Universities as knowledge hubs: the US lessons and the Italian case

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IUFA conference, Johns Hopkins University, 16 June 2009

Two questions:

- **to what extent does the embedded nature of universities as knowledge hubs shape the trajectory of local innovation?**
- **is the US model the most appropriate model for EU mid-range universities that are trying to define the boundaries of their entrepreneurial role?**

The rise of the knowledge economy

The new production of Knowledge

- Emergence of a new mode of knowledge production (Mode 2) (Gibbons, 1994) that basically occurs in *contexts of application* and through *transdisciplinary practices*;
- Differently from “Mode 1” when knowledge was produced primarily in scientific institutions and structured by scientific disciplines.
- The idea of a contextualised science is reasserted in a second volume by the same authors (Nowotny et al., 2001) highlighting the view of a knowledge production that is “socially distributed” and of society speaking “back to science
- This new mode is not undisputed (Hessels and van Lente, 2008)

How do universities fit into the new knowledge production picture?

- Over the last decades, a fundamental transformation in the way science, academia and economic development relate to each other (Etzkowitz and Leyesdorff, 2000), highliting the new entrepreneurial role of universities (Etzkowitz, 2001), originally starting in the US with the experiences of Stanford and MIT;

- The central role of universities in knowledge diffusion has prompted research on the commodification or commercialisation of knowledge in terms of intellectual property and patents (Powell and Snellman, 2004), technological transfer offices, spin offs and incubators.

- The key interpretative framework for this new scenario was introduced by Etzkovitz (2000) through the concept of the Triple helix of university – industry – government

The acknowledged role of universities

- Universities play a crucial role at the crossroads between national and regional systems of innovation. They actually negotiate their role in a multi-level governance mode and act as integrators of various forms of knowledge including the commodified type of knowledge described above, human capital and social capital (Charles, 2006)

- In this context universities can be properly described as “knowledge hubs” (Youtie, Shapira, 2008) since they are “local innovation systems that are nodes in networks of knowledge production and knowledge sharing

Universities and mid-range localities

- need to assume a different perspective with regard to mid-range universities (Wright et al., 2008), to account for universities that do not have world-class research and are located in regions where there is less demand of innovation.

- This perspective is important when tackling stories of universities and localities in Europe and particularly in Italy,

The US lessons

US universities have always been conceived as embedded institutions. The US tradition of land-grant institutions, started with the Morril Act in the XIX century. As far as their position of knowledge hubs is concerned a fundamental hallmark for US university research evolution is provided by early 1980’s legislation, namely the Stevenson-Wydler Act and the Bayh-Dole Act

The US lessons

Obviously, there are still differences in the way different US universities approach this strategy. The spectrum can range from universities as “Ivory towers” of pure research, to university largely devoted to technology commercialization. Differences in the “knowledge capitalization” mode can be related to the tradition of university/industry linkages in a specific region (Gunasekara, 2006) or even to the organizational structure of university offices devoted to that mission (Bercovitz et al., 2001).

Patents issued, income from licensing and startups for selected US universities

Universities	patents issued in 2007	USD gross income from licenses (cumulative 2005-2007)	startups 2007
University of California (system)	331	360.330.462	38
MIT	149	129.187.162	24
W.A.R.F./University of Wisconsin Madison	124	n.a.	6
Stanford University	106	n.a.	6
University of Michigan	87	46.566.700	7
Georgia tech	58	8.274.891	9
University of Minnesota	44	163.990.475	4
Johns Hopkins University	43	35.508.677	4
Harvard University	42	51.896.640	6
University of Pennsylvania	40	21.475.342	3
University of Colorado	21	71.052.217	10
University of Pittsburgh	21	18.826.436	8

Source: data AUTM survey, FY 2007

The Italian case

In Italy, research by universities represents one third of the overall R&D conducted in the country. It is the highest percentage in the EU and OECD area.

On the other hand though, just 47% of R&D is conducted by the industrial sector, well below any other OECD country.

University research is funded by the national government for 24%, by contract research for 23%, for 16% through own funds, for 12% by EU, and for 7% by regional and local governments (CRUI-Netval, 2007).

The University of Bologna

- The university of Bologna is the oldest university in Europe. In 2004 it has initiated a gradual policy of revision of its research activities, setting up a technological transfer office and hiring an external CEO for the management of the entire R&D mission.
- Its laboratories especially in the departments of Chemistry and Physics are participating in European platforms of research and it is the first university in Italy for the number of EU sponsored research awards.
- It is an anchor institutions but more than that it is a recognized education hub, especially for engineering secondary education.
- Over the last ten years its decentralised campus, in the southern part of the region Emilia Romagna (Romagna), has initiated an acknowledged “third mission” of innovation, beyond education and research (Etzkowitz, Leydesdorff, 2000), through the setting up of teaching courses and research laboratories and contract research initiatives with local firms.

Our two original questions:

- **the embedded nature of universities as knowledge hubs shape regional development if a university chooses to engage as a local leader and to participate in regional and international networks;**

- **the US system provides useful insight on the management of codified knowledge transmission, but given the prevalent tacit dimension of knowledge exchanges in small and medium size localities and the relative idiosyncratic nature of development in mid range regions in Europe, the US system cannot be the model of university led local development, especially since collaborative partnerships in mid-sized European localities are not centred upon commercialisation of codified knowledge.**

conclusion

- The role of Italian universities in this scenario is crucial in that they are the main producers of research (one third of the total R&D against 19% in EU Nordic countries and 15% in the US) and faced with an increasing reduction of national funds for research, they are stimulated to take up an entrepreneurial role in terms of contract research and licenses agreements.
- Yet the modal shift in Italian knowledge production system is not easy task. Italian industry is made up for 98% by firms with a size below 10 employees, lacking the sufficient scale for big R&D projects and for embarking in the purchase of licensed technology.
- A question is whether the presence of a university is per se a sufficient condition for local development. There is more than one single factor that help explain the success of a locality
- As this model of collaboration proceed in Europe, a major question will have to be asked on the preservation of the quality of research and of the autonomy of the academic to avoid that out of the need for funds, universities lower their standards of research to adjust to demand