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Local-Level Immigration and Life Satisfaction: The EU Enlargement Experience in England and Wales

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November 2015

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ABSTRACT

Local-Level Immigration and Life Satisfaction: The EU Enlargement Experience in England and Wales*

The 2004 European Union enlargement resulted in an unprecedented wave of 1.5 million workers relocating from Eastern Europe to the UK. We study how this migrant inflow affected life satisfaction of native residents in England and Wales. Combining the British Household Panel Survey with the Local Authority level administrative data from the Worker Registration Scheme, we find that higher local level immigration increased life satisfaction of young people and decreased life satisfaction of old people. This finding is driven by the initial 'migration shock' – inflows that occurred in the first two years after the enlargement. Looking at different life domains, we also find some evidence that, irrespective of age, higher local level immigration increased natives' satisfaction with their dwelling, partner and social life.

JEL Classification: F22, J15, I31

Keywords: immigration, life satisfaction, United Kingdom, 2004 EU enlargement

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1. Introduction

Immigration has become a major concern across the Western world. Much of the public and political discourse has focused on how migrants affect wages and employment of receiving populations, with claims such as ‘immigrants take our jobs’ resonating well with the general public, media and politicians. However, for some time academics have been pointing that immigration has few, if any, adverse effects on the labour markets of migrant-receiving countries (Constant, 2014; Peri, 2014). Such findings, coupled with the increasing worries over immigration, raise a question: in what ways does immigration affect the well-being of people in migrant-receiving countries – beyond the realm of the labour markets?

Recent experience with immigration in the United Kingdom (UK) is a case in point. Following the 2004 enlargement of the European Union, the UK opened its labour market to citizens of the new EU member states (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia – also known as the accession or A8 countries). The resulting migrant inflow was the “biggest peacetime movement [of people] in European history”.¹ Between 2004 and 2011, 1.5 million East Europeans started working in the UK.² According to the 2011 UK Population Census, Poles – the largest group among the A8 migrants – have overtaken the Irish, Pakistani and Bangladeshi to become the UK’s second-largest foreign-born population group, after the Indians.

It has been shown that this large and unexpected inflow of A8 migrants had no adverse effect on either UK wages or unemployment (Gilpin et al., 2006; Lemos and Portes, 2013; Lemos, 2014).³ Employers have been praising East Europeans for their work ethic (MacKenzie and Forde, 2009; Anderson et al., 2006; The Guardian, 2010) and the broad public thinks these migrants have contributed to the UK economy (British Future, 2013). However, there have

¹ This quote is from the evidence submitted by David Goodhart to the HM Government Review of the Balance of Competences between the United Kingdom and European Union: Single Market: Free Movement of Persons, (2014, 28): available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335088/SingleMarketFree_MovementPersons.pdf

² Only the UK, Ireland and Sweden opened their labour markets upon enlargement; other ‘old’ EU members introduced transitional arrangements limiting immediate inflows of the ‘new’ Europeans. Ireland received more migrants than any other EU country *in relative terms*: between 2004 and 2007 the share of East European migrants in Ireland’s population increased from 1.07% to 4.09%. Similar figures for the UK are 0.20% and 1.00% and for Sweden, 0.26% and 0.46% (Brucker and Damelang, 2009).

³ It has also been shown that A8 migration contributed to the UK public finances (Dustmann et al., 2010) and may have reduced crime (Bell et al., 2013).

also been many concerns. It has been claimed that A8 immigration has disadvantaged the UK's low-skilled and young workers (Sumption and Somerville, 2010; MigrationWatch, 2012). Multiple cases of migrant exploitation, unfair treatment and substandard accommodation have been reported (Jayaweera and Anderson, 2006; BBC, 2013). Local communities complained about the strains that the large numbers of A8 migrants put on public services, in particular health and education.⁴ These reports, even if not always generalizable to the whole A8 migrant population, have received wide media coverage. Coupled with the extent of the A8 migration and the frustration over the EU internal labour mobility rules, they have contributed to the rising anti-immigration and anti-EU sentiment in the UK, and fuelled support for the far-right political parties (Geddes, 2014; Lawless, 2015). Migration has indeed become the biggest worry of the British people (The Economist, 2015).

If such a large migration shock had no adverse effects on the UK economy, could the non-economic factors explain the rising public concerns over immigration? In this paper, we explore whether immigration from A8 countries affected a specific individual-level outcome: life satisfaction of the UK residents. Life satisfaction, together with other manifestations of subjective well-being (such as happiness), is a more integrated representation of individual utility and can reflect a broad range of real and perceived effects of immigration on individual welfare. Governments across the world have been adopting different measures of subjective well-being as prime variables to capture individual welfare and societal progress, and guide policymaking (OECD, 2013; Office for National Statistics, 2013). In addition, the politicians' prospects of being re-elected may depend directly on how happy the voters are (Liberini et al., 2014; Ward, 2015). It has been shown that higher levels of *subjective* well-being have *objective* benefits: happier and more life-satisfied people are healthier, more productive and sociable (De Neve et al., 2013). Given the importance of both subjective well-being and migration for policy, it is surprising how little is known about the effects of immigration on the subjective well-being of immigrant-receiving populations.

