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## Developing Top Academic Institutions to Support Innovation

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### 1 Introduction

Any competitive innovation ecosystem requires a stimulating higher education and research environment. Academic institutions are key contributors and stakeholders to fuel such economic and societal dynamics.

Such a statement is obvious at local levels. Regional technology innovation ecosystems such as Silicon Valley in California; Boston; Tech City in London; Paris-Saclay, or the Beijing ecosystem are rated by the MIT Technology Review (2012) as being the most promising worldwide for the years to come. Each benefits from the collaboration with an academic fabric located in its area, which includes at least one if not more research universities supported by several colleges and vocational schools.

Identical configurations are at work when considering countries or regions of the world. An obvious case is provided by the USA. Its dynamic leadership

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is dependent on a sophisticated blend of business entrepreneurship, federal funding, and a skilled labor force, a key contextual factor being the existence of a dense network of universities. While in 2013 the members of the European Union (EU) had an estimate of more or less 3,300 active higher education institutions (HEIs), the number reached an estimated 4,500 universities and colleges granting degrees across the various states of the USA. Quantity per se does not really make the whole difference, at least not as much as quality. The world leadership of the US innovation ecosystem relies first of all on the quality of its academic production both in higher education and in research.

US HEIs are overrepresented among the best of the best universities worldwide as measured by metrics of excellence. For instance 22 of its universities are ranked in the top 30 segments of the world league as defined by the 2015 Annual Ranking of World Universities, better known as the Shanghai ranking. By comparison only four HEIs located in EU member states—all four being British—join this segment.<sup>1</sup> The leadership of US HEIs covers fields such as emergent technologies, just to name one. It is also the case for most academic areas, from life and earth sciences to humanities and social sciences where their colleges and vocational schools are persistently positioned as world benchmarks. Academic contribution to innovation ecosystems does not mean an overspecialization in a few niches while dropping any attention for general education and for research in basic science as well as in social sciences and humanities. Cutting-edge innovation production requires intellectual agility and cognitive openness of the labor force. Its educational background matters as much as its professional expertise. Size as such does not by itself make a difference. For instance the California Institute of Technology includes 300 faculty members and enrolls 2,130 students, 55 % being postgraduates.

Universities and institutes of technology acting as knowledge hubs inside performing innovation clusters look similar in the USA as well as in other regions of the world. They cover a wide spectrum of academic domains. Their classrooms provide at the same time excellent teaching to high-caliber students, and their research labs provide outstanding knowledge that might be in one way or another of relevance for societal needs and economic progress. Leading research universities set benchmarks not

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<sup>1</sup> Another university based in Europe is ranked in this segment: the Swiss Federal Institute of Technology at Zurich.

only inside their national environment but also for universities located in other regions of the world (Thoenig and Paradeise 2014). They define new academic knowledge agendas others would later imitate. They operate at the forefront of innovation. They definitely are research universities but of a special kind. In the USA they are part of a class of HEIs that, comparatively speaking, are running so-called very high research activity.<sup>2</sup> While metrics-based ranking approaches have been welcomed by many EU member state policy makers, no classification has ever been developed at the levels of the EU and of most of its member states as such, as if all HEIs would be equal—a principle crystallized into their legal frame—and even much more equal than the US stratified system, this is not the case in terms of quality production and support by steering agencies.

A collateral strength of the US academic fabric relates to its density. Should two or three leading domestic HEIs start to underperform, their decline would not induce major damages for the whole innovation ecosystem capacity competitiveness as such, at least less than what would be the case inside an EU-based ecosystem today. This presents to a large extent the robustness of the US innovation ecosystem for many years. Ferocious competition is at work between HEIs to attract talent and deliver knowledge. The same happens in receiving successful access to federal grants and donors such as companies. For private as well as for public research universities, such revenues are a matter of financial survival. For instance one-fifth of the operating revenues of the University of California–Berkeley are federal grants and contracts.<sup>3</sup> But for Washington policy makers this is less a worry than a resource: should one HEI fail, many other substitutes are accessible to play the game.

The People's Republic of China, while still lagging behind the USA, has in the last few years also paved the road to high competition dynamics in building a national ecosystem based on two main pillars: the academic excellence of some of its HEIs and close linkages with innovative firms and emergent markets, for instance associated inside a local or a national cluster.

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<sup>2</sup>The Carnegie Classification of Institutions of Higher Education is a framework for classifying US colleges and universities in terms of missions. HEIs classified at the top in terms of academic quality grant at least 20 doctorate awards per year. Their research activities are assessed by research expenditures, the number of research doctorates awarded, the size of research-focused faculty, and other factors.

<sup>3</sup>See <http://opa.berkeley.edu/campus-statistics/financial-and-research-data>.

