1. Longer-term labour market trends

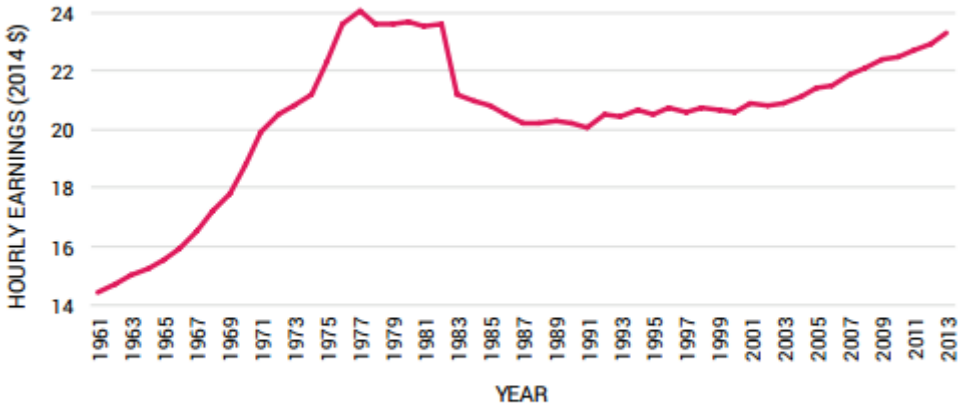
2. Emerging issues – digital economy

3. Impact on jobs and skills

4. Impacts on immigration policy

Unequal Prosperity

Real Wage Growth (Average Hourly Earnings, Adjusted)



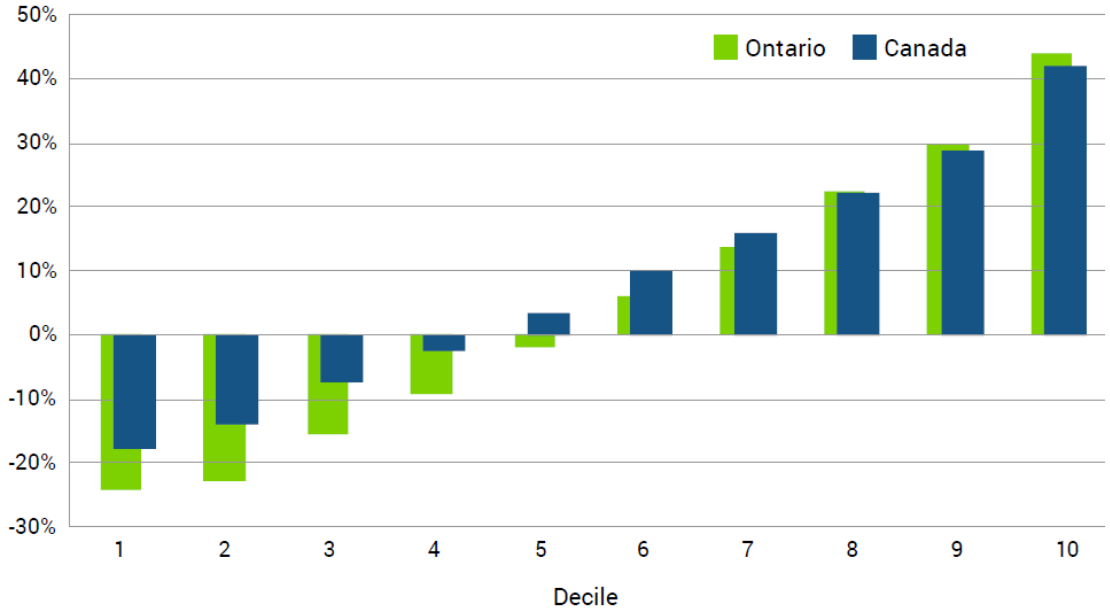
Source: CANSIM Tables 281-0022, 281-0008, 281-0030. Note: the method used by Statistics Canada to categorize employment changed in 1983 and again 1997. The slight shift upwards after 1997 can partially be attributed to this change in categorization, not substantial wage increases[10]

