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IZA DP No. 18199

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ISSN: 2365-9793

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ABSTRACT

The Impact of Immigration on Wages and Employment in the UK Using Longitudinal Administrative Data*

We study the labour market impact of immigration to the United Kingdom, focusing on the large inflows following the 2004 EU enlargement. Using the Lifetime Labour Market Database (LLMDB)—a longitudinal 1% sample of National Insurance records—we provide the first analysis of immigration's effects on employment and wages based on high-quality administrative microdata. Exploiting individual, area and time fixed effects, as well as area-time, individual-time and individual-area fixed effects, we reduce endogeneity concerns that have limited previous work. We find limited aggregate impacts, but distributional consequences: existing immigrants—particularly those who were young or low paid—experienced modest negative employment effects, while natives faced little evidence of displacement. For wages, impacts were mixed: existing immigrants overall gained, but low-paid immigrants lost. The results suggest labour market adjustment operated through both substitution and complementarities across groups. More broadly, we provide a methodological framework for analysing the much larger and more diverse post-2021 immigration flows.

JEL Classification: J22, C23

Keywords: immigration, employment, wages, Central and Eastern Europe, UK

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* Special thanks to Gianni De Fraja, James Rockey, Brian Kovak and Jerzy Szroeter. We acknowledge and thank the UK Department for Work and Pensions for both access to the data used in this paper and financial support. Views expressed in this paper are not necessarily those of the Department for Work and Pensions or any other UK Government Department.

1. Introduction and Motivation

Immigration to the UK, which stabilised at modest levels after the 1960s restrictions on Commonwealth movement, rose sharply from the late 1990s. The foreign-born share of the UK population doubled from 8.3% in 2001 to 16.7% in 2021. This reflected policy liberalisation (notably of work permits), humanitarian inflows, and crucially, free movement from Central and Eastern Europe after the 2004 EU enlargement. The UK's decision not to impose transition controls on the "A8" countries triggered an unprecedented wave of immigration, followed later by inflows from Bulgaria and Romania in 2014, and more recently by post-pandemic shortages and the new post-Brexit immigration regime.

These inflows carried major political and economic consequences. The large, unanticipated arrival of A8 workers in particular generated intense debate about potential displacement of native workers and downward pressure on wages, mirroring earlier controversies in the United States (e.g. Card 1990; Borjas 2003). Given the UK's less flexible labour market institutions compared with the US, many anticipated stronger negative effects.

Empirical work, however, painted a more nuanced picture. Early studies (Gilpin et al. 2006; Lemos and Portes 2014) and subsequent reviews (Migration Advisory Committee, MAC 2018) found little evidence of large adverse impacts on natives' overall employment or wages. Yet the absence of aggregate effects does not rule out distributional consequences. Theory predicts heterogeneous impacts, with adverse effects concentrated among earlier immigrants or low-skilled natives, offset by complementarities elsewhere (Dustmann, Fabbri and Preston 2005; Manacorda, Manning and Wadsworth 2012; Nickell and Salaheen 2015). Empirical results support this: for example, Dustmann et al. (2013) show immigration compressed the lower tail of the wage distribution while raising median and upper wages.

Despite this progress, the evidence base remains limited. Almost all UK research relies on the Labour Force Survey (LFS), which suffers from small immigrant samples, undercounting of EU nationals after 2004, and weak wage data. Administrative sources such as the Annual Survey of Hours and Earnings (ASHE) lack immigration identifiers, while the Worker Registration Scheme (WRS), used in earlier work, provided only partial coverage of new arrivals. Further, endogeneity remains a concern: immigrants self-select into growing labour markets, while natives may relocate in response to immigration, undermining spatial approach designs and raising doubts about the validity of common shift–share instruments (Goldsmith-Pinkham, Sorkin and Swift 2020).

In this paper we revisit the UK immigration debate using the Lifetime Labour Market Database (LLMDB)**:** a 1% random sample of National Insurance records. This dataset combines near-universal coverage with rich demographic and labour market information, including country of birth, entry year, and address. Crucially, its large size and longitudinal structure permits estimation including individual, area and time fixed effects, as well as area-time, individual-time and individual-area fixed effects, reducing concerns about endogenous location choices and addressing common identification issues in the literature. This novel approach is more convincing than prior UK studies and offer a framework applicable to other contexts.

Our contribution is threefold:

1. Higher-quality data: We provide the first analysis of UK immigration impacts using comprehensive administrative microdata, avoiding known weaknesses of survey-based evidence.
2. Distributional focus: We move beyond averages to provide credible and novel estimates of heterogeneous effects across immigrants, natives, and subgroups defined by age, pay, and gender.
3. Methodological advance: We demonstrate the value of exploiting linked administrative data with a rich set of fixed effects, offering a framework applicable to other settings.

We find that new A8 immigration reduced employment probabilities for existing immigrants—especially the young and low paid—but had little effect on natives. Wage effects were positive for most existing immigrants, though negative at the lower tail. These results suggest substitution among immigrant cohorts combined with complementarities with natives, consistent with limited aggregate impacts. Perhaps more importantly, as more recent and better quality longitudinal administrative data becomes available, our analysis provides a roadmap for future research focusing on the recent (post 2021) very large immigration inflows to the UK, which dwarf the 2004 shock in magnitude and are also likely to have had important distributional consequences.

The remainder of the paper is as follows. Section 2 describes the LLMDB and our sample construction. Section 3 provides descriptive statistics and situates our data in relation to existing sources. Section 4 sets out our empirical strategy, Section 5 presents the results, and Section 6 concludes.

2. Data

Our analysis uses individual-level longitudinal data from the Lifetime Labour Market Database (LLMDB)**,** a 1% random sample of National Insurance records maintained by the Department for Work and Pensions. The LLMDB links tax and social security data, covering virtually the entire working-age population. UK-born individuals receive a National Insurance number automatically, while immigrants obtain one upon entering the tax or benefit system.

