



# The labor market impact of immigration in Western Germany in the 1990s

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## ARTICLE INFO

### Article history:

Received 25 February 2008

Accepted 20 October 2009

Available online 31 October 2009

### JEL classification:

E24

F22

J61

J31

### Keywords:

Immigration

Wages

Labor market rigidities

Employment

## ABSTRACT

In this article we estimate the wage and employment effects of recent immigration in Western Germany. Using administrative data for the period 1987–2001 and a labor-market equilibrium model, we find that the substantial immigration of the 1990s had very little adverse effects on native wages and on their employment levels. Instead, it had a sizeable adverse employment effect on previous immigrants as well as a small adverse effect on their wages. These asymmetric results are partly driven by a higher degree of substitution between old and new immigrants in the labor market and in part by the rigidity of wages in less than flexible labor markets. In a simple counter-factual experiment we show that in a world of perfect wage flexibility and no unemployment insurance the wage-bill loss of old immigrants would be much smaller.

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## 1. Introduction

Within Europe, Germany hosts the largest number of immigrants. Workers with foreign origin have represented more than 10% of the total German labor force since the late 1990s.<sup>1</sup> The socioeconomic worries produced by rising immigration led the German government to introduce selective immigration measures and stirred a lively public debate.<sup>2</sup>

The present paper investigates the interactions between immigration, employment and wages in Western Germany by adopting a structural labor market equilibrium approach recently employed, following Borjas (2003), in several national studies. This approach aims at providing a full picture of the adjustment of the labor market to immigration by modeling aggregate production through a multi-level constant elasticity of substitution (CES) production function in which workers with different observable characteristics are imperfect substitutes. Considering explicitly the production structure makes clear that the marginal productivity of workers with certain skills depends not only on the supply of workers with their same skills but also on the supply of other workers. Hence this structure produces a better identification of competition and complementarity effects of immigrants on natives. The assessment of the effects of immigration thus requires a careful

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<sup>1</sup> Authors' calculation using the IAB data.

<sup>2</sup> See, e.g., Zimmermann et al. (2007) for an outline and an economic evaluation of the norms contained in the measured contained Immigration Act of 2004.

estimation of all the elasticities of substitution between different groups of workers. The original framework proposed by Borjas (2003) and then enriched (adding imperfect native-immigrant substitutability) by Ottaviano and Peri (2008) and Manacorda et al. (2006) focuses only on wage adjustment. This is not enough in the case of Germany, where due to labor market rigidities, persistent changes in employment could be important effects of immigration.

This paper contributes to this recently revived literature in three respects. First, it produces new estimates of very important elasticity parameters: between new and old immigrants, between immigrants and natives and between workers of different age and education. These estimates can be interpreted as short-run elasticities as we use a yearly panel of German workers drawn from a large administrative dataset, representative of all employment spells subject to social security taxation (see Section 3 and the Data Appendix for details). Also new in the identification strategy is the use of the large inflow of Eastern Germans after the fall of the Berlin Wall as an exogenous shock. Second, the paper extends the labor market equilibrium approach to allow for employment as well as wage responses. This is very important especially when we consider short-run effects (as we do here) and when we move beyond the US data analyzing countries characterized by wage rigidities, as it is typical of the German labor market.<sup>3</sup> Third, having identified the actual employment and wage effect of immigration we can produce a counter-factual scenario in which, with perfect wage flexibility, all the inflow of immigrants is absorbed by wage changes (Walrasian markets). Comparing this case with the actual one we can compute the total difference in wage bill and welfare under each scenario and hence the loss in total wages from having the existing rigidities.

In the estimation of the elasticities of substitution, 'new' immigrants are defined as those who have worked in Germany for five years or less whereas 'old' immigrants are those who have worked in Germany for strictly more than five years. Then, for each year we stratify workers in cells defined according to their education, experience and nativity (native-immigrant; new/old immigrant). We allow the relative wage of natives and immigrants (or new/old immigrants) across cells to depend systematically on the year and on their education and experience. We interpret the remaining within-cell variation of immigrants over time as being supply driven. The results reveal stronger competition between new and old immigrants than between immigrants and native workers: while natives and new immigrants are imperfect substitutes, new and old immigrants are close to perfect substitutes. In particular, we estimate a significant elasticity of substitution between natives and immigrants of around 20 (close to what Ottaviano and Peri, 2008; Card, 2009, find between native and immigrants in the US and somewhat larger than what Manacorda et al., 2006, found for the UK) and an elasticity of substitution between new and old immigrants around 60 and not significantly different from the one implied by perfect substitutability.

Previous work by Ottaviano and Peri (2008) on the US and Manacorda et al. (2006) on the UK not only did not distinguish between new and old immigrants but only focussed on the effects of immigration on wages neglecting its effects on employment levels. The reason for this is that the US and the UK labor markets can be reasonably considered as fully flexible with wages adjusting to their market clearing level. In those countries the employment effects of immigration are negligible. This is not the case for Germany where labor market institutions are characterized by generous unemployment benefits and other sources of wage rigidities leaving room for possible employment effects (Angrist and Kugler, 2003; Schmidt et al., 1994).<sup>4</sup> To detect the presence of these effects, we regress the cell specific year-to-year variation in the number of immigrants (new immigrants) on the same measure calculated for the total workforce (total immigrant workforce). The corresponding results reveal the presence of significantly negative impacts of new immigrants on previous immigrants but not on native workers. In particular, our estimates suggest that, for any 10 new immigrants in the German labor market, three to four old immigrants are driven out of employment, whereas no native is affected.

Combining the estimated elasticities of substitution between different types of workers with data on immigration and with the related employment response in each cell, it is finally possible to recover the full impact of migration on wages. Our estimated elasticities imply that over the period 1992–2001 new immigrants to Western Germany reduced the average wages of old immigrants by 0.5%, with highly educated old immigrants losing around 1.1% of their wages. Approximately half of the negative wage effect on the highly educated was due to immigration from Eastern Germany. As for the effects of new immigration on natives, there is essentially a null average effect: negative on highly educated (–1%) and positive on the less educated (+1%).<sup>5</sup>

<sup>3</sup> See Dickens et al. (2007) for a recent cross-country comparison of wage rigidity levels. In this study, the fraction of workers potentially affected by real wage rigidity in Germany is estimated to be twice the United States' one.

<sup>4</sup> The importance of the employment effects of migration in Germany is stressed by Pischke and Velling (1997) who, using data on 167 German regions for the 1985–1989 period, show evidence of displacement of the native workforce by immigration. More recently, Glitz (2006), analyzing the specific issue of the impact of ethnic German immigration on the relative skill-specific employment and wage rates of the resident population, finds evidence of adverse employment effects but no detrimental effects on average wages.

<sup>5</sup> Bonin (2005) recently applied a skill-based analysis of immigration to the German labor market using IAB data for a different time period (1975–1997). His approach, however, is a reduced-form one. He identifies the partial effect of immigration on wages of each skill group but, since he does not specify a structure of labor demand and supply he cannot identify the total effects of immigration on wages and employment. Moreover, the analysis defines immigrants simply as foreign nationals in the IAB and therefore omits the very important inflow of Eastern Germans and Ethnic German immigrants. Nevertheless, his results do not systematically differ from ours: he finds small wage effects of migration on native workers and no effects on unemployment.

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