Therefore, to develop a competitive innovation ecosystem at national, and a fortiori at regional levels such as the EU, requires a web of strong academic institutions that play the role of knowledge hub in research and education. They have to provide an actual strategic capacity of their own, enabling them to get their projects funded by private donors, companies, as well as by public grants, to allocate a great deal of attention to evolving societal needs as well as to new economic opportunities. They should also contribute to overcome mental and practical obstacles to business-university cooperation—such as preferences for subsidies because of presumed academic freedom—that may still survive in some countries such as France and new EU member states. In any case such academic institutions will have to play a major role in defining new horizons for knowledge development, as is the case today for multidisciplinary issues. Their performance has to be rather consistent across time and domains. Scientific merits are considered the main criterion of success in a competitive environment.

## 2 Where Is the EU Academic Landscape Heading To?

Building a stronger academic capacity inside the EU is an ambition often considered as a geopolitical and socioeconomic priority for the years to come. Though a dozen or so of its universities may compete with their US counterparts, the EU has not yet reached a critical mass that builds up a competitive innovation ecosystem of its own. It may even be lagging behind upcoming Asian ecosystems like China and India. While time goes by, many obstacles have yet to be overcome by the EU and by its member states before giving birth to relevant achievements.

Reforming academic institutions is often considered to be a desperate cause when not a nightmare to avoid. Inside the EU the landscape remains highly scattered when it is not heterogeneous at the local level—HEIs operating according to a variety of statutes and constitutive rules—and at the level of the member states—higher education and research affairs being steered with very different approaches.

A series of initiatives have already been launched to decrease the fragmentation of the European academic fabric. For instance, some common standards such as the Bologna agreement about education diplomas have been defined and implemented by member states. Specific programs funding student exchanges and supporting R&D projects have also been launched in the EU budget. In the last 20 years new ideas have spread around to handle the challenges raised by evolving societal expectations. A worldwide massive wave of enrolled students has gone hand in hand with a commodification of higher education—students being more and more mobile internationally—and a corollary globalization of world standards—world league ranking being a major reference. Higher education and research are supposed to contribute increasingly as the vehicles that build a knowledge society, as defined by the EU Lisbon agenda of 2001. At the same time taxpayer money has become scarcer and policy makers less generous. Some concepts prescribed by the OECD and the World Bank have for better or worse been supported by policy makers in most member states: quality benchmarks such as the ideal of the so-called World Class University, ranking metrics to assess academic performances, increasing attention allocated to cost rationalization and new public management principles (Thoenig and Paradeise 2015).

To some extent the structural opposition between three models of higher education and research—the Anglo-Saxon, the German Humboldtian, and the French Napoleonic model—is slowly fading away (Paradeise et al. 2009).<sup>4</sup> Relevant steps forward have already decreased heterogeneity in the world of European academia. Agreeing to share common standards or joining intergovernmental research programs generates positive incremental achievements, even if sometimes they may require patience and compromises. Nevertheless much remains to be achieved. The legacy of the past still remains an influential source of heterogeneity.

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<sup>4</sup>Differences between the three models refer among other things to the degree of proximity between the universities, the state, and the referential community (local or national), the status of the universities (whether similar or different in the same country), the ties between education and research activities, and inner institutional and organizational structures of universities. See G. Neave, “The Bologna Declaration: Some of the Historic Dilemmas Posed by the Reconstruction of the Community in Europe’s Systems of Higher Education,” in *Educational Policy*, 2003, 17 (1): pp. 141–164.

One fundamental reason is that national steering of higher education and research affairs remains very active, even more than in previous times. A de facto quasi-hegemony of member state policy makers is not per se to be considered as a good or bad principle on the road to building an EU innovation ecosystem. What is at stake is a pragmatic question: do the ways member state public authorities actually steer the domain of higher education and research facilitate the capacity of the EU—not to be restricted to the sole EU policy makers—to build such an ecosystem? Facts may suggest that this may not be the case, at least within the very near future. To a large extent this delay is the consequence of many fault lines in the EU policy-making system. For some issues are handled at the EU level and many others remain member state competence, while at the same time the economy is more and more conforming to a single market. No effective governance system has been implemented until now to overcome these fault lines. For instance the Open Method of Cooperation (OMC), as defined in Lisbon in 2001, has clearly failed. Traditional cooperation styles remain much too slow to cope with rapid technology progress and ongoing market evolutions.

It is often mentioned that national policy makers are not spontaneously eager to welcome initiatives that might open the door to third parties—other member states, the EU Commission, etc.—to have a say how to steer their own national jurisdiction. Apart from obtaining financial opportunities, foreign interference in my own backyard is not really welcome. I as a member state want to have the final say about exclusive control in my academic affairs including the steering of the HEIs located on my territory. Even when common principles are shared that may harmonize the EU academic landscape they actually induce more heterogeneity across countries. This is what happens most of the time with the autonomy of HEIs.

