

Education Standards, Technological Change and Incentives

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Research questions

- 1 Who should set normative education standards (“competency models”)?
- 2 What is the best institutional arrangement for setting the standards?
- 3 How can the “institutional sclerosis” of competency models best be prevented?

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Economic theories of training decisions

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- The economic theory of training regards decisions about training as investments in human capital.
 - Economic agents will only undertake the training for which the benefits exceed the costs.
 - Pigou (1912) reasoned that firms would not be willing to invest the socially optimal amount of human capital in their workers due to moral hazard and adverse selection.
 - Becker (1962) showed that this is only valid for general training which raises the productivity of an employee in many firms.

General vs. firm-specific training

- General training results in an accumulation of unspecific human capital which increases the market wage by the full increase in productivity.
- Workers will therefore pay for general training themselves.
- Firms are willing to invest in general training for several reasons:
 - Appropriable returns from training
 - Capital market imperfections
 - Verification problems
 - Market imperfections (asymmetric information)
- According to Becker (1964) firms and workers will share the costs of firm-specific training.

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Training contracts

- The bargaining environment influences contracting between workers and firms (Williamson 1985):
 - Specificity of human capital investments
 - Market structure
 - Frequency of interaction
 - etc.
- According to Williamson non-verifiable specific investments make parties fear that they may be expropriated of the surplus created by the transaction and will therefore tend to underinvest.
- The theory usually looks at employee (worker) and employer (firm).

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An application to education systems

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- Let us change the point of view and model the contracting problem between suppliers and demanders in a human capital procurement process.
- Several sectors within the education system can be identified:
 - Apprenticeship sector: school \rightarrow firm
 - Intermediate education sector: school \rightarrow university
 - Teachers' education: university \rightarrow school
 - Higher education sector: university \rightarrow firm
 - Inter-firm sector: training firm \rightarrow employing firm
- Different education sectors are characterized by different bargaining environments.

Technological change and incomplete contracting

- Human capital procurement contracts are often incomplete:
 - Incompleteness rules out binding agreements between the parties.
 - Incomplete contracts are prone to hold-up problems, which are aggravated by wrong distributions of bargaining power.
- One reason for incompleteness is technological change:
 - There is uncertainty regarding the ex post productivity of human capital.
 - In the training period the demand for competencies may change.
 - Improvements are unknown ex ante and can not be part of the contract.

Hedging against the risk posed by technological change

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- Demanders of human capital can hedge against the risk posed by technological change by investing in flexibility, e.g. by investing in additional training.
- These investments are sunk costs that raise possibility of realizing a high productivity.
- Depending on how the contractual status quo is defined and the allocation of bargaining power at the renegotiation stage parties will tend to underinvest in specific human capital.
- The question is: *who bears the cost of flexibility?*

Some preliminary results and interpretation

- The initial intuition that deeply vertically integrated education systems will provide better training than non-integrated ones can not be upheld:
 - If the initial contract does *not* prescribe new competencies to be added, and the more specific human capital investments are, the more vertically integrated the education system should be: school → university → training firm → employing firm
 - But: non-integration may in some sectors be the lesser evil, depending on who has the bargaining power.
- The debate on normative education standards should concentrate on enhancing or reducing vertical integration *where necessary*.
- The question is not to maximize vertical integration in every sector but to *optimize* it.

Potential measures to optimize vertical integration in education

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Incomplete Human Capital Procurement Contracts

First Ideas for Policy Implications

- Re-frame the debate on normative education standards: less ideology and more thinking about vertical integration is needed.
- Competency standards should be formulated in such a way that the initial contract prescribes that improvements will be made.
 - This might be achieved by
 - having standards be revised by independent commissions where neither upstream nor downstream parties have veto powers, or
 - by federalizing education to enable jurisdictions to experiment and compete.

End of presentation

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Thank you for your attention.