



# Sorting and agglomeration economies in French economics departments



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## ABSTRACT

Are agglomeration and peer effects at stake in academic research? To tackle this question, we study how departments' characteristics affect the quantity and quality of academics' publications in economics in France, controlling for individual time-varying characteristics and individual fixed effects. Department characteristics have an explanatory power at least equal to a quarter of that of individual characteristics and possibly as high as theirs. The quantity and quality of an academic's publications in a field increase with the presence of other academics specialised in that field and with the share of the department's publications output in that field. In contrast, department size, proximity to other large departments, homogeneity in terms of publication performance, presence of colleagues with connections abroad, and composition in terms of positions and age matter for some publication measures but only if not controlling for individual fixed effects.

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## 1. Introduction

Every academic has an opinion about what makes a good department. However, there are surprisingly few econometric studies that quantify this precisely, despite possible implications for the design of education and research institutions, an always-topical

concern (see for instance [Aghion et al., 2010](#)). Indeed, a large literature documents both the gains from spatial concentration (see [Rosenthal and Strange, 2004](#); [Combes and Gobillon, 2015](#)) and the effects of local peers and networks (see [Sacerdote, 2011](#); [Jackson, 2011](#)), which all could be at stake in academic departments. Here, we focus on the role on individual publication records in economics in France of both individual characteristics and a large set of departments' characteristics. We develop a careful strategy that controls for possible spatial selection of academics and missing variables.

Both the urban economics and the local peer effects literatures have emphasised the importance and difficulty of disentangling the role of individual sorting from the causal impact of the local environment. What makes individuals productive? Is it their own abilities, or the location (firm, city, school, etc.) where they operate? In the context of universities, do academics publish more because of their higher ability (based on gender, age or some other possibly unobserved characteristics) and a publication strategy that brings higher rewards (e.g. research field, number and location of co-authors)? Or because they are located in departments that provide better local environments and stronger externalities, which

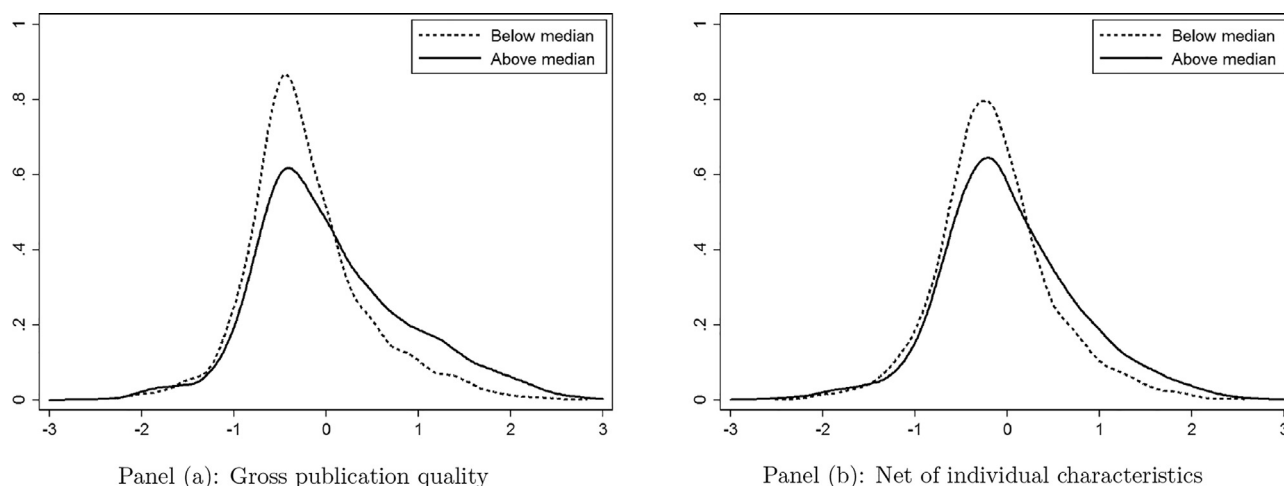
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**Fig. 1.** Distribution of the (detrended logarithm of) individual publication quality in departments above and below median total number of publications.  
*Notes:* Panel (a): Net of time and field fixed effects only. Panel (b): Net of time and field fixed effects and observed individual characteristics (gender, age and age squared, position, number of authors per publication, overall field diversity, co-authors located abroad). Publication measures and individual characteristics are defined in Section 2.

include both standard agglomeration economies due to specialisation, size and proximity to other departments, and the composition of local peers and their connections to foreign co-authors? Using an exhaustive panel of French academics in economics, over 19 years (1990–2008), including their quality-adjusted publication records in EconLit<sup>4</sup> and the location of the French economics departments employing them, we find that both individual skills and location matter for publications.

