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Automation, AI and COVID-19

PETER J. LOEWEN & BLAKE LEE-WHITING

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EXECUTIVE SUMMARY

A Public Policy Forum article titled **Automation, AI and Anxiety: Policy Preferred, Populism Possible** suggests that there is a relationship between fear of job loss via automation and support for more populist governments among people who feared their own job loss and those who feared job loss for others. The paper also demonstrated that there was an appetite among those who were fearful of automation, whether for themselves or others, for government playing a more active role in response to this emerging economy. Governments thus face a choice: respond to fears of automation through a variety of focused and effective policies, or, leave things open for those who would employ the well-known playbook of protectionism and veneration of the working-class in place of action.

The purpose of this report is to revisit the landscape of that first paper to provide context for what has changed in light of the massive disruptions introduced by COVID-19 and the subsequent shutdown of the Canadian economy. To better understand these shifting dynamics, we consider three related questions:

- Has COVID-19 accentuated fears about automation and AI amongst Canadians?
- Do citizens wish for more, or less, government in response to the dual challenges of COVID-19 and automation and AI?
- Are these demands most acute among those who have experienced job or income loss due to shutdowns?

To understand citizens' views on automation and AI in the global COVID-19 pandemic context, we surveyed 1,920 Canadians in May and June 2020 and another 603 Canadians in April 2021.

FINDINGS

- Canadians are worried about the long-term effects of COVID-19 on the labour market. Individuals prompted to think of job losses see links between increasing AI and automation practices and the labour challenges presented by COVID-19. The adoption of AI and automation will not stop when the pandemic ends. Accordingly, we must better understand how individuals chose to prepare themselves and their skill sets for a changing jobs market. In particular, we find that:
- The coming technological revolution is not completely unexpected, as a majority of Canadians indicate they have at least a basic understanding of AI and automation. Politicians have an opportunity to seize upon this (perceived) knowledge to address coming challenges. They should consider linking COVID-19 solutions to challenges presented by AI and automation.
- Canadians are deeply concerned that their jobs and the jobs of their family and friends are at risk of being lost to automation and AI in the next five to twenty-five years.

- Citizens are worried that their job skills are not keeping up with the economy and are likewise substantially concerned about the long-term social mobility and economic inequality impacts of automation and AI. Policymakers should pursue equitable solutions, considering carefully who is likely to be impacted negatively.
- Four-in-ten Canadians believe the government should punish corporations that reduce their workforces using automation and AI. Likewise, a similar share believe that consumers should boycott these companies and that companies should continue to employ workers even when technology that can do the job more effectively exists. Policymakers should consider that the policy preferences of the public will sometimes be punitive in nature for firms that negatively impact workers.
- Finally, individuals who lost their jobs due to the COVID-19 pandemic are slightly more likely to favour decreasing immigration levels and increasing funding for STEM university programs than those who did not lose their job because of the pandemic. Politicians should be cautious of increasing nativist attitudes among those most affected.

This is an unprecedented time of labour-market change and technological innovation. Politicians have an opportunity to respond not only to the current crisis, but those that potentially lurk just beyond the horizon.

There are good reasons to be deeply concerned about the effects of the COVID-19 pandemic more than a year out from its onset: the depth and impact of the economic shutdown looks like no other Canadians have ever experienced, the prospects for a full recovery in the short-to-medium-term are limited, and economies are opening up unevenly.

INTRODUCTION

Two major labour-market disruptions are happening at the same time. First, there is the ongoing technological revolution presented by automation and artificial intelligence (AI). Second, there are massive economic repercussions as a result of the COVID-19 pandemic.

Disruption as a result of automation is ongoing and longstanding and has been occurring at a steady pace for the past few decades. There are, however, important signs that the nature and pace of automation is changing, especially as machine learning, AI and related technologies find wider adoption and application. Indeed, according to a work by Peter Loewen and Benjamin Allen Stevens in 2019, 90 percent of jobs in Canada have some task that could be automated using currently demonstrable technologies.[1] Tasks in the top quartile of automation capability include pattern recognition, planning, transportation and navigation-related tasks,[2] implying that automation risk is not limited to those in manual jobs, but also those in higher-income positions.

COVID-19 related labour-market disruptions are the result of policies intended to combat the global pandemic by limiting interpersonal contact to reduce viral transmissions. These policies have included indoor dining restrictions, entertainment venue shutdowns, work-from-home protocols, government office closures and reductions in manufacturing hours.[3] While it is still too early to comment meaningfully on the long-term implications of these policies, some firms did indicate in early days that wages would decrease in response to the normalization of work-from-home employment.[4]

There are good reasons to be deeply concerned about the effects of the COVID-19 pandemic more than a year out from its onset. First, the depth and impact of the economic shutdown looks like no other Canadians have ever experienced.[5] Women accounted for over 62 percent of job losses in Canada: "Many people's worlds were getting smaller, scarier, more uncertain, but it was arguably women who felt this most keenly." [6] Government messaging on social distancing and other mitigation measures has led to negative market shocks.[7] Second, the prospects for a full recovery in the short-to-medium-term are limited; Public Health Ontario data suggests that COVID-19 variants may require additional lockdown measures.[8] There is plainly a lack of adequate and

synchronized childcare that would allow parents of young children, especially women, to return to work. The return to school has been uneven, both within and across levels of schooling, further exacerbating the challenges for those with children. Third, economies are opening up unevenly. Some sectors, such as the entertainment and restaurant industries, are still facing significant public-health restrictions. The inequality experienced in reopening, with some sectors returning to normal while others perhaps never return, is likely to generate long-term unemployment for some classes of workers and potentially deep resentment. Here, the gap between private- and public-sector experiences is likely to be highly relevant and acute.

Do these factors have the potential to play into a populist political appeal? Or will these forces be offset by the widespread experience of government intervention effectively buffering the worst of the economic effects of COVID-19?