We believe that the 2004 enlargement and the ensuing migrant inflows to the UK represent an instructive laboratory for the examination of the effects of immigration on the subjective well-being of natives. Due to the sheer contribution of the new member states to the EU

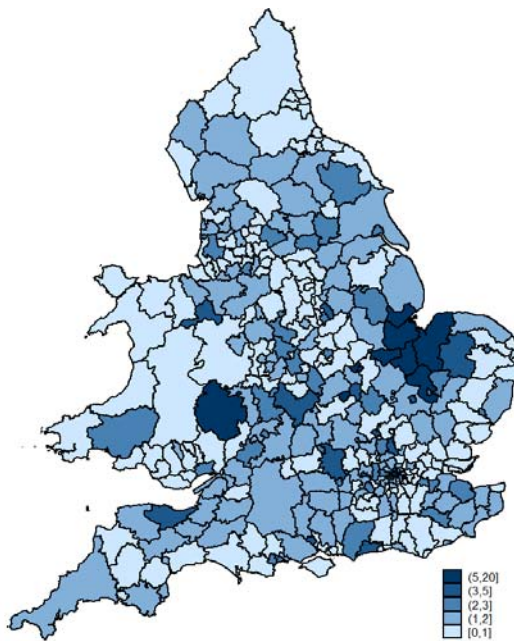
⁴ Rhys et al. (2009) found that higher East European inflows were associated with lower public service performance, especially in communities with no prior experience of dealing with such migrants.

population (it increased by 20%) and the fact that only three countries – the UK, Ireland and Sweden – opened their borders to the new Europeans immediately upon accession, the 2004 enlargement has often been considered a natural experiment (Constant, 2012; Elsner, 2013; Lemos and Portes, 2013, Kahanec et al., 2014).⁵ In the context of our study, it is, for example, highly unlikely that the large and fast inflows of East Europeans were *driven* by the subjective well-being (or their changes) of the UK residents; in other words, we can by and large exclude the possibility of reverse causality – one potential source of endogeneity.

Besides being large, unexpected and fast, the A8 migration to the UK was also geographically unevenly distributed (Figure 1). The demand for jobs in the geographically-concentrated, ‘migrant-intensive’ industries, such as agriculture, food processing and manufacturing, coupled with powerful migrant networks meant that that some UK communities were affected by the East European migration much more than others. Our identification strategy relies on this uneven geographical distribution of A8 immigration. In particular, we relate the local-level intensity of A8 migration to the changes in people’s life satisfaction over time. To capture the local-level migration intensity, we use data from the Worker Registration Scheme (WRS), which documented, between 2004 and 2011, the number of A8 workers starting a job in the UK at the local authority level. To capture changes in individual life satisfaction, we use the British Household Panel Survey (BHPS). Since the BHPS follows the same people over time, we can estimate fixed effects regression models that take account of the potentially confounding impact of time-invariant individual characteristics.

⁵ Lemos and Portes (2013, 299) argue that the post-enlargement immigration to the UK “corresponds more closely to an exogenous supply shock than most migration shocks studied in the literature”.

Figure 1. Geographical distribution of A8 migration in England and Wales, 2004-2008, % of local population



Source: Worker Registration Scheme.

We are also interested in how immigration affects life satisfaction of different groups of people, in particular people of different age. One might expect that younger people are more supportive of diversity, which is brought along by immigration, but also more concerned about labour market competition. Older people might be less keen on diversity and also more concerned about the effects of immigration on the provision of public services (for example, health services). Studying how life satisfaction responds to immigration across age groups is policy relevant – for example, the elderly are more likely to vote and may thus have a greater say over the formation of immigration policy. To gain further understanding on how immigration affects life satisfaction of the receiving population, we also delve into specific channels through which immigration affects subjective well-being of natives, looking at the migration effects on different life satisfaction domains – satisfaction with income, job, family life, housing, leisure etc.

Our results suggest that the A8 immigration led to a change in life satisfaction of the UK residents. In particular, more intense local-level immigration increased overall life satisfaction of young people and decreased life satisfaction of old people. These effects were

pronounced immediately after the UK opened its labour market to the new Europeans. We also find that the A8 immigration increased natives' satisfaction with their dwelling, partner and social life; these results do not depend on the natives' age and tend to be valid for both the shorter and longer runs.

Our paper contributes to the nascent literature on the effects of immigration and diversity on the subjective well-being of native populations (Betz and Simpson, 2013; Longhi, 2014; Akay et al., 2014).⁶ Betz and Simpson (2013) study the relationship between the country-level immigrant flows and individual happiness in 26 European countries. Their analysis draws on the five waves (2002-2010) of the European Social Survey, which allows controlling for year and country, but not for individual fixed effects (the European Social Survey consists of repeated country cross-sections). They report a positive association between the recent (one-year lagged) immigration flows and the happiness of natives. Two-year lagged immigration has a smaller positive effect, and the effect of longer-term immigration flows is insignificant.