The dataset records both country of birth and date of entry, enabling precise identification of immigrants and years since arrival. Attrition is very low among individuals active in either the labour market or the benefit system. Demographic variables include sex, nationality, and age (derived from date of birth).

For the empirical analysis, we define:

- Existing immigrants**:** individuals with date of entry prior to 2004.
- New immigrants**:** those arriving from 2004 onwards, classified into A8 and non-A8 groups.
- Young**:** aged under 25.
- Employment**:** at least one week of paid work in the tax year;
- Earnings**:** capture total annual income from all jobs, deflated using the CPI

- Low paid**:** annual earnings below £4,000.
- Mobility**:** coded as one if the individual changes postcode during the year.

We restrict the sample to working-age individuals (16–64). We restrict the sample to those with annual earnings below £100 or above £1 million. To enable fixed-effects estimation, we retain only individuals observed at least twice.

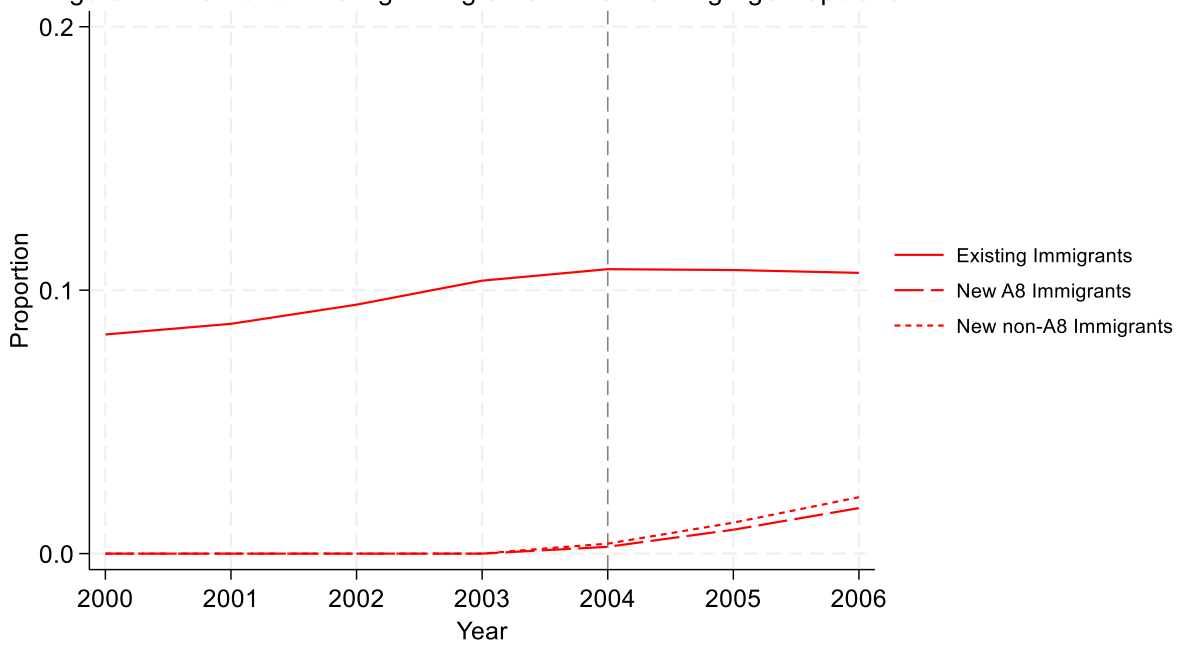
Our data span 2000–2006, covering the years immediately before and after EU accession. The sample comprises 343,641 natives and 55,797 immigrants. Natives are observed an average of six times, immigrants 4.5 times, yielding just over 2.3 million person-year observations (see Table 1).

While education and occupation are not observed—a common limitation of administrative data—the inclusion of individual fixed effects mitigates omitted-variable concerns by absorbing all time-invariant characteristics.

3. Descriptive analysis

Figure 1 shows the rising immigrant share of the LLMDB sample between 2000 and 2006, with A8 arrivals accounting for a growing fraction after 2004. The inflow of A8 immigrants represented a labour supply shock of around 2% of the working age population. Geographically, A8 immigrants were concentrated in London and the South-East, but less so than earlier waves; new concentrations also emerged in areas with little prior immigration, notably East Anglia.

Figure 1 – New and Existing Immigrants in the Working Age Population



Two features of this inflow are well established. First, A8 immigrants were disproportionately young and highly attached to the labour market: employment rates on arrival were high and

inactivity rates low. Second, they were concentrated in lower-paid occupations and sectors, reflecting the demand profile at the time. Lemos and Portes (2014) and contemporaneous administrative statistics from the Worker Registration Scheme (WRS) show concentrations in administrative/support services, hospitality and catering, agriculture, manufacturing and food processing; common occupations included process operatives, catering assistants, packers, waiters, cleaners, warehouse operatives, retail assistants and care assistants.

A recurring theme in the UK literature is measurement error in survey data during the 2004–2008 period, especially the undercount of EU nationals in the LFS/APS later revealed when reconciling with the 2011 Census. This reconciliation implies that cumulative EU net migration over 2004–2008 was substantially higher than contemporaneous estimates suggested—explaining why survey sources struggled to capture the scale and location of the A8 inflow. While precise magnitudes remain uncertain, it is well established that survey undercount was material in the mid-2000s. Our use of administrative LLMDB records therefore helps address coverage weaknesses that can bias descriptive profiles and attenuate econometric estimates.

Table 1 compares the LLMDB with the main survey-based datasets used in prior UK research. The advantages of the LLMDB are clear. It captures far more A8 immigrants than the LFS, which is known to undercount them. On earnings, the LLMDB records actual annual earnings (including part-time work and unemployment spells), unlike the LFS, which relies on a single-week snapshot. The LFS therefore tends to overstate low earnings relative to both ASHE and the LLMDB. Nonetheless, average earnings trends over time are broadly consistent across all three datasets (Lemos 2017; Dickens and McKnight 2008).

