



INFINITY

**The missing synergy: Aligning
our world class academic R&D
with our leading digital financial
services industry**

JULY 2024

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Foreword

The UK is a leading academic powerhouse and a global leader in digital financial services. But we're missing synergies between academia and industry that could better support UK businesses and consumers, kickstart economic growth and stimulate increased investment. More closely aligning the research priorities of our academics with the needs of a dynamic digital financial services sector offers a conservative £8.2bn uplift in UK GDP.

The UK must move away from fragmented and limited R&D arrangements in digital financial services if it is to unlock greater economic and social benefits. Effective commercial pathways and strong levels of industry-academic collaboration will concentrate R&D spend on where it can impact UK growth and international competitiveness. It will attract further substantial private capital, help create the next generation of spin-outs in the sector, and generate a portfolio of very high quality, highly valued research and associated intellectual property.

The fundamentals are already in place. The UK already has world renowned universities, a globally leading financial services sector and an enviable digital finance sector, with reach into international markets, which could power economic growth⁽¹⁾. Both industry and academia make major contributions to our financial system, attracting inward investment, contributing to exports, improving productivity and financial inclusion. But the synergies between the two have not thus far been capitalised upon.

Think of the massive contribution that academia has made to the technologies at the frontier of digital financial services – machine learning, explainable AI, behavioural finance, deep consumer analytics, financial markets models and the invention of blockchain. These technologies have been created by universities. Add to this our fast growing, hyper innovative digital financial services sector – 100,000 jobs, reinvention of digital, the developments in reg-tech and sup-tech markets, quantum computing, smart-contracts, new asset classes, open banking and embedded finance.

Now focus and enable those combined capabilities to face into the commercial and societal challenges and opportunities of the next 10 years. We have the ingredients to create a UK fit for the future, support hundreds of thousands of new jobs, add billions to our economy, breed a generation of commercially minded smart entrepreneurs, develop new sectors and a globally recognised “IP factory”, constantly leading global thinking.

By more closely aligning these two UK ‘powerhouses’ we can:

Maximise the power of AI in a safe way by overcoming the explainability and bias challenges to create new business value, improve productivity in financial services delivery, and deliver breakthroughs on societal issues

Create new markets by setting the rules and standards for the adoption of new technologies - common standards for tokenisation and digital currencies, a framework for explainable artificial intelligence

Improve credit access to SMEs and consumers, deepen financial markets, and improve risk management models, improving financial inclusion and making products and service more tailored to the needs of SMEs and consumers

Use technology to address scams and fraud, which are the most reported crimes in the UK. Better data and AI will detect and stop bad actors and help consumers and businesses avoid harm

Help address climate change through improved data flows, more accurate risk management and impact reporting. Leveraging the power of behavioural science and smart data analysis, we can influence consumer behaviours to move more swiftly to a decarbonised world.

1. [The UK Can Use FinTech to Drive Growth and Economic Opportunity \(institute.global\)](https://www.institute.global/)

There is potential for huge positive economic and social change in the UK, IF we can bring together academia and industry more effectively. The fundamentals are in place. This journey is about coordination, collaboration and system improvement, with the right backing. It's all within our grasp.

Professor John Gathergood, Co-Director of INFINITY

INFINITY is grateful to the members of the Steering Group for their ideas and input to this review and the consultation on the arising recommendations. We would like to thank Faith Reynolds for chairing the Steering Group and John Hallsworth at KPMG for their help and support throughout the project. The recommendations and other content in this review do not necessarily reflect the views of individual members of the Steering Group, or their organisations. The University of Nottingham, which hosts the INFINITY project, is wholly responsible for the recommendations and other content in this review. We would also like to thank colleagues from the British Business Bank, who were consulted on the findings and recommendations of this review.

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- *Karen Elliott (University of Birmingham)*
- *John Gathergood (University of Nottingham)*
- *Simon Hepworth (Imperial College London)*
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- *Phillip Mind (UK Finance)*
- *Geeta Nathan (Innovate UK)*
- *Faith Reynolds - Chair (Devon Fields Consulting)*
- *Markos Zachariadis (University of Manchester)*

INFINITY

INFINITY exists to catalyse the next generation of university-inspired financial technology commercialisation ventures. It brings together an existing ecosystem of three leading Midlands-based universities with financial technology expertise (Nottingham, Birmingham and Warwick), the UK's leading funders and accelerators of start-up and growth for financial services, together with existing UKRI and government network investments.



Collaboration between academia and industry is key to foster innovation and provide UK FinTechs not only with cutting-edge technologies that are essential for our global competitiveness but also highly skilled talent that can help accelerate FinTech's growth in the UK - and to strengthen this bridge between academia and industry we launched the FinTech Academic Network in 2023, in partnership with Alliance Manchester Business School.

We are delighted to support the findings of this new report looking at key recommendations for achieving the benefits of a stronger, less fragmented ecosystem where academia can work more closely with the FinTech sector and develop an investment framework that is fully aligned with the country's economic and societal goals.

Janine Hirt, CEO,
Innovate Finance



Open Banking Limited is delighted to support this initiative. A well-funded and aligned academic R&D and financial services industry will only enable more benefits to consumers and businesses.

As noted in the report, the UK has a host of world-renowned universities and a strong digital finance sector with global reach. It's essential our academic sector can support the incredible work already taking place.

The UK is a leader in open banking, and its ecosystem is worth more than £4 billion to the UK economy. A well-resourced academic sector can ensure we cement this position, particularly as we look to address key concerns like liability and risk sharing, privacy enhancing data-sharing and allowing researchers to access relevant data.

Open banking and academia both deliver a public good and it's great to see them aligned and working in partnership.

Marion King, Chair,
Open Banking



At TISA, we believe that academic research is crucial in shaping the future of financial services. By working more closely with leading institutions, we can develop evidence-based strategies that enhance consumer understanding and trust. Research is hugely important in driving the innovation in systems, business models and products that is so needed to deal with the challenges on the horizon. TISA is a strong believer in the value of collaboration and co-ordination to achieve better outcomes. We are pleased to welcome this report and initiative.

Carol Knight, CEO at TISA
(The Investing & Savings Alliance)





CFIT launched in 2023 with a mission to enhance the UK's fintech sector and deliver benefits for consumers and SMEs - and the entire economy. I am pleased to say that we are delivering on this mission by creating industry-led partnerships that take problem solving proofs-of-concept and turn them into working prototypes in selected areas of the UK. Together with Government, industry, regulators and academic institutions, we are ensuring that Britain's financial services sector continues to lead the way and be the envy of the world.

"Academic partnerships have been critical in the fulfilment of CFIT's mission and journey, all the way through from defining key issues to address and then helping to deliver proofs of concept from defined workstreams. We're pleased to support this report which highlights some of the key barriers academics face commercialising their research and how these can be addressed to further unleash innovation in the UK.

Ezechi Britton MBE, CEO,
Centre For Finance, Innovation
and Technology



Digital transformation continues to drive change in banking and finance and the way businesses and customers manage their finances – offering opportunities for new products and services and wider efficiencies. These technologies, such as generative AI, need to be deployed carefully within well-governed risk, control and compliance frameworks.

The importance of academic research and development to digital transformation cannot be overstated. There is a great opportunity for industry to build on existing partnerships with academic institutions to drive growth, innovation and international competitiveness.

This report is an important reminder of the value of research, an exploration of how to foster that collaboration better and a valuable contribution to the debate. We look forward to continuing this discussion.

Phillip Mind, Director for
Digital Technology and
Innovation, UK Finance



The UK has a world-leading financial services sector. Digital technologies are transforming finance. The potential benefits of these new financial technologies, for UK citizens and for UK economic performance, are enormous. Fully realising these benefits is though challenging: a giant multi-piece jigsaw puzzle.

The INFINITY report on academic R&D and innovation in financial services tackles one of the key pieces in this puzzle. It provides clear practical recommendations on coordinating the substantial capacity for financial technology research in UK universities with their commercial application across the industry, by incumbents, startups and university spinoffs.

Prof. Alistair Milne
Principal Investigator,
TECHNGI



Executive Summary

The current ecosystem that brings together academic research capabilities and business interest to support innovation in our financial services industry is limiting. It is characterised by low levels of central investment by UK Government, hard to quantify but likely low levels of private investment and fragmentation across agendas and topics. And whilst there are numerous bodies who actively convene academia and industry – the regulators, CFIT, Innovate Finance, regional FinTech bodies – there is no systematic, over-arching approach aligned to the UK’s economic and societal goals.

To give a sense of the current level of investment, UK Research and Innovation (UKRI) invested in only 81 grants over the 15-year period 2008-2023 that have clear alignment to digital financial services, with an average grant size of £406k. While many of these are sensible investments on a standalone basis, they tend to be isolated without reference to any common national priorities. As well as being fragmented the investment level is very low, at £55m for that 15-year period (averaging just £3.6m p.a.), compared with pharmaceuticals at £1.6bn and aerospace at £2.2bn. Comparatively, financial services is a significantly larger contributor to UK GDP than both aerospace and pharmaceuticals.