While the analysis of Betz and Simpson (2013) draws on the country-level variation in immigrant flows, Longhi (2014) focuses on a single country (UK) and studies the relationship between life satisfaction and diversity (by country of birth, ethnicity and religion) at a geographically much more disaggregated level. Merging the 2009-10 wave of the Understanding Society survey with the local-authority-level diversity statistics from the 2011 UK Census, Longhi (2014) finds that people living in more diverse communities are less satisfied with life. The result, however, is statistically significant only for the white British population; the life satisfaction of the non-white British and the foreign-born is not affected by diversity.

Finally, Akay et al. (2014) study the impact of immigration on the life satisfaction of natives in Germany. Relating changes in the share of immigrants in Germany's 96 regions to changes in individual life satisfaction over 11 years (1998-2009), Akay et al. (2014) uncover a positive relationship between immigration and life satisfaction of natives. This effect is highest in regions with intermediate levels of immigrant assimilation and appears to be driven

⁶ This literature can be seen as part of a broader, rapidly-growing literature on subjective well-being and migration. See Simpson (2013) for an overview, Ivlevs (2015) for a review of the effects of subjective well-being on the emigration decision and Nikolova and Graham (2015) for a review of the effects of migration on migrants' subjective well-being.

by satisfaction with dwelling and leisure. An important distinction from Betz and Simpson (2013) and Longhi (2014) is that Akay et al. (2014) use panel data (German Socio-Economic Panel Survey), which allows them to control for unobserved individual-level heterogeneity. Our paper adopts a similar methodology, although we exploit a more disaggregated spatial variation in immigration rates (323 local authority districts) and concentrate on the effects on life satisfaction of a specific migration shock (A8 migration).

More broadly, our paper also contributes to the literature studying the relative importance of individual and regional variation in subjective well-being, as well as the regional and local-level determinants of it. While some studies have found that, after controlling for individual-level factors, the role of geography in explaining well-being is limited (Ballas and Tranmer, 2011), others have found that the regional dimension matters (Aslam and Corrado, 2012; Pittau et al., 2010; Pierewan and Tampubolon, 2014) and that contextual characteristics, such as the neighbourhood levels of social support and socio-economic deprivation, can be important determinants of subjective well-being (Shields et al., 2009). Our findings support the importance of the regional dimension in explaining subjective well-being and suggest that local-level immigration inflows are an important predictor of the changes in individual life satisfaction.

Finally, our paper is also related to the broader literature on the effects of immigration on receiving societies. An important debate within this literature has been whether immigration affects natives' wages and employment; as mentioned earlier, the consensus is that immigration has no adverse effects on the natives' labour market outcomes.⁷ The effects of immigration, however, do not have to be confined to labour markets. Recent literature has shown that immigration can affect a variety of local-level socio-economic outcomes, including the prices of goods and services (Cortes, 2008), house prices (Sá, 2015), crime rates (Bell et al., 2013) and the NHS (public health provider in the UK) waiting times (Giuntella et al., 2015). To identify the effects of immigration, all these contributions have used the spatial correlation approach, which relies on the existence of local- or regional-level variation in immigration levels. We follow this methodological approach and find that immigration can also affect natives' subjective well-being.

⁷ That said, the effects of refugee inflows on labour market outcomes tend to be negative, especially among natives who compete with refugees for the same jobs (Calderón-Mejía and Ibáñez, 2015; Ruiz and Vargas-Silva, 2015).

The remainder of the article is organised as follows. Section 2 presents the data and estimation approach. Section 3 reports the results, while section 4 discusses them in more detail and concludes.

2. Data and methods

2.1 BHPS and life satisfaction

The individual-level data used in the empirical analysis are from the British Household Panel Survey (BHPS) – a nationally representative survey of the adult population (16+) of more than 5,000 households (containing approximately 10,000 individuals) in Great Britain, sampled in 1991 and followed annually until 2008/2009.⁸ The BHPS contains individual and household-level information on demographic characteristics, income, education and training, employment, as well as values and opinions on social and political matters. Importantly for our study, a series of questions on health and subjective well-being are also included in the survey.

Information on satisfaction with different life domains and overall life satisfaction was collected during BHPS waves 6-10 (1996-2000) and 12-18 (2002-2008/2009). In particular, individuals were asked to record (on a 7-point Likert scale ranging from ‘not satisfied at all’ to ‘completely satisfied’) their satisfaction with the following life domains: health, income of household, house/flat, husband/wife/partner, job (if employed), social life, amount of leisure time, and the way they spend their leisure time. Finally, individuals were asked to record (using the same scale) how dissatisfied or satisfied they are with their life *overall*. The answers to this latter question form our overall life satisfaction measure, while the former questions will be used to examine satisfaction with the various life domains.

2.2 Worker Registration Scheme and local migrant flows

The Worker Registration Scheme (WRS), in operation between May 2004 and April 2011, was introduced by the British Government to monitor the inflows of the nationals of the eight

⁸ The BHPS was succeeded in 2009 by “Understanding Society: the UK Household Longitudinal Survey”. See <https://www.understandingsociety.ac.uk/> for more details.

