

Training and economic density: Some evidence from Italian provinces [☆]

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Abstract

In this paper we use a search and matching model to investigate the economic relationship between training and local economic conditions. We identify two aspects of this relationship going in opposite directions: on the one hand, the complementarity between local knowledge spillovers and training generates a positive correlation between training and local density; on the other hand, higher wages and labor turnover in denser areas reduce training. Overall the relationship can be either positive or negative, depending on the relative strength of these two effects. Our empirical analysis, based on a sample of Italian firms, shows that training is lower in provinces with higher labor market density, measured as the number of employees per squared kilometer.

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Introduction

The productivity gains associated to local economic density are documented by an increasing body of empirical research (Henderson, 1986; Ciccone and Hall, 1996; Ciccone, 2001). Understanding the sources of these gains is important for policy, especially in the light of the Lisbon strategy, which aims at making of Europe a highly competitive and productive region of

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the world. One source identified by the literature is the positive spatial externalities associated to the physical proximity of workers and firms, which more than offset the negative congestion effects originated by the intense use of capital and labor (Ciccone and Hall, 1996). An additional channel linking density to productivity operates via training and its positive influence on productivity:¹ on the one hand, denser areas encourage firms to invest in human capital, because knowledge spillovers are better exploited by skilled workers, and trained employees are more productive. On the other hand, density increases wages and turnover, which discourage training investments and reduce productivity. If the former effect prevails on the latter, higher density is associated to more training, and thus to higher productivity.

The purpose of this paper is to explore this second channel, both theoretically and empirically. We believe that the study of the relationship between density and training is important because it helps us understand how local agglomeration patterns influence productivity. The complementarity between knowledge spillovers, innovation and skills has already been emphasized in the relevant literature. Acemoglu (2002), for instance, argues that the ability of each firm to adapt new technologies and ideas developed by other firms is strictly related to the skills of its own labor force. On the empirical side, Moretti (2004), finds that productivity gains from human capital spillovers are relevant for manufacturing establishments in the US.

Skills after labor market entry are generated by training and experience. Training is important both because it increases the ability to perform well the relevant task and because it improves the ability to understand and process the flow of information from the productive environment, and to translate this information into higher productivity on the job (Jaffe et al., 1993; Anselin et al., 1997). The complementarity between skills and local knowledge spillovers suggests that firms located in denser areas have stronger incentives to invest in training: by increasing the skills of the labor force, firms benefit more from the positive externalities associated to density and are more productive.

This complementarity, however, is not sufficient to generate a positive relationship between local economic density and training incidence, because denser areas have also higher wages (see Glaeser and Mare, 2001; Ciccone and Cingano, 2003, for a review) and higher labor turnover, which discourage investment in training.² It follows that the relationship between local agglomeration effects, measured by local employment density, and employer-provided training, can take either sign. In their empirical analysis of UK data, Brunello and Gambarotto (in press), show that the balance of positive and negative effects is tilted in favor of the latter, and that training incidence is lower, *ceteris paribus*, in denser economic areas.

In this paper, we present a model of employer-provided training in search equilibrium which illustrates the steady - state relationship between training, density and productivity in local labor markets. The model also provides guidance to the empirical investigation which follows. We use data on more than 1000 Italian manufacturing firms, drawn from the Survey of Italian Manufacturing (*Indagine sulle Imprese Manifatturiere*) conducted by Mediocredito Centrale, and estimate the relationship between training incidence, measured as the percentage of trained employees in each sampled firm during the year of reference, and local labor market density, where the local market is identified with the province.

¹ The empirical evidence showing that training increases productivity is reviewed by Bassanini et al. (in press). In this paper, we restrict our attention to employer-provided training.

² The effects of labor market conditions on training have been studied in the relevant literature. Acemoglu and Pischke (1999), for instance, argue that firms operating in local labor markets characterized by high unemployment rates have more incentives to invest in training, because worker have lower bargaining power. An alternative view is that high local unemployment, by increasing the availability of skilled employees in the local labor market, reduces matching costs and the incentives to train (see Brunello and Medio, 2001; Stevens, 1996).

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