Flexibility of local research and education entities is a crucial prerequisite to allow them to be more active contributors to innovative ecosystem building and performance. Autonomy is the name of the game. An HEI should benefit from maneuvering and defining its own strategic capacity, therefore having discretion for instance about its revenues and its expenditures, about which partnerships to build with other parties of its cluster or about the financial vehicles to run joint programs with companies. Policy makers, politicians, and HEI heads claim *urbi et*

*orbi* that autonomy has to be allocated. This does not at all imply that public universities should be privatized. Nevertheless, wide differences exist between countries for instance in terms of the decision-making capacity of their own governing bodies to allocate their budgets, to raise revenues such as tuition fees, to set up institutional arrangements and vehicles such as endowed foundations attracting money from donors, and to deliver specific diplomas.

A comparison between public and nonpublic hubs of regional ecosystems suggests that the former benefit from a high level of strategic capacity despite the fact that they are part of a state system. Constitutional and legal factors may matter but in the end what makes the difference is the way the system is actually steering its HEIs. Such is the case when comparing a private foundation such as the Massachusetts Institute of Technology with a campus such as the University of California–Berkeley that is part of the major public university system in the world. Both research universities operate in very autonomous ways, a slight difference being that Berkeley is not allowed to decide in a discretionary way the level of tuition fees for most of its students (Thoenig and Paradeise 2014). An identical autonomy-based steering method is how the Swiss federal authorities manage their relations with their two very successful institutes of technology at Zurich and Lausanne.

What happens inside the EU? A study made by the European University Association suggests that the autonomy principle does not carry the same meaning and content when comparing how member states and German Länder steer their HEIs (Estermann et al. 2011). Four different components of autonomy are assessed: organizational, financial, human resources, academic. The scorecard suggests major differences. Two countries, the UK and Estonia, score at the top on all four facets. A few other countries such as France and Greece score very low in terms of autonomy of their HEIs. Most of the other countries have moderate autonomy, sometimes high on one or two facets and average or below average on the others. In synthesis the impressively wide spectrum suggests that the flexibility capacity of local HEIs varies dramatically from one country to another, some being agents acting in a highly centralized national system and others being able to act in an entrepreneurial mode in decentralized systems.

Worse, in some cases the right hand of policy makers ignores what their left hand does. The way the authorities apply their policies, far from making the changing environment of academia easier to understand, in fact amplifies uncertainty and even confusion by producing a series of effects, which, although they are not always contradictory, contain their share of ambiguity.

On one hand, policy makers use more or less coercive measures to drive the universities. They force them to rationalize their administration to take on new missions, adopt a rationale based on the quest for excellence, and implement rulings and laws that follow each other at high speed. In France, for instance, three new laws regarding higher education and research were introduced between 2006 and 2013. They concerned a very scattered collection of points, ranging from how to implement the Bologna Declaration or to cooperate, and how local institutions may combine forces or even merge, to defining teachers' responsibilities, languages of instruction, or institutions' accounting systems. Guidelines gush forth with no time for the preceding one to be deployed in the field before the next arrives. The more productive and pushy the policy makers become to try to get results, the less things actually change on the ground and vice versa. These lead the academic institutions to navigate between great caution and opportunism. Public policies also encourage opportunistic tactics, which make use of the tools for purposes other than those they were designed for. In the UK, the Conservative government introduced a ceiling to university tuition fees of £9,000 per year. The idea was to ensure financial protection for all universities. In fact, it is used by some of them to increase the number of students they recruit by maximizing their investments on additional academic personnel recruitment and infrastructure building. More precisely, the top-ranked institutions are the ones that gain the most from the provision, and they do so at the expense of the mid-range institutions, because the latter do not have the same advantages as the former in the competition to attract mobile students. Opportunism is also expressed in several EU countries by HEIs hunting for students from outside Europe, because they pay tuition fees that are significantly higher than the legal cap set for national residents and Europeans.



Another practice of central policy makers is to develop procedures and uniform indicators themselves and impose them top-down, relocating micromanagement into HEIs. Nevertheless, the latter remain closely controlled by the incentives and evaluations to which their performance is henceforward subject. This remote control is a modern version of bureaucratic administration, which combines the invention of common performance or quality criteria with the assignment of financial resources, the formulation of formal structures, and the verification that they are actually applied. In fact, it inflames the paradox of seeking to create autonomy. It makes them more compliance seeking, instead of heightening their local strategic capacity. In fact their dependency on how the resources of public policies are used is increased. The local HEIs that the central officials wanted to make more autonomous by giving them administrative expertise, in fact behave like disciplined agents in the eyes of their principals, who assign resources to them. This happens in countries that also hope to spend less taxpayer money for academia. In the UK, the performance criteria used in universities are defined by the ministry—using categories built with the support of academic peer committees—which implements them via the Research Excellence Framework when assigning financial resources.

