



Labor market polarization and international macroeconomic dynamics



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ABSTRACT

During the last thirty years, labor markets in advanced economies were characterized by their remarkable polarization. As job opportunities in middle-skill occupations disappeared, employment opportunities concentrated in the highest and lowest wage occupations. A two-country stochastic growth model that incorporates trade in tasks, rather than in goods, accounts for this evidence. This polarization did not result from a steady process: the relative employment share of each skill group significantly fluctuated over short to medium horizons. The aggregate shocks estimated within this framework can rationalize the observed skill-based employment dynamics, while providing a good fit to the macroeconomic data.

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1. Introduction

Concern is growing about the disappearance of jobs available for middle-skill workers. Fig. 1 shows the change in the share of U.S. total employment in 318 occupations since 1980 (with skill rank approximated by the average wage in each occupation). The figure demonstrates that middle-skill occupations witnessed a decrease in their share of total employment as employment shifted towards both the bottom and high end of skill distribution. Little of this phenomenon can be attributed to changes in the demographic composition of the labor force.¹ Other advanced economies display similar trends. For instance, Fig. 2 depicts an analogous change in employment shares for three sets of occupations grouped according to average wage levels (low, medium, and high) in 16 European countries.²

International trade appears to be a decisive factor in this shift. In particular, tasks typically held by middle-skill workers are increasingly offshored (See Ottaviano et al., 2013). In addition, Firpo et al. (2011) disaggregate the task content of each job and quantify the role that technology and offshoring play in labor market polarization, finding that the last factor became predominant in the 1990s.³ To account for this finding, this paper introduces a tractable model where international trade delivers this polarization. The model indicates the presence of trade in *tasks* rather than in *goods*, as originally coined by Grossman and Rossi-Hansberg (2008, 2012). Namely, as revolutionary advances in transportation and communications

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¹ The online appendix discusses in detail the role of demographic change (including age structure, gender and national origin) in the composition of the labor force.

² This figure is based on a table in Goos et al. (2009), which was replicated by Acemoglu and Autor (2011). Green and Sand (2014) use the Canadian Census and Labor Force Survey (LFS) data for the period from 1971 to 2012 finding that, in Canada, there has been faster growth in employment in both high and low paying occupations than those in the middle since 1981. Among emerging markets, Attanasio et al. (2004) show that trade reforms in Colombia led to an increase in the proportion of skilled workers in every industry, as well as, an expansion in the size of the informal sector.

³ See also Goos et al. (2014) and references therein.

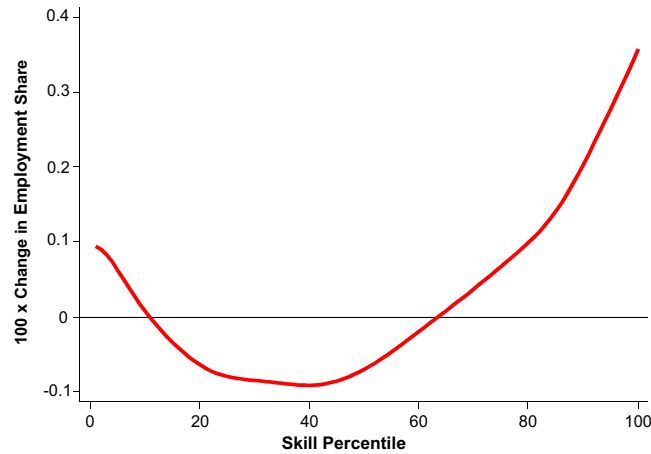


Fig. 1. Changes in US employment by skill percentiles (1980–2007). *Note:* Smoothed changes in employment. Skill percentile is ranked by occupational mean wage in 1980.

