



Enterprise Research Centre

Research Showcase

Tuesday 20th June
The RSA, London

@ERC_UK

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#research





Welcome

Welcome to the Enterprise Research Centre's 2017 Research Showcase event. We're delighted you are able to join us at the RSA for what we hope will be a very interesting day.

We have a packed agenda which reflects the range of research we are currently undertaking at the Centre. During the morning session we will be presenting new findings from our closing research projects, and in the afternoon we are launching four new projects. As ever, we look forward to sharing our research insights and ideas with our key stakeholders, and welcome your feedback and suggestions. The ERC endeavours to provide timely and policy-relevant research on SME growth, innovation and productivity, and events such as this one play an essential part in achieving this.

We hope that you enjoy the day, and we look forward to catching up with you during the breaks.

Stephen Roper, Mark Hart, Vicki Belt



Agenda

ERC Research Showcase Event
10.30am on 20th June, at the Durham Street Auditorium,
RSA House, Durham House Street (off the Strand), London, WC2N 6HG

10.00 – 10.30 Arrival Refreshments

Morning Session Findings from current projects

10.30 – 11.00 [Productivity and internationalisation in SMEs](#)
Jim Love, Areti Gkypali and Stephen Roper

11.10 – 11.40 [Finance barriers to growth and productivity](#)
Stuart Fraser Bo Grace Peng and Stephen Roper

11.40 – 12.00 Break

12.00 – 12.30 [An exploratory study linking SME data to the science base](#)
Bettina Becker, Enrico Vanino and Stephen Roper

12.40 – 13.10 [An Integrated Treatment of Firm Age, Firm Growth and Job Creation](#)
Mark Hart, Michael Anyadike-Danes and Karen Bonner

13.10 – 14.00 Lunch

Afternoon Session Overview of new projects

14.00 – 14.20 [Accessing and using alternative finance](#)
Enrico Vanino and Mike Wright

14.20 – 14.40 [Leadership and management: an activity-based perspective](#)
Kevin Mole

14.40 – 15.00 [Measuring the spillovers from publicly funded R&D activity](#)
Stephen Roper and Nola Hewitt-Dundas

15.00 – 15.20 [Micro-businesses, SMEs, business support and UK productivity](#)
Stephen Roper and Michael Anyadike-Danes

15.20 Tea/coffee and close of the event



Meet the Team



Professor Stephen Roper
Director
Warwick University



Professor Mark Hart
Deputy Director
Aston University



Dr Vicki Belt
Deputy Director
Warwick University



Professor Stuart Fraser
Warwick University



Dr Bettina Becker
Aston University



Dr Kevin Mole
Warwick University



Professor Mike Wright
Imperial College, London



Dr Karen Bonner
Aston University



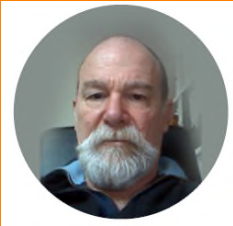
Jiao Liu
Centre Manager
Warwick University



Wendy Ferris
Centre Manager
Aston University



Professor Jim Love
Warwick University



Dr Michael Anyadike-Danes
Aston University



Professor Nola Hewitt-Dundas
Queen's University Belfast



Dr Areti Gkypali
Warwick University



Dr Enrico Vanino
Aston University



Grace Bo Peng
Warwick University



Save the Date

**State of Small Business Britain
Conference 2017**

“Driving Innovation and Growth”

**Thursday September 7th
WBS @ The Shard.**

**Places strictly limited.
Register NOW at
www.enterpriseresearch.ac.uk/events**



Current Projects – Interim findings

Productivity and Internationalisation in SMEs

A constant policy concern is that ‘not enough UK firms export, and trade as a share of the UK economy has grown more slowly than in the rest of the G7 competitors over recent decades’ (Industrial Strategy Green Paper, 2017; p.19). Hence, an interest exists in designing and implementing effective policy schemes aimed at helping non-exporters become exporters, and exporters to remain exporters. To address this challenge, research and policy efforts have been concentrated in identifying factors that not only distinguish exporters from non-exporters, but are also able to secure a long term export status.