On the one hand, this contrasts with a few recent papers that consider a subset of the effects identified here. For instance, Waldinger (2012) concludes for Germany that there were no localised peer effects among physicists, mathematicians and chemists under the Nazi regime. Somewhat similarly, Kim et al. (2009) conclude that affiliation to one of the top 25 US universities in the 1990s, unlike in the 1970s and 1980s, no longer had an effect on individual academic outcomes in economics and finance. This is confirmed for mathematics all over the world by Dubois et al. (2014), who show that the best departments do not necessarily generate positive externalities even if they are the most successful at hiring the most promising academics. Oyer (2006) shows that top placements for new PhD graduate economists have long-term benefits for their careers, but no benefits related to enhanced productivity (in the 1990s). Our somewhat discordant conclusion might be explained by either the different context under study, which would mean that European institutions currently generate more local externalities than modern-day US universities, or German universities under the Nazi regime, or by the fact that our data set allows us to consider more local effects and to develop a more complete econometric strategy.

On the other hand, our finding clearly matches the agglomeration effects literature, which concludes that gains from spatial concentration exist in market activities even if individual characteristics and spatial sorting explain much of productivity differentials. This is illustrated for instance by Combes et al. (2008a) who use a reduced form approach similar to the one considered here or by Baum-Snow and Pavan (2012) in a structural approach. The conclusion is also in line with the local peer effect literature, which emphasises a significant (although not always large) role of peers and networks, either on labour markets (see recent examples by

Damm, 2014; Hellerstein et al., 2014), at school (e.g. Lefgren, 2004; Kang, 2007; Lavy et al., 2012) or in criminal activities (e.g. Zenou, 2003; Bayer et al., 2009). This is also consistent with the role of proximity found for innovative activities. Indeed, studying academic publications also bears the advantage, compared to general labour market outcomes for instance, to better isolate a specific agglomeration mechanism, innovation and knowledge spillovers, which the literature usually does by using data on patents and innovation, as surveyed by Carlini and Kerr (2015).

Fig. 1, inspired by Combes et al. (2012), shows both the higher quality of the publications of academics located in departments that produce a larger number of publications, and the fact that individual observed characteristics explain only part of this difference. In panel (a) in Fig. 1, the distribution of (the detrended logarithm of) individual average publication quality in a given field (for precise definitions see Section 2) is plotted for two groups of academics from departments above and below the median for total number of publications. Clearly, the former distribution is shifted and dilated, to the right of the latter. Academics in departments with more publications have higher average publications quality. This can be seen at any point in the distribution (the shift) and is especially obvious for higher quality (the dilation). Interestingly, in panel (b), which uses the same department grouping, the conclusion still emerges when individual average publication quality is netted out of the role of some individual observed characteristics. However, it holds to a lesser extent due to the positive sorting of academics with better characteristics into better departments. More generally, we show that, when not controlling for individual fixed effects, location explains as much as do observed individual characteristics. When controlling for individual fixed effects, location still represents at least a quarter of the explanatory power of all individual characteristics.

Beyond the respective roles of individual and local effects, it is crucial for the optimal policy design to shed some light on the mechanisms underlying local effects. This goal is shared for instance by Hellerstein et al. (2014) who try to assess whether neighbourhood effects on labour markets are stronger between or within groups, in terms of race or ethnicity, by Lavy et al. (2012) who evaluate the impact of the presence of low-ability peers in classrooms on teachers' pedagogical practice and the quality of inter-student and student-teacher relationships, or by Agrawal et al. (2008) who study the relative role of spatial and social proximity for knowledge flows. In urban economics, the initial focus on

<sup>4</sup> EconLit is the electronic bibliography of the American Economic Association (see <http://www.aeaweb.org/econlit/index.php>). It is one of the largest publication data sets, listing more than 560,000 articles published between 1969 and 2008 in more than 1200 journals.

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