The “Great Decoupling” while the economy continues to grow, wages have remained mostly stagnant for almost 30 years

Unequal Prosperity

FIGURE 4

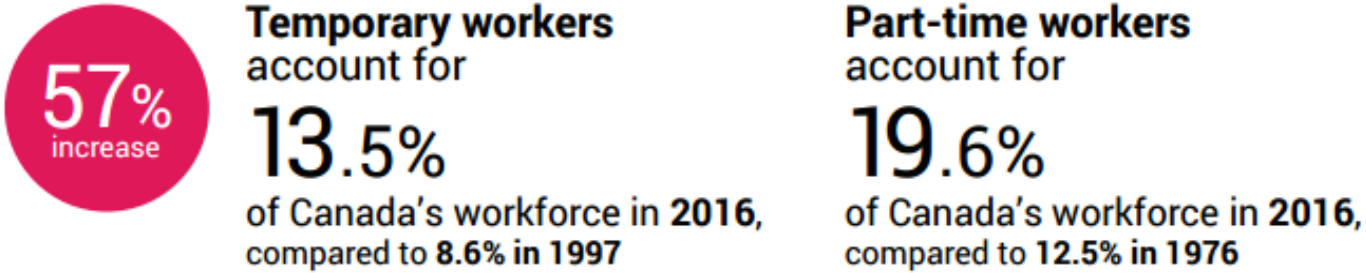
Percentage Change in Average Incomes between the Periods of 1976-79 and 2012-15 for Income After Tax (2015 $'s) by Decile | Non-Senior Economic Households, Canada and Ontario



Source: Statistics Canada, Custom Tabulation from Canada Income Survey.

Rise of precarious work

The standard employment relationship - characterized by full-time hours, permanency and benefits - is becoming increasingly rare



Source: CANSIM Table 282-0087, CANSIM Table 282-0079

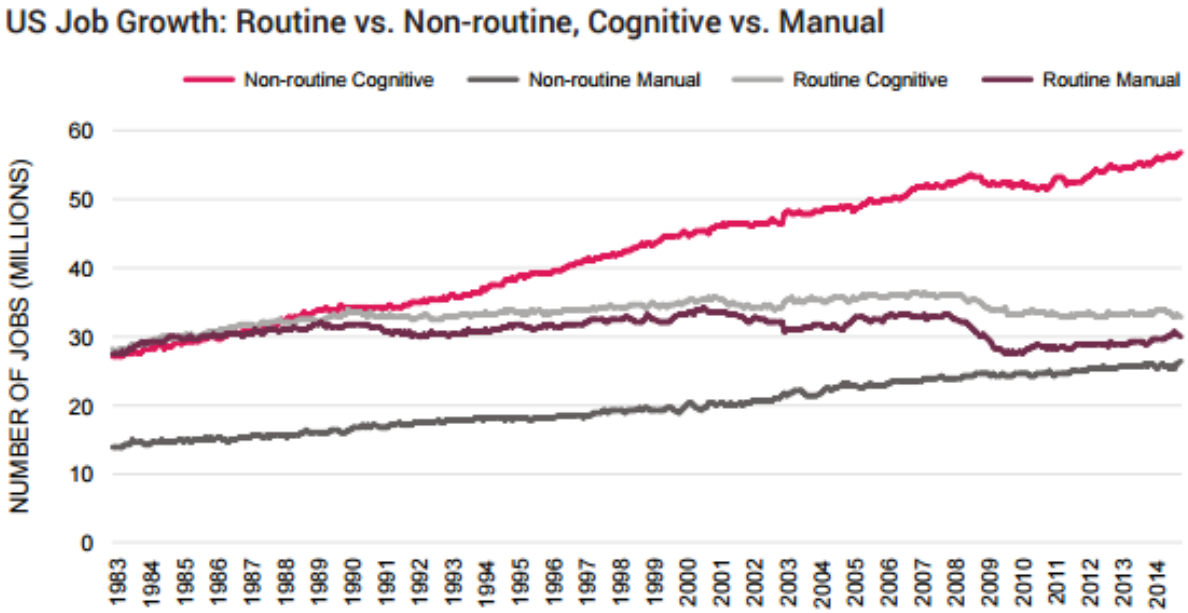
Digitization

❑Fewer full-time employees, in part due to technological advancements that enable higher productivity.