These two disruptions are related. The pandemic-induced economic shutdowns have provided firms with ample opportunity to seize the gains offered by automation and AI. Rather than having to face the dual challenges of maintaining production and retooling processes, manufacturing firms have taken advantage of shutdowns to retool. In many industries, fewer workers will return. Parallel trends will exist in work conducted in offices, where working from home is revealing to firms both the unnecessary elements of offices and the back- and front-office functions that can be performed remotely and ultimately in an unsupervised and automated fashion. If firms aggressively pursue automation and AI strategies in a period of government-induced shutdown, will this do more or less to increase citizen demands for policy responses? And what kinds of policy responses will they be most likely to support?

There are two important political trends occurring in the background of these labour disruptions. First, there is the continued trend of a global brand of populist politics, which warns against uncertain futures, venerates selectively remembered pasts and taps into the long-term effects of labour disruption. This has not ended with the election of a new American president. Second, there is a renewed sense in the necessity and effectiveness of government, itself brought on by the large-scale and activist responses of governments to the COVID-19 pandemic. Public opinion studies, for example, demonstrate sustained approval of incumbent governments in countries that have taken large-scale responses to COVID-19 democracy.[9] This consensus about big government action has continued into 2021.[10] In Canada, elite-level responses to the COVID-19 pandemic have presented uniquely cross-partisan consensus on the importance of a serious government response to the pandemic, including substantial government social-distancing messaging.[11] At the ground-level, citizens in many countries are being supported directly by governments on a scale that has not been experienced during recent decades of decreasing government income support.

In this paper, we examine Canadians' views on these issues. Using original data collected from a representative sample of Canadians in June 2020 and April 2021, we examine two broad sets of results. First, we compare results from the surveys with results obtained in 2019. In comparing year-over-year results, we look for differences in attitudes and beliefs about the future of work and the role of government in confronting this

future. Second, we consider the effects of COVID-19, specifically. The goal here is to understand how exposure to the COVID-19 pandemic and job or income loss as a result of the pandemic informs people's attitudes towards the future of work.

There are two important political trends occurring in the background of these labour disruptions: first, there is the continued trend of a global brand of populist politics, and second, there is a renewed sense in the necessity and effectiveness of government, itself brought on by the large-scale and activist responses of governments to the COVID-19 pandemic.

COVID-19, AUTOMATION, AI AND LABOUR

Widespread job loss and economic shutdown has encouraged many firms to speed up their own processes of automation. Firms increasingly look to analytical tools, including AI and automation, to address organizational and economic shortcomings as a result of COVID-19.[12] Analysis by McKinsey in 2020 suggested that "we have vaulted five years forward in consumer and business digital adoption in a matter of around eight weeks."[13] Indeed, as the COVID-19 pandemic passes beyond a year of disruption, some firms are automating as a means by which to socially distance their workers.[14] If these initiatives are successful, will firms bring back workers when the pandemic ends?

In contrast, firms that have not suffered as a result of the pandemic, namely health care and social care, have not witnessed a similar uptick in automation implementation.[15] This finding suggests that automation implementation will be contingent, at least partially, on the negative economic effects of the COVID-19 pandemic.

Overall, firms are responding to the labour disruption and concomitant demand disruptions presented by COVID-19 shutdowns as an opportunity to reconsider and retool their operations.

Disruption has accelerated the (planned) pace of adoption for automation and artificial intelligence innovations in the context of a radically different labour environment.

In contrast to research done in 2019, when automation and AI were a less tangible reality for many Canadians, how has the pandemic affected AI and automation beliefs among Canadians?

DATA

To understand citizens' view on automation and AI in the global COVID-19 pandemic context, we surveyed 603 Canadians in April of 2021 and 1,920 Canadians in May and June of 2020. We fielded this survey on the Qualtrics platform. The survey sample reflects the age, gender and regional diversity of Canadians, acting as a representative sample of the population. Some weighting was conducted using available census data.

EMPIRICAL APPROACH

Our project proceeded as follows. First, after collecting standard demographic data, we asked respondents to describe their employment in detail, including the types of work-related tasks conducted by the respondent. This approach allowed us to make estimates about the susceptibility of job replacement using an approach found in *A Future that Works*, a pioneering study by McKinsey Global Institute.[16] Second, we asked respondents, on a seven-point Likert-scale, "How much would you say you understand automation and artificial intelligence?" The motivation here related to a check on understanding, so we could separate high-knowledge respondents from respondents who may not have thought about these topics before. We also asked questions about income loss as well as job loss as a result of the pandemic for those respondents who have indicated they are currently unemployed. Finally, we ask respondents about their views on a number of policies, political preference and perceptions of job-losses relating to automation and AI. These questions primarily relate to the role that Canadians believe government should play after the pandemic. Our overall approach links all of these sections econometrically. More information on our approach can be found in the paper's appendix.

THE COVID-19 CONTEXT

We distributed our second survey at the end of May and beginning of June 2020 when COVID-19 cases in Canada were falling. At that time, it was unclear whether the pandemic would worsen as it has in the months following. Our third survey was fielded in April 2021, just as vaccines were starting to be made available to most Canadians. We asked respondents if they had lost income due to the COVID-19 pandemic. For respondents who indicated that they were unemployed, we asked if they were unemployed as a result of the pandemic. These two groups of respondents directly impacted by COVID-19 are important because they have experienced the effects described in this paper firsthand. We compared their responses to those of the general population.

