

# **SFC Alliances for Research Challenges (ARCs)**

## **Outline structure for expressions of interest**

### **1. A cover sheet which includes:**

#### *A) Relevant contact details.*

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Marc.Cowling@derby.ac.uk

#### *B) Interested partner universities/organisations.*

University of Edinburgh (UoE), University of St Andrews (UoSA), University of Derby (UoD),  
Scottish Parliament and Fintech Scotland.

#### *C) Disciplines that would be included.*

Small Business Economics, Small Business Finance and Entrepreneurship, Data Science and  
Economic Geography.

## **2. A brief description of the proposed challenge area, including:**

*A) How it aligns with Scottish Government priorities (through reference to key strategy and/or policy documents or otherwise).*

This proposal outlines a small and medium-sized enterprises (SME) growth challenge to help aid economic recovery post-Covid. It aims to contribute to the [Scottish Government Covid Recovery Strategy](#), assess the implementation of the [National Strategy for Economic Transformation](#), and contribute to [Scotland's ambition to become a tech nation](#). The work will yield valuable insights to help unlock economic and productivity growth in a period of profound instability.

SMEs are a crucially important part of the economic system that make up the Scottish economy. As such, they play a key role in promoting and stimulating economic dynamism, job creation and growth through their contribution to innovation, competitiveness and productive 'churn' (Thurik and Wennekers, 2004). It follows that the ability of smaller firms to access finance (and when they do on reasonable terms given their relative risk) is crucial in order that these firms can fund the level of investment that maximises their growth potential (Beck and Demirguc-Kunt, 2006) and also their efficiency. Lack of finance not only reduces the rate of new business information, but it impedes the ability of existing firms to grow and can endanger their survival (Cowling, Brown, and Rocha, 2020). Specifically, external finance is an important part of the market mechanism that facilitates the efficient allocation of resources within economic systems (Ball, 2009).

The Covid-19 pandemic created an unprecedented economic shock, potentially surpassing the global financial crisis in 2007/8. The impact of the pandemic is being compounded by the ongoing shock caused by Brexit which has been especially damaging to export-oriented SMEs (Brown et al, 2019). Several empirical studies (Calabrese et al., 2019 and 2020; Lee and Calabrese, 2018) show SMEs are heavily impacted by economic shocks due to financial instability and liquidity problems (Calabrese et al., 2020). Around 8,000-10,000 Scottish SMEs may be under immediate threat of closure due to a lack of cash reserves, a further 30,000 to 40,000 are in financial distress during the pandemic (Brown, 2020). The Coronavirus Business Interruption Loan (CBILS) and the Bounce Back Loan (BBLs) were two short-term schemes designed by the UK government to support SMEs during the pandemic (Calabrese et al., 2022).

Some types of SMEs such as knowledge-intensive and business services have been particularly adversely impacted due to a rapid decline in sources of equity finance during the pandemic, especially seed stage finance for start-ups (Brown et al, 2020). These types of firms are likely to play a disproportionate role in the economic recovery in years to come when they scale-up into larger businesses. Scale-ups play a pivotal role in economic development and help generate more than half of all new job creation (Brown et al, 2017). In order for these firms to grow it is crucial that the Scottish Entrepreneurial Ecosystem can sustain and nurture these important ventures with the necessary resources such as finance, human capital and innovation.

Ensuring that smaller firms have access to adequate finance for investment and growth is an important priority for Scottish policy-makers. However, the Covid-19 pandemic has meant that the current position of many Scottish SMEs is tangibly weaker than it was in 2019. They are cash-poor, loaded with debt, and facing tremendous pressure in terms of accessing raw materials and general increases in the costs of energy, materials, labour and capital. All of these factors will constrain the ability of the Scottish SME sector to play a major role in the recovery and growth of the Scottish economy in the post-Covid era. This is where our proposed research will focus. Firstly, we will establish the current state of play for SMEs in Scotland in respect of finance and investment. Then we turn our attention to offering detailed and nuanced

recommendations for policy development that will stimulate new investment in the SME sector as a critical building block in the process through which SMEs can deliver the growth in jobs, sales and productivity that will drive the economy forward.

