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KEY ISSUES SERIES 2020

# **A PLACE-BASED LENS TO THE FUTURE OF WORK IN CANADA**

**SEAN SPEER & WESEEM AHMED**

JUNE, 2020



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# INTRODUCTION

The “future of work” has become the subject of considerable research and scholarship in light of technological trends such as artificial intelligence, machine learning and automation more broadly. Scholars may disagree on the magnitude of impending technology-induced disruption to our labour markets, but few believe the effects will be minimal.

To date, most research has focused on the labour market overall or potential effects within specific sectors or occupations. This research can tell us which parts of the economy are most susceptible to automation, but it does not necessarily point us toward the geographic areas most at risk. Place-based analysis of what these trends will mean for different communities is still nascent. Yet early signs indicate the impacts could differ significantly between urban centres and rural areas.<sup>1</sup> And that could exacerbate pre-existing urban-rural differences in economic outcomes and labour market performances.

Understanding how these emerging technological developments may affect labour markets in urban centres and rural areas is thus a crucial ingredient to long-term policymaking. It can help to identify possible place-based trends and enable policymakers to prepare policy responses accordingly. It can also support the development of broader economic programmes to boost investment and job creation in high-risk communities. An urban-rural scan of the potential long-term effects of the “future of work” is, in short, a key input into an effective place-based policy agenda for Canada.

This report for the Public Policy Forum aims to carry out such a scan. It applies a place-based lens to the research to explore the current urban-rural economic divide in Canada, how technology-induced disruption may exacerbate it, and what Canadian policymakers can do about it. The goal of this analysis is to identify potential urban-rural trends and start to develop policy options for Canadian governments.

What do we find?

The preponderance of research points to asymmetrical effects between urban centres and rural areas. This is mostly a function of the sectoral composition and labour market characteristics of rural places. That is to say technology-induced disruption is expected to disproportionately affect rural labour markets due to their overrepresentation of “routinized work” and less diversified industrial footprints.<sup>2</sup> The result will be to hasten a growing urban-rural economic divide in Canada.

This analysis comes with caveats. Projections on the impact of technology are informed yet ultimately speculative. They can be affected by unexpected developments such as geopolitical changes spurred by the COVID-19 crisis. And, of course, there is a role for public policy to shape the diffusion and adoption of new technologies across the economy.

Policymakers in communities vulnerable to technology-induced disruption will nevertheless need to be prepared and the following analysis aims to arm them in this regard:

- The first section develops the rationale for a placed-based framework to analyse the future of work;
- The second outlines the current state of the urban-rural economic divide in Canada, including differing labour market outcomes;
- The third synthesizes current research on potential effects of technology-induced disruptions on urban and rural labour markets; and
- The final section starts to set out possible policy responses to manage these disruptions and minimize spatial inequality along urban-rural lines.

As part of PPF's [\*Brave New Work\*](#) project, our ultimate goal is to bring a place-based lens to the study of the “future of work” in Canada.

# THE FUTURE OF WORK AND THE ROLE OF PLACE

Policymakers, economists, and other researchers are increasingly focused on the impact that new technologies will have on our economies in general and on labour markets in particular. The underlying assumption of most of this work is that while automation will likely produce efficiency gains overall, it will be destructive for certain industries and occupations. These displacement effects could produce economic, social and political pressures as affected individuals face job losses, financial insecurity and other non-financial consequences.

Automation risk is typically estimated using labour market information and a set of assumptions about the skills that are difficult to computerize, in combination with detailed data concerning the skills content of occupations. It is a complicated analysis that has its pitfalls. It is obviously speculative. And there are varying degrees of skepticism.<sup>3</sup> But even if the precise estimates prove incorrect, the general trends are useful for informing public policy thinking.

What does this analysis tell us?

Automation risk varies across different types of employment. Jobs that involve adaptability to novel problems or complex forms of social engagement as a key function—such as police officers, physicians or instructors of persons with disabilities—are less susceptible to automation. Occupations that require low levels of adaptation in the tasks performed and do not require nuanced human interactions—such as bookkeepers, motor vehicle assemblers, and service station attendants—face a much higher probability of automation. And, of course, there are various jobs somewhere in between that may experience partial automation.<sup>4</sup>

C.D. Howe Institute researcher Rosalie Wynoch has sought to analyse the Canadian labour market according to its automation risk in a 28-year period from 1987 to 2015. She organizes Canadian employment into three categories:

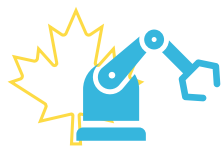
- **Low-risk occupations;**
- **Medium-risk occupations;**
- **High-risk occupations.**

Her research finds there has been some movement within these groups as Canada's economy has evolved, with employment increasingly shifted toward professional services. The share of the labour market in high-risk occupations (or jobs that require less adaptive skills) fell to 40 percent in 2015 from 50 percent in 1987.

Similarly, the share of jobs in low-risk occupations increased to 37 percent from 27 percent over the same period.<sup>5</sup>

High-risk occupations are not evenly dispersed across the country. They tend to be concentrated in certain provinces, regions and communities and the industries and occupations facing the highest rates of automation risk tend to be geographically clustered.<sup>6</sup> This is exacerbated by the level of economic diversification according to place. Those places with high levels of high-risk occupations also tend to have less diversified industrial footprints—they are disproportionately dependent on particular sectors or employers that are also the most susceptible to automation risk.

Wynoch's research has extended her occupational analysis to the provincial level to better understand the geographical distribution of automation risk among the provinces.



**British Columbia and Ontario have the lowest risks of automation, while Newfoundland and Labrador and Nova Scotia have the highest.**

These estimates are consistent with other analyses of automation risk. The research overwhelmingly points to a place-based clustering of high-risk occupations and, in turn, an unequal place-based distribution of automation risk. As one analysis of the recent experience with technology-induced disruption puts it: “Digital automation in its first phase has contributed to significant labour market disruptions and a job-quality crisis that have translated into uneven local employment outcomes.”<sup>7</sup>

The geographical distribution of automation risk ought to be a major concern for policymakers. It is not to say that we should want to avoid technological development. The process of “creative destruction,” as economist Joseph Schumpeter famously described it, is critical to innovation and productivity. But we must recognize the “destruction” part of the phrase is an inextricable part of the bargain and it tends to concentrate itself according to place. The process of creating new industries does not occur without sweeping away parts of the pre-existing equilibrium. Jobs are lost, companies disappear and industries are reconfigured. That is the nature of capitalism.<sup>8</sup>

If the resulting job losses are geographically concentrated, the process of creative destruction can be positive in the aggregate but negative in the locality. Public policy itself cannot stop this process, but it can moderate technology-induced disruption and, in so doing, extend the benefits of innovation along geographical lines.

Why should policymakers care about geographical inequality?

The geographic concentration of the so-called “losers” of creative destruction can have various economic, social, and political consequences. Spatial inequality has become associated with declining social cohesion

and rising political populism in advanced economies.<sup>9</sup> It is no coincidence, for instance, that Donald Trump's election as U.S. president has come to be described as "the revenge of places that do not matter."<sup>10</sup> To the extent that technology-induced disruption markedly increases geographical inequality, it is reasonable to assume it could contribute to accompanying political disruption in Canada.

But this is not merely about minimizing populist politics. It is also about economic efficiency and inclusion. Analysis by the Organisation for Economic Co-operation and Development (OECD), for instance, finds that lagging regions can harm aggregate economic performance as well.<sup>11</sup> It is in our collective interest then to mitigate the negative effects of technology-induced disruption in rural areas and help these communities more fully participate in the modern economy. Human flourishing should not be just a function of one's postal code. Herein lies the case for a place-based lens to automation risk.

