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Immigration and self-reported well-being in the UK

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Abstract

By exploiting spatial and temporal variation in the number of foreign-born individuals across neighbourhoods, we examine the relationship between immigration and individual's self-reported well-being. Looking at the population level, we observed no significant overall relationship between inflows of foreign-born individuals and subjective well-being. Focusing on 'average' main effects masks significant heterogeneity however, with relatively older people, the unemployed, and those in the lowest quartile of household income, undergoing some substantive well-being losses. We note that this is congruent with voting patterns evident in the recent UK referendum on EU membership. Strengthening the causal interpretation of our results, our fixed-effects regression results were robust to the traditional 'shift-share' instrumental variable approach, whereby we instrument our measure relating to numbers of foreign-born individuals living in local areas with an exogenous predicted value based on prior settlement patterns. Our findings suggest that perceived labour market competition and perceptions surrounding the importance of national identity may be two of the channels through which immigration can adversely affect the subjective well-being of certain groups in society.

Keywords: Immigration; subjective well-being; UK; Brexit
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1. Introduction

Following the 2004 enlargement of the European Union, the UK experienced a large influx of migrants from new EU member states (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia – also known as the accession or A8 countries). The effect of this influx of new migrants on the UK economy has been the subject of intense political debate, and was one of the dominant issues in the recent UK referendum on EU membership. Yet much of the research that has been done in this area suggests that immigration has had few, if any, negative effects on the economic outcomes of natives (Gilpin et al. 2006; Lemos and Portes 2013; Lemos 2014). This finding is mirrored in studies outside the UK (Card, 1990; Card, 2005; Borjas, 1995, 2001, 2005; Carrington and Lima, 1996; Dustmann et al., Fable; Ottaviano and Peri, 2012; Mancorda et al., 2007; Glitz, 2012).

In public discourse, immigration is also often associated with increased burdens on taxpayers through rising health care costs and demand for social services. Again, the available evidence suggests that immigrants are typically younger and healthier, and in turn more likely to be at work (hence less likely to access social services) than the native UK population. In effect, it is likely that they not only pay their own way, but also partly subsidise the costs of public services for others (Dustmann et al., 2010).

Such findings, coupled with increasing worries over immigration expressed by many during the recent EU referendum campaign in the UK, leads us to question if there are other pathways by which inflows of foreign-born individuals affects the welfare of individuals already living in the host communities. Rather than looking at objective measures of welfare such as employment outcomes, wages etc., we therefore examine the relationship between inflows of foreign-born individuals into

local areas and subjective well-being. To date, relatively little research has focused on the specific relationship between immigration and self-reported, as opposed to objective indicators of wellbeing. Exceptions to this include Betz and Simpson (2013) who, using a cross sectional analysis, analysed the effects of aggregate immigration flows on the subjective well-being of native born populations, and found a positive correlation between immigration and subjective well-being in 26 countries over the period 2002 to 2010. Focusing specifically on the UK, Longhi (2014) also using a cross sectional analysis found that white British people living in diverse areas have, on average, lower levels of life satisfaction than those living in areas where diversity is low. In another UK study, but this time focused on a relatively short time period, namely 2003-2008 (immediately before and after the 2004 EU enlargement), Ivlevs and Veliziotis (2017) observed a negative association between inflows of migrants from the A8 accession countries and self-reported life satisfaction for certain groups, namely the elderly and those on relatively lower incomes.

In contrast to these UK studies, Akay et al. (2014; 2017) using the German Socio-Economic Panel report a positive relationship between both immigration and ethnic diversity respectively with subjective well-being. One advantage of the work by Akay et al. relative to much of the existing literature in this area is its longitudinal, as opposed to cross sectional, nature. Our proposed study adopts a similar methodology to these studies, which used the German Socio-economic Panel, but is focused on the UK context. We suggest that there are many reasons to expect that the positive relationship observed in Germany between immigration and well-being, may not be the same as what would be observed in other countries, such as in the UK. For example, the composition of migrants in both countries in terms of skill levels and origins are quite dissimilar (see Giulietti, 2017 for a discussion of this issue). Furthermore, the rate of change and overall numbers of foreign-born individuals are different across both countries, and these contextual differences may translate into different well-being effects.

Our analytical approach involves linking data from the British Household Panel Survey (BHPS) and the UK Household Longitudinal Study (UKHLS) (comprehensive longitudinal household surveys recording individual well-being) with data pertaining to annual numbers of foreign-born individuals living in each local authority area available from the Office for National Statistics. To help us identify the effect of changes in inflows of foreign-born individuals on subjective well-being, we first take advantage of the panel nature of our dataset by employing individual and regional fixed-effects. Furthermore, in order to at least partly mitigate any bias resulting from time-variant unobserved heterogeneity at the local authority level, we merge our household survey datasets (BHPS and UKHLS) with the English Indices of Multiple Deprivation. Linking our datasets with the English Indices of Multiple Deprivation enables us to add a neighbourhood-level deprivation measure to our econometric analysis, thereby helping us control for differences in economic and social conditions across local authority areas.

Notwithstanding our use of fixed-effects and the broad array of individual and neighbourhood level control variables, our regression estimates may still be affected, at least to some degree, by endogeneity issues, such as sorting decisions of individuals into areas with higher or lower levels of immigration based on further unobservable local-area characteristics. We adopt the traditional 'shift-share' instrumental variable approach as a means to account for any remaining endogeneity bias. With this approach, we instrument actual numbers of migrants with an exogenous predicted value based on prior settlement patterns. This approach exploits the fact that prior settlement patterns of migrants have a strong predictive effect on the location choice of future migrants and has been widely used in the recent literature relating to the broader economic impact of immigration (Card and DiNardo, 2000; Bell et al., 2013).