To achieve these goals, we will gather data from a variety of different sources at firm level in order to build different measures of firms' performance indicators that would allow us to identify changes due to the Covid-19 pandemic. We will mainly use two datasets: one on the Covid government loans (CBILS and BLS) provided to Scottish SMEs and one on business account and performance of business loans and credit cards provided by Smart Data Foundry. Another strand of the research will involve a longitudinal tracking study of a cohort of Scottish scale-ups using the database Crunchbase. A subset of these firms involved in the country's most successful private sector business incubators such as Codebase will also be examined in-depth. Based on the results of these analyses, we will shape data-driven policies that can effectively and efficiently target support towards SMEs and current and potential scale-ups. We will also focus the government's attention on geographic areas that are more entrepreneurial and or with strong potential for economic growth, in line with Scotland's National Strategy for Economic Transformation. In turn, this will create concrete mechanisms that helps the government to support key players in the Scottish economy -i.e. SMEs and Scale-ups – for example through improving their productivity, export activity, survival rate and access to finance. These represent some of the [key transformational programmes of action](#) to improve Scotland's economy. Given the central role of SMEs in the Scottish economy, providing the adequate support to these companies to survive and adapt to the Covid-19 pandemic will have a huge impact on future welfare in Scotland and will ensure "fairer and more equal economic opportunities".

## **B) The nature of the multidisciplinary response required and how areas of evidenced Scottish sector research excellence and quality would be required to be involved.**

The researchers involved in the project have a multidisciplinary expertise that is necessary to be able to provide comprehensive policy recommendations to support small businesses in Scotland. Raffaella Calabrese is Professor in Data Science at the University of Edinburgh Business School. As data scientist, Raffaella has ten years' experience analysing data on SMEs and developing an applying innovative spatial econometric models. As academic fellow at the Scottish Parliament, Raffaella is working closely with researchers at the Scottish Parliament Information Centre (SPICE) and at the Economy, Energy, and Fair Work Committee understand the best ways of supporting Scottish SMEs that face challenges as an effect of the COVID-19 pandemic. Raffaella has attracted £1.2mln in funding since 2013. She has authored/co-authored 25 journal articles published in AJG 3 and 4 journals. Raffaella is part of the Fintech stream at EFI and Director of the Fintech PhD programme. For these roles, Raffaella is working closely with Fintech Scotland that will be involved in this project.

Ross Brown is Professor in Entrepreneurship and Small Business Finance at the School of Management, University of St Andrews. He is a recognised expert in the areas of entrepreneurship, high growth firms, small business finance and entrepreneurship policies. He regularly undertakes research and consultancy assignments for various national governmental departments and international organisations such as the EU/OECD and the World Bank. His ground-breaking work on entrepreneurial ecosystems for the OECD has influenced governments and policy makers around the World. In recognition of the policy-oriented nature of his work he was appointed to the Evaluation Panel of London School of Economics "What Works" policy programme and the Peer Review Group of the Department of Business, Energy and Industrial Strategy. He is currently advising BEIS on the economic evaluations being undertaken of their Covid-19 business support programme.

Dr Augusto Rocha is a Lecturer in Entrepreneurship and Innovation at the University of Edinburgh Business School. His main research interests are entrepreneurial ecosystems, regional development, entrepreneurial finance and growth-oriented entrepreneurship. He has benefited from a background in computer science to explore and develop uncommon metrics allowing a unique view of how entrepreneurial conversations and finance flow within diverse ecosystems. These uncommon metrics include analysing live data sources for equity finance.

Professor Marc Cowling is ranked in the top 7% of economists in the world by citations (H-index) according to Research Publications in Economics (REPEC, January 2021), and in the Top 2% of researchers in the world by Stanford University. He is a member of the Innovate UK Innovation Caucus and the ESRC Productivity Insight Network. Marc has spent the last 30 years researching in 4 core areas: The Dynamics of Early Stage Survival and Growth; The Financing of SMEs and Entrepreneurial Businesses; Labour Market Dynamics, and; Evaluating Public Policy. He is Professor of Business Economics and Head of Research & Innovation at the College of Business, Law and Social Sciences at the University of Derby.

An academic collaborator of this project is Edinburgh Futures Institute (EFI) based at UoE, a multi-disciplinary centre funded by the Data-Innovation Programme. The team of this project will work closely with researchers at the Scottish National Investment Bank, the Scottish Parliament, Fintech Scotland, the new Innovation Accelerator in Glasgow, the Department for Business, Energy and Industrial Strategy and the technology accelerators the SG plan to locate across Scotland.

