Arnaud Dyèvre – Cover Letter
London School of Economics, Department of Economics
January 31st, 2024

Email: a.dyevre@lse.ac.uk
Website: arnauddyevre.com
Tel: +44 (0) 7 442639313

To the NBER Innovation Research Boot Camp selection panel,

I am a PhD candidate in Economics at the London School of Economics–currently on the academic job market–and I expect to receive my degree in the Summer of 2024. I am a **macroeconomist** with interests in **growth**, **innovation** and **firm heterogeneity**. In my work, I use a mix of quasi-experimental research designs and macro models to investigate these themes.

I am very excited to apply to the 2024 NBER Innovation Bootcamp. My application essay describes how my current research is aligned with the themes of the bootcamp. I also describe there my future research plans as they relate to the Economics of innovation. Most notably, I outline the work I plan to do during a *Science for Progress Initiative* postdoctoral fellowship at MIT next year (which I am very likely to accept), under the supervision of Pierre Azoulay, Heidi Williams and Paul Niehaus. Finally, my CV describes my relevant experience.

One of my main supervisors, professor **Xavier Jaravel**, has kindly accepted to support my application. His letter of recommendation will arrive shortly.

Thank you very much for your consideration.

Yours Faithfully,

-Arnaud Dyèvre

Arnaud Dyèvre

Ph.D. candidate, London School of Economics — *a.dyevre@lse.ac.uk*
Department of Economics, Centre for Macroeconomics & STICERD — *arnauddyevre.com*
WC2A 3PH, London, UK — *@ArnaudDyevre*

Placement officer: Prof. Matthias Doepke, m.doepke@lse.ac.uk
Placement coordinator: Emma Taverner, econ.facultysupport@lse.ac.uk

Fields

Primary: Macroeconomics
Secondary: Public Economics

Interests

Growth/Innovation
Firm Heterogeneity

Education

London School of Economics, London
2020 - *present* Ph.D. in Economics
2018 - 2020 M.Res. in Economics (*Distinction*)
Courses in Microeconomics, Macroeconomics, Econometrics
Advanced Macroeconomics, Public Economics and IO

Sorbonne Université, Paris
2014 - 2018 B.Sc. in Mathematics

Job Market Paper

Public R&D Spillovers and Productivity Growth

Best Job Market Paper Award 2023 - European Economic Association & UniCredit Foundation

Does the source of Research and Development funding, public or private, matter for aggregate productivity growth? Using a unique firm-level dataset with patent and balance-sheet information covering 70 years (1950-2020), I estimate the impact of the decline in public R&D in the US on long-run productivity growth. I use two instrumental variable strategies–a historical shift-share IV and a patent examiner leniency instrument–to estimate the impact of the decline in public R&D on the productivity of firms through spillovers. I find that a 1% decline in public R&D spillovers causes a 0.17% decline in productivity growth. Public R&D spillovers are three times as impactful as private R&D spillovers for firm productivity and their impact persists at the sector level. Moreover, smaller firms experience larger productivity gains from public R&D spillovers. I calibrate a model of growth with heterogeneous firms which suggests that the decline in public R&D can explain around a third of the decline in TFP growth in the US from 1950 to 2017, and a third of the rise in size inequality between firms over the same period.

References

Xavier Jaravel (supervisor) Dept. of Economics, LSE, x.jaravel@lse.ac.uk
Benjamin Moll (supervisor) Dept. of Economics, LSE, b.moll@lse.ac.uk
Arun Advani (advisor) Dept. of Economics, Warwick, a.advani.1@warwick.ac.uk
John Van Reenen (advisor) Dept. of Economics, LSE, j.vanreenen@lse.ac.uk

Publications

Innovation Catalysts: How Multinationals Reshape the Global Geography of Innovation

with Riccardo Crescenzi & Frank Neffke, ***Economic Geography***, June 2022

Graduating from Food Insecurity: Evidence from Graduation Projects in Burundi and Rwanda
with Stephen Devereux, Keetie Roelen, Ricardo Sabates, Rachel Sabates-Wheeler & Dimitri Stoelinga, ***Food Security***, February 2019

Work in progress

The Rwanda-Uganda border closure: Impacts and Adaptation through Production Networks
with Andrew Bernard, Patrick Hitayezu and John Spray

Fragmentation, Employment and Compensation in Production Networks
with Jan Bakker, Kalina Manova and Andreas Moxnes

70 Years of Patents Matched to Firms: Methodology and Insights About Firm Heterogeneity
with Oliver Seager

The Impacts of Migrants on Firm Performance: the Central Roles of Migrant and Firm Heterogeneities
with Arun Advani and Andy Summers

Awards, grants & fellowships

Awards

2023	UniCredit Foundation Econ Job Market Best Paper Award 2023
2021	LSE Class Teacher Award, recipient, Department of Economics
2021	LSE Excellence in Education Award, recipient, Department of Economics
2020	Distinction, M.Res. in Economics, LSE
2020	LSE Student Union Teaching Award, nominated by students

