The changing economics of (open-source) software

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References for this conference

- Main reference: Dalle J.-M. (2002), Open Code: the Sources of Open-Source Innovation (also bears upon a paper presented to an NSF Conference in Washington, D.C. last January)
  - See http://www.druid.dk/conferences/summer2002/Papers/DALLE.pdf
- About Generic Software, a more specific reference is Dalle J.M. & Kott L. (2002), Plaidoyer pour des logiciels génériques, in La Recherche, January. An English version is available from me.
- About the idea of an « Educative Napster », the reference is to two recent conferences and to a forthcoming article Dalle J.M. (2002) in « Terminal ». An English version should be available soon (mail me).
- I'm an academic so… I'm really glad if you are willing to use my ideas, since it's what I'm supposed to do: producing ideas for the others to use! However, I simply ask you to kindly refer to my work then, since it is also the way the academic community goes…

The (underestimated) political significance of software

- Software is « ubiquitous »: a General Purpose Technology
- Software is subject to very strong network effects: “de facto” standardization and « natural » monopolies
- Major efficiency could be gained thanks to modularity and potential reusability: yet, still in search of a component (COTS) model.

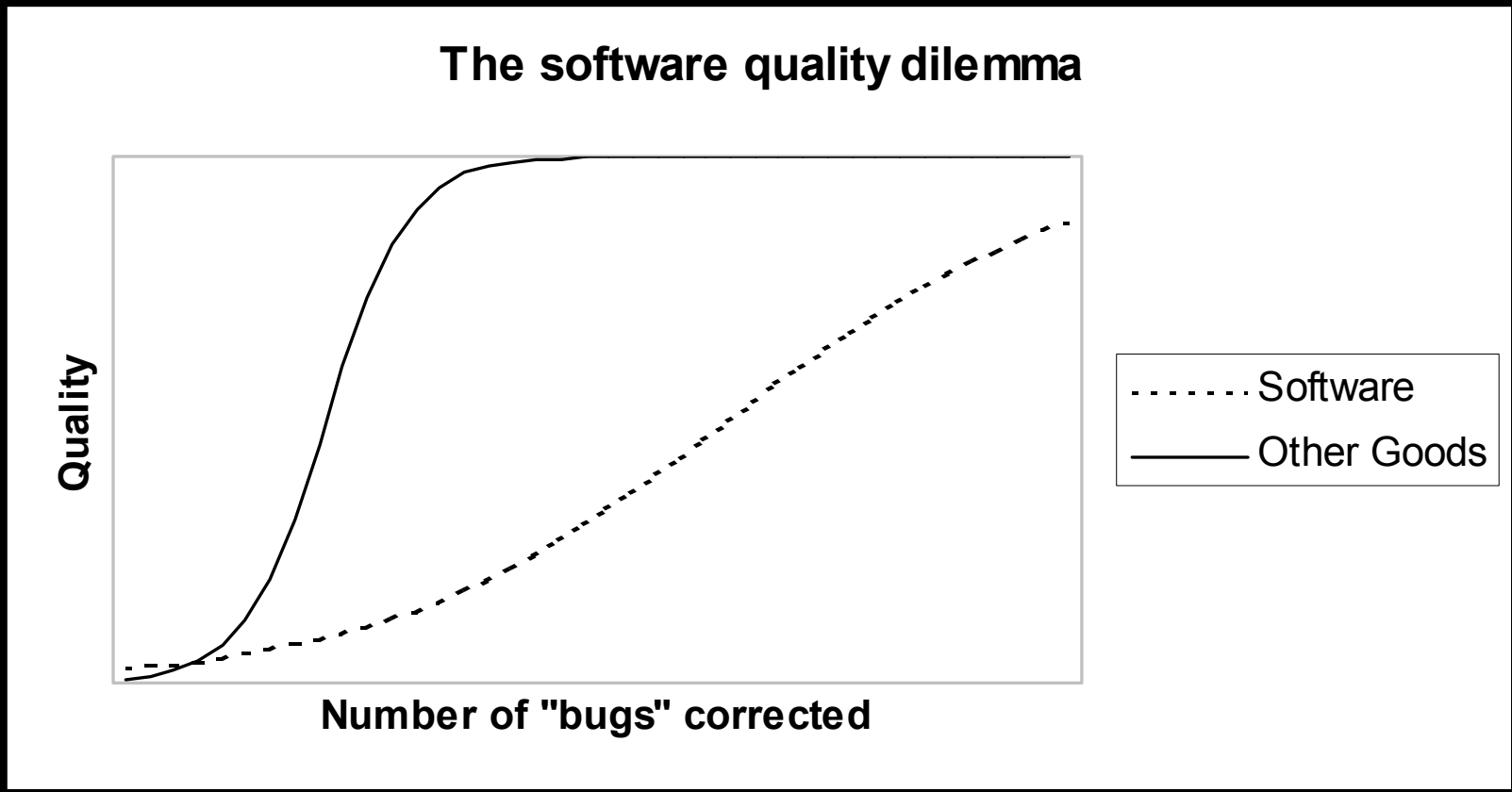
Software Goods: Complex Goods

- Complex goods: software is code (1rst occurrence), typically millions of lines of code!
- And therefore low-quality goods: bugs!

→Considerable increasing returns associated with cumulative improvements and learning provided by users

→The crucial role of minor user-driven innovations (von Hippel, 1988)

Software Goods (II)



“Open Code”

- Debugging costs too high in a proprietary model
- Openness of sources allow for the exploitation of a major source of software innovations: users!
- Considering enough users, “all bugs are shallow” (Raymond, 1998)
- And specially EASY to correct since software is code! (2nd occurrence)
- The so-called “source code” is essentially codified **knowledge** therefore (relatively) easy to modify.

The economic analysis of open-source software

- Incentives and motivations: blurred issues
- Competition: explain the competitive power of OSS
- Business models: rely on hybrid organizations between firms (either profit or non-profit) and communities
- …
