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A European agency for disruptive innovation: How could it look like and what would it do?

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To promote Europe's competitiveness in the digital age, the French president proposed to establish a "European agency for disruptive innovation", in the vein of the US agency DARPA. This blog post assesses the functioning of DARPA and the potential use and institutional setup of an equivalent European agency. We argue that Europe currently lacks an innovation policy tool comparable to DARPA and explore its potential for European industrial policy and the public procurement by Member States.



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1 A new agency for Europe's digital competitiveness?

“I propose that, over the next two years, we create a European agency for disruptive innovation in the same vein as the Defense Advanced Research Projects Agency (DARPA) in the United States during the conquest of space. This must be our ambition.” (Emmanuel Macron, 26 September 2017)¹

In his Sorbonne speech, the French president Emmanuel Macron outlined the establishment of a “European agency for disruptive innovation” to strengthen Europe's competitiveness in the digital age and as one way of moving towards more common European expenditure on research and development. His ambition is for the EU to catch up with competitors in North America and Asia in technologies such as artificial intelligence or biotechnology. Even though Macron did not specify his proposal, the idea immediately gained traction and received support from various sides. Carlos Moedas, EU commissioner for research and innovation, was quick to thank Macron for supporting a European innovation agency. In October 2017, a group of French economists reiterated the call for such an innovation agency, either as an EU or a French-German initiative with others to follow.²

In this blog post we take a closer look at what establishing a European equivalent of DARPA would actually mean. We argue that the European innovation policy landscape currently lacks a comparable agency, as EU instruments are more focused on innovation close to market maturity and embody less the mission-orientation and risk-taking approach of DARPA. A European DARPA-like agency could in our view be used as a tool of European industrial policy and as a tool for public procurement. Introducing an agency in the same spirit as the US model will however be challenging in the European institutional context. Both a supranational Commission agency with a dedicated EU budget line, and an intergovernmental agency financed directly by Member States, are conceivable options for its implementation.

2 How does DARPA work?

The US Defense Advanced Research Project Agency (DARPA) was created in 1958 in the wake of the Sputnik crisis as an agency of the United States Department of Defense. From the beginning, its intention has been to promote US technological superiority in defence. DARPA was assigned the task of filling the gap between ‘blue sky’ academic work and the incremental innovation process taking place within the military.³ It is supposed to “make pivotal investments in breakthrough technologies for national security”.⁴

¹ Emmanuel Macron, [Discours du Président de la République - "Initiative pour l'Europe : Une Europe souveraine, unie, démocratique"](#), Paris, 26 September 2017.

² LeMonde, ["Pour une initiative européenne sur l'innovation de rupture"](#), Opinion piece co-signed by 26 French experts on digital disruption and CEOs, 17.10.2017.

³ Block, F., *Swimming Against the Current: The Rise of a Hidden Developmental State in the United States*, *Politics and Society* 36(2), pp.169-206, 2008.

⁴ DARPA, [About DARPA](#), Accessed on 8 December 2017.

It has around 220 employees and a dedicated budget of about \$3 billion per year. Around 100 program managers (PMs) oversee about 250 research and development programs in six technical offices specialized in fields such as biotechnology, information innovation or microsystems technology. PMs must have a proven record of excellence in their field and are only recruited for a limited period of three to five years, from academia, industry and government agencies. They are at the heart of the DARPA model, as their short engagement serves as incentive to boost technological development in their field of expertise.

Technical offices publish funding opportunities, so-called Broad Agency Announcements (BAAs), in which PMs define the capabilities being sought as well as criteria for the selection process. In this so-called Scientific Review Process, PMs again play a pivotal role, as they are responsible for designating proposals recommended for funding, which will then be reviewed within the agency.⁵ Different types of instruments may be awarded to successful applicants, such as procurement contracts, grants or cooperative agreements.⁶

Three features characterize the way DARPA functions: First, the agency is highly **autonomous and flexible**. PMs are supervised by only a handful of managers and can quickly engage and disengage from research projects. Second, DARPA programs are strongly **mission-oriented**: technical offices define the technological capabilities they seek and curate a broader research agenda to push scientific boundaries in specific fields, which demands a thorough diagnosis and foresight.⁷ Third, DARPA projects involve basic as well as applied research, aimed at breakthrough scientific progress in a short period of time. This approach involves a lot of **risk-taking and a high tolerance for failure**, as many projects turn out to be dead ends.⁸

Projects funded by DARPA contributed significantly to the development of computer chips, the internet, stealth fighters and GPS. This contradicts the widespread belief that in the US, the state's role is limited to correcting market failures while private actors such as entrepreneurs and venture capitalists are the most capable risk-takers. Quite to the contrary, private investors are often too risk-averse to provide venture capital at the early stages of applied research. Most of the time, venture capital only starts to flow when a certain commercial viability is reached and risks decrease.⁹ The contribution of government-funded and developed general-purpose applications to the creation of the iPhone and other Apple-products is a good example. Without the strategic early-stage funding in projects leading to technologies like voice recognition, microprocessors or the touch screen by DARPA and other government agencies, the iPhone would not have been possible.

Interestingly, EU Research Commissioner Carlos Moedas interpreted Macron's proposed agency as being identical with a new Commission initiative, the European Innovation Council (EIC) pilot, which will bundle four instruments of the Horizon 2020 framework with a total budget of

⁵ DARPA, [Soliciting, Evaluating and Selecting Proposals under Broad Agency Announcements and Research Announcements](#), DARPA Instruction 20, 3 November, 2016.

