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What has been the contribution of the LRU reform and specifically what has the Creation of Research Centers and Higher Education (PRES) done to establish universities back at the heart of the research strategy in France?

French research produces excellent results, but still suffers from a lack of international visibility, which is why we are reorganizing our scientific landscape. With clusters of higher education and research, we facilitated the consolidation of higher education institutions and research organizations to facilitate better collaboration between them. Indeed, these hubs enable different actors (universities, colleges, research institutions) to be consistent in respective mechanisms, to pool their activities and offer a research and training more consistent and readable. For example, while studying (PhD, master), coordination of studies may lead to the issuance of a certificate under the seal of the ESRP, corresponding to the training provided by one or more member schools or universities. Then, with the law on autonomy, the universities accrue a greater role in research as they can now develop and pursue genuine scientific strategy, and forge alliances as they wish with other educational institutions and research organizations.

French universities are very different from those in the USA. They are small in size, and the concept of a campus organization is rather new. What steps is the government taking to make French universities more attractive to both French and foreign students?

More than the size or the number of students, which is really the strength of our institutions, it is first and foremost their educational and scientific strategy that is important. The autonomy gives universities the freedom to manage their strategic alliances, to diversify the participants in their courses, develop strong links with companies to improve the employability of their students … etc.. The proper test is therefore not the size but the performance of an institution. The Autonomy Act gives institutions the tools of dyanmic human resource management to stimulate scientific excellence, and help attract and retain top talent. Thus, universities have stepped up recruitment of teachers and researchers of international standing.

Meanwhile, the campus operation, which is an exceptional plan launched for university real estate, will create the campus tomorrow, thought of as places of real life, and organized around real scientific projects, to thus increase the international visibility and attractiveness of our universities.

One of the criticisms we have heard about French universities is that students find it difficult to find a job at the end of their studies and transition into the workforce. How is this process approached by the university? Is it possible to make universities closer to the 'private world' without 'privatizing' education?

Universities now have the task of ensuring the employability since the Home Rule Act. The contents of the license have been renovated with learning and mastering new skills (ie foreign language, computer … ..).

In terms of careers, this course also provides the second year to open up fields of business, including a compulsory course for students to learn applicable skills and will also be an opportunity for them to make contact with the professional world.

Finally in the 3rd year, they will specialize in a field of business, with more courses on their specialty. Then, the Autonomy Act aims to give the university the means to support students until they find their place in the professional world. The law established institutions with a mission orientation of job placement. They must now publish statistics on their success rate in trials but also their job placements. Finally, the boards include representatives of the socio-economic world, who bring their expertise on the needs of businesses.

The promotion of public-private laboratories could help break the invisible walls that often exist in France between government institutions, academic establishments and private actors. Already there has been a positive reaction to this initiative as made evident by partnerships such as sanofi-aventis and INSERM. Nevertheless, co-owned patents can be a

contentious issue and it seems that in France many discoveries that were made in coordination between several actors never make it to the market as either the players never find an agreement, or take too long to reach one. How has the system been organized to address this issue?

We encourage research partnerships between public institutions and businesses, through various devices ranging from clusters to Carnot institutes, because it should not be a dividing line between private research and basic research. Indeed, to clear large areas ranging from nanotechnology to biotechnology, going back and forth constantly between basic and applied research, between public and private research is the key to success. The latest scientific awards crowned French researchers: the Nobel Prize with Albert Fert, co-founder of a research unit with CNRS and Thales, the Turing Award and Joseph Sifakis, Director of the LSI laboratory in Grenoble, which is also a Carnot Institute.

We also needed to accelerate the flow of the transfer of knowledge and skills among private and public research to facilitate the patenting and more rapidly transform discoveries into innovative therapies. Today this is done with the introduction of the single manager of intellectual property for all discoveries that are the result of collaboration between various government agencies who promotes the signing of licenses with the interested industry.

The way in which you reward innovation is one of the keys to a national strategy, and obviously what matters the most to companies. It seems that France has taken important steps to meet these demands in particular thanks to the Credit Impôt Recherche (CRI). Nevertheless some disagree on what defines a level of innovation, and say that « small innovations », while not a big breakthrough, should be taken into account. How is this aspect incorporated into the decision process?

You are right; companies are very sensitive to innovation incentives, especially research tax credits. Why? Because R&D strategy is now a global matter. Incremental investments are rarely made without putting in competition several countries, including emerging ones. To retain and attract R&D capacities, a country needs to prove the excellence of its R&D workforce, and its competitiveness. This is precisely why, in order to be more competitive that France has decided to simplify, amplify and secure the French research tax credit, known as the ‘Credit Impôt Recherche’ (CIR). Thanks to this reform carried on in 2008, a company can, simply put, get back 30% of its R&D investment in tax credits and even 60% when the R&D work is subcontracted to a public research laboratory. And eligibility of the R&D can be secured prior to begin work, within less than three months.

Thanks to this reform, France is now recognized as one of the most competitive places for doing research in the OECD. We have been able to retain, and even attract, major R&D investments.

Numbers speak for themselves: the companies using the CIR were 5.300 in 2003, versus more than 12.000 in 2008, which represents approximately 15 billion euro of R&D.