Looking at the population as a whole, we find no evidence to suggest that increases in the inflows of foreign-born individuals materially affects subjective well-being. We do, however, find that focusing

on population-level differences would mask notable heterogeneity in this relationship, as certain groups do appear to undergo some well-being losses. These groups include relatively older individuals (60+), the unemployed and those in the lowest income quartile. On the other hand, we find some evidence to suggest that individuals in the highest income quartile as well as people born outside the UK may have experienced some well-being gains in response to rising inflows of foreign-born individuals into their local area. We note that there is a significant degree of congruence, therefore, between these well-being differentials across socio-demographic groups, and voting patterns (e.g. see Ipsos 2016) observed in the recent UK referendum on EU membership (commonly referred to as Brexit). We cautiously suggest therefore, that adverse subjective well-being effects associated with rising inflows of foreign-born individuals may have been one of the driving forces behind the decision of the UK to leave the EU.

We posit that one potential channel through which rising inflows of foreign-born individuals within the UK may negatively affect the subjective well-being of certain groups is through perceptions surrounding labour market outcomes. Put differently, we suggest that while recent research would indicate that inflows of foreign-born individuals into the UK has had little, if any, negative effect on the employment outcomes of native workers, subjective perceptions may be very different. In support of this proposition, we find that in contrast to their more job satisfied counterparts, those relatively dissatisfied with their job experience significant well-being losses in response to rising inflows of foreign-born individuals. One potential explanation is that when dissatisfied with their job, individuals may feel that this is partly the result of 'perceived' high numbers of foreign-born individuals. Another potential pathway through which rising numbers of foreign-born individuals may diminish well-being for certain groups relates to attachment to a national identity. We find that individuals who place relatively more importance on 'being British' experience a more substantive reduction in their self-reported well-being in response to rising inflows of foreign-born individuals. One plausible explanation here is that attachment to nation-state fosters well-being, and that rising

inflows of migrants for some people may diminish their attachment to Britain as their nation-state or sense of what it is to be British.

2. Data

Our study uses information from two longitudinal British surveys, namely the British Household Panel Survey (BHPS) and its successor, the UK household longitudinal Survey (UKHLS). These surveys collect, on an annual basis, information relating to individual's subjective well-being, together with numerous other individual characteristics. The BHPS started in 1991 with a sample of around 10,000 individuals in the UK and was collected annually up until 2008. It was replaced by the UKHLS in 2008 which is still ongoing. The UKHLS collects information from approximately 50,000 individuals. Fortunately, many of the same questions were used and the same individuals surveyed in the UKHLS, as in the BHPS. This allows us to construct a panel dataset covering 24 years (i.e. from 1991 up until 2015). We restrict our analysis to the period 2000 until 2015, as the year 2000 was the earliest date in which we have annual data relating to numbers of *foreign-born individuals* living in local authority areas in England, and 2015 is the last year where we have survey data available.

The indicator of subjective well-being we use as our key outcome variable is the General Health Questionnaire (GHQ) which consists of a 12 item scale designed to assess somatic symptoms, anxiety and insomnia, social dysfunction and general happiness. It is probably the most common indicator of mental well-being used in the literature to date (Goldberg et al., 1997; Jackson, 2007) and it has been used in the economics literature to investigate the impact of severe events on distress (see e.g., Metcalfe et al., 2011). It consists of a 12 item scale and some examples of the types of statements include: 'Have you recently felt unhappy or depressed, 'Have you recently lost much sleep over worry?'; and 'Have you recently been able to enjoy your normal day-to-day activities?' Each item is accompanied by four possible responses: two of the answers are positive and two are negative. A score ranging from 0 (best mental well-being) to 36 (worst mental well-being) is

computed for each individual in the survey – the higher the score then the more likely it is that respondents are suffering from some form of psychological distress. For simplicity, we reorder this variable so that individuals are scored from 0 (worst) to 36 (best), and label this variable as subjective well-being.

Our analytical approach involves spatially linking the geo-referenced household survey datasets (BHPS and UKHLS) recording individuals reported subjective well-being (as well as the usual socio-demographic and socio-economic controls) with detailed information available from the Office for National Statistics, relating to information on numbers of foreign-born individuals living in each local authority area.[1] In other words, for all individuals in our sample, we have a measure of their self-reported subjective well-being, which is collected in each wave of our combined BHPS and UKHLS dataset. Through a special license application, we have a variable which records a relatively precise geographic identifier, i.e. which local authority district each individual in our sample resides in.[2] Using this geographic identifier, we then link our longitudinal household survey datasets with information from the Office for National Statistics (ONS), relating to estimated numbers of foreign-born individuals living in each local authority district. The ONS bases these estimates on the UK Annual Population Survey which is the largest survey in the UK consisting of 320,000 respondents. Like our household surveys recording individual well-being, this information from the ONS is available on an annual basis. The end result of this data linkage is that we can relate changes in individuals' well-being, to estimated changes in the numbers of foreign-born individuals living in their local area.

Of course any raw correlation between numbers of foreign-born individuals and subjective well-being will likely be biased by unobserved characteristics of the individual and/or the local area. To

[1] Foreign-born individuals are simply defined by the ONS as individuals who were born outside the United Kingdom.
[2] In England there are 328 local authorities.

help mitigate this possibility, we take advantage of the longitudinal nature of our dataset, by employing both individual and regional fixed-effects.[3] Even with fixed-effects, it is still possible, if not likely, that any estimates relating to the relationship between changes in the numbers of foreign-born individuals living in local areas and subjective well-being could be biased by time varying confounding factors, such as neighbourhood deprivation. For example, areas with the highest levels of immigration may be the most prosperous, and this type of selection bias could lead us to misstate the relationship between numbers of foreign-born individuals and subjective well-being.

In order to mitigate this concern, we merged our household survey datasets with the English Indices of Multiple Deprivation provided by the Department for Communities and Local Government.[4] These Indices of Multiple Deprivation rank each neighbourhood in England according to seven distinct measures of deprivation. The specific deprivation rankings include Income; Employment; Health and Disability; Education, Skills and Training; Crime; Barriers to Housing and Services; and Living Environment. In addition to these specific rankings, the Department for Communities and Local Government publish an amalgamated measure reflecting the overall level of deprivation in each neighbourhood. We include this amalgamated deprivation ranking as a control variable in order to at least partly control for any differences in the economic and social conditions across local authority areas.[5] These indices are published at regular intervals, i.e. 2002, 2005, 2008 and 2013.[6] We extrapolate and interpolate across these intervals to obtain a measure of neighbourhood deprivation for each year of our analysis.