⁶ DARPA, [Opportunities](#), Accessed on 8 December 2017.

⁷ Mazzucato, M. & Semieniuk, G., [Public financing of innovation: from market fixing to mission oriented market shaping](#), 2017.

⁸ See for example Block, F., *Swimming Against the Current: The Rise of a Hidden Developmental State in the United States*, *Politics and Society* 36(2), pp.169-206, 2008; or Mazzucato, M., *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*, New York: Public Affairs, 2015.

⁹ Ghosh, S. and R. Nanda, *Venture Capital Investment in the Cleantech Sector*, *Harvard Business School Working Paper*, pp.11-20, 2010.

2.7 billion euro for a period of three years.¹⁰ Its future after the pilot phase is up for review. However, most EIC tools have a strong focus on close-to-market innovation and do not try to actively steer research in a certain direction. In addition, given its structure, the EIC staff will also most likely be much less involved in the direct steering of projects than DARPA officers. Thus, the EIC instruments are unlikely to achieve the same degree of risk-taking and mission-orientation as the US agency.

3 What would a European agency for disruptive innovation do?

The previous section concluded that the EU currently lacks an agency comparable to DARPA, but could potentially profit from an institution that sponsors innovation in a similar fashion. This leads to the question: What would a European agency for disruptive innovation actually do in practice and how could it be used? To add value to the existing funding landscape, such an agency could ideally be used in two complementary ways: First, it could be an instrument of assertive European industrial policy and help foster technological advances in industries deemed strategically important to the European economy. Second, the agency could develop applications for public sector procurement in areas such as e-government, emission-free mobility or defence.

The agency as a tool of a European Industry Policy: A central mandate of the agency could be the promotion of technological breakthroughs in industries that are strategically vital for the European economy. The agency's effort to determine technological directions and missions could be guided by two principal considerations. Firstly, it could aim to boost the future competitiveness of Europe's digital and digitalizing economy by investing in the development of relevant general-purpose technologies such as artificial intelligence. In doing so, the agency could focus specifically on industries in which the European economy has comparative advantages, but which are also highly affected by digitalization, such as European machine and car industries. Currently, they are globally competitive. However, they are also in the midst of a difficult transition towards increasingly data-driven business models, which create added value mainly using software and algorithms. Secondly, the agency could strategically invest in areas where EU countries have committed themselves to achieving environmental or social goals that depend on technological advances, such as a low-carbon economy, climate-friendly mobility or data security and protection.

The agency as a tool for public procurement: European governments could also use the agency to carry out innovative public procurement and task it with researching and developing specific applications that improve the quality of government services. Application-oriented research funded in this way could, for example, include the development of sophisticated e-government and e-identification systems or safe solutions for signal transmission between autonomous cars and intelligent traffic systems. In addition to working towards more efficient government services and public infrastructure, the European agency for disruptive innovation could also look into technically enhancing transnational communications for its citizens. For instance, it could be tasked with developing a breakthrough in AI-driven voice recognition, and developing language aids for simultaneous translation into all 27 European languages. Such a focus on civilian applications would be a clear departure from the mission statement of DARPA,

¹⁰ Kelly, E. & Alho, I., [Macron wants to set up 'EU agency on disruptive innovation'](#), Science/Business, 26 September 2017.

whose main beneficiary is the American military. Although we also consider the procurement of defence technology to be a prospective activity of a European DARPA-like agency, we see a greater potential for collective procurement within the EU for civilian applications.

4 Which institutional setup for the new agency?

Besides the possible mission statement outlined above, a European agency for disruptive innovation, just like its American counterpart, requires a budget and a governance and oversight structure. We can envisage this agency either in a supranational setting within the EU institutions (either as a fully-fledged EU agency for the EU-27, or within a more deeply integrated euro area) or as an intergovernmental project with a possible French-German nucleus.

The new agency would need a governance structure that provides technical offices with high autonomy in awarding grants and contracts, as well as in managing the programmes. The possibility of pushing the boundaries of research is what makes such an agency attractive for top individuals from academia and industries to serve as project managers. This means that the political leadership (European Commission or governments) should be somewhat detached from the day-to-day business and allow for flexible use of the agency's budget.

A supranational setup has the advantage that it could be smoothly integrated into existing EU innovation and research policies, an area in which the EU already manages a significant budget. This would avoid a duplication of functions. Furthermore, governance within the EU framework could foster independence from national influence. At the same time, making funds available in the EU budget that would match DARPA's resources could become a contentious issue, as the radical approach of the agency will probably be most beneficial to research institutes and industries in Member States that are already innovation leaders. The French administration also floated the idea of setting up the agency as part of a future investment budget for the euro area (itself a highly contested proposal), which might consequently be constituted outside the EU's traditional institutional setup.

An intergovernmental setup would have the advantage that participating Member States would view the agency as a direct extension of the government, possibly linking it more closely to national ministries and agencies that would be direct beneficiaries through public procurement. As a project of deeper integration, of a few pioneering Member States, the agency could be implemented more quickly. At the same time, the project would be dependent on political support among the largest contributors, potentially jeopardizing its agility and autonomy.

In light of this analysis, we conclude that in order to put forward a concrete proposal for a European DARPA, several open questions need to be addressed first: Which strategic industries could benefit from such a model and where are the existing funding or networking gaps that need filled? How can diverging industrial priorities among Member States be reconciled? And last but not least, what is the most suitable institutional setup and source of financing? Macron's proposal provides a welcome momentum to tackle these questions and consider riskier, but potentially more rewarding, approaches to innovation policy in Europe.