Beyond financial investment, as with other industries, the digital finance ecosystem shares the same challenges of realising value from R&D as highlighted in recent reports into University spin-outs. There is significant friction in contractual processes, a need to support more diverse groups of academics and potential founders, a lack of clarity and transparency as to how to realise commercial value, and limited data about how existing investment creates returns for UK plc.

We need a renewed digital finance ecosystem that integrates the UK’s research powerhouses with our leading financial services to solve major challenges. These include challenges faced by the financial services sector which limit better-serving customers and firms, such as: the implementation of artificial intelligence and machine learning, the creation of safe and reliable digital currencies, cyber security and the fight against scams, and the increased provision of inclusive financial services. Beyond these, there are wider benefits to be gained through addressing low productivity through increased access to small business finance, carbon accounting in action to address climate change, and long-term socio-financial challenges including retirement saving, funding a sustainable housing market and financial products fit for life’s challenges.

The UK faces pressing issues: Small businesses and consumers still experience financial exclusion. We have an ageing population and a pensions deficit estimated to be £25tn by 2050. Unclaimed benefits is currently estimated to stand at £23bn. 24% of the UK is affected by a poverty premium with a cost of £2.8bn to the economy. Approximately 8 million people need debt advice and yet the majority go without help. Criminals stole £1.17bn in fraud and scams in 2023.

A renewed ecosystem bringing in knowledge-based, independent research leaders is needed to bring coordination and network solutions to many of these challenges that are pan-sector. Competition law and coordination challenges commonly prevent firms from coordinating on network-level challenges, such as determining the marketplace for digital currency, standards for artificial intelligence or carbon accounting. Hence, the independent and knowledge-led input of researchers and academic institutions is a key input to solving these challenges. These types of issue demonstrate the need for academic R&D that can address the typically intractable challenges faced by communities and wider society but which individual firms are not necessarily well positioned to address alone. The international experience indicates this can be highly productive. When compared to significant programmes internationally, for example Singapore’s A*STAR, it is clear that the UK lacks central co-ordination but could stand to realise significant value from a more strategic approach directed to key social and economic challenges.



There is a strong economic case for improvement that aligns to the desire to kickstart economic growth. There is a “missing synergy” available of at least £8bn in annual GDP alongside further societal benefits and enhancement of our global standing as an innovator in the sector. The benefits can be realised by:

- solving market network challenges, where longer term systemic change is required, for instance in relation to cyber-security, risk sharing, explainability, short-termism and managing legacy infrastructure. Solving these challenges will allow for greater deployment of new technologies like, for example AI, tokenisation and digital identity
- an increase in ventures and spin-outs, building on our existing track record of successfully commercialising university R&D in other sectors. This is a missing sector in the spin-out portfolio of UK universities, which should be sizeable given the size of the private market in financial services, and academic expertise in the underlying technologies
- uplifting productivity in existing financial services institutions, by more closely aligning the academic resources for economic benefit. This is already demonstrated in the use of academic research by start-ups and established institutions alike. Pushing this further could also take the form of enhancing our local enterprise capability to drive regional growth out of our universities located across the UK
- focusing on delivering wider societal benefits through digital financial innovation as a positive force for enhancing business viability, consumer protection and helping to solve long-term financial challenges in the UK

There are good reasons to believe it is achievable. We know, from other studies, that the Russell Group of Universities alone return an 8.5x return on investment and we can also point to fantastic examples of start-ups that have emerged from close interaction between academia and industry, companies such as RegGenome and Cytora. There are also examples of academic research having significant impact on regulation and policy-making in the UK.

Achieving the benefits requires the UK to move from this fragmented ecosystem to a coordinated ecosystem, led by a body with a clear mandate and commission. We therefore recommend:

- 01 Development of an investment framework that sets priorities aligned to national economic and societal goals against which investments will be awarded. These include both the large-scale network challenges to be solved by consortia of academics, firms and regulators, and the pump-priming investment in the commercial ventures to put technologies into practice
- 02 Development of “commercialisation pathways” that embed standard legal structures and provide transparency, increase certainty for academics and support in how to realise commercial value from research both at the network level through open and scalable IP, and at the venture level
- 03 Development of an IP framework and register to support commercialisation that incentivises and facilitates both spin-outs and realisation of commercial and social value from applied research
- 04 Improvement in data access protocols such that academics can more easily access industry data existing in major institutions to develop their research and models. This will be especially important in a world of AI, and where network solutions are needed
- 05 Appointment of a central body to convene the ecosystem both to address the above points but also to co-ordinate on an ongoing basis. They will foster collaboration between industry and academia by acting as the key locus for ecosystem engagement. They will also act as a centre of excellence, support university Technology Transfer Offices (TTOs), and be a central point to advertise available research. They will work with investors to co-design new investment vehicles and attract increased levels of private investment.

These proposals require investment at three levels:

1. An increase in the allocation of UKRI research funding to digital financial services. There is potential to resource this activity through the UK's innovation budget, through programmes such as the Next Generation Service and Connecting Capabilities programmes, and related funding streams within the resource portfolio
2. Project funding to develop the recommendations above
3. Core ongoing funding to co-ordinate the ecosystem. Likely to take the form of increased funding to an existing industry body with the capacity to convene universities, the private sector and regulators.

We propose that this be made available on a phased basis aligned to outcomes, and phase one funding would cover:

1. Creation of the mandate for a central body to operate, and commissioning of it to act. There are existing bodies who would be logical to undertake this work and thus set up costs would be minimised
2. Identification of national priorities for R&D investment, by convening the ecosystem stakeholders in a structured way, assessing investment levels, return, staged deliverables and developing the investment framework to oversee it
3. Establishment of operational support to the ecosystem – development of IP frameworks and commercial pathways and scope other supporting activities such as investor engagement, training and mentoring



1.0 Background

This review was led by the Inclusive Financial Technology Hub, INFINITY (a collaboration of the Universities of Nottingham, Birmingham and Warwick). INFINITY ⁽¹⁾ is funded by UK Research and Innovation (UKRI) and exists to catalyse the next generation of university-inspired financial technology commercialisation ventures, and solve the network challenges in deployment of technologies in digital financial services. INFINITY commissioned KPMG to research and co-author this review and also support in convening a Steering Group comprised of other UKRI-funded universities alongside digital finance experts, trade bodies in the financial services sector and investors.

The purpose of this report is to examine the potential advantages and steps to investing more heavily into the commercialisation of academic research relevant to financial innovation. It represents a high level but informed view of the existing state of collaboration, its potential, and how that potential might be achieved. It aims to set out the opportunity available, a path forward to promote discussion and gain traction, and to pursue the next phase of work.

By commercialisation we mean, “the process by which new or improved technologies, products, processes and services that have arisen from research are brought to market. It is a valuable mechanism that enables us to solve real problems and fulfil unmet needs, creating significant economic and societal value as a result.”⁽²⁾ Such commercialisation may be led by students, academics or alumni, all of whom contribute to the research ecosystem of a university. University research-inspired commercialisation might arise from an undergraduate thesis, a PhD or a professor’s research portfolio: each present opportunities for growth and new ideas to flourish as commercial prospects.

Commercialisation is worthy of support which can include:

- Funding for universities to carry out knowledge exchange, follow-on funding to take fundamental research to later-stage innovation, translation of research into commercial setting, and other commercialisation activities (e.g. through the Higher Education Innovation Funding)
- Training to help academics identify commercial opportunities of their work, become entrepreneurs, and develop the skills and expertise necessary to be business as well as academic leaders
- Development of research clusters which create dynamic ecosystems that “drive collaboration, innovation and research translation. They help drive scientific discovery, technological advancement and economic prosperity”
- Business development services including mentoring, coaching, product development, market research delivered through incubators and accelerators
- Promotion of networks involving all parts of society: regulators, industry, civil society, trade-bodies and government to help shape the environment to support spin-outs
- Access to facilities and infrastructure, for instance through the Digital Catapult

The report aims to develop the theme of commercialisation of research specifically into digital financial services in the UK.

To inform the report, the team undertook the following work during March to June 2024:

- formed a steering group comprised of experts in commercialisation of research-based propositions alongside investors, digital finance academics, University networks, digital finance trade and change bodies
- reviewed relevant research into commercialisation including the recent “Independent Review of University Spin-out Companies” and subsequent DSIT response “Evolution of the Research, Development and Innovation Organisational Landscape”⁽³⁾, plus other recent reviews of university commercialisation
- reviewed the ecosystem current state and researched relevant case studies
- looked at commercialisation programs/frameworks from other sectors and internationally
- developed an economic case, key recommendations and next steps

1. [INFINITY: The University of Nottingham Inclusive Financial Technology Hub](#)

2. [Research commercialisation – UKRI](#)

3. [Independent review of university spin-out companies - GOV.UK \(www.gov.uk\)](#)

2.0 Current state of academic R&D in support of the digital finance sector

Academic led R&D in digital financial services is successful but small-scale and piecemeal in comparison to international counterparts. Investment is low. There is limited co-ordination and as such no strategic alignment to industry's economic or societal goals. This makes it hard for the industry to connect with academia systematically and reduces the potential to leverage additional investment.