East European states which joined the EU in 2004. Workers had to register for their first job taken in the UK (if working for more than one month), and re-register if they changed employer within the first 12 months; no further registration was necessary after one year of uninterrupted employment in the UK. The registration fee for the first job was £50 (eventually rising to £90), while re-registrations were free. The self-employed were exempt from registering.

The WRS provides information on the nationality, gender and age of migrants, as well as their occupation, sector of employment, hours of work and hourly pay while taking up employment in the UK. Crucially for our study, information is also available on the spatial (local authority district level; henceforth, LAD level) distribution of migrant registrations.

Using the WRS statistics we construct our regressor of interest – the A8 migrant inflow rate at the LAD level, which we express as total A8 migrant inflows as a percentage of the LAD population.⁹ The LAD level WRS data are available for an aggregated time period between May 2004 and December 2005 (20 months) and for each year from 2006 until the end of the scheme (2011). Considering the A8 inflows as one big migration wave, we will use the aggregate 2004-2005 registrations to capture the inflows that occurred at the very beginning of this wave – the ‘migration shock’. The registrations from 2006 onwards will help identify longer-term effects, when migration becomes more established and natives have time to adapt to it. To combine the BHPS with the WRS data, the A8 migrant inflow rate for each LAD is matched with the LAD identifier that is available in the BHPS for each household and survey year. In our analysis, we focus on the period 2003-2008, assigning the value of zero to the migrant inflow rate in 2003 and excluding year 2004 from our analysis due to the aggregated nature of the WRS data in 2004-2005.

While the WRS data represent a rich source of labour market information about A8 migrants, several limitations of the data have to be acknowledged (McCollum, 2012). First, not all migrants registered with the scheme – partly because there were no sanctions for non-compliance, partly because of the fee. Given that the self-employed and those out of the labour market did not have to register at all, the WRS data underestimate total A8 migration. Second, migrants did not have to de-register when they stopped working – the data thus

⁹ Population for each LAD and year is available from the Office for National Statistics as a mid-year estimate (see <https://www.nomisweb.co.uk/>).

reflect migrant inflows rather than net migration. This, however, is not necessarily an issue for our study, as it can be argued that it is the inflow rate of new migrants that matters for the life satisfaction of receiving populations – regardless of whether migrants become permanent or not. Third, to avoid double counting the data refer only to first migrant registrations (Bauere, 2007); they, therefore, cannot capture migrants’ spatial mobility.¹⁰

2.3 Estimation strategy

The baseline linear regression model explaining life satisfaction for individual i in local authority district j at year t can be expressed as follows:

$$\begin{aligned}
 (\text{Life satisfaction})_{ijt} = & \alpha_1 * (\text{migrant inflow rate})_{jt} + \\
 & \alpha_2 * (\text{LAD level controls})_{jt} + \\
 & \alpha_3 * (\text{socio-demographic controls})_{ijt} + \\
 & \alpha_4 * (\text{person fixed effects})_i + \\
 & \alpha_5 * (\text{region dummies}) + \\
 & \alpha_6 * (\text{year dummies})_t + \\
 & (\text{unobserved error term})_{ijt}
 \end{aligned} \tag{1}$$

We assume cardinality of the life satisfaction measure – a common practice in the literature on happiness/life satisfaction (see, e.g., Ferrer-i Carbonell and Frijters, 2004). This assumption enables us to run individual fixed effects OLS regressions, which accounts for time-invariant individual unobserved heterogeneity in a simple way by using a standard within estimator and permits a straightforward interpretation of the coefficients of interest. For comparison purposes, we also report results from pooled OLS regressions.

We initially control for time-invariant spatial heterogeneity with the insertion of a series of region dummies (for 11 government office regions). We also include in the model a dummy variable indicating whether the respondent has moved across local authorities since the

¹⁰ Bell et al. (2013) find that there is a very close correlation between the WRS registrations and the changes in corresponding migrant stocks across the (more aggregated) Police Force Areas, implying a limited spatial mobility of migrants.

previous year. Although these are imperfect ways to deal with the issue of time-invariant LAD level heterogeneity that may bias our estimate of α_1 , we will also report results from robustness checks where our model is estimated on the sample of people who do not move between local authorities. Focusing on these people effectively controls for any time-invariant LAD level effects.

To account for time-varying LAD characteristics, which might be related to both life satisfaction and migrant inflows, we include the LAD-level job claimant rate and the crime rate (total job claimants and total crime count as a proportion of LAD population).¹¹ Crime statistics are only available for England and Wales, so our final sample excludes respondents interviewed in Scotland. All specifications also include a set of standard socio-demographic controls: gender (included only in the exploratory pooled OLS models), age group (14 dummies in five-year intervals), log of household monthly income, labour market status, subjective general health status, marital status, number of children, household size, housing tenure and highest education level attained. Finally, all year-specific influences on life satisfaction are captured by year dummies.¹²

We proceed by presenting our baseline estimates for three time periods: the whole period (2003-2008), the initial period of the ‘migration shock’ (2003-2005), and the later, ‘matured flows’, period (2006-2008). Also, as discussed above, we are interested in whether the impact of migration differs across age groups. For this reason, we also report results from specifications where the migrant inflow rate is interacted with age.