Grants

2022	IGC Small Research Grant (£18,000, co-PI)
2022	STICERD Ph.D. research grant (£5,000, PI)
2021	CEPR-STEG Ph.D. Research Grant (£15,000, PI)
2021	STICERD Ph.D. research grant (£5,000, PI)
2021	LSE Race Equity Innovation Fund (£2,000, co-applicant)

Fellowships

2022	National Bank of Belgium visiting fellowship
2020-2022	Alan Turing Institute Enrichment Student fellowship
2018-2023	ESRC Doctoral fellowship

Research experience

National Bank of Belgium — Brussels

2022	Visiting Ph.D. Researcher

Alan Turing Institute — London

2020-2022	Visiting Ph.D. Student ('Engage@Turing' and 'Enrichment')

LSE — London

2019 - 2021	RA to Profs. Arun Advani, Felix König & Andy Summers, LSE
2017 - 2018	RA to Profs. Camille Landais & Johannes Spinnewijn, LSE

Harvard Kennedy School & LSE — Cambridge (MA) & London

2016 - 2017	RA to Prof. Riccardo Crescenzi (LSE) & Frank Neffke (HKS)

Teaching experience

LSE

2021 - 2023	M.Sc. Macroeconomics – TA to Matthias Doepke, Wouter den Haan & Alwyn Young
2020 - 2023	M.Sc. & Ph.D. Statistics and Probabilities for Economics – TA to Marcia Schafgans
2019 - 2020	B.Sc. Econometrics – TA to Taisuke Otsu, Steve Pischke & Canh Thien Dang
2019	Python for Social Scientists – weeklong Course for Ph.D. students

LSE, Widening Participation school

2020	Economics teacher for students from London state schools (outreach program)

Skills

IT	Stata, Matlab, Python, ArcGis, Gephi, Git & GitHub, HTML & Markdown
Languages	**French** (native), **English** (full professional proficiency), **German** (fading)

Outreach and Service

2020 - 2023	Co-founder and coordinator of the Ph.D. Applicant Mentoring Programme Mentoring scheme for PhD applicants from underrepresented backgrounds. Jointly led by Ph.D. students at Cambridge, LSE, Oxford, UCL and Warwick
Referee for	Economica, Economic Journal

Updated: January 27, 2024

Arnaud Dyèvre – Essay
London School of Economics, Department of Economics
January 31st, 2024

Email: a.dyevre@lse.ac.uk
Website: arnauddyevre.com
Tel: +44 (0) 7 442639313

This short note describes how my current research aligns with the themes of the Innovation boot camp, what my future research plans are and what motivates me to apply to the boot camp.

Current research. The central piece of my research portfolio is my job market paper: 'Public R&D Spillovers and Productivity Growth' where I study how the secular decline in publicly funded R&D in the US affects long-term productivity growth and inequality between firms. Leveraging a unique dataset that I assembled, I combine two quasi-experimental designs (a Shift-Share Instrumental Variable and a patent examiner instrument) with a heterogeneous-agent model of growth to quantify the impact of the decrease in public R&D on aggregate TFP growth. This current line of research is very much aligned with the work of many innovation scholars who will teach the boot camp.[1] I was honored that my JMP has received one of the ***EEA Econ Job Market Best Paper Awards 2023***.

Future research. After my PhD, and barring any job market surprise,[2] I will start a one-year post-doctoral fellowship at J-PAL, within MIT, under the supervision of Pierre Azoulay, Heidi Williams and Paul Niehaus. This fellowship is part of the *Science for Progress Initiative* whose aim is to promote work in the 'Science of Science' literature. My plan is to use my time at MIT and the great supervision I will benefit from to (1) revise and present my job market paper before preparing it for submission to a general-interest journal, (2) write up the methodological paper about the new panel of firms matched to patents I used in my job market paper, (3) start a new project about how to identify basic and applied research among patents and scientific articles using machine learning techniques and (4) write blog posts with Matt Clancy of OpenPhilanthropy about the role of the government in fostering (or hampering!) innovation.[3]

Reasons for applying to the boot camp. Two reasons make this boot camp a fantastic opportunity for me. First, I am very keen to be brought to the frontier of research about innovation. While I am

[1]For instance, my empirical results complement recent evidence about the magnitude of public R&D spillovers by Pierre Azoulay (Azoulay *et al.*, 2018) and Kyle Myers (Myers and Lanahan, 2022). My analysis of spillovers relies on a specification made popular by John Van Reenen (Bloom *et al.*, 2013). I constructed the lag structure of my empirical estimation using insights from the work of Benjamin Jones (Ahmadpoor and Jones, 2017). My patent examiner leniency instrument is inspired by the work of Heidi Williams (Sampat and Williams, 2019). Finally, my model builds upon a theoretical framework developed by Chad Jones (Jones and Kim, 2018).