Like other sectors, academics in digital financial services face barriers to commercialising their research and friction in agreeing commercial terms and Intellectual Property (IP) ownership. There is a gender imbalance in academic spin-outs and work is needed to improve diversity. Finally, the need to access data from financial institutions to test, develop and produce innovative services is held up by appropriate concerns of security, compliance with GDPR and commercial sensitivity.

Levels of co-ordination

The commercialisation of research in digital financial services is held back by the lack of UK-wide coordination. Research strategies are emerging for digital financial services, but there is no UK-wide research strategy aligned to economic and societal goals against which funding is clearly prioritised and allocated. Regional FinTech clusters engage with universities but outcomes are “hit and miss”.

The existing ecosystem of institutions, academics, trade and regional bodies collaborating can best be described as “organic”.

Current state of the digital finance spin-out ecosystem

- Grant funding of £55.1m spread across 81 individual grants (2008-2023)
- Average grant size £0.4m (adjusting for outliers)
- Private investment by FS institutions typically localised on a tactical basis
- No industry standards governing data access or IP
- Emerging regional bodies operating cross sector
- No centrally set priorities, funding decided on basis of individual applications
- Return on investment difficult gauge
- Difficult for private investors to engage across a complex network
- No clear commercialisation pathways – some but relatively limited spin-outs

Despite the obvious challenges in the existing ecosystem, it is successful in microcosm, with many great examples of collaboration and numerous strong partnerships undertaking excellent value-adding research that makes a significant contribution to the financial services industry. For instance, the work by the Cambridge Centre for Alternative Finance has published substantial reports to further academic thinking and regulatory and policy work in financial services both here in the UK and internationally⁽¹⁾.

UKFAN⁽²⁾ is an industry-academic network led by the University of Manchester with Innovate Finance to help unlock new partnerships and investment in research and innovation.

FinTech Scotland has worked with seven universities in Scotland to create a research strategy for digital financial services.

1. [CCAF's impact - Cambridge Centre for Alternative Finance - Cambridge Judge Business School](#)

2. [UK FinTech Academic Network - Innovate Finance – The Voice of Global FinTech](#)

UKRI-funded initiatives like INFINITY, UKFin+⁽¹⁾ and Future Finance 4 All⁽²⁾ create building blocks for industry and academia engagement. They focus on training, and research commercialisation in digital finance; providing funding for academics to work with industry, regulators and non-profits to co-define challenges and solutions needed for the financial services industry; and supporting companies in the UK financial services sector to adopt innovative processes and products that boost their productivity and improve accessibility of services.

There are examples of industry convening bodies too like the Centre For Finance, Innovation and Technology (CFIT), Open Banking Limited, Pay.UK which convene industry around key challenges and have driven significant innovation in the sector. Trade bodies like UK Finance, Innovate Finance, TISA (The Investing & Savings Alliance) and the ABI (Association of British Insurers) create fora for industry to collaborate. However, academics are rarely systematically involved in informing, or being informed by, industry collaborations.

There are also important regional bodies in the FinTech National Network: FinTech West, FinTech Wales, FinTech North and FinTech Scotland. These bodies work in different ways but are consistent in their desire to build the capacity of FinTechs in regional clusters. These initiatives work closely with universities in their jurisdictions. For example, FinTech Scotland works with the Universities of Glasgow and Strathclyde to run the Financial Regulation Innovation Lab⁽³⁾ which integrates academic research with an industry relevant agenda.

This review heard how it can be difficult for industry to know where to go or how to start engagement with academia. The financial services industry has no way to systematically engage with researchers or discover academic work that may be relevant to them.

There is also limited movement between academia and industry. Leaving academia to gain experience in industry is not rewarded and hinders publication of papers by

1. [UKFin+ Funding Research Collaborations for Wicked Problems in Financial Services](#)
2. [Accelerator for UK Financial Services | Future Finance \(future-finance.tech\) Financial Regulation Innovation Lab - FinTech Scotland](#)
3. [Missing out 2024: £23 billion of support is unclaimed each year - Policy in Practice](#)
4. [8 million people need debt advice and 12 million are living on the edge | Money and Pensions Service \(maps.org.uk\)](#)
5. [Fraudsters stole £1.17 billion from victims in 2023 - Which? News](#)

which academics progress their careers. We also heard that where there is engagement, academic institutions do not appear to understand the industry and are on a learning curve. They can be slow and there are cultural differences and priorities.

The industry itself is making slow progress in deploying new technologies because of implementation challenges, compliance requirements and competition rules that prohibit collaboration. There are fundamental network challenges – for instance, interoperability between data-sharing schemes - which hold back innovation and progression.

From a societal perspective, small businesses and consumers still experience financial exclusion, the poverty premium, high levels of fraud and scams and limited engagement with later life planning. Unclaimed benefits stand at £23bn⁽⁴⁾ and approximately 8 million people need debt advice and yet many go without help⁽⁵⁾. Criminals stole £1.17bn in fraud and scams in 2023⁽⁶⁾.

These issues require strategic co-ordination and collaboration to solve with a clear public mandate for delivering greater social and public good.



International examples of success

International examples of the successful creation of ecosystems bringing together academic R&D and the private sector show that there are solutions to the challenges facing this sector in the UK. When we look at best in class internationally, we can learn from their successes in many dimensions. The Singaporean A*STAR⁽¹⁾ is an example of a successful global spin-out central coordinating body engaged in digital finance, MIT REAP⁽²⁾ provides a toolkit for public and private sector stakeholders to collaborate in addressing regional challenges, whilst Switzerland offers an insight into the components of a world leading innovation powerhouse.

Singapore: A*STAR (Agency for Science, Technology and Research) and the Asian Institute of Digital Finance

The Singaporean A*STAR is a central body that acts as a nexus between research initiatives and private/public funding looking to invest. Most notably, A*STAR aligns research and investment priorities based on Singapore's Research, Innovation and Enterprise plan (RIE), which has helped the nation become Asia's most innovative economy for eight out of the last ten years⁽³⁾. With a budget of S\$7.3bn⁽⁴⁾ going towards strengthening Singapore's university research alone, comparisons can be drawn between UKRI's funding allocation to university research and more specifically digital finance related propositions. The Asian Institute of Digital Finance⁽⁵⁾, a collaboration jointly founded by the Monetary Authority of Singapore and the National Research Foundation, in collaboration with the National University, is an experimental site for developing digital financial technologies as well as for nurturing current and future FinTech researchers and practitioners in Asia. It serves as an example of how groups can be convened to address network challenges in digital finance at the economy-wide level.

Recently, A*STAR has pivoted to a more balanced approach for both basic and translational research: acknowledging that basic research should not be disregarded because it can take 10-15 years for valuable products to emerge.

MIT REAP (MIT Regional Entrepreneurship Acceleration Program)

Renowned for its Stakeholder Model, MIT REAP engages teams of five to eight comprised of academics, entrepreneurs, government, corporates and capital from each region. The program has successfully expanded across 63 regions globally and continues to act as a leading body to identify regional challenges for economic growth, enabling funding to be aligned to identified priorities. The program also allows public and private stakeholders to inform strategy, improving commercialisation rates of research propositions. Success is monitored and compared to regions globally, fostering international relationships and collaboration within and outside of the MIT REAP program.

MIT REAP has a number of cohorts around the world focused on digital finance initiatives, including MIT REAP Riyadh⁽⁶⁾ which seeks to position Riyadh as a financial hub by 2030, focusing on innovating and leading in FinTech and catalysing digitalisation across new business service segments. UK cohorts have also participated in MIT REAP, including from Leeds where the process, centred around Nexus at the University of Leeds led to a more joined up approach in the region and a far more diverse and focused innovation ecosystem⁽⁷⁾. It serves as an example of how teams can be built purposed towards solving network challenges in digital finance, to the benefit of regional economies.

Switzerland – An Innovation Powerhouse

Switzerland has been ranked 1st in the Global Innovation Index⁽⁸⁾ for thirteen years consecutively, with Sweden, the United States and UK competing for the top four spots. The success seen in Switzerland can be owed to a number of factors including its Institutional strength (ranked 2nd vs 24th in UK), University R&D-industry collaboration (3rd vs 12th in UK) and Cluster Development (3rd vs 14th in UK). It also leads in Knowledge Creation, which can partly be attributed to ETH Zurich's strength in supporting commercialisation of spin-outs, achieving a record 43 spin-outs in 2023⁽⁹⁾.