RESULTS

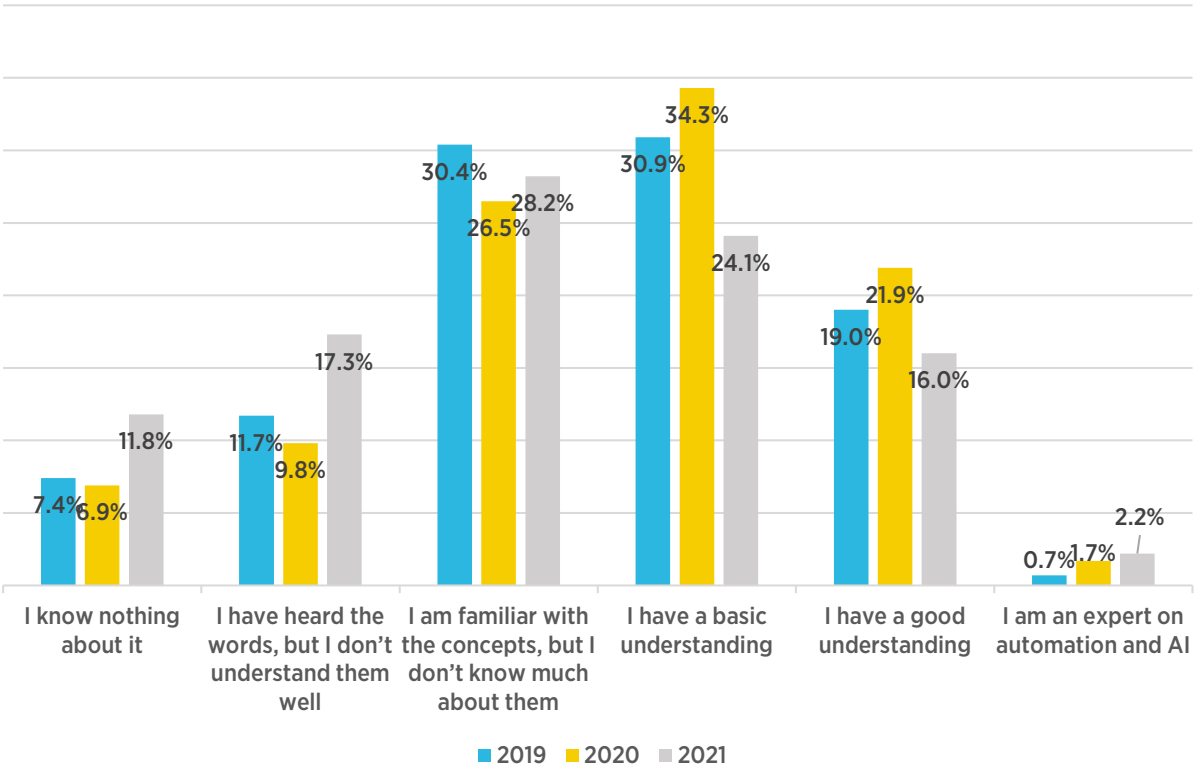
Our study presents two key overarching insights. First, we present a comparison between 2021, 2020 and 2019 on attitudes towards automation and AI. In particular, we are interested in the how attitudes and beliefs about the future of work and the role of government have changed. Second, we explore the effects of the COVID-19 pandemic specifically. The goal here is to understand how exposure to COVID-19 and job or income loss as a result of COVID-19 structures attitude towards the future of work.

KNOWLEDGE OF AUTOMATION AND AI

To begin, we asked respondents how much they feel they understood about automation and AI. We presented respondents with a short introduction to automation and AI to prepare them to think about these topics and to give them an opportunity to reflect meaningfully on their knowledge of these subjects.

Figure 1 presents these results. For the most part, we find moderate self-assessed knowledge of automation and AI. Indeed, 52.3 percent of respondents in 2021 and 61 percent of respondents in 2020 indicated they were familiar with the concepts or have a basic understanding. This is indistinguishable from the frequency observed in 2019 (also 61 percent). There is a very slight increase at the top of the self-assessed knowledge scale, likely indicating that, as expected, Canadians are becoming more aware and knowledgeable about AI and automation. At the lower end of self-assessed understanding, substantially more respondents, 29.1 percent in 2021 compared to 19.1 percent in 2019 and 16.7 percent in 2020 indicate they either know nothing about the topic or have "heard the words, but don't understand them well." This downward overall trend may suggest Canadians are becoming increasingly aware of the complexity of automation and AI and are therefore less likely to express feeling confident in their knowledge. The overall story here is that there has not been a sharp increase in knowledge about automation and AI over time as Canadians are feeling less confident in their knowledge of automation now.

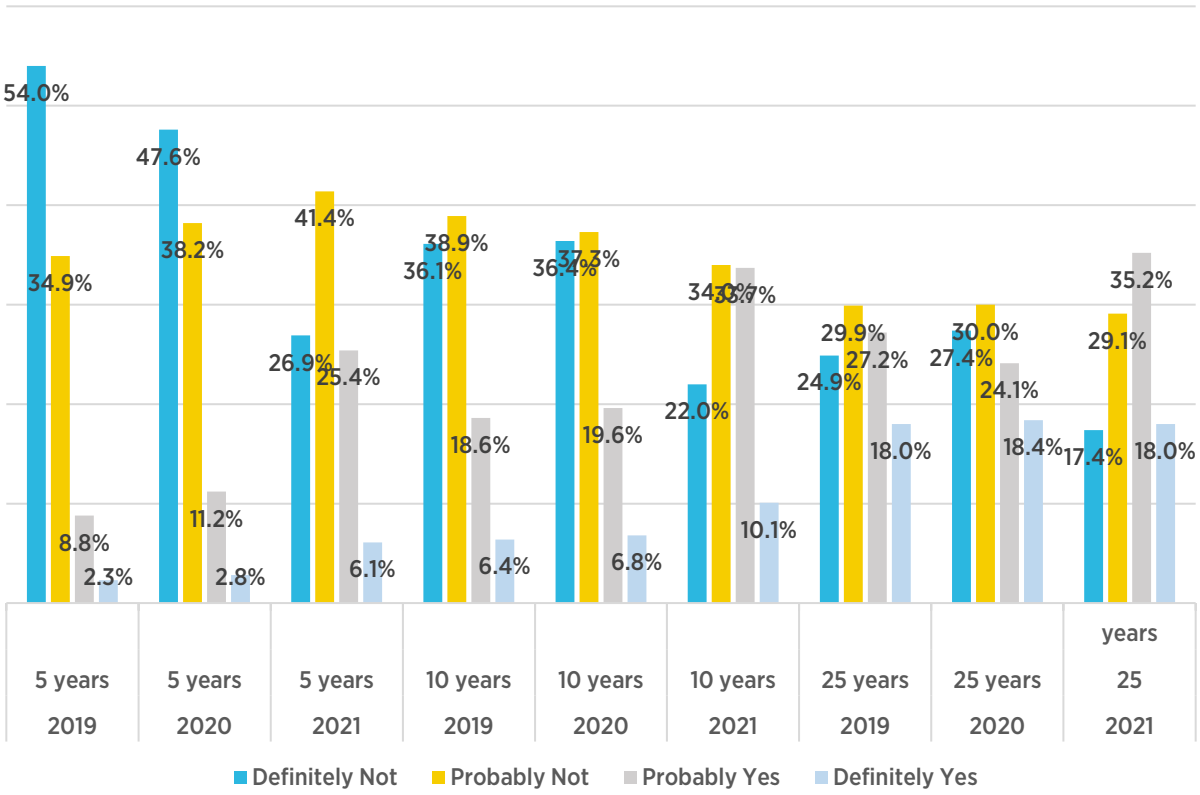
Figure 1: Self-assessed understanding of automation and AI (percentage of respondents)