➢For example, AT&T was America's most valuable corporation in 1964, worth USD $267 billion (adjusted) with 758,611 employees.

➢Today, technology giant Google is valued at USD $370 billion with only 55,000 employees.

Automation of industry



Source: Maximiliano Dvorkin (2016) "Jobs involving routine tasks aren't growing" Federal Reserve Bank of St. Louis

Automation of industry

Comparing Job Loss Estimates

Study	Estimated risk of job loss to automation over 10-20 years	Percentage of workforce	Number of jobs
OCCUPATION-BASED METHODOLOGY			
Frey & Osborne (Oxford)	USA	47%	68,031,090
Lamb (Brookfield Institute)	Canada	42%	7,537,572
TASK-BASED METHODOLOGY			
Arntz et al. (OECD)	USA	9%	13,027,230
	Canada	9%	1,615,194

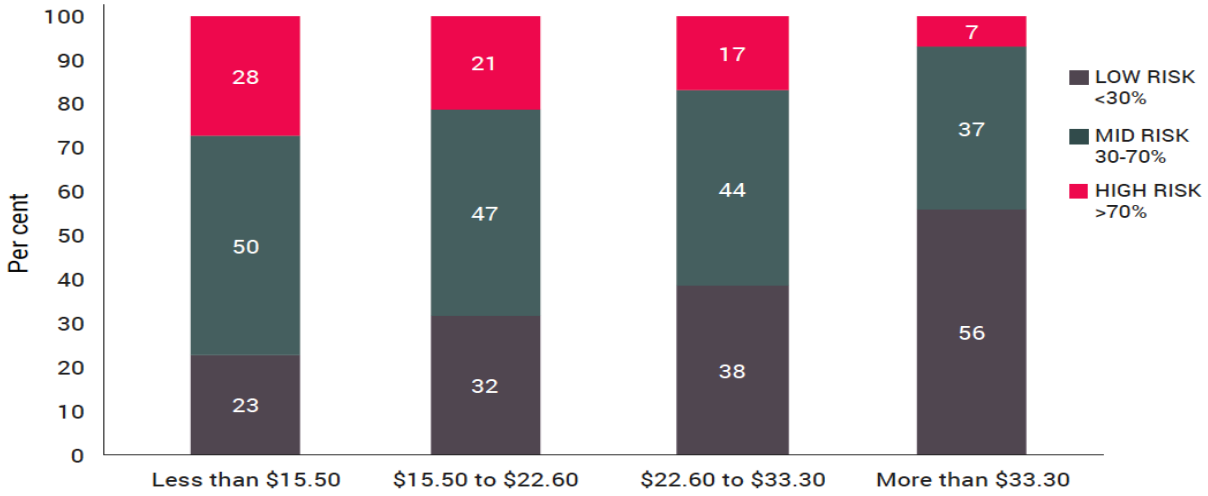
Source: Lamb (2016), Frey and Osborne (2013), CANSIM Table 282-0008, United States Bureau of Labour Statistics, Mowat Centre calculations

Many studies have attempted to estimate the size of job loss due to automation across various jurisdictions, using different methodologies