As we will discuss in subsequent sections, previous Canadian research has tended to focus on the occupational distribution of automation risk. Some research has drilled further into the provincial or regional implications. This paper goes even further to better understand the urban-rural effects of automation risk. This is important because if automation risk is concentrated in certain places due to their sectoral and occupational characteristics, it will exacerbate the pre-existing urban-rural divide in Canada. Policymakers ought to know so they can prepare and respond accordingly.

# CURRENT STATE OF THE URBAN-RURAL DIVIDE IN CANADA

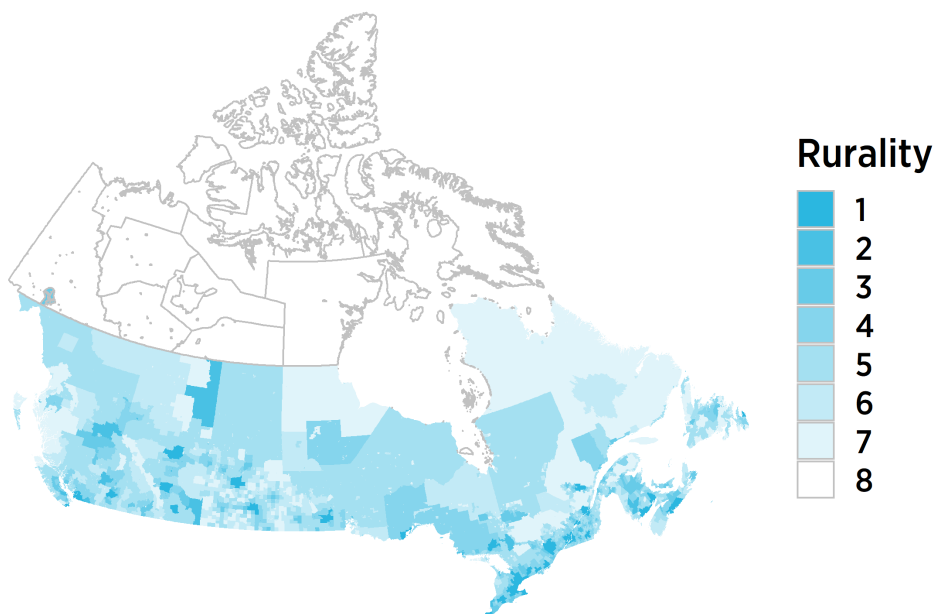
The first step in understanding how technology-induced disruption may affect urban centres and rural areas is to establish the current urban-rural divide according to various demographic, educational and labour market characteristics.

## DEFINING URBAN AND RURAL

Defining urban and rural is more complicated than one might think. There is no universal definition. Governments and scholars use a combination of metrics, including overall population size, population density, proximity to a major urban centre and even self-identification.

Statistics Canada uses a measure of “rurality” that ranks each of Canada’s 5,162 census subdivisions (CSDs)<sup>12</sup> based on a score between 1 (most urban) and 8 (most rural). These scores are a function of labour flows into urban centres. CSDs with scores ranging from 1 to 3 are parts of metropolitan areas and considered urban. CSDs with scores from 4 to 7 are more isolated from metropolitan areas, according to labour flows, and are considered rural for the purposes of this study. A score of 8 is reserved for the three territories, outside of Whitehorse and Yellowknife.<sup>13</sup> Figure 1 illustrates the distribution of urban centres and rural areas across the country.

**Figure 1: Rurality by Census Subdivision, Canada, 2016**



Source: Statistics Canada.

## URBAN-RURAL DEMOGRAPHICS

The vast majority of Canadians live in CSDs that are considered urban. These places represent only 18.8 percent of CSDs but 83.2 percent of Canada's population. Rural CSDs are the mirror image. They represent 78 percent of CSDs but 16.7 percent of the overall population (see Table 1).

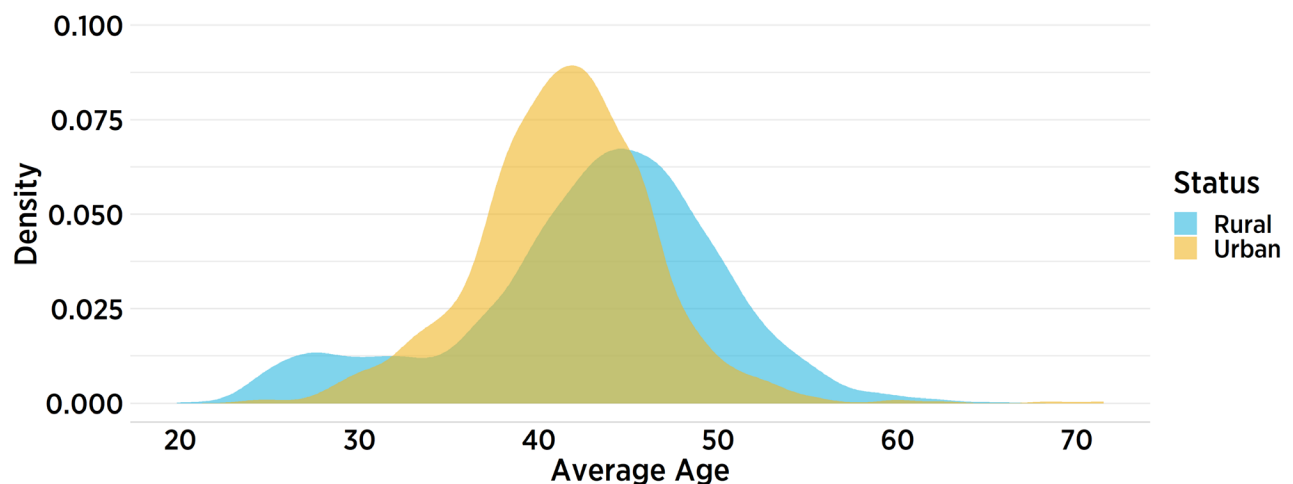
**Table 1: Population Shares and Number of Census Subdivisions by Rurality, Canada, 2016**

Rurality	Population share	Proportion of CSDs
1	70.96%	9.36%
2	3.52%	2.49%
3	8.68%	6.87%
4	5.67%	12.41%
5	6.58%	22.94%
6	3.72%	13.87%
7	0.68%	28.80%
8	0.19%	3.25%

Source: Statistics Canada, 2016 Census, Table 98-401-X2016056 (2016 Boundary Files).

Urban centres are also generally younger than rural areas. The average age in Canada in 2016 was 42.7 years.<sup>14</sup> But average ages differ between urban centres and rural areas. The average rural resident is 43 years old compared to 41.5 years in urban centres (see Figure 2).<sup>15</sup>

**Figure 2: Age Distributions for Urban and Rural Canada, 2016**



Source: Statistics Canada, 2016 Census, Table 98-401-X2016056.

Figure 2 highlights the age composition of urban and rural places. This is highly relevant for an analysis of their workforces and the potential effects of technology-induced disruption. Readers can see that a much larger share of urban populations is working age (between the ages of 25 and 64) than rural populations. This working-age advantage is most pronounced in the 30-45 years cohort.

## EDUCATIONAL ATTAINMENT

As one might expect, these differing urban-rural demographics manifest themselves in other ways. Educational attainment is an example.