Perceived labour impact

The story is markedly different when we probe Canadians' beliefs about whether their job is at risk due to automation or AI. As *Figure 2* shows, Canadians have become increasingly worried that their jobs will be replaced by automation and AI in the next five to 25 years. Compared with 14 percent and 11 percent of respondents in 2020 and 2019 respectively, 31.5 percent of respondents in 2021 believe their jobs will be probably or definitely replaced by a computer in the next five years. When asked about 25 years from now, more than half (53.2 percent) of respondents in 2021 were concerned their jobs will be replaced. Overall, there is a strong expectation of replacement via automation or AI now than there was just last year.

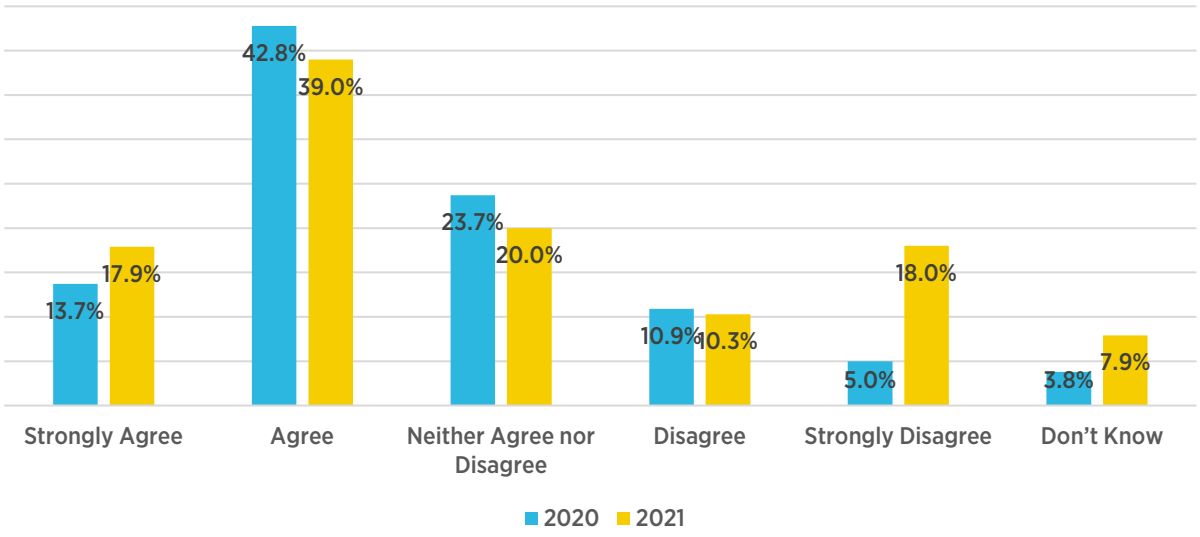
Figure 2: Percentage of respondents who perceived risk of losing their job to automation and AI within the next...



We also asked respondents for an estimation of "how many of your friends and family's jobs" will be replaced. More than half (50.8 percent) of Canadians are concerned that many or most of their friends and family will have their jobs replaced within the next 25 years. This finding suggests that Canadians are clearly concerned that their friends and family will also be negatively impacted by automation and AI.

To further test the extent to which Canadians are concerned about job security, we asked respondents if they perceive their skills as keeping up with the new economy: To what extent do you agree or disagree with the statement "I feel I have the skills necessary to maintain my standard of living in the current economy." Our findings are presented in *Figure 3.*

Figure 3: Are skill-level perceptions keeping up with the economy? (percent of respondents)



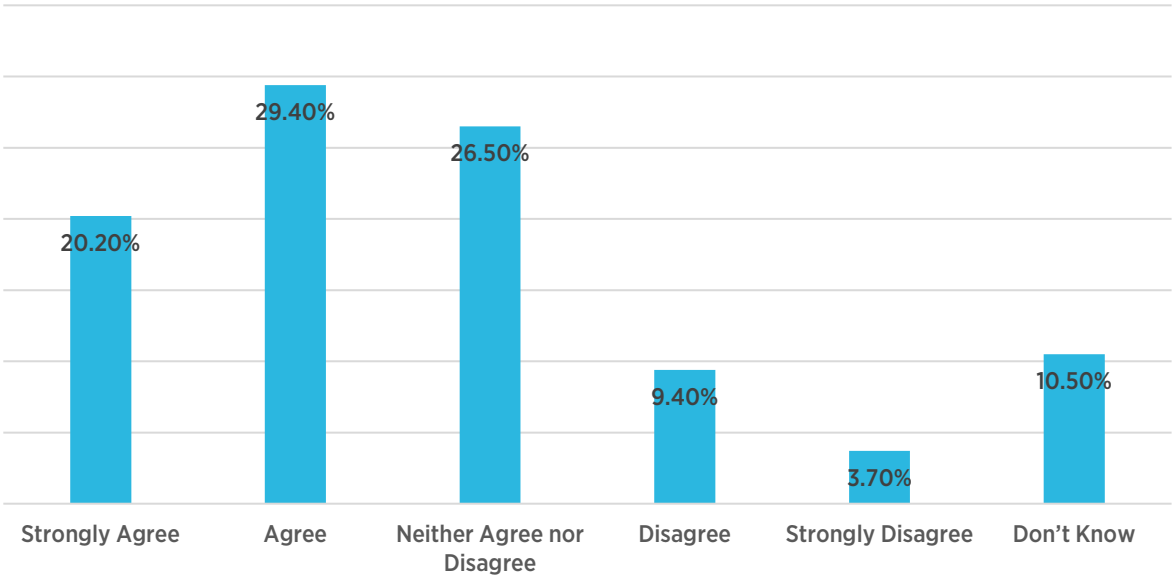
These results indicate that 28.3 percent of respondents in 2021 believe that they do not have the skills necessary to maintain their standard of living in the current economy. The story here, overwhelmingly, is that Canadians in general are concerned about their own skills, their own job security and the job security of their friends and family.