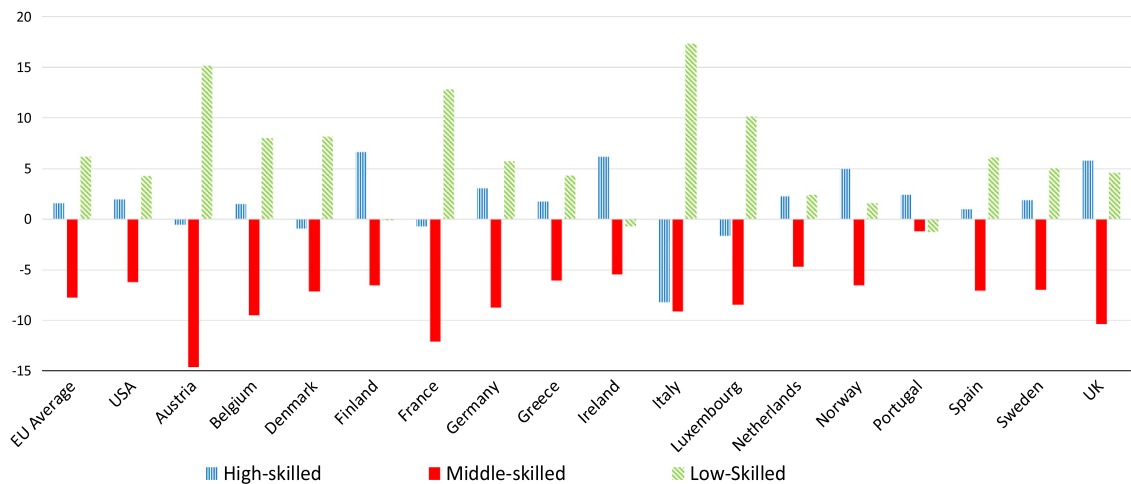


Fig. 2. Change in European employment by different skill groups. *Note:* Changes in employment shares by occupation (1993–2006) in 16 European Countries. Occupations grouped by wage tertiles: low, middle, high. Data on EU employment are from [Goos et al. \(2009\)](#). US data are from the May/ORC CPS files for 1993–2006 earnings (Source: [Acemoglu and Autor, 2011](#)).

take place, international trade increasingly involves small amounts of value added in different locations rather than as a standard exchange of finished goods. Firms can deliver instructions instantaneously and move components of unfinished goods quickly and cheaply. This facility allows firms to incorporate labor inputs in the production process that are located in different countries.⁴

For instance, as trade links deepen, U.S. workers can specialize in design and marketing of a new high-tech computer device while countries with a different local expertise (Indian programmers to debug software, Japanese technicians to provide microchips, and Chinese workers to assemble the final product) can accomplish other tasks. In the U.S., those high-skilled individuals working on design and marketing will benefit from trade as the new high-tech device will be sold globally, whereas the relatively less skilled workers will be displaced by foreigners unless offshoring costs fail to justify sending the work overseas.

Trade in tasks can explain why those with high skills stand a better chance in the global marketplace than the middle-skilled, but this observation alone is unable to account for the polarization that also benefits those at the very bottom of the skill distribution chain. This paper argues that low-skill workers select into occupations that are “protected” from the offshoring wave. As shown in [Autor and Dorn \(2013\)](#), this skill group specializes in manual tasks that require little (if any)

⁴ In some instances, the distinction between “tasks” as “intermediate goods/inputs” is just semantic for modelling purposes. There are, however, some meaningful differences with the more established literature on trade of intermediates. Seminal papers like [Dixit and Grossman \(1982\)](#), or [Yi \(2003\)](#) assume that final goods are produced by a continuum of production stages that use intermediate goods. However, none of these authors associate a production stage with a particular factor of production (labor in the case of trade in tasks). More generally, these models assume that intermediate inputs must be shipped across countries. In theory, “trade-in-tasks” allows for individuals working together and sharing ideas, directions, or new product designs on real-time. This may be the result of advances in telecommunications, without necessarily involving any shipping of intermediate goods across countries.

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