Table 1 - DESCRIPTIVE STATISTICS

VARIABLES	LLMDB		LLMDB		WRS	JSA	ASHE		LFS	
	April 2000 - March 2006		April 2004 - March 2006		May 2004 - May 2006	May 2004 - May 2006	May-04	May-06	April 2004 - June 2006	
	natives	immigrants	natives	immigrants	migrants	claimants	workers		UK born	Overseas born
I - POPULATION VARIABLES - % of those who are:										
Aged:										
16 to 24 years old	0.13	0.10	0.14	0.10	0.37	0.30	-	-	0.15	0.12
25 to 34 years old	0.22	0.33	0.21	0.36	0.45	0.24	-	-	0.15	0.26
35 to 64 years old	0.64	0.57	0.65	0.53	0.18	0.45	-	-	0.50	0.48
over 64 years old	0.01	0.00	0.01	0.00	0.00	0.00	-	-	0.20	0.14
Women	50.40	48.03	50.25	48.00	0.43	0.74	-	-	0.51	0.52
Parents (with dependent children)	-	-	-	-	0.06	-	-	-	0.27	0.32
Nationality:										
Polish	-	0.04	-	0.06	0.61	-	-	-	-	0.02
Lithuanian	-	0.01	-	0.01	0.12	-	-	-	-	0.01
Slovakian	-	0.00	-	0.00	0.10	-	-	-	-	0.00
Latvian	-	0.00	-	0.00	0.07	-	-	-	-	0.00
Located in:										
London	0.11	0.42	0.12	0.43	0.17	0.19	-	-	0.09	0.41
South East	0.13	0.12	0.13	0.12	0.14	0.08	-	-	0.14	0.13
East of England	0.09	0.07	0.09	0.07	0.12	0.07	-	-	0.09	0.08
East Midlands	0.07	0.05	0.07	0.04	0.09	0.06	-	-	0.07	0.05
Yorkshire and the Humber	0.09	0.05	0.09	0.04	0.08	0.09	-	-	0.09	0.06
West Midlands	0.09	0.06	0.09	0.06	0.08	0.11	-	-	0.09	0.07
North West	0.12	0.07	0.12	0.06	0.08	0.12	-	-	0.12	0.07
South West	0.08	0.05	0.08	0.05	0.08	0.05	-	-	0.09	0.05
Scotland	0.10	0.06	0.10	0.06	0.08	0.10	-	-	0.09	0.04
Northern Ireland	0.03	0.02	0.03	0.02	0.04	0.03	-	-	0.03	0.01
Wales	0.05	0.02	0.05	0.02	0.03	0.05	-	-	0.05	0.02
North East	0.05	0.02	0.05	0.02	0.01	0.05	-	-	0.05	0.02
II - LABOUR MARKET VARIABLES - % of those who are in:										
Occupations:										
elementary occupations	-	-	-	-	0.46	0.35	-	-	0.11	0.14
machine operatives occupations	-	-	-	-	0.32	0.10	-	-	0.08	0.07
skilled trades occupations	-	-	-	-	0.06	0.11	-	-	0.12	0.08
personal services occupations	-	-	-	-	0.04	0.05	-	-	0.08	0.08
unknown occupation	-	-	-	-	0.04	0.01	-	-	0.00	0.00
sales and customer service occupations	-	-	-	-	0.03	0.13	-	-	0.08	0.07
administrative occupations	-	-	-	-	0.03	0.10	-	-	0.13	0.09
professional occupations	-	-	-	-	0.01	0.04	-	-	0.12	0.17
managers and senior officials	-	-	-	-	0.01	0.04	-	-	0.15	0.15
technical occupations	-	-	-	-	0.01	0.06	-	-	0.14	0.15
Sectors:							-	-		
manufacturing	-	-	-	-	0.31	-	-	-	0.13	0.11
distribution, hotels & restaurants	-	-	-	-	0.27	-	-	-	0.19	0.21
transport & communication	-	-	-	-	0.09	-	-	-	0.07	0.08
agriculture and Fishing	-	-	-	-	0.08	-	-	-	0.01	0.01
banking, finance & insurance etc	-	-	-	-	0.08	-	-	-	0.15	0.19
public admin, educ & health	-	-	-	-	0.06	-	-	-	0.28	0.28
construction	-	-	-	-	0.04	-	-	-	0.08	0.05
other services	-	-	-	-	0.02	-	-	-	0.06	0.06
energy and water	-	-	-	-	0.00	-	-	-	0.01	0.01

(continued)

Table 1 - DESCRIPTIVE STATISTICS (continued)