The level of educational attainment (which refers to an individual's degree or level of completed education) is generally higher in urban centres. Ontario's educational divide is illustrative. More than half of the working-age population (ages 25 to 64) in Ontario cities with rurality scores of 1 have a bachelor's degree or advanced degree. That falls to barely 10 percent in Ontario towns with rurality scores of 7.<sup>16</sup>

Figure 3 shows the level of educational attainment according to rurality level across the country. The national pattern is the same as Ontario's. Those living in census metropolitan areas<sup>17</sup> are twice as likely to hold advanced degrees than those outside of them and three times more likely to have completed high school.<sup>18</sup>

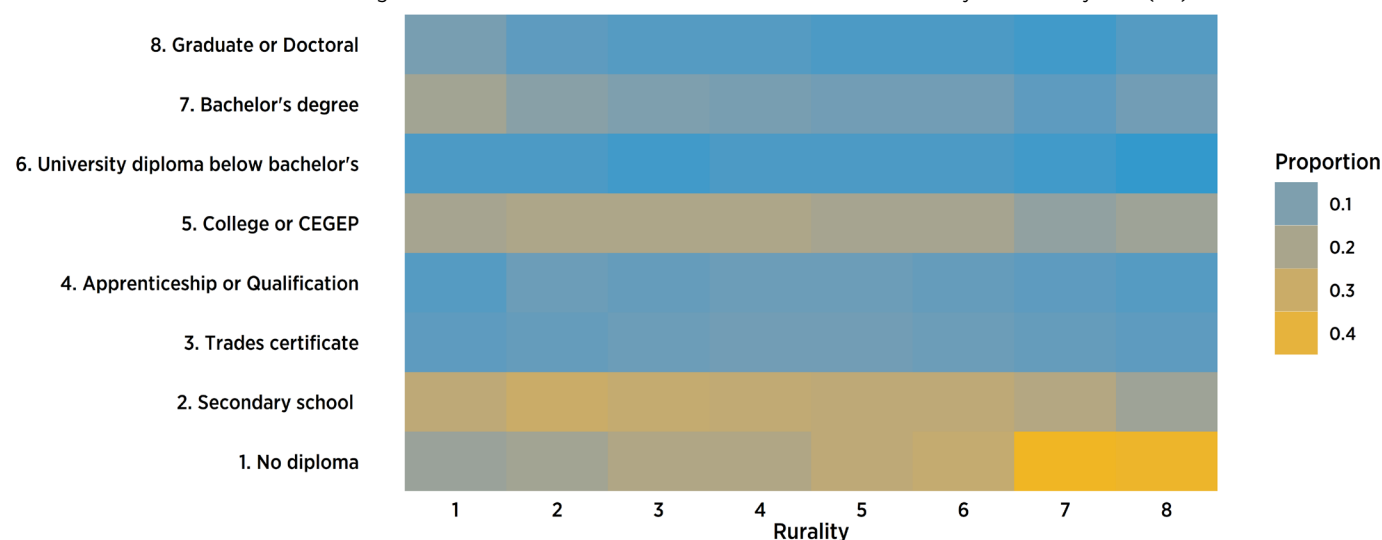
More generally, places with rurality scores between 1 and 3 are much more likely to have some form of post-secondary qualification, with the exception of skilled trade certificates. Those living in places with rurality scores between 4 and 7 generally have lower levels of educational attainment. The two most notable observations are:

1. The share of the population with graduate or doctoral degrees declines across all ruralities.
2. Forty-four percent of those living in places with a rurality score of 7 (virtually no interaction with urban areas) do not have high school diplomas.

**Figure 3: Educational Attainment by Rurality, Canada, Ages 15 and Older, 2016**

Source: Statistics Canada, 2016 Census, Table 98-400-X2016261.

Note: Columns sum to 1. Looking down columns shows distribution of educational attainment by each rurality level (1-8).



Urban-rural differences in educational attainment are not unique to Canada. Other jurisdictions similarly find lower levels of educational attainment in their rural areas.<sup>19</sup> But Canada's urban-rural gap is significant: In fact, according to the Canadian Rural Revitalization Foundation, it is the largest among the 34 countries that comprise the OECD.<sup>20</sup>

This educational gap is highly relevant for several reasons. Educational attainment is not only correlated with individual outcomes (such as labour force attachment and earnings), it is also linked to collective outcomes (such as crime rates and population health). As urban scholar Richard Florida has observed: "If there is one single factor that influences the social stability, economic success, and overall well-being of places, it is educational attainment."<sup>21</sup> And, as we discuss later, educational attainment is a strong correlate in the risk of technology-induced disruption.

Although this paper draws no firm conclusions on the source of this educational divide, we can speculate about possible reasons behind the growing educational divide. One factor is self-selection on the part of young people who migrate from rural areas to urban centres to pursue higher education.<sup>22</sup> Another is that educational expectations in urban and rural labour markets are different and people can find employment in rural areas without post-secondary qualifications.<sup>23</sup> Other reasons may include proximity to post-secondary institutions<sup>24</sup> or socio-economic factors.<sup>25</sup> There are no doubt others. But irrespective of the causes, this educational attainment gap between urban and rural Canadians has significant labour market effects now and will invariably have them over the long term in the face of technology-induced disruption.

An important point: Research indicates that educational level is a major determinant of automation risk. Research by the Brookfield Institute for Innovation and Entrepreneurship, for instance, finds that among low-risk occupations the level of educational attainment is three times the level of high-risk ones.<sup>26</sup>

## LABOUR MARKET OUTCOMES

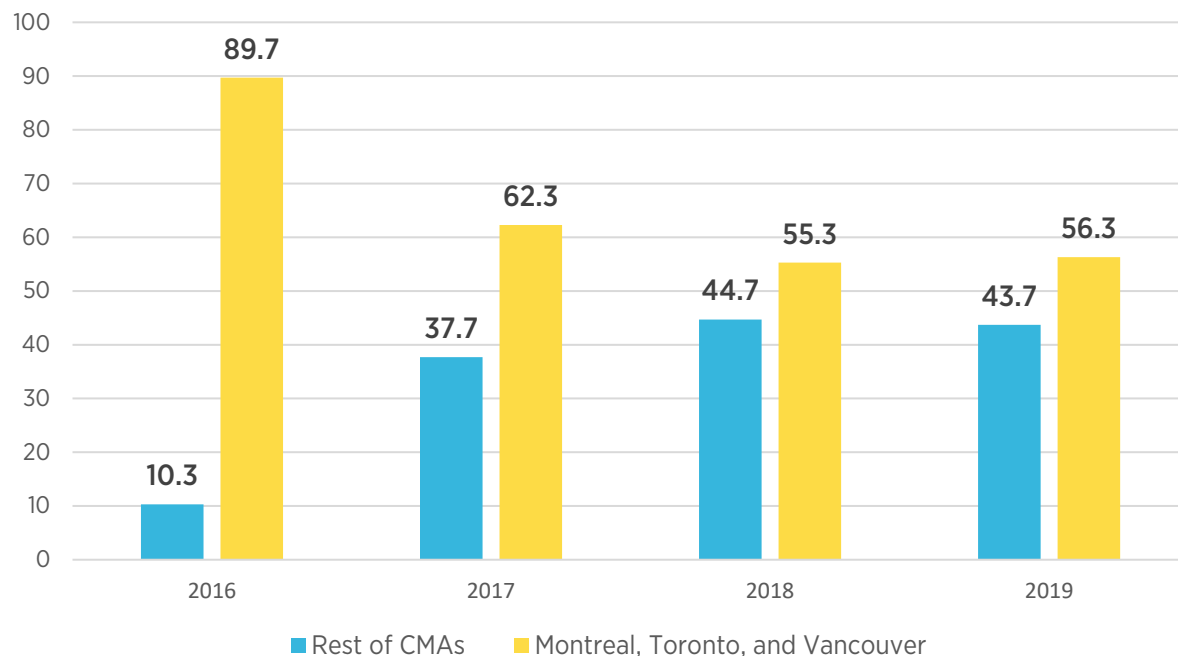
A combination of an older population, lower levels of educational attainment and other factors have contributed to less economic dynamism and, in turn, poorer labour market performances in rural areas.

