Nurullah Gulec
9842606805
mg445@duke.edu

NBER Innovation Research Boot Camp February 18, 2023

Dear Members of IRBC Committee

I am thrilled to apply for the NBER Entrepreneurship Research Boot Camp, as I am passionate about exploring cutting-edge research in the field of economics of entrepreneurship. With my background as a Ph.D. student in economics at Duke University and an MPhil graduate in Economics from the University of Oxford, I have developed a strong foundation in the intersection of industrial organization and strategy. I am interested in understanding how spinoffs are created and how they contribute to aggregate productivity growth. To accomplish this, I am utilizing novel administrative data sources such as employer-employee-matched data and VAT data to answer previously unfeasible research questions.

Spinoffs have played a significant role in the formation of innovation hubs such as Silicon Valley, where numerous companies can trace their origins back to a single firm, such as Fairchild Semiconductor. There have been various explanations for this phenomenon, mostly focused on supply-side factors, where entrepreneurs acquire knowledge and skills in technology, business, and entrepreneurship from the parent company. To shed new light on the topic, I am proposing an explanation from the demand side where friction in customer base accumulation can lead to spinoff formation. I am developing a unique metric to measure the inherited connection level for new entrant firms which will allow me to estimate and differentiate between the business-stealing effect and creative destruction effect of spinoffs and other entrants. Additionally, I am working on another project examining the spillovers of R&D subsidies through labor mobility and how information circulates in the labor market from R&D companies to others.

Entrepreneurship is a critical driver of innovation, job creation, and productivity growth. Despite the challenges posed by data limitations and causal inference in this field, it remains an incredibly promising area for research. My goal is to leverage new data sources to conduct in-depth research on spinoffs and to comprehend the impact of new firms on overall productivity growth by measuring resources and connections they inherit from their parent companies. By attending the week-long boot camp I am eager to connect with prominent scholars and practitioners and to engage with the exciting questions and debates that are ongoing in the entrepreneurship research community. Through my coursework and active participation in this community, I am confident that I will be well-equipped to pursue meaningful research and make valuable contributions to the field of entrepreneurship economics.

Thank you for considering my application. A letter of recommendation has been submitted on my behalf by my supervisor, Allan Collard-Wexler. I look forward to the opportunity to participate in the boot camp and further my understanding of the economics of innovation.

Sincerely,
Nurullah Gulec

M.Nurullah Gulec

PhD, Economics, Duke University

mg445@duke.edu

Education

Duke University — *Durham, NC/USA*

PhD in Economics — *2019 - Present*

- Interests: Industrial Organization, Applied Microeconomics, Economics of Innovation, Strategy
- Honors: Graduate School Fellowship, Summer Research Fellowship

University of Oxford — *Oxford, UK*

MPhil in Economics — *2017 - 2019*

- Pembroke College Dean of Graduates Grant
- CSAE grant for fieldwork in Pakistan

Bogazici University — *Istanbul, TR*

BA in Economics and BS in Mathematics — *2012 - 2017*

- GPA = 3.85/4.0
- Ranked 3^{rd} in Bogazici University, Department of Economics
- Presidential High Honour Scholarship for ranking 3^{rd} in the University Entrance Exam among 2M students

Research and Professional Experience

Turkish Ministry of Industry and Technology — *İstanbul, TR*

Consultant Data Analyst — *July 2020 - August 2021*

- Researched the effect of R&D subsidies in the firm-firm network
- Worked with the data covering all firm-firm transactions and firm-worker network in Turkey
- Used 2SLS, Matching, and OLS models for evaluating the impact of the subsidy policy
- Presented the findings to government officials including Deputy Minister of Industry and Technology

University of Oxford — *Lahore, PK*

Researcher for Field Work in Pakistan — *July 2018-August 2018*

- Explored the preferences over different contract structures for an innovative microfinance product.
- Designed and implemented a lab-in-field experiment in Pakistan
- Elicited the risk aversion levels of the sample using Bayesian Mixture Models

Work in Progress

[1] M. N. Gulec and M. F. Ulu, "Measuring the R&D spillover through the mobility of workers and firm to firm network," 2021.

Leadership & Club Activities

Oxford University Turkish Society — *Oxford, UK*

President — *2018-2019*

Bogazici University Islamic Studies Association (BISAK) — *İstanbul, TR*

Founder & President — *2015-2016*

Skills

Programming Python, MATLAB, Stata, R

Language English(Fluent), Arabic(Fluent), German(Advanced), Turkish(Native)

List of PhD Courses

- **2022 Fall**
  - BA 990-Economics of Innovation
- **2022 Spring**
  - BA 990S-Economics of Innovation
- **2021 Fall**
  - ECON 890S-Dynamic Discrete Choice
- **2021 Spring**
  - ECON 825-Industrial Organization
  - ECON 885-Economics of Contracts
- **2020 Fall**
  - COMPSCI 671D-Theory and Algorithm of Machine Learning
  - ECON 824-International Trade
  - ECON 826-Partial Identification: Industrial Organization
  - ECON 883-Causal Inference and Treatment Effects
- **2020 Spring**
  - ECON 704-1st Year Intro To Research
  - ECON 705D-Microeconomic Analysis II
  - ECON 706D-Macroeconomic Analysis II
  - ECON 707D-Econometrics II
- **2019 Fall**
  - ECON 704-1st Year Intro To Research
  - ECON 701D-Microeconomic Analysis I
  - ECON 702D-Macroeconomic Analysis I
  - ECON 703D-Econometrics I

Research Summary

I am doing research to understand spinoff formation and their contribution to aggregate productivity growth and to quantify the effect of past connections in the success of entrant firms. The entry of new firms is crucial for economic growth and innovation, and the literature suggests that it can be driven by several factors such as creative destruction, spinoff formation by employees of incumbent firms, and incomplete contracts. My research project focuses on investigating the patterns and mechanisms of employee spinoffs, particularly the role of demand-side learning, in firm entry and growth. To accomplish this goal, I use a unique dataset from Turkey, the Enterprise Information System (EIS), which includes comprehensive information on the formal firms in Turkey.

