Productivity and Knowledge Transfer: Evidence from Prisoner Employment*

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Abstract

Worker mobility can facilitate the transmission of knowledge and ultimately increase productivity. Yet isolating such productivity effects is challenging because of worker sorting, labor market adjustments, and assimilation processes. We exploit quasi-experimental variation arising from the temporary employment of Italian prisoners of war in agricultural production in Australia during World War II to isolate the effects of worker mobility on productivity. We find that this inflow of workers increased agricultural output in the short run and generated productivity gains that persisted after the workers' departure. Examining mechanisms, we show that the employment of foreign workers led to greater mechanization and to a shift toward crops better suited to local conditions in areas that received workers from Italian provinces where such technologies and crops were more common. Our findings point to the transfer of origin-specific know-how as a key channel through which worker mobility generates lasting productivity gains in the host economy.

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1 Extended Abstract

A long-standing literature in economics debates the effects of worker mobility across countries, or across regions within a country, on destination economies. Most of this literature focuses on the impact of increased labor supply, resulting from worker mobility, on labor markets and the subsequent adjustments in production processes (e.g., Card, 1990; Borjas et al., 1997; Card, 2001). Less is known about whether an inflow of workers also affects productivity *per se*, independently of adjustments induced by labor markets, and, if so, whether these productivity effects outlast the workers who originated them. Such persistent effects may arise through the transfer of origin-specific skills (Bazzi et al., 2016) or technology know-how (e.g. Bloom et al., 2013) that new workers may bring with them, which are valuable in the destination economy but otherwise difficult to transfer.

Isolating the productivity effects of a labor inflow is challenging in most settings for several reasons. First, workers may select destinations according to their skills (Obolensky et al., 2024), creating an identification problem that is challenging to address. Second, even when workers are allocated to regions independently of their skills, changes in labor supply typically induce shifts in the relative cost of labor versus other production inputs, which themselves influence production and productivity (e.g., Lewis, 2011; Ottaviano and Peri, 2012; Ottaviano et al., 2013). Third, workers often remain in the destination economy for long periods, so that productivity effects may be shaped by long-run factors such as immigrant assimilation into society and production (e.g., Abramitzky and Boustan, 2017).

This paper isolates the causal effects of knowledge transfer stemming from an inflow of labor on agricultural productivity. We draw on newly digitized data linking agricultural productivity to detailed records of Italian prisoners of war (POWs) held in Australia during World War II and exploit the variation arising from the POWs employment program. The unique features of this program, in which workers were quasi-randomly allowed to work only in certain areas and only temporarily until the end of the war, allocated independently of their farming skills, and paid wages and hours set by the government to match those of local workers, allow us to overcome the challenges that typically arise when isolating the effects of knowledge transfer through worker mobility on productivity. We find that the inflow of wartime foreign workers increased both agricultural production and productivity. While output gains peaked when foreign labor utilization was highest, productivity gains persisted after their departure, indicating longer-lasting effects. By linking workers' provinces of origin in Italy to pre-war Italian agricultural data and Australian soil characteristics, we show that farms employing these workers experienced greater mechanization and a shift toward crops better suited to local conditions. These productivity-enhancing adjustments were

concentrated in areas that received workers from Italian regions where such crops were more common and mechanization was more advanced before the war. Overall, the evidence points to the transfer of origin-specific know-how as a key mechanism through which temporary labor inflows can generate lasting productivity improvements.

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