Our final sample, after dropping observations with missing information for any of the variables used in the baseline models and keeping only UK natives (i.e. people reporting that were born in the UK), consists of 28,684 observations, across 7,464 persons and 323 local authorities in England and Wales, for the whole 2003-2008 period (excluding 2004, as was mentioned above).

¹¹ The job claimant rate for each LAD and year is available from the Office for National Statistics (see <https://www.nomisweb.co.uk/>). Total crime is also available from the ONS and it is divided by LAD population.

¹² Descriptive statistics for all variables used in the following analysis are presented in Appendix Table A1.

3. Results

3.1 Baseline estimates

We start our analysis by estimating the baseline model for the three time periods: 2003-2008, 2003-2005 and 2006-2008. Estimates from two specifications for each period, the first without the migration-age interaction term and the second including it, are presented in Table 1.¹³ In all periods, we find an insignificant coefficient for the migrant inflow rate in the specification without the interaction term (left panel of Table 1). This holds for both the pooled OLS and individual fixed effects versions of the model. Thus, on average, there is no significant relationship between local migrant inflows and the life satisfaction of UK nationals.

Table 1: Migrant inflows and life satisfaction – OLS estimates

Baseline model without age interaction term			Baseline model with age interaction term		
	Pooled OLS	Fixed effects		Pooled OLS	Fixed effects
2003-2008					
Migrant inflow rate	2.752	-2.575	Migrant inflow rate	17.173**	20.845***
			Migrant inflow rate*Age	-0.309*	-0.496***
Number of observations	28,684	28,684	Number of observations	28,684	28,684
2003-2005					
Migrant inflow rate	0.021	0.372	Migrant inflow rate	23.292**	23.788**
			Migrant inflow rate*Age	-0.486**	-0.493***
Number of observations	11,792	11,792	Number of observations	11,792	11,792
2006-2008					
Migrant inflow rate	6.740	-0.280	Migrant inflow rate	3.723	16.924
			Migrant inflow rate*Age	0.066	-0.395
Number of observations	16,892	16,892	Number of observations	16,892	16,892

Source: BHPS 2003-2008 and authors' calculations.

Notes: All models include controls for: LAD job claimant rate, LAD crime rate, whether changed LAD since previous year, gender (only in pooled OLS models), age group, log of household monthly income, labour marker status, subjective general health status, marital status, number of children, household size, housing tenure, highest education level attained, as well as region and year dummies. *** Significant at 0.01, ** at 0.05, * at 0.1. Standard errors (not reported) clustered at the person level.

A different picture emerges when the interaction term between the migrant inflow rate and age is included in the model (right panel of Table 1). For the whole period of 2003-2008, the coefficient of the migrant inflow rate is positive and the interaction term is negative (both are statistically significant). Accounting for individual fixed effects strengthens the estimated

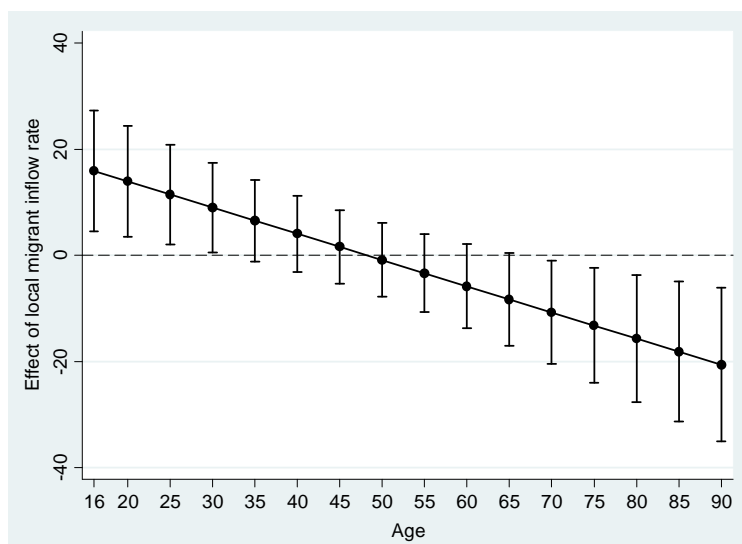
¹³ Only the estimates for the coefficients of interest are reported. Full results are available from the authors on request.

relationship: both coefficients increase in absolute value and become significant at the 0.01 level.

A positive coefficient of the migrant inflow rate and a negative for the interaction term imply that young people become more satisfied with life as immigration increases in their local authority, while old people become less satisfied; the age at which the effect of immigration on life satisfaction turns from positive to negative is 42 years. Estimating the model for the two time periods reveals that this finding is driven by the initial 2004-2005 ‘migration shock’ (the coefficients of interest are insignificant for 2006-2008). This makes intuitive sense, since a large change in migration, like the one that took place between 2003 and 2005, is generally needed for an effect to be more accurately identified.

