Paolo Zacchia
CURRICULUM VITAE – MARCH 2024

Italian national, born in Rome on December 17th, 1985. Currently resident in the Czech Republic.

Contacts

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Research Interests

Productivity, Labor and Innovation; Economics and Econometrics of Networks; Spatial Economics

Current Positions

2021 – present	**Assistant Professor**, CERGE-EI, Prague

Education

2009 – 2015	**Ph.D. in Economics**, University of California, Berkeley
2007 – 2009	**M.S. in Economics**, Università di Bologna
2004 – 2007	**B.S. in Economics**, Università di Pisa

Previous Positions

2019 – 2021	**Visiting Fellow**, CERGE-EI, Prague
2015 – 2021	**Assistant Professor**, IMT School for Advanced Studies of Lucca
2012 – 2013	**Research Analyst**, European Bank for Reconstruction and Development (on leave from U.C. Berkeley)

Teaching Experience

2019 – 2021	**Lecturer**, CERGE-EI Statistics (*Ph.D. level, core*); Microeconometrics (*Ph.D. level, since 2021*)
2015 – 2021	**Lecturer**, IMT School for Advanced Studies Econometrics (*Ph.D. level, core*); Microeconomics (*preparatory Ph.D. class, 2016-2018*); Productivity and Innovation (*Ph.D. elective module, 2015*)
2011 – 2015	**Graduate Student Instructor**, University of California, Berkeley Urban Economics (*reader, intermediate, 2015*); Statistics and Econometrics (*intermediate, 2014*); Economic Analysis: Macro (*intermediate, 2011-2014*)

Helena Schweiger, **Alexander Stepanov** and **Paolo Zacchia**. "The Long Run Effects of R&D Place-based Policies: Evidence from Russian Science Cities."

Abstract. We study the long-run effects of historical place-based policies targeting R&D: the creation of *Science Cities* in former Soviet Russia. The establishment of Science Cities and the criteria for selecting their location were largely guided by military and strategic considerations. We compare current demographic and economic characteristics of Science Cities with those of appropriately matched localities that were similar to them at the time of their establishment, and had similar pre-trends. We find that in present-day Russia, despite the massive cuts in government support to R&D that followed the dissolution of the USSR, Science Cities still host more highly skilled workers and more developed R&D and ICT sectors; they are the origin of more international patents; and they generally appear to be more productive and economically developed. We also rule out alternative explanations related to the differential use of public resources, and we find limited evidence of reversion to the mean. By estimating a spatial equilibrium model in our matched sample, we interpret these findings as the result of the interaction between persistence and agglomeration forces.

Paolo Zacchia. "Knowledge Spillovers through Networks of Scientists."

Abstract. In this paper I directly test the hypothesis that interactions between inventors of different firms drive knowledge spillovers. I construct a network of publicly traded companies in which each link is a function of the relative proportion of two firms' inventors who have former patent collaborators in both organizations. I use this measure to weigh the impact of R&D performed by each firm on the productivity and innovation outcomes of its network linkages. An empirical concern is that the resulting estimates may reflect unobserved, simultaneous determinants of firm performance, network connections and external R&D. I address this problem with an innovative IV strategy, motivated by a game-theoretic model of firm interaction. I instrument the R&D of one firm's connections with that of other firms that are sufficiently distant in network space. With the resulting spillover estimates, I calculate that among firms connected to the network the marginal social return of R&D amounts to approximately 112% of the marginal private return.

Paolo Zacchia. "Benefiting Colleagues but not Cities: Localized Effects from the Relocation of Superstar Inventors."

Abstract. In this paper I examine episodes in which superstar inventors relocate to a new city. In particular, in order to assess whether the beneficial effects of physical proximity to a superstar have a restricted network dimension or a wider spatial breadth (spillovers), I estimate changes in patterns of patenting activity following these events for two different groups of inventors: the superstar's close collaborators, and all the other inventors in a given urban area, for both the locality where the superstar moves to and for the one that is left behind. In the case of collaborators, I restrict the attention to patents realized independently from the superstar. The results from the event study register a large and persistent positive effect on the collaborators in the city of destination, as well as a simultaneous negative trend affecting those still residing in the previous location. In the long run, these effects translate into an increased difference between the two groups of about 0.16 patents per inventor. Conversely, no city-wide spillover effect can be attested, offering little support to place-based policies aimed at inducing a positive influx of top innovators in urban areas.

Santiago Pereda Fernández and **Paolo Zacchia**: "Identification of Network Effects with Spatially Endogenous Covariates: Theory, Simulations and an Empirical Application."

Status: revision requested at *Econometric Reviews*.