The argument underlying the observations listed in this section is that reform dynamics like the ones currently in progress are not by themselves going to facilitate the creation of a competitive academic capacity at the level of an EU innovation ecosystem. Despite some initiatives launched that have member states adopt shared standards or even joint common programs in research and in education, dysfunctional consequences have not made the landscape capable of generating spontaneous prerequisites to harmonize policies so as to build up sufficient academic institutional capacity to back up a European ecosystem. More specifically, the obstacles refer to the strength of national steering approaches. They keep playing a decisive role, in some cases now more than ever. All are trying to address identical issues such as increasing international competition and decreasing public money. But each does it in its own way. Path dependence remains strong. The current landscape, which was diverse, enters a phase of complexity. National policy makers' goodwill is less a problem than the fact that they basically have to care first and foremost so much about their own jurisdiction that

they do not share identical cultural and cognitive mind-sets, and still major differences are at work between the constitutive blueprints ruling the various countries. The idea of building up the academic support for a EU ecosystem might be listed by them not as a priority on their agenda, but as a source of distraction. Why should the EU rush to put higher education policy issues on its agenda? It might be a good idea to consider, but not now; later on, in a few years, why not? One should not forget that EU member states are also competitors, higher education and research being major factors of success for national balances of payments.

### 3 Learning from Change Reforms

To expect that a majority of member states will spontaneously apply much pressure so as to push the EU and its ruling bodies to handle the issue might be a do-gooder wish but has very little chance of occurring. Unfortunately, as time goes by, the delays in catching up with other regional or national ecosystems might become longer; to place the EU among the leading continental competitors worldwide is with the goal to achieve—not just two or three competitive academic poles but at least twenty if not more by 2025. To give birth and develop, academic poles initiatives have to be considered and launched at least 10 if not 20 years in advance. The problem is that a 2025 time horizon is quite short. Three lessons should be kept in my mind by policy makers, whether at the national or at the European level, when considering how HEIs should and could contribute more intensively and actively to allow an EU competitive ecosystem to emerge. They may be listed as three “don’t’s”: do not waste time to launch change processes as soon as possible, do not anticipate immediate relevant outcomes, and do not set up a centralized governance process in the new academic fabric.

First, the time required for changes is quite long. A former president of Harvard University said a century ago that to build another HEI such as Harvard would require at least half a century. Such wisdom remains valid today. The Federal Institute of Technology at Lausanne has been considered since its creation a decent but average local HEI. Nowadays, it is the academic hub of a highly performing local innovation ecosystem, it is ranked

in the world league according to Quacquarelli Symonds (QS) and has joined the top 100 segment of the Shanghai ranking world league. It went through a radical change of its research and education strategy, it modified its governance style, and it built up strong partnerships with companies dealing with emergent technologies in numerous fields. This transition period started in the early 1970s. It is still going on according to the blueprint that had been defined half a century ago and was implemented step by step under the leadership of three different presidents. In other words, changing and remodeling academic institutions requires patience and continuity. As social and human organizations, they have to address managerial and strategic challenges such that they attract and retain talented faculty and students, to set up productive and cooperative ways to make different disciplines compatible under the same roof, to upgrade and diffuse cutting-edge R&D production, etc. Running them in a sustainable manner as top-of-the-pile HEIs requires much more than sheer charismatic leadership or business/ firm-inspired strategic capabilities and operational skills (Thoenig and Paradeise 2015). Such ambitions cannot be achieved by decree and require changes that cannot be managed top-down. This may lead to contradictions. For policy makers tend to underestimate the importance of time horizons when launching a reform policy. Sometimes they dream that this or that university would be a good candidate to join the ranks of the elite of the elite. They forget that academic change requires long time horizons that are not compatible with electoral time horizons. They expect positive outcomes to occur in the short term, which often means before the end of their political mandate.

Second, policy makers are sometime willing to allocate plenty of taxpayer money to build a new campus, to buy costly equipment, and to attract top-notch faculty members. Money is not the main effective vehicle or incentive to grow an academic hub, although it is needed. They may also believe that the size of the faculty and the number of registered students are prerequisites for success, which is far from true when considering the quality and status of most world-class universities. A spectacular case is provided by the Paris-Saclay University project. In order to add an academic critical mass to an already promising technological innovation cluster developed in this suburban location by companies, both multinational and local companies, and public research institutes such as the Centre National de la Recherche Scientifique and the Commissariat à l'Énergie Atomique

et aux Énergies Alternatives, the French government has spent about €6 billion to build new infrastructures and to fund research programs of such a Greenfield project. The intended ambition is to catch up with the Federal Institute of Technology in Lausanne and with Cambridge, the success criterion being to rank this new institution among the top twenty in the world league. The way is to merge seventeen already established institutions, some more than 200 years old such as the *École Polytechnique*. They also do not a priori share much in common—a French understatement—as they cover a variety of different domains such as management, engineering, information technology, or agriculture. Some are actually specialized research institutes and others classic universities. Some are elitist *Grandes Ecoles*—for instance the *Ecole Polytechnique* steered by the ministry of defense, the *Ecole Normale Supérieure de Cachan* steered by the ministry of higher education, and the business school called *HEC Paris* (ranked as one of the two top management schools in Europe), which is steered by the Paris Chamber of Commerce. Others are public universities such as the University of Paris-Sud. This project would regroup 300 research laboratories, 15,000 faculty and doctoral students, and spent 15 % of the French public research budget. Will money and size make the difference? This is a question still open considering the internal heterogeneities when they are not open to resistance attitudes to the full merger that have been expressed since its initiation several years ago (Thoenig 2015).