However, it may be the case that non-exporting firms may make a strategic decision not to export but still achieve high productivity (Gkypali and Tsekouras, 2015). At any given pre-export stage firms may exhibit various degrees of export readiness and choose either to move forward with, or postpone or even abandon their exporting plans. This in turn suggests that non-exporting firms are heterogeneous in terms of goals and strategies adopted to achieve these goals. Put differently, it may be the case that, at any given time, non-exporting firms may or may not be willing or able to export (Roper et al., 2017).

In this research we focus on the heterogeneity of non-exporters, and we exploit unique information provided by the Longitudinal Small Business Survey (LSBS) for the period 2015-2016 to distinguish three groups of firms: (i) firms planning to export, (ii) firms able to export (i.e. which have suitable products or services), and, (iii) firms that are neither willing nor able to export. As a first stage in our analysis, we ask what features distinguish each non-exporting state in terms of strategies, ambition and demographics. We then proceed with exploring the pre-exporting transitions within a two-year period, and finally we investigate whether transitioning from one (pre)export stage to another is linked with firm performance (i.e. productivity).

Based on our empirical results we confirm previous empirical findings that exporters are more productive than non-exporters irrespective of pre-export stage. Firms that plan to export are ambitious and young, but less productive compared to the rest of the non-exporters. Furthermore, for firms that are able but unwilling to export, innovation matters, and to some extent the same applies for other investment.

Turning to the mapping of the transitions between (pre)export stages, empirical results confirm persistence both of the state of exporting, and of the state of unwillingness and inability to export. Turbulence is observed in the rest of pre-export phases. This suggests that the internationalisation process is a dynamic process, and intermediate pre-export phases serve as a transition to a more steady state. Finally, results suggest that the initial pre-export phase matters for attaining productivity benefits only when switching to another state, however this is not the case for exporting firms which are better off when they remain exporters.



Current Projects – Interim findings

Finance Barriers to Growth and Productivity

Going as far back as the MacMillan (1931), Bolton (1971) and Wilson (1979) Committees, there have been concerns in academic and policy circles about funding gaps in the supply of debt and equity to smaller businesses. More recently attention has been focussed on funding gaps following the Great Financial Crisis of 2007-8 (Rowlands, 2009; Breedon, 2012; NIESR, 2013; Fraser, 2014a).

Evidence of a funding gap is usually interpreted as a gap between the demand and supply of a particular type of finance (Fraser et al, 2015) as manifested, for example in survey data, by an incidence of financial rejection or discouragement (e.g. NIESR, 2013; Fraser 2014a, 2014b; British Business Bank, 2017). However, this can be misleading as rejection/discouragement may signify a lack of viability rather than a missed opportunity (Fraser et al 2015). Therefore it is important to look beyond the funding gap *per se* and examine its relationship with business performance to establish the presence or otherwise of a financial constraint. This research project rectifies the deficiencies of previous research which has either looked at funding gaps, but stopped short of looking at the relationship with business performance, or which has tried to infer financial constraints from a relationship between internal finance and performance.

Two scenarios with very different policy implications can be envisaged in relation to funding gaps. In the first scenario, the funding gap (related to an incidence of rejection or discouragement) has a negative effect on performance (holding constant all other factors that might impact on performance). In this case the relationship points to a financial constraint since performance would have been higher absent the gap; in essence, there has been a missed opportunity. In this scenario policy should be directed towards improving supply through e.g. debt/equity market interventions and promoting diversity in finance markets (e.g., British Business Bank, 2017). In the second scenario, the funding gap has a non-negative (i.e., zero or positive) effect on performance (holding other factors constant). In this case the issue is not a missed opportunity; instead the cause of the 'funding gap' is entrepreneurial misperceptions about funding needs. Policy in this situation should be directed towards improving entrepreneurs' financial skills e.g., through the provision of mentoring and business planning advice (e.g., Business Finance Taskforce, 2010; Fraser, 2014b).

One reason for the lack of research hitherto into the relationship between funding gaps and business performance has been the absence of appropriate data. In short, longitudinal data is required to establish a causal relationship between rejection/discouragement events, experienced by the business at a particular point in time, with its performance at a later time. In this respect, the Longitudinal Small Business Survey (LSBS), which currently tracks business finances and performance in 2015 and 2016 with further waves planned in the future, is beginning to fill the data gap. Preliminary analysis of these data in this project has so far involved a summary analysis of different measures of business performance (in 2016) and previous (2015) financing needs/experiences (relating to debt and equity) along with regressions of performance on previous financing experiences controlling for a wide range of business and owner characteristics.