Data in this section predates the coronavirus crisis, which has harmed employment in both urban and rural areas. There is persuasive evidence that the virus has spread more dramatically in major urban centres such as New York City, Detroit, Chicago, and Los Angeles due to what some have described as the “density divide.”<sup>27</sup> But the economic effects of the virus are far from limited to urban centres—in fact, due to their less diversified economies, rural areas may be more vulnerable to the economic fallout.<sup>28, 29, 30</sup>

The trends described here though originated far in advance of the current crisis. Rural areas have lagged in most labour market measures for the past several years.

Consider, for instance, that of the 1.05 million jobs created between 2015 and 2019, roughly two-thirds were created in Montreal, Toronto and Vancouver. Adding Ottawa-Gatineau, Calgary and Edmonton brings it to 77 percent (see Figure 4). The other 30 census metropolitan areas (CMAs) have made up less than one-quarter of national employment growth. Some, like Saint John, N.B., and Saguenay, Que., had flat employment growth over this period. Others, like St. John’s, N.L., and St. Catharines-Niagara, Ont., actually experienced negative employment growth.

**Figure 4: Percentage of Employment Change by Census Metropolitan Areas, Both Sexes, Ages 15 and Over, 2015-2019**

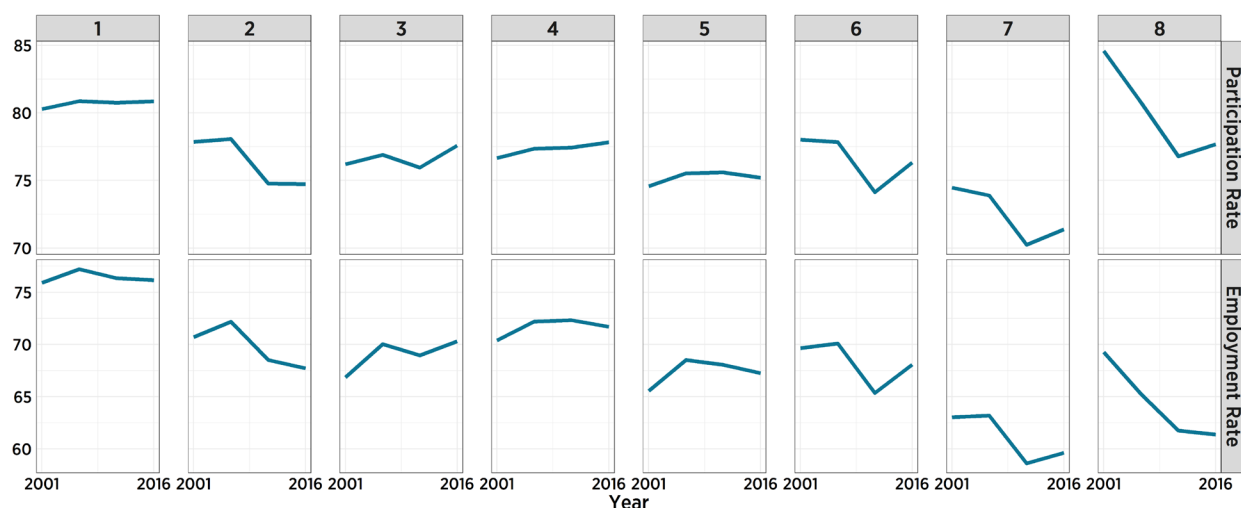


Source: Statistics Canada, Labour Force Survey, Table: 14-10-0096-01.

The parts of the country outside of CMAs have performed even worse. The 2016 Census data enable us to evaluate employment and labour force participation trends according to rurality. We have focused on the working-age population (ages 25 to 64) to correct for the older populations of rural areas and the extent to which they may skew results. The employment and labour participation rate gaps are significant along rurality lines.

The levels of employment and labour force participation fall based on rurality. CSDs with a rurality score of 1 had an average employment rate and participation rate for their working-age populations (ages 25 to 64) of 76.2 percent and 80.1 percent respectively. These numbers fall to 59.6 percent and 71.2 percent respectively for CSDs with rurality scores of 7 (see Figure 5).

**Figure 5: Average Employment Rate and Labour Participation Rate by Rurality, Both Sexes, Ages 25 to 64, 2001-2016**



Source: Statistics Canada, Census.

**Rural Canada is older,  
less educated, less  
employed, and poorer  
than urban Canada.**



These poorer labour market performances translate into lower incomes in rural areas. A 2010 paper produced by Statistics Canada finds a persistent 25-percent wage premium for Canadians in large metropolitan areas.<sup>31</sup> This is consistent with new and older research in Canada<sup>32</sup> and the United States.<sup>33</sup>

The main takeaway here is that rural Canada is older, less educated, less employed, and poorer than urban Canada. There is a reasonable chance the COVID-19 crisis may exacerbate these trends. There is certainly evidence that the 2008-09 recession had a similar effect.<sup>34</sup> But no matter the short-term effects, the long-term trends—

including those driven by technology-induced disruption—point in the direction of urban agglomeration and rural decline.

## FUTURE OF WORK AND THE URBAN-RURAL DIVIDE

The previous section provided a starting point for the urban-rural divide in Canada, including the potential short- and medium-term effects of COVID-19. This section aims to understand the future of work trends, how they may affect labour markets in urban and rural areas, and the possible long-term impact on the urban-rural divide. These trends and the potential effects of automation predate the COVID-19 crisis, though some scholars believe the coronavirus may hasten them,<sup>35</sup> which could sharpen the need for a place-based policy response.

Place-based research on the future of work is fast evolving. Initial work tended to focus on the overall labour market or specific sectors or forms of employment. The research is starting to drill down further to distributional effects based on gender, educational attainment and place. This analysis can help to inform policymakers on how technology-induced disruption may affect different communities, including urban centres and rural areas.

Place-based research focuses on the geographical distribution of high-, medium-, and low-risk occupations and the overall level of economic diversification in certain communities. Research shows higher levels of displacement in communities with a concentration of high-risk occupations and less diversified industrial footprints with rural areas being home to a disproportionate share of high-risk occupations and having less diversified economies.

One way to think about it: There are industrial and labour market characteristics more or less prone to technology-induced disruption and there is a concentration of high-risk characteristics present in rural places.

## INTERNATIONAL RESEARCH

Just consider the following international research:

1. A 2019 study published by the Brookings Institution estimates 25 percent of U.S. employment faces a “high exposure” to automation but that “smaller, more rural communities are significantly more exposed to automation-driven task replacement—and smaller metros more vulnerable than larger ones.”<sup>36</sup>

2. Another 2019 report, by the McKinsey Global Institute, forecasts that of the 512 U.S. counties projected to experience the highest levels of technology-induced disruption, more than 80 percent are rural.<sup>37</sup>
3. The same report estimates that although rural and other low-growth areas in the United States account for 20 percent of jobs today, they could drive as little as three percent of job growth through 2030 due to a combination of technology-induced disruption, deindustrialization and population outflows.<sup>38</sup>
4. A 2019 report produced for the G-20 meeting in Germany warned that the “uneven impact of automation can widen inequality in employment conditions between urban and rural areas.”<sup>39</sup>
5. A 2018 academic study similarly found that smaller cities have less occupational specialization than larger ones and in turn face higher rates of worker displacement due to automation and technology-induced disruption.<sup>40</sup>
6. A 2018 report by the OECD found smaller towns and rural areas are more exposed to automation than urban centres because of a lower share of service sector jobs and a greater dependence on a small number of employers.<sup>41</sup>
7. Analysis conducted in 2017 by a group of researchers at the Massachusetts Institute for Technology’s Media Lab found that places with fewer than 10,000 residents were more at risk of technology-induced disruption because employment in these communities is generally less specialized than larger centres.<sup>42</sup>
8. A 2015 report by an Australian think tank found 40 percent of jobs in Australia are at risk of automation by 2030, but the estimate jumps to 60 percent for rural parts of the country.<sup>43</sup>
9. A 2006 study published by the Carsey Institute (affiliated with the University of New Hampshire) found that low-skilled workers in rural communities were the most vulnerable to displacement caused by technology- and trade-induced disruption.<sup>44</sup>

This international research is quite overwhelming: it conveys that the interrelationship between high-risk occupations, educational attainment and place will have a disproportionate effect on rural areas in the coming years. To the extent to which this research is correct, policymakers can anticipate a concentration of technology-induced disruption in rural areas. Put differently: The benefits of technological progress will disproportionately accrue to those in urban centres and the costs will be disproportionately felt by those in rural area.

