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Combining Universities' third mission and place based industrial development

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This short note is aimed at proposing a synthetic view of the combination of two important contemporary tendencies in both post-industrialized and emerging industrialized places and nations. They are: 1. The increasing diffusion of the so-called third mission of universities, that is the valorization of the results of academic research through direct knowledge transfer for innovation; 2. The expanding 'intrusion' of science-based knowledge in worlds of production, included those characterized by specialized SMEs clusters embedded in compact centres of industry, like industrial districts and urban poles of innovation. The combination is more or less implicitly subsumed within approaches entitled at the triple helix and at the regional innovation system. We would rather refer to a more direct approach and to some applications. That is: 3. The model of the University centric industrial district (UCID); 4. Some suggestions from current third mission's strategies at the universities of the Tuscany region (Italy) and the prospects of their relation with a regional territory rich (not only of art and history but also) of place based SMEs clusters.

1. The traditional (and still fundamental) missions of universities are the advancement of universal knowledge and culture and the higher education for critical competences in complex societies. Universities (together with other public research organizations and academies) are more and more actively engaged also in a third mission, using an ample range of tools available nowadays for transferring/confronting directly the knowledge they develop to/with local and non local production systems and institutions:

support to patents and industrial property rights on inventions developed within the university;

support to university spin-offs also by means of incubators;

support and monitoring of university-business joint laboratories and on research focused on business needs;

support and actions on regional, national, and international calls regarding research & innovation projects;

career vocation and support to job placement for innovation and entrepreneurship;

integration of the previous tools with the help of both specialized centers and the possible involvement within science and technological parks and communities of interest in the territory.

Tools and actions are not novelties of this age. Organized experiences date back to the first decades of the 20th century, at least. However their global diffusion is a contemporary tendency and may be related to both: a) knowledge becoming more integrated across disciplinary fields, and requiring a combination of various types of codified and practical knowledge as well as the interface of science and technology with communities of users and producers; b) relative scarcity of funding from states and families' budgets to the two traditional missions of universities hitting diffusely, and urging universities to organize more systematically the contradictory relations with business sources of funds.¹

2. Let us consider now the question of specialized SMEs clusters of old or post industrialized regions and countries confronting the contemporary deeper intrusion of science-based knowledge in their daily frame of competitive challenges. The champions of SMEs clusters in the second half of the last century, riding new artisan and post-fordist tendencies, corresponded to specialized industrial districts, like in Italy where they were (and still are) a fundamental basis of exports and industrial development (*made in Italy*). Among the economies external to the single SMEs but mainly internal to successful industrial districts (or

¹ More on the themes of this section in Weber L.E., Duderstadt J.J. (eds.), *University Research for Innovation*, London: Economica Ltd, 2010.

sometimes to industrial regions including industrial districts and larger cities) there were those corresponding to the advancement of knowledge and technology. They are based in district processes of *decentralized industrial creativity*. Variety and novelty, especially incremental innovations, spring from the interaction of a rich set of original approaches embedded into the life (educational, working, etc.) experiences of large groups of producers and traders engaged in common if differentiated fields of industry (*territorial and cultural proximity*). New nuclei of productive knowledge may also emerge, then enlarging the inner structural multiplicity of knowledge and technology within the district, and opening new fields for its specialised SMEs. The contemporary intrusion of science in the frame of challenges confronting SMEs clusters in old and post industrialized areas come from the coupling of the rapid expansion of opportunities of innovation led by experimental knowledge (see tendencies recalled in section 1), and the globalization of many value chains (especially those controlled by big firms) also pulling the fast take-off of new (in some cases huge) industrial regions and countries. SMEs clusters need more and more innovation, and this has to be developed in closer contact with science-base knowledge and institutions, which implies not easy adaptations and in particular the modifications of decentralized industrial creativity processes and factors:

universities, international innovation-related actors, international sub-contractors or client firms were external actors, now they (a right selection of them) have to be included into the networks of the district inner relations, perhaps by means of weak ties, nonetheless asking the local actors new skills (cross-cultural abilities) and attitudes (a business culture that enables boundary-spanning activities and the integration of diverse fields of judgment);

as investments in R&D is becoming increasingly important, the need to appropriate their returns both reduce firms' willingness to cooperate and exchange ideas among cluster SMEs, and increase the need to go global, bringing about the emersion of pivotal roles played by either more structured entrepreneurial firms or more formally constituted teams of small firms;

the direct use of results of science based knowledge both pushes and pulls the expansion of more codified ways of exchanging ideas and experiences (this is also related to ICT and "smart" strategies), tending to affect the local structure of market power and plausibly engendering conservative reactions.

The above mentioned implications sum-up to a great deal of incentive and coordination difficulties for investments in both private and specific public goods, which may easily lock-in the SMEs cluster and the district within decline traps, or derail them towards neo-fordist, de-territorialised and hierarchical models.²

3. The model of the University centric industrial district (UCID) proposed by Patton and Kenney could be seen just as a variation on High Tech Clusters, but it is much more since it connects explicitly the HT cluster to a compact centre of industry and life and to university activities embedded in the same centre. The model is composed by a set of elements which can be summarized as follows:

a city with industrial traditions or an industrial district with urban features have hosted a university (or at least some important campuses of her) for a pretty long period;

networks of entrepreneurs partly but not casually overlap with networks of university scientists thanks to a tradition of joint researches and job placement of graduates, also supported by institutions and strategies both within the university (e.g. Industrial Liaison Offices) and the entrepreneurial community (e.g. Cultural associations promoting industry-university matching);

scouting and entrepreneurial tutoring and mentoring from both university services (e.g. University incubators) and external (private and public) initiatives help a constant flow of companies spinning-off from innovative projects tied to university competencies and related to local specializations;

finding a favorable innovative eco-system, university spin-offs embed at least for a while into the local clusters and fed them with new specialized activities both directly and through further new companies spinning-out from the university spin-offs or from relations with other innovative local firms;