[3] They are 9 regions in England (12 in the UK as a whole) and they define areas (constituencies) for the purposes of elections to the European Parliament and Eurostat also uses them as Territorial units for statistical purposes. The 9 regions in England are South East, London, North West, East of England, West Midlands, South West, Yorkshire and the Humber, East Midlands, North East.

[4] See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464597/English_Indices_of_Deprivation_2015_-_Research_Report.pdf for more details

[5] Results are robust to different combinations of these neighbourhood level control variables

[6] The indices are published in 2004, 2007, 2010 and 2015. However they typically capture information from neighbourhoods in 2002, 2005, 2008 and 2013. In addition to a relative ranking across neighbourhoods the DECLG also publish scores for each neighbourhood but these scores in contrast to the ranks are not directly comparable over time, and so are not used in the analysis.

We also include a detailed set of individual controls. These controls include socio-demographic variables such as age, household income, gender, education, relationship status and labour force status (see table A1 in the appendix for relevant summary statistics). Additionally, in order to control for any macro and period-specific changes not already captured by our individual and regional fixed-effects, we added in wave dummies and a measure of annual GDP growth.[7] Lastly, to account for any potential heteroscedasticity or serial correlation, we used cluster robust standard errors (clustered at the individual level).

3. Empirical Specification

The analysis begins by assuming that subjective well-being of individual *i* living in local authority *l* at time *t* (W_{ilt}) is explained by a vector of socio-economic and demographic characteristics (X_{it}) (including labour force status), neighbourhood deprivation (ND_{lt}), annual GDP growth at the national level (GDP_t) and number of foreign-born individuals living in each local authority area (FB_{lt}). This yields the following explanatory model where a_i is the individual fixed effect and *v* and *r* are a set of wave and regional dummies:

$$W_{ilt} = \beta_0 + \beta_1 X_{it} + \beta_2 ND_{lt} + \beta_3 GDP_t + \beta_4 FB_{lt} + + a_i + v_t + r + \varepsilon_{ilt} \quad (1)$$

The aim of this fixed-effects analysis is to give us an initial understanding of the overall relationship between changes in the numbers of foreign-born individuals living in each local authority area and the subjective well-being of individuals already living in those areas. Next, we explore if there is any heterogeneity in this relationship, by estimating the equation above for different sub-groups of the population, depending on their age, gender, education, income, and employment status.

[7] Interviews span over two and in some cases three years, so GDP controls for calendar year variations.

It is worth noting that our use of fixed-effects will account for any unobserved heterogeneity that is time-invariant at the individual or regional level. Macroeconomic conditions are accounted for by including annual GDP growth; other general trends and factors common to our sample of respondents are also captured by our wave dummies (*v*). Furthermore, we control for a wide array of both individual level controls, and neighbourhood deprivation, which helps us account for any time-variant sources of heterogeneity. Still it is possible that our regression estimates are affected to some degree by endogeneity issues such as measurement error as the ONS data relating to numbers of foreign-born individuals in each local authority area are estimates based on annual population surveys. Furthermore, even with the comprehensive set of controls and the use of fixed-effects, there may still be some remaining endogeneity (sorting) bias. For example, as the inflows of foreign-born individuals increase, relatively unhappy individuals might decide to move to a region with a lower one, or migrants themselves might decide to move to areas with greater proportions of individuals with relatively high levels of subjective well-being (see, Akay et al., 2014; 2017 for a discussion of these issues).

One mechanism to account for these endogeneity concerns would be to adopt an instrumental variables approach. Fortunately, the recent literature relating to the broader economic impact of immigration provides us with some guidance relating to what we could use as suitable instrumental variables. Specifically, we rely on an instrumental variable strategy based on past settlement patterns first developed by Card and DiNardo (2000) and Card (2001) and subsequently used in the immigration literature by, for example, Bianchi et al. (2012), Braakmann (2016), Card (2009), Cortes (2008), Gonzalez and Ortega (2013), Hunt (2012), Ottaviano and Peri (2006) and Saiz (2006). Focusing specifically on the UK context, Bell et al. (2013), Sa (2011) and Giuntella et al. (2016) have recently employed this instrumental variable approach to examine the impact of immigration on crime, house prices and work injury respectively. To implement this approach in our study, first we obtain data relating to the concentration of migrants in each local authority area from the 2001 and

2011 Censuses. Next we use this information to obtain the 'predicted' level of migrants in each local authority area to use as an instrument for the actual number of migrants (foreign-born individuals).

The predicted number of migrants in each local authority area is obtained by simply redistributing the total numbers of migrants across local authority areas, based on prior settlement patterns, i.e. the migrant share evident from the 2001 and 2011 censuses respectively.[8] The rationale for such an instrument is that incoming migrants will tend to locate in areas with higher densities of migrants and therefore prior settlement patterns will help predict future inflows into each local authority area. One potential threat to the validity of this instrument is if local economic shocks which initially attracted migrants persist over time as these may be correlated with individual well-being. This potential problem is substantially mitigated in our analysis by including fixed effects as well as wave dummies (which will account for any trends) a measure of national GDP and time-varying local controls such as neighbourhood deprivation.

4. Results

4.1 Changes in aggregate numbers of foreign-born individuals

As can be seen in figure 1, there has been a substantive increase in the numbers of foreign-born individuals living in the UK. The number has almost doubled in the 15 years covered by our study, from 4.4 million in 2000 to 8.6 million in 2015, with an average growth of 5% per annum. More than 90% of these foreign-born individuals settled in England as opposed to Scotland or Wales. There is a great deal of variation across local authorities over this period with the largest number of foreign-born individuals recorded at the local authority level amounting to 239,000 and the lowest rounded up to 1,000. In the next section, by exploiting spatial and temporal variation across local authority

[8] For years pre 2011 we redistribute the total number of migrants based on the 2001 census figures (we use actual ONS values for 2000 and actual census values for 2001). For years post 2011 we redistribute based on the figures obtained from the 2011 census (and use actual census values for 2011).

areas, we examine if the observed increases in the number of foreign-born individuals are associated with any subjective well-being effects.