## CANADIAN RESEARCH

These international studies are useful to identify trends in the research and analysis. But we have also sought to survey the Canadian research to better understand how automation may affect urban and rural Canadians.

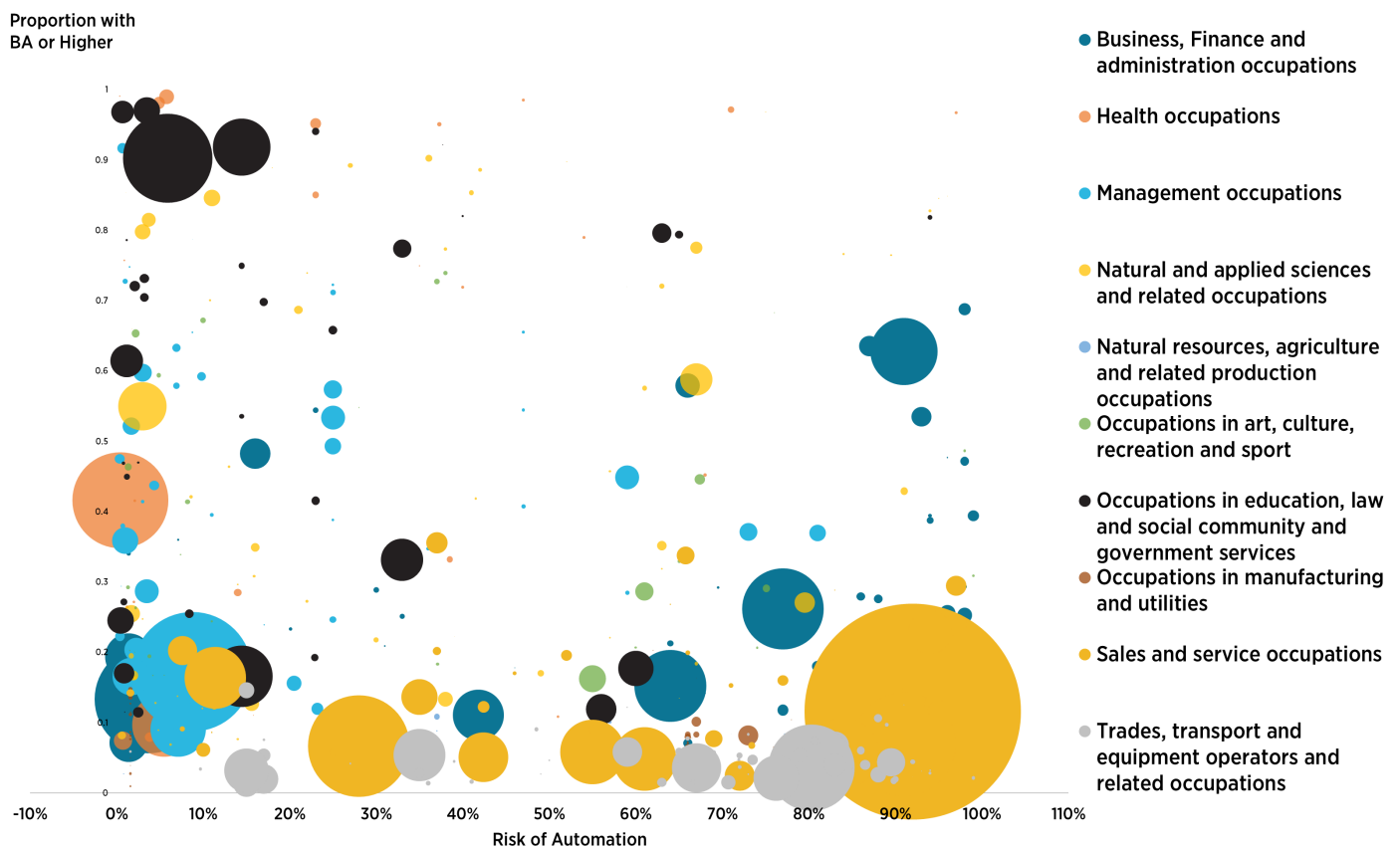
Our analysis shows Canadian-based research broadly conforms to the international research. As an internal government document (obtained by Canadian media via access to information) explains:

**“Less-educated local work forces mean that rural areas and small towns are less likely to seize the economic opportunities presented by new technologies. Less diversified local economies mean that rural areas and small towns are less likely to adapt if incumbent sectors and businesses are disrupted.”<sup>45</sup>**

Canadian academic and think tank scholarship point in this direction as well. The Brookfield Institute for Innovation and Entrepreneurship, for instance, has produced several reports on this topic, including two by Creig Lamb.

A 2016 report by Lamb adapted research into the probability of automation in various occupations in the United States to Canada’s labour market.<sup>46</sup> This work was not focused on the distribution of automation risk based on place but rather according to occupation and education level. His analysis estimated nearly 42 percent of the Canadian labour force is at “high risk” of being affected by automation in the next two decades. This is broadly consistent with Wynoch’s research referenced earlier. Those in low-paying occupations or with fewer post-secondary qualifications are disproportionately at risk (see Figure 4).

**Figure 6: Potential of Automation by Major Occupation Groups and Educational Attainment, Canada**



Source: 2011 National Household Survey, Frey and Osborne (2013), and Brookfield II+E.  
Note: Size corresponds to the number of employees and colour to the major occupation classification.

**46 percent of work activities in Canada (the equivalent of 7.7 million jobs) have the potential to be automated—a figure that is generally higher for smaller cities and towns.**

Lamb, 2017.

Lamb's analysis does not focus on urban and rural effects per se, but the correlation between automation risk and education level will necessarily have place-based consequences. Drawing on this research, the distribution of occupations and educational credentials should enable urban centres to better navigate the threat of technology-induced dislocation.

A 2017 report by Lamb sought to understand the potential impact of automation across the country based on CMAs and census agglomerations.<sup>47</sup> The report estimated 46 percent of work activities in Canada (the equivalent of 7.7 million jobs) have the potential to be automated—a figure that is generally higher for smaller cities and towns. Communities dependent on manufacturing, for instance,

(such as Ingersoll, Tillsonburg, Leamington and Woodstock in Ontario) may see half of their work activities subject to automation. Major urban centres are not immune to automation risk—Toronto, for instance, ranked ninth lowest based on its risk levels—but they are generally better positioned than rural areas due to their diversified economies.

