Research proposal: Returns to Capital in Small and Medium Enterprises: Evidence from a UK loan Guarantee Program

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Governments spent a non-trivial amount of funds supporting small and medium sized enterprises (SMEs). The rationale for such support typically rests on the perception that there are constrained SMEs, which would disproportionately contribute to growth if given the opportunity. However, recent work casts doubt on this perception. Haltiwanger, Jarmin and Miranda (2013) show it is mostly the young firms, rather than the small companies, which have substantial impacts on job creation; and several studies question the importance of financing constraints for entrepreneurship in advanced economies (see Kerr and Nanda, 2009). A key policy question is, therefore, whether SMEs in advanced economies really hold the potential for growth that can justify their government support.

In this paper, we explore this question by analysing the response of SMEs to the launch of a UK loan guarantee program, and estimating the marginal returns to capital in participating SMEs. The Enterprise Finance Guarantee (EFG) program was introduced in January 2009 in response to the credit crunch as a replacement for the long-established Small Firms Loan Guarantee (SFLG) scheme created on 1981. The EFG is designed to facilitate additional bank lending to viable SMEs. It accounts for around 1% to 2% of total bank lending to SMEs—and constituted 3% of the SME lending market during the recession in 2009 (BIS, 2013).

We exploit variation in access to the program across firms of different sizes, and use the marginal profitability of investments as a proxy for capital returns (cf., de Mel, Mckenzie and Woodruff, 2008; McKenzie and Woodruff, 2008; Banerjee and Duflo, 2012).[1] Our data includes novel information from firms' financial filings on the value of inputs and outputs, as well as on capital sources (including: financial debt, inside debt provided by the owners of the firm, trade credit and equity). Our empirical strategy compares trends in financial debt issuance among eligible and non-eligible SMEs before and after 2009. Eligible firms are those that in 2008 were sufficiently small so as to satisfy the revenue-based eligibility requirement (below £25M). We restrict the comparison to a sub-sample of SMEs with sizes close to the eligibility threshold in 2008—revenues ranging between £12.5M and £37.5M (i.e. +/- £12.5M window around the revenue threshold of £25M), to make sure non-eligible firms are a reasonable comparison group for the shocked group. The main assumptions are that investment opportunities among eligible and non-eligible firms would have similarly evolved absent the program launch, and that firms did not sort on revenue size pre-launch. Consistent with these assumptions, we show evidence of similar pre-trends among eligible and non-eligible firms, and of no sorting around the eligibility threshold. The lack of sorting is likely explained by uncertainty regarding the SME definition in UK: the government uses different definitions based on revenue, assets and employees across different programs and purposes.

[1] This proxy is useful as the majority of SMEs are private companies. It is of course not without caveats. Returns to capital measure the net present value of all expected future cash flows per unit of invested capital. Our proxy based only on concurrent net cash-flows will thus likely be biased. For example, if marginal investments by SMEs are expensed immediately but generate returns only in the log-run (such as investments in innovation), then our proxy will underestimate returns to capital in these firms. In addition, our measure of returns are also not adjusted for risk.

Preliminary results estimate that returns to capital from the loan guarantee program average 35% per year, which is substantially higher than average interest rates for SMEs in the UK (market: 5.0%, loan guarantee: 5.8%). This average, however, is representative of only a very small fraction of eligible firms that increase their investment in response to the loan guarantee program.[2] We find that 96% of eligible SMEs either do not take-up government guaranteed loans, or they use them to replace other potentially costlier sources of *financial debt*. There is evidence of substantial heterogeneity across loan takers too: roughly 30% appear not to invest the proceeds, but use them instead to partially replace other *non-financial-debt* capital sources, such as debt and equity from owners.

We find evidence against several potential methodological concerns such as: sorting of firms, spurious trends, serial correlation, and setting limitations. We finalize the analysis by discussing the evidence on the potential for risk-shifting by participating lenders and borrowers, given the evidence of such behaviour on other settings. We argue that overall the evidence suggests such behaviour does not appear to be first order in our setting. For example, we find no evidence of increased liquidation for eligible firms. We discuss potential explanations based on the program's design and the UK government's own experience with such behaviour in prior iterations of their loan guarantee programs for SMEs.