VARIABLES	LLMDB		LLMDB		WRS	JSA	ASHE		LFS	
	April 2000 - March 2006		April 2004 - April 2006		May 2004 - May 2006	May 2004 - May 2006	May 2004 - May 2006		April 2004 - June 2006	
	natives	immigrants	natives	immigrants	migrants	claimants	workers		UK born	Overseas born
Part time			-	-	0.08	-	-	-	0.26	0.22
% in work:										
0 weeks in the year	0.26	0.43	0.25	0.42	-	-	-	-	-	-
1 to 25 weeks in the year	0.10	0.13	0.10	0.14	-	-	-	-	-	-
26 to 50 weeks in the year	0.13	0.14	0.13	0.15	-	-	-	-	-	-
51 to 52 weeks in the year	0.51	0.30	0.52	0.30	-	-	-	-	-	-
Average number of employed weeks in the year	44.40	39.87	44.39	39.30	-	-	-	-	-	-
Average number of unemployed weeks in the year	24.42	25.83	24.93	26.81	-	-	-	-	-	-
Average number of jobs in the year	1.48	1.68	1.45	1.62	-	-	-	-	-	-
Average hours worked	-	-	-	-	37.83	-	-	-	36.87	38.37
Employment rate	-	-	-	-	-	-	-	-	0.76	0.67
Unemployment rate	-	-	-	-	-	-	-	-	0.05	0.07
Fraction of all employed weeks worked by	91.41	8.59	89.53	10.47	-	-	-	-	-	-
Fraction of all unemployed weeks worked by	91.76	8.24	90.66	9.34	-	-	-	-	-	-
Average claim duration			-	-	-	31.32	-	-	-	-
Looking for a job in their usual occupation			-	-	-	0.84	-	-	-	-
5th percentile hourly wage distribution	3.91	4.23	3.83	4.12	4.50	-	4.77	5.16	4.50	4.61
10th percentile hourly wage distribution	5.06	5.80	5.00	5.67	4.65	-	5.14	5.55	5.26	5.31
20th percentile hourly wage distribution	6.84	7.88	6.82	7.68	4.85	-	5.99	6.45	6.15	6.22
30th percentile hourly wage distribution	8.28	9.73	8.27	9.39	4.87	-	6.92	7.45	7.02	7.19
40th percentile hourly wage distribution	9.73	11.71	9.73	11.31	5.00	-	7.95	8.55	7.98	8.34
50th percentile hourly wage distribution	11.33	13.90	11.34	13.50	5.05	-	9.18	9.89	9.06	9.59
Average hourly wage distribution	18.96	30.86	18.93	30.45	5.56	-	12.04	13.09	11.02	11.88
Standard deviation hourly wage distribution	64.71	117.31	67.48	138.50	2.03	-	-	-	7.16	8.01
Adult minimum wage	4.50	5.05	4.50	5.05	4.80	-	4.50	5.05	4.50	5.05
f individuals	343641	55797	314693	52882	-	-	-	-	-	-
number of observations	2073115	252518	887622	132108	562830	22016120	21915	23725	201294	21169

Source: Lifetime Labour Market Database, Worker Registration Scheme data, Jobseeker's Allowance data, Annual Survey of Hours and Earnings and Labour Force Survey.

(1) Variables not available or not defined in a particular dataset are indicated by "-". For example, the employment and unemployment rates are not defined for the WRS, ASHE or JSA where all individuals are working/unemployed.
The proportion of parents from the LFS is for 2006 Q2, where the household weight used is based on 2003 population estimates as re-weighted household datasets are yet unavailable (the other figures are based on 2007 population estimates).

(2) As ASHE is not available at the micro level, we are unable to compute percentiles for the period 2004-2006; we instead report percentiles for 2004 and 2006 directly from the ASHE tables. Similarly, standard deviation is not available.

(3) The WRS measures inflows, whereas the JSA and LFS measure stocks. Therefore, the WRS figures are cumulative.

(4) National minimum wage (adult rate) is: £4.50 between 1 October 2003 and 30 September 2004; £4.85 between 1 October 2004 and 30 September 2005; £5.05 between 1 October 2005 and 30 September 2006. The weighed average adult minimum wage in the period is £4.81.

(5) Week-Employment (Unemployment) "rate" is the proportion of observations where the individual did (did not) work at least one week.

(6) Total pay is reported in the LLMDB as annual pay, which is the variable used in the regressions. For comparison purposes here, real hourly pay was calculated for those in full time employment, working 52 weeks and assuming 37 hours week (this can be thought of as an upper estimate, since it excludes part time workers and workers who did not work a full year).

The post-2004 immigration occurred against a backdrop of high and stable labour demand. Figure 2 shows that overall employment rates remained historically high, with only a slight weakening in 2006 and a modest rise in claimant unemployment. Employment probabilities for new A8 immigrants were considerably higher than those for either natives or existing immigrants, reflecting strong labour demand for new entrants. The subsequent fall in 2006 likely reflects selective return migration, a limitation of administrative data which do not capture international exits.