Insert figure 1 here

4.2 Main effects

Table 1 presents the main effect estimates for the full sample population in England between 2000 and 2015.[9] The information on whether the individuals in the survey are born in or outside the UK is only available for the UKHLS (i.e., after 2008) and not for the BHPS sample, so for most of the analysis we do not make any distinction between natives and non-natives.[10] The results relating to our control variables are all along expected lines and are reported in table A1 in the Appendix and so for parsimony are not discussed (see Dolan et al. 2008). The first specification outlines the results from a pooled cross sectional model, whereas in the second column we take advantage of the panel nature of the dataset by using fixed-effects. The key explanatory variable of interest is *foreign-born individuals* (measured in ten thousands). This captures the relationship between changes in the numbers of people born outside the UK within each local authority area, and the subjective well-being of individuals already living in those areas. These models include a full set of individual characteristics (including labour force status), national GDP, wave fixed effects, local authority deprivation rank, and regional fixed effects.

In our pooled cross sectional model, *foreign-born individuals* attracts a positive coefficient (0.003, p-value=0.6) but is not statistically significant at conventional levels. For specification two, we take advantage of the panel nature of our dataset by employing fixed-effects. This time *foreign-born individuals* attracts a negative coefficient (-0.009, p-value=0.5) but again one that is not statistically significant. One potential explanation for the difference between our pooled cross sectional and fixed-effects specifications is that immigrants are relatively more likely to locate in prosperous areas,

[9] We focus on England as opposed to the UK as one of our key control variable – Indices of Multiple Deprivation – are only available for Local Authority Districts in England. The sample excludes people aged 18 or less.

[10] Results from separate regressions on natives vs non-natives are presented when analysing subgroups.

and these differences are picked up by our fixed effects, but not adequately controlled for in the pooled cross sectional model.

Insert table 1 here

4.3 Heterogeneity across groups

Next, using our fixed-effects model specification, we examined if there was any heterogeneity in the relationship between our key explanatory variable *foreign-born individuals* and subjective well-being. The dimensions that we explored were standard socio-demographic traits such as age, income, gender and education. We suggest that attitudes towards immigration may vary significantly along socio-demographic lines (either positively or negatively). We present the estimates of *foreign-born individuals* from this sub-group analysis in table 2.[11]

As illustrated in table 2, there is a significant degree of individual heterogeneity in the relationship between *foreign-born individuals* and subjective well-being. First looking at age, we can see that when the analysis is focused on those aged over 60, *foreign born individuals* attracts a negative and statistically significant coefficient (-0.057, p-value=0.05). A similar picture emerges when we just focus on the over 70s, only this time *foreign-born individuals* attracts a much larger negative coefficient (-0.137, p-value=0.001)[12]. This means the population-level effects outlined in table 2 masks significant age-group heterogeneity in the relationship between *foreign-born individuals* and subjective well-being.

Household income also appears to moderate the relationship between *foreign-born individuals* and subjective well-being. When looking at individuals in the lowest quartile of the household income distribution, we can see that *foreign-born individuals* is associated with a negative coefficient (-0.059), which is statistically significant at 5%. The estimated coefficient of individuals with below

[11] In order to assess whether the difference of coefficients from separate regressions is statistically different we employ the standard *z* statistics $Z = (b_1 - b_2)/\sqrt{(SEb_1)^2 - (SEb_2)^2}$, which is valid in large samples (Clogg et al., 1995 but see also Gelman and Stern, 2006).

[12] We computed the *z*-test and confirm that these coefficients are statistically different from that on 'age<60'.

median household income is still negative, but it is not precisely estimated. While not statistically significant it is perhaps worth noting that *foreign-born individuals* attracts a positive coefficient when looking at those in the top half or top quartile of household incomes[13]. Similarly to age, the analysis in relation to income therefore suggests that rising numbers of foreign-born individuals is associated with well-being losses for those with relatively low levels of household incomes, and these estimated effects become more pronounced and more precisely estimated as income falls.

Next we examine if education moderates the relationship between *foreign-born individuals* and subjective well-being. We do this by breaking the population into four different groups based on their educational qualifications. The first group consists of those with at least a University degree, the second consists of those with a secondary level qualification (in the UK system this is known as GCSE or A-levels) and the third group can be thought of a residual 'other' category. This third category captures individuals with an educational qualification of some description, but one that is unknown. The final group consists of individuals with no formal educational qualifications. *Foreign-born individuals* has a negative and statistically significant coefficient for the group of individuals without a formal educational qualification (-0.099, p-value=0.015), whereas we observe no statistically significant relationship for the other groups.[14] This analysis means that similar to age and income, education appears to moderate the relationship between *foreign-born individuals* and subjective well-being.

Table 2 also presents a comparison between those in full time employment and the unemployed. When we just focus on those in full time employment, we do not observe any significant relationship between *foreign-born individuals* and subjective well-being (-0.003, p-value=0.85). On the other hand, when we restrict our analysis to the unemployed, *foreign-born individuals* attracts a negative

[13] The difference of the estimated effects of *foreign-born individuals* between individuals in the lowest income quartile is statistically different from individuals with above median income (at 5% level).

[14] The *z* test confirms that the difference between the coefficient capturing individuals with no formal educational qualifications and the other educational groups is statistically significant at the 5% level.

and statistically significant coefficient (-0.141, p-value=0.085).[15] Next, we found no significant gender differences in the relationship between *foreign-born individuals* and subjective well-being.

