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The phantom of the opera: Cultural amenities, human capital, and regional economic growth☆

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ABSTRACT

We analyze the extent to which endogenous cultural amenities affect the spatial equilibrium share of high-human-capital employees. To overcome endogeneity, we draw on a quasi-natural experiment in German history and exploit the exogenous spatial distribution of baroque opera houses built as a part of rulers' competition for prestigious cultural sights. Robustness tests confirm our strategy and strengthen the finding that proximity to a baroque opera house significantly affects the spatial equilibrium share of high-human-capital employees. A cross-region growth regression shows that these employees induce local knowledge spillovers and shift a location to a higher growth path.

1. Introduction

The connection between the presence of exogenous local amenities, such as weather conditions, and spatial differences in wages and rents has long attracted a great deal of interest.[3] Roback (1982) shows in the framework of a spatial equilibrium model that exogenous local amenities that are valued by employees are capitalized into rents and wages. In an extension of this model, Moretti (2004) distinguishes low-human-capital employees from high-human-capital employees, assuming that only the latter value the local amenity. This model suggests a spatial equilibrium, with a larger share of high-human-capital employees in the high amenity location. In this paper, we focus on consumptive amenities and argue that especially high-human-capital individuals cherish the availability of cultural amenities, a hypothesis that is supported by reality. For example, a large survey of about half a million individuals in Germany finds that the highly educated full-time employed respondents who moved in the previous 10 years in fact rank

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[3] See, e.g., Rosen (1974, 1979), Roback (1982, 1988), Blomquist et al. (1988), Gabriel and Rosenthal (2004), Gyourko and Tracy (1991), and Rappaport (2007) for research in this area and Bartik and Smith (1987) for an overview.

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"cultural offerings and an interesting cultural scene" among the top five reasons (out of 15 possible reasons) for their location choice.[4]

The challenge in analyzing the effect of local cultural amenities on high-human-capital employees is that cultural amenities – as compared to natural amenities like weather – are not exogenously determined. Initially, the endogeneity issue arises from local high-human-capital individuals' ability and willingness to pay for cultural services (Glaeser, 2005). Furthermore, local governments might compete for creative individuals by subsidizing cultural services. For instance, German municipal governments subsidized "music and theatre" with more than 35 Euro per capita in 2006 (Destatis, 2008). Given the local government's budget constraint, subsidies for cultural services, other local public spending, e.g., for education and local taxes are to a degree simultaneously determined (Gyourko and Tracy, 1991). This gives rise to a second endogeneity problem when analyzing the effect of local cultural amenities on high-human-capital employees. In both cases, it is not possible to refer an observed share of high-human-capital individuals in a region to the cause of cultural amenities and, consequently, it is not guaranteed that expenditures for cultural amenities do indeed attract high-human-capital individuals.

To overcome these endogeneity problems and identify a causal relationship between cultural amenities and the spatial concentration of high-human-capital employees, we exploit a quasi-natural experiment in German history. During the Baroque era, absolutistic courts and churches competed with each other for musical talent.[5] This competition was especially fierce in what is now Germany, which at that time and up until industrialization was politically fragmented into several hundred princedoms. Vaubel (2005) illustrates this nicely when he mentions that Thuringia alone, where the composer J. S. Bach grew up, contained 22 separate courts. Music was so highly regarded that "every local court (Hof) worth its salt had its own orchestra or band (*Kapelle* or *Harmonie)*, and the more affluent courts maintained opera houses" (Scherer, 2001a, p. 719). These opera houses, many of which still exist, acted as tangible symbols of their builders' prestige. However, the presence of one of these opera houses does not necessarily mean that the surrounding region was wealthy and prosperous enough to afford it; very often the rulers incurred vast debt and engaged in deficit spending in their quest for grandeur (Duchhardt, 1992; Vierhaus, 1984). In other words, we argue that baroque opera houses do not indicate regional wealth or predict future prosperity. Accordingly, proximity to these opera houses, which were the result of a competition for prestige between kings, dukes, and princes, should be exogenous to the distribution of high-human-capital employees that originates from the period of and after the Industrial Revolution.