ECONOMIC INEQUALITY AND SOCIAL MOBILITY

Recent popular political rhetoric in the United States has linked increasing economic inequality and downward social mobility with automation and AI.[17] Do Canadians share these concerns?

We asked respondents to register their agreement or disagreement with the following statement: "Automation and artificial intelligence will make economic inequality worse in the future, with the rich getting richer and the poor getting poorer." Our results are presented in *Figure 4* below.

Figure 4: Will AI and automation (self-) drive economic inequality? (2021)



Nearly half (49.6 percent) of Canadians agreed with this statement, whereas only 13.1 percent of Canadians disagreed that the rich will get richer and the poor will get poorer as a result of automation and AI. Attitudes are pessimistic towards AI and automation as a means by which to decrease economic inequality, reflecting earlier findings that Canadians are worried about their own jobs and skills.

Another important aspect of economic inequality pertains to whether automation will make it easier, or more difficult, for poor people to become richer. If the prevailing view is that the lives of the poor will not improve as a result of increasing automation, then it may be difficult for firms to introduce automated practices in public-facing capacities. Fully 58.8 percent of respondents in 2021 thought that automation would make it harder for poor people to become richer, while only 14.8 percent of Canadians responded that automation would make it easier. These numbers are similar to findings in 2020 and 2019, suggesting again that Canadians view the future of automation as having a net negative effect on economic mobility.

POLICY RESPONSES

If a large percentage of Canadians feel exposed to job loss via automation, AI and now the COVID-19 pandemic, how are policy preferences shifting to meet these new concerns? While it is difficult to explain complex preference changes in the face of other global phenomenon, such as political uncertainty in the United States, rising threats from China and emerging trade regimes, we can understand COVID-19's impact by looking for policy preference change between those who are in COVID-affected groups and those who are not.

First, we can examine base attitudes towards government action. We asked our respondents in all three waves of our study to indicate to what degree they agreed with the following statements:

- The government should penalize companies that fire workers and replace them with computers or machines;
- Consumers should boycott companies that fire their employees and replace them with computers or machines;
- Companies should continue to employ workers even when computers or machines could do their job more efficiently.

Figure 5: Support for government response to job losses (2021)

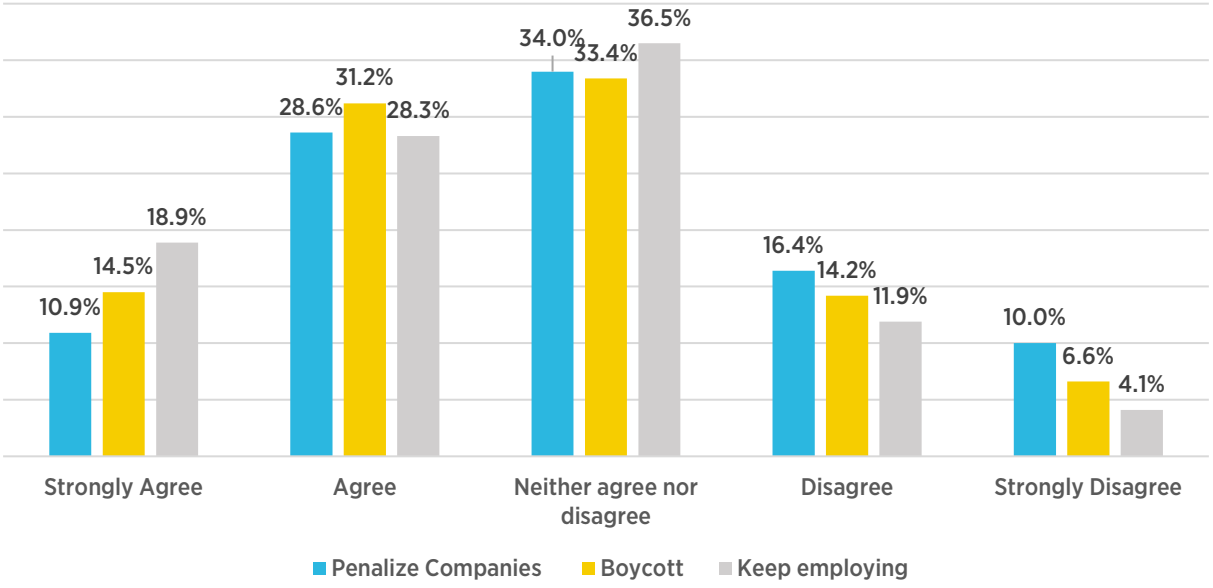
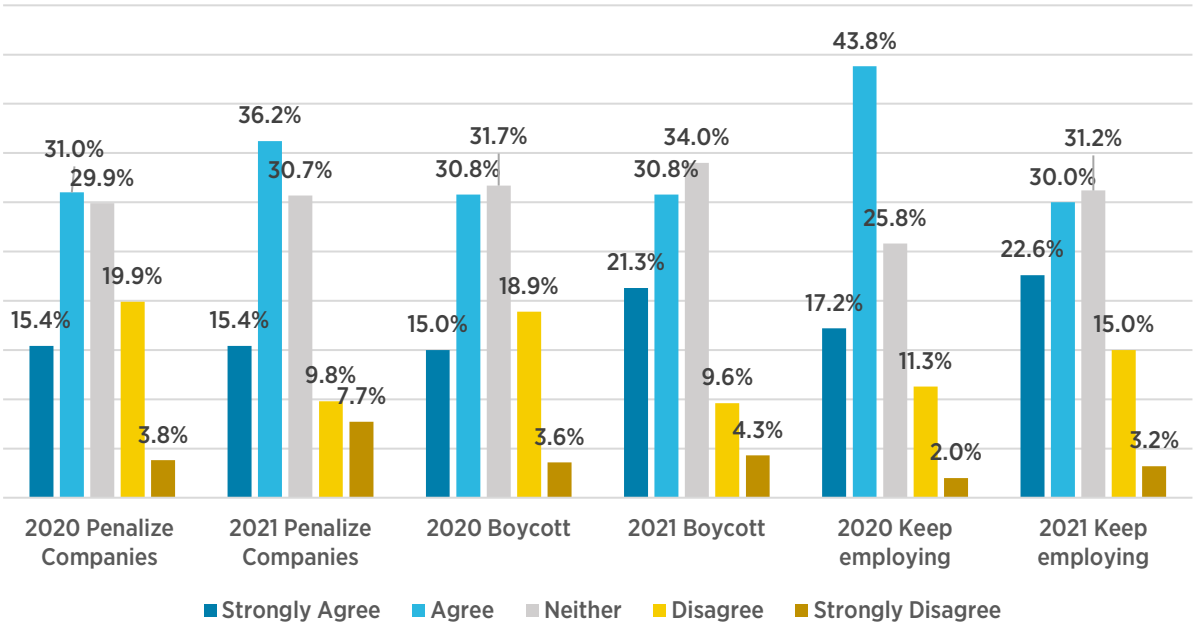


