



Educational diversity and knowledge transfers via inter-firm labor mobility[☆]



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ABSTRACT

This article contributes to the literature on knowledge transfer via labor mobility by providing new evidence regarding the role of educational diversity in knowledge transfer. In tracing worker flows between firms in Denmark over the period 1995–2005, we find that knowledge carried by workers who have been previously exposed to educationally diverse workforces significantly increases the productivity of the hiring firms. Several extensions of our baseline specification support this finding and confirm that our variable of interest affects the arrival firm's performance mainly through the knowledge transfer channel.

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1. Introduction

Worker flows are closely connected to firm outcomes, reflecting the contributions to firm productivity of both incoming workers' human capital and the knowledge that they carry over from previous workplaces. Therefore, inter-firm worker movement provides insight into how inter-firm knowledge transfer typically occurs. However, although scholars have long discussed and relied on the notion of inter-firm transmission of knowledge as a means to explain growth (Lucas, 1988; Romer, 1990; Grossman and Helpman, 1991), they have devoted less attention to the mechanisms governing these knowledge spillovers. Up until now, no study has, for example, investigated how knowledge transfers are linked via labor mobility to the previous exposure of mobile workers to educationally heterogeneous workforces.

When workers move from one firm (the sending or departure firm) to another (the receiving or arrival firm), they carry with them knowledge that they have obtained both from their work and their interactions with co-workers at previous workplaces. Thus, through inter-firm labor mobility, an enterprise may gain access to the knowledge pool to which incoming

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workers have been exposed in past work environments. This knowledge pool may partly arise from learning-by-using or learning-by-doing activities as acknowledged in early seminal works (Arrow, 1962; Atkinson and Stiglitz, 1969; Nelson and Winter, 1982) and more recent empirical studies (Irwin and Klenow, 1994; Darr et al., 1995; Schilling et al., 2003; Gaynor et al., 2005). The firm knowledge pool may also arise from interpersonal exchanges between co-workers, as documented in a number of studies (Battu et al., 2003; Moretti, 2004; Munch and Skaksen, 2008; Nanda and Sørensen, 2010). Since Marshall (1890), the firm environment has been viewed as a main locus in which social interactions favor the sharing and transfer of knowledge (Moretti, 2004). Working in close physical and psychological proximity with colleagues can affect the rate of knowledge accumulation of an individual due to his or her exposure to the pool of skills, attitudes to decision making and problem solving and, more generally, the cognitive ability and experience of others. In this context, co-workers represent potential sources of knowledge and information at the individual's disposal that differ from the (usually task-specific) knowledge acquired directly through on-the-job-training and learning-by-doing practices. The likelihood and frequency of social interactions in workplaces induce employees to share what they know and use what they learn in addressing both simple and complex problems. Although co-worker interactions rarely occur without some form of knowledge sharing and exchange, the magnitude of such knowledge transfer is highly context specific. For instance, knowledge transmission is indeed facilitated within the collaborative network of an employee, who is likely to build close interpersonal ties with direct collaborators. More importantly, knowledge transmission and sharing may be particularly related to the heterogeneity of the actors involved.

Researchers have recently examined the contribution of labor heterogeneity to firm productivity by considering the direct relationship between these variables without evaluating the possible influence of the workforce composition of the departure firm. Among other studies at the firm level (e.g., Leonard and Levine, 2006; Iranzo et al., 2008), Parrotta et al. (2014a) investigate the existence and magnitude of this direct relationship. On the one hand, the reduced-form analysis reveals that labor diversity in education is significantly and positively associated with firm productivity for all the sectors included in the analysis. On the other hand, the estimated parameters of the structural production function governing the substitutability between labor types suggest that, for about half of the sectors, skill diversity arising only among highly educated workers is positively associated with firm productivity. This evidence is consistent with the theoretical predictions of Lazear (1999), who argues that labor diversity in terms of educational background is productivity enhancing if one worker's information set is relevant to and does not overlap with another's. Therefore, whereas informational asymmetry is detrimental to the productivity of individuals working in isolation, it is a necessary condition for effective knowledge sharing among co-workers within organizations. However, Parrotta et al. (2014a) also finds that ethnic and demographic heterogeneity generally does not positively correlate with productivity, suggesting that the negative effects of the communication and integration costs associated with a more demographically and culturally diverse workforce counteract the positive effects of diversity that arise from enhanced creativity and knowledge spillover (Lazear, 1999; Glaeser et al., 2000; Alesina and La Ferrara, 2005).

Concerning the role of knowledge transfers via labor mobility, we know that labor flows between firm pairs are a conventional proxy for knowledge transfer. Earlier studies have traced the movement of specific categories of workers – such as engineers (Almeida and Kogut, 1999), R&D workers (Maliranta et al., 2009), and scientists and technical personnel (Tambe and Lorin, 2013), and have focused on labor mobility as producing knowledge transfers from foreign-owned (Balsvik, 2011; Poole, 2013), R&D-intensive (Moen, 2005), patenting (Kim and Marschke, 2005) or more productive (Stoyanov and Zubanov, 2012) firms, all of which enjoy clear competitive advantages. Nevertheless, Parrotta and Pozzoli (2012) provide evidence that labor mobility is a potential channel for knowledge spillover within a broader set of firms in both the manufacturing and service sectors, introducing a deep and generalized process of learning-by-hiring into the economy.¹ Although Parrotta and Pozzoli (2012) provide critical details regarding the general knowledge transmission mechanism, they do not explore how differences in co-worker profiles in previous workplaces may encourage knowledge transmission. Examining this aspect is our main goal in this paper. Specifically, we investigate whether and to what extent past workforce diversity in education affects arrival firm productivity.

Based on the evidence provided in both fields of studies, we expect to observe that, with all other things being equal, a more heterogeneous departure firm's educational pool results in a more likely knowledge transfer from the departure firm to the arrival firm through labor mobility. Thus, interactions with co-workers who have heterogeneous knowledge due to their different educational backgrounds may create an opportunity for new combinations of knowledge and skill complementarities and may promote learning opportunities that can eventually be transferred to firms through labor mobility. Identifying and measuring the economic consequences of the spillovers generated by the educational heterogeneity of previous co-workers is clearly important for a complete comprehension of the various factors that play a role in determining firm performance as well as sharpening our understanding of how the well-documented (firm-specific) benefits from the educational diversification of labor inputs can be transmitted to other firms in the economy. The primary aim of the present research is to test the hypothesis that firm productivity benefits from educational labor diversity of other enterprises because the flow of workers among firms facilitates the acquisition of considerable portions of the knowledge pool characterizing

¹ Pioneering studies on the concept of learning by hiring include Song et al. (2003) and Rosenkopf and Almeida (2003).

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