Figure 2 – Employment Probability By Groups

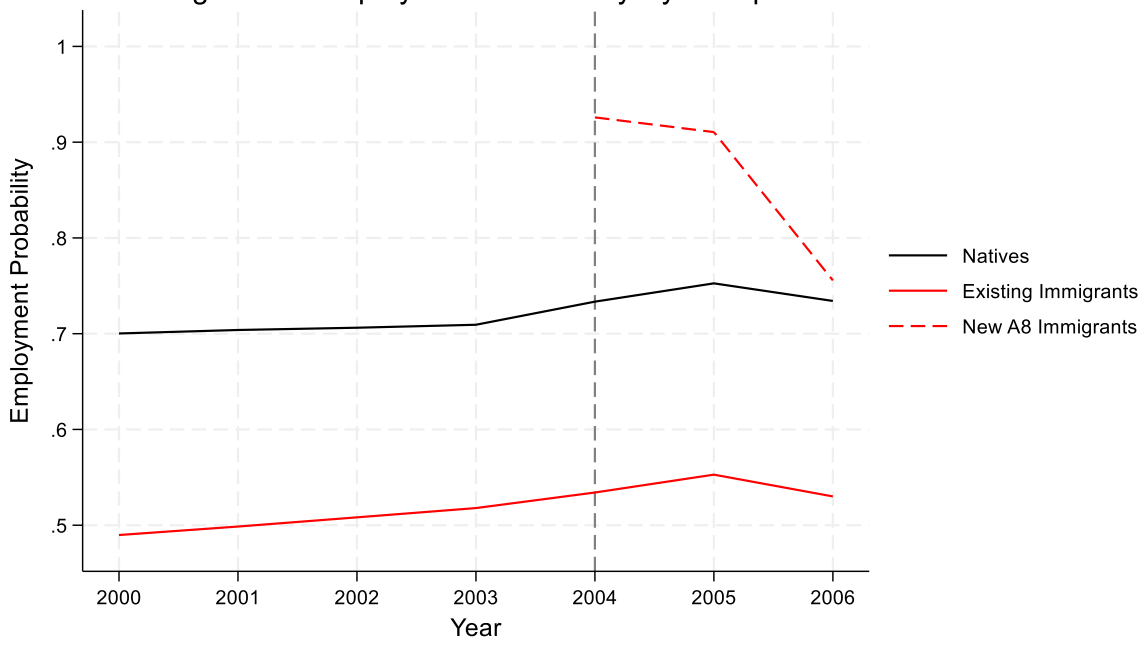
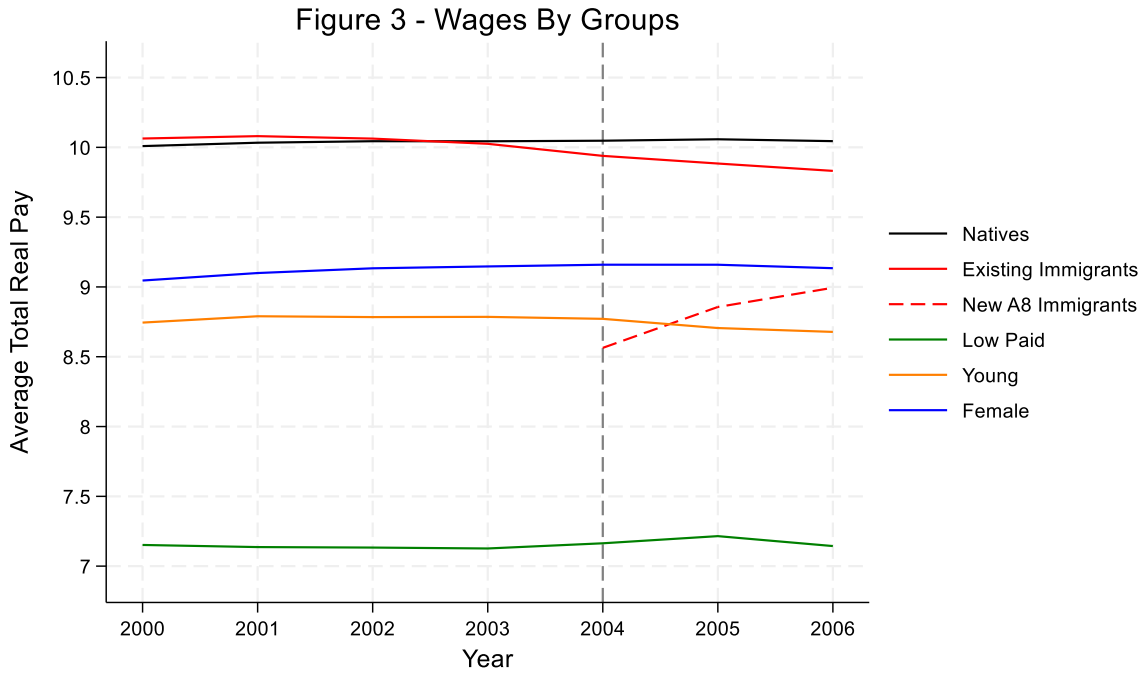


Figure 3 plots earnings trajectories for natives, existing immigrants, new A8 immigrants, and key subgroups. Existing immigrants earn more than natives on average, with greater dispersion, and the raw earnings gap widened after 2003. Low-paid and young workers display persistently lower earnings, while women's average earnings track those of men but at a lower level.



The overall picture—significant inflows, strong employment attachment of new immigrants, entry concentrated in low-paid jobs, and stable aggregate outcomes—is consistent with the early UK literature. Lemos and Portes (2014) found little evidence that accession-era immigration raised claimant unemployment or depressed wages at the aggregate level; the Migration Advisory Committee's comprehensive review reached a similar conclusion for natives overall, with suggestive evidence of distributional impacts for specific subgroups (e.g., the low-skilled). Our regression results will therefore focus on relative outcomes and heterogeneity—where theory predicts the largest effects—rather than aggregate averages.

4. Empirical Framework

The standard approach to estimating immigration's effects is to partition the labour market—geographically or by skill—and regress local outcomes on immigrant inflows (Borjas 1999; Card 2001; Dustmann et al. 2005). Such "spatial correlation" designs are vulnerable to endogeneity: immigrants may move disproportionately into expanding labour markets, while natives may leave declining ones. Instrumental-variable strategies, most notably shift–share instruments (Altonji and Card 1991), attempt to address this but rely on strong assumptions about the exogeneity of historical settlement and the persistence of immigrant inflows across

cohorts. These assumptions are particularly fragile in the UK context, where the A8 inflow was both sudden and unprecedented in origin (Goldsmith-Pinkham, Sorkin and Swift 2020).

We therefore adopt a different strategy, exploiting the longitudinal structure of the LLMDB to estimate within-individual changes in outcomes as new A8 immigrants arrive in local areas. By following individuals over time, we hold constant all fixed personal characteristics, including those unobservable in survey data (e.g. education, innate ability). By including area–time fixed effects, we absorb local demand shocks common to all workers. By tracking address changes, we directly account for mobility, mitigating concerns of "native flight" or "incumbent immigrant flight."

This design is not intended to identify aggregate average effects at the area level, which are absorbed by area–time effects. Rather, our estimates should be interpreted as differential impacts across groups, consistent with theory predicting heterogeneous effects across workers.

We begin by estimating whether new A8 immigration affected the outcomes of existing immigrants relative to natives, before extending the analysis to young workers, the low paid, and female. We also examine interactions of these group characteristics.