A third lesson derived from scientific observation of higher education steering relates to the unintended consequence of centralization. The more HEIs are parts of centralized systems—the less they are autonomous, and the less they have some form of control on their own resources—the less they compete between themselves but also with HEIs that do not belong to their own system. It would be too easy to blame them and only them. In fact, the steering of centralized systems is a key part of the problem. To develop differentiation and competition means to develop inequality among them. For instance, this is occurring whenever public decision makers refer to a unique model of HEI positioning as it may be discerned in the policy incentives and tools. One best approach requires each university to align its way of doing things according to standards set by world-class academic institutions such as Harvard or Cambridge. The unintended consequence is a classical benchmarking paradox. If all universities were to

adopt the same strategic responses to try to align themselves according to the same model, a hierarchy would be generated, which is eventually made visible by rankings benefitting some and disqualifying others while directing a large number of them away from certain necessary missions of higher education. Performance in leading-edge research is one about many missions of HEIs. When each of them focuses its efforts to comply with it, even though it is often unattainable for many, the ability to accomplish other missions such as undergraduate education or contribution to local development can deteriorate. Does it make sense to cut the financial funds allocated to HEIs that are not able to compete with research universities—they are many among small and mid-size institutions—but are more or less performing in preparing students for labor markets, and to pretend that they do not need cutting-edge, knowledge-based education? A similar question may be raised about autonomy. As a principle, decentralization is a good steering approach for academic affairs. But some nuances might be helpful in defining its content. Research universities as academic hubs need even more autonomy than other HEIs to be competitive in achieving their main mission. A cutting-edge research environment refers to a highly competitive international environment—he who runs faster wins—and it becomes even more difficult for policy makers to assess them, research assessment basically requiring academic criteria more than administrative guidelines. A way to give room to competitive games and spirit is that public steering systems do not have a monopoly on higher education: other research universities exist that are not institutionally part of their jurisdiction and even are run as private institutions that are research universities. In that case public HEIs have a stronger capacity to negotiate with their steering bodies.

#### **4 Why Federal Approaches Are More Successful in Generating and Implementing Academic Changes**

How do we bring the issue of the academic contribution to European innovation to the EU agenda? As of today the role of Brussels remains associated with the fact that EU governing bodies are basically considered

as providers of ways and means to sponsor arenas that set up new research projects and allocate additional funding to academic activities. Their policies are considered as legitimate insofar as they basically remain distributive policies. To suggest that the EU as such might endorse a more constitutive approach raises eyebrows, constitutive meaning that EU policy tools would require institutional capacity to steer and reform academic affairs. The hostile prejudices expressed are many: the fear that it gives birth to a centralized and distant policy making level, political opposition, and ideological resistance to more European integration, etc. How to make an evolution happen is a serious issue not only because member states may be shy to see Brussels leading the game, but also because reforming the institutional academic fabric might imply choices that would not satisfy every state, in particular those that may not acknowledge the existence of an academic hub potential located in their country.

Torn apart between the Charybdis danger of not playing a part at all and the Scylla idea of building up a new institutional academic system of their own from scratch, steered in a centralized and bureaucratic manner, the EU institutions such as the Brussels-based Commission should define a third alternative. One may wonder whether a federalism-based model of policy making should not be considered.

Switzerland provides a fascinating example of a major reform of its institutional academic landscape run in a federal mode. Up to the end of the twentieth century, the Swiss universities were steered and funded by cantons. Local parliaments and executive branches of each of them were in charge, benefitting from some additional funding allocated by the Confederation. The national government steered two HEIs of its own called federal institutes of technology, one located in Zurich and one located in Lausanne, the latter having been set up and steered by the local canton but transferred to the federal policy makers in the early 1970s. Several cantons also had set up by their own initiative undergraduate colleges (*Technicums*) to supply a highly skilled labor force to local companies. The cantons were very proud of their own HEIs, as markers of their identity and as autonomous polities and sources of prestige whether locally or in some cases internationally. The first Shanghai ranking positioned three Swiss HEIs (the universities of Zurich and Basle as well as the Federal Institute of Technology of Zurich) among the 100 top world

institutions. The small country called Switzerland was the third highest ranked country in terms of the percentage of its HEI, much lower than the USA but close to the UK, and in absolute terms much higher than any other member state of the EU.