Finally, we restrict our sample to the UKHLS survey to study whether *foreign-born individuals* has a differential impact on individuals well-being depending on whether they were born within or outside the UK. For this analysis, we exclude individuals interviewed before 2009 because there is no information related to their ethnic origins in the BHPS, whereas in all waves post 2008 (UKHLS) respondents were asked a question relating to their country of birth. Using responses to this question we can classify individuals into two groups depending on whether they were born in or outside the UK. For ease of writing we label these two groups as natives and non-natives. The coefficient for *foreign-born individuals* is negative and somewhat larger in size, but again is not statistically significant for natives (-0.023). On the other hand, we observe a positive and statistically significant coefficient for non-natives (0.065, p=0.078).[16] Therefore, notwithstanding our reliance on a relatively small time period for this sub-group analysis, it seems reasonable to suggest that our analysis provides at least some weak evidence that inflows of foreign-born individuals into local areas has positively enhanced the well-being of individuals born outside the UK.

Insert table 2 here

4.4 Communicating effect sizes

The analysis in the preceding section suggests that for certain sub-groups of the population, rising numbers of foreign-born individuals living in local areas has had a detrimental impact on subjective well-being. The question remains how large are these effects? One way to gain an understanding of this issue is to compare estimated effect sizes to that of other commonly observed negative correlates with subjective well-being. For illustration purposes, we select unemployment and divorce

[15] The difference between both coefficients is statistically significant at 5% level.
[16] Both coefficients are statistically different from each other.

as useful comparison metrics as they are two of the most commonly observed negative correlates with subjective well-being in the literature. We note, however, that the following interpretation needs to be taken cautiously as it is hard to compare effect sizes of personal characteristics with a contextual variable such as the number of foreign born individuals within a local authority area. We can see in the second column of table A2 that being divorced, as opposed to being single, is associated with a -0.42 unit reduction in subjective well-being, whereas unemployment as compared to paid employment is associated with a -1.63 unit reduction. This is in keeping with much previous research which suggests that unemployment alongside disability is associated with the largest reductions in subjective well-being, whereas the adverse well-being effects associated with divorce while still significant and substantive is typically more modest.

If we first look at the over 60s, we can see in table 2 that a one unit (10,000's) increase in *foreign-born individuals* is associated with a -0.057 reduction in subjective well-being. In other words, each ten thousand person increase in the numbers of foreign-born individuals in a local authority area is associated with a -0.057 unit reduction in the subjective well-being of individuals over 60. In 2000, the mean level of foreign-born individuals in local authority areas for respondents in our sample came to 16,845, whereas in 2015 the mean number had increased to 41,750. If we use this mean level change (24,906) as a reference point, we can see that such a change would translate into an average well-being loss of -0.14 units (2.49*-0.057) for the over 60s. This would be equivalent to 34 and 8.6 percent of the estimated well-being losses from divorce and unemployment for the population as a whole. If we look at the over 70s, the estimated well-being losses are more notable (-0.34 unit reduction) and are equivalent to 82 and 21 percent of the estimated well-being effects from divorce and unemployment respectively for the population as a whole. It is worth noting that an increase of 24,906 in the number of foreign-born individuals in a local authority area is by no means an extreme scenario, as 30% percent of the current UK population live in a local authority area which has experienced a change in excess of this during the sample period.

If we restrict our analysis to those in the lowest quartile of household income, the estimated well-being losses from an increase of 24,906 in the number of foreign-born individuals (-0.15 unit reduction) come to 36 and 9 percent of the estimated wellbeing losses from divorce and unemployment respectively for the population as a whole. For the unemployed, the estimated effects are somewhat larger (-0.35 unit reduction) which is equivalent to 84 and 21 percent of the estimated effects of divorce and unemployment.

To sum up, our analysis suggests that, for the population as a whole, increases in the inflows of foreign-born individuals at least at the levels experienced to date is unlikely to bring about significant changes, be it positive or negative for subjective well-being. That being said, there is significant individual heterogeneity in this relationship, meaning that our analysis suggests inflows of foreign-born individuals has brought about some significant well-being losses for certain groups, at least in areas with notable increases in the numbers of foreign-born individuals. The specific groups we identified include relatively older individuals, those in the lowest quartile when it comes to household income, the unemployed and finally those less than satisfied with their job. Moreover, apart from these estimated effects being significant, in a general sense they appear substantive, at least for certain groups.

4.5 Instrumental variable analysis and sensitivity checks

To address any concern that our fixed-effects estimates are affected by endogeneity bias we next adopted an instrumental variable approach. Specifically we instrumented *foreign-born individuals* with our 'shift-share' instrument, i.e. predicted numbers of migrants in each local authority area based on prior settlement patterns. Specification 3 in table 2 presents the results from this instrumental variable analysis.[17] This time *foreign-born individuals* attracts a somewhat larger negative coefficient (-0.016 v -0.009) as compared to our fixed-effect estimates for the population as

[17] The first stage regression estimate of our predicted migrants variable is 0.36 ($p < 0.001$). The F-stat is 40692 and the partial R^2 is 0.76.

a whole. The coefficient for *foreign-born individuals* is still, however, not statistically significant and in a practical sense is still very small in comparison to other commonly observed negative correlates with well-being. The larger coefficient could, however, suggest some downward bias associated with our fixed-effects model and this could be the result of measurement error as we are relying on estimates of total numbers of migrants in each local authority area.

Given that our instrumental variable analysis suggests that our fixed-effects estimates may be downward biased at least to some extent, we re-ran our sub-group analysis outlined in table 2 using our instrumental variable (IV) specification. The estimates are inevitably somewhat more imprecise when relying on an IV approach but the results from the IV specification follow the same general pattern as that described in the fixed-effects analysis. That is, while not significant for the population as a whole, there does appear to be some well-being losses associated with *foreign-born individuals* for certain sub-groups, especially for relatively older individuals, those in the lowest income quartile and those least satisfied with their job. If anything, our IV analysis suggests that our fixed-effects analysis understates some of these negative impacts. For example, our IV estimates relating to the over 70s, those in the lowest household income quartile, the unemployed as well as those dissatisfied with their job are approximately double (or more) that observed in our fixed effects analysis.

