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# The role of human capital investments in the location decision of firms

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## Abstract

We explore the role of human capital investments in the location decisions of firms. We show that whether human capital investments act as a force for or against concentration depends on who is undertaking them and whether they are industry or firm specific. We also discuss the empirical predictions of our theoretical analysis.

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## 1. Introduction

In this paper, we explore the role of human capital investments in the location decisions of firms. We argue that the location of firms influences the extent of labor market imperfections, which in turn affect the incentives to invest in workers' human capital. We show that the optimal location of firms depends on who is undertaking the investments and

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whether they are industry or firm specific. Thus, even a simple model that focuses exclusively on human capital investments can provide rich predictions about the spatial concentration of firms.

As an illustrative example, consider the accordion industry which is almost entirely concentrated in Castelfidardo, a small city near Ancona, Italy (see [Tappi, 2002](#)).<sup>2</sup> If one asked locals why this industry is concentrated there, they would probably reply that it is due to the great skill of the local workforce in producing accordions. But this would just lead to the next question, namely, why are all these skillful accordion workers concentrated in Castelfidardo. One potential answer, and the one we focus on here, is that workers who settle down in this medieval town when they are young have very strong incentives to invest in skills that are specific to the accordion industry. In particular, these workers do not have to worry about being held up by their employers after they have invested in their accordion making skills in as much as they can always threaten to work for another local manufacturer. In as much as they do not worry about being held up when they are old, they have strong incentives to invest in their own skills when they are young.

The idea that colocation of firms can mitigate the potential hold-up problem between workers and firms and can thus induce more efficient (industry specific) human capital investments by the workers is not novel and was recently analyzed by [Rotemberg and Saloner \(2000\)](#).<sup>3</sup> The main empirical prediction of their paper is that firms that use the same type of labor are located close to each other to protect the workers' human capital investments. Thus, using the terminology introduced by [Duranton and Puga \(2003\)](#), they predict 'functional' concentration, i.e., concentration of firms using similar skills, rather than 'sectoral' concentration, i.e., concentration of firms producing similar goods. [Dumais et al., \(1997\)](#) test this prediction and find evidence that "plants do seem to locate near other industries when they share the same type of labor. This effect is quite large and suggests that labor market pooling is a dominant force in explaining the agglomeration of industry" ([Dumais et al., 1997, 28–31](#)).<sup>4</sup> A number of other papers have since confirmed the importance of labor market pooling in explaining the spatial concentration of firms (see, for instance, [Rosenthal and Strange \(2001\)](#), [Rigby and Essletzbichler \(2002\)](#) and, for a survey, see [Rosenthal and Strange \(2004\)](#)). All these papers take it for granted that spatial concentration of firms mitigates the hold-up problem.

We agree with the authors of these papers that labor market considerations can play an important role in determining the location of firms. However, we want to caution against the view that spatial concentration by firms unambiguously improves the incentives to invest in the workers' human capital. We show below that human capital investments can

<sup>2</sup> There are of course many other examples of industries that are very spatially concentrated, such as the carpet industry in Dalton, Georgia, (USA) and the Swiss watch-making industry in Geneva and in the northwestern mountains of the Jura. Moreover, this is by no means a recent phenomenon. [Marshall \(1920\)](#) reported almost a century ago that the British cutlery manufacturing industry was concentrated in Sheffield, and [Duranton and Overman \(2004\)](#) show that this is still the case today. We review the recent empirical literature on the agglomeration of industries below.

<sup>3</sup> See also [Almazan et al. \(2003\)](#) and [Combes and Duranton \(2003\)](#).

<sup>4</sup> We are deliberately referring to the working paper and not to the published paper ([Dumais et al. \(2002\)](#)) in as much as the latter omits the material on the sources of agglomeration economies.

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