1. [A*STAR Research Attachment Programme \(ARAP\) \(a-star.edu.sg\)](https://a-star.edu.sg)
2. [MIT Regional Entrepreneurship Acceleration Program \(REAP\) - MIT Office of Innovation](https://reap.mit.edu)
3. [Global Innovation Index \(GII\) \(wipo.int\)](https://wipo.int)
4. [The roadmap to RIE2025 - A*STAR Research \(a-star.edu.sg\)](https://a-star.edu.sg)

5. [Home - NUS - AIDF](https://nus.edu.sg)
6. [Riyadh - MIT REAP](https://reap.mit.edu)
7. [Centre for Financial Technology and Innovation | Centres and institutes | University of Leeds](https://leeds.ac.uk)
8. [Global Innovation Index 2023, 16th Edition \(wipo.int\)](https://wipo.int)
9. [Spin-off companies of ETH Zurich | ETH Zurich](https://ethz.ch)

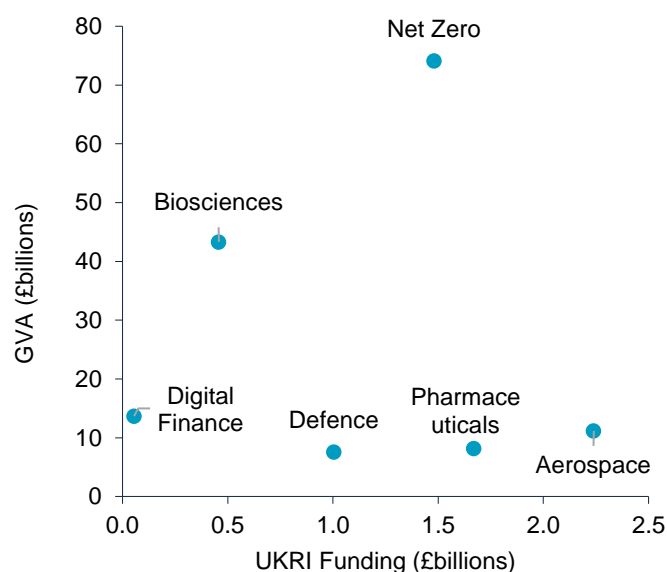
Levels and types of investment

Analysis of UKRI grants for the period 2008-2023⁽¹⁾ tells us that investment levels are very low at an absolute level and also compared to other industries and their relative economic contribution. This can be seen in the diagram below. Over the 15-year period there have been only 81 grants – i.e. an average of under 4 per year.

UKRI Investment by Sector, 2008-2023⁽²⁾

Sector	UKRI Funding Awards	UKRI Funding Value
Aerospace	1635	£2,238m
Pharmaceuticals	3099	£1,669m
Defence	1756	£1,005m
Net Zero	1790	£1,481m
Biosciences	931	£457m
Digital financial services	81	£55m

UKRI funding between 2008-2023 against GVA to the UK economy⁽³⁾



Furthermore, the organic nature of the ecosystem means that investment is spread across a relatively wide range of topic areas. The funding is therefore spread quite thinly: average grant value (omitting outliers) is £406k, across 18 Universities and covering 12 topic areas:

Topic	Count of Projects
AI	13
China's Financial Systems	4
Cryptocurrency & Blockchain	7
Cybersecurity	1
Ecosystems, Data Sharing and Data Processing	14
Financial Wellbeing and Inequalities	9
Other	7
Payments & Contracts	18
Pensions	1
Policy	2
SME Financing	2
Sustainable Finance	3
TOTAL	81



- [Research England grant allocations to HEPs 2023 to 2024 – UKRI](#)
- [Number of awards and value sourced from Gateway to Research](#)
- Number of awards and value sourced from Gateway to Research, Gross Value Added sourced from 2022 UK National Accounts, for digital finance sourced from [Khalifa \(2021\)](#). * Digital finance includes searches for “fintech”, “financial technology”, and “digital finance”.

As is the norm, core UKRI investment is matched via private investment, which tends to occur from the larger financial services institutions. This data is not disclosed, and therefore measuring the current scale of private investment into university-based research and commercialisation in this field is problematic.

Nevertheless, we can see key academic investments made by larger financial institutions. For example, Lloyds Banking Group has undertaken a multi-year programme of research in collaboration with the University of Warwick covering a range of topics including gambling behaviour⁽¹⁾ and individual carbon accounting⁽²⁾. Barclays has an established climate tech hub at the University of Cambridge with a soon-to-launch dedicated programme for climate FinTech entrepreneurs⁽³⁾. The University of Edinburgh have formed an industry-academic partnership with the global asset manager, abrdn, to deliver innovation in the investment sector⁽⁴⁾. The Experian Centre for Economic Modelling (ExCem) at the University of Nottingham⁽⁵⁾ was formed as a collaboration between Experian and the university to develop next-generation models for credit scoring and consumer and firm financial analytics.

However, it is clear that UKRI investment is not currently leveraging the large investments seen in other sectors such as university technology centres, large-scale programme grants, or industry conglomerate investment. Where private investment does occur in this field, it tends to be institution-specific and time-limited.

1. [The association between gambling and financial, social, and health outcomes in big financial data - WRAP: Warwick Research Archive Portal](#)
2. [Estimating carbon footprints from large scale financial transaction data \(warwick.ac.uk\)](#)
3. [Barclays launches climate tech hub in Cambridge \(finextra.com\)](#)

Commercialisation and IP challenges

Commercialisation of research is a recognised, and recently publicised, challenge for universities across a wide range of sectors. There are various issues that have been identified, mostly surfaced from other sectors, by the recent University Spin-out report⁽⁶⁾, as well as recommendations on how to improve, gained from leading programmes internationally.

The Spin-out Review and TenU's University Spin-out Investment Terms (USIT) Guide⁽⁷⁾ provide useful insights into the current state commercialisation pathways and funding mechanisms. One particular characteristic of this industry is that typically IP is not patentable, and therefore the ability to commercialise the IP is more complicated and limited.

Unlike other patent-oriented industries such as pharma, academic developments in financial services are much more likely to take the form of algorithms, software, protocols or other referenceable research. These are likely to be short-lived as continuing research soon supersedes them. There are also multiple interested parties – the academic, the University, any sponsoring commercial organisation, and “other” for example a founder working alongside the researcher.

4. [Edinburgh Innovations | abrdn and Edinburgh join forces to develop an...](#)
5. [School History - The University of Nottingham](#)
6. [Independent Review of University Spin-out Companies \(publishing.service.gov.uk\)](#)
7. [Universities and investors launch founder-friendly blueprint for boosting UK software spin-outs — TenU \(ten-u.org\)](#)



Key, relevant issues and recommendations from the Independent Review of University Spin-out Companies which are relevant to digital financial services (see Appendix 1 for full listing):

Issue	Recommendation
(a) Lengthy spin-out deal negotiations with minimal investment framework	<p>All parties should agree spin-out deals on market terms, avoiding unnecessary negotiations. Equity splits identified via TenU's University Spin-out Investment Terms (USIT) Guide can be used as a starting point for life sciences spin-outs (10-25% university equity) with exact terms varying depending on the wider commercial deal.</p> <p>Universities, investors and founders to jointly build on the USIT guidance to develop a template for spin-out term sheets, similar to the US University Startup Basic Out Licensing Template (US-BOLT) to help streamline the negotiations process.</p>
(b) Greater support is needed for academics from individuals and organisations with experience in operating successful high-tech start-ups	<p>Founders need access to support from individuals and organisations with experience of operating successful high-tech start-ups, specifically:</p> <ul style="list-style-type: none"> • Advice, support and representation during negotiations with investors/universities • Training on commercialisation and entrepreneurship • Support with business building activities i.e. connecting with investors and accessing customers • Access to shared equipment inc. rental facilities
(c) Lack of transparency on spin-out activity	<p>More data and transparency on spin-outs through a national register of spin-outs, and universities publishing more information about their typical deal terms. The Higher Education Statistics Authority's ongoing review of the Higher Education Business & Community Interaction (HE-BCI) dataset must present solutions to improve the reliability of data on spin-outs.</p>
(d) University spin-out income used to fund TTOs	<p>Higher Education Innovation Funding (HEIF) should be used to reduce the need for universities to cover the costs of Technology Transfer Offices (TTOs).</p>
(e) Lack of funding during the critical proof-of-concept phase pre spin-out	<p>Government should increase funding for proof-of-concept funds to develop confidence in the concept prior to spinning-out. These should integrate with the timing and offering of commercialisation support and venture-building programmes. Investors should lend their expertise to assessing funding bids for proof-of-concept and translational funds.</p>
(f) Improvements in the movement and porosity between academia and industry required	<p>Government should improve the provision of funds that enable it to 'buy out' academic time to focus on commercial partnerships and potential ventures.</p>
(g) PhD students have limited training on entrepreneurship and commercialisation pathways	<p>UKRI should ensure all PhD students have a voluntary option of attending high-quality entrepreneurship training and increase the opportunities for them to undertake internships in local spin-out, venture capital firms or TTOs.</p>

An additional challenge is for the sector, as in others, is the lack of a single source of information about the commercial impact of academic research into digital financial services. This makes it hard to discover academic research that an industry organisation or collaboration may want to deploy or to find proof points for the return on investment into the sector.