Our results point to the existence of constrained SMEs that exhibit very high returns to capital if given the opportunity, which is consistent with perceived wisdom among policy makers. Our results, however, also point to substantial heterogeneity in returns among SMEs: only 2.5% of eligible SMEs appear to operate at a level with high marginal returns to capital when financed with government-guaranteed loans. Consistent with binding financial constraints, we find take-up rates and returns are higher among younger firms, which are more likely to face constraints due to the information and agency frictions common in these businesses. While we find similar take-up rates among firms with low and high asset tangibility, high-tangibility firms are more likely to invest the loans in the firm—particularly by hiring employees, whereas the low-tangibility firms appear more likely to use the proceeds to replace other sources of capital—particularly, issued equity.

We connect our estimates to the literature on growth accounting, by adjusting our measure of returns for the potential effect of new hires on profits (see McKenzie and Woodruff, 2008; Banerjee and Duflo, 2012). Taken at face value, our estimates imply that the average marginal product of the firms that take-up the loan guarantees is 3 times higher than the average marginal product of capital in the UK (12.0%; Caselli and Feyrer, 2007). Our results thus suggest there is overlap between firms facing financial constraints and those businesses that have high potential for growth. The policy implications are far reaching.

We are applying for a grant in the area of Entrepreneurship. We plan to expand our data to include information on patents and trademarks so as to calculate impact of program on innovation in SMEs. We are seeking funds for an RA to help with the data collection and cleaning. We estimate the cost of this data extension to be roughly $3,000 USD, as the data on trademarks and patents, will involve coding some fuzzy matching procedures based on company names with multiple sources (e.g., the USPTO, the EPO etc). We also plan to submit our work to multiple entrepreneurship-related conferences to incorporate feedback, and as such we are seeking funds to finance associated travel. We estimate that total travel costs will be at least $10,000 USD, as many of the conferences we plan to submit are overseas (in the US).

[2] The low take-up rates are largely consistent with low participation in microfinance programs (Karlan, Morduch and Mullanathain, 2010) and in other subsidies for young and small firms in UK (Gonzalez-Uribe and Paravisini, 2017).

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EDUCATION

***London School of Economics*, London, UK** 2013-Present
Ph.D in Finance Supervisors: Vicente Cunat; Daniel Paravisini

***University of British Columbia*, Vancouver, Canada** 2011-2013
M.Sc in Finance

***Southwestern University of Finance and Economics*, ChengDu, China** 2007-2011
B.A in Economics and Finance

REASEARCH INTERESTS

Corporate governance, Corporate finance, Entrepreneurial Finance

PUBLICATION

A Robust Test for Weak Instruments in Stata,
with Carolin E. Pflueger, Stata Journal, 2015,15(1):216-225.

WORKING PAPER

Manager Turnover and Product Market Competition: evidence from UK family firms(2016)
Media coverage: RES Media Briefings, LSE Business Review

Returns to Capital in Small and Medium Enterprises: Evidence from a UK Loan Guarantee Program
With Juanita Gonzalez-Uribe, 2017

CONFERENCES

FMA Europe PhD student session, 2017
Royal Economic Society Conference 2017
Belgrade Young Economics Conference 2016

AWARDS AND FELLOWSHIPS

PhD Scholarship, LSE, 2013-
Student Scholarship, UBC, 2012-2013
National Academic Scholarship, China, 2009, 2010

TEACHING

London School of Economics
Class Teacher, FM212 Principles of Finance (undergraduate).2014
Teaching Assistant, FM407 Mergers, Buyouts and Corporate Restructurings (part time& full time postgraduate).2014-present; LSE executive course 2017 summer & winter

University of British Columbia
Teaching Assistant, COMM374 Applied Financial Markets (undergraduate) 2012-2013

PERSONAL INFORMATION

Languages: English (fluent), Chinese (native)
Programming: Stata , SAS, Matlab, LATEX, Python

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Education

Ph. D. Economics and Finance , Columbia University GSB	2013
M. Phil., Columbia University GSB	2009
M.Sc. in Economics, Universidad de los Andes	2006
B.A., Mathematics, Universidad de los Andes	2006
B.A., Cum Laude, Economics, Universidad de los Andes	2004

Research Experience

Assistant Professor in Finance, London School of Economics	2013-present
Research Assistant Columbia University GSB	2009-2012
Specialized Professional, Banco de la Republica Colombia	2006-2007
Research Assistant, Department of Economics, Universidad de los Andes	2005-2006
Junior Researcher, Banco de la Republica Colombia	2003-2004
Research Assistant, Department of Economics, Universidad de los Andes	2000-2003

Fields

Empirical Corporate Finance, Entrepreneurial Finance, Private Equity and Innovation

