Discussion of Joel’s Mokyr: “Technology and Labor: Lessons from Economic History”

Manuel Trajtenberg
Tel Aviv University, NBER & Knesset

AI and the Economy
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Hard to discuss **Mokyr’s work**: can’t challenge his **grasp** of economic history, worse, can’t help but **agree** with him...

What do we learn from 200-years history of TC? That there have always been optimists and pessimists, the latter of 2 types:

- fear that there will be too little TC
- fear there will be too much...

*Is this time different?!* Regarding tech itself - no idea!
*But perhaps this time is different from viewpoint of society, the receiving side, the political-economy of TC*
Is this time different?
Political economy implications of tech disruption

- **New GPTs** always bring disruption, **winners and losers**, 
  “We enjoy higher standards of living because we are standing on the broken backs of those that paved the way for tech progress, but did not live to benefit from it.” *(paraphrasing Newton’s “...standing on the shoulders of giants”)*

- Still don't have effective mechanisms to **ameliorate impact on losers**: existing safety-nets (e.g. unemployment & welfare benefits, health insurance), can’t handle large flows of **tech displaced workers and longer life expectancy**! even software programmers may become obsolete by age 40!

- Live in era of **“democratization of expectations”**: harder to have some bear costs of tech disruption ("losers"), **others reap benefits ("winners")**. Part of rise in living standards and spread of democracy.

- **We are more impatient, more demanding of governments, more intolerant of failures.**
Political economy implications of Tech Disruption cont.

- **Wider costs**, not just for *individual* tech losers:
  - If systematic divide of tech winners & losers coincides with *political* divide: *dangerous*, threatens fabric of democracy
  - **Macro impact**: can’t afford longer-living *un-*/*under*-employed

  ➢ **Gov** may have to assume wider *responsibility* for effective *transitions*, not just for alleviating costs

  ➢ Reduce number of "losers" *NOT* by attempting to slow down TC, but on the contrary, but making sure more can participate
Policies for inclusion - democratizing AI

- Assuming **AI** becomes a **GPT** (hence spreads widely), and
  - **employment** in occupations relying on “old” **skills** declines
  - surge of new occupations using **new skills**

- **policies** for:
  1. **Education**: change in **nature of skills**
  2. **Personal services**: upgrade **occupations** integrating **AI**
  3. **Direction of TC**: **Human-enhancing** or **Human-replacing**?
1. Education

- 19th century industrial revolutions ↔ education revolution.

- Ever since more of the same “factory model” of education (more years, hours, subjects).

- Need new education revolution for 21st century, complement AI as GPT - shift,
  - Away from imparting knowledge & uniformity (no PISA...)
  - To skills relevant for AI economy
### Top skills sought for employment

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<th><strong>UNICEF 10 life skills</strong></th>
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*Most of those skills are neither imparted in the current K-12 system, nor in academia*
Top skills for employment – examples: “type I”: creative, decision making, adaptive

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**Top skills for employment – examples:**

“**type II**: interpersonal, communication

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**Top skills for employment – examples:**

“type III”: emotional, self confidence

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1. **Invert the pyramid** - invest much more in **early-age** (birth to 6): critical skills acquired very early on, hard to remedy later.

2. Promote **bottom-up experimentation** in pedagogy, social skills development, classroom & school design.

3. **Don’t** aim at **Gov** mandated **uniform** curriculum/”model”, encourage open innovation communities.

4. Foster **research on effectiveness** of new education models, adequacy to needs, equal opportunity (**use eco tools**).
2. Personal services: upgrade occupations

- Fastest growing occupations: **personal care** (PC) – healthcare, social assistance, education, nursing, etc.

- Many of them require **little training** & educational requirements => low wages, low status, low tech

- **Policies** to professionalize PC occupations: set job, training & academic standards, expose them to **advanced techs**
  => develop smart human-AI/machine interfaces

- **Example - Nurses** in US post WWII: very low wages, low skills, till *Nurse Training Act of 1964* - upgraded curriculum, required academic degrees. Since then: wages up, **upscale roles** for nurses, **integrate medical techs**!
3. Direction of TC: H-enhancing or H-replacing?

- **Human Enhancing Innovations - HEI**: those that *magnify, enhance and extend* sensory, analytical & problem solving human capabilities (not “input saving”), e.g.,
  - in medicine: AI for diagnostics – *better doctors!*
  - in education: AI to track individual progress of pupils, *better teachers!*

- **HEI** can unleash new wave of *human creativity & productivity*, even if lower skills – finely grained *professional continuum* (e.g. in medicine...)

- **Human Replacing Innovations (HRI)** do the opposite – see Walmart: turn workers into *unthinking automatons...*

- **Can Gov affect direction of tech change**, i.e. promote HEI versus HRI? *Maybe*, but with *great caution!*
Concluding remarks

so what do we learn from history?

- That **dismal tech prophecies** rarely come to pass,

**but**

- The complementary changes required in e.g. education, socio-economic policies, etc. **take too long and are painful**

- In the 21st century we have **less tolerance** for bearing the **costs**, higher expectations for sharing the **benefits** from TC here & now,

**therefore,**

- Need to **anticipate** the required changes – experiment, design and implement proactively **new policies**

- Deploy **new techs** for that purpose: Tech displaces but may provide **powerful tool-kit** for new, effective policy interventions (e.g. for retraining using on-line personalized instruction).

- We as **economists** should play a role in this all-important mission!
Thanks!
FUTURE WORK SKILLS OF 2020:

**Sense Making**
- Ability to determine the deeper meaning or significance of what is being expressed
- **The Drivers:**

**Social Intelligence**
- Ability to connect to others in a deep and direct way, to sense and stimulate reactions and desired interactions
- **The Drivers:**

**Novel and Adaptive Thinking**
- Proficiency at thinking and coming up with solutions and responses beyond that which is rote or rule-based
- **The Drivers:**

**Cross Cultural Competency**
- Ability to operate in different cultural settings
- **The Drivers:**

**Computational Thinking**
- Ability to translate vast amounts of data into abstract concepts and to understand data based reasoning
- **The Drivers:**

**New Media Literacy**
- Ability to critically assess and develop content that uses new media forms, and to leverage these media for persuasive communication
- **The Drivers:**

**Transdisciplinary**
- Literacy in and ability to understand concepts across multiple disciplines
- **The Drivers:**

**Design Mindset**
- Ability to represent and develop tasks and work processes for desired outcomes
- **The Drivers:**

**Cognitive Load Management**
- Ability to discriminate and filter information for importance, and to understand how to maximize cognitive functions
- **The Drivers:**

Source: [http://www.top10onlinecolleges.org/](http://www.top10onlinecolleges.org/)
Political economy implications of Tech Disruption cont.

- **Wider costs**, not just for *individual* tech losers:
  - If systematic divide of tech winners & losers coincides w/*political* divide: *dangerous*, threatens fabric of democracy
  - **Macro impact**: can’t afford longer-living *un-/under-*employed

- **Gov** may have to assume *responsibility* for effective *transitions*, not just for alleviating costs: *active* retraining, *reskilling*, *reorientation*, even *relocation*...

- Deploy *new techs* for that purpose: Tech displaces but may provide *powerful tool-kit* for new, effective policy interventions (e.g. for retraining using on-line personalized instruction).

- **We** (*economists*) should *play a role* in designing new policies...