In terms of previous experiences, the data shows that 10% of business in 2015 needed external finance but felt discouraged from applying; 3% sought external finance but failed to obtain any (failed seeker); 2% sought external finance and were partially successful; 16% sought external finance and were fully successful; and the remainder (69%) had no need for external finance (self-sufficient businesses).

In terms of the impact of financing experiences on business performance, the regression analysis indicates that fully successful seekers are over 50% points more likely to experience employment growth in 2015-16 compared to failed seekers. Also productivity (sales per employee) is almost 7 times higher for fully successful seekers compared to discouraged borrowers; and just under 6 times higher for fully successful seekers compared to failed seekers. Overall these initial findings suggest that funding gaps caused by rejection or discouragement have quite a significant negative impact on firm performance. However the caveat with these findings is that, while they control for systematic observable differences between businesses (due e.g. to firm size, age and sector) there may remain systematic unobservable differences (due e.g. to entrepreneurial talent) which might bias these estimates.

The theoretical framework developed in the research suggests that previous experiences of rejection or discouragement may constrain not only finances but also entrepreneurial learning. This suggests additional testing to examine the impact of previous financing experiences on the entrepreneur's perceived capabilities. In addition it will be important to use more advanced statistical methods, which will allow us to take into account systematic unobservable differences between businesses, so that we can estimate the impacts of funding gaps more robustly.

Looking beyond the current project, with future waves of LSBS it will be possible to investigate how business dynamics unfold over the long term following financing experiences. In particular it will be possible to investigate how financing experiences affect the financial growth cycle (or 'funding escalator') of the business (Berger and Udell, 1998). The financial growth cycle is essentially the idea that the optimal capital structure of the business varies over time. So whereas smaller/younger businesses rely on insider finance and trade credit (and possibly angel finance for the more venturesome), as the business develops it gains access firstly to intermediated finance (from banks, finance companies and, in some instances, venture capitalists) and eventually, if the business survives, it may even tap public equity and debt markets.

Currently we simply do not know how financing experiences, resulting from interactions with finance providers at one stage in the financial growth cycle, affect businesses' progress through later stages of the cycle. Yet, from a policy perspective, it would seem absolutely vital that we know more about this. For example, do negative experiences cause stagnation in the development of the business (leading e.g. to a state of 'permanent non-borrowing' and low growth)? Or, in some instances, does adversity provide learning experiences that benefit business performance (at least, among those which survive) in the long term? Where do alternative finances fit into this story? Are businesses rejected/discouraged from mainstream finance providers more likely to seek alternative finance (and does it benefit performance)?

It is only with further research that it will be possible to shed light on these and many other related issues.



Current Projects – Interim findings

An exploratory study linking SME data to the science base

Through its publicly funded Research Councils the UK invests around £1.7bn annually in supporting scientific research. This investment is set to increase sharply in future years as the Industrial Strategy Challenge Fund is steadily expanded to £2bn in 2020.

To date, assessments of the impact of this public investment have been partial and largely case-based. Where quantitative assessments of impact have been attempted, they have often relied on the limited information of innovation surveys or focussed on specific elements of the public science system. Several previous studies add to the substantial evidence from a range of countries on the positive role of research grants, subsidies and tax credits in helping firms to innovate successfully (Zuniga-Vicente et al. 2014).

In our study we analyse for the first time the comprehensive effect of public support to innovation, assessing the impact of engaging with publicly-funded research grants on the performance of UK firms. We draw on funding and partnership data from Gateway to Research, which provides information on funding provided by all of the UK Research Councils over the 2004 to 2016 period as well as the characteristics of the partners involved in each research project. Data on business performance is taken from the Business Structures Database which provides longitudinal data on business performance for all UK firms in terms of employment, turnover and productivity growth.

Our study responds to the call by (Scandura 2016) for more extensive research on the performance effects of publicly funded scientific research. We extend the existing evidence base in several ways.

- First, we provide the first comprehensive assessment of the business impacts of public science investments in the UK.
- Second, as we have data from each of the Research Councils we are able to compare the impact of firms' engagement in basic science projects funded by different organizations
- Third, we are also able to explore the potential continuous effect of engagement, according to the value of research grant received.
- Fourth, we are able to compare levels of impact between sectors, firm size bands and regions.