[2]I have received the offer for the fellowship. I need to confirm with universities where I had fly-outs that they would be happy with me deferring the start of an AP position.

[3]Matt and I have already collaborated on two posts about the link between firm size and innovation. See here and here.

familiar with a lot of the work done in this space, the field has grown very rapidly over the last few years and the state of the art is constantly evolving. Learning from scholars who are pushing the frontier and attending the NBER SI Innovation Policy meeting would be the single best way to stay abreast of this expanding literature. Second, I would love to get to know the innovation scholars I will be likely to interact with in the future; both the attendees of the boot camp and the established academics who will teach it. Talking research with them, getting feedback on my project and discussing potential collaborations would be a unique opportunity for my career. For these reasons, and because I believe I can positively contribute to the camp due to my doctoral experience, I am hopeful that I can be considered as a serious candidate for the NBER Innovation boot camp.

Thank you for your consideration.

Yours Faithfully,

-Arnaud Dyèvre

REFERENCES

AHMADPOOR, M. AND B. F. JONES (2017): "The dual frontier: Patented inventions and prior scientific advance," *Science*, 357, 583–587. [*Cited on page 1.*]

AZOULAY, P., J. S. GRAFF ZIVIN, D. LI, AND B. N. SAMPAT (2018): "Public R&D Investments and Private-sector Patenting: Evidence from NIH Funding Rules," *The Review of Economic Studies*, 86, 117–152. [*Cited on page 1.*]

BLOOM, N., M. SCHANKERMAN, AND J. VAN REENEN (2013): "Identifying technology spillovers and product market rivalry," *Econometrica*, 81, 1347–1393. [*Cited on page 1.*]

JONES, C. I. AND J. KIM (2018): "A Schumpeterian model of top income inequality," *Journal of political Economy*, 126, 1785–1826. [*Cited on page 1.*]

MYERS, K. R. AND L. LANAHAN (2022): "Estimating Spillovers from Publicly Funded R&D: Evidence from the US Department of Energy," *American Economic Review*, 112, 2393–2423. [*Cited on page 1.*]

SAMPAT, B. AND H. L. WILLIAMS (2019): "How do patents affect follow-on innovation? Evidence from the human genome," *American Economic Review*, 109, 203–36. [*Cited on page 1.*]

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Date: February 1st, 2024

To: NBER Innovation Research Boot Camp 2024 selection panel

Subject: Reference letter in support of Arnaud Dyèvre's application to the Boot Camp

Dear selection panel,

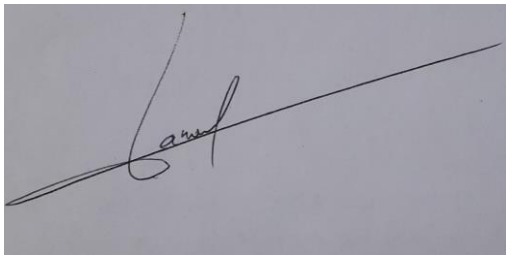
I am writing in my capacity as an Associate Professor at the Department of Economics, London School of Economics, and as the PhD supervisor of Arnaud Dyèvre, who is currently a job market candidate under my supervision. I very strongly recommend Arnaud's application to the Boot Camp for two reasons.

Firstly, Arnaud's research will benefit tremendously from interacting with instructors and attendees of the Boot Camp. His research, as exemplified by his job market paper, combines the macroeconomic modelling of endogenous growth through innovation and spillovers, with the micro-empirical estimation of spillovers. Both approaches are central to the Boot Camp's syllabus, and he will capitalize on his strengths by learning from you. Furthermore, Arnaud's work going forward is perfectly aligned with the themes of the Boot Camp. He has secured a postdoctoral position for next year with Pierre Azoulay, Heidi Williams and Paul Niehaus at MIT, as part of the Science for Progress Initiative. This outcome is a testimony of Arnaud's strengths in the Economics of innovation, and of his appetite for conducting research in this field.

Secondly, while Arnaud will definitely benefit from attending the Boot Camp, I believe his peers will also benefit from interacting with him. Due to his familiarity with a lot of the research at the frontier of this field, he will be an engaging colleague to talk to for other young scholars and a very dynamic proponent of research in innovation.

I rank Arnaud in the top 2 PhD students I have supervised at the LSE over the past seven years. I think he has great potential and would be a fantastic participant in the 2024 Innovation Research Boot Camp. Please don't hesitate to contact me if you have any questions.

Yours sincerely,



Xavier Jaravel
Associate Professor
Department of Economics
London School of Economics
32 Lincoln's Inn Fields
London WC2A 3PH
Email: x.jaravel@lse.ac.uk