The Effect of ( Mostly Unskilled ) Immigration on the Innovation of Italian Regions

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Innovation is a key factor for a country’s economic growth and there exists an extensive literature aiming to analyze its potential drivers. Among the several factors that may affect the innovation rate, a growing number of studies has recently devoted attention to the possible consequences of immigration on the level of innovation of host countries. There are several reasons why immigration may have an effect on innovation. First of all, the inflow of foreign population directly modifies some of the receiving regions’ features which are powerful predictors of innovation. Immigration causes changes in the size of the population, which is likely to spur innovation through the advantages produced by the agglomeration of economic activities (Becker et al. 1999, Population and economic growth in American Economic Review 89:145-149, Glaeser 1999, Learning in cities in Journal of Urban Economics 46:254-277) and market size (Acemoglu and Linn 2004, Market size in innovation: Theory and evidence from the pharmaceutical industry in The Quarterly Journal of Economics 119:1049-1090). Also, immigrants might change the average skill level and the age structure of the population, affecting local human capital, an important engine for the production of new ideas (Romer 1990, Endogenous technological change in Journal of Political Economy 98: S71-S102; Faggian and McCann 2009, Human capital, graduate migration and innovation in British regions in Cambridge Journal of Economics 33: 317-333; Andersson et al. 2009, Urbanization, productivity and innovation: Evidence from investment in higher education in Journal of Urban Economics 66:2-15; Cowan and Zinovyeva 2013, University effect on regional innovation in Research Policy 42:788-800). Immigration also produces a more culturally diverse population, triggering mechanisms that may act in opposite directions. On the one hand, beneficial effects are expected from the interplay of complementary skills (Jacobs 1969, The economy of cities. Random House, New York) between natives and migrants, and from the transfer of new knowledge. On the other hand, cultural diversity could also entail difficulties in communication, reduce social capital, and act as an obstacle to innovation and growth (Alesina and La Ferrara 2005, Ethnic diversity and economic performance in Journal of Economic Literature 43:762-800). The net effect is likely to depend on the skill composition of immigrants. Finally, a large inflow of low-skilled immigrants in a region may affect firms’ choices concerning technology adoption and investments in physical capital. It has been shown (Lewis 2011, Immigration, skill mix and capital skill complementarity in The Quarterly Journal of Economics 126:1029-1068) that a worsening in the average level of education induced by immigration may cause a slower adoption of new technologies by plants, and that the increases in the relative supply of low-skill workers can be associated with slower growth in capital-labor and capital-output ratios. According to another study (Peri 2012, The effect of immigration on productivity: Evidence from U.S. states in The Review of Economics and Statistics 94:348-358), immigration seems to promote the adoption of unskilled-efficient technologies.

studies find a positive effect of skilled immigrants on innovation and productivity in receiving countries. However, in most European countries just the minority of immigrants are skilled. Quite surprisingly, the literature has paid scarce attention to the general effect of immigration, or of low-educated immigrants.

In our paper (Bratti and Conti 2014, The Effect of (Mostly Unskilled) Immigration on the Innovation of Italian Regions, IZA Discussion Paper n.7922), we investigate the causal effect of foreign immigration on Italian provinces’ innovation during 2003-2008, using as main sources of data ISTAT (Italian National Statistical Institute) and EUROSTAT. Italy is an interesting case to study, since it has been exposed to a very fast and large wave of immigration during the 2000s (the share of foreigners on the Italian population grew from 2.7% in 2003 to 5% in 2007 - Fondazione Leone Moressa 2011, Rapporto annuale sull’economia dell’immigrazione, Il Mulino, Bologna). Moreover, Italy displays peculiar characteristics related to the immigration phenomenon: the big majority of immigrants tends to take manual-intensive and routine-type occupations (e.g., in construction, agriculture and personal-services sectors). In 2008, one third of the low-skilled labor force was composed of immigrants, while the share in the high-skilled workforce was 1.9% (Fondazione Leone Moressa 2011). This is mainly due to the low schooling levels which characterize most of the foreign population in Italy, a country which fails to attract foreign high-skilled workers and university students. In addition, the few educated immigrants are often employed in traditional sectors and fill low-skilled jobs, suffering from substantial over-education.

In our study, we use as a proxy for innovative performance of Italian provinces the number of patent applications filed at the European Patent Office (EPO), assigned according to the inventors’ provinces of residence. The two variables used to assess the impact of immigration on innovation are the share of immigrants on the resident population and the ‘diversity index’, an indicator that accounts for the ‘variety’ of a province population. Control variables are included in the regression in order to avoid that the presence of foreigners might pick up the fact that immigrants tend to settle in provinces that are ex ante more innovative. Since it is reasonable to think that unobserved provinces’ characteristics and demand shocks may affect both migration flows and provinces’ innovation, we tackle potential endogeneity issues by using a well established instrumental variables strategy (Altonji and Card 1991, The effects of immigration on the labor market outcomes of less skilled natives. Immigration, trade and the labor market, University of Chicago Press) based on the distribution of immigrants by nationality across Italian provinces in 1995, i.e. on the idea of immigrants’ enclaves. The idea is that immigrants tend to settle where individuals of the same nationality are already located, since, for example, immigrant networks may provide newly arrived individuals with important information on the local labor market and the availability of job vacancies, or provide hospitality. Given the characteristics of immigration in Italy, we focus our analysis on the general impact of immigration on innovation, and then separately look at the effects of low-educated and high-educated immigrants.

Our results suggest that, as far as total immigration is concerned, there was no significant effect on innovation during 2003-2008. However, we expected this overall effect to hide more complex dynamics related to the heterogeneity in immigrants’ skill levels, which can generate different effects, working in opposite directions. Indeed, decomposing the overall effect into the contributions of low- and high-skilled migrants shows that an increase of 1 percentage point in the share of low-skilled migrants on the population reduces patent applications by about 0.2%. By contrast, the impact of high-skilled immigrants on innovation is positive, in line with the previous literature, but cannot be precisely estimated. The strongly significant negative effect of low-skilled immigrants and the fact that the positive impact of high-skilled immigrants turns out not to be statistically significant in our regressions are the two sides of the same coin, and can be explained by the particular features of the immigration phenomenon in Italy, characterized – as we said before - by the large prevalence of low-educated immigrants and the under-utilization of immigrants’ human capital, which prevents the emergence of the (potentially) positive effect of high-skilled immigrants on innovation. By contrast, the adverse effects arising from increasing transaction and communication costs and reduction of social capital seem to prevail. Moreover, in Italy, immigrants mainly appear as a source of low-skilled or cheap labor force, and this creates scarce incentives to the adoption of new capital-intensive technologies.

These results stress the key importance of both immigration policies and labor market policies to promote the pro-innovation effect of immigrants. The former should be aimed at attracting high-skilled immigrants and the latter at ensuring a good match between immigrant workers’ skill levels and the working positions they fill. Improving these policies should allow Italy to exploit the innovative potential embodied in skilled foreigners, as other countries do. This is particularly important because the negative effect of low-skilled immigrants on innovation can intensify in the long run, if the economic system further adapts its technological choices to the availability of a large share of unskilled workforce. A better use of the
competences of skilled immigrants and the valorization of their human capital could help to compensate the discussed negative effects, by attracting educated immigrants, giving complementary skills the possibility to emerge, and shifting firms’ decisions towards investments in the production and adoption of innovative technologies.

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