Figure 5 presents data from 2021. Here, almost four-in-10 Canadians (39.5 percent) believe the government should punish corporations that reduce their workforces due to new automation or AI practices. Almost half (45.7 percent) of respondents believe consumers should boycott companies that engage in such reductions. A similar number of respondents (47.2 percent) think companies should continue to employ workers even when technology could do the job more effectively. These results suggest broad support for a variety of actions to stem technology-driven job loss. These results are also consistent with the 2019 and 2020 surveys, suggesting that there has been consistent support for policy responses by government to job losses.

When we consider preferred actions by government according to a respondent's self-assessed job risk, important differences emerge. The most current results for Canadians concerned about their job security are presented in *Figure 6.*

Figure 6: Support for government response among those who are concerned about losing their own job (2021)



In 2021, 51.6 percent of people who were concerned about job loss in the next five years support penalizing companies that terminate workers to replace them with computers or machines. 52.1 percent of this group is likewise in favour of consumers boycotting these same companies. A similar number (52.6 percent) of respondents who are concerned about job losses are also in favour of continuing to employ workers even when there are computers or machines available that could do their job more efficiently. All of these numbers represent substantial increases over 2020.

These trends also hold for those most affected by COVID-19. In Figures 7 and 8, we report support for the three options among those who have lost income, or their job, due to COVID-19.

Figure 7: Support for government response among those who lost income due to COVID-19