Equity, diversity and inclusion

Academic-inspired spin-outs from universities tend to be more numerous in the South East. However, the nature of digital financial services means that they are not contained to specific regions but can be located anywhere. The network of universities could be better leveraged to ensure benefits reach across the UK, bringing greater regional equality.

Academics need support to engage and certainty that their engagement will not damage their academic careers. Juggling commercialisation alongside teaching, conducting cutting-edge research and producing impactful publications can be challenging. Academic career paths are rigid with greater value placed on academic publications than commercialisation and spin-outs. This reduces the diversity of academic founders.

Recent research into FinTechs⁽¹⁾ demonstrates that diversity is key, delivering greater likelihood of growth and success. It notes that “firms with female founders achieved an annual turnover growth of 30%+ versus those with male only founders, but only 16% of firms had a female founder”. Businesses which have more than one founder are also likely to do better at scaling up, suggesting the importance of connecting academics with the right expertise and skills to help them take their research to market.

Limited access to data

New technologies often need to be tested on large scale datasets. These are not always readily available. Various attempts have been made to create repositories of data or provide alternative ‘synthetic’ data to solve this problem. However, in some cases these simply do not provide a sufficient substitute for real-life data.

Individual firms may struggle to provide access to data to academics because they are concerned about security, compliance with GDPR and the privacy of their customers. Academics may need access to data but do not want to give up all the IP they create when using the data.

1. [Scaling-UK-Regional-FinTech_2024.pdf \(whitecapconsulting.co.uk\)](#)



3.0 The opportunity

Digital financial services is a high-productivity, innovation-focused and scalable growth sector of the UK economy. It represents the highest value-add component of financial services, which is a longstanding strength of the UK economy. It also has the potential for fast growth with wide geographic and social benefit as we witness the impact of the next waves of innovation through AI, tokenisation, open / smart data, Large Language Models (LLMs) and quantum computing.

But while technologies create new opportunity and value, realising that value can be challenging. Regulation, security, compliance, liability and risk sharing, explainability, short-termism and legacy systems make implementation slow and piecemeal. Mass adoption requires all market participants to move in step, whilst competition rules may make it difficult for firms to solve the challenges in a collaborative manner for the long term. Big tech provides a new force in the industry, changing the competitive and regulatory dynamics and this is where the UK's intellectual leadership in universities could be leveraged to add further value to the financial services sector.

Supercharging a nationwide connected R&D ecosystem could create more than £8bn in additional GVA for the UK over the next 10 years, create thousands of skilled jobs and hundreds of high growth spin-outs.

There are four broad areas of opportunity where a new digital finance ecosystem will add value:

Market creating network solutions

The adoption of key technologies like AI, LLM, tokenisation, open finance, digital identity are being held back by key issues like explainability, risk-sharing, security, liability, business model and compliance. These are challenges that require system-level solutions to be developed in a coordinated manner over the medium to longer term. Topical areas might include explainable AI in credit scoring to drive deeper inclusion, delivery of regulated crypto exchanges, the implementation of off-line payments with CBDC, or reducing systemic risk in a limited number of cloud service providers.

The economic benefit of delivering these types of solutions would be widespread. As new markets are created, firms are able to deploy new technologies with confidence, and consumers benefit from improved products and services. Individual firms are also inspired to undertake further R&D as new network solutions become available to gain competitive advantage. New developments like Open Banking have increased innovation and competition.

New market creation also provides opportunity for tax revenue generation, operating licensing, and levying. We do not quantify these benefits here, but the experience of the UK in widening financial market access in the 1980s and 1990s shows the potential enormous benefits of becoming an early implementer of market solutions.

More recent international experience shows how the implementation of the new technologies, like the India Stack⁽¹⁾ or Brazilian Pix payment system⁽²⁾, can catalyse significant innovation while also delivering greater financial inclusion. The UK could capitalise on new technology in the same way to modernise its systems, so that it maintains its leading position into the future.

1. [India Stack](#) is the moniker for a set of open APIs and digital public goods that aim to unlock the economic primitives of identity, data, and payments at population scale.
2. [Pix is one of the world's most used instant payment systems \(bcb.gov.br\)](#)

Organic venture creation

We envisage the new markets created by solving the system-level challenges will increasingly be served by university-born ventures in new technologies e.g. artificial intelligence for scoring, language processing for disclosure and compliance, new personalisation of products and services. Cytora and RegGenome (see below) are both examples of ground-breaking digital finance offerings from university research. A more coordinated academic-industry ecosystem, and further investments will see the proliferation of many more such ventures.

UK spin-outs significantly contribute to the regional and national economy through various channels. Spin-outs in the UK alone exceeded £2 billion in turnover and employed over 30,000 people⁽³⁾. Looking to the field of digital finance, we can estimate the potential returns from organic venture creation by drawing on other fields, such as the returns on investment achieved in bioscience as reported by UKRI, (9.8:1)⁽⁴⁾. Based upon this, we project the returns which would arise from £100m per annum equivalent investment in digital finance, rising to £150m per annum after 5 years. These are shown in the table below, and sum to a total direct economic value therefore accruing from investment in digital financial services would sum to £8.2bn by 2035. This estimate is a lower bound on the potential economic benefits from this sector as it excludes the market-making opportunities from investment in digital financial services or the economic benefits to citizens from improved services. The benefits of network development could be substantially higher.

3. [Data from Beauhurst](#)

4. [Publicly backed bioscience spin-outs make big impact on economy – UKRI](#)

Projected Direct Economic Benefits

	Phase 1	Phase 2	Phase 3
Time period	0-5 years	5-10 years	10-12 years
GVA per annum	£200m	£600m	£1.4bn
Employment	3,000	12,000	30,000
Spin-outs	150	600	1,500

Productivity uplift and levelling

Digital finance also presents a prime opportunity to realise economic benefits across the regions of the UK due to the network of universities hosting the R&D ecosystem. According to the Russell Group, in 2020/21 more than 56,000 jobs and almost £6bn of investment were generated by spin-out companies and start-ups linked to just 24 of the UK's leading universities⁽¹⁾.

An advantage of the digital finance sector is that innovations in the R&D ecosystem can be scaled across universities without the requirement for significant capital investment in facilities or equipment. Instead, the digital deployment of the ecosystem itself support fast scaling, equality of access and market deepening within the university sector spread across the regions.

Societal Benefit

The economic benefits arising from the new ecosystem will extend to wide societal benefits as digital finance innovation is a positive force for enhancing business viability, consumer protection and helping to solve long-term financial challenges in the UK. A more focused and less piecemeal approach to academic investment in digital financial services could be directed to address key challenges. For instance,

- Financial inclusion:** lack of data, low quality credit⁽²⁾ files and outdated credit scoring models contribute to an estimated £3bn gap in the provision of affordable credit which new AI-led modules could help address. 24% of the population are affected by at least one poverty premium costing the economy £2.8bn which new payment systems and products could reduce⁽³⁾. Data provides for greater personalisation but could lead to wider financial exclusion – new research could help create new technologies and business models that are more inclusive by design and more informed by people's lived experience of financial services. Consumers and small business could stand to gain £18bn from a greater roll out of Open Finance, access to credit and productivity gains⁽⁴⁾.
- Health and wealth in an ageing population:** the number of people aged 65-79 is set to increase by a third to over 10 million in the next 40 years. The way we are living is also changing and by 2043 4.5m people over 65 are expected to live alone⁽⁵⁾. Changes in health tech will play an important role in digital financial services as there is an increasing focus on staying healthy, accessing healthcare and solving the predicted £25tn retirement savings gap⁽⁶⁾. More seamless integration of welfare, tax benefits and financial services could reduce pensioner poverty and address gender imbalances⁽⁷⁾.
- Security and resilience** in the face of growing scams and fraud. Fraud is the most commonly experienced crime in the UK⁽⁸⁾. Technology is already helping to identify and stop fraud and scams. New approaches to anti-money laundering are desperately needed. Quantum computing power will bring new solutions (and challenges) for financial services.
- Climate change:** the UK has pledged to meet net zero by 2050. This will require change in all sectors and affect everything from consumer spending to agricultural insurance.