Finally, thanks to the longitudinal data on both firm performance and engagement with the publicly funded science system, we are able to assess time lags between firms' engagement with the science system and any impacts on firms' growth in the short, medium and long term.

We employ a difference-in-differences propensity score matching technique to analyse the differences in performance between almost 10,000 UK firms who received publicly-funded research grants and a matched comparator group of firms which received no support. Comparing their performance before and after the award of the research grants we are able to estimate the causal effect of publicly-funded research grants on the performance of firms, taking into account the endogenous factors influencing the decision and the self-selection of firms into this kind of R&D support.

Our findings show that receiving a research grant has on average a positive impact for employment and turnover growth. Employment grows faster both in the short and in the medium term, while turnover and labour productivity growth effects are stronger in the medium term, suggesting a time lag between the grants award and the ability of firms to commercially exploit the outcome of their R&D activity. Moreover, we find that the impact of publicly-funded research grants is stronger for manufacturing firms, in particular for high-tech manufacturing companies compared to low-tech manufacturing and other services firms. The positive impact is also incremental as the overall value of the grant increases.



Current Projects – Interim findings

An Integrated Treatment of Firm Age, Firm Growth and Job Creation

The proposition that a relatively large proportion of job creation is attributable to a relatively small proportion of job creating firms has been discussed now for more than 40 years (the conjecture is generally attributed to David Birch). A variety of approaches have been taken to tackling the calculations required, but in recent years HGFs (as defined by the OECD), seem to have attracted the most attention. By construction HGFs are very likely to display 'disproportionality': they are relatively large (ten or more employees, so in the top 10% of the firm size distribution), and grow relatively rapidly over a short period of time. But considering HGFs alone represents a rather 'lopsided' approach to the job creation question because it simply ignores the potential contribution of rapidly growing, relatively small, firms.

Using ONS data (longitudinal BSD) on the 15 year survivors of four cohorts of UK firms (1998; 1999; 2000; 2001) we find that 80% of jobs created by job creating firms over a 15 year period (commencing in 1998) are accounted for by two quite distinct, and readily identifiable, groups of high performance firms. These are:

1. **high-growth firms (HGFs)** – firms with ten or more employees, which grow 20% or more on average over three years (72.8% over a three year period) – the official OECD definition of a HGF;
2. **small high-growth firms (SHGFs)** – firms with less than ten jobs which add eight or more in a three year period – an official variation of the OCED definition developed in the US.

Each group contributed about 40% of job creation (hence 80%). Whilst 80% of job creation is equally split between SHGFs and HGFs, the contribution of high performing firms to job creation is disproportionate: SHGFs are about 20% of job creating firms and create 40% of jobs; HGFs also create 40% of jobs but are just 5% of job creating firms.

Whilst their contributions to job creation provides the motivation for taking HGFs and SHGFs equally seriously, these two groups of firms also provide raw material for the study of firm growth more generally, and provide some insight into the relationship between firm growth, firm age, and firm size.

We seek to make progress on a notoriously intractable problem – understanding firm growth – by using two key simplifications: the microenterprise/larger firm distinction built into the SHGF/HGF definitions; and the three year growth period which helps to render manageable the extraordinarily distributed year-to-year variation in firm growth.

High performing firms are identified by their exceptional job growth over three year growth periods and we count the numbers of SHGFs and HGFs born in each of the 12 (overlapping) three year growth periods between birth and age 15: there are about four times as many SHGFs than HGFs born in each growth period. The key findings about age, growth and size can be translated directly into results about job creation are:

- Job creation is relatively highly concentrated in **younger high performing firms**.
- SHGFs born in the first growth period (i.e., one-third of SHGFs) account for about half of SHGF job creation by age 15.
- For HGFs (with the extra effect of the dependence of size on age) almost two-thirds of job creation is contributed by HGFs born in the first growth period (this is one third of HGFs).

Further longitudinal analysis on the dynamics of HGFs over time show that, on average, 63% of HGFs in 2012-15 were having a 'repeat high growth episode' but this varies by age – that is, older HGFs had higher proportions of 'repeat episodes'. Also, when we re-visit the HGFs analysed in the NESTA report "The Vital 6%" which looked at the HGFs in the 2002-05 and 2005-08 periods we find that 59% and 69% respectively had survived.