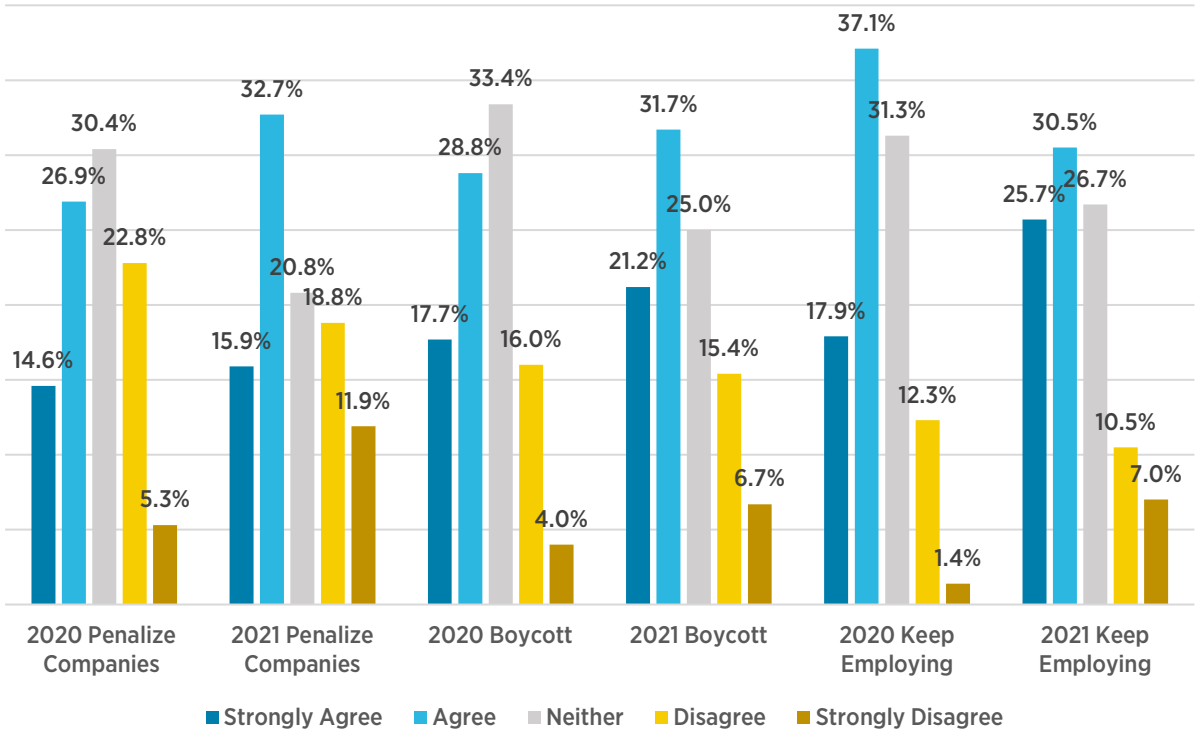
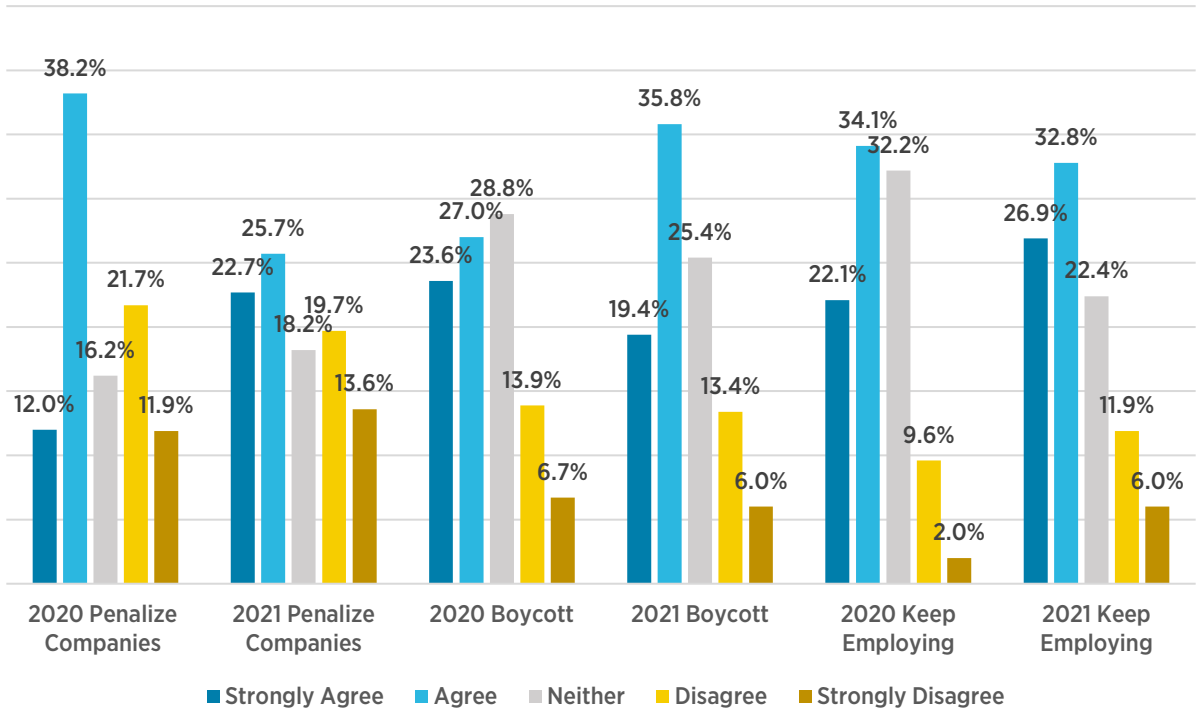


Figure 8: Support for government response among those who lost their jobs due to COVID-19



When compared to the general population, Canadians who lost their job due to COVID-19 are more likely to favour employers keeping employees, even when those jobs can be done by machines. This group is also less favourable to punishing firms that automate, suggesting there is some concern about the labour-market effects of punishing these firms. Importantly, support for such actions is greater across all actions in 2021 than in 2020.

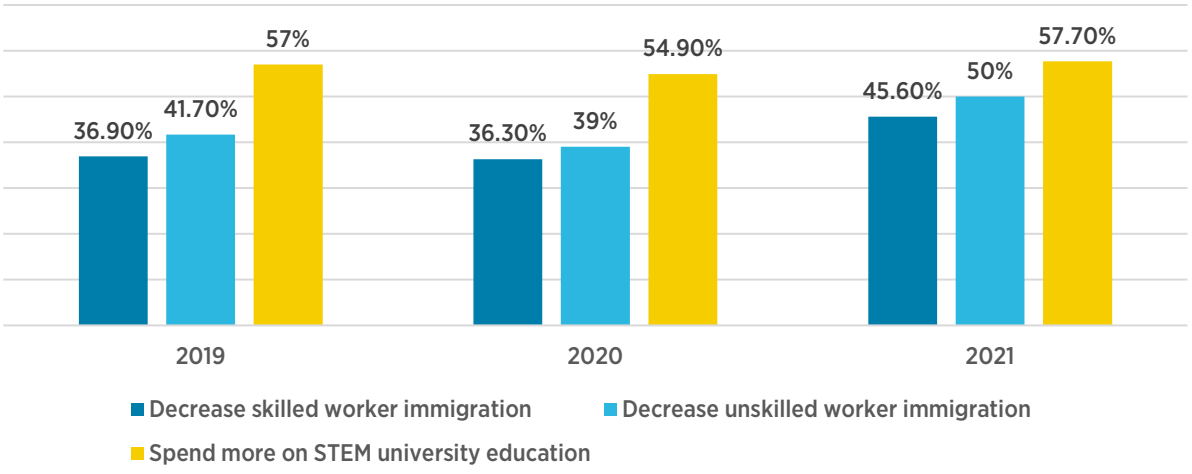
We also presented respondents with a number of particular policy actions government could take to respond to automation and AI. Moving beyond simply described punitive measures, we presented respondents with various ideas governments could implement, of various types and various efficacy. In particular, each respondent was given this status quo statement:

- I don't think there is much the federal government can do to stop automation and artificial intelligence from taking away a large number of jobs. Workers should prepare themselves for the changes that are coming.

The status quo statement was presented three times alongside the following potential policy responses:

- Automation and artificial intelligence are going to take away a large number of jobs, so the federal government should begin decreasing immigration of **skilled workers** from other countries.
- Automation and artificial intelligence are going to take away a large number of jobs, so the federal government should begin decreasing immigration of **unskilled workers** from other countries.
- Automation and artificial intelligence are going to take away a large number of jobs, so the federal government should begin spending a lot more money on university education in science and technology.

