University-Industry Relations: Different solutions to common problems

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motivation

• STI policy has nicely evolved from science policy to innovation policy
  – A story of about 50-60 years

• There are signs that science and industrial policy are coming back
  – Two trends have greatly affected how we do science and how we produce
    – Technology and globalisation

• Can we talk of a new era of “science-industry” policy rather than science policy and industrial policy
SWR policy has evolved

<table>
<thead>
<tr>
<th>Decade</th>
<th>science</th>
<th>industrial</th>
<th>technology</th>
<th>innovation</th>
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<td>2010-15</td>
<td>113</td>
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Articles in SSCI that include STI policy terms in title (absolute numbers)

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<tr>
<th>Decade</th>
<th>science</th>
<th>industrial</th>
<th>technology</th>
<th>innovation</th>
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Articles in SSCI that include STI policy terms in title (share in total STI policy articles)
STI policy has evolved

• Two observations can be made looking at the evolution of STI policy
  – What is the next catch-all term after innovation?
    • Entrepreneurship?
  – If we cannot name the next catch-all term can we consider an STI policy cycle?
    • Back to science policy?
    • Or a new approach as science-industry policy?
argument

• Assuming that there is an STI policy cycle we posit that “science-industry” policy rather than science policy and industrial policy will be in the spotlight
  – Policy on the link rather than the nodes
approach

• Science and industry are accepted to be two separate bodies in terms organization, workforce and output creation
• Post 1980s both parties are shaped by technology and globalisation
• Today there are problems that are common to science and industry
• Policy should be directed to these common problems
taking stock: science

- Technology and globalization have affected the way we do science
- Problem: immense knowledge
- How to deal with this “immense knowledge” problem to produce new knowledge?
  - Either work more or divide things into pieces
    - Demography
    - Specialization and rise of team-work
    - Rise of interdisciplinarity
taking stock: science

• Demography
  – Researchers are getting old!
  – Similar findings for articles, patents, PhD thesis, great inventions etc.

• Specialization and rise of team-work
  – One way to deal with immense knowledge
  – Huge time cost of immense knowledge
  – Finding: team-size is rising

• Rise of interdisciplinarity
  – Sophisticated knowledge
  – Cross-boundary research
taking stock: science & education

• Technology and globalisation also affects science education
  – Technology substitutes education
  – Technology helps separation of education and research and globalization helps distribute in space
  – Education is slowly being alienated from research
taking stock: industry

• Immense knowledge problem
  – Specialize and outsource

• Sophisticated output
  – Products are getting sophisticated
  – Rise of team-work
  – Rise of between-sector knowledge production

• Technology divides production into smaller pieces; globalization distributes in space
  – Separation of production and knowledge production
similar problems?

<table>
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<th>science</th>
<th>industry</th>
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<td>immense knowledge</td>
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<td>• Sophisticated knowledge</td>
<td>• Sophisticated products</td>
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<td>who produces knowledge?</td>
<td>• Rise of team work</td>
<td>• Rise of outsourcing and co-production</td>
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<td>disciplines; sectors?</td>
<td>• Rise of interdisciplinary research</td>
<td>• Rise of products that demand inter-sector knowledge</td>
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<tr>
<td>cost issues</td>
<td>• Transform education (online, distant etc.) to cut education cost</td>
<td>• Rise of fragmented production to deal with cost of production</td>
</tr>
<tr>
<td></td>
<td>• University education and university research is being separated</td>
<td>• Manufacturing and R&amp;D departments are being separated</td>
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</table>
common solutions?

• Given these common problems are we offering common solutions?

• I see two approaches
  – Offer similar solutions to similar problems
    • Still a science policy and an industrial policy
  – Offer a completely new approach that focuses on the link between university-industry rather than nodes
    • A science-industry policy
common solutions?...Turkish case

• Various policy tools that builds policy for the node (either university or industry)

• Two policy tools that stands
  – Technology development zones
    • Technology parks, incubators etc.
    • Why firms locate in a university?
      – Tax breaks; image; and various other hard tools
      – Networking with the university least important!
      – Logic: firm benefits, university as resource
  – Technology transfer offices
    • Directly supported by TUBITAK
    • Logic: university benefits as science proceed to practical outcomes
common solutions?...Turkish case

• Even the policies that aim university-industry interaction are based on the node not on the link

• Policies that aim the link are rather soft tools
  – Two questions:
  – What about supply of these policies?
  – Do firms in Turkey demand such policies?