January 19, 2022

Home Adress
Via Degli Artisti 37
quarto piano
Firenze 50132, Italy
Phone: +39 348 539 94 70
Email: tuna.abay@eui.eu

NBER
1050 Massachusetts Ave.
Cambridge, MA 02138

Dear Professors,

I am pleased to send my application to the Innovation Research Boot Camp 2022. I am a first-year Ph.D. student in Economics at European University Institute. I am interested in growth theory, innovation, and firm dynamics. Please find out more about me in the essay, where I mention my research interests, research experience, and current research.

The reference letter will be written and sent by Philippe Aghion.

Thank you very much for your time and consideration.

Sincerely yours,

Tuna Abay
European University Institute

Tuna ABAY

Via Degli Artisi 37, Florence 50132 | +39 348 539 94 70 | +90 538 856 44 44 | tuna.abay@eui.eu

Education

2021-present	**European University Institute, Florence, Italy** Ph.D., Economics
2019-2021	**Paris School of Economics, Paris** MPhil in Economics (APE) Thesis Superivisors: Philippe Aghion and Gilles Saint-Paul Thesis: Falling from the Shoulders of Giants: Patent Trades, Competition, and Falling Growth
June 2018	**Bachelor of Arts, Faculty of Economic and Administrative Sciences, Galatasaray University, Istanbul** Rank: 1^{st} place in the department and the Faculty of Economic and Administrative Sciences. Prof.Dr Besim Üstünel Award, given to the top student in the Faculty of Economic and Administrative Sciences Thesis: Valuation techniques and application of discounted cash flow method in the stock market.
2016-2017	**Exchange Program, Dauphine University, Paris IX**
June 2014	**Galatasaray High School, Istanbul**

Research Experience

2020-present

RA and Co-Author of a Research Paper

In summer 2020, I started to work as Research Assistant on a theoretical paper with Simone Moriconi from the Economics department of IESEG Business School Paris. Now I am the co-author of this paper, and we continue to work on it. It is a theoretical micro paper about the welfare analysis of the taxation under the incomplete contract model of Legros and Newman(2012).

March 2021-August 2021

Research Assistant of Philippe Aghion at Collège de France

I worked as RA with Philippe Aghion and the other co-authors David Strömberg, Céline Antonin, and Xupeing Sun on a project which examines the causal relationship between democracy and the mobility of researchers based on the Elsevier Scopus database.

Work in progress

Abay, T., and Moriconi S. (2022 Forthcoming),"Managerial Firms, Taxation, and Welfare".

Research Interests

Primary: Growth Theory, Innovation, Firm dynamics, Contract Theory, Industrial Organization,
Secondary: Empirical Industrial organization, Monetary and Fiscal Policy

Languages and Skills

Languages : Turkish (Native), English (Fluent), French (Advanced)
Computer Skills : R, Python, Matlab, Stata, MS Office, LaTeX
GRE Quantitative Exam: 169/170
Scholorships:
Embassy of France Scholarship based on academic excellence. (2019-2021)
Doctoral Fellowship, European University Institute (2021-2025)

Courses Taken At PSE

Macroeconomics I (G.Saint Paul, Hairault), Macroeconomics II (Tobias Broer, Daniel Cohen),Econometrics I (Jacquemet), Time Series Econometrics (Doz), Microeconometrics (Behaghel), Economic History (Thomas Piketty), R Programming, Python programming(From ENS Ulm) Microeconomics I (Geoffard), Microeconomics II (Caillaud), Emprical Industrial Organization (Gagnepain) International Economics (Pappada), Game Theory (Compte), Growth Theory (Philippe Aghion, Saint-Paul) Advanced Macroeconometrics (Ferrera, Doz), Economics of Public Intervention (D. Martimort), Business Cycles (Hairault, Broer),Theory of Incentives (D.Matimort), Computational Economics, International Macroeconomics (Bussiere), FDI (Reshef).