## DRILLING DOWN INTO AUTOMATION RISK BY PLACE

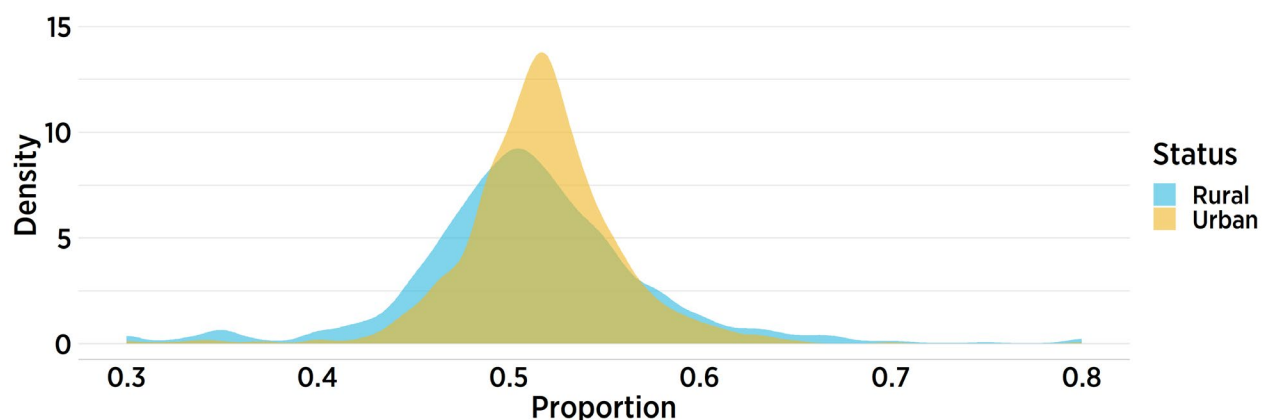
What do we know so far?

We know automation risk correlates with different occupations and levels of educational attainment. We also know these characteristics have geographic implications. That is to say, they are not evenly dispersed across the country. The interrelationship between these different considerations point in the direction of greater automation risk among rural areas.

But we have sought to test this question. We have built on Lamb's research by using the National Occupational Classification (NOC) codes<sup>48</sup> and the probabilities of automation risk to share of workers at risk of automation based on census subdivisions. The goal here is to drill down into the census metropolitan area and census agglomeration data to better understand the threat of technology-induced disruption based on a community's rurality score. We have applied the probabilities of automation risk derived from Brookfield's 2016 report to the 2016 Census data for the various CSDs. We have data for 4,562 CSDs, which represent most of the CSDs across the country.

Our analysis of course finds that every subdivision is home to workers who will face automation risk. The average per CSD is 51.2 percent of the workforce over the next two decades. But what is interesting is the urban-rural differences. The proportion of workers in rural areas facing automation risk is significantly greater than those in urban centres (see Figure 7).

**Figure 7: Proportion of Urban and Rural Workers Facing Automation Risk, Canada**



Source: 2011 National Household Survey, Frey and Osborne (2013), and Brookfield II+E, author's calculations.  
Note: Only CSDs where employment in at least one 4-digit NOC was recorded are included in this analysis.

These estimates are slightly higher than others that focus on CMAs and census agglomerations because census subdivisions capture more rural areas, which face higher automation risks. By drilling down into census subdivisions, we are able to get a more comprehensive picture of automation risk in rural areas and smaller towns.

The median automation risk among the CSDs is 51.1 percent. The median is a useful metric here because it adjusts for outliers on either side. Examples of communities at the median include:

- |                        |                         |
|------------------------|-------------------------|
| ▪ Saint-Jérôme, Que.   | ▪ La Malbaie, Que.      |
| ▪ Port Coquitlam, B.C. | ▪ Annapolis, N.S.       |
| ▪ Sarnia, Ont.         | ▪ Maniwaki, Que.        |
| ▪ Mirabel, Que.        | ▪ Pictou, N.S.          |
| ▪ Lakeshore, Ont.      | ▪ Lac-des-Écorces, Que. |
| ▪ Clearview, Ont.      | ▪ Kingsey Falls, Que.   |
| ▪ Trent Hills, Ont.    | ▪ Saint-Esprit, Que.    |
| ▪ Yarmouth, N.S.       | ▪ Shippagan, N.B.       |
| ▪ Rigaud, Que.         | ▪ Dawn-Euphemia, Ont.   |

These places have low population densities and generally share the industrial and labour market characteristics—including reliance on manufacturing and other production-based industries—associated with automation risk. The list gives readers a sense of the types of places that face elevated risks in the coming years.

What is the upshot of this research and analysis?

Anticipated technology-induced disruption will not be equitable. It will likely disproportionately affect rural areas, which generally have a concentration of high-risk occupations, less-skilled workforces and less diversified industrial footprint. As leading policy scholar Mark Muro has put it:



**“smaller, less-educated communities will struggle relatively more with AI-phase automation, while larger, better-educated cities will experience less disruption.”<sup>49</sup>**

The result will be to exacerbate pre-existing gaps in urban-rural labour market outcomes described earlier. This ought to be a subject of concern for policymakers. Spatial inequality has become associated with declining social cohesion and rising political populism in advanced economies.<sup>50</sup> To the extent that technology-induced disruption markedly increases geographical inequality, it is reasonable to assume it could contribute to accompanying political disruption in Canada.

## **PLACE-BASED STRATEGIES FOR THE FUTURE OF WORK**

Some level of technology-induced disruption is unavoidable and we should not necessarily aim to stop it anyway. Automation in the form of artificial intelligence, machine learning and other technological developments will produce higher productivity and should in turn contribute to higher wages and standards of living.<sup>51</sup>

But that does not mean welfare gains will be equitable or that there will not be industries and workers negatively affected. And, as we have described in earlier sections, the so-called “losers” will likely be disproportionately concentrated in rural areas. It is this clustering of dislocation that has the potential to produce significant political consequences. Researchers have come to identify evidence of spatial disaffection, calling it “the geography of discontent.”<sup>52</sup>

It is not just about protecting against poor political outcomes, either. Analysis by the OECD finds that lagging regions can harm aggregate economic performance as well.<sup>53</sup> It is in our collective interest then to mitigate negative effects of technology-induced disruption in rural areas and help these communities more fully participate in the modern economy. Human flourishing should not be just a function of one’s postal code. Herein lies the case for place-based policy.

What is place-based policy?

Place-based policies are targeted programmes to support underperforming regions and communities. It is an overarching policy approach that emphasizes place as a driver of outcomes and recognizes that different places need different policies. These policies can come in various forms such as industrial supports, employment benefits and public infrastructure projects.<sup>54</sup> The OECD describes place-based policy as a

“policy of policies” because it is more of a comprehensive programme to support economic development in particular regions or communities than a single initiative.

The basic, underlying idea of a place-based approach is that the market’s allocation of resources is not producing enough economic activity in these places on its own. Public policy can potentially play a role in pushing the market to direct greater investment and employment to these places and in turn improve their economic performance.<sup>55</sup>

This is a somewhat controversial proposition. Place-based policy has generally been met with skepticism from policy scholars due to the risks of cronyism, market distortions and inefficiencies. Even more sympathetic research questions whether place-based policies ultimately create self-sustaining economic gains.<sup>56</sup> It is hard to argue, for instance, that the record of the federal regional development agencies has been overwhelming.<sup>57</sup>

The preference instead has been for policies to target disadvantaged individuals rather than places in order to minimize distortions and enable labour dispersion in response to market signals. This approach (which has come to be described as “people, not places”<sup>58</sup>) has been pursued with the overriding goal of economic efficiency in mind.