You mentioned some disagreements regarding the «CIR» eligible spend. Companies' first request is actually to secure the current CIR formula, as R&D investments are long term investments. This will really be our priority.

France's CIR system is highly innovative and the current Obama administration in the US is looking to create a similar model to incentivise research. However, critics have noted that 80% of the benefit goes to large companies, not those most in need of funding aid. Does the Ministry have plans to restructure the system in order to provide more for start-ups and PMEs?

First of all, the CIR benefits more to SMEs than to large companies: SMEs benefited from 35% of the total CIR amount, while their share in eligible R&D was only 22%. And this share has increased thanks to the 2008 reform: companies declaring less than 100k€ on R&D spending represented more than 50% of 2008 new entrants, versus only 33% in 2006. This is not to mention the status of the 'Jeune Entreprise Innovante', which provides with additional benefits for innovative companies.

On top of this, large companies are typically the ones which evaluate several locations when planning for a new R&D investment. This is why it is important to support them as well, and provide them with long-term visibility. This does not mean that we are not conducting thorough evaluations: reports to the Parliament are provided every two years, and a detailed evaluation of 2008 reform will be done in 2010.

In 2008, INSERM was given the responsibility for coordinating strategic, scientific and operational biomedical research in France while the intent is to REORGANIZE both INSERM and CNRS in order to arrange and direct research at the national level. How effective have been recent steps and how will the proposed actions better facilitate the innovative capacity of France? How does the newly created National Agency for Research (ANR) coincides with the objective of reformed INSERM and CNRS? In what ways does this agency 'revolutionize' research financing in France?

Given the fragmentation of our research strengths, particularly in the field of life sciences, it was necessary to better coordinate the relationship between players and to seperate a national strategic vision beyond the different research institutions. We created the Alliance of Life Sciences and Health, which includes all the research institutions in this sector (CNRS, CEA, INRA, INRIA, IRD, Pasteur Institute), universities and teaching hospitals, around Inserm. It has 10 institutes, each covering one large area of research. The objective is clear: it is to have joint programming on all disciplines of life sciences and health and to prepare common approaches at EU level and internationally. The Alliance must strengthen the agencies in their vital mission of coordinating all

the public research, and partnerships with universities. The recommendations of the alliance will be taken into account by the National Agency of Research in the preparation of calls for projects it finances.

France is internationally recognized as a center of scientific excellence, specifically within the field of high speed trains, nuclear energy and aeronautics. At the same time it appears that France has been a historically dominant player in the life sciences sector, but has ignored the development of future technologies in this industry. How has this segment been left aside for so long? Does the placement of healthcare and well-being as one of the key priorities in the first ever national strategy for research and innovation signal major change in perception of life sciences in France? How are healthcare priorities integrated in the Grand loan and what will be the benefit to the French economy and welfare?

France ranks among the leading nations in terms of academic research in life sciences and health. In fact, our scientists are now internationally recognized, particularly in the areas of cancer, infectious diseases, genetic diseases and even neurodegenerative diseases. The Nobel Prize in medicine awarded in 2008 to Francoise Barre Sinoussi and Luc Montagnier for discovering the AIDS virus also recalls that France remains a world leader for research on AIDS. French research has the strength necessary to meet the enormous challenges facing our people, such as aging, chronic diseases, the emergence of new infectious diseases or customizing treatment of cancer as well as rare diseases.
The foresight exercise that we conducted in France, the Strategy for Research and Innovation, has identified 3 major research priorities for the coming years, including health and biotechnology. These sectors benefit from investments and outstanding domestic borrowing. Indeed, these investments will fund the creation of 5 university-hospital Institutes to attract top international researchers, accelerate the transfer of results from basic research to the patient, and strengthen partnerships with pharmaceutical companies and biotechnology. It will structure the centers of excellence in the field of biomedical research, and develop care and training in contact with the best teams of basic and applied research. Thus, € 850 million will be spent on IHU but 1.65 billion € on biotechnology and large population cohorts. Our goal is obviously to catch up in France, especially, for example, in the major centers of genotyping and sequencing or with large population cohorts, and the results are extremely likely in public health.

A lot has been done in to improve the attractiveness of France in terms of research over the past few years. What are the keys to convincing French nationals to return from abroad and attracting foreign researchers to consider France for their careers?

The reasons why some young doctors go abroad are much more related to the attractiveness of these jobs, in financial terms but also in terms of research facilities, than the lack of jobs in institutions of higher education and research.

So we had to make ourselves more attractive in these features, including better pay early in one's career, taking into account years spent as doctoral and post-doctorate students, a faster career-track and higher premiums, and finally by an improved scientific environment. Because the challenge is to attract the best students into careers in higher education and research so that they are more interested, not only in jobs abroad, but also other jobs in the private sector in France. It's the whole purpose of the plan for careers in teachering and researcher we have launched.

The "opération campus" is an exceptional effort of 5 billion euros, aimed at bringing together the major campuses of tomorrow and increasing international visibility. The university campus is a real factor in the attractiveness of a university for both French students, teachers, and researchers, but it also attracts those who are non French/foreigners.

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