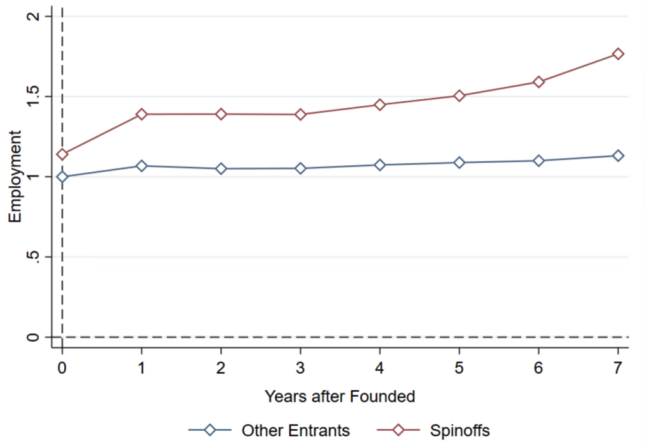


Figure 1: Evolution of the exponential of coefficients of spinoff and age indicator interactions in the regression of real sales(log) on industry and age fixed effects The level of other entrants in year 0 is normalized to 1.

I have compared employee spinoffs, the entrant firms for which we can trace a clear parent firm, to other entrants using linear regressions saturated with fixed effects and rich sets of controls. I find that they are around 25% larger in terms of employment and sales and have a larger customer and supplier base which can be seen in Figure 1. These advantages persist and increase over the sample period

and, which is 7-years after entry. They are also around 10% more productive during their life cycle.

The data also shows that the customer base of the parent firms, or the previous employers of the initial workers of the entrant firm, contributes to this advantage and additionally the worker's wage reflects the premium due to the customer base at their previous employer. There is an additional wage premium if this customer base is utilized, namely if the entrant firm acquires customers from the base brought by the worker. Additionally, I have found that the parent firms tend to expand in size and customer base before the establishment of the spinoff firm and then gradually shrink around the time of the entry.

These findings suggest that customer base acquisition can be seen as a friction that could potentially provide opportunities for other market participants. Based on these stylized facts, I plan to develop a structural model that incorporates different theories on employee spinoffs and demand-side learning. This model could provide important insights into the effects of regulations on entry and labor mobility using counterfactual analysis for potential interventions.

In conclusion, my research project on employee spinoffs aims at providing a more nuanced understanding of the patterns and mechanisms of this process and its impact on aggregate productivity growth. The preliminary analysis results suggest that customer base acquisition by employee spinoff firms is an important factor contributing to their success. A structural model incorporating different theories on employee spinoffs and demand-side learning will be developed to further explore these findings. In the future, I plan to enhance the database by integrating ownership data to address inquiries about the job histories of not only employees but also entrepreneurs.

I am eager to attend the boot camp because I believe it will provide me with the opportunity to interact with experts in the field, expand my network, and receive valuable feedback on my research. The boot camp will also give me a chance to learn about new research approaches and techniques that I can apply to my work and improve my skills as a researcher in the field of entrepreneurship research.

Duke University Department of Economics

Allan Collard-Wexler
Box 90097
Social Sciences 230
Durham, NC 27708

(347) 948-4707 (phone)

allan.collard-wexler@duke.edu
February 2, 2023

Dear NBER Boot Camp Committee,

I am writing this letter to support **Nurullah Gulec**'s application to attend the NBER Entrepreneurship boot camp this summer. Nurullah, is a fourth-year Ph.D. student in Duke's Economics department.

Nurullah is focused on measuring the knowledge spillovers that occur when inventors and R&D workers move between different firms. A famous example is the team at Fairchild semiconductors, which quit and founded most of the important computer firms in Silicon Valley in the 1960s and 1970s. He has acquired some impressively detailed datasets from Turkey that allow him to both track work workers and firms. This would be virtually impossible to do in the United States, but in Turkey, there is integrated data on firms, workers, and R&D activities.

He uses individual-level administrative data (think IRS tax records) which enables him to track both workers in engaged in R&D and not, along with their wage data, using the Enterprise Information System (EIS) that is collected by the Ministry of Industry and Technology of Turkey. Using this data, he shows that regressions that imply that building a link with an R&D firms, either through the labor market, that is, hiring a worker from an R&D intensive firm is correlated with higher performance measures. Moreover, using data on the sales between firms based on VAT tax data, he also shows an association between buying inputs from an R&D intensive firm and productivity.

Now of course, there is an issue that firms that hire R&D workers, or buy inputs from R&D firms might be systematically different from other firms, and Nurullah is starting to think about instruments to address this issue.

Please do not hesitate to contact me, whether by email or phone, if I can provide further assistance.

Sincerely yours,

Allan Collard-Wexler
Professor of Economics
Duke University