Conferences and Seminar Presentations

Nova (scheduled), Universidad Catolica de Chile (scheduled)	2018
Bank of England London Financial Intermediation Workshop, MIT TIES, IADB, , Berkeley, Toulouse University, Nova, WFA	2017
University of Michigan-Ross Business School, University Pompeu Fabra, Universidad de los Andes, University of Exeter, LBS Coller Private Institute Conference, FIRS, IDC Financial Economics Conference, IDC Summer Finance, IPA, Copenhagen Business School, Stockholm School of Economics, Scheduled: Maryland, NBER Innovation and Entrepreneurship	2016
University of Illinois, University of Lugano, University of California in Los Angeles, Cavalcade Finance Conference, FIRS, Adam Smith Conference, Duke/UNC Conference, Emory Accelerators Colloquium, European Summer Symposium in Financial Markets, Global Entrepreneurship Week, WFA, Entrepreneurial Finance and Innovation around the World Conference Program, AIEA-NBER conference on innovation and entrepreneurship, Berkeley Crowdfunding Conference	2015

NBER entrepreneurship, Fifth Entrepreneurial Finance and Innovation Conference (Brandeis), Deloitte Institute of Innovation and Entrepreneurship Conference, Summer Conference University of Washington, EFA, NBER Innovation, Gerzensee, LBS Conference Private Equity, Banco de la Republica Colombia, Oxford Said Business School, Internal seminar LSE, Frontiers of Finance Conference- Warwick University	2014
Copenhagen Business School, Duke University, University of North Carolina at Chapel Hill, University of Hawaii at Manoa, Harvard Business School, Wharton, London School of Economics, London Business School, Foster Business School, Federal Reserve Board, Universidad de Chile	2013
9th Annual Corporate Finance Conference Washington University in St. Louis Ph. D. Poster Session, New York FED/NYU Stern Conference on the Role of Private Equity in the U.S Economy, 5th Annual Searle Center Conference on Innovation and Entrepreneurship. USPTO-Ewing Marion Kauffman Foundation-Northwestern University, Columbia GSB Finance, Universidad de los Andes Business, Universidad de los Andes Economics, Universidad Católica de Chile Business, Universidad Católica de Chile Economics, Columbia Ph D. Finance	2012

Articles

The Effects of Business Accelerators on Venture Performance: Evidence from Start-Up Chile (Joint with Michel Leatherbee), 2018, *Review of Financial Studies*, 31(4), 1566-1603

On the Benefits and Costs of Job Reallocation in Colombia, 2006, Revista Desarrollo y Sociedad No.57, Centro de Estudios sobre Desarrollo Económico (CEDE).

Book Chapters

Selection Issues (joint with Michael Leatherbee) in "Accelerators", to be published in Editors: Mike Wright, Imperial College Business School and Israel Drori, VU, Amsterdam

Key Performance Indicators (joint with Michael Leatherbee) in "Accelerators", to be published in Editors: Mike Wright, Imperial College Business School and Israel Drori, VU, Amsterdam

Working Papers

Exchanges in Venture Capital Portfolios—*R&R Journal of Financial Economics*

CEO Contract Horizon and Innovation (Joint with Moqi Groen-Xu)—*R&R Journal of Financial Economics*

How Sensitive is Young Firm Investment to the Cost of Capital? Evidence from a UK Tax Relief (Joint with Daniel Paravisini)

Returns to Capital in Small and Medium Enterprises: Evidence from a UK Loan Guarantee Program (joint with Su Wang)

Information Sharing and Credit Outcomes: Evidence from a Natural Experiment (Joint with Daniel Osorio)

Suspension of Payments: An Empirical Analysis (joint with Ashwini Agrawal and Jimmy Martinez)

Venture Debt (joint with William Mann)

Awards

2017 - Juan Fernandez de Araoz Price for Best Paper in Empirical Corporate Finance (joint with Daniel Paravisini)
2016 – Nesta and Kauffman Foundation Grant (joint with Edgar Kausel and Michael Leatherbee)
2016 - NBER Entrepreneurship Grant (joint with Daniel Paravisini)
2015 - CEPR-Assonime with Daniel Paravisini (had to refuse)
2014 - BA/Leverhulme Small Research Grants (with Lora Dimitrova)
2014 – Coller Institute of Venture (with Lora Dimitrova)
2014 - NBER Innovation Policy Grant (with Moqi Xu)
2014 - Santander Travel Grant
2013 - Coller PhD Prize | Coller Institute of Private Equity LBS
2012 - Kauffman Dissertation Fellowship