And finally, a reminder of some 'facts' about business population dynamics in the UK:

Churn

The most important fact we have learned from a decade long study of the UK business population is that it is in a constant state of flux: each year around 250,000 firms are born and just over 200,000 die. So the population (currently just over 1.8 million) typically grows a little, but underlying that growth are much larger inflows and outflows of firms.

Age

The most important factor conditioning firm performance is age. Of the quarter of a million firms born in a particular year, more than 80% are dead by age 10. Not only does survival depend critically on age, but growth in jobs does too. By age 10 a relatively small proportion of the surviving firms have grown, most that have grown have not grown very much, and most of those that do grow at all do so in their first five years.

Size

Of the quarter of a million firms born in a particular year around 90% have less than five employees, and around 85% of 10 year survivors still have less than 5 employees. However, size does have some effect: very small firms do grow a little faster than larger firms, but have slightly worse chances of surviving.

‘What drives SME growth and productivity?’

The Enterprise Research Centre (ERC) was established in February 2013 to answer this question.

The Centre has become the UK’s leading independent centre for research, knowledge and expertise on SME growth and innovation with a reputation for research that is both rigorous and policy-relevant.



The ERC is led by Professor Stephen Roper, Professor Mark Hart and Dr Vicki Belt supported by two Centre Managers. The ERC is a collaboration of 6 University Business Schools centred around Warwick and Aston Business Schools.

- ❑ ERC is supported by an independent Advisory Panel consisting of a group of senior policy makers, business representatives, advice and support practitioners who have a strong interest in the outputs of our research work.
- ❑ The Advisory Panel shapes the scope and focus of research projects from inception and distils out the implications for their own organisations as projects come to an end. The panel acts as a key dissemination channel.

- ❑ The Centre is also advised by a core Advisory Group whose role is to provide strategic advice to the senior team on the direction and development of the centre and its research. The Advisory Group is chaired by Lucy Armstrong of The Alchemists.

“The ERC are now seen as the ‘go-to’ experts on SMEs and innovation”

(Government stakeholder)

Our research is project based and reflects a number of core themes each linked to the growth and productivity of small and medium sized businesses. Each research project is led by a senior academic who is responsible for the project outputs with contributions from our team of research fellows and oversight of the ERC’s Directors.

The Centre undertakes commissioned work for other organisations including the devolved nations, sector regulators and others who are seeking to create the right conditions for SMEs to thrive and grow.

UK Local Growth Dashboard

March 2017

Innovation

“New products, new services and new ways of doing business help firms to win new customers and sell more both in the UK and internationally.....but although innovation may promote growth and productivity it can also drive inequality both in job opportunities and competitiveness”

ERC Blog : ‘ Innovation policy: Driving equity or driving inequality?’

High Performing Firms

“Business dynamics plays an important role not only as a driver of job creation but also as an engine of reallocation and productivity growth. Our work goes beyond the average firm paradigm when analysing firm growth accounting for different characteristics such as size, age, ownership and trade status.”

Business Dynamics and Productivity - OECD

University - SME Links

“Our research re-affirms the evidence of the value of university collaboration and suggest the value of policy action to address market failures which arise in the formation of university-small business collaborations.”

ERC Research Paper 57



To find out more about the ERC, visit our website at www.enterpriseresearch.ac.uk follow us on Twitter: @ERC_UK or email at CentreManager@enterpriseresearch.ac.uk



New ERC Projects

Accessing and using finance

New financing alternatives, notably crowdfunding, microfinance and peer-to-peer lending, are becoming increasingly influential funding mechanisms for start-ups. Despite the importance of these sources in funding ventures with growth potential, only a small number of studies have examined these phenomena. We know little about how and why firms access these funding sources and their resultant growth.

This project will examine the following questions:

- What determines a firm's ability to access and use alternative sources of finance?
- How aware are entrepreneurs of alternative sources of finance?
- What is the role and nature of social networks in a successful alternative finance campaign?
- What is the impact of alternative funding sources on ventures receiving this funding?