1. [russellgroup.ac.uk/news/jobs-and-investment-boosted-in-every-region-of-uk-by-new-businesses-linked-to-russell-group-universities/](https://www.russellgroup.ac.uk/news/jobs-and-investment-boosted-in-every-region-of-uk-by-new-businesses-linked-to-russell-group-universities/)
 2. [220916-Scaling-affordable-credit-provision-roundtable-read-out-v09.pdf](https://www.fair4allfinance.org.uk/wp-content/uploads/2020/09/220916-Scaling-affordable-credit-provision-roundtable-read-out-v09.pdf) (fair4allfinance.org.uk)
 3. [What is the Poverty Premium - Fair by design](https://www.fair4allfinance.org.uk/what-is-the-poverty-premium-fair-by-design)
 4. [Consumer Priorities for Open Banking_V4.indd](#)

5. [Our Ageing Population | The State of Ageing 2023-24](https://www.ageing-better.org.uk/our-ageing-population-the-state-of-ageing-2023-24) | Centre for Ageing Better (ageing-better.org.uk)
 6. [WP How We Can Save for Our Future report 2018.pdf](https://www.weforum.org/reports/wp-how-we-can-save-for-our-future-report-2018) (weforum.org)
 7. [How do we defuse the pensioner poverty time bomb?](https://www.jrf.org.uk/defuse-the-pensioner-poverty-time-bomb) | Joseph Rowntree Foundation (jrf.org.uk)
 8. [Fraud - National Crime Agency](https://www.ncra.gov.uk/fraud)

4.0 Feasibility and current examples of success

Why is university-focused R&D investment in the future of digital finance right for the UK? There are good reasons to believe that the UK economy is the ideal context for this investment globally, and that the steps to success can be achieved:

We already have massive strength in both our academia and digital financial services. The proposition is to effectively realise the “missing synergy” between the great UK strengths of digital financial services innovation and universities’ academic prowess:

- 1 The UK has the world’s second largest financial services centre and in 2021 contributed 8.3% of total economic output, over 1 million jobs and approximately £160bn to GDP⁽¹⁾
- 2 In 2023, digital finance attracted \$5.1bn dollars in investment across 409 deals (this was down from \$14.6bn across 592 deals in 2022 due to market conditions). The UK is second only to the USA as a recipient of this investment⁽²⁾
- 3 UK is second only to Singapore in terms of private digital finance investment per capita and as a percentage of GDP⁽³⁾
- 4 The UK also has a concentration of the world’s leading research-intensive universities (QS, 2024) which performed £14.9 billion (25%) of the UK’s R&D in 2021⁽⁴⁾
- 5 Foreign Direct Investment into UK universities created 60,372 jobs in the UK in 2021⁽⁵⁾ (the highest in Europe)
- 6 In addition, we have a strong track record of commercialisation of university ventures in other sectors, e.g., pharmacy, propulsion technologies, emerging artificial intelligence.

Despite the challenges highlighted in this review of delivering commercial university R&D in digital finance, **there are several good examples of successful university inspired ventures that have had commercial success and high impact on policy and regulation.** Some leading examples are listed below and demonstrate different commercialisation pathways including commercialisation of research, academia and industry collaboration and university support for student and alumni enterprises.

RegGenome

RegGenome, a regulatory data provider transforming how the world produces and consumes regulation using ML and NLP, benefited from a central body: Cambridge Centre for Alternative Finance (CCAF). CCAF promotes collaboration between academics and companies to commercialise research. As a result, RegGenome has successfully educated 2,600 regulatory bankers, without CCAF’s internship and secondment opportunities this would have been much harder to achieve. RegGenome offers services using AI-driven data technologies to create regulatory solutions to achieve compliance and operational excellence.

Cytora

Cytora is a Cambridge founded analytics platform that gathers and analyses data about global geopolitical risks and is used in most major financial institutions to mitigate global risks to their financial services activities. With the help of Cambridge Enterprise – which supports the University of Cambridge to achieve knowledge transfer and research impact - Cytora raised £2.4 million in series A funding. Cambridge Enterprise proved crucial in linking Cytora, a high potential startup at the time, to investors and public capital. Public capital plays a crucial role for spin-outs, with support from public funding bodies such as UKRI and British Business Bank (BBB) raising 4.6x external equity on average, compared to 2.9x equity for those without public funding.

1. [researchbriefings.files.parliament.uk/documents/SN06193/SN06193.pdf \(parliament.uk\)](https://researchbriefings.files.parliament.uk/documents/SN06193/SN06193.pdf)
2. [Press Release: In 2023 levels of global investment in FinTech decreased amid economic slowdown - Innovate Finance – The Voice of Global FinTech](#)
3. [Why is the UK so successful in FinTech? - FTAdviser](#)
4. [Research and development spending - House of Commons Library \(parliament.uk\)](#)
5. [Foreign Direct Investment into universities: Towards a national strategy - HEPI](#)

Onfido

Onfido is an ID verification software business that was founded in 2012 by three Oxford students. Using the Oxford University Innovation incubator, they gained £120k of funding in 2013 from a venture firm. (Notably, the Oxford Innovation incubator recently cut its equity requirement from 10% to 5% following an overhaul of its framework.)

Quantum Dice

Quantum Dice is a spin-out from University of Oxford's quantum optics laboratory. Having raised £5.5m in equity and grant funding, they are developing a protocol to provide trusted and secure randomness leveraging the unique properties of quantum systems. They are now working with large financial services institutions to bring true randomness to their stochastic modelling.

Funding Circle

Funding Circle, started by a group of Oxford students is one of the most successful UK FinTechs of the past decade, connects small to medium enterprises with potential investors via peer-to-peer lending. Funding Circle grew through the UK government facilitating £20m of loans, enabling it to grow and secure £160m of private loans and a seed round of £45m funding via venture capital. Since 2010, the firm has funded more than 150,000 business with £16.9 billion and listed on the London Stock Exchange in 2018.

Amplified Global

Amplified Global uses AI and machine learning to simplify complex legal and regulatory communications and provide an audit trail for customers. It is an industry-led start up that brought in academic leadership at the beginning of its journey following the founder's attendance at university-led training in AI for founders. Amplified Global provided masters students at UCL with industry projects which have led to acceleration in its product development. It's Lead Machine Learning Engineer is graduate from this UCL collaboration. The academic lead has invested in Amplified Global using funds from other companies they have spun-out and leveraged industry contacts to enable acceleration from a key law company.

INFINITY (Inclusive Financial Technology Hub, a collaboration of the Universities of Nottingham, Birmingham and Warwick)

An early finding from the INFINITY project is that there is a much wider, latent interest in commercialisation among researchers in UK universities. The INFINITY accelerator programme is hosting new ventures in a wide range of topics in digital financial services i) application of artificial intelligence to unstructured financial data, ii) application of machine learning methods to modelling uncertainty in valuations, iii) design of standards for explainable machine learning in credit scoring, iv) creation of new valuation models for housing portfolio diversification, v) application of natural language processing methods to readability of financial terms and conditions. These ventures are giving rise to commercial opportunities in a variety of forms including: spin-out companies, licensing deals, shared royalty ventures, open IP standards.



UKFIN+

UKFin+ is an EPSRC funded programme of funding, whose aim is to bridge the gap that currently exists between the research in universities and the needs of the financial services industry, consumers, and regulators. Based on an inclusive, diverse and responsible research culture it will harmonize technological know-how across regions.

The goal of UKFin+ is to create a community of researchers, innovators, regulators, and practitioners that sustains beyond the initial funding, and are actively collaborating to create more competitive, trusted and socially relevant financial services which are underpinned by responsibly designed, implemented and adopted technologies.

Future Finance 4 All

Funded by Innovate UK and the UK Research and Innovation's Economic and Social Research Council (ESRC), the innovation adoption accelerator based at the University of Bristol will work closely with smaller financial services firms to understand the challenges they face and explore how technology and innovation can help over those issues and make a tangible difference to their businesses. The accelerator is designed to be highly collaborative, bringing together smaller financial services firms with experts in technology and innovation to work together to find solutions. Ultimately, the aim is to help these smaller financial services firms better serve the needs of their existing customers but also to reach new customer bases, whether those are individuals or enterprises.

