Technology and the Australian Labour Market

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Investment, production and use of technology has grown rapidly

• Since early 1990s in Australia, industries with strongest output growth:
  – Information, media & telecommunications
  – Professional, scientific & technical services
    (Both stronger than mining!)

• Investment in intellectual property now accounts for 20% of total (non-mining) business investment
  – Up from 3% in early 1980s
Non-mining Intellectual Property Investment

Chain volume, RBA estimates

Sources: ABS; RBA
Structure of the workforce has changed...

**Employment by Skill Type***

Per cent of total

- **Routine manual**
- **Non-routine cognitive**
- **Routine cognitive**
- **Non-routine manual**

* Non-seasonally adjusted
Sources: ABS; RBA
Why? Partly technology

• Long-run decline in share of ‘routine manual’ employment
  – *Partly* reflects technology/automation. eg. manufacturing and agriculture

• Further technological advances have contributed to recent decline in share of ‘routine cognitive’ employment
  – New set of occupations exposed to automation
  – More feasible to offshore jobs (call centres, back office) where labour costs are lower

• Stronger growth in ‘non-routine’ employment
  – Tend to be harder to automate. eg. Require creativity, human presence
  – Partly reflect general equilibrium effects of technology (eg. rising productivity and real income)
Employment by Industry

Sources: ABS; RBA; Withers, Endres and Perry (1985)
Why? Other factors…

For example

• Rising health care employment, partly related to population ageing

• Rising child care employment, partly related to increased female participation

• Increase in education attainment

Some of these can be linked back to technological advancement, but also reflect broader social trends and policies.
Employment by Skill Type
Cumulative change since 1986

- Non-routine cognitive
- Routine cognitive
- Non-routine manual
- Routine manual

Sources: ABS; RBA
Cumulative Employment Growth

By skill type

Sources: ABS; RBA
Have robots taken our jobs?  (Borland and Coelli, 2017)

Figure 3 Hours of Work Per Capita, Australia, 1965–66 to 2015–16,
Actual Hours Worked Series (equals 100 in 1965–66)
Has the rate of structural change increased?

Employment by Skill Type*

Per cent of total

* Non-seasonally adjusted

Sources: ABS; RBA
Has the rate of structural change increased?

Figure 10  Rate of Outflow from Employment, 13-Month Average, Australia, February 1980–November 2016

Borland and Coelli 2017
Which skills are being rewarded?

Skill Wage Premium*
Estimated coefficient from wage regression

* 95 per cent confidence intervals are shown in orange.
Sources: ATO; O*Net; RBA
Wage growth and potential for automation

Key Variables Effect on Wage Growth*

Coefficient estimates from random effects model

* 95 per cent confidence intervals are shown in orange

Sources: ABS; Frey and Osborne (2017); HILDA Release 16.0; RBA