- Political Economy: might open-source software create new opportunities for public policy in a knowledge-based economy?

Open-Source “Generic Software”

- Like Generic Drugs (Dalle & Kott, 2002).
- Provides a choice for consumers: generic software restores competition and creates more efficient market structures.
- Generic alternatives do not appear in software markets due to de facto standardization
- Software patents wouldn’t do the job: modularity, editors, etc.
- Open-Source software can do the job, even for developing economies: competitive power, no editor, many small ancillary service firms, etc.

The potential dangers of strong IPRs for software goods

- Strengthen already existing natural monopolies
- Create anticommons (Heller & Eisenberg, 1995)
- Hinder Components-Off-The-Shelf (« COTS ») models
- Leave user-driven learning by doing and innovation unexploited

“Open Academic Software”

- NSF Workshop, January 2002
- Academics as « lead users »: the Web, LaTeX, scientific software, etc.
- OSS communities are very close to Open Science communities: reputation, etc.
- Peer-reviewed Open Academic Software publishing

What about education?

- The « Open Contents » issue.
- But the power and economic interest of open-source mainly relies on the facts that:
  - Software is code / codified knowledge.
  - Software markets are prone to natural monopolies.
- Furthermore, a risk to create some unnecessary standardization incentives in education

Not exactly like open-source, but…

- Like programmers, teachers belong to creative communities of active users: here again, users as innovators.
- Knowledge flows are difficult to develop in education: experimentations, but consolidation/accumulation is rather poor.
- Appropriate tools?

An « Educative Napster »?

- P2P-like exchange mechanisms would be most appropriate for creative communities of teachers
  - In a way, Napster was not that appropriate for music…
- Decentralized problem-solving, and enhanced thanks to the access to the creativity of the entire community!

Conclusions

- Open-Source, born as a fad, might have an institutional future.
- More generally, collaborative technologies might provide solutions for several institutional issues.
- New degrees of freedom for public policy… and new ideas for political economy!
- Not the first time in history that economic institutions dealing with creativity are born "bottom-up": patents, academic science…
- Too bad for economists?