Formally, we define outcome variables as:

Y_{ijt} is 1 if the individual is employed, zero otherwise,

W_{ijt} is individuals log annual earnings,

for individual $i = 1, \dots, 399{,}438$, in local authority district $j = 1, \dots, 409$ (ONS 2003)[4] and tax-year $t = 2000, \dots, 2006$.[5]

The treatment variable is the relative inflow of new A8 immigrants to an area–time cell:

$$I_{jt}^{r} = \frac{I_{jt}}{P_{jt}}$$

That is, the number of A8 immigrants observed in area j in time t, I_{jt}, as a proportion of the working age population in the same area-time, P_{jt}. We estimate linear probability models[6] for employment and analogous wage regressions of the form:

$$Y_{ijt} = \alpha + \beta M_i + \gamma M_i I_{jt}^{\mathrm{r}} + \delta X_{ijt} + u_{ijt}$$

where Y_{ijt} is defined above (we estimate the same equation for wages); M_i is 1 if the individual is an existing immigrant, zero otherwise (we estimate the same equation, in turn, for each of the following indicators: low-paid, young, and female, as defined in Section 2). Our controls, X_{ijt} include a gender indicator, a low-paid indicator, a young indicator, age, age squared, years since

[4] Our main result is confirmed when we drop neighboring near-treated areas, this way defining a "buffer area", as a robustness check.

[5] Our estimates remain robust when using alternative sample periods, such as 2000 to 2006.

[6] Our estimates remain robust when using logit specifications. Given the large sample size, however, the occasional extrapolation of predicted probabilities beyond the [0,1] interval in linear probability models does not materially affect inference.

immigration, nationality, number of jobs in the year and a changed address indicator (see Section 2).

We decompose u_{ijt} into:

$$u_{ijt} = f_i + f_j + f_t + f_{ij} + f_{it} + f_{jt} + f_j M_i + f_t M_i + f_{jt} M_i + f_{ij}^{2003} M_i + v_{ijt}$$

As some interaction terms are collinear with lower-order fixed effects, and are therefore omitted in estimation, the final estimated equation is:

$$Y_{ijt} = \alpha + \gamma M_i I_{jt}^{\mathrm{r}} + \delta X_{ijt} + f_{ij} + f_{it} + f_{jt} + f_{jt} M_i + e_{ijt}$$

The fixed effect terms in this equation fulfil the following roles:

- Individual–area fixed effects f_{ij} capture local conditions for each worker.
- Individual–time fixed effects f_{it} absorb national shocks that differentially affect immigrants and natives in a given time.
- Area–time fixed effects f_{jt} absorb local demand shocks common to all groups in a given time.
- Group–area–time interactions $f_{jt} M_i$ allow immigrants and natives to respond differently to local conditions.[7]

Under this design, the coefficient of interest, γ, identifies the effect of new immigration on the relative outcomes of one group in relation to another – it effectively estimates the gap between immigrants and natives. The key assumption is that selective settlement of new A8 immigrants is not correlated with group-specific shocks beyond those absorbed by our fixed effects. Put differently, inflows may target booming areas, but as long as those booms raise outcomes for immigrants and natives in a similar fashion, our estimates remain unbiased. Bias would arise only if new arrivals systematically coincided with shocks that differentially affected, for example, existing immigrants but not natives.

Relative to shift–share IV approaches, our design trades off some external variation for stronger internal validity. Shift–share exploits national shocks to immigrant inflows interacted with historical settlement, but its validity requires both exogeneity of past distributions and persistence across cohorts. By contrast, our fixed effects framework does not rely on historical settlement patterns. Instead, it leverages administrative microdata to estimate causal effects from individual level variation, controlling flexibly for local shocks.

The cost of this approach is that aggregate average effects at the area level are absorbed by area–time fixed effects and cannot be separately identified. Our estimates should therefore be interpreted as distributional impacts across groups, not aggregate labour-market consequences. This is consistent with existing evidence suggesting that aggregate effects are modest, but subgroup differences matter. In other words, we are estimating the gap – the differential – effect. That is, how the increase in the immigration inflow affected one group, say immigrants, relative

[7] Our errors are area clustered. We experimented with area-time clustered errors, but our rich set of fixed effects absorbs most of the variance at that cluster level.

to another group, say natives.

Several residual concerns remain. First, if there are group-specific shocks coinciding with immigrant inflows—such as sector-specific downturns affecting low-paid incumbents—these may not be fully captured by our area–time effects. Second, inflow measures may be subject to measurement error: short-term immigrants who never register for tax or benefits will be missed, potentially attenuating estimates. Third, selective return migration abroad could bias results if adversely affected individuals disproportionately exit the dataset.

These limitations imply our estimates are likely conservative, more prone to understate than overstate adverse effects. Nevertheless, the combination of individual level longitudinal data, comprehensive administrative coverage, and a rich set of fixed effects provides a substantially more credible identification strategy than has previously been available for the UK context.

5. Results

5.1 Immigrants versus Natives

Table 2 reports our estimates of the relative impact of new A8 immigration on existing immigrants compared to natives. Without fixed effects, our baseline estimate in column 1 suggests a relatively large negative correlation between inflows and employment probabilities. However, as expected, this raw correlation is largely driven by compositional differences across areas and groups. Once we introduce fixed effects and controls, our estimate in column 4 is dramatically smaller, though still significant. Our preferred specification estimate in column 5 – where we control for area mobility – remains robust and significant.[8]

Specifically, we find that a one percentage point increase in the A8 immigration rate reduces employment probability of existing immigrants by 0.8 percentage point more than the employment probability of natives. To place this into context, the A8 share of the working age population in our data increased by roughly 1 percentage point during the sample period. The cumulative employment effect for existing immigrants is, therefore, small but non-trivial. This aligns with the intuition from labour-market theory: new entrants who are close substitutes for incumbent immigrants may displace them in the short run, especially in low-wage and low-skill segments where competition is most intense.

Our subgroup analyses underscore this mechanism. The employment probability penalty is significantly larger for younger immigrants, consistent with the view that this group is at the greatest risk of substitution when the new low-paid A8 labour arrived. Young workers, often less established and with fewer firm-specific skills, are more easily replaced by new entrants. These results are consistent with previous evidence that earlier immigrant cohorts bear the brunt of subsequent inflows (Manacorda, Manning and Wadsworth 2012).

Turning to wages, Table 2 reveals a strikingly different pattern. In contrast to the negative employment effects, the estimated impact on relative earnings is consistently positive. A one

[8] Adding lagged working age population growth as a mobility measure, common in the literature, results in perfect collinearity with area-time fixed effects, so its effect is already accounted for in the model.

percentage point increase in the share of new A8 immigrants raises the wages of existing immigrants by approximately 1.7%.