Automation of industry

FIGURE 10

Distribution of employment by vulnerability to automation, by hourly wage group



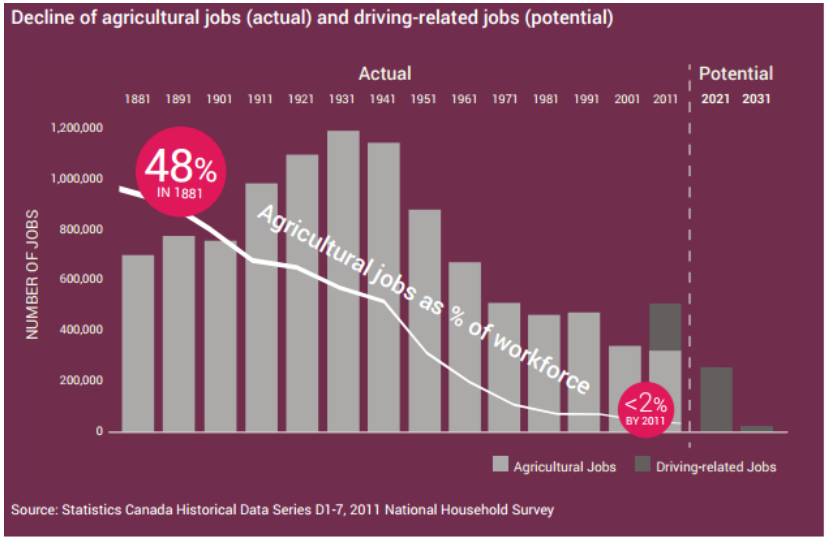
3. What's the impact?

- Increased uncertainty
- Increased pace of change
- Constant disruption and volatility
- Significant pressure on existing regulatory/social and economic frameworks
- Increased need for quick, flexible, coordinated and international responses

The pace of disruption

- Decline of agricultural jobs in Canada took 150 years (from 48% of workers to under 2%)

- 500,000 Canadians who drive for a living could be out of work within 10-15 years



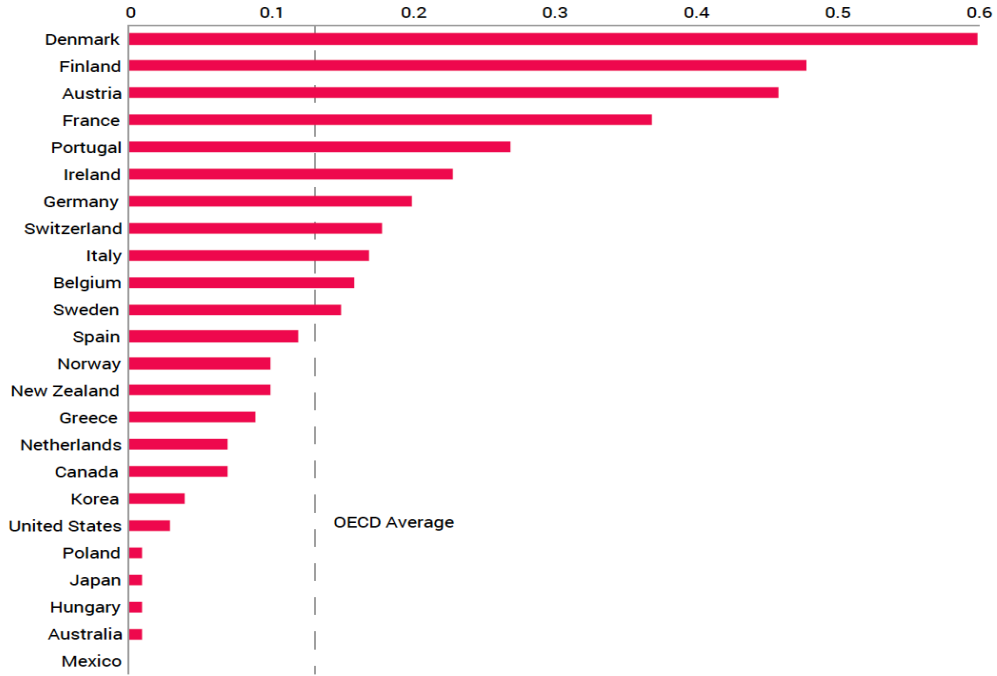
Decline of **agricultural jobs** took **150** years

