

Abstract

A fast-growing literature shows that technological change is replacing labor in routine tasks, raising concerns that labor is racing against the machine. This paper is the first to estimate the labor demand effects of routine-replacing technological change (RRTC) for Europe as a whole and at the level of 238 European regions. We develop and estimate a task framework of regional labor demand in tradable and non-tradable industries, building on Autor & Dorn (2013a) and Goos, Manning and Salomons (2014), and distinguish the main channels through which technological change affects labor demand. These channels include the direct substitution of capital for labor in task production, but also the compensating effects operating through product demand and local demand spillovers. Our results show that RRTC has on net led to positive labor demand effects across 27 European countries over 1999-2010, indicating that labor is racing with the machine. This is not due to limited scope for human-machine substitution, but rather because sizable substitution effects have been overcompensated by product demand and its associated spillovers. However, the size of the product demand spillover -- and therefore also RRTC's total labor demand effect-- depends critically on where the gains from the increased productivity of technological capital accrue.