Figure 2 plots the estimated coefficients, along with their 90% confidence intervals, of the migrant inflow rate as a function of age. Notably, for people between their early 30s and late 60s, the confidence interval of the migration inflow rate coefficient includes 0. Hence, local migration inflows are a significant determinant of life satisfaction only for relatively young and relatively old people.

Figure 2. The effect of migration on life satisfaction, by age, 2003-2005



Source: BHPS 2003-2005 and authors' calculations.

Notes: Vertical lines represent 90% confidence intervals. Coefficients and confidence intervals derived from the fixed effects model for 2003-2005 (Table 1, right panel).

To get an idea of the size of the effects, we use the estimates of the different age coefficients reported in Figure 2 for some additional calculations. For a 20-year old UK native living in England or Wales in 2005, an increase in the migrant inflow rate in her local authority from zero to the maximum value observed in the data (5.65%) led to an *increase* in life satisfaction equal to 0.65 of its standard deviation, *ceteris paribus*. A similar migrant inflow led to a *decrease* of half a standard deviation in life satisfaction for a 70-year old, *ceteris paribus*. These are substantial effects. For comparison purposes, consider the impact of one of the strongest (statistically and substantially) predictors of life satisfaction in our estimated equation – the subjective general health status of individuals. Based on our results, a person experiencing a deterioration of health from “excellent” (the highest health category) to “very poor” (the lowest health category) is estimated to expect a reduction of around 0.60 standard deviations in her well-being, *ceteris paribus*.

3.2 Robustness checks

The absence of LAD dummies in our baseline model means that time-invariant LAD level factors are not controlled for (we noted above, however, that the more aggregated region dummies are included in all estimations). If people in our sample move to different local authorities between periods, the estimated coefficient of the migrant inflow rate will be biased if time-invariant LAD characteristics that affect life satisfaction are also correlated with migrant inflow rates. Hence, as a first robustness check, we estimate our model (with the interaction term) on a sample restricted to people who do not move between local authorities. The results remain qualitatively unchanged: for 2003-2005, the migration inflow rate is positive and significant and the interaction term is negative and significant; for 2006-2008, the coefficients of the variables of interest are statistically insignificant (Column 1 of Table 2).

Table 2. Robustness checks, fixed effects estimates

		(1)	(2)	(3)
		Non-movers	Average life satisfaction (2000-2003)	Psychological health (GHQ)
2003-2005	Migrant inflow rate	23.568**	16.854*	-62.800
	Migrant inflow rate*Age	-0.516***	-0.415**	0.846
	Number of observations	11,506	11,792	11,708
2006-2008	Migrant inflow rate	-21.071		30.851
	Migrant inflow rate*Age	0.516		-2.253
	Number of observations	15,901		16,777

Source: BHPS 2003-2008 and authors' calculations.

Notes: All models include the same controls as reported in notes of Table 1. The non-movers specification excludes respondents who moved to a different LAD (3% of the sample), hence also excludes controls for region and whether changed LAD since previous year. *** Significant at 0.01, ** at 0.05, * at 0.1. Standard errors (not reported) clustered at the individual level.

Second, we estimate a variant of the individual fixed effects regression for 2003-2005 where each person's level of life satisfaction in 2003 is replaced with the average life satisfaction for 2000-2003¹⁴ (Column 2 of Table 2). We do this to ensure that our results are not driven by the way life satisfaction data were reported and recorded in a particular year (2003). The findings point in the same direction – the estimated effect of the local immigration rate on life satisfaction turns from positive to negative as age increases – although the magnitude of the two estimated coefficients falls.

Third, we have used an alternative measure to capture subjective well-being – an index of psychological health, derived from the General Health Questionnaire (GHQ).¹⁵ The results suggest that, in both periods, local migrant inflows are not significantly related with psychological health (Column 3 of Table 2). A plausible explanation is that life satisfaction and the GHQ index are not comparable measures. The GHQ index is closely related to mental health issues, while life satisfaction is a broader measure of individual well-being. A question, however, remains: through what channels does immigration affect life satisfaction? The next section addresses this question.

¹⁴ 2001 is omitted since the life satisfaction question was not asked in that year.

¹⁵ The GHQ in BHPS has 12 question items with possible answers ranging from 0 to 3, each corresponding to (increasing) frequencies of feelings related to psychological health. Hence, the final measure ranges from 0 to 36, with higher values corresponding to worse health. We reverse the measure so that it increases in good health. See Dawson et al. (2015) for a more in depth discussion of health and well-being measures in the BHPS.

3.3 Satisfaction with different life domains

The BHPS asks respondents to record their level of satisfaction with eight life domains: health, income, house/flat, partner, job, social life, amount of leisure and use of leisure. Results of the fixed effects models explaining the effect of immigration on these life domains are reported in Table 3; the models are estimated for the two time periods without and with the age-migration interaction term (specifications A and B, respectively).

The results suggest that the A8 immigration increased satisfaction with dwelling in both time periods and satisfaction with partner in 2003-2005. The 2006-2008 specification with the interaction term for social life would also indicate that immigration increased satisfaction with this life domain. These findings do not depend on age: when the migration-age interaction term is included in the model, it is always insignificant.