But by the end of the 1990s several issues pushed the executive branch of the Confederation to consider that a reform of the landscape was becoming a must: the increase of student enrollment, whether domestic or foreign, the recession of taxation revenues, and the fear that the Swiss quality of academic production would drop given much tougher international competition. While most cantons were still caring about their own university future and autonomy, Bern put political pressure to put the issue of the reform of the whole national landscape on its agenda. Early on the initiative raised major cantonal resistance from political parties and cantonal policy makers. It became headline news in the media. But in the end a new national law was passed that designed an integrated system including three categories: federal institutes of technology, universities, specialized *Hautes Ecoles* such as the former *Technicums* and other vocational schools from education to art. The process enacted to set up this quasi-revolution is worth considering for it explains to a large extent how this achievement was made possible.

The federal policy makers co-opted the stakeholders involved—academics, heads of HEIs, political party leaders, cantonal policy makers, business associations, etc.—and shared with them intensive analysis, constructive deliberation, and lasting negotiations in order to overcome obstacles and design acceptable but also rational compromises. Horizontal coordination of the Swiss means that stakeholders are respected as expressing relevant arguments, solutions, and ideas. They also share a public common good reference and ideological pragmatism. The national and cantonal levels played win-win games. Since September 2011, the Confederation cares jointly with the cantons about the quality and the competitiveness of the Swiss domain of higher schools. The public status of academic institutions and much of the taxpayer money are pragmatically blended with support to and from private firms. A direct linkage is made between the massive attraction of academic talent from foreign countries and the economic benefits the Swiss economy could derive from it. For instance, the two federal institutes of technology are

generously funded by the national parliament so that they may keep charging low tuition fees to foreign students. Policy makers in Bern are also by law committed to allocate the same amount of taxpayer money for the coming 4 years, enabling the two institutes to work with a time horizon that will remain stable. Integration means that the various academic institutions involved are simultaneously cooperating—their heads meet several times per year in Bern, their research laboratories manage joint projects—and competing—for instance to raise funds from private donors or from research grants. Academic quality as controlled by a dedicated body makes the difference for the benefit of the single winners but also for the benefit of the very successful national innovation ecosystem and its strong academic hub.

Though the Swiss case should be considered as a showcase given its major achievement, other countries also address academic affairs using identical approaches. Within the EU this also happens in Germany. What is theorized as *Horizontale Politikverflechtung* (Benz et al. 1992) defines a common way to set up arenas facilitating deliberation and negotiation systems co-opting the various parties and stakeholders, the Bund, the Länder, the academic community associations, and industry, etc.

Federalism also is at work in the USA when considering the steering capacity of academic hubs from a national innovation ecosystem perspective. In the USA the estimated of the number of active institution granting degrees in 2013 was around 4,500. Comparatively speaking, the US number includes a higher proportion of nonpublic institutions operating under a variety of legal and fiscal statuses. Public sector universities and colleges report to state legislatures. The executive branch also steers federal research laboratories in various domains, from energy to health. Such a heterogeneous academic fabric might be very complex to handle at the federal level given its heterogeneity and also the importance of pork barrel practices. Yet Washington plays a decisive role in a persistent manner in the way it allocates differentiated funding to universities in particular in the field of major research and development programs. It defines and operates a policy that supports universities playing a decisive role in R&D and that operate like academic innovation hubs. In fact, the federal policy is in line with a classification—which is not a ranking metric—of higher education institutions



according to their actual distinctive mission—for instance, in fields such as research, education, or local development. The Carnegie Foundation for the Advancement of Teaching, an independent not-for-profit body<sup>5</sup> updates this classification every fifth or sixth year. In fact, policy makers trust academics' judgments. Professional and HEIs associations as well as think tanks and foundations have been since the end of the nineteenth century very active and influential actors whenever constitutive policies are at stake to reform the national academic landscape. The National Science Foundation keeps advising top policy makers and evaluating federal research programs. Whenever academic and scientific issues are under consideration, federal policy makers give much credit to stakeholders such as academics, state governors, leading think tanks, and private foundations, just to name a few. Pioneering massive support given to some leading research universities to domains such as nanotechnologies, agronomy, or IT gave birth to leading innovation ecosystems.

The argument of federalism as underlined here should not be understood as implying that only federal states can make it. The purpose is more pragmatic: it refers to an approach that is effective; whenever a common good to deliver has been defined as the rationale—such as upgrading the European competitiveness as well as addressing societal needs—some changes may be required in a field such as the academic landscape reforms, the issue being not yet positioned as a priority for political agendas, the legitimacy of the institutions formally in charge of the future of ecosystems being not yet shared by influential stakeholders. In contexts that a priori seem stalled in terms of change, stakeholders adopt a collaborative approach. Cooptation, negotiation, and cooperation as processes facilitate the way to deal with divergent views. This collaboration culture and the methods are useful in multilayered governance systems such as supranational ones whenever objectives are clear and strategies to achieve them are flexible. Federalism as a style of policy making means polyarchy. The EU Commission should play two roles much more than it is used to: acting as a convener and a coach. It should not govern as a regulator or a standard setter as is the case for policies dealing with markets.

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<sup>5</sup> Carnegie classification available at <http://carnegieclassifications.iu.edu/>.

