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# The Contribution of Universities to a Knowledge-Based Economy

Since the beginning of 2003 universities as institutions of higher education and of research have gained a prominent place in policy papers of the European Union.<sup>1</sup>

Up to 2003 the term “university” was hardly used by the EU. In the Framework Programmes, universities only played a marginal role. Even in the Bologna Declaration of June 1999, originally signed by 29 countries in order to promote the attractiveness of the European higher education system within an intergovernmental process (Bologna process), universities were just mentioned in the introductory statement. They did not exist when the action lines of the Bologna process (introduction of a common study architecture and of comparable degrees) were laid down. Universities were only expected “to respond promptly and positively”. It took the Bologna process two years, until the Prague Communiqué of May 2001, that ministers explicitly recognized the role of higher educa-

<sup>1</sup> See the communications from the EU Commission “The Role of the Universities in the Europe of Knowledge” – COM (2003) 58, 4/2/03; “Researchers in the European Research Area: One Profession, Multiple careers” – COM (2003) 436, 18/7/03; “Europe and Basic research” – COM (2004) 9 final, 14/1/04; resolution of the European Parliament P5-TA-PROV (2003) 0495, 18/11/03 and other documents.

tion institutions and of students as stakeholders in creating the European Higher Education Area.

Before this recent rediscovery of the role of universities as actors in the field of higher education and research, universities were only perceived as a sum of individual researchers or research groups, as a conglomeration of individual departments, as an accumulation of study programmes or just as locations where students happen to study. This perception of universities by policymakers and by the public in large reflected and still reflects the fact that universities in Europe are highly fragmented institutions and that, related to the phenomenon of fragmentation, governmental influence is dominant not only in the general management of university affairs, but also in deciding on details of running a university.

Why did this shift of attention by policymakers occur? The prime reason for perceiving universities as important institutions is the insight that the EU can only become “the world’s leading knowledge-based economy by 2010” (Lisbon, 2000), if universities – as it is the case in the USA – become main actors in shaping knowledge-based societies. Universities have to overcome their fragmentation and need professional management. In addition, they need to shapen their profiles and have to build up critical masses in research. They should reach out for more excellence. They have to broaden the base of higher education in society. Better relations with the society and, in particular, with industry are

needed. In short, universities must become more “entrepreneurial” (B. Clark) in the future “Europe of Knowledge”.

Of course, the necessary improvements of the higher education system and of basic research should be backed by community-wide and national measures. The Sapir Report (2003)<sup>2</sup> clearly states: “Member States and the European Union as a whole need to invest *more* and also to invest *better* in higher education and research” (p. 132).

For the European Union, there is the issue of authority. As long as basic research was regarded predominantly as a consumption activity that an affluent society may pursue in the interest of extending human knowledge and as long as higher education had to serve national interests and had to reflect national values and cultures, the EU could not demand any authority to influence the politics of Member States in these fields.

Once higher education and basic research are seen as main contributors to the success of a knowledge-based economy and, as a consequence, to long-run economic growth or to job opportunities within the EU, the EU gains authority. This is especially true with respect to research, but may have an impact on shaping the Bologna process as well.

As a consequence, the Lisbon process might strengthen the role of EU institutions vis-a-vis Member States in finding new and better policies concerning higher education and basic research.

<sup>2</sup> *An Agenda for a Growing Europe. Making the EU Economic System Deliver. Report of an independent high-level study group established on the initiative of the President of the European Commission, July 2003 (A. Sapir/ chairman, P. Aghion, G. Bertola, M. Hellwig, J. Pisani-Fery, D. Rosati, J. Vinals, H. Wallace).*

The link between investment in universities on one hand and overall growth on the other hand is, however, difficult to prove empirically. The effects of higher education and basic research diffuse internationally through many channels. Applications of new results of basic research often take detours before they become economically successful. The time patterns of the links between education or research on the one hand and economic output on the other hand do not follow strict lines which are easily testable. At best, indirect links can be determined.

In many studies, e.g., the Sapir Report (2003), Europe's unsatisfactory growth performance with regard to the USA since the 1970s is traced back to "its failure to transform into an innovation-based economy" (p. ii). As a consequence, boosting investment in knowledge, in higher education and research and development (R&D), seems to be an appropriate remedy. The low European growth performance is then explained by an underfinanced higher education system, too low "Action Plans" for basic research have become important points on the European policy agenda. Within the EU Commission it is not only the DG "Education and Culture" and the DG "Research" which are working on programmes for universities. In addition, the DG "Regions" is of increasing importance, since universities will be the engines of tomorrow's regional innovation and growth.