Table 3. Migrant inflows and satisfaction with different life domains, fixed effects estimates

		Satisfaction with health	Satisfaction with income	Satisfaction with house/flat	Satisfaction with partner
2003-2005	A. Migrant inflow rate	2.607	3.417	12.104**	8.967*
	B. Migrant inflow rate	7.014	6.315	19.072	18.836
	Migrant inflow rate*age	-0.093	-0.061	-0.147	-0.211
	<i>Number of observations</i>	11,758	11,753	11,736	8,844
2006-2008	A. Migrant inflow rate	4.448	-7.408	21.488*	-17.305
	B. Migrant inflow rate	-21.715	-34.404	53.518*	-17.393
	Migrant inflow rate*age	0.602	0.621	-0.737	0.002
	<i>Number of observations</i>	16,864	16,843	16,838	12,664
		Satisfaction with job	Satisfaction with social life	Satisfaction with amount of leisure	Satisfaction with use of leisure
2003-2005	A. Migrant inflow rate	4.547	0.783	5.943	6.294
	B. Migrant inflow rate	-6.871	15.967	7.153	10.428
	Migrant inflow rate*Age	0.272	-0.320	-0.026	-0.087
	<i>Number of observations</i>	7,148	11,784	11,773	11,778
2006-2008	A. Migrant inflow rate	-16.458	13.103	4.995	-2.089
	B. Migrant inflow rate	36.029	43.717*	11,604	19.396
	Migrant inflow rate*Age	-1.384	-0.704	-0.152	-0.494
	<i>Number of observations</i>	10,170	16,845	16,862	16,849

Source: BHPS 2003-2008 and authors' calculations.

Notes: All models include the same controls as reported in notes of Table 1. The "satisfaction with job" model is estimated for employed people only. *** Significant at 0.01, ** at 0.05, * at 0.1. Standard errors (not reported) clustered at the person level.

4. Discussion and conclusion

The 2004 European Union enlargement triggered an unprecedented wave of 1.5 million Eastern European workers to the UK. While the evidence shows that this massive migrant inflow had a very modest impact on the UK labour market, its wider effects on the UK population are still underexplored. In this paper, we went beyond the standard labour-market effects of migration and explored how A8 migration affected life satisfaction of the UK residents.

Combining data from the British Household Panel Survey with the administrative, local authority level information on A8 migrant inflows, we related the changes in individual life satisfaction with the intensity of local-level immigration. The results of the estimations, which account for unobserved individual heterogeneity and time-varying local-level characteristics, suggested that more intense local-level immigration increased life satisfaction of people younger than 30, did not change life satisfaction of people aged 30-65, and decreased life satisfaction of people older than 65. This effect was pronounced in the ‘migration shock’ period – the first two years after the UK opened its labour market to the new Europeans – and became statistically insignificant in the longer term. We also found that, regardless of age, immigration increased satisfaction with dwelling (both during the ‘migration shock’ and in the longer term), spouse/partner (during the ‘migration shock’ period) and social life (in the longer term).

How can one explain these results? A positive effect of immigration on life satisfaction for the very young could imply that young people do not consider East Europeans as competitors in the labour market, which is consistent with the evidence that the post-enlargement immigration did not have adverse effects on the UK wages and unemployment (Gilpin et al., 2006; Lemos and Portes, 2013; Lemos, 2014). It is also possible that very young people are in favour of diversity brought about by immigration. For people in the middle of the age distribution, any positive ethnic diversity effect might be offset by the pressure that immigrants put on public services, in particular local schools; hence, an insignificant effect of immigration on life satisfaction is found for this age group. People older than 65 might be particularly opposed to diversity and change, as well as be concerned by the pressure immigrants put on local health services; this could explain why they become less life-satisfied when larger immigrant inflows take place. Overall, the age group differences corroborate a finding from the literature on attitudes towards immigration that old people are more opposed to immigration than young people (Mayda, 2006; Facchini and Mayda, 2008; Malcow-Moller, 2008).¹⁶ It is thus likely that people’s attitudes towards immigration, possibly strengthened by actual encounters with immigrants, feed into life satisfaction.

¹⁶ Unfortunately, the BHPS does not contain information on individual attitudes towards immigration and we are unable to test whether the negative relationship between age and pro-immigration attitudes holds in our case.

Turning to life satisfaction domains, a positive effect of immigration on satisfaction with dwelling – both during the initial ‘migration shock’ period and in the longer term – can be explained by the migration-induced supply of cheap household services.¹⁷ Another explanation is that migrants settle, at least initially, in lower-quality accommodation than natives, which increases natives’ *relative* position and satisfaction in terms of residing in more attractive housing.¹⁸ Overall, this finding supports similar results reported by Akay et al. (2014), who also show that immigration increases satisfaction with dwelling in Germany.

