

Job Polarization and Highly Educated Workers in the Low-Wage Sector

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Abstract

Paradoxically the demand and the wage premium for highly educated workers in Germany is rising (Dustmann et al. 2009) at the same time the share of the highly educated in the low-wage sector is (slightly) increasing (Kalina and Weinkopf 2009). In this paper, we use German panel data from various sources and present details on the structure and development of highly qualified low-wage employment in Germany. We ask whether the tasks performed in the job are increasingly correlated with the probability of highly qualified workers to be employed in the low-wage sector. We argue that ‘job polarization’ (Goos and Manning 2007) explains this paradox better than ‘skill-biased technological change’ (SBTC; see Bound and Johnson 1992; Katz and Autor 1999; Machin 2008).

Theory

Developed in the 1990s, the SBTC hypothesis contends the idea that new production technologies are biased in favor of the skilled (in the sense of a better educated) workforce when compared with its less or unskilled part. It predicts a general increase in the demand for highly educated workers and a decrease in the demand for workers with a low education (see Katz and Autor 1999 for an overview). Following this basic version of SBTC, we would expect the shares of the highly educated in the low-wage sector to be decreasing with ongoing technological change.

In 2003, Autor, Levy and Murnane proposed a more nuanced way of understanding the impact of new production technologies, especially of computers, on labor demand by studying the way how computerization alters the composition of job tasks (Autor et al. 2003). Autor et al. argue that computers and other machines can easily substitute workers performing routine tasks – tasks that follow step-by-step rules – but can not replace workers performing nonroutine tasks requiring the flexible use of the human brain and body. Autor et al. (2003), however, do not focus on the analysis of workers with nonroutine manual tasks but rather predict an increase in the labor demand for highly educated workers since they are expected to have comparative advantages in nonroutine analytical and interpersonal tasks. Hence, they cannot explain the increasing shares of highly educated in the low-wage sector we want to explore in this paper.

Building on Autor et al. (2003), Goos and Manning (2007) observe that computer-substitutable routine tasks never were the least-paid jobs in the labor market because of the precision and skills required to perform them. Nonroutine tasks are either in the upper part of the wage distribution and complementary to technology (e.g. skilled professional and managerial tasks) or in the low-wage sector and not directly affected by technology (typically unskilled work demanding nonroutine manual tasks, e.g. cleaning). Goos and Manning argue that the constant substitution of routine tasks (‘routinization’) proposed by Autor et al. (2003) will lead to rising relative demand in well-paid skilled jobs (where workers habitually perform nonroutine analytical and interactive tasks) and in least-skilled jobs in the low-wage sector (where workers habitually perform nonroutine manual tasks), and decreasing relative demand in the ‘middling’ jobs that traditionally require performing routine tasks. They call this process ‘job polarization’.

Empirical Evidence

Empirical evidence for Germany, the US, the UK and 14 other European countries indicates growths in both the highest paid and lowest paid occupations, with declining employment in the middle of the wage distribution (Autor et al. 2003; Autor et al. 2006; Black and Spitz-Oener 2007; Goos and

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Manning 2007; Autor et al. 2008; Dustmann et al. 2009; Goos et al. 2009; Dustmann et al. 2010). Studies on the low-wage sector in Germany report a considerable expansion of this sector since the 1990's (European Commission 2004; Eichhorst et al. 2005; Brenke 2006; Rhein and Stamm 2006; Bosch and Kalina 2007). According to findings based on GSOEP data, in 2007, 21.1 % of all West German employees and 23.5 % of all East German employees worked in the low-wage sector (Kalina and Weinkopf 2009). Findings for the US, the UK and Germany show a rapid rise in educational attainment of workers in all jobs including jobs in the low-wage sector (e.g. Ingram and Neumann 2006; Goos and Manning 2007; Dustmann et al. 2009).

Of particular importance to our study is a recent rise in the shares of low-wage earners across all educational groups in Germany, even among highly educated workers (Rhein and Stamm 2006; Kalina and Weinkopf 2008; Kalina and Weinkopf 2009). Kalina and Weinkopf (2009) report that between 1995 and 2007, the share of workers in the low-wage sector among the low educated increased from 30% to 43%, among the medium educated from 13% to 23% and among the highly educated from 7% to 8%. Spitz-Oener (2006) provides evidence from Germany that is consistent with job polarization caused by routinization: between 1979 and 1999, the demand for nonroutine analytical and interactive tasks increased while the demand for routine tasks declined. Much of these changes can be attributed to computerization. Similarly, Dustmann et al. (2009) show that during the 1980s and 1990s in Germany, occupations at the upper end of the 1980 wage distribution predominantly use nonroutine analytical and interactive tasks while occupations in the middle of the wage distribution mostly use routine tasks.

Analysis

In this paper, we first describe the highly educated workers employed in the low-wage sector in Germany. We do this by (a) describing the shares and their characteristics over time, analyzing German employment registry data from 1993 to 2007 (Beschäftigten- und Leistungsempfänger-Historik). Using as additional data sources the German Microcensus and the German Qualification and Career Survey (BiBB-IAB- und BiBB-BAuA-Erhebung), we (b) describe the jobs and the tasks these highly educated workers perform in their jobs over the observation period.

We separate our descriptive analyses by region (East and West Germany due to the different wage levels and labor market conditions) as well as by gender and by migration status (due to changes in the selection of women and foreigners in the workforce, potential differences of the human capital and statistical discrimination).

We restrict our sample to individuals aged between 23 and 43 years. On the one hand, sample members should have had the opportunity to complete college or university education. On the other hand, recent evidence suggests that technological change affects cohorts differently with younger workers better complementing new technologies than older workers arguably because they can more easily adopt to new nonroutine tasks (Autor and Dorn 2009; Dustmann et al. 2010).

Second, focusing on the job polarization hypothesis of Goos and Manning (2007), we further explore if we find evidence for a polarization of jobs in Germany within the groups of highly educated workers that is caused by routinization. We test this hypothesis by exploring the impact of their job tasks on the probability for them being employed in the low-wage sector. We expect that during our observation period between 1993 and 2007, workers performing routine tasks (both cognitive and manual) will experience wage losses due to a falling relative demand in the 'middling' jobs that have typically required these tasks. Thus, over the years, performing routine tasks should more and more increase one's probability to be employed in the low-wage sector. Performing nonroutine analytic and interactive tasks we expect to lower this probability over time. Nonroutine manual tasks on the other hand should increase the probability of being employed in the low-wage sector in general, but should not show a strongly decreasing or increasing impact over time.

The contribution of our paper is to be the first to focus on the group of highly educated in the low-wage sector, a group that has to our best knowledge not yet been explicitly studied. Second, we introduce the hypotheses of 'routinization' and 'job polarization' in the literature on the German

low-wage sector and provide a new piece of evidence in favour of or against these hypotheses. Third, we explicitly investigate East Germans, women, and migrants in the low-wage sector since previous studies for Germany mostly focused on West German men, often without further consideration of migration status.

Our results might therefore also be useful to a broader audience trying to understand the complex interactions of recent developments on the labor market throughout the OECD, for example skill-upgrading, the employment growth of both low- and high-wage jobs, the 'fanning-out' of the wage distribution, and – especially in the German case – the widening of the low-wage sector with highly educated workers.

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