

THE USE OF INDUSTRIAL ROBOTS IN ITALY: AN INTERNATIONAL COMPARISON

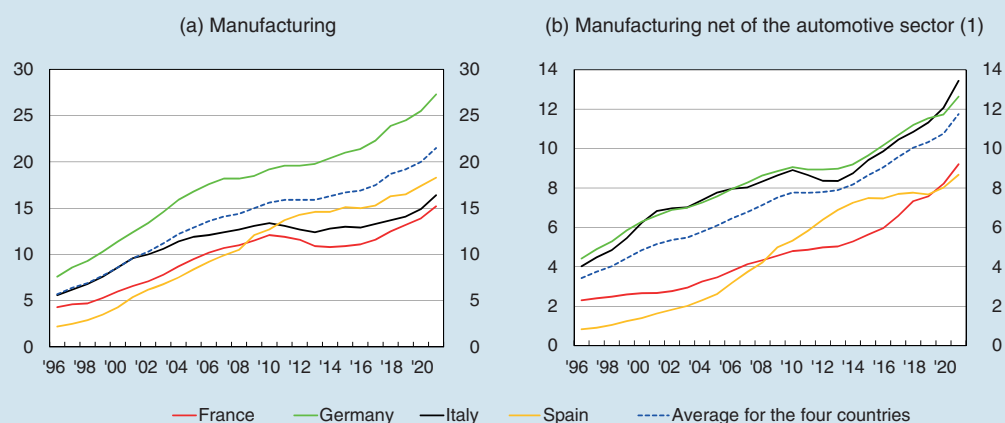
Industrial robots are automatically controlled, reprogrammable and multipurpose machines capable of performing an increasingly wide range of tasks with limited human intervention. This technology is especially widespread in the manufacturing of motor vehicles (133 robots per 1,000 workers on average in the four main euro-area economies in 2021), with the rubber and plastics, pharmaceutical, and computer and electronics sectors ranking immediately behind it (36, 27 and 20 robots per 1,000 workers, respectively).¹

Robot intensity has increased at different rates in the four main euro-area economies over the last three decades. In the mid-1990s, there were 5.6 robots per 1,000 workers in Italy (see panel (a) of the figure), less than in Germany (7.6), but more than in France and Spain. The gap with Germany widened significantly in 2021 (16.4 against 27.3); the share of robots fell below that of Spain (18.3), but remained higher than in France (15.2).

Figure

Robot intensity in the main euro-area countries

(annual data; number of robots per 1,000 workers)



Sources: Based on Eurostat and IFR data.

(1) Total manufacturing minus the figure for sector C29 (manufacture of motor vehicles, trailers and semi-trailers) of the NACE Rev. 2 classification.

Lower robot intensity in Italy is largely attributable to its different sectoral specialization. Specifically, the leading role of the automotive industry explains the high level of automation in Germany and Spain. Besides being smaller in terms of number of workers and value added, the robot intensity of Italy's automotive industry was only 58 per cent of the average for those two countries in 2021. This reflects the fact that Italian firms are specialized in the manufacturing of parts, which is less suitable for automation than the assembly of motor vehicles, as well

¹ The analysis uses data from the International Federation of Robotics (IFR) on the number of industrial robots installed by country and sector, and from Eurostat National Accounts.

as the reduction in the number of robots installed since 2010,² in contrast to the other countries.

Excluding the automotive sector, Italy's manufacturing industry is the most automated and the trend over time is similar to that of Germany (see panel (b) of the figure). In particular, the manufacturing of electrical equipment, machinery and metal products has traditionally been more robot-intensive in Italy. Moreover, while initially low, the number of robots installed in the basic metals, food and beverages, and pharmaceutical sectors has grown at a faster pace than in the other countries over the last decade.

The automation of the manufacturing process can have labour substitution effects, especially in the short term. At the same time, it can increase demand for new job profiles and lead to productivity gains which, by strengthening competitiveness and scaling up production, can support employment in the long run. The analyses available show that the effects of the adoption of robots on employment have so far been negative in the United States, positive in France and nil in Germany and Italy.³ Based on our calculations, for the four main euro-area economies on average, the sectors that stepped up automation the most between 1996 and 2021 recorded employment and productivity growth in line with that of the other sectors: for Italy, in particular, there is no correlation with employment but there is a positive correlation with productivity. The extension of artificial intelligence applications to industrial robotics points to an ever increasing take-up of automation, which could partly offset the expected gradual reduction in the labour force share, although the overall effects on labour demand are difficult to assess (see the box 'The potential impact of AI on Italian workers', Chapter 7).

² In 2011, the auto manufacturing group formerly known as FIAT shut down the production plant in Termini Imerese and abandoned its 'Fabbrica Italia' industrial plan (announced by the group in 2010 for 2010-14), which was supposed to modernize the existing assembly lines; instead it adopted a strategy more geared to the manufacturing of high-end vehicles, i.e. goods that are more labour intensive than large-scale robot-intensive production.

³ For further details, see D. Dottori, 'Robots and employment: evidence from Italy', *Economia Politica*, 38, 2, 2021, pp. 739-795, also published in Banca d'Italia, *Questioni di Economia e Finanza (Occasional Papers)*, 572, 2020.