Policy and regulation impact

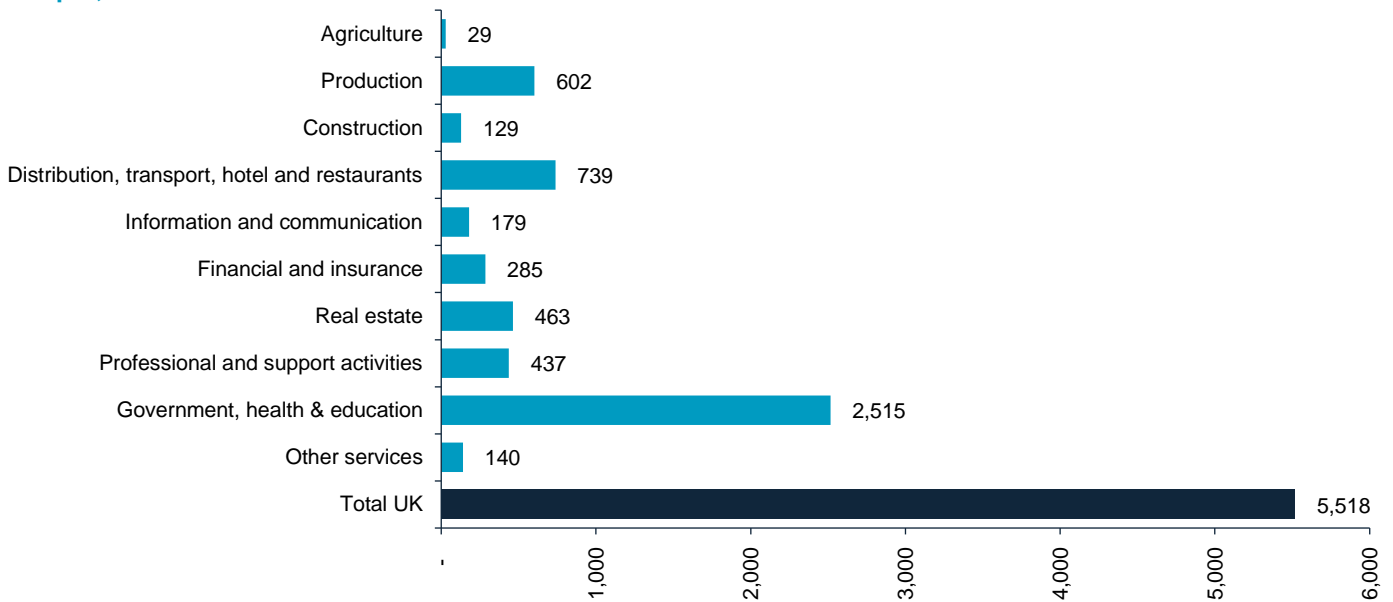
There are also examples of academic research having impact on regulation and policy-making in the UK. In consumer protection, UK-based academics including those from the INFINITY group at Nottingham and Warwick have been involved in the background research for, plus design and implementation of major consumer protection initiatives from the Financial Conduct Authority (FCA) including the design of the price-cap on payday lending and in the rent-to-own market, the Credit Card Market Study, and more recently the design of research into consumer behaviour on trading apps. UK-based academics serve on the board of the Competition and Market Authority, regularly advising on market investigations. Chief Scientific Advisors at DCMS have contributed to the design of legislation regulating the digital economy. Academics at the London School of Economics and Political Science (LSE) worked with the FCA's Financial Services Consumer Panel identified gaps in protection for consumers of Open Banking which the FCA subsequently closed⁽¹⁾. The University of Manchester's presence on the HM Treasury's Open Finance Taskforce⁽²⁾ brought academic expertise to inform industry activity. Academic research has also been part of the UK export of Open Banking Expertise through academic knowledge exchange to countries such as Canada and via the Bank for International Settlements. In these ways, there is already strong interaction between researchers and policymakers in this space.

1. [Ensuring fair treatment for Open Banking customers \(lse.ac.uk\)](https://www.lse.ac.uk)
2. [HMT Open Finance Taskforce - The Centre for Finance, Innovation and Technology \(CFIT\)](https://www.cfit.ac.uk)

Investment in academia has proven high returns. Analysis on Russell Group Research⁽¹⁾ shows a return of 8.5x to the national economy. The same research indicated that “the Russell Group universities’ wider knowledge exchange activities resulted in particularly large impacts within the government, health & education (£2,515 million, 46%), the distribution, transport, hotels, and restaurant sector (£739 million, 13%), and the production sector (£602 million, 11%).” The current value to finance and insurance is £285m.

Estimated total economic impact associated with Russell Group universities’ knowledge exchange activities in 2021/22, by sector

Output, £m



1. [Research-intensive universities generate nearly £38 billion for UK economy through research, innovation and the creation of new businesses, new analysis reveals \(russellgroup.ac.uk\)](https://www.russellgroup.ac.uk/research-intensive-universities-generate-nearly-38-billion-for-uk-economy-through-research-innovation-and-the-creation-of-new-businesses-new-analysis-reveals)

5.0 Recommendations

We recommend that:

1. the UK moves from its existing 'organic' ecosystem' to a 'coordinated ecosystem' i.e. an ecosystem that builds on its current strengths but addresses the challenges, aligns R&D to agreed priorities and maximises the returns for all participants. We set out in this section a series of further recommendations that form the basis of achieving this outcome
2. there is an increase in the level of central UKRI investment into this ecosystem and its underlying projects in order to achieve the economic case (which is based on a £100m p.a. investment)

Recommendations to support the implementation of a 'coordinated ecosystem':

Recommendation 1

An investment framework be developed to align R&D investment to priority investment areas in digital financial services

Development of an appropriate framework to govern how investment is made, and return realised, is key to the success of a coordinated ecosystem. We recommend that a framework be developed based on the following principles:

- Alignment of a research programme to an agreed set of key economic and social challenges, for instance: financial inclusion, an ageing population, fraud, scams, cybersecurity and resilience, and climate change
- Prioritisation of economic growth and productivity through creation of a unified research and development portfolio reflecting the technology and innovation needs of the sector over the next 5-10 years
- Alignment of funding options so they are integrated with commercialisation support, venture building programmes and networks of private investors, and facilitate a pipeline of translational research and development to proof of concept and spin-outs
- Proactive promotion of diversity, equity and inclusion across the commercialisation journey to reduce barriers to engagement and improve sustainability of spin-outs
- A focus on regional equality in the UK and centres of excellence outside the Golden Triangle to maximise wider academic and business school capacity. Targeted investment across regional financial hubs should build on existing clusters of digital finance firms establishing a physical presence (in partnership with local universities) to deliver local economic benefit.

Recommendation 2

Commercialisation pathways are improved to facilitate effective transition of research to commercial value

We recommend the adoption of the recommendations from the "Independent Review of University Spin-out Companies" and subsequent DSIT response "Evolution of the Research, Development and Innovation Organisational Landscape". Acknowledging these recommendations, we suggest focusing on developing the below commercial pathways:

- Creation of standardised market terms, avoiding unnecessary negotiations and recognising that digital financial services are aligned closer to soft-IP categories in the proposed equity share models suggested in the sector (e.g. 10-25% university equity)
- Development of software and hardware-based spin-out commercialisation guidance (different IP intensities). Build on USIT guidance⁽¹⁾ to develop a template for spin-out term sheets, similar to US-BOLT
- Greater data and transparency through the creation of a register containing deal terms, commercial value and economic benefits (i.e. beyond those of the financial returns to the specific institution)
- Development of workplace experience as valuable academic currency and increased funding for "academic returner" fellowships, addressing the very low rates of returners in this sector wishing to return to academia from the private sector
- Increase founder access to support from individuals and organisations with experience in operating successful high-tech start-ups including commercialisation and entrepreneurship
- Increase government funding for proof-of-concept to develop confidence prior to spinning-out.

1. [The USIT Guide: Leading Universities and Investors Launch Set of Recommendations for the Innovation Sector — TenU \(ten-u.org\)](https://www.ten-u.org/recommendations-for-the-innovation-sector)

Recommendation 3

An IP framework be developed that is specific to digital financial services recognising the idiosyncrasies of the market

Like other sectors, digital financial services faces challenges to the commercialisation of research particularly in relation to contracting and managing IP. However, innovation in digital financial services faces an additional, particular challenge, because the nature of its intellectual property is less well defined.

We propose that:

- “Ownership” of IP remains consistent with established arrangements with regards to patentable IP, i.e. the University retains “ownership” with the academic benefitting typically through royalties or equity
- Existing legal arrangements are used to protect the IP – trade secrets, copyright, know-how, with associated licensing. These may need developing in a university context, with innovation in licensing and audit arrangements to ensure greater protection
- Equity ownership in any spin-out be used to ensure other interested parties that have invested early benefit from the commercialisation, as opposed to using complex IP ownership arrangements
- Where appropriate, new forms of revenue generation from IP are developed, such as licensable code databases available to market participants on a subscription basis, realising the value of codebases as digital assets
- A central register for commercial value and impact be developed and owned by a convening body that would a) provide proof points as to the realisation of value from investment, b) act as an access point for any organisation seeking to understand and leverage academic IP, potentially on a subscription basis to provide a funding mechanism for the convening body.

Recommendation 4

Data access protocols be developed to allow R&D capability to have more access to underlying Industry data

The value of R&D can only be realised with appropriate access to customer and industry data sets. This is particularly the case for digital finance innovation, where data is a key ingredient, and even more urgent as we move into an AI world. While open data and synthetic data offer some solutions, innovations can only be hard tested using real customer and firm data. We therefore recommend the creation of a protocol (i.e. a standardised access contract for academia) for data access by university researchers:

- The design of the protocol should draw upon current successful examples of researchers accessing customer and firm data from financial institutions, such as retail banks and credit reference agencies, for transformative research
- New protocols should be designed in conjunction with industry bodies, and the Financial Conduct Authority, to ensure they are fit for purpose and have support from both the sector and the financial regulator
- Design considerations should take into account development of good governance and API standards to ensure access, security and consumer protection
- The protocol should set out the potential for banks to obtain minor spin-out equity to encourage data sharing.