Abstract. Researchers interested in the estimation of peer and network effects, even if these are algebraically identified, still need to address the problem of correlated effects. In this paper we characterize the identification conditions for consistently estimating all the parameters of a spatially autoregressive or linear-in-means model when the structure of social or peer effects is exogenous, but the observed and unobserved characteristics of agents are cross-correlated over some given metric space. We show that identification is possible if the network of social interactions is non-overlapping up to enough degrees of separation, and the spatial matrix that characterizes the co-dependence of individual unobservables and peers' characteristics is known up to a multiplicative constant. We propose a GMM approach for the estimation of the model's parameters, and we evaluate its performance through Monte Carlo simulations. Finally, we show that in a classical empirical application about classmates our approach might estimate statistically non-significant peer effects when conventional approaches register them as significant.

Francesco Del Prato and **Paolo Zacchia**: "The Heterogeneous Consequences of Reduced Labor Costs on Firm Productivity."

Status: under review. Project approved for the 2020 VisitINPS program.

Abstract. We explore the effect of a reduction in overall labor costs, indirectly induced by an Italian reform that weakened employment protection legislation, on the productivity distribution of manufacturing firms. Due to the unique institutional features of the Italian collective bargaining system, in the manufacturing sector the reform led to a clean reduction in average worker compensation, without altering the average structure of employment relationships. This decrease in labor cost resulted in a reduction in average total factor productivity (TFP) among less productive firms, and an increase at the upper end of the distribution. We pair these findings with increased entry and exit dynamics among low-productivity firms, suggesting the presence of an adverse selection mechanism at the bottom of the TFP distribution, enhanced by the reform. We formalize this concept via a general equilibrium model that links productivity to frictions in the markets for inputs.

Alonso Alfaro-Ureña and **Paolo Zacchia**: "Matching to Suppliers in the Production Network: an Empirical Framework."

Status: under review. Financially supported by Charles University's PRIMUS grant (2021-2023).

Abstract. This paper develops a framework for the empirical analysis of the determinants of input supplier choice on the extensive margin using firm-to-firm transaction data. Building on a theoretical model of production network formation, we characterize the assumptions that enable a transformation of the multinomial logit likelihood function from which the seller fixed effects, which encode the seller marginal costs, vanish. This transformation conditions, for each subnetwork restricted to one supplier industry, on the out-degree of sellers (a sufficient statistic for the seller fixed effect) and the in-degree of buyers (which is pinned down by technology and by "make-or-buy" decisions). This approach delivers a consistent estimator for the effect of dyadic explanatory variables, which in our model are interpreted as matching frictions, on the supplier choice probability. The estimator is easy to implement and in Monte Carlo simulations it outperforms alternatives based on group fixed effects. In an empirical application about the effect of a major Costa Rican infrastructural project on firm-to-firm connections, our approach yields estimates typically much smaller in magnitude than those from naive multinomial logit.

Selected Work In Progress

"Good and bad suppliers." Joint with **Alonso Alfaro-Ureña** and **Jose Vasquez**.

Info: financially supported by Charles University's PRIMUS grant (2021-2023).

Abstract. We document an ample degree of dispersion of supplier quality, defined as the effect of a supplier's inputs on its buyer's sales, in the Costa Rican production network. Supplier quality also appears uncorrelated with buyer unobservables, suggesting the existence of both informational and spatial frictions affecting firms' choice of suppliers. We quantify these two forces via a structural model of production network formation.

"Hierarchical networks and their microeconomic origins." Joint with **Yaroslav Korobka**.

Info: financially supported by the Czech Ministry of Education's ERC-CZ grant (2023-2025).

Abstract. Borrowing tools from the practice of neural networks, we design a framework for the analysis of "hierarchical networks:" socio-economic settings featuring multiple, layered networks, whose nodes are linked across layers. We use this framework to revisit questions involving networks of workers and firms.

"Do AKM effects really matter?" Joint with **Aslan Bakirov** and **Francesco Del Prato**.

Info: financially supported by the Czech Ministry of Education's ERC-CZ grant (2023-2025).

Abstract. We revisit the wage decomposition literature using machine learning. We show empirically that if both worker- and firm-level observable characteristics are treated non-parametrically via generalized random forests, the share of log-wages variance explained by typical "AKM" fixed effects falls precipitously.

"Human capital value chains in local labor markets." Joint with **Francesco Del Prato**.

Info: project approved for the 2023 VisitINPS program.

Abstract. In local labor markets, workers often move at early stages of their careers from lower-paying firms that provide them training, to better-paying, specialized firms. We call this mechanism "human capital value chain" and we document its implications on both workers' wage paths and local agglomeration externalities.

"Estimation of correlated games."

Abstract. I consider the problem of estimating the parameters of a game where players are allowed to play correlated equilibria (Aumann, 1974). I show that the existence of correlation between strategies is testable, and I develop an empirical application of the proposed estimator to assess spatial collusion in airline entry.