First year courses at EUI

Mathematics (Villanaci), Satatistics
Microeconomics I,II,III (Laurent Mathevet, David K. Levine, Zeinab Aboutalebi),
Macroeconomics I,II,II (Russell Cooper, Edouard Challe, Alexander Monge-Naranjo),
Econometrics I,II,II (Andrea Ichino, Sule Alan, Russell Cooper)

Tuna Abay
European University Institute (EUI),
Department of Economics

January 14, 2022

I BACKGROUND

I am a first-year economics Ph.D. student at European University Institute (EUI) in Florence. My research interests are in endogenous growth theory, innovation, and firm dynamics. My curiosity about these topics started while studying my Masters at the Paris School of Economics, where I had the opportunity to take the growth lecture of Philippe Aghion and later worked for him as a Research Assistant on a project on the mobility of researchers and freedom. For this forthcoming paper, we used the Elsevier Scopus database to track researchers and their affiliated institutions in their publications over time to identify their mobility. For the identification, we looked at the countries where democracy and freedom were temporarily disrupted due to military coups, such as those in Chile between 1973-1990 and in Argentina between 1976-1990. The project's preliminary results were presented by one of the co-authors, David Stromberg, at the "The Economics of Creative Destruction" seminar organized by the College de France last summer.

During my master's at PSE, I took the core economics courses in the first year. I took many advanced courses in growth theory, macroeconomics, time series econometrics, industrial organization, and contract theory in the second year. I wrote my master thesis as an extension of Akcigit and Ates's (2021) paper "Ten Facts on Declining Business Dynamism and Lessons from Endogenous Growth Theory," where I endogenized the knowledge diffusion parameter in the original paper by introducing patent trades between the leader and the laggard firms.

Currently, I am taking core first-year Ph.D. lectures at EUI, and from April on, I will start working on my potential job market paper. In line with my preliminary research idea, I will mainly focus on the historical patent data in the US and the UK. As you mention in the application form, the economics of innovation is not taught as a separate field course within my Ph.D. program. Thus, although I have some knowledge of the endogenous growth theory and firm dynamics, attending the boot camp will be extremely helpful to learn the broader theoretical foundations of the innovation literature from the leading professors in this field just before starting my own research in this field.

II CURRENT RESEARCH

II.A Forthcoming Paper

With Simone Moriconi (2022 Forthcoming)," Managerial Firms, Taxation, and Welfare".

I started to work with Simone Moriconi as a research assistant in the summer of 2020. As a result of my theoretical contribution to the model, he offered me to be the co-author. Since then, we have been working together and are about to complete the paper.

The paper contributes to the knowledge and investigates the welfare properties of perfect competitive equilibrium and the effects of taxation in an economy where managerial firms take production decisions. The model is based on Grossman-Hart's (1986) and Hart-Moore's (1990) vertical integration literature. Moreover, Legros-Newman's (2012) framework is taken as the benchmark model. In the model, supply decisions are taken by managers that choose the organizational structure of their firm (between non-integration and integration) to maximize their own payoff. In the case of non-integration, managers maximize their payoff separately, and Nash equilibrium is obtained. In an integrated structure, managers sell the firm to a headquarters (HQ), which centralizes the decision-making process, and obtains part of the revenues. We show that the first-best-efficient outcome cannot be reached, as managers' private coordination costs impose welfare losses at the market equilibrium. We also investigate the welfare effects of taxation. Our results show that a non-lump-sum tax may create an additional dead-weight loss compared to the neo-classical case since it may induce a switch to a less efficient organizational structure.

Finally, we showed that welfare properties of the market equilibrium and non-lump-sum taxation might differ in an extended setting, where HQs enjoy private benefits from coordinating activity and impose fixed production losses under integration. This new theoretical modeling is based on the empirical findings of the recent works on CEO literature, such as Bandiera et al. (2020) and Hoffman-Tadelis (2018). Consequently, we proved that if the productive efficiency gain due to organizational switch to a more efficient one outweighs the distortion of tax, introducing non-lump sum tax may increase the total welfare.