Table 2 - Wage and Employment Gap Estimates Between Natives and Existing Immigrants

Model	(1) Base Model	(2) Unconditional Model	(3) Conditional Model	(4) Mobility Model	(5) Interaction Model		
	coefficient	coefficient	coefficient	coefficient	coefficient	coefficient	coefficient
	s. errors	s. errors	s. errors	s. errors	s. errors	s. errors	s. errors
Employment Effect							
Treatment Variable	**-0.067**	**-0.029**	**-0.007**	**-0.008**	**-0.007**	**-0.004**	**-0.011**
	0.028	0.004	0.003	0.002	0.002	0.002	0.003
Treatment Variable Interacted with Low Paid Indicator					**-0.006**		
					0.005		
Treatment Variable Interacted with Young Indicator						**-0.061**	
						0.009	
Treatment Variable Interacted with Female Indicator							**0.007**
							0.002
Sample Size	2315714	2251201	2251201	2054474	2054474	2054474	2054474
Wage Effect							
Treatment Variable	**-0.024**	**0.025**	**0.009**	**0.017**	**0.023**	**0.014**	**0.012**
	0.010	0.005	0.005	0.003	0.004	0.003	0.004
Treatment Variable Interacted with Low Paid Indicator					**-0.050**		
					0.024		
Treatment Variable Interacted with Young Indicator						**0.037**	
						0.014	
Treatment Variable Interacted with Female Paid Indicator							**0.013**
							0.007
Sample Size	1629424	1561930	1561930	1456283	1456283	1456283	1456283
Individual Fixed Effects	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Local Authority District Fixed Effects	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Time Fixed Effects	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Two-way Fixed Effects Interactions	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Controls	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Mobility Variable	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**

(a) Estimates are obtained via OLS with high-dimensional fixed effects. The model absorbs individual, area and time fixed effects as well as their two-way interactions. Standard errors are clustered at the area level. Coefficients reflect within-unit variation net of all absorbed heterogeneity.

(b) The dependent variable is, in turn, and employment indicator and total real pay.

(c) See text for discussion on the controls included in the conditional model, which are of the expected sign, and in the main, signficant. The mobility model includes an indicator which is one if the individual changed postcode at least once in the tax-year.

(d) The interpretation of the coefficient is that a one percentage point increase in the treatment variable (the A8 immigration rate in a given area and time multiplied by an immigrant indicator, which is 1 for an existing immigrant and zero for natives) changes the depend variable by B percentage points.

This result suggests that while displacement pressures reduce employment probabilities for some incumbent immigrants, those who remain employed may benefit from reallocation or from complementarities with the new arrivals. For example, employers may reorganise production or restructure tasks, with new immigrants concentrated in particularly low-skill activities, thereby enhancing the productivity—and hence wages—of existing workers who move into more complex tasks.

The interaction results reinforce this interpretation. For non-low-paid immigrants, the wage impact of new inflows is clearly positive, suggesting they may have benefited from complementarities. By contrast, for low-paid immigrants, the wage impact is negative. This divergence highlights that the positive wage effect at the aggregate immigrant level masks a distributional split: new immigration appears to push down the earnings of low-paid incumbents but boosts the wages of higher-paid ones.

Overall, this points to a dual adjustment process: substitution at the bottom of the earnings distribution, where low-paid existing immigrants – disproportionately concentrated in low-skill occupations and thus facing direct competition from the new arrivals – are crowded out by new entrants, and complementarities higher up – where incumbents benefit from specialisation and reallocation. This interpretation is consistent with the wider theoretical literature (Dustmann, Frattini and Preston 2013; Peri 2012), which emphasises heterogeneous effects across the wage distribution.

Gender differences appear relatively small. While there are some signs of marginally larger employment impacts for female immigrants, these estimates are imprecisely estimated and smaller in magnitude than those by pay or age. By contrast, the youth effects mirror those for the low paid: younger immigrants experience negative employment impacts but relatively positive wage effects. This again suggests that displacement risk is highest among less established workers, but those who remain employed may benefit from reallocation.

5.2Other Subgroups

Table 3 broadens the analysis, examining the impact of new A8 immigration on low-paid, young, and female workers across the entire workforce (immigrants and natives combined). For comparability, we present only results from the preferred specification (in column 4 Table 2) with the full set of controls and fixed effects.

Table 3 - Wage and Employment Gap Estimates By Groups

Model	Low Paid	Young	Female
	coefficient	coefficient	coefficient
	s. errors	s. errors	s. errors
Employment Effect			
Treatment Variable	**0.008**	**-0.001**	**-0.003**
	0.002	0.001	0.001
Sample Size	2054474	2054474	2054474
Wage Effect			
Treatment Variable	**-0.020**	**0.077**	**0.025**
	0.010	0.007	0.002
Sample Size	1456283	1456283	1456283
Individual Fixed Effects	**Yes**	**Yes**	**Yes**
Local Authority District Fixed Effects	**Yes**	**Yes**	**Yes**
Time Fixed Effects	**Yes**	**Yes**	**Yes**
Two-way Fixed Effects Interactions	**Yes**	**Yes**	**Yes**
Controls	**Yes**	**Yes**	**Yes**
Mobility Variable	**Yes**	**Yes**	**Yes**

(a) Estimates are obtained via OLS with high-dimensional fixed effects. The model absorbs individual, area and time fixed effects as well as their two-way interactions.
Standard errors are clustered at the area level. Coefficients reflect within-unit variation net of all absorbed heterogeneity.
(b) The dependent variable is, in turn, and employment indicator and total real pay.
(c) See text for discussion on the controls included in the conditional model, which are of the expected sign, and in the main, signficant.
The mobility model includes an indicator which is one if the individual changed postcode at least once in the tax-year.
(d) The interpretation of the coefficient is that a one percentage point increase in the treatment variable (the A8 immigration rate in a given area and time multiplied by an immigrant indicator, which is 1 for an existing immigrant and zero for natives) changes the depend variable by B percentage points.