In pluralistic democratic polities, passions, suspicions, and prejudices often play a crucial role and may hinder the construction of new solutions. Therefore, deliberation and aggregation remain poor alternatives. Governance based on agnostic visions may be more adequate (Mouffe 2009). This principle refers to the give and take that occurs between actors or stakeholders who consider each other as adversaries, not enemies. An enemy defines his/her stance in the symbolic death of the other party. The conflict is a zero-sum game. One actor takes it all or loses it all. Though enemies may even respect one another, their purpose is to kill each other. An adversary bases his/her stance on a dynamic of conflict, which is not the same thing. Conflict is resolved through a compromise or a synthesis. For adversaries share enough values or objectives to make negotiations possible such that neither party wins nor loses. It expresses respect for the adversaries.

## 5 First Steps Matter

The ambition to develop a specific EU innovation ecosystem implies that the EU academic fabric, while evolving by considering good practices at work in other regions of the world, should not just replicate models already existing in the USA, India, or China.

The political leadership of the Commission should help European stakeholders leave the zone of indifference and enter a zone of shared acceptability about required academic evolutions. The scenario to avoid is to subcontract the task mainly to administrative approaches and routines. Setting up arenas and processes keeping stakeholders busy preparing reports but with no access to policy making capacity would not change much. The issue has to be considered as a transversal policy, meaning that it should not be under the sole jurisdiction of one specific general directorate located in Brussels. Federal steering requires know-how and legitimacy that are quite different from administering programs that fund specialized knowledge domains and educational niches to competing institutions. Constitutive policies and the inequalities they may induce require some form of political legitimacy, and not sheer bureaucratic excellence.

How higher education and research should contribute to the building of a highly competitive European Union innovation ecosystem is an issue that cannot be addressed as such independently from all the other policy facets that such an ambition covers. Interfaces between the world of academia and the other stakeholders involved or to be involved are key concerns that have to be addressed straight on to overcome prejudices about academic affairs as long as their contributions make sense for and get appropriated by companies, public service institutions, users, and citizens, just to mention a few.

Therefore, suggestions and ideas as expressed hereunder should be related to reform initiatives made for other innovation policy domains such as property rights, cluster management, or public service delivery. They also imply that the ambition itself of building such an ecosystem within the next 10 years is endorsed and legitimized by the political authorities ruling the European Union. Yet the suggestions made hereunder may seem quite modest. They should be seen with two lenses. They avoid defining right from the beginning major institutional change blueprints related to the roles and jurisdictions of the EU and its member states about a domain, higher education and research, in which the stakeholders involved will have to cooperate anyway. They are first steps that enable the generation of halo effects in the interim.

## **5.1 Identifying and Assessing Potential European-Level Academic Hubs**

A preliminary step would be to identify HEIs having the potential to play the role of cutting-edge innovation hubs.

This initiative should be launched as soon as possible and supply detailed information within a short time period. Its mission would be to list European-based HEIs from the point of view of several perspectives such as the network of partnerships they are embedded in, the type of domains they are covering, their way of managing and diffusing knowledge downstream, the relevant knowledge developments they may produce in the very coming years, their capacity to cooperate with nonacademic innovation stakeholders, their ability to react to new opportunities and to multidisciplinary requirements, and how they

are positioned internationally. This would also cover the quality of their internal management as organizations, their ability to attract talented faculty, researchers, and students, and their funding policies.

A priori not more than two dozen HEIs may qualify for such a study as far as they would fit criteria similar to those used by the Carnegie Foundation to label very high-caliber research universities, but more weight and attention should be given to their role and potential as academic innovation ecosystem hubs.

The presidency of the Commission should mandate this study and fund it. It would be assigned to professionals well acquainted with academic affairs. An independent body would supervise it with the support of outside experts. The High Level Policy Group on Innovation Policy Management might help define which HEIs to observe, which information and data to collect, and how to interpret them. The European Political Strategy Centre as well as the Joint Research Centre of the EU Commission could provide advice and play role as well.

The next step would be to define a classification—and not a ranking—of HEIs as academic innovation hubs.

This should be subcontracted to a dedicated institution that is autonomous enough so as not to be vulnerable to third-party administrative or political interferences.<sup>6</sup> Every fourth or fifth year the classification would be revised in line with possible evolutions having occurred in the meantime at the level of a single HEI. This classification would provide a guidance tool for companies in search of adequate partnership environments and for policy makers in charge of economic development, but also and above all for EU policy initiatives to support HEIs as active and competitive EU-level innovation actors in various ways such as supporting partnerships with companies, other universities and research institutes, as well as public service agencies, cutting-edge innovation initiatives, and programs. They might also deliver some form of quality certification.