II.B Master Thesis

Over the last two decades, we have observed a decline in business dynamism in the United States. Akcigit and Ates (2020) attempted to explain the symptoms and the causes of the decline by the anti-competitive use of intellectual property rights. To this end, they constructed an endogenous growth model based on the step-by-step innovation of the firm dynamics. The model can explain most stylized facts by the exogenous decrease in knowledge diffusion from the leader to the follower firm. The driving force of the model also matches with the data that shows the patent re-assignments to the top 1 percent increases

drastically over the last decade. My extension supports this aspect of declining business dynamism and takes a step further by endogeneizing the patent trades by linking it to the ICT revolution and GPT literature (Aghion et al., 2014). It also enables it to interpret the growth as it eliminates the opposite forces that stem from the interplay between composition and incentive effect in the baseline model.

With this new theoretical extension, I show that the theoretical model can explain the empirical trend in the US productivity growth rate since the ICT revolution: The weak stock of knowledge in the ICT sectors in the 1970s causes an initial slowdown in the economy; over time, an increasing number of innovations creates a basis for upcoming innovations and leads to a burst of growth. However, an excess number of patent trade and collection of patents by big firms causes a decrease in competition over time. Eventually, increasing innovation costs in mature industries alongside weak competition lowers the growth rate.

EUROPEAN UNIVERSITY INSTITUTE

Academic Service

Florence, 18 January 2022

CERTIFICATE

This is to certify that Mr. **Tuna ABAY**, born on 22/06/1995 in Istanbul (Turkey), is registered as a 1st year researcher in the doctoral programme of the Department of Economics at the European University Institute, Florence (Italy), for the academic year 2021/2022 (01/09/2021 – 31/08/2022)

The EUI Doctoral Programme is a four-year grant programme (lasting four years, or a total of forty-eight months) therefore Mr. **Tuna ABAY** is expected to be registered with the European University Institute until 31/08/2025, conditionally on successful completion of all relevant academic requirements.

The specific academic requirements of the doctoral programme in the Department of Economics are set out in the Researcher's Guide:
https://www.eui.eu/Documents/DepartmentsCentres/Economics/RulesForms/Researchers-Guide-2021-2022.Final.pdf

Dr. Mathias Neukirchen
Academic Service

EUROPEAN UNIVERSITY INSTITUTE
Academic Service

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50014 San Domenico di Fiesole (FI), Italy
www.eui.eu

1.3 Structure of the Academic Year 2021-2022

	Week	Programme	Hours
First Block (11 weeks)			
26.08-22.10	1–9	Maths, Micro 1, Statistics & Econometrics 1 Advanced courses	21 x 3
25.10-29.10	10	Makeup classes/revision	
02.11-08.11	11	Exam Period (Block I)	
Second Block (11 weeks)			
10.11-22.12	1–6	Macro 1, Micro 2, Statistics & Econometrics 2 Advanced courses	21 x 3
22.12-04.01	7-8	Christmas Break	
05.01-07.01	9	Last week of teaching	
10.01-14.01	10	Makeup classes/revision	
17.01-21.01	11	Exam Period (Block II)	
Third Block (9 weeks)			
25.01-11.03	1-7	Macro 2, Micro 3, Statistics & Econometrics 3 Advanced courses	21 x 3
14.03-18.03	8	Makeup classes/revision	
21.03-25.03	9	Exam Period (Block III)	
Fourth Block (9 weeks)			
29.03-13.05	1-7	Macro 3 Advanced courses: 1st and 2nd yr students	21 x 1
16.05-20.05	8	Makeup classes/revision	
23.05-27.05	9	Exam Period (Block IV)	
13-17 June		**Comprehensive or retake exams**	

Student registration at the EUI takes place at the end of August. Each year the Department

Provisional transcript – relevé de notes provisoire
Année scolaire/Academic year: 2020/2021

Programme: Analysis and Policy in Economics/Analyse et Politique Economiques M2

Prénom NOM / First name LAST NAME Tuna ABAY
Date de naissance / Date of birth 1995-06-22
N° étudiant / Student ID 180231
Etablissement d'inscription / Enrolled at EHESS