The results differ somewhat from those for immigrants alone. For the low paid as a whole, we find positive employment impacts but negative wage impacts. One possible explanation is that inflows of new immigrants increased labour demand in low-wage sectors, generating more employment opportunities overall, but simultaneously exerting downward pressure on pay within these jobs. This is consistent with theoretical predictions of imperfect substitutability: an increase in supply may lower wages but, if labour demand is sufficiently elastic, expand employment.

For younger workers, the opposite pattern emerges: negative employment impacts but positive wage effects. This is harder to reconcile directly with simple supply–demand reasoning. One interpretation, although necessarily speculative, is that younger workers who remain employed benefit from reallocation into relatively higher-wage positions, while marginal young workers are displaced or discouraged. This dynamic reflects the volatility of labour market entry and suggests that immigration-induced adjustment may disproportionately affect labour market attachment rather than earnings levels for younger cohorts.

Finally, for women, the estimated effects are small and not statistically distinguishable from zero in most specifications. This may reflect the broad occupational distribution of women across the labour market, diluting any concentrated effects of new inflows.

Taken together, these results suggest that labour market adjustment to large immigration shocks is highly heterogeneous. Aggregate impacts on natives appear limited, but distributional effects within the workforce are substantial. For existing immigrants, especially the young, new arrivals create employment pressures but at the same time may raise wages for those who remain employed. For the workforce as a whole, the low paid gain in terms of employment but lose in terms of pay, while young workers show the opposite pattern. Gender differences, by contrast, are small.

These findings are consistent with a labour market that adjusts through both substitution and complementarities. New arrivals displace some workers, particularly at the lower end of the labour market, but they also enable restructuring that enhances opportunities for others. The result is limited aggregate disruption but important shocks at the subgroup level – with some groups and individuals gaining and others losing.

6. Discussion and Conclusion

This paper revisits the impact of a large immigration shock–the inflows from new EU Member states to the UK after the 2004 enlargement–on the employment and wages of existing workers, both natives and previously existing immigrants. Using a large and underexplored longitudinal administrative dataset—the Lifetime Labour Market Database (LLMDB)—we provide UK evidence on comprehensive microdata linking employment, earnings, and demographic records. By combining a rich set of fixed effects with a direct measure of mobility, our strategy overcomes many of the weaknesses of previous survey-based and spatial approach designs.

Four key results emerge. The aggregate impact of the 2004 A8 inflows on the employment and wages of natives appears limited, confirming earlier evidence. However, our longitudinal analysis shows clear distributional effects.

1. Existing immigrants were the most affected: their employment probabilities declined modestly in the face of new inflows, especially among the young. Yet at the same time, their wages rose on average, suggesting complementarities for those who remained employed.
2. Low-paid workers overall saw positive employment but negative wage effects, consistent with supply-driven expansion of low-wage jobs but intensified wage competition within them.
3. Younger workers experienced the reverse: reduced employment but positive wage impacts, plausibly reflecting displacement of marginal entrants alongside reallocation of incumbents into higher-paying roles.
4. Gender differences were small, with no robust evidence of differential impacts.

These results suggest that the labour market adjusted to the A8 immigration shock through a mixture of substitution and complementarities. New immigrants displaced some workers—particularly young existing immigrants—but also enabled restructuring that improved wages for others, although numerous questions on the nature of this process remain open. This duality reconciles the absence of large aggregate effects with the presence of significant distributional effects.

Our findings align with theoretical models of immigration that predict heterogeneous impacts

across the wage distribution (Dustmann, Frattini and Preston 2013; Peri 2012). They also echo other evidence that earlier immigrant cohorts are disproportionately affected by new arrivals (Borjas 2003; Manacorda, Manning and Wadsworth 2012). At a methodological level, our approach contributes to the growing literature that moves beyond shift–share instruments, which are increasingly recognised as fragile. By leveraging individual-level longitudinal variation, we provide estimates that are less reliant on potentially endogenous historical settlement patterns and more robust to local labour market shocks.

For policymaking, the findings carry two implications. The adjustment burden–and indeed benefits–of immigration fall primarily on previously existing immigrants and certain vulnerable subgroups, not on the native workforce as a whole. Second, distributional impacts matter: even if aggregate effects are small, concentrated pressures on low-paid or younger workers can and should be a matter of policy concern. Policies aimed at supporting vulnerable groups—through skills upgrading, stronger wage floors, or targeted employment support—are likely to be of greater benefit, and therefore, be more effective than blanket restrictions on immigration, which would negate the benefits, both to the economy as a whole and to other subgroups–of the complementarities offered by immigrants to the existing workforce.

Several limitations remain. Our estimates identify relative distributional impacts rather than aggregate general equilibrium effects, which are absorbed by area–time fixed effects. We do not control for education or sectoral allocations, limiting our ability to understand the nature of the adjustment process, and in particular of the potential mechanisms by which any complementarities are realised. Nor can we directly observe temporary immigration or return migration, which may attenuate measured effects.

This research is very much a first step. With better data, we could study longer-term trajectories; and if linked to firm level data, as is now becoming possible, would allow a much more detailed analysis of the adjustment process. Extending this type of analysis to the post-2021 immigration regime would be particularly valuable to current policy debates. The scale and composition of recent inflows dwarf the A8 episode, which likely has larger and more complex distributional consequences.

In conclusion, the UK labour market absorbed the large A8 inflows of the mid-2000s with relatively little aggregate disruption, but not without important distributional consequences. New immigrants displaced some existing immigrants while complementing others, creating both winners and losers within the labour force. Our analysis demonstrates the value of longitudinal administrative data in identifying these dynamics and provides a roadmap for future research into the much larger and more diverse immigration flows now reshaping the UK economy.

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