Economic History and Innovation

A Review of Readings

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Outline

Economic History and Innovation

Articles this week

- Temin (1997)
- Epstein (1998)
- Gray (2013)
- Khan and Sokoloff (2001)
- Khan and Sokoloff (1993)
- Khan and Sokoloff (2004)
- Mokyr (2010)
- Schumpeter (1947)
- Moser (2013)

The Contribution of Economic History to the Study of Innovation and Technical Change

Summary

- Industrial revolution changed dynamics of how innovation comes about & the speeds of invention & diffusion
- Technological component of economic modernity caused by a set of intellectual & ideological changes that altered the way Europeans interacted with their physical environment. Not due to growth of foreign trade / Growing use of coal / Emergence of urban bourgeoisie

The Contribution of Economic History to the Study of Innovation and Technical Change

Technology and economic modernity

- Technology is produced within the system by men
- It is non-rivalrous. Debate on how best to establish optimal incentives in innovative activity
- It is produced under uncertainty - Unknown outcomes & Unintended consequences
- Sets the agenda for scientists
- Declining access costs for technology helps economic modernity

The Contribution of Economic History to the Study of Innovation and Technical Change

Technology in a "Malthusian Economy"

- Traditional societies - "Culture of improvement"
- 18th century transition of handling useful knowledge. Empirical, unsystematic, tacit set of "understandings" –¿ Collecting & Analysing in systematic, organised fashion
- Paradox: Productivity growth fails to lead to long term improvements in living standards. "Iron law" of wages rules in the long run
- Most inventions made by artisans. Organised as conservative guilds

The Contribution of Economic History to the Study of Innovation and Technical Change

A new approach in the first industrial revolution

- Industrial Enlightenment. Bacon's dream that useful knowledge would become a "rich storehouse for the Glory of the Creator and relief of Man's estate"
- Most of 18th century's natural philosophy consisted of 3 Cs: counting, cataloguing & classifying
- Malthusian & epistemic constraints broken because propositional knowledge got better at informing technology; feedback from improved technology into more knowledge
- Push for progress on a wide front in second half of 18th century
- First Industrial Revolution's importance is due to Western economies' ability to sustain technological progress and avoid negative feedbacks & hard constraints

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The transition to modern growth, 1830-1880

- Growth in transport technology- most spectacular. Railroad technological history, an eg. of "hybrid" technology
- Special purpose tools used
- Immediate impact of Lavoisier revolution in chemistry on industrial practices
- Useful knowledge in form of "Mechanical science" in early 19th century Britain

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The second industrial revolution

- Large scale electricity generation
- French, American adoption of automobile technology
- Ship design changes, Screw propellor
- Development of food preservation & preparation - reduced food borne diseases

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A suggested interpretation

- Dynamic of innovation began to change in 18th century in the West. Made possible due to a set of institutional developments
- A market for ideas- Efficiency judged by consensus, contestability, cumulativeness
- An open source System of knowledge creation emerged in Europe before Industrial Revolution
- In 18th century, Coercion and Repression were relegated to marginal roles in the market for ideas; Accommodation between religion and the search for useful knowledge; Britain didn't expropriate the profits of innovators & entrepreneurs
- Technological advances, a result of both discrete quantum leaps in knowledge & of small incremental and cumulative microinventions

Patents and Innovation: Evidence from Economic History

Summary

- What is the optimal IPR system to encourage innovation?
- Is there one?

Patents and Innovation: Evidence from Economic History

Patent laws and the rate of innovation

- Innovation outside the patenting system - 1851 Crystal Palace
- Alternative: secrecy and lead time
- Contradictory effects of patenting on encouraging economic growth

Patents and Innovation: Evidence from Economic History

Plant patents in 1930 and innovation

- Plant Patents with over half between 1930 - 1970 for roses

Patents and Innovation: Evidence from Economic History

Secrecy and the direction of technical change

- Secrecy is effective
- Countries without patent laws used secrecy

Patents and Innovation: Evidence from Economic History

Diffusion of innovation

- Diffusion effects have been largely ignored
- Patent laws seem to affect direction of technological change and diffusion, but the effect is not causal or necessary

Patents and Innovation: Evidence from Economic History

Patent pools and the mechanism to modify patent laws

- Patent pools expected to weaken the intensity of competition
- Results show that improvements slowed after pooling, only to recover after breaking it down

Patents and Innovation: Evidence from Economic History

Compulsory Licensing

- Trading with the enemy act, 20% increase in domestic patenting
- Effect may be delayed
- Problems with uncodified knowledge

Patents and Innovation: Evidence from Economic History

Conclusion

- Many inventors have avoided patents when possible
- Granting strong IP rights to early generations of inventors may discourage innovation

The Creative Response in Economic History

Summary

- Adaptive response in the presence of changing conditions

Outline

Perspectives

- Multiple perspectives on effectiveness of patenting in encouraging innovation, diffusion

Epstein, S. R. (1998). Craft guilds, apprenticeship, and technological change in preindustrial europe. *The Journal of Economic History*, 58(3):684–713.

Gray, R. (2013). Taking technology to task: The skill content of technological change in early twentieth century united states. *Explorations in Economic History*, 50(3):351 – 367.

Khan, B. Z. and Sokoloff, K. L. (1993). "schemes of practical utility": Entrepreneurship and innovation among "great inventors" in the united states, 1790-1865. *The Journal of Economic History*, 53(2):289–307.

Khan, B. Z. and Sokoloff, K. L. (2001). History lessons: The early development of intellectual property institutions in the united states. *The Journal of Economic Perspectives*, 15(3):233–246.

Khan, B. Z. and Sokoloff, K. L. (2004). Institutions and democratic invention in 19th-century america: Evidence from "great inventors," 1790-1930. *The American Economic Review*, 94(2):395–401.

Mokyr, J. (2010). Chapter 2 - the contribution of economic history to the study of innovation and technical change: 1750–1914. In Hall, B. H. and Rosenberg, N., editors, *Handbook of The Economics of Innovation, Vol. 1*, volume 1 of *Handbook of the Economics of Innovation*, pages 11 – 50. North-Holland.

Moser, P. (2013). Patents and innovation: Evidence from economic history. *The Journal of Economic Perspectives*, 27(1):23–44.

Schumpeter, J. A. (1947). The creative response in economic history. *The Journal of Economic History*, 7(2):149–159.

Temin, P. (1997). Two views of the british industrial revolution. *The Journal of Economic History*, 57(1):63–82.