

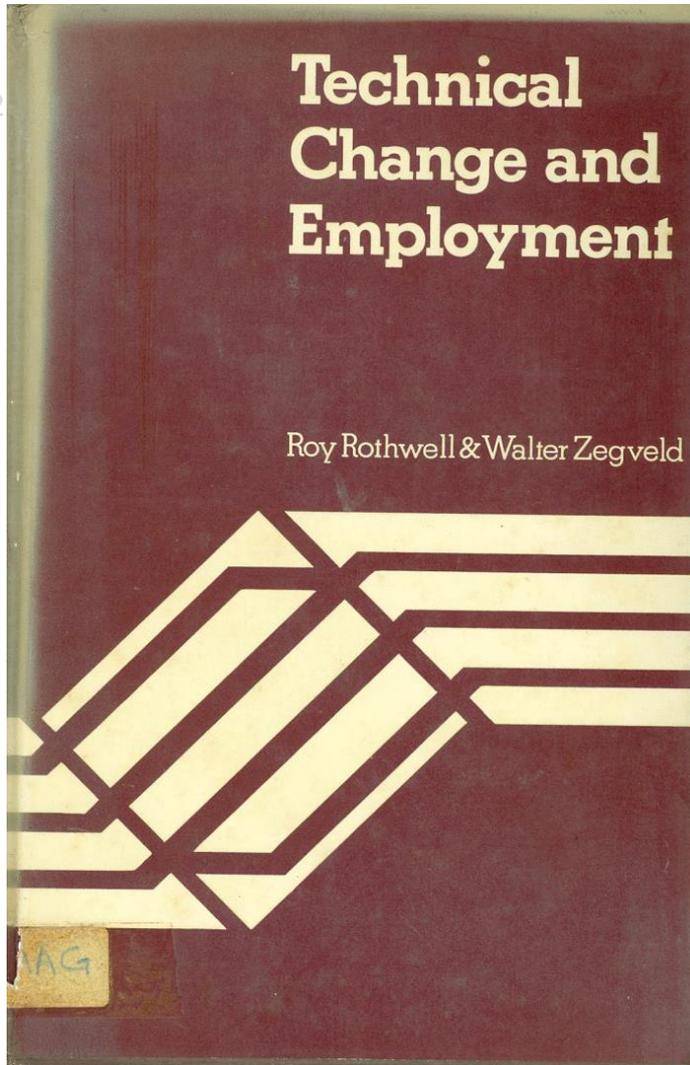
# Technology and Employment

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**What would Walter say? 50 years of innovation policy  
A 6CP Workshop in memory of Walter Zegveld**

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## Where it began...

- Workshop of the 6CP, November 1978 in Paris on technical change and employment
- Roy Rothwell and Walter Zegveld: Technical Change and Employment (TC&E). Frances Pinter Publishers 1979, synthesized the findings of the workshop

# Structural change is looming...and technical change is at its core

3

- Contrary to the post-war period, in post-1973 crisis a significant structural change seemed to happen: productivity growth without corresponding increases employment
- ..- “Are there new features [...] which will mean that the employment problems of the 1980s will differ significantly from those encountered in the 1960s?”
- ***“We will argue that the rate of technical change [...] must be accepted as one of the central issues involved”.*** (TC&E, 2 and 3)

## ...the spread of jobless growth...

4

- Hypothesize that the combination of (i) changes in the world-wide location of industry (ii) the relative cost of factors of production and (iii) technological changes affecting products and processes “make it rather improbable that manufacturing employment will ever again expand in Europe and North America as it did in the 1950s and 1960s.” (TC&E, 5) or, even more pessimistically: “The phenomenon of jobless growth has now also become established in the goods-producing sectors of the advanced economies caused mainly through technological change.” (TC&E, 167)
- “The most important single event in recent technical change which has affected employment throughout manufacturing has been the application of electronics. The use of electronic controls in manufacturing has resulted in both loss of employment and changes in skill distribution ... The application of microelectronics will intensify both these trends in the manufacturing sector” (168/169).....

## ...but no compensation mechanisms around...

5

- “Although the private service sector has a substantial potential for growth [...] the potential of mainly ME to greatly increase productivity, make it less likely that labour absorption in this sector will be coming to an end.  
**An additional jobless growth sector will evolve”**
- ...given constraints on budgets and perceptions of overburdening welfare states **“it seems unlikely that governments will be free to expand public services in order to soak up significant numbers of the unemployed”**

(TC&E, 169/170)

# ..not only level, but also structure of employment is affected ...

6

- Apart from the effects on the level of employment, also effects on the composition of jobs might be substantial and result in mismatches: “There generally exists a growing mis-match between skills and job opportunities” (TC&E, 169)
- And they observe increasing diversity of effects of TC: innovative firms, high-tech sectors/branches and the higher-skilled employees are benefiting, while less innovative/productive firms and sectors loose out in competition and low-skilled workers loose jobs and income

## ...in the long run...

7

- They acknowledge the potential for short-term gains, especially in the technology-producing sectors:  
“Previous experience with the use of electronics (i.e. computers) in the service sector has shown that the widespread adoption of new technology takes over period of many years and has resulted [...] in an increase in employment. **The negative employment impact of microprocessors is not [...] likely to manifest itself in the short run. However, its somewhat longer-term consequences for service employment are immense.**” (TC&E, 169 and 170)

# One of the triggers of innovation policy...

8

- ***... "this is one reason why governments in mature technological societies are currently placing so much emphasis developing so-called innovation policies"***
- Main thrust of policy: not hampering technological change, but fostering it: "...TC itself is not the problem. Rather, it is more probable that low rates of technical change will accompany high rates of unemployment"
- And certainly no protectionistic measures would be recommended: "It would be short-sighted and nationalistic to begrudge the newly industrialising countries their recent success. Moreover, the effects on employment have so far been rather small and confined largely to one or two industries, especially textiles. But it would also be foolish to overlook that these effects may now become more widespread." (all: TC&E, 5)

# ... aspects of innovation policy that still are very relevant ...

9

- comprehensive (re)training schemes to address skill mis-match
- “to develop policies to stimulate companies to embark on more vigorous programmes to develop new products in both existing and new firms”
- “pay increased attention to offering incentives towards, and creating the right environment for the creation of many new firms” (TC&E, 170)

...which would certainly be recommendations also highly relevant today...

# ..aspects of future policy dealing with technical change...

10

- **Neo-Schumpeterian STI policy:** a credible way out of crisis...? Or only part of a **broader policy response**?
- ~~Future (?)~~ **Present (!)** Policy has to address:
  - Inequality in society to which TC contributes
  - Concerns regarding economic power ('winner-takes-(almost)-all' situations especially in 'digital markets')
  - Concerns regarding privacy and control (which will become even more severe in IoT settings and areas like 'autonomous driving')
- ...so it's **back** to TA/STS and **forward** to 'social innovation' (like new forms of employment and income distribution, of education, and maybe back to the question of 'who owns the robots?')

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**Thank you for your attention!**

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