We find that proximity to a baroque opera house is a strong predictor of a region's equilibrium share of high-human-capital employees. In several robustness tests, we discuss confounding factors that might be correlated with both proximity to a baroque opera house and the local share of high-human-capital individuals. Including control variables that are measured at the baroque opera house location and that are likely to capture productive spillovers from that location to the region being investigated does not change our result. To further validate our argument that proximity to a baroque opera house is a valid explanation for the effect of cultural amenities, we construct counterfactual opera house locations. Using propensity score matching, we determine from the pool of locations not having a baroque opera house those locations that are the "historic twins" of locations that did have an opera house. We then test the impact of proximity to these counterfactual places on a location's share of high-human-capital employees. These counterfactual locations differ significantly from the actual opera locations in the size of their cultural scene today but not in terms of the quality of infrastructure or the degree of urbanization. Eventually, we do not find a significant effect of distance to the closest counterfactual baroque opera house location on a location's share of high-human-capital employees.

Local governments, however, are interested not only in whether local cultural amenities attract high-human-capital individuals but also in whether these high-human-capital individuals generate some form of local knowledge spillover. In the absence of positive spillovers, it is difficult for a local government to justify its use of taxpayer money to subsidize cultural amenities. Thus, we exploit the exogenous variation in the local share of high-human-capital individuals stemming from proximity to a baroque opera house and analyze the effect of the local level of human capital on a location's growth path. Endogenous growth theories suggest that in the presence of some form of local knowledge spillovers, the local level of human capital should have a positive effect on a location's growth path. Applying an instrumental variable approach, we find that it is the local level of high-human-capital employees who value their proximity to a baroque opera house that shifts a location to a higher growth path.

The remainder of the paper is organized as follows. In Section 2, we provide a detailed description of the quasi-natural experiment in German history that provides us with an exogenous spatial distribution of cultural amenities, i.e., baroque opera houses. In Section 3, we analyze the effect of proximity to a baroque opera house on the spatial equilibrium share of high-human-capital employees and discuss a variety of confounding factors that might bias our estimates. In Section 4, we exploit this exogenous variation in the local share of high-human-capital individuals to test the impact of the local level of human capital on a location's growth. We conclude, in Section 5, by discussing some of the implications of our findings.

2. Baroque opera houses in Germany as a quasi-natural experiment

In the centuries following Charlemagne, France, Spain, England, and Habsburg Austria developed into states where power was wielded by a centralized sovereign. In contrast, the Holy Roman Empire became increasingly fragmented because the emperor had to buy the loyalty of kings, princes, and dukes within the empire by granting territorial and governance concessions. When the Treaty of Westphalia finally ended the Thirty Years' War in 1648, what we know as Germany today was comprised of hundreds of sovereign kingdoms, principalities, and dukedoms. This environment of political fragmentation continued until the German Empire was established in the second half of the 19th century. During this same period, European instrumental music experienced its apogee with the Baroque era, the most famous composers of which came from politically fragmented areas of Germany and Italy (Scherer, 2001a; Vaubel, 2005).[6] Elias (1993, p. 26) explains this conjunction of circumstances as the result of competition for prestige among rulers of principalities[7]:

> In France and England the decisive musical positions were concentrated in the capitals, Paris and London, as a result of state centralization. A high-ranking musician in these countries therefore had no chance of escape if he fell out with his princely employer. There were no competing courts that could rival the king's in power, wealth and prestige, and that could have given refuge to, for example, a French musician who had fallen from favor. But in Germany and Italy there were dozens of courts and

[4] The "Perspektive Deutschland" (Perspective Germany) Survey by the McKinsey consultancy. For more details, see Buettner and Janeba (2009).

[5] We concentrate on the period 1650–1800, which covers the whole time of Baroque. In the following, we thus refer to this whole period as Baroque era.

[6] Among these composers were Johann Sebastian Bach, Georg Friedrich Handel, Georg Philipp Telemann, Joseph Haydn, Christoph Willibald Gluck, Ludwig van Beethoven, Wolfgang Amadeus Mozart, and Antonio Vivaldi.

[7] Scherer (2004) provides empirical evidence in support of this assumption.