

## Technical change and automation of routine tasks: Evidence from local job markets in France, 1990-2011 \*

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### Key question

Over the last three decades, France, like other advanced economies, has seen a profound transformation in firms' labour demand in favour of high skilled workers. The empirical literature puts forward two main hypotheses to explain this change: technical change and the growth of international trade. This article tests the hypothesis of technical change related to the spread of information and communication technologies (ICT), which would have resulted in the disappearance of jobs involving a high proportion of routine tasks (manual work) in favour of service industries and high skilled jobs.

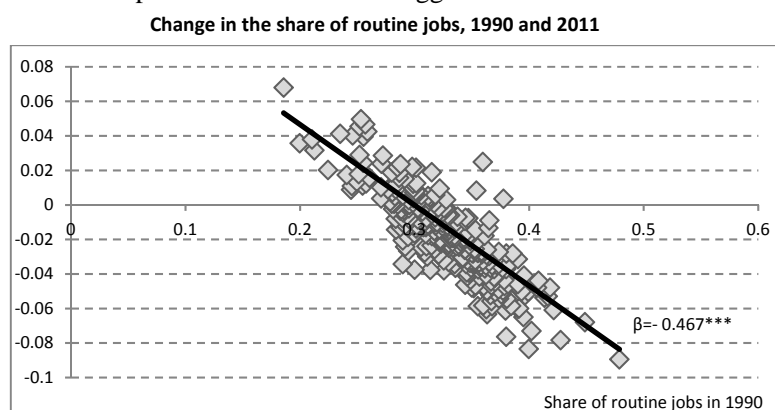
### Methodology

Based on data on workers' occupations (employees and self-employed) at the geographical level of 304 employment zones of metropolitan France, drawn from population censuses, the article characterises occupations, in terms of the classification of professions and socio-occupational categories, according to their routine task content, distinguishing support and production functions. It then studies, over the 1990-2011 period, the empirical validity of the prediction of Autor and Dorn's (2013) theoretical model linking changes in the structure of employment in local job markets to the spread of ICT.

### Main results

The empirical results from French data are overall consistent with the theoretical model's predictions:

- Employment areas where routine occupations (with a high routine task content) were more prevalent at the start of the period, saw:
  - a larger increase in IT capital;
  - a faster reduction in the proportion of routine occupations (substituted with IT capital) and a greater increase in the proportion of skilled occupations (complementing the IT capital) than in other employment areas;
  - an increase in the proportion of service sector jobs for workers with fewer qualifications and greater unemployment among them: routine occupations are not systematically replaced by less skilled service jobs, as in other advanced economies such as the United States.
- These results are robust to the introduction in the empirical model of other explanatory hypotheses such as offshoring, competition from imports and economies of agglomeration.



Change in the share of the different types of occupations between 1990 and 2011 regressed on its initial level in 1990, at the level of employment zones (304 observations). Employed labour force, mainland France. Source: Insee, Census 1990 and 2011, and Autor et Dorn (2013).

### Main message

The technical change hypothesis and, more particularly, the automation of routine tasks, is consistent with the changes in local labour markets in France between 1990 and 2011. It cannot be ruled out that globalisation and the growth in international trade have also played a role; however, the effects of technical change are still present when these hypotheses are also taken into account. Finally, two phenomena must be taken into account in the French case over the period: a high unemployment rate and an increase in functional specialisation between production and support occupations in local job markets.