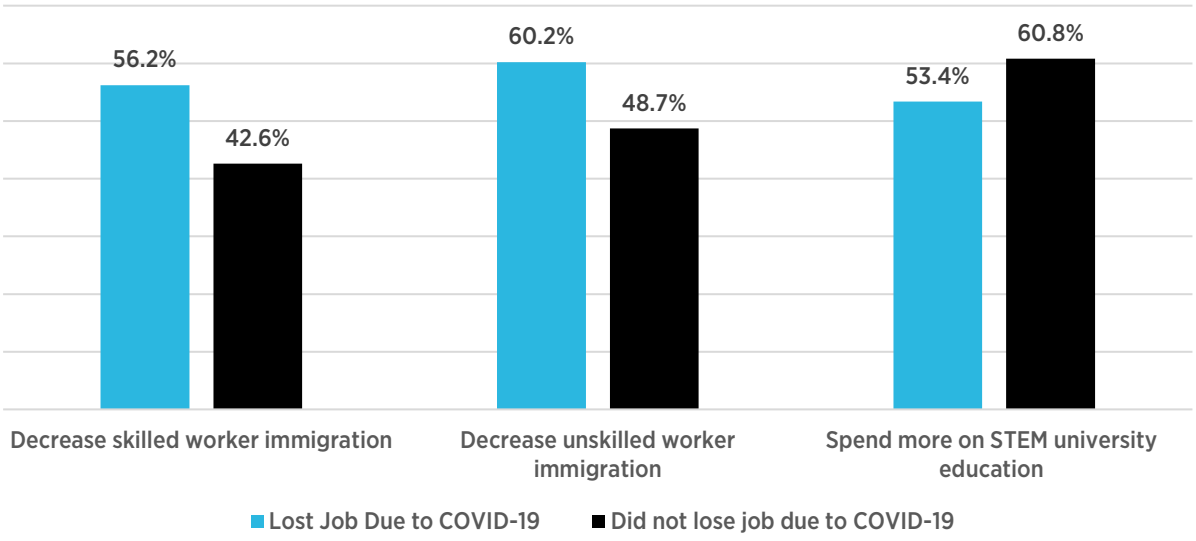
Figure 9: Support for policy options



In addition to these average levels of support, we found that those who feared job loss through automation were more likely to favour all actions than those who did not. Those in fear of job loss seemed to want government to take some action — any action — more than those who did not fear job loss.

Canadians have slightly increased their preferences for immigration-related policy responses to automation and AI over time as the pandemic has progressed. When broken down by COVID-related job loss however, this finding becomes more pronounced. In *Figure 10,* we show that Canadians who lost their jobs due to the pandemic are a lot more likely to support government intervention against immigration. This suggests there is some anti-immigrant sentiment among Canadians who have lost their jobs due to COVID-19. There is, on the other hand, no increase in support for increased STEM training. Canadians affected by COVID-19 have updated their policy preferences, but not across the board.

Figure 10: Support for policy options among those who lose their job due to COVID-19 (2021)



As populist governments seize upon labour disruptions to capitalize on anti-immigrant agendas, Canadian policymakers have the opportunity to grow government capacity and discourage anti-immigrant sentiments.

POLICY IMPLICATIONS AND RECOMMENDATIONS

There is a positive, demonstrative role for government in responding to the disruptions outlined in this paper. We present three recommendations, two of which are policy-related, whereas the last is a call for policymakers to more closely consider the long-term implications of COVID-era policymaking in the context of automation and AI.

As the COVID-19 pandemic finally winds down, government remains at the centre of the action in our politics. Millions of Canadians and hundreds of thousands of businesses turned to government support. The rebound in economic growth tells that this backstop largely worked. People have seen firsthand the massive effects that organized, decisive government policy can have.

Despite this new sense of government action, the first waves of COVID-19 did not seem to stimulate the type of renewed sense of government that could be expected. Support for sustained labour-market responses has not meaningfully changed since 2019. Despite massive efforts by government to retrain workers, the big picture on what Canadians want from government has not changed.

Second, there was a slight populist backlash due to COVID-19 labour disruption. Support for skilled and unskilled immigration decreased among Canadians who lost their job due to COVID-19. As populist governments seize upon labour disruptions to capitalize on anti-immigrant agendas, Canadian policymakers have the opportunity to grow government capacity and discourage anti-immigrant sentiments.

Finally, government has shown it can backstop challenging, unprecedented disruption. By many measures, government was able to get people through the first wave of COVID-19. Government can also get people through times of automation, but citizens have not yet made this connection. People are still afraid of job loss and increasing inequality as a result of automation and AI.

They also fear job losses and extensive labour disruptions due to automation and AI. Unlike COVID-19, government has the opportunity to proactively address concerns associated with automation and AI. It is up to policymakers whether to address these new challenges head on, or after the coming automation epidemic is already under way.

CONCLUSION

The COVID-19 pandemic is an unprecedented disruptive force. The labour market is shifting permanently as a result of the lessons learned by firms during the pandemic. Firms are adopting AI and automation to solve problems presented by COVID-19. Citizens are worried about losing their jobs in the long term to these new technologies.

While the COVID-19 pandemic highlights these problems, it also presents a path forward. Citizens are hungry for policy change. Those most affected are looking for concrete labour-market policymaking. Government is rolling out new policies daily to deal with the pandemic and citizens are responding positively.

Canada has not seen a significant populist backlash to the pandemic yet, but our data suggests that could be coming if citizens feel the government is not following through on job creation. The goodwill the pandemic has created could be lost, especially if job losses continue to mount.

The challenges presented to policymakers in this short paper are straightforward. The timeframe is set. It is up to policymakers to address the coming challenges associated with automation and AI with the same visionary approach they did with the COVID-19 response.

ENDNOTES

[1] Loewen, P. and Stevens, B.A. (2019). Automation, AI and Anxiety: Policy Preferred, Populism Possible. Public Policy Forum.

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