Decline of **driving-related jobs** might take **20** years

Training Challenges

FIGURE 13A

Government spending on training programs as a share of GDP, selected OECD countries, 2015



Jobs of the future

- Occupations at highest risk of automation may disappear or have their tasks shared with robotics
- Jobs in industries such as education, health and nursing tend to be at the lowest risk of automation
- New jobs are likely to emerge in the development, maintenance and management of new technologies

Skills for the future

- **Social and emotional intelligence** are key skills that computers have not yet mastered
- **Adaptability, creativity, and desire for constant learning** will be critical in a rapidly changing economy
- **Computational and analytic thinking** are exceptionally important in complementing new technology

4. Automation & Immigration

Background

- Canada is a top 4 destination for highly-skilled immigrants (World Bank, 2016)
- An aging Canadian population in context:
    1. A shrinking labour force may struggle to **replace** older workers
    2. Need for more **care** workers to take care of older population

Automation as a substitute for immigration?

- **Japan**: Increased reliance for automation & AI without large-scale immigration policies (Bloomberg, 2017)
- **USA:** Agriculture sector automating rapidly in wake of Trump crackdown on illegal immigrants (Reuters, 2017)
- **Canada:** Increase in highly-skilled immigrants since 1990s (Ferrer et al., 2014) to fill targeted labour gaps: most immigrant jobs safe

Top 10 immigrant jobs

Occupation	# of immigrants	Likelihood of automation
Food counter attendants & kitchen helpers	115,210	91.5%
Retail & wholesale trade managers	97,975	20.5%
Nurse aids + patient support services	95,365	38.5%
Transport truck drivers	84,750	79%
Cashiers	83,515	97%

Sources:

- Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016372.
- Lamb, C. (2016). *The talented Mr. Robot: The impact of automation on Canada's workforce*. Brookfield Institute.

Top 10 immigrant jobs

Occupation	# of immigrants	Likelihood of automation
Customer & Information services representatives	75,570	7.6%
Information systems analysts & consultants	73,145	11.3%
Financial auditors & accountants	72,240	94%
Cooks	71,340	83%
Registered nurses and registered psychiatric nurses	70,865	0.9%

Sources:

- Source: Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016372.
- Lamb, C. (2016). *The talented Mr. Robot: The impact of automation on Canada's workforce*. Brookfield Institute.

Immigrant jobs & broader workforce

Top 10 Occupations	% of overall workforce (% immigrants)	Likelihood of automation
Retail Salespersons	3.8% (20.9%)	92%
Food counter attendants & kitchen helpers	2.13% (27%)	91.5%
Retail & wholesale trade managers	2.08% (23.5%)	20.5%
Cashiers	2.03% (20.6%)	97%
Transport truck drivers	1.68% (25.1%)	79%
Customer & information sales representatives	1.5% (22.9%)	7.6%
Registered nurses & registered psychiatric nurses	1.56% (22.8%)	0.9%
Elementary school/kindergarten teachers	1.52% (12.5%)	0.4%
Light duty cleaners	1.46% (34.5%)	69%
Administrative officers	1.45% (20%)	96%

Immigrants comprise 23.8% of the Canadian workforce

- Source: Statistics Canada, Lamb.

Concluding thoughts

- Should we place a technology-screen on the skills that prospective immigrants have?

- How can we ensure long-term coherence of immigration policy in light of uncertainty in labour market over the medium-longer-term?

- What data will inform decisions? How can we apply a human-capital lens to decisions?

Concluding thoughts

- In a labour market where soft-skills are prized, how can we ensure immigrants well-placed to thrive?

- How will we ensure newly landed immigrants have access to adequate skills-training? What fixes to EI eligibility are required?

@johalsunil
sunil@mowatcentre.ca

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