One thing worth noting when it comes to income is that when we look at those in the highest quartile, *foreign-born individuals* again, similarly to our fixed effects model, attracts a positive coefficient, but this time it is statistically significant at the 5% level (0.117, p=0.039). This therefore, provides some weak evidence to suggest that in contrast to those with below average incomes, inflows of foreign-born individuals may have positively enhanced the well-being of those with relatively high household incomes. In relation to education, our fixed-effects results do not appear to hold when looking at those with no formal educational qualifications, as in our IV specification the

coefficient for *foreign-born individuals* changes sign. We therefore suggest a degree of caution when interpreting our fixed-effects results which suggest a negative relationship between *foreign-born individuals* and well-being for those with no educational qualifications.

As a sensitivity check, instead of using aggregate numbers of foreign-born individuals as our key explanatory variable, we used migrant share. Migrant share was derived by dividing the aggregate inflows of foreign-born individuals by the total population in each local authority area.[18] What is of note here is that even when using migrant share instead of *foreign-born individuals* as our key explanatory variable, our findings follow the same general pattern. At the population level, we find no statistically significant relationship between migrant share and subjective well-being (unreported). However, there is again significant individual-level heterogeneity with people aged 70+ and the less financially well-off as well as those relatively dissatisfied with their jobs in particular, appearing to be negatively affected in terms of well-being by a rising migrant share.

5. What are the mechanisms underlying these effects?

In the preceding section we outlined how inflows of foreign-born individuals into local areas are associated with some substantive adverse well-being effects, at least for certain groups. In this section, we examine what mechanisms can help explain these results. In the analysis that follows we focus on two potential channels, namely perceived labour market competition and perceptions regarding the importance of national identity, albeit we recognise that there are likely other important mechanisms (results are presented in table 3).

5.1 Perceived labour market competition

Looking first at perceptions surrounding labour market competition, while objective evidence would suggest that inflows of foreign-born individuals has had few, if any, negative effects on UK

[18] To aid interpretation we multiplied this ratio by 100 so that the coefficients capture the estimated impact of a 1% increase in the migrant share.

employment or wages (and indeed positive when considering the distribution of wages as a whole), subjective perceptions may be very different. Much of the popular media discourse on this topic has focused on the potential threat that immigrants pose on the employment opportunities of natives. Within this context, it seems reasonable to conjecture that many individuals may feel that inflows of foreign-born individuals harms their own employment prospects and this may in turn translate into adverse well-being effects.

To test this idea, we took advantage of a question in our household survey dataset which asked employed individuals in all waves post 2008 (UKHLS) to assess their level of job satisfaction. Specifically, respondents were asked to indicate the number ranging from 1 completely dissatisfied to 7 completely satisfied, when answering the following question "how satisfied or dissatisfied they were with their present job overall?". We used answers to this question to break the population into three groups reflecting differing levels of job satisfaction. The first group consists of people who reported that they were neither satisfied nor dissatisfied, somewhat, mostly or completely dissatisfied with their job. For ease of writing, we label this group as dissatisfied with their job. The next group consists of individuals who report that they are somewhat or mostly satisfied with their job. We label this group as satisfied with their job. The final group consists of individuals who are completely satisfied with their job.

We find that *foreign-born individuals* is not statistically significant for the groups that are satisfied and completely satisfied with their job respectively (see table 3). That being said, it is perhaps worth noting that foreign-born individuals attracts a positive coefficient (0.060) for the group of individuals who are completely satisfied with their job, albeit one that is not precisely estimated in a statistical sense. In contrast to individuals that are completely satisfied with their job, *foreign-born individuals* attracts a negative coefficient (-0.11), which is statistically significant at 10%, for the group of

individuals that are dissatisfied with their job.[19] Taken alongside our results relating to the role of unemployment in moderating the well-being effects from rising numbers of foreign-born individuals, this provides suggestive evidence that perceptions surrounding labour market competition may be one of the channels through which rising numbers of foreign-born individuals may diminish subjective well-being. In effect, irrespective of objective evidence, the unemployed or those who are relatively dissatisfied with their job, may well still feel that greater numbers of foreign-born individuals coming into their local area adversely effects their employment prospects, and in turn their well-being.

To add further weight to this idea we tested if the relationship between *foreign-born individuals* and well-being is moderated by changes in the wider economy, i.e. changes in GDP. If the relationship between *foreign-born individuals* and well-being was responsive to changes in economic growth, then this would further support our suggestion that perceptions surrounding labour market competition is one of the channels through which inflows of foreign-born individuals negatively affects the perceived well-being of certain groups. The idea being that in times of economic stress (negative GDP growth), natives may see inflows of foreign-born individuals as more of a threat to their own economic security. To examine this issue, we simply ran two separate regressions to estimate the impact of *foreign-born individuals* on perceived well-being when GDP growth was below 0 and above 0 respectively[20]. Both coefficients are negative, but while the estimated effect of foreign-born individuals on well-being is close to 0 when GDP growth is positive, the same effect is negative, statistically significant and more pronounced in times of negative GDP growth[21].

[19] Again these differences between coefficients are statistically significant using standard z-tests.
[20] The two coefficients are statistically different from each other
[21] The same pattern exists when we select different cut off points, e.g. above and below 1% GDP growth

5.2 National identity

There is a rich literature within social psychology and more recently economics which suggest that social identity matters for well-being (see Haslam et al., 2009 for a review of this work). The central tenet of this work is that affective attachment to a group, be it family and friends, community and religious groups or nation-state can provide people with a sense of place, purpose, and belonging and all of this can enhance psychological well-being. In support of the premise that attachment to nation-state matters for well-being, Morrison et al. (2011) found in a sample of 132,516 individuals from 128 countries participating in a World Poll conducted by the Gallup Organization that identification with one's nation-state, which they captured by reported feelings of 'national satisfaction' enhanced subjective well-being.

We suggest that for some individuals, rising inflows of foreign born individuals may diminish their sense of attachment with Britain as their nation-state and this in turn can have negative consequences for their well-being. In order to test this idea, we took advantage of a question in the UKHLS relating to the importance people place on being British.[22] Specifically in waves 1, 3 and 6 of the UKHLS, respondents were asked: *Most people who live in the UK may think of themselves as being British in some way. On a scale of 0 to 10 where 0 means 'not at all important' and 10 means 'extremely important', how important is being British to you?*. While this question surrounding the importance of being British was just asked of individuals in wave 1, 3 and 6 of the UKHLS (i.e. all individuals post 2008), we made the simplifying assumption that the values obtained in wave 1, 3 and 6 will be an adequate proxy for individuals in subsequent waves of the UKHLS (i.e. wave 2 and 5).[23]

[22] Respondents who did not feel British were not asked this question

[23] For waves 2 and 5, we simply took the mean reported value from respondents in other available waves (e.g. wave 1, 3 and 5).

