDP growth rate of 3 percent corresponded to a government expenditure-to-GDP ratio of 26 percent. Beyond this relative size of government, the rate of economic growth declined.

While government expenditure-to-GDP ratios were well below 10 percent in the nineteenth century, government spending in some countries came to account for well over 40 percent of GDP by the late twentieth century (Tanzi, 2011; Tanzi and Shukenecht, 1997). After growing for much of the twentieth century, particularly after World War II, public sectors began to decline in size after 1980. However, the first decade of the twenty-first century saw a resumption of growth in public sector size fueled by the spending response to 9-11 and the 2008-09 recession (Di Matteo, 2013).

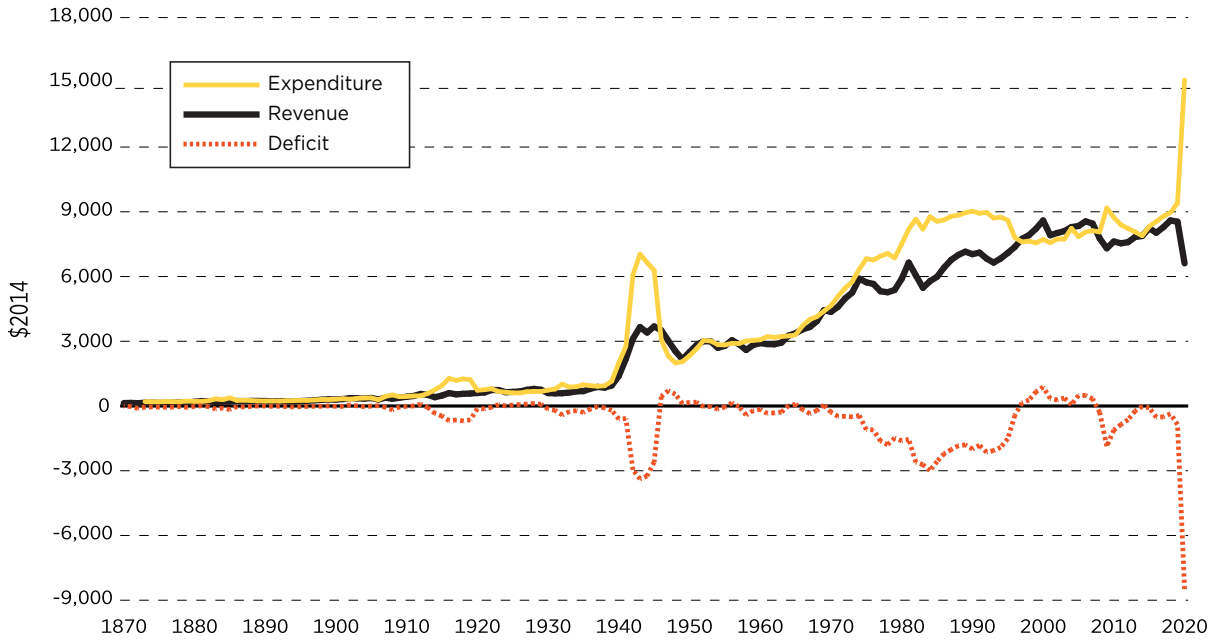
For example, in Canada's case, the total government expenditure-to-GDP ratio at the dawn of Confederation was 4.9 percent rising to 7 percent by 1913. It remained under 10 percent until World War II when it rose dramatically as a result of military spending and reached 43 percent in 1945. It subsequently declined and by 1960 reached 15 percent. It then began to grow again reaching a peak of 52 percent by 1993 and then declined from there.[46] By 2007, total consolidated government spending in Canada as a share of GDP was down to 37 percent, but it increased to 42 percent in 2009 and by 2018 was at 40 percent (Whalen, 2020). With increased government spending associated with the COVID-19 pandemic, the ratio can be expected to rise dramatically in 2020 and, perhaps, beyond.

Indeed, times of crisis seem to generate demands for government spending which, once in place, are difficult to dislodge after the crisis passes. Indeed, one theory of public expenditure growth targets precisely this tendency. Peacock and Wiseman (1961) argued that the rate of growth of public expenditures was driven by taxpayer perception of tolerable levels of taxation, and that this tolerance is greater during times of national or social crisis.[47] Thus, the public sector has grown in a step-like fashion of abrupt jumps and long plateaus driven by crises such as war. The onset of the COVID-19 pandemic might therefore be expected to promote a sustained increase in public sector size barring changes in government policies. Indeed, as figure 2 illustrates for Canada, there have been spikes in real per capita government spending during times of social crisis such as world wars, but even those spikes are dwarfed by the current estimated impact of COVID-19 on the federal public finances.

[46] Data source: IMF, Public Finances in Modern History (https://www.imf.org/external/datamapper/datasets/FPP) as of August 24, 2020.

[47] The other traditional explanation is Wagner's Law, which states that government spending grows faster than output in industrializing countries because government expenditures are highly income elastic—that is, the ratio of the percentage responsiveness of government expenditures to a given percentage change in income is greater than one (Wagner, 1883, 1892-94).

Figure 2: Real Per-capita Revenue, Expenditure, and Deficit/Surplus ($2014) of Canada's Federal Government, 1870 to 2020



Note: 2019 and 2020 are forecasts.

Source: Livio Di Matteo (2017). Updates to 2020 provided by the author. Reprinted with permission. **Sources for revenue and expenditure:** 1867-2018: *Historical Statistics of Canada*, HSC-H1-18, HSC-H19-34; 1966–2018: *Federal Fiscal Reference Tables*. **Sources for population:** 1867–1977: v742019 Canada; Estimated population; 1971–2019: v52154496 Canada, Total marital status. Population 2020 is April 1st Statistics Canada estimate. **Sources for GDP deflator:** 1870–1985: Urquhart, 1988; 1981–2018: v62788999; Federal Economic and Fiscal Snapshot 2020 assumes for 2019 and 2020 GDP inflation at 1.9% and 0.5%.

The concept of an "optimal" size of government creates the temptation for the Scully Curve to be viewed as a sort of policy menu whereby policymakers might try to exploit a potential trade-off between government spending and economic growth rates. However, this is likely misplaced given evidence that Scully Curves appear to have shifted over time, and that as a result, the growth optimizing size of government has varied over time. Indeed, Di Matteo and Summerfield (2020) estimate Scully Curves using panel data covering 17 industrialized nations from 1870 to 2016 for the entire period and for sub-periods. The results suggest that over the period 1870 to 2016, a range of government expenditure-to-GDP ratios between 24 and 32 percent were historically growth maximizing. Given that since the 1970s the total size of government in Canada has generally ranged between 35 and 53 percent of GDP, it stands that Can-

ada's public sector size over the last half-century has been larger than that empirically documented to maximize economic growth.

Taken together, the evidence suggests there are important implications for productivity and economic growth associated with the size of government. Government spending, taxation, and regulation can affect the efficiency of production and by extension the rate of economic growth. Moreover, there is an optimal size for the government sector when it comes to economic growth, although the optimal size is not a constant and has varied throughout history. Nonetheless, Canada's public sector size over the last 50 years has generally been well above the growth optimizing range of values.

Government is indeed very important, and its programs are important to our quality of life. At the same time, more and larger government is not always associated with improved outcomes. The recent expansion of government spending and deficits during COVID-19 should be treated as a temporary measure and not an opportunity for a "transformative" expansion of government's role in the economy. The entrenchment of new spending that increases the long-run size of government implies higher future tax rates and slower productivity growth, which will reduce future rates of economic growth when growth will be sorely needed.

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