

Bottlenecks to be addressed by the New European Innovation Agenda

LERU Recommendations

Executive Summary

The recent 'call for evidence' for the 'New European Innovation Agenda' from DG Research and Innovation, identified a number of key bottlenecks to its progress, namely:

- Access to Finance
- Framework Conditions, including legislation
- Fragmentation of the EU Innovation System
- Innovation Performance
- Developing and Attracting Entrepreneurial Talent

Universities are a key component of successful innovation ecosystems, being a wellspring of talent and technology, along with being a convenor of innovation actors in providing platforms and programs where enterprise, government and investors can collide and interact.

The League of European Research Universities ([LERU](#)) is a well-established network of research-intensive universities and develops and disseminates views on research, innovation and higher education to shape policy at the EU level. The League is a valued interlocutor for the European institutions and other policy stakeholders.

In this short paper, LERU reflects on the identified innovation bottlenecks and provides input as to how each of the bottlenecks can be addressed including access to finance for 'deep tech' start-ups, continued support for science excellence as the source of invention, the convening power of universities in activating and supporting innovation ecosystems, the provision of entrepreneurial education to students and the creation of pathways for academic research talent to enterprise.

LERU urges governments, policy makers and funders, at the EU, national and other levels, to recognise and endorse the view of impact as a dynamic, open, and networked process in a culture of sustained engagement and co-production of knowledge and its economic exploitation. The non-linear knowledge production of basic science is an engine of progress for new enterprises and the development of informed graduates, fuelling societal and economic impact via innovative systems.

This paper summarizes a list of insights and recommendations from the perspective of the LERU research-intensive universities. While the European Innovation Agenda predominantly concerns the business sector, based on its members' multiple and long-term experiences with industry innovation, LERU concludes that its views are complementary and additional to the known business needs and concerns. Furthermore, these LERU recommendations are consistent with the systemic nature of innovation policy agendas, including their business dimensions.

LERU recommendations

1. Access to finance: scale-up gap

- a. Scaling first and foremost is a matter of leadership, business model quality and company governance, rather than a pure matter of innovation policy. This leadership should first and foremost originate from within institutions (universities, research centres, companies) as they deploy their strategic autonomy towards science-based innovation activity.
- b. Targeted investment in university start-ups with dedicated funds is fruitful as been the experience in LERU universities. More funds of this nature, perhaps as European based funds, would provide for more competition with the VCs. Funds focused on individual sectors, such as Biotech, or MedTech or ICT would also be beneficial. Scale Up funds also need to be available, targeted at post Round A, when companies are looking to grow from 10 employees to 100 employees. Further development of a European Capital Markets Union would stimulate more VC and private equity market activity that will aid scaling up viable companies.
- c. Support for 'Deep Tech' start-ups, which are defined as " those start-ups whose business model is based on high tech innovation in engineering, biosciences, or significant scientific advances " should be prioritised as these companies have the greater ability to develop into high value, high growth and sustainable enterprises. Universities are a key source of such start-ups which are most often created from breakthroughs in fundamental research.
- d. The strict regulatory and supervisory frameworks promulgated by ECB and its national bodies need to be challenged as they can also act as inhibitors.

2. Framework conditions, including legislation: scope for more pro-innovation regulation

- a. Excellence in science is the raison d'être of the LERU research intensive universities, which facilitates invention and subsequently innovation. As such we need frameworks that support and stimulate both inventive and innovative actions within research organisations. Pro-innovation regulation should continue to support the invention process and university's exploitation of its inventive outputs. The right balance between university and entrepreneur/start-up involvement should be found, so that the former can continue to enable the latter. As the source of the innovation output is rooted in the excellent science, the innovation agenda should continue to support and indeed enhance curiosity-driven research from where springs breakthrough ideas. The positioning of regulatory sandboxes should comprehend this connectivity and look to strengthen the integration between invention and innovation. This approach will strengthen the already strong engagement of many academic researchers with technology transfer activities.
- b. There is a huge variety and portfolio of data, indicators and methodologies tested, proven, and available. The goal should be to make these more transparent and accessible, rather than starting new data interventions.
- c. Transparent and enforceable IP rights are essential to pro-innovation regulation. LERU institutions are dealing with (very) early-stage scientific results, which means that in a lot, if not most, cases identifying commercial partners (industrial partners, investors, ...) is a challenge requiring expertise, professionalism, and a deep insight into linking scientific and market resources. Often potential commercial partners will require exclusivity as a condition precedent to further develop the scientific results, at least in a certain technology domain, geography, etc. In certain domains with very high development costs, such as drug discovery, it will simply be impossible to find partners on a non-exclusive basis. Once too many IP claims to the research results can be exerted, the outcome will be that such research results will not be further developed. Inventorship and ownership rights therefore should be well-delineated, precise, and enforceable to foster the invention's journey towards a successful innovation. Such clarity and enforceability are the cornerstones of the trust relationship between the institution and its scientists. Whenever "pro-innovation" regulation neglects this fundamental insight, it will unfortunately lead to exactly the opposite effects, i.e., dampening rather than stimulating innovation.