The current mix of place-based challenges seem different, however. The trend toward urban agglomeration has been exacerbated by the rise of the intangibles economy (as defined by the growing value of intangible assets such as intellectual property, data, and so on). This transition from an industrial economy to a knowledge-based one—what economist Richard Baldwin describes as the “economy of things” versus the “economy of thoughts”—is contributing to a hyper concentration of economic activity and opportunity in our urban centres.<sup>59</sup> Urban policy expert Richard Florida calls it “winner-take-all urbanism.”<sup>60</sup>

This is not mere sloganeering. It is notable, for instance, that a 2019 OECD study found productivity in rural areas is less than 80 percent of average productivity in urban areas within the same country, and automation is bound to increase this productivity gap.<sup>61</sup> It seems far from obvious that, in the absence of policy intervention, this trend is going to change. Redistributing the economic gains from individuals in dynamic cities to displaced workers in rural areas does not seem like a sustainable strategy—especially since we have evidence that concentrated unemployment has negative spillover effects for communities, families and households.<sup>62</sup>

Economic migration will be the solution for many rural residents, but it will not be an option for others due to labour market considerations, housing, family or other preferences. It is wrong though to assume that this is answer for everyone. And the evidence from the 2016 U.S. presidential election is that a concentration of people with high levels of economic anxiety can contribute to political disruption.<sup>63</sup>

The market trends toward urban agglomeration, moreover, mean market forces alone are unlikely to spread opportunity equitably across regions and communities. Geographic inequality is not a case of market malfunction. It is a function of markets allocating resources efficiently. If we want to push the market to bring investment and opportunity to rural and economically distressed communities, there will be a need for public policy to shape these desired market outcomes.



**The question, then, is less about whether Canada ought to pursue a place-based agenda than how can one be designed to minimize distortions and contribute to more inclusive outcomes?**

There are no silver bullets here. The research indicates effective place-based policies must be tailored to particular locales.<sup>64</sup> This places limits on any generalized insights. A place-based model will also invariably involve a mix of policies to push the market in the direction of investment and job creation in rural areas. But there are a few areas that appear promising and deserve the attention of Canadian policymakers.

## WAGE SUBSIDIES

The federal government has enacted a temporary wage subsidy to help firms maintain their workforces during the COVID-19 crisis. The short-term goal has been narrowly focused on sustaining work attachment in a moment when the vast majority of businesses have been temporarily shut down. But even before the crisis, there was increasing scholarly attention to the wage subsidy model to help displaced workers in normal circumstances. Wage subsidies could be used both to encourage employers to hire workers in the form of payroll tax cuts and to encourage workers to accept jobs that pay less than their previous ones in the form of wage top-ups.

Economists and policy scholars from the left and the right have come to see a role for wage subsidies in place-based policy along these lines. Economist David Neuwark, for instance, has proposed a temporary wage subsidy to stimulate employment in communities with high poverty rates.<sup>65</sup> Policy scholar Oren Cass, by contrast, has proposed a wage subsidy paid directly to workers in order to close the wage gap between a previous job and a new, lower-paying one.<sup>66</sup> The first policy design aims to stimulate marginal hiring. The second aims to augment the labour market determination of price for certain workers.

The truth is there may be a need for both approaches—that is, there may be a case for a policy that minimizes hiring costs for employers and one that tops up wages for employees—depending on the circumstances in individual places. That is one of the virtues of the place-based approach. It will invariably require flexible policy models that reflect locale particulars. But the commonality of the two approaches is that the policy intervention has a pro-work bias with an emphasis on private sector employment.

The policy design would require serious thinking. The subsidy's generosity may vary depending on local economic conditions. It would ostensibly involve some conditionality around retention. And it would require careful policy design on the eligibility, timing and phaseout of the subsidies. These outstanding design questions should not be underestimated. There is a high risk of administrative complexity and potential for employer gaming.

But it is still worth pursuing for two reasons:

1. Analysis by the Brookings Institution shows that wage subsidies can raise earnings and employment among disadvantaged workers, which will be particularly important for workers displaced by automation.
2. Wage subsidies can have broader spillover effects such as reducing the use of other public assistance, improving school outcomes among children of workers, lowering criminal justice system involvement among workers and children, and reducing long-term poverty.<sup>67</sup> This is in large part a function of their pro-work bias, which recognizes the financial and non-financial benefits of paid employment for individuals and their families.<sup>68</sup>

The COVID-19 crisis has shown that our current income support model—including Employment Insurance—has major shortcomings. There is bound to be some degree of lasting reform that follows from this experience. One of the takeaways may be an ongoing role for wage subsidies to support labour market attachment and paid employment among displaced workers. This may have general, nation-wide application as well as a targeted or enhanced approach for rural and economically distressed places.

## INVESTMENT INCENTIVES

**A long-term strategy requires pulling private investment into rural and economically distressed communities.**

It is not enough merely to aim to stabilize employment. A long-term strategy requires pulling private investment into rural and economically distressed communities. This is critical because private capital is the lifeblood of entrepreneurship, innovation and employment.<sup>69</sup>

Yet previous models at drawing private capital to rural and economically distressed places have not been generally successful. Experiments with Enterprise Zones, Empowerment Zones and regional economic development spending have a mixed record. In

particular, policies targeting individual businesses have shown a weak performance in terms of positive spillovers or durable benefits.<sup>70</sup>

One of the main challenges with this model is that it often subsidizes investment decisions that would have happened anyway.<sup>71</sup> Another is that it does not produce large, positive spillovers because it tends to involve

adjusting the location of jobs rather than creating more of them.<sup>72</sup> Research by American scholar Tim Bartik, for instance, highlights the practical challenges in ensuring that direct business incentives catalyse local employment rather than in-migrants, regional hiring, or employment elsewhere within a firm.

This does not mean that governments should not seek to incentivize investment. It just means they need to rethink how they pursue this goal. Top-down incentives for particular firms are shown to be generally ineffective. The better model is to create a policy framework that enables greater market-led investment choices. As Bartik puts it: “To promote broadly shared prosperity, incentives should not be eliminated... incentives should be tamed.”<sup>73</sup>

The Manufacturing USA network, which was launched by the Obama Administration to cultivate lower costs of private research and development in the manufacturing sector, is one model worth considering in the Canadian context.<sup>74</sup> It basically involves the creation of a large number of sub-sectoral institutes spread across the country that enable public-private partnerships on new manufacturing-related technologies (see appendix). Each institute has a different research focus and aims to serve as a regional manufacturing hub based on a place’s pre-existing industrial advantages. In practice, the institutes bring together industry, academia and government to co-invest in the development of innovative manufacturing technologies and capabilities.

Each institute is an independently run non-profit organization leveraging a combination of public spending and investments by its industry partners. This is an important point: it is not about government selecting one firm to receive public subsidies or micromanaging research projects. Instead, public dollars are being used to catalyse co-operation among various industry players, including large and small firms. The current mix of institutes boasts more than 1,900 member organizations.

The goal here is to facilitate public-private collaboration, supply chain co-ordination and knowledge spillovers. The early signs are promising. A 2017 review found that the model seems to be spurring R&D investment and commercialization by decreasing the cost of R&D experimentation and knowledge exchanges.<sup>75</sup> Public spending is, in short, unlocking new and incremental private investment.

One could envision leveraging this model for place-based policies in Canada. It already has similarities with the Next Generation Manufacturing Canada model that was funded under the federal Superclusters Initiative. The main difference is the Superclusters Initiative has not had an explicit place-based objective. As policymakers learn more about Manufacturing USA’s strengths and weaknesses, there may be room to deploy it more purposefully as a basis for place-based policy.

Canada might adopt the Manufacturing USA model with institutes located in various places across the country based on regional industrial strengths. The goal would be to use public dollars to catalyse private investment on a more equitable, regionalized basis. The innovation and collaboration would be driven by

market forces. But the government would have a catalytic role at the outset by bringing the various players together and creating the initial demand.