For firms to grow, there also needs to be a bridge between alternative finance and later stage investments. Accordingly, we will also examine the role of linkages with business angel funders. We will use publicly available data from various funding platforms to look at these questions. The study has significant implications for policy makers who need to understand and promote these new financial alternatives in seeding entrepreneurship with growth potential.

Leadership and management: an activity-based perspective

Leadership is central to understanding the growth of entrepreneurial ventures since growth opportunities cannot be identified and exploited without the facilitation of individuals and teams. Entrepreneurial leadership has been defined as "influencing and directing the performance of group members toward achieving those organizational goals that involve recognizing and exploiting entrepreneurial opportunities".

Effective general management such as human resource management processes provide a foundation for all forms of growth where it contributes to profitability. Social networks are also of critical importance for entrepreneurial performance. In this project, we will examine the interactive effects of skills and networking in influencing growth using an activity-based perspective.

We will be using data from the earlier leadership and management skills research work we undertook in 2015. These are large cross-sectional samples with good measures of underlying constructs in management and leadership within SMEs.

The project potentially has significant implications. Since entrepreneurs are the key decision-makers for their organizations, their influence on the performance of their business cannot be over-estimated. The management of SMEs matters greatly for their economic performance and by extension influences consumers and other companies within their ambit.

Measuring the spillovers from publicly- funded R&D activity

Much of the argument for publicly funding R&D activity either in universities or companies rests on the assertion that the knowledge created is a public or quasi-public good, i.e. it has the potential to generate benefits for society at large. Big investments in public R&D in a particular locality may, for example, generate clustering effects attracting other firms to co-locate. Knowledge or innovation stimulated by publicly funded R&D may stimulate new business and generate positive multiplier or supply chain benefits

Here, we aim to use matched data from the Gateway to Research (GtR) database and UK Innovation Survey to explore these spillovers. The UK Innovation Survey provides detailed data on the internal factors which shape firms' innovation outputs. GtR provides comprehensive data on public R&D spending which we can categorise by locality and broad sector. Linking the two datasets will allow us to assess the (direct) contribution of public funding to the innovation activity of UKIS recipients and assess any (indirect) spillover effects.

The central question is whether firms which are in industries or localities which receive high levels of public support are more innovative than they would have been without that public support? In what industries or areas are these spillovers strongest?

The results will be relevant to current thinking about the IS and questions about the allocation of IS Challenge Fund resources between industries.

Micro-businesses, SMEs, business support and UK productivity

The UK's productivity performance is currently seen as 'poor' and 'puzzling', and in urgent need of treatment. This demand creates difficulties for policymakers concerned with the design of business support and its evaluation.

One of these is that the data typically deployed in research studies of productivity, which provides the current evidence base, is unlikely to be (even potentially) collectable from scheme participants, let alone from a control group.

Moreover almost all available productivity research has virtually nothing to say about microbusinesses, historically the bulk of participants in many support schemes. This project will help bridge these gaps by extending and deepening our recent investigation of the performance of a rather simpler productivity measure — turnover per job.

This measure is both readily computed for data which is typically collected from scheme participants and their performance can then be straightforwardly compared to that of other firms by drawing on the large-scale population data available from our Longitudinal Business Structure Database.

The UK Local Growth Dashboard

New Metrics on Business Growth

The report presents a set of key business growth metrics for start-ups and existing firms across a range of sub-national geographies in the UK, with specific pages on each of the English Local Enterprise Partnership (LEP) areas.

“The UK Growth Dashboard provides us with the most detailed picture of where entrepreneurial activity and business growth is occurring around the country. At a policy level, this can help us create an environment for business to thrive throughout the country.”

Professor Mark Hart, Deputy Director, ERC

The Local Growth Dashboard can be used as a source of evidence for policy makers and practitioners to inform discussions on priorities in business support. The focus is on presenting easily understood data that is updated on an annual basis.

You can access the latest report, and download the data at :

<https://www.enterpriseresearch.ac.uk/erc-reports/>



Notes



Website : www.enterpriseresarch.ac.uk
Twitter: @ERC_UK
Email : CentreManager@enterpriseresearch.ac.uk

Enterprise Research Centre
Warwick Business School
University of Warwick
Coventry CV4 7AL

Enterprise Research Centre
Aston Business School
Aston University
Birmingham B1 7ET

@ERC_UK

www.enterpriseresearch.ac.uk

#research