Recommendation 5

A central body should be appointed and mandated to convene and coordinate the ecosystem

To maximise the return on investment, a central body should be appointed to convene industry, academia, investors, founders, incubators and accelerators to create the underpinning network for an entrepreneurial ecosystem. This body would be responsible for working with the ecosystem to set priorities and work with UKRI to ensure its value is realised. We recommend that an existing body be commissioned to do this.

Specifically, it would:

- be given a mandate to bring together the complex ecosystem to identify the portfolio of research and development priorities for the sector
- advise UKRI on funding allocation and the design of funding schemes which are more agile and responsive to academic needs, ensuring timing of funding is integrated with commercialisation support and venture building programmes
- act as a central point to attract private capital, both domestic and international, including matched funding and other industry support from global financial partners
- act as a centre of excellence and provide guidance for Technology Transfer Organisations (TTO), providing sector specific TTO services for universities (especially smaller ones)
- work with universities to create technology transfer pathways appropriate for digital finance (including benchmarking / best practice models for contracts, IP, legal support etc)
- own the register for commercial value and impact to support the Research Excellence Framework and create incentives for academics to engage
- have a focus on aligning funding so it's 'integrated with commercialisation support and venture building 'programmes' which the Independent Review of University Spin-out Companies identified was a problem for spin-outs (alongside limited funding from UKRI).



6.0 Next steps

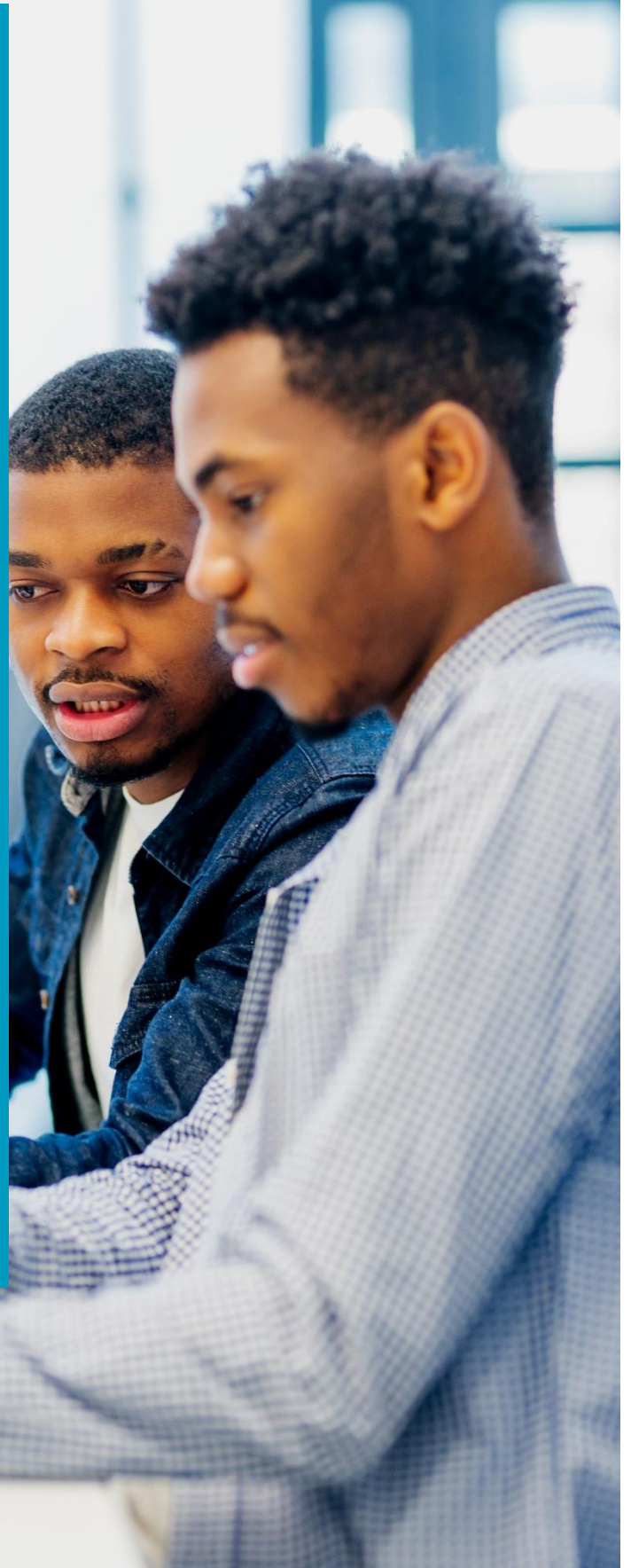
We suggest a phased approach to creation of the new ecosystem.

To realise the economic case, and get in place the coordinated ecosystem envisaged in this report is likely to be a 3 year journey. It requires investment at three levels:

1. An increase in the allocation of UKRI research funding to digital financial services. There is potential to resource this activity through the UK's existing innovation budget, through programmes such as the Next Generation Service and Connecting Capabilities programmes, and related funding streams within the resource portfolio
2. Project funding to develop the recommendations above
3. Core ongoing funding to co-ordinate the ecosystem. Likely to take the form of increased funding to an existing industry body.

There are three significant streams of activity required in order to move forward for which project funding is required on a phased basis:

1. Identification of national priorities for R&D investment, by convening the ecosystem in a structured way, assessing investment levels and returns, developing the investment framework to oversee it aligned to the principles set out earlier, and working with investors to outline "investable vehicles" for private funding solutions
2. Establishment of operational support to the ecosystem – development of IP frameworks and commercial pathways, development of the IP framework and data access protocols and definition of other supporting services to TTOs (in conjunction with TenU) such as training and mentoring
3. Enablement of a central convening and coordinating body. Creation and commissioning of a mandate to operate with associated funding and convene academia and industry.



7.0 Appendix

Appendix 1 Recommendations of the Independent Review of University Spin-Out Companies

Recommendation 1	Accelerate towards innovation-friendly university policies that all parties, including investors, should adhere to where they are underpinned by guidance between investors, founders and universities
Recommendation 2	More data and transparency on spin-outs through a national register of spin-outs, and universities publishing more information about their typical deal terms. The Higher Education Statistic Authority's ongoing review of the Higher Education Business & Community Interaction (HE-BCI) dataset must present solutions to improve the reliability of data on spin-outs.
Recommendation 3	HEIF should be used to reduce the need for universities to cover the cost of technology transfer offices (TTOs) from spin-out income. Given the HEIF equivalent are lower in the devolved administrations, the devolved governments may want to consider the findings of this review and provide additional support for their universities.
Recommendation 4	Create shared TTOs to help build scale and critical mass in the spin-out space for smaller research universities. These could be operated through collaboration with established university TTOs and could be implemented at a regional or sector-wide level. We note that the latter may be particularly of interest to spin-outs from the social sciences, humanities and the arts.
Recommendation 5	Government should increase funding for proof-of-concept funds to develop confidence in the concept prior to spinning-out. These should integrate with the timing and offering of commercialisation support and venture-building programmes. Investors should lend their expertise to assessing funding bids for proof-of-concept and translational funds.
Recommendation 6	In developing the 'engagement & impact' and 'people & culture' elements of REF 2028, the four Higher Education Funding Bodies should ensure that the guidance and criteria strongly emphasise the importance of research commercialisation, spin-outs, and social ventures as a former research impact.
Recommendation 7	<p>Founders need access to support from individuals and organisations with experience of operating successful high-tech start-ups, regardless of the region founders are base in or sector they operate in. The existing landscape of support services needs both consolidation and targeted expansion to ensure that founders have access to:</p> <ul style="list-style-type: none"> • Advice, support, or representation in negotiations with universities and investors. • Training on entrepreneurship and commercialisation • Support for business building activities: provide support to identify the commercial proposition of spin-outs, build a business case, access customers, help connect Independent review of university spin-out companies investors with spin-outs, and help identify experienced and diverse people to join as early employees, advisors, and board members. • Access to part-time or on-call professional support in law, finance, or operations in early stages before permanent hires are needed. • Access to shared equipment and facilities for rent.
Recommendation 8	UK Research and Innovation (UKRI) should ensure that all PhD students they fund have a voluntary option of attending high-quality entrepreneurship training and increase the opportunities for them to undertake internships in local spin-outs, venture capital firms or TTOs.
Recommendation 9	Recognising the important role that the university-affiliated funds have played in helping spin-outs from some regions access finance, universities considering working with new affiliated investment funds should continue to ensure they are still able to attract a wider set of investors and encourage competition when agreeing such deals.
Recommendation 10	We welcome ongoing reforms to support scale-up capital, such as changes to pensions regulation and encourage the government to accelerate these efforts. Government should continue its reforms to ensure that UK capital markets are able to provide the financing to incentivise companies to stay in the UK.
Recommendation 11	<p>Government should improve the provision of funds to enable movement or porosity between academia and industry, including through:</p> <ul style="list-style-type: none"> • Funds that 'buy out' academic time to focus on commercial partnerships and potential ventures. Or adapting funds for industry collaboration to be more accessible to spin-out founders. • An 'academic returner' fellowship for researchers wishing to return to academia from the private sector.

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