² More on the themes of this section in Becattini G., Bellandi M., De Propris L. (eds.), *A Handbook of Industrial Districts*, Cheltenham: Edward Elgar, 2009.

the innovative eco-system, connecting local firms and university spin-offs, is supported both by specific organizations (e.g. Business angels associations, Communities of technological practice, Clubs of managers and innovators) which enrich the above mentioned institutional frame of industry-university relations, and by the team structures that realize integration/absorption of technology and management/business development within the companies and among them; the network of scientific and didactic relations among universities; some spin-offs after the first phase of business acceleration leaving the UCID but keeping in contact with local networks; some of the university alumni who leave out but stay well connected to the local homeland; flows of incoming FDI and skilled migrants; a generation of young people (in particular graduates) with skills and attitudes apt to cross-cultural social and business activities either at the local or at the non local and international level: all this may help a systemic overlap of localized and extended networks fuelling local innovative dynamics, and allowing some of local SMEs a not subservient insertion in global value chains.

The UCID's model and cases give an original perspective not only on HT clusters but more in general on evolutionary paths of business clusters affected by the intrusion of science-based knowledge (and globalization) and open to the opportunities of universities' third mission. "If" supported by an "up-dated" (remember the lock-in risk) structure of specific public goods, even SMEs clusters specialized in traditional products may benefit from UCID-like processes: a structured combination of artisan expertise and technological frontiers, as in design led innovation, may develop within regional "magic circles" of cities and industrial districts where university systems find both urban structures and nearby SMEs clusters.³

4. Laboratories for the UCID model have been USA metropolitan areas like Madison in Wisconsin and Boston in Massachusetts (see note iii). They present HT (life sciences) clusters and top level universities with deep traditions in the third mission. It would be interesting the comparison with European cases of well structured combination of Universities' third mission and place-based industrial development based on a long history, like Grenoble and Munich. We rather conclude this brief note with some hints taken from a much less structured European case, i.e. that of Tuscany (an Italian region whose capital city is Florence) and its regional university network. Tuscany's universities and academies are nowadays actively if not always effectively engaged in the third mission. Only recently Italian university institutions began to promote systematically the third mission. This is also true of Tuscan universities and academies: some made an earlier start a decade ago, while others, including the major one i.e. the University of Florence, have been accelerating over the last few years. To support these activities, universities make use of internal structures of service (*viz.* knowledge transfer offices), sometimes shared with external institutes (e.g. technology parks and incubators), and with a view to regional coordination. Relations and actions between universities, and among them and local productive systems and institutions, are oriented and supported also by a framework of Research and Innovation Policies implemented by the Regional government. The Tuscan worlds of production are characterized by SMEs clusters and districts specialized in typical products of made in Italy, together with some HT clusters and some clusters led by large companies. The need of relations with universities for a more systematic inclusion of science-based knowledge is strong everywhere, but not always correctly felt and pursued. Lack of a deep tradition on such relations affects current attempts. Institutional learning both within and among universities and with both local/regional government and the business clusters will help in translating objectives and strategies into effective contributions to sustainable innovation ecosystems. However such learning and its

³ On the UCID model, Patton D., Kenney M., 'The University Centric Industrial District in U.S.A', in Becattini G. *et al.* (cit.); on structured teams in innovative eco-systems, Best M.H., 'Massachusetts high tech: A manufactory of species', in Becattini G. *et al.* (cit.); on magic circles, Dunford M., 'Industrial Districts, Magic Circles, and the Restructuration of the Italian Textile Clothing Chain', in *Economic Geography*, Vol. 82:1, 2006, ps. 27-59; on design innovation, Cooke P., Eriksson A., "Design Driven Regional Innovation", in Cooke P., Asheim B., Boschma R., Martin R., Schwartz D., Todding F. (eds.), *Handbook of Regional Innovation and Growth*, Cheltenham: Edward Elgar, 2011.

beneficial support depend also on the contradictory effects of strong local (sub-regional) traditions on regional coordination in Tuscany: fragmentation and low persistency in strategies from one part, civil emulation among competing but also cooperating localities on the other part. A second important set of contradictory effects have to be considered eventually: those of the last years' reduction of State funding to public academies and research in Italy. If they push Italian (and Tuscan) universities towards a stronger orientation to the third mission and to a rapid overcoming of cultural barriers to relations with the worlds of production and to regional coordination, the evil sides could not be underestimated meanwhile. The reduction of the Italian State's ordinary funding of universities –too strong, too fast, and not compensated by a real autonomy of universities from a burden of state constraints on administration– not only makes difficult to invest in the expansion of third mission's tools and attitudes, but also tends to damage the long lasting inner source of the third mission, which are the results of the first two missions - the social progress of science and culture, and the higher education of a mass of brilliant young people to critical competencies for our age's complex societies.⁴

⁴ On strong European cases see the special issue of *Regional Studies* in Volume 33:4, 1999. More on the third mission at the University of Florence in Bellandi M., Caloffi A., 'Il modello "University Centric Industrial District" fra difficoltà e opportunità', in *Economia e politica industriale*, Vol. 37:2, 2010, ps. 99-108. See also www.csavri.unifi.it; www.fondazionericerca.unifi.it. On recent overviews and data at the regional level: Region of Tuscany, *The Regional Research and Innovation System*, Florence: Regional Government (Area of Research Coordination and EU Liaison Office), 2012.