ODTÜ TEKPOL

RESEARCH CENTER *for* SCIENCE *and* TECHNOLOGY POLICIES

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

STI policy has evolved

	science	industrial	technology	innovation
1950-59	2	1	0	0
1960-69	38	7	1	0
1970-79	128	36	28	0
1980-89	107	201	79	11
1990-99	105	175	145	12
2000-09	132	153	99	69
2010-15	113	121	46	111

Articles in SSCI that include STI policy terms in title (absolute numbers)

	science	industrial	technology	innovation
1950-59	0.67	0.33	0.00	0.00
1960-69	0.83	0.15	0.02	0.00
1970-79	0.67	0.19	0.15	0.00
1980-89	0.27	0.51	0.20	0.03
1990-99	0.24	0.40	0.33	0.03
2000-09	0.29	0.34	0.22	0.15
2010-15	0.29	0.31	0.12	0.28

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, work force 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?

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

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?