If migrants increase the supply of cheap household services, which may explain the positive effect of immigration on natives’ satisfaction with dwelling, the delegation of domestic tasks to migrants may also leave natives with more time to spend with their spouses and partners. This could be behind the positive relationship between immigration and satisfaction with spouse/partner. Finally, a positive relationship between migrant inflows and satisfaction with social life could be a result of cultural enrichment brought along by immigrants or the decrease in prices of goods and services that people consume when they socialise (e.g. cafés and restaurants). This relationship, however, is observed only in 2006-2008. It is possible that migrants start affecting social life (via cultural enrichment or lower prices) only when they become more embedded in local communities.

Would migration-induced changes in satisfaction with different life domains help explain changes in overall life satisfaction? This could be claimed for very young people, whose overall life satisfaction, as well as satisfaction with dwelling and satisfaction with spouse/partner, increased with immigration – at least in the initial ‘migration shock’ period. A more counterintuitive result is obtained for people aged 65 and over: immigration increased their satisfaction with dwelling and partner but decreased life satisfaction overall. It is possible that overall life satisfaction depends on a broader range of factors than satisfaction with different life domains. As mentioned earlier, one factor potentially feeding into overall life satisfaction could be attitudes towards immigration.

¹⁷ Cortes (2008) shows that low-skilled immigration reduces prices of immigrant-intensive services, such as housekeeping and gardening.

¹⁸ A different explanation for this finding can be that higher local level migration may increase house prices (due to increased demand), hence the satisfaction with their housing of local house owners. However, evidence suggests that immigration in the UK, including immigration from A8 countries, has actually led to a reduction in house prices (Sá, 2015).

The results of our paper suggest that the effects of immigration on receiving populations should not be confined to the labour markets. The subjective well-being of particular groups, such as the elderly, may be negatively affected. This may have implications for the formation of the immigration policy in most developed immigration-receiving countries, where populations are aging and older people are generally more likely to vote (see, e.g., Melo and Stockemer, 2014). In the absence of any adverse effects of A8 immigration on the UK labour market, the recent rise of the far-right UKIP party and the determination of the ruling Conservative party to renegotiate the EU internal mobility rules could well be explained by the negative effect of A8 immigration on life satisfaction of older people in the UK.

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APPENDIX TABLE A1: Descriptive Statistics

Variable	Mean	St. dev.	Min	Max
Life satisfaction	5.2191	1.2031	1	7
LAD level variables				
Migrant inflow rate	0.0024	0.0028	0	0.0565
Job claimant rate	2.2221	1.0715	0.4	6.5
Crime rate	0.0946	0.0362	0.0205	0.3758
Individual level variables				
<i>Age variables</i>				
Age	47.0174	18.2606	16	99
Age 15-19	0.0496			
Age 20-24	0.0712			
Age 25-29	0.0781			
Age 30-34	0.0880			
Age 35-39	0.0948			
Age 40-44	0.1019			
Age 45-49	0.0952			
Age 50-54	0.0773			
Age 55-59	0.0802			
Age 60-64	0.0734			
Age 65-69	0.0537			
Age 70-74	0.0464			
Age 75-79	0.0406			
Age 80-84	0.0299			
Age 85+	0.0198			
Female	0.5412			
Log monthly household income (in 2005 prices)	7.7565	1.0258	-6.9893	11.2887
<i>Labour market status</i>				
Employed	0.6121			
Unemployed	0.0265			
Inactive	0.3614			
<i>Subjective general health status</i>				
Excellent	0.2218			
Good	0.4869			
Fair	0.2097			
Poor	0.0656			
Very poor	0.0161			
<i>Marital status & household characteristics</i>				
Married or Cohabiting	0.6838			
Widowed, Divorced or Separated	0.1324			

	Never Married	0.1838			
	Number of children in household	0.4883	0.8901	0	7
	Household Size	2.7921	1.2899	1	10
<i>Housing tenure</i>					
	Outright House Owner	0.3135			
	House Owner with Mortgage	0.4733			
	Rented House	0.0827			
	Social Housing	0.1305			
<i>Education</i>					
	Degree	0.1444			
	Further Education	0.3333			
	A Levels	0.1244			
	O Levels	0.1618			
	Other Qualifications	0.0751			
	No Qualifications	0.1610			
<i>Year</i>					
	2003	0.2202			
	2005	0.1909			
	2006	0.2005			
	2007	0.1973			
	2008	0.1911			
Additional variables					
	GHQ – Psychological health	24.7976	5.4660	0	36
	Satisfaction with health	4.9486	1.4823	1	7
	Satisfaction with income of household	4.6268	1.4834	1	7
	Satisfaction with house/flat	5.4187	1.3352	1	7
	Satisfaction with partner	6.1947	1.1685	1	7
	Satisfaction with job	5.0021	1.3692	1	7
	Satisfaction with social life	4.8777	1.3992	1	7
	Satisfaction with amount of leisure	4.8105	1.5474	1	7
	Satisfaction with use of leisure	4.8604	1.4436	1	7
<hr/>					
	Number of person-year observations	28,684			
	Number of persons	7,464			
<hr/>					

Source: BHPS 2003-2008 and authors' calculations.

Notes: Full descriptive statistics for continuous and satisfaction variables, only sample means reported for dummy variables.