The impact of immigration on wage distributions in the era of technical automation

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The US and Europe have both seen wage polarisation in the last three decades, in parallel with increasing technical automation. This column analyses the impact of immigration on this wage divergence via its effect on the labour supply side. It finds that immigration partially reverses natives' polarisation of employment opportunities and wages by expanding aggregate demand and allowing natives to move to better paying occupations. Policies to reduce low-skilled migration with the aim of favouring native middle-class labour market opportunities may in fact do the opposite.
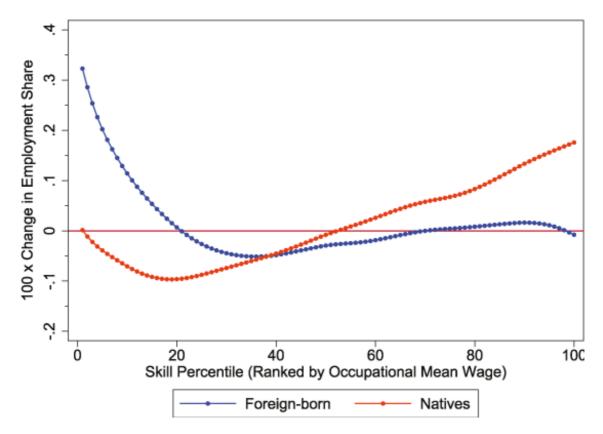
Polarisation of employment and wages has been pervasive both in the US and in Europe over the last 30 years (Autor et al. 2003, OECD, 2017). The gains have been concentrated at the polar ends of the wage distribution (associated typically with manual and personal service jobs at one end, and professionals and managerial jobs at the other), with a shrinking of jobs and subdued wages for workers in the middle of the distribution, non-college educated people who perform routine tasks.

These changes have been intensely studied and mostly attributed to technology-driven labour demand transformations (Autor and Dorn 2013, Goos et al. 2014). Little is known, however, about the labour supply side. Sustained inflows of foreign-born workers with low average education represent a major shift in the skill supply of the US labour market over the same period. How did they interact with technology-driven labour demand shifts? Did foreign workers respond to structural labour demand shocks by moving to areas that are adopting automating technology? If so, do the occupations they work in and their areas of specialisation affect overall job polarisation? The answers to these questions might have relevant implications for the assessment of the recent patterns of polarisation of employment opportunities and wages among US natives.

The response of immigration to automation

In a new study (Basso et al. 2017), we show that US local labour markets that were more likely to adopt computing technologies, and whose labour productivity increased the most thanks to the adoption of these technologies, also attracted low-skilled immigrants at higher rates. Having a comparative advantage in manual-intensive jobs, these workers fuelled the boom of service occupations whose demand rose because of the increased productivity of the local economy. Figure 1 shows that the increase in the employment shares at the low end of the skill distribution can be attributed almost entirely to the foreign-born workforce. This is a very interesting qualification of the polarisation phenomenon that, although previously noted by Mandelman and Zlate (2014), has not received much attention in the literature.

Figure 1 Job polarisation, natives and foreign-born

Note: The graph shows the changes in employment share by skill percentile measured as the occupational average wage in 1980. Authors' elaborations on US Census data (Ruggles et al., 2015).

Consistent with existing literature, we observe that as the price of automating technology dropped, US local labour markets underwent polarisation in terms of both employment and wages. However, if we focus just on native workers this is far less so, especially at the very low end of the wage distribution. The increasing number of low-wage positions, such as manual-intensive personal services, was mostly filled by immigrants, thus moderating the resulting upward wage pressure. This contributed to push natives to upgrade their skills and join better paying production occupations, even as employment of computer capital continued to rise. This reduced the 'de-routinisation' of native employment and boosted natives' routine and analytical wages through an increase in aggregate demand. At the higher end of the wage distribution, migrants also enabled natives to access professional and managerial occupations by incentivising them to invest in human capital (Hunt 2016).

In our analysis, we observe local labour markets (commuting zones) in the US with differing potential for attracting immigrants. We establish this by looking at the past inflow of immigrants prior to 1980 and the presence of local networks of foreign-born people, which is well known to facilitate the arrival of new immigrants (Altonji and Card 1991). Analysing whether the intensity of automation produced the same level of polarisation among natives across different markets, we discover that native employment and wage polarisation is less pronounced in markets with more access to immigrants. This is because the inflow of immigrants responding to computerisation-driven productivity growth filled many of the low-wage manual jobs, pushing native workers toward the middle of the distribution and complementing their skills with the skills of migrants.

During the past four decades, the US also experienced significant inflows of high-skilled migrants that contributed to technological advancements (Peri et al. 2015, Bound et al.2017, Jaimovich and Siu 2017, Waugh 2017). Such inflows did not undo the process of

moderating the natives' job polarisation, as endogenous skilled migration further ignited the attraction of unskilled migrants through an increase in aggregate demand.

The consequences of fewer immigrants

This new evidence indicates that immigration responds endogenously to structural long-term changes in the labour market, such as those induced by automation and the adoption of computer technology. Moreover, our study has important implications for policymakers as immigration partially reverses natives' polarisation of employment opportunities and wages, by expanding aggregate demand and allowing them to join better paying occupations. Our simulations show that policies aiming to reduce low-skilled migration with the purpose of favouring native middle-class labour market opportunities may in fact do the opposite. A counterfactual simulation exercise, in which we reduce the supply of low-skilled migrant workers, shows that natives would face lower demand and would be forced to provide low-paying manual services. The hollowing out of middle-class jobs would even be more significant.

Authors' note: The views expressed in this column are those of the authors and do not necessarily reflect the position of the Bank of Italy. Any errors or omissions are the responsibility of the authors.

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