### **C) Justification of the balance the challenge strikes between breadth and specificity.**

This SME growth challenge will encompass elements of breadth and specificity. In terms of the former, the work will examine SMEs which constitute around 99% of all enterprises in the Scottish economy. It will adopt a national focus so that insights can be obtained regarding the spatial dynamics of firm-level performance within this cohort of firms. In terms of the latter, the work will concentrate on access to finance in SMEs given its crucial role in unlocking growth in small firms. A particular emphasis will be placed on innovative firms who often face the most endemic limitations accessing finance. The focus on Scale-ups is key given their disproportionate role in promoting growth within the economy. Finally, sectoral and spatial analysis will reveal most in need of assistance to enable future growth.

### **3. Suggested future or current defined funding opportunity(ies) which an ARC focused on this challenge would be well-placed to target.**

Professor Cowling is the Principal Investigator and Calabrese and Brown are Co-Investigators of the three years project "Understanding how constraints on access to finance and under-investment impact on productivity growth in smaller firms" that attracted £1.9m ESRC funding (ES/W010259/1). The ESRC project is focused on the productivity growth for small UK companies and offers a number of synergies to benefit this SME Challenge initiative. This project will instead investigate not only productivity growth but also how to open new markets, how to stimulate entrepreneurship, and how to enhance more sustainable, fairer and more equal economic opportunities, in line with [Scotland's National Strategy](#).

### **4. A brief description of the prospective or potential coalition of universities and others involved which could deliver an ARC in this area.** This should indicate who would lead.

Based on the insights of this project, the academics at the UoE, UoSA and Derby will design long-term policy interventions to boost the growth of Scottish SMEs in consultation with policymakers (researchers at the Scottish Parliament and Scottish National Investment

Bank) and business associations in Scotland, for example Fintech Scotland and Scottish Enterprise.

Professor Calabrese at the UoE, expert in Data Science, Small Business Finance and Spatial Econometrics, will lead the project. As academic fellow at the Scottish Parliament, she has the unique opportunity to work collaboratively with researchers at SPICE. She has extensively worked with government bodies (BBB, CMA, Bank of England and Scottish Parliament) and industry (Moody's Analytics, Nationwide, RBS, Barclays, SAS and Equifax) on developing new approaches for analysing access to finance for SMEs.

Professor Brown has also recently liaised with the Finance and Economy Secretary, Kate Forbes MSP, to help inform the Scottish Government's work on the Scottish Entrepreneurial Ecosystem.

Professor Cowling has spent the past two years working with BEIS, HMT and Innovate UK researching into the effectiveness of the government response to Covid-19 in supporting the business sector. He is an internationally recognised expert in SME finance and policy instruments and has produced 60 sponsored reports and policy evaluations in the UK for DBEIS, HMRC, HSE, DWP, Investors in People, and the Department for Education. Internationally, he has evaluated the European Investment Fund regional financing instruments for DG Regio and the performance of Cohesion Funds 2007-2013. He also conducted evaluations of the Danish Growth Fund for the Danish Ministry, Swedish Regional VC Schemes for the Swedish Growth Agency, and the Australian Innovation Investment Fund for DIISR.

Due to their extensive policy maker connections, the project team can design the policies to effectively support SMEs in Scotland. The outputs of this project will be presented to the Economy, Energy, and Fair Work Committee of the Scottish Parliament. Fintech Scotland and Scottish Enterprise will be provided with crucial insights to shape the interventions for Scottish SMEs. This can also feed into the main goals and objectives of the recently established Scottish National Investment Bank.

## **5. The added benefit that would be brought by SFC funding.**

SFC funding could help piggyback on a major ESRC grant recently awarded to Professors Cowling, Brown and Calabrese. As the ESRC project "Understanding how constraints on access to finance and under-investment impact on productivity growth in smaller firms" is focused on all the UK, the main benefit of SFC funding is to develop an analysis that is concentrated on Scotland. Two postdoctoral researchers, one based at the UoE and one at the UoSA, to support the delivery of the project. The researcher based at the UoE will be a data scientist who will analyse the datasets provided by Smart Data Foundry. The researcher based at the UoSA will analyse how knowledge-intensive businesses should develop new strategies to overcome challenges of attracting equity finance. This would provide a huge developmental opportunity for two post-doctoral candidates whilst simultaneously aiding the research project with key evidence to inform future public policy.

This SFC challenge project will also strengthen linkages between policy makers and leading Scottish academics whilst simultaneously fostering knowledge exchange between the private sector (Fintech Scotland, Codebase etc) and the research community. Another outcome of the SFC funding will ensure powerful insights and brought to bear for Scottish policy makers to help aid the recovery of the economy post-pandemic. Ultimately, this will increase economic activity and wealth creation in the Scottish economy.