For descriptive ease, we broke the population into two groups – those who felt being British was extremely important to them (gave a rating of 10 on the 10 point scale – 33% of respondents) and those who felt it was less than extremely important (a rating of less than 10 – 67% of respondents). Looking at first our fixed-effects regression results relating to *foreign-born individuals* (table 3), we observe no clear differences between both groups, i.e. the coefficient for *foreign-born individuals* is close to zero for individuals who feel that being British is extremely important and also those who feel it is less than extremely important. Our instrumental variable regression results do suggest, however, that perceptions surrounding the importance of national identity may be an important moderating variable when it comes to the relationship between inflows of foreign-born individuals into local areas and subjective well-being. Specifically, *foreign-born individuals* attracts a negative and statistically significant coefficient for the group of individuals who feel that 'being British' is extremely important to them, whereas it attracts a much smaller coefficient and one that is not statistically significant when looking at individuals who feel 'being British' is less than extremely important.

We observe a similar pattern if instead of using *foreign-born individuals* as our key explanatory variable we use migrant share[24]. In unreported results we also examined directly the relationship between the variable capturing the importance placed by individuals on being British and reported well-being. Our findings are in keeping with the results by Morrison (2011) discussed earlier, as we find attachment to nation-state - here captured by the importance respondents place on being British - is positively related with well-being using both our pooled cross sectional and fixed effects model specifications[25].

[24] These differences are statistically significant

[25] Estimated effect sizes while statistically significant were significantly smaller in our FE model specification (0.081 v 0.031) which is perhaps expected given that perceptions surrounding the importance of British identity does not display a great deal of variation over time.

6. Conclusion

In this study, we investigated the relationship between increases in the numbers of foreign-born individuals living in local authority areas within England and the subjective well-being of individuals living in those same areas. This was achieved by creating a long run panel dataset where we could exploit both spatial and temporal variation in the share of migrants residing in local authority areas. We find several important results. The first is that in contrast to other recent studies using the German Socio-Economic Panel, we did not observe any significant 'main' effects when it comes to the relationship between inflows of foreign-born individuals and subjective well-being. A useful avenue for future research, therefore, would be to examine what lies behind differences in the well-being effects of immigration across countries. Some possibilities here include differences in the rate of change, levels of integration, composition of migrants or features of the native population.

A second important finding of our analysis is that we demonstrated how there is significant heterogeneity in the relationship between numbers of foreign-born individuals within local areas in England, and the subjective well-being of individuals already living in those areas. In other words, focusing on 'average' effects across the population will mask significant differences across groups. More specifically, we find that in contrast to their younger and financially better-off counterparts, the subjective well-being of relatively older individuals (60+), and those in the lowest income quartile appear to be negatively affected in terms of perceived well-being by rising numbers of foreign-born individuals living in their local authority area. On the other hand, our analysis provides some weak evidence to suggest that certain groups such as those in the top quartile of household incomes as well as people born outside the UK (non-natives) may have benefited in terms of perceived well-being from rising inflows of foreign-born individuals. Neglecting to consider such individual heterogeneity and focusing on 'average' effects, will, therefore, invariably lead to an incomplete and perhaps superficial understanding of the role of immigration for subjective well-being. It is worth noting that the observed well-being differentials across socio-demographic groups

are congruent with voting patterns evident in the recent UK referendum on EU membership. This could suggest that well-being differentials may have been an important factor behind the recent referendum result.

Future work is needed to unpick the various channels through which changes in the number of foreign-born individuals living in an area can affect the subjective well-being of certain groups in society. A third important aspect of our work is that we point to two potential channels, namely perceived labour market competition and perceptions regarding the importance of national identity. First looking at perceived labour market completion, while objective evidence would point to negligible, if any, negative effects on employment outcomes for natives who are unemployed or on relatively low wages (and evidence would point to positive effects for the wage distribution as a whole), public perception may differ. Indeed a cursory examination of the popular media would suggest that, for large sections of the public at least, immigration is often associated with negative effects on the employment opportunities for natives. This means that for certain cohorts, foreign-born individuals may be seen as a threat by natives to their own future employment prospects or career advancement. In support of this proposition, we find that in contrast to their employed or more job satisfied counterparts, the unemployed and those who are relatively less satisfied with their job are likely to experience a substantive reduction in their well-being in response to rising numbers of foreign-born individuals. In further support of this idea, we find that the negative relationship between inflows of foreign-born individuals and well-being is more pronounced when macro-economic conditions (GDP growth) are less favourable.

While national identity is a multi-faceted concept, some recent research in social psychology points to positive well-being effects stemming from attachment to one's nation state. Within this literature it is commonly argued that relating to various social groups be they at the family, community or national level helps to define who we are and as noted by Haslam (2009) such groups have the

capacity to enrich our lives as they are a source of personal security, social companionship and emotional bonding. We find that individuals who feel that 'being British' is relatively more important are relatively more likely to be adversely affected when it comes to their self-reported well-being from rising inflows of foreign-born individuals. Our proposed explanation is that for some individuals, rising inflows of foreign-born individuals may dilute what they feel it is to be 'British', translating into adverse well-being effects.

To conclude, our findings suggest that inflows of migrants into local areas are associated with significant well-being effects, but that these effects diverge sharply across different social groupings. It is worth noting that even if objective evidence would suggest that rising levels of immigration does not negatively affect the economic outcomes of natives, if rising number of migrants are associated with adverse well-being effects for certain social groups then this makes the challenge of integration more difficult. In such circumstances, it becomes important not just to determine which groups are adversely affected by immigration but also what can explain these effects. In this study we point to two potential mechanisms that warrants further investigation when it comes to understanding the dynamics between immigration and subjective well-being, namely perceived labour market competition and perceptions surrounding the importance of national identity.