Chronic underfinancing and the self-perception of universities in Europe may not help to get the necessary changes in universities quickly under way. Good comprehensive research universities in the USA re-

ceive, at least, an annual budget of EUR 1 billion (Harvard University has about USD 2.5 billion). In Europe, there is hardly a university with this size of a budget.

Are European societies willing to spend more on universities, either through governmental support or through private donations? In the USA 2.3% of GDP is spent on universities, 1.1% out of public money, 1.2% as private money. In the EU-15 only 1.1% of GDP is given to



universities (0.9% as public money, 0.2% as private money). Are European universities ready to accept that research money will go to a more concentrated set of institutions and will not be spread along existing patterns? In addition, since traditional public money (General University Funds) is stagnating, universities in Europe need to actively look after alternative ways of financing their activities. Are they capable to increase sponsoring? Are they ready to build up strong university-industry relationships? Are they ready to charge tuition fees with better incentives to do good teaching?

The role of the universities in building knowledge-based economies has been reinforced by the insight that pushing towards the "3% objective" in 2010 (3% of GDP for R&D) implies an increase of the number of researchers in the EU by about 700,000. This number is de-

rived from a comparison of the number of researchers per one thousand of the workforce between Europe and other parts of the world. In the EU-15 this number is 5.7 and 3.5 for the ten new Member States. In Japan there are 9.1 researchers per 1,000 of the workforce, 8.1 is the number for the USA (see the Gago Report).<sup>3</sup>

Evidently graduate education at universities should grow, but the contents of graduate education should change, too. Future research training in Europe should include more project design and project management, better data analysis, more collaborative work and the “ability to handle uncertainty in an interdisciplinary context” (Gago Report, p. 8).

The European debate on the role and structure of doctoral programmes, which should lead to a set of European wide proposals for the next summit conference of ministers of the Bologna process in Bergen in May 2005, has been intensified by the demands for more human resources in research within the Lisbon process. Hopefully, after Bergen in May 2005, a common study architecture for doctoral studies will emerge in Europe, leading the way to more intra-European mobility of prae and post doctors.

During the past years, mainly three factors have contributed to the emergence of partnership between universities and the economy: (1) restrictions on government financing of universities, especially reductions of “general university funds”; (2) the strong demand by firms for science-

based knowledge to innovate products as well as production processes; (3) the pressures of internationalisation on both sides, universities and firms. Pressures of internationalisation and the help of new technologies have enhanced even geographically remote university-industry partnerships. Increasingly, the transfer of knowledge from universities to firms is targeted to specific research outcomes, jointly defined and developed by universities and firms.

The direct financing of universities by firms remains however limited. The Organisation for Economic Co-operation and Development (OECD, 1998)<sup>4</sup> estimates that industry funding of university research, within the OECD area, averages around 5%, ranging from 2% in Japan (and probably 2% in Austria) to about 6% in the USA and UK and to nearly 11% in Canada. Yet, in many countries (USA, UK), as much as 20% of university research is associated with industry in various ways (in Austria own estimates indicate that this figure is about 6% to 8%).

These numbers demonstrate that the partnerships between universities and the economy are less established by explicit contracts. Instead, informal arrangements seem to prevail: informal partnerships among individual researchers in industry and academia, special dissemination of informations, advisory exchange programmes, student training placements in industry etc.

Since the costs of university research associated with firms are higher than the financial means flow-

<sup>3</sup> *Increasing Human Resources for Science and Technology in Europe. Report presented at the European Commission conference “Europe needs more scientists”, Brussels, April 2, 2004*

<sup>4</sup> *University/Industry Research Partnerships: Typology and Issues. DSTI/STP/SVR (98) 4*

ing from industry to universities, the question arises: Who is paying the major part of industry-related university research?

In many OECD countries, there are various government agencies who sponsor the partnership between universities and industry: E.g., government grants go to specific research projects jointly undertaken by firms and universities (Australia: “Collaborative Research Grants Scheme”), to large-scale research programmes, carried out by several partners (e.g., Framework Programmes of the EU), or help financing facilities or centres for collaborative research (Sweden: NUTEK Competence Centres, now Vinnova). In Austria, the government launched a programme in 1998, similar to the one mentioned for Sweden, the so called “K plus –

Programme for Competence Centres”, which, in 2001, was amplified by the so called (Academia plus Business) AplusB programmes.

Government should actively support partnerships between university and firms. The main task of this public support is to overcome initial risks and to secure the positive external effects that such partnerships may bring about for the society and the economy. This support should also help to turn universities away from being ivory towers.

Universities are now increasingly aware that they have to meet the new demands of a knowledge-based economy. I am convinced that universities are ready to become main actors in shaping this economy, although the necessary changes within universities will not be easy to implement. 