The government could, for instance, provide seed funding to establish a forestry institute in Thunder Bay, a 3D printing or plastics institute in southwestern Ontario, an auto manufacturing institute in Oshawa, and other initiatives across the country. There could be various means for selecting the institutes, including an independently arbitrated competition or a pilot. But the key point is that this model is showing promising outcomes, has characteristics that are better than conventional business support programs, and has the potential to be used as a regional development tool. This seems particularly timely in light of growing interest and discussion about the need to restore certain manufacturing capacities as a result of the COVID-19 crisis.

## A ROLE FOR UNIVERSITIES, COLLEGES, AND POLYTECHNICS

One of the most promising areas of place-based policy centres around the role of post-secondary institutions. These institutions play an anchor role in their communities. They are hubs for attracting dynamic people (including international students), developing human capital, undertaking research and development, and partnering with local firms. These various functions can produce large, positive spillovers that can be both highly localized and additive to pre-existing local economic activity.

Research by economists David Neumark and Helen Simpson, for instance, shows that:

**“Higher-education institutions generate productivity spillovers that may be highly localized. Not surprisingly, these benefits are specific to industries with technological links to university research and that employ many university graduates. Some evidence finds that university research facilities attract high-tech, innovative firms to an area, which can help form industry clusters that may deliver longer-term benefits from agglomeration. Much of the evidence is from long-established universities, although research from Sweden points more directly to new universities increasing local labour productivity with benefits that do not appear to create negative effects in other regions.”<sup>76</sup>**

The research seems to be clear: Investing in post-secondary institutions produces large, ongoing spillovers for their immediate communities and broader regions. Bloomberg columnist Noah Smith has even gone so far as to observe that universities “are the only thing standing between many healthy small towns and the looming specter of long-term decay.”<sup>77</sup>

Smith persuasively argues that policymakers ought to see universities, colleges and polytechnics as sources of economic development in rural and economically distressed communities. The largest benefit probably comes from university research. The confluence of dynamic research, public-private investment and the attraction of human capital seems to “harness the forces of knowledge-industry clustering to increase the wealth of an entire region.”<sup>78</sup>

One of us has previously argued that policymakers ought to see international student attraction and retention as a key part of place-based policy.<sup>79</sup> Smith’s “university-centric development” model extends that earlier research to build a more ambitious agenda around post-secondary institutions as a source of place-based development.

This could manifest itself in various policy interventions, including:

- Targeted research funding for post-secondary institutions in rural and economically distressed communities;
- Incentives to encourage localized commercialization (as opposed to university-business partnerships with foreign firms);
- Subsidies for public-private research projects; and
- An ambitious international student retention strategy.

The latter is worth elaboration. Research highlights the crucial role that a critical mass of talented, dynamic and entrepreneurial people can play in cultivating new innovations and businesses in a community.<sup>80</sup> Such individuals may succeed or fail with individual businesses but that is not the right test of success. Leveraging the human capital of international students is thus a major opportunity for rural and economically distressed places.

But the key here is to start to think of regional universities, colleges and polytechnics not as just institutions of higher learning, but as tools for regional and local economic development. This may require provincial governments to permit a greater degree of flexibility and differentiation among universities, colleges and polytechnics to be more responsive to regional and local contexts. And it may require adjustments to the funding formula so that institutions do not suffer serious financial consequences for orienting themselves to the regional industrial composition and needs.

These three policy ideas—wage subsidies, investment incentives and an economic development role for post-secondary institutions—are not meant to be exhaustive. There are various others worth examining, including public infrastructure spending, the role of government procurement, immigration policy and so on. The purpose here is primarily to synthesize some of the current policy thinking on place-based policies and galvanize a debate in Canada. That we now have a federal minister for rural economic development creates

a major opportunity for a comprehensive and rigorous analysis about what has been tried elsewhere, what shows signs of progress and what Canadian policymakers ought to consider.

But it is still worth recognizing that even if these policies are generally successful, there will be limits on the extent to which public policy can solve spatial inequality. The market forces pushing in the direction of urban agglomeration are powerful. The low density of rural areas creates structural disadvantages—including transportation costs, access to skilled labour and diminished knowledge spillovers—that could be minimized but probably cannot be fully overcome. This does not mean policymakers should not try to catalyse investment and employment in rural and economically distressed places. It just means we ought to be clear-eyed about what they are ultimately able to achieve.

## CONCLUSION

The Public Policy Forum's [Brave New Work](#) project aims to understand how new and emerging technologies may affect employment in Canada and how policymakers should prepare for the forces of automation, technology-induced disruption and the changing nature of work. This report has sought to contribute to the project's overall goals by elucidating how the “future of work” may manifest itself in urban centres and rural areas.

There is already a considerable urban-rural gap in labour market outcomes in Canada and the research tells us technology-induced disruption is likely to accentuate these pre-existing gaps. A large body of scholarship from Canada, the United States and elsewhere anticipates rural areas will be disproportionately affected by automation in particular and technology-induced disruption in general due to their lower levels of educational attainment, overrepresentation of “routinized work” and less diversified industrial footprints. The result will be to exacerbate the growing urban-rural economic divide in Canada.

We have looked at place-based policies and the renewed attention they are receiving from policy scholars and policymakers. Place-based policies have a mixed record of catalysing investment and employment in distressed areas. But in light of the trends described in the report, there is a strong case for policymakers to reconsider how place-based policies may be able to help mitigate the place-based effects of technology-induced disruption.

# APPENDIX:

## MANUFACTURING USA INSTITUTES

INSTITUTE	TECHNOLOGY	LOCATION
National Additive Manufacturing Innovation Institute (AmericaMakes)	3D Printing / additive manufacturing	Youngstown, Ohio
Digital Manufacturing and Design Innovation Institute (DMDII)	Digital manufacturing	Chicago, Illinois
Lightweight Innovations for Tomorrow (LIFT)	Lightweight materials	Detroit, Michigan
Next Generation Power Electronics Institute (PowerAmerica)	Wide-bandgap semiconductors	Raleigh, North Carolina
Institute for Advanced Composites Manufacturing Innovation (IACMI)	Composite materials	Knoxville, Tennessee
American Institute for Manufacturing Integrated Photonics (AIM Photonics)	Photonic integrated circuits	Rochester, New York
Flexible Hybrid Electronics Manufacturing Innovation Institute (NextFlex)	Flexible electronics	San Jose, California
Advanced Functional Fabrics of America (AFFOA)	Textiles	Cambridge, Massachusetts
Smart Manufacturing Innovation Institute	Smart manufacturing	Los Angeles, California
National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL)	Biopharmaceutical	Newark, Delaware
Advanced Regenerative Manufacturing Institute (ARMI)   (BioFabUSA)	Regenerative medicine / tissue engineering	Manchester, New Hampshire
Advanced Robotics Manufacturing (ARM)	Human-Collaborative-Robotics/ Artificial Intelligence / Automation	Pittsburgh, Pennsylvania
Rapid Advancement in Process Intensification Deployment (RAPID)	Process Intensification / modularization	New York, New York
Reducing EMbodied-energy And Decreasing Emissions (REMADE)	Design for Reuse / ReManufacturing	Rochester, New York

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## ENDNOTES

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- <sup>12</sup> A census subdivision is an area that is a municipality or an area that is deemed to be equivalent to a municipality for statistical reporting purposes (e.g., as an Indian reserve or an unorganized territory). Municipal status is defined by laws in effect in each province and territory in Canada.
- <sup>13</sup> Whitehorse and Yellowknife are both classified as census agglomerations and thus are ranked 2 on the rurality scale.

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<sup>14</sup> There is a slight gender difference. The average man is 42.4 years old and the average woman is slightly older at 43 years old.

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