Course	Grade	ECTS
Foreign Investment	18/20	3
Business cycles and Stabilization Policies	15.8/20	6
International Macroeconomics	15/20	3
Economics of Public Intervention	16/20	6
Growth and Structural Changes	15/20	6
Advanced Macroeconometrics	15.8/20	6
Computational Economics	14/20	3
The Theory of Incentives	16/20	3
Macroeconomics & Globalization // Topics in Macroeconomics	17/20	3
M2 APE Average Grade	15.65/20	60

Date (DD/MM/YYYY) : 01-07-2021

Signé par/Signed by: Homa Soroosh

Fonction/Position: Secrétaire Pédagogique

MINISTÈRE DE L'ÉDUCATION NATIONALE,
DE L'ENSEIGNEMENT SUPÉRIEUR
ET DE LA RECHERCHE

ÉCOLE DES HAUTES ÉTUDES
EN SCIENCES SOCIALES

MASTER ET DOCTORAT
ANALYSE ET POLITIQUE ÉCONOMIQUES

48, Boulevard Jourdan 75014 PARIS France

RELEVE DE NOTES ET RESULTATS

Session unique

ABAY Tuna

N° Etudiant : 180231 INE : 0G5LAT001Y6

Né le : 22 juin 1995 à : ISTANBUL (TURQUIE)

inscrit en **MASTER 1 ANALYSE ET POLITIQUE ECONOMIQUES**

Notes et résultats

	Note/Barème	Pts jury	Résultat	Session	Crédits
M1 APE SEMESTRE 1	13.68 /20		Admis	SU 2019/20	30
COURS FONDAMENTAUX ANALYTIQUES NIVEAU 1	12.9 /20		Admis	SU 2019/20	17
Macroeconomics 1	11.5 /20		Admis	SU 2019/20	6
Microeconomics 1	11.7 /20		Admis	SU 2019/20	6
Econometrics 1	15.5 /20		Admis	SU 2019/20	5
COURS FONDAMENTAUX THEMATIQUES	14.7 /20		Admis	SU 2019/20	13
Introduction to Economic History	13.5 /20			SU 2019/20	3
Game Theory	14.8 /20		Admis	SU 2019/20	5
International Economics	15.8 /20		Admis	SU 2019/20	5
M1 APE SEMESTRE 2	14.4 /20		Admis	SU 2019/20	30
COURS FONDAMENATAUX ANALYTIQUES NIVEAU 2	14 /20		Admis	SU 2019/20	24
Microeconomics 2	12.8 /20		Admis	SU 2019/20	6
Econometrics 3	13.25 /20		Admis	SU 2019/20	6
Econometrics 2	13.75 /20		Admis	SU 2019/20	6
Macroeconomics 2	16.2 /20		Admis	SU 2019/20	6
COURS D'OUVERTURE	16 /20		Admis	SU 2019/20	6
Elective course	14 /20		Admis	SU 2019/20	3
Optional course	18 /20		Admis	SU 2019/20	3

Résultat global

Résultat d'admission :	**14.04 /20**	**+ 0.46**	**Admis**	**60**

MINISTÈRE DE L'ÉDUCATION NATIONALE, DE L'ENSEIGNEMENT SUPÉRIEUR ET DE LA RECHERCHE
ÉCOLE DES HAUTES ÉTUDES EN SCIENCES SOCIALES
MASTER ET DOCTORAT ANALYSE ET POLITIQUE ÉCONOMIQUES
48 Boulevard Jourdan 75014 PARIS France

Fait à Paris, le 21 septembre 2020
Le responsable de la formation de master

Jean-Philippe Tropeano

Avis important : Il ne peut être délivré qu'un seul exemplaire du présent relevé de note. Aucun duplicata ne sera fourni.

PARIS SCHOOL OF ECONOMICS

ECONOMIC ANALYSIS AND POLICY MASTERS PROGRAM

The APE Program is a full-time 2-year program offered in English. It is a joint program of some of France's finest institutions of higher education and is thus issued (co-habilité) by the EHESS, the Université Paris 1 Panthéon-Sorbonne, the Ecole Normale Supérieure-Université Paris Sciences Lettres (ENS-PSL) and the Écoles des Ponts ParisTech. This program is certified by the Paris School of Economics.

