Brexit and Beyond: Impact case studies of EU funding

EU Framework Programmes are the most successful multilateral funding scheme in the world, with prestigious individual grants and strong collaborative and industry funding mechanisms.

Compared to national schemes, EU funding, where researchers seek funding from a wider pool ensures that research is internationally competitive.

EU funding also rewards the full science and innovation pipeline, supporting individual led basic research to European wide industries developing future technologies. There are no opportunities elsewhere in the world that provide the same scale and impact.

Excellence and Efficiency
Establishing Disciplines, Epigenomics

"Through EU support of the Epigenetics/ Epigenomics networks, the whole became greater than the sum of its parts, achieving major advances both in fundamental functional genomics and in knowledge of the contributions of epigenetics to health and disease.

Key to this was the widespread dissemination and utilisation of high quality analytics on the one hand, and investment in training and capacity development on the other."

Prof. Anne Ferguson-Smith, University of Cambridge

In the early 2000s, the epigenetics was a new but growing discipline, led by a small, unconnected community. Two successive EU-funded Networks of Excellence (The Epigenome 2004-2010 & EpigeneSys 2010-2016) transformed the field, unifying a world-leading European community. These investments helped to foster a truly interdisciplinary, collaborative community, drawing on each country's strengths, like the UK's genomics capability, computational analytics in Germany and Austria, and Spanish excellence in cancer sequencing.

EU funds gave the best junior researchers a launchpad to independence, networking them into a wider community and raising their profile. They supported workshops, bringing in new experts with different perspectives and expertise such as mathematics. They helped UK labs to grow, transporting and standardising new approaches, like computational research, to traditional labs. They also propelled researchers into leadership roles across Europe – in organisations like EMBL or Max Planck Institutes.

In just a decade, this coordinated approach pushed Europe to lead the field of epigenomics. A deep understanding of collaborators' research meant that activities were planned, focused and delivered at the best locations. For example, much of the epigenome sequencing was at the Wellcome Sanger Institute, drawing on the cells from the Addenbrookes blood bank, while EMBL-EBI securely hosted and shared data. The €30 million, 42 partner, Blueprint Project built on these networks to make Europe the world leader in high-quality epigenome references – setting global standards. Without similar coordination in new fields like RNA modifications, the UK could end up behind the curve.

Collaboration
Winning the Brain Prize

"As an international company, we particularly value the ability to work with a range of partners to ensure that we are conducting the best and most relevant research"

GlaxoSmithKline

In dementia research, EU funding has brought researchers together to make progress, faster. Prof. Bart de Strooper and Prof. John Hardy at UCL have been at the heart of a team improving progress towards a treatment for Alzheimer's. A European Research Council (ERC) advanced grant drove Prof. de Strooper to explore a new field of research before collaborative funding helped him and others share their methods and techniques. This identified the most efficient way to analyse amyloid plaques linked to dementia. A single technique made comparing results faster, and more effective. But crucially, through the Innovative Medicines Initiative, industry could pick up the technique and exploit it at scale. This close collaboration between academia and industry isn't found in any other funding mechanism. Prof. Hardy and de Strooper recently won the Brain Prize for ground-breaking research on Alzheimer's interventions.

The labs that developed these techniques are diverse, with around half coming from other European countries. Of the three UK-based prize winners, only one is a UK national. This mobility is driven by excellence-led EU funding. Large awards to early career researchers through ERC consolidator awards and Marie-Skłodowska Curie actions, give scientists leverage to take risks. The UK, through its scientific leadership has traditionally taken advantage of this. By measuring themselves against the best from around Europe, UK-based researchers are sharper and more competitive. Institutes like the Dementia Research Institute use the EU's competitive application process to save time on recruitment and increase their international visibility, improving collaborations and attracting staff from further afield.

Reputation
Switzerland

Following a referendum on Freedom of Movement in 2014, Switzerland was temporarily excluded from Horizon 2020. A small reprieve eight months later enabled Swiss researchers to access the 'Excellent Science' pillar, including single recipient ERC grants. Switzerland has traditionally excelled in this pillar, getting out more funding than it puts in.

During its exclusion from the ERC, the Swiss Government provided short-term domestic funding to bridge the gap. While Universities like ETH-Zurich appreciated the funding, they missed the more important recognition from winning competitive EU grants[1]. The lack of domestic competition and prestige prevented Switzerland from replicating ERC Advanced Grants. Uncertainty over Switzerland's involvement in Horizon 2020 saw a large decrease in their leadership of EU projects, which fell from 3.9% in FP7 to 0.3% in the first 18 months of Horizon 2020.

This had a knock-on effect. Swiss universities dropped in the World University Rankings as their profile and visibility fell, hitting student application numbers. PhD students were excluded from collaborative grants, missing out on what is seen as a vital step to post-doctoral positions, reducing their job competitiveness.

1) /sciencebusiness.net/framework-programmes/news/switzerlands-exile-eu-research-cautionary-tale-uk

Long-term Innovation
Clean Sky Technology

‘Demonstrator programmes – such as those done through Clean Sky – are often inherently international and expensive, making them natural activities to be conducted at European level. These include flying and ground-based technology demonstrators which are vital to de-risk and mature technologies prior to commercialisation.

Aircraft design and manufacture are highly skilled activities that draw on skills, knowledge and infrastructure that are no longer the preserve of individual countries. Aerospace is an inherently global endeavour requiring carefully considered international collaboration, something that Clean Sky provides’.

Aerospace Technology Institute

Clean Sky is an EU programme to develop sustainable and competitive aviation in Europe. It aims to set a consistent strategy that supports industry to take more risks, and finance the testing of next generation aircraft. The project began in FP7 with EU funding of €0.8 billion, leveraging a further €0.8bn from industry. In Horizon 2020, this grew to €1.8bn from the EU, leveraging €4bn from the commercial sector.

UK involvement in Clean Sky amplifies domestic funding, enhancing its impact. Through the Aerospace Technology Institute, there is already a strong incentive for organisations to research in the UK. But access to Clean Sky leverages UK funding and leadership; UK organisations can plug gaps in their own capability by gaining access to partners with skills and infrastructure not readily available in the UK, such as Airbus’ test plane based in France.

Clean Sky provides UK companies with a critical route to engage and cooperate with new customers in Europe. It also supports SMEs, as lead partners like Rolls Royce cascade their funding locally, improving the surrounding research base. Losing access could remove Rolls-Royce’s leadership, but will disproportionately hurt SMEs who, without existing networks or international supply chains, lose a vital way to connect to EU markets and organisations.

Competition
Norway

In 2012, Norway commissioned a report to assess how deeply it should collaborate with EU Framework Programmes, particularly as financial contributions were outpacing funding received. The report, enshrined in a Norway’s 2014 EU Framework Programme Strategy, recommended the closest possible integration with Framework Programmes. It found that access to cutting edge technologies, standards, and networks, were crucial to boosting international competitiveness. They also provided access to customers and suppliers through collaborative commercial projects[2].

Technopolis found that generous domestic funding hit Norwegian competitiveness. Researchers did not have to challenge themselves to access funding. This slowed down improvement in higher education, and made it harder for researchers to participate in EU consortia. Committing to EU funding means the Norwegian government can now target financial support to address these issues, like raising awareness of EU exchanges.

Norwegian policymakers found that Framework Programmes play an important role in EU policy development particulary in energy, climate change and health. Involvement in Horizon 2020, and greater presence in Brussels, helps Norway influence regulation, giving them advantage when EU policy is implemented.

2) regjeringen.no/globalassets/upload/kd/vedlegg/forskning/rapporter/eu-forskningeng.pdf?id=2305819