Grants, Awards and Fellowships

2023 – 2025	Czech Ministry of Education, ERC-CZ grant (for future ERC applicants) Project title: "Hierarchical networks and their Microeconomic Origins" Principal Investigator grant: 5,293,000 CZK ($\approx$ 250,000 USD)
2021 – 2023	Charles University's PRIMUS Research Programme, fifth round Short project title: "(Mis)matching to Suppliers in the Production Network" Principal Investigator grant: 2,810,250 CZK ($\approx$ 130,000 USD)
2020 – 2021	*Jan Švejnar and Katherine Terrel* excellence in teaching award, CERGE-EI
2020 – 2021	Charles University's JUNIOR Fund for researchers based outside Czechia Fellowship supporting the local visiting position at CERGE Total fellowship amount: 900,000 CZK ($\approx$ 42,500 USD)

2013 – 2014	Dean's Normative Time Fellowship, U.C. Berkeley
2011	*Grace Katagiri* Prize for the best econometrics paper, U.C. Berkeley
2009 – 2011	*Marco Fanno* fellowship for graduate students in Economics
2007 – 2009	Full scholarship, Università di Bologna (*Collegio Superiore*)
2004 – 2007	Full scholarship, Sant'Anna School of Advanced Studies, Pisa

INVITED SEMINARS

2022	University of Ottawa
2021	Università di Roma Tor Vergata, Università di Bologna
2019	Universität Innsbruck, University of Nottingham, University of Warwick, CERGE-EI, École Polytechnique (Paris-Saclay), Université de Cergy-Pontoise
2018	Hungarian Academy of Sciences, STICERD at the London School of Economics
2017	Università di Genova, GREQAM Université de Marseille
2016	L.M.U. (Munich), Max Planck Institute (Munich), K.U. Leuven, Einaudi Institute for Economics and Finance (Rome), I.I.E.S. at the Higher School of Economics (Moscow), Università di Bologna
2015	Sant'Anna School of Advanced Studies (Pisa), New Economic School (Moscow), IMT School for Advanced Studies (Lucca), Stockholm School of Economics, Banca d'Italia

PRESENTATIONS AT CONFERENCES AND WORKSHOPS

2023	Annual VisitINPS conference, Rome (*invited*)
–	Meeting of the European Association of Labour Economics, Prague
–	Society of Labor Economics Meeting, Philadelphia (*accepted, replaced by coauthor*)
2022	European Winter Meeting of the Econometric Society, Berlin
2020	Innovation Workshop at the University of Luxembourg (*invited, canceled*)
2019	Northwestern Junior Workshop on the Econometrics of Networks, Evanston (*invited*)
–	Annual Conference of the International Association for Applied Econometrics, Nicosia
2018	European Winter Meeting of the Econometric Society, Naples
–	13th Meeting of the Urban Economics Association, New York
–	4th Geography of Innovation Conference, Barcelona
2017	7th EIEF-UNIBO-IGIER Workshop on Industrial Organization, Bologna
–	XVIII April International Conference on Economic and Social Development, Moscow
2016	AQR Workshop on Regional and Urban Economics, Barcelona
–	Annual Conference of the International Association for Applied Econometrics, Milan
–	North American Summer Meeting of the Econometric Society, Philadelphia
–	3rd Geography of Innovation Conference, Toulouse
2015	Pacific Conference for Development Economics (PacDev), San Diego
2014	14th International Workshop on Computational Economics and Econometrics, Rome
–	Munich Conference on Innovation and Competition (MCIC), Kreuth

Organization of Conferences and Workshops

2023	Meeting of the European Association of Labour Economics, Prague Member of the local organizational committee (CERGE-EI)
2018	7th Workshop on Networks in Economics and Finance (NETEF), Lucca Member of the local organizational committee (IMT School for Advanced Studies)

Student Placement

2024	Francesco Del Prato (Ph.D.; main advisor): tenure-track position at Aarhus Universitet
2022	Francesco Del Prato (Ph.D.; main advisor): post-doc at the Paris School of Economics
2021	Giorgi Chavchanidze (Master's): Ph.D. at Boston College, Finance Santiago Campos-Rodriguez (pre-doc): Ph.D. at U.C. Irvine, A.R.E.

Refereeing Activity

American Economic Journal: Economic Policy, *Econometric Reviews*, *Journal of Political Economy*, *Journal of the European Economic Association*, *Quarterly Journal of Economics*, *Research Policy*

Affiliations

American Economic Association, Econometric Society, European Economic Association

Languages

Italian (native), English (fluent), Spanish (fluent), German (advanced), Russian (intermediate), Czech (intermediate)