Each year of the Masters programme (M1 and M2) requires students to validate 60 ECTS credits (European Credit Transfer System). This makes for a total of 120 credits over the full two-year programme. Each semester (S1 and S2 during year M1, S3 and S4 during M2) includes approximately 30 credits.

Language of instruction: English

The M1 Year

The M1 year aims to reinforce fundamental knowledge and basic methodological tools in **microeconomics** (a sequence of two courses, plus a course in games theory), **econometrics** (a sequence of three courses), **macroeconomics** (two courses, plus a course in international economics), and in **economic history**.

This year involves taking and passing 10 obligatory courses (6 courses of 6 ECTS, 3 courses of 5 ECTS and 1 course of 3 ECTS), one of six elective courses in a specific field of economics (3 ECTS), and a seminar in social sciences (3 ECTS), taken in another department of one of the partner establishments. Finally, students are invited to take a 8h practice class on R software though not for credit. The total teaching load during the M1 year is 552 hours minimum.

The M2 Year

The aim of the second year (M2) is to lead students to their first experience of a successful research project. It is centered around **a wide choice of advanced courses** designed to allow students to acquire specialized knowledge in different domains of current economics research.

The M2 Year requires students to validate 39 credits of courses (4 core courses of 6-credit during the first semester and 5 elective courses of 3-credit during the second semester). At the same time, **training in research processes** takes place throughout the year. The research project is composed of a work-in-progress seminar, worth 6 ECTS, where students present their first steps in the development of their research projects and Masters' dissertation worth 15 ECTS. The teaching load during the M2 year is 288 hours.

GUIDE TO EXAMINATION AND CLASS GRADES

Grades for all courses (both compulsory and optional) are between 0 and 20. Official rankings are not available at Paris School of Economics. **Grades of more than 15.50 are relatively rare and mean that the student has done very good work. A grade of more than 18.00 is hardly awarded.** Students must attend all of the courses for which they have signed up. In order to be admitted into the M2 year, students must pass all of the exams. The average grade required during the M2 year in order to be awarded the Masters' degree is 10/20.

The examiners for each course will determine a numerical grade for each candidate between 0 and 20 based on the following scale:

French Grade	Equivalent
16-20	A+
14-16	A- / A
13-14	B+
11-13	B- / B
10-11	C
Below 10	Fail

For the M1 Year: The average grade is calculated based on the grades for all of the courses, weighted by the number of ECTS credits each is worth. A student is automatically authorized to enrol into the second year of the master's program if his average grade is at least 10/20.

For the M2 Year: The average grade is calculated based on the grades for all of the courses, weighted by the number of ECTS credits each is worth. A student will be awarded his master's degree if he gets at least 10/20 on average grade of the second year.

The examiners for the Masters' Degree calculate the average of the 2nd year grades and award each candidate a *"Mention"* (Honors) based on the following scale:

French Grade	Honors
16-20	Highest Honors (Summa Cum Laude)
14-16	High Honors (Magna Cum Laude)
12-14	Honors (Cum Laude)
10-12	Pass

20 January 2022,

Dear Colleagues,

It is a pleasure to recommend Tuna Abbay for admission in the NBER Summer Innovation Program. Tuna was my research assistant last year at College de France on an ongoing project on Freedom and Innovation, and he did a fantastic job. At the same time, Tuna completed his Master thesis entitled "Falling from the Shoulders of Giants: Patent Trades, Competition, and Falling Growth".

This thesis aims to model the US TFP growth pattern since the ICT revolution in a step-by-step innovation model. This paper's main contribution and novelty are introducing endogenous patent trades between the leader and follower firms into the firm dynamics and innovation literature. Tuna added a binary variable into the value functions of firms where the leader firm can choose to buy the patent of the follower firm so that the leader can keep her position. This is an excellent master thesis that uses the existing theory very well and makes an incremental contribution to the endogenous growth and firm dynamics literature.

It is thus wholeheartedly that I recommend Tuna for admission in the NBER Summer innovation Program

With best regards,

Philippe Aghion