Plan of the presentation

Based on Automation, Skills Use and Training
Joint work with Ljubica Nedelkoska

- The potential for automation
- What it means concretely
- What we can do about it
1 Understand

To what extent will technology change the way jobs are performed?

2 OBJECTIVES

2 Policy

Who will be the most affected and how could adult learning policies help?
Measuring the risk of automation with PIAAC

BASELINE: Frey and Osborne

1. Identify the same occupations and similar bottlenecks
2. Canadian PIAAC sample to exploit 4-digit ISCO
3. Out-of-sample prediction for jobs in different countries
Key bottlenecks to the risk of automation

**Perception and manipulation**
- Finger dexterity
- Manual dexterity
- Cramped space

**Creative intelligence**
- Originality
- Fine arts

**Social intelligence**
- Social perceptiveness
- Negotiation
- Persuasion
- Assisting/caring

**Warning!!!**
Potential over-estimate at low end
Fears of mass technological unemployment are likely exaggerated.

Share of jobs at **significant risk (50-70%)** and of **high risk (>70%)** of automation.

However, many jobs will experience significant change.

Why are jobs in other countries more/less automatable than in Canada? (1)

Within-industry variation in tasks (70%) more important than differences in the industrial structure (30%)

A shift share analysis of industries

Source: PIAAC, all countries, own calculations.
Why are jobs in other countries more/less automatable than in Canada? (2)

A shift share analysis of occupations

Equal importance of differences within and between occupations

Source: PIAAC, all countries, own calculations.
Job tasks in a given job can be very different across countries.

Source: PIAAC, all countries, own calculations.
In the era of AI, the risk of automation is highest for low-skilled low-paid workers

<table>
<thead>
<tr>
<th>Highest risk in <strong>routine jobs</strong> with low skill and education requirements BUT low risk applies to a broad range from <strong>professionals to social workers</strong></th>
<th>The risk of automation also falls with <strong>educational attainment</strong></th>
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<tbody>
<tr>
<td>Automation mostly affects <strong>manufacturing industry and agriculture</strong> BUT some service sectors are highly automatable too.</td>
<td>No evidence of <strong>higher risk for middle-skilled or rising risk at the high end</strong>: automation risk declines with skills, education and hourly wages</td>
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<td>The risk of automation falls monotonically with <strong>hourly wages</strong></td>
<td><strong>Young people</strong> are the most at risk of automation, followed by older workers, with disappearing student jobs and entry positions.</td>
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Job content has already changed significantly in the past decades

**United Kingdom**
- **Down**: manual tasks (between occupations)
- **Up**: social skills (within occupations)
- **Up**: analytical skills (within and between occupations)

**Germany**
- **Down**: manual tasks (between occupations)
- **Up**: social and analytical skills (within and between occupations)

**Overall**
- **Shift away from occupations with high manual task content**
- **Rise of social and analytical tasks: more important in existing jobs, more jobs that use these intensively**
Effects on employment visible at the regional level

Share of regions by net employment changes and automation profile of jobs 2011-2016

- 60%: Creating jobs, predominantly in less risky occupations
- 10%: Creating jobs, predominantly in riskier occupations
- 22%: Losing jobs, predominantly in riskier occupations
- 9%: Losing jobs, predominantly in less risky occupations

Source: OECD calculations based Labour Force Surveys
From potential to actual employment effects

Sectors differ in:

Their human capital endowment

Their structure and organisation of production

The extent to which they develop and adopt new technologies

Job creation!!!
The cost of inaction is high

For individuals
- Lower wages
- Risk of jobs loss and skills obsolescence

For employers
- Vacancies remain unfilled for too long
- Delays in technology adoption
- Higher turnover and re-training costs

For countries
- Less competitiveness and lower productivity
What can we do about it?

- **Education**: Teach kids the relevant skills
- **Adult learning**: Develop future-ready inclusive programmes
- **Social protection**: Income support and re-employment assistance
Re-training for new jobs is challenging, especially for the low-skilled

Source: PIAAC, all countries, own calculations.
Risk of automation and training

Workers in fully automatable jobs get:

- **4 times** less job-related training
- **3 times** less on-the-job training
- **30 hours** less training per year
Different policy scenarios for different situations

1. Increasing employment reducing risk
   - Help workers transition to better jobs

2. Increasing employment and risk
   - Help firms transition to digital economy

3. Losing jobs but reducing risk
   - Help workers transition to better jobs and spur job creation

4. Losing jobs and increasing risk
   - Need employment to complement regional dev. policies

Help workers transition to better jobs
What do inclusive adult learning systems look like?

**Information and guidance**
- Public awareness campaigns
- Career guidance
- Online databases

**Lower participation barriers**
- Recognition of prior learning
- Flexible learning provision
- Training leave
- Financial incentives

**Target the low-skilled**
- Higher subsidies for low-skilled
- Targeted information campaigns

**Engage social partners**
- Provision subsidies to employers
- Training levies paid by employers
- Social partners management of training funds
- Unions outreach

Source: OECD, Future-ready adult learning (forthcoming, Q4 2018)
Future-Ready Adult Learning Systems to deal with changing skill needs
Contact: Glenda.Quintini@OECD.org

Website: http://www.oecd.org/employment/skills-and-work.htm

Blog: www.oecdskillsforjobsdatabase.org