It may happen that some member states are not be immediately eligible to have a HEI located in their own country selected or even classified. In any case *saupoudrage* of support should be avoided: academic quality and

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<sup>6</sup>The US National Science Foundation could provide a reference. Some of its academic members are assigned full-time for 5–7 years to handle such jobs.

contribution potential are the names of the game. At the other extreme one scenario to avoid during the implementation phase of any EU distributive policy is hyper-concentration. For instance a French program of support to set up local competitive clusters launched an initial call to select only twelve of them with a support of €100 million each. This was not feasible facing strong demand and lobbying by local economic and political actors. Yet the task force in charge was powerful enough to drive the government to accept the creation of three categories: world-level clusters, potential world-level clusters, and so-called national clusters. Seventy de facto clusters were selected since the 12 world-level ones received over 3 years nearly €150 million of support each, the “potential” ones—another ten—some €20 million each, and the 50 “national” level €5 million each or less. The lesson was learned, and the criteria applied to a different program aimed at upgrading HEIs’ academic excellence, concentrating 75 % of the €7 billion program on the top layer, 15 % on the promising layer, and 10 % on the focused layer.

## 5.2 A Dedicated Policy Arena

Another initiative for the presidency of the Commission would be to open new avenues to coordinate mid- and long-term development perspectives of the many stakeholders. In line with some principles described in section 4 of this chapter, the purpose would be to set up an arena where various stakeholders would meet a few days per year to debate and share points of view, ideas, and experience.

This could be a dedicated council dealing with specific academic development reforms or a section of a council dealing more broadly with the construction and the governance of the European innovation ecosystem as a whole. Its members might be people in charge of executive functions operating at the European, national, or local levels, steering higher education and research affairs as well as economic development policies, heading HEIs, companies, and professional associations, etc. Such an arena would favor open discussion and informal negotiation opportunities. It would debate, assess, and report about initiatives and opportunities, achievements and obstacles, that are of relevant interest for the linkages

between academic, societal, and economic needs, cooperation, flexibility, and shared action logics being at the core of competitive innovation systems. It could get some advice and backup from a pool of European and non-European experts in innovation management, science prospective, or innovation cluster design.

### **5.3 Articulating Research and Innovation: The Challenge of Transversality**

In the coming years policy makers will have to fit the requirement of designing and managing transversal policies.

Articulating research and innovation policies is by far more productive than keeping them separate. Being locked in their unique space paradigm, the risk is that they become too supply oriented and forget demand. They may also be prone to vested-interest capture processes or to routine biases. To build a very performing European innovation ecosystem and therefore to develop high-level academic hubs with the potential to collaborate with economic actors, transversal policies become a decisive requirement for public policy makers at the EU level but also at national and local levels. Policy maker mind-sets make less and less sense when they consider that clear-cut differences exist between normal versus frontier science or between core- versus project-based funding. Though the evolution of technologies, life, and nature sciences should still attract major attention, social sciences and even humanities should also play a relevant part more than they currently do given evolving societal needs and the impacts they may have for users and public authorities who are supposed to appropriate the benefits of innovation. Fostering a broad science base for innovation purposes will more and more remain an old type of science policy approach. Policy making paradigms should evolve. The Commission should give special attention to support such an ambition, which is not the case currently.

The EU budget is far from being irrelevant, at least considered in global terms. Main EU programs are well endowed, to say the least. For instance, the Erasmus program has an overall indicative financial envelope of €16.45 billion for 7 years (2014–2020). Horizon 2020, which

is supposed to be the flagship EU program dedicated to research and innovation program, receives funding of nearly €80 billion. Two of its major sections are the Marie Skłodowska-Curie actions with an estimated €6.16 billion to be spent between 2014 and 2020, and the European Research Council with a budget of €13.095 billion for the same period. Apparently, money is not a major obstacle and innovation is considered as an explicit matter of priority. Yet a closer analysis suggests four observations. First, some of the programs support initiatives that are not explicitly focused on innovation; this is the case with Erasmus. Second, though specific programs are labeled as dedicated to projects combining research and innovation, in fact the reference to innovation gets much less attention than the reference to research, in particular for grants funding HEIs projects. Third, innovation-focused sub-programs do not explicitly fund the midterm development of specific HEIs but research projects, each of them being assessed for its own scientific merit. Fourth, some of the programs are in fact run as a set of sub-programs each covering a specific, narrow thematic niche. In other words, silo dynamics is at work between sub-programs, not to mention the fact that the same silo logics may also occur across the various programs when not across from initiatives taken by various units inside the Commission.

To support the ambitions listed above as soon as possible, allocating additional funding from the Commission budget should not be a major obstacle. As important is when the challenge is organizational and administrative: how to successfully run an institutional development-focused project, which means how the various segments of the Commission will actually cooperate to address policies combining research, innovation, and education facets while at the same time fostering economic competitiveness and social welfare by a closer and more fruitful collaboration between academia and industry. The Commission should handle such a project with adequate professional skills and innovative operational processes. For the institutional development of HEIs requires not only the allocation of more funds but also and above all to coach and convene a multilayer action arena. A dedicated task force reporting to its presidential level could be seriously considered as a way to supervise administratively an unusual but decisive ambition such as the contribution of its academic landscape to the new EU innovation ecosystem.

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