3. Fragmentation of the EU innovation ecosystem: need to strengthen and better connect innovation ecosystems mobilising different funding instruments

- a. Connecting innovation ecosystems is a noble goal, but can quickly become nebulous. Before this connectivity can become effective, the functioning of the local ecosystem in and of itself needs to be understood and constructed. This is typically a local process, embedded in the concept of place-based innovation, where proximity provides the kinds of collisions amongst the various and varied actors to seed effective collaborations. In these ecosystems the University, through its Technology Transfer Offices, typically plays the key dual role as both of convenor and provider of innovative outputs. Ecosystem governance and guidance then is a joint responsibility of the University & local actors. Connectivity to other ecosystems would best be initiated and operated via the University channels, thus deploying the convening power of the Universities to establish meaningful connections over large distances and potentially across borders.
- b. Universities should continuously seek to support and promote societal impact as a dynamic, open and networked process in a culture of sustained engagement and co-production of knowledge. - Universities should engage with others across the broad spectrum of the research ecosystem, including governments, research funders, the private sector, the investor community, civil society and society at large, so as to foster a better understanding of economic impact, to develop future-oriented policies and implement innovative practices based on the concept of impact

4. Innovation performance: differences among EU regions

- a. Europe is very segmented in regards to its public research intensity with the top performing countries committing well over 2% of public spending on research and the lowest being close to 0.5%. As such we are not deploying our full intellectual capital to building great companies. The difference in research intensity is mirrored in the innovation performance of the different countries with the Scandinavian region leading the way. Hence, investment in R&D always precedes innovation performance and innovation regulation.
- b. One of the major advantages that US start-ups have is that they have access to large markets and hence their companies can grow faster. It also enables them to 'think bigger' and be more ambitious from the start. In Europe, particularly in smaller countries, the small markets and lack of potential customers can be an inhibitor. Exporting is an option, but requires expertise and resources which a young company will struggle with. A useful initiative then would be to create a 'virtual' market place for start-ups so that they could engage with potential customers from across the region. However, just as the scaling of VC and private equity activity throughout Europe requires the advent of a real Capital Markets Union, the scaling of start-ups requires the presence of a real Single Market Union. Both "Unions" are till this very day imperfect and hence act as impediments to the dynamics of scaling and growing international champions amongst the European start-up population. Optimising and perfecting both "Unions" therefore is imperative, rather than increasing the amount of innovation regulation that may in and of itself become an impediment to innovation as both "Unions" remain imperfect.
- c. LERU urges governments, policy makers and funders, at the EU, national and other levels, to recognise and endorse the view of impact as a dynamic, open and networked process in a culture of sustained engagement and co-production of knowledge and its economic exploitation. Expectations in regards to the question of predicting the outcome(s) of grant applications should be dialled back, since the production of knowledge is non-linear and inherently unpredictable. In line with Abraham Flexner's 1939 monograph (The Usefulness of Useless Knowledge), the non-linear knowledge production of basic science is an engine of progress in deep tech and its societal and economic exploitation. The mRNA scientific breakthrough that gave rise to many Covid-19 vaccines, stand witness to this logic.

5. Talent: developing and attracting entrepreneurial talent, encouraging diversity

- a. There are two aspects to consider in regards to universities. Firstly for university spin outs to be successful, the start-up team needs to be skilled, as otherwise investors will not invest. The best

teams incorporate the intellectual skills of the principal investigator (researcher) with the business acumen of a business leader with both operating in a CTO/CEO type structure. The second aspect is the availability of entrepreneurial talent. While lots of universities provide entrepreneurial training, the most effective programs incorporate hands on project work where students look to turn ideas into fledgling start-ups. Interdisciplinary student work and project-based learning are essential components of successful entrepreneurship education.

- b. Universities need to be open and take the lead with regard to entrepreneurship education in their entrepreneurial ecosystem.
- c. Researchers should be trained for a multitude of roles in society, requiring a shift of perspective from a straight career track to multiple career pathways. The mechanisms by which early-career researchers find their way from academia into enterprise and beyond to society need to be strengthened.
- d. Research funding bodies should ensure that funding schemes supporting the employment of early-career researchers fund both research work and researcher development. The funding for researcher development includes scope for developing their own independent research and innovation ideas and allows them to gain further skills apart from the research itself, e.g. via participation in conferences, talks, posters, teaching, networking, courses, and career development programmes. Complementary to this skill development, (doctoral) researchers may also engage in the design of an exploitation plan of their Ph.D. work; such endeavours can be supported by the TTO of the university.
- e. Employers outside academia should engage in discussions with universities and research institutions on the development of skills training programmes that enable successful transfer of researchers and look to remove barriers for mobility from and to universities.
- f. Governments should facilitate flexible career pathways to ensure mobility connecting academia, the private and the public sector. In order to achieve permeability between the systems, universities will need to have flexibility with respect to salary.
- g. More effort is needed to accelerate progress of women in senior and leadership positions and to exploit diversity strengths. More work is also required to enable females to succeed as company founders.
- h. Universities should develop open, explicit and transparent reward systems that include the value of all kinds of impact, reward it and take it into account for individual promotion. They should avoid (inadvertently) creating or following perverse incentive systems and metrics. Shared value creation (at the intersection of societal and economic impact, as advocated by Porter and Kramer, see Harvard Business Review, 2011) offers an interesting avenue to design more synergetic incentive systems and metrics, linking basic science and its relevance to society and economy.

Reference Documents (see <https://www.leru.org/publications>)

1. *Student entrepreneurship at research-intensive universities: from a peripheral activity towards a new mainstream* – LERU Advice Paper no. 25 April 2019
2. *Delivering talent: Careers of researchers inside and outside academia*. LERU Position Paper, June 2018
3. *Productive interactions: societal impact of academic research in the knowledge society*, LERU Position Paper, March 2017
4. *The TTO, a university engine transforming science into innovation* – Koenraad Debackere, LERU Advice Paper no. 10 January 2012

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