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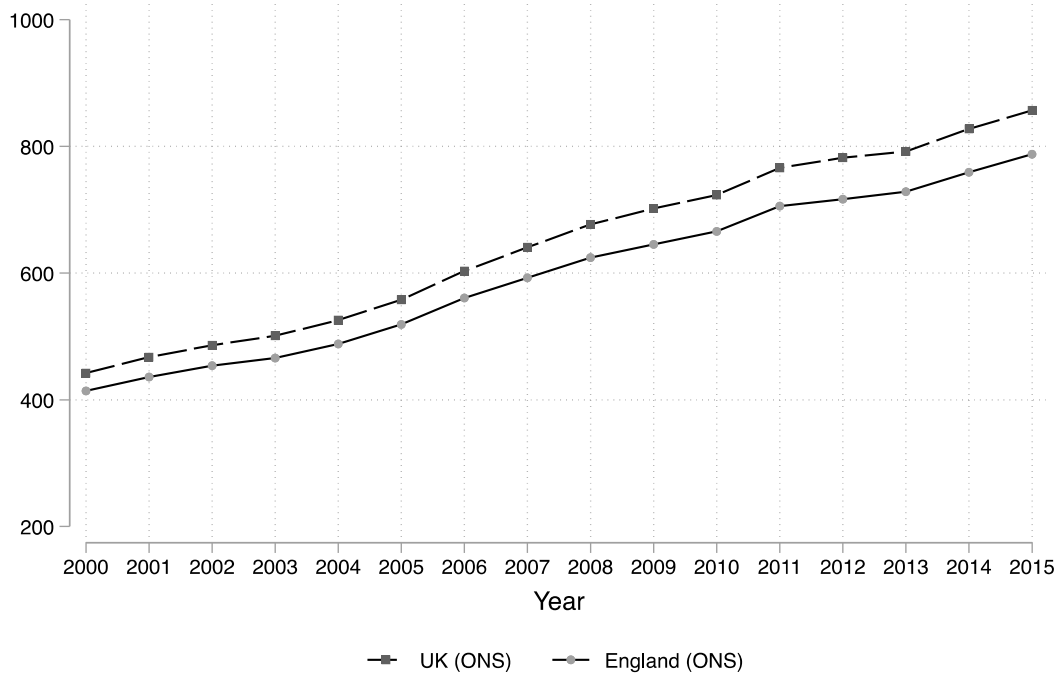
Figure 1: Total number of foreign-born individuals in UK and England over 2000-2015 (00,000s)



Source: ONS (2000-2015)

Table 1: Subjective well-being (GHQ) and foreign-born individuals

	(1) Pooled OLS	(2) Fixed Effect	(3) IV
Foreign-born individuals (00,000s)	0.003 (0.006)	-0.009 (0.013)	-0.012 (0.025)
Individual characteristics	Yes	Yes	Yes
Index of Deprivation	Yes	Yes	Yes
Wave dummies	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes
Observations	235,371	235,371	183,822

Notes: This table reports coefficients from regressions of individual subjective well-being (GHQ) on number of foreign-born individuals within the local authority of residence. Each regression controls for individual characteristics (age, age-squared, educational attainment dummies, gender, gross household income, marital status dummies, number of children, labour force status dummies), the local authority deprivation rank, annual GDP growth at national level, wave fixed effects and regional fixed effects. The second column labelled Fixed Effects include individual fixed effects. The third column reports estimates of a regression in which the variable *foreign-born individuals* has been instrumented using the "shift-share" instrument. See Section 4.5 for more details. The full set of estimates can be found in Table A2 in the appendix. Standard errors in parenthesis are clustered at the individual level. * statistically significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 2: Subjective well-being (GHQ), foreign-born individuals and migrant share – subgroup analysis

	Foreign-born individuals				Migrant share	
	Fixed effects		IV		IV	
	Coef.	Clustered Std. Err.	Coef.	Std. Err	Coef.	Std. Err
			Age			
Age<=60	0.004	0.014	0.0003	0.027	0.0002	0.018
Age > 60	-0.057 *	0.030	-0.099	0.082	-0.055	0.045
Age > 70	-0.137 ***	0.043	-0.226**	0.132	-0.147*	0.086
			Household income (quartiles)			
Lowest 25%	-0.059**	0.030	-0.173**	0.074	-0.120**	0.052
Lowest 50%	-0.032*	0.021	-0.053*	0.050	-0.034	0.032
Highest 50%	0.005	0.017	0.034	0.036	0.021	0.022
Highest 25%	0.007	0.023	0.117*	0.056	0.067**	.032
			Education			
Degree Education	0.012	0.017	0.010	0.034	0.006	0.023
Secondary Education	0.012	0.023	-0.051	0.044	-0.031	0.027
Other Education	-0.031	0.047	-0.062	0.127	-0.039	0.080
No formal qualifications	-0.099**	0.040	0.154	0.109	0.108	0.077
			Gender			
Males	-0.004	0.018	-0.030	0.034	-0.019	0.021
Females	-0.012	0.018	0.004	0.035	0.003	0.024
			Labour market status			
Unemployed	-0.142*	0.082	-0.395	0.030	-0.296	0.198
Employed	-0.003	0.017	-0.011	0.264	-0.007	0.020
			Natives and non-natives			
Natives	-0.023	0.018	-0.093**	0.044	-0.062**	0.030
Non-natives	0.065*	0.034	0.091	0.077	0.060	0.051

Notes: Each cell reports coefficients or standard errors of foreign-born individuals from separate subjective well-being (GHQ) regressions on specific sub-groups. Each regression controls for individual characteristics (age, age-squared, educational attainment dummies, gender, gross household income, marital status dummies, number of children, labour force status dummies), the local authority deprivation rank, annual GDP growth at national level, wave fixed effects and regional fixed effects. *statistically significant at 10% level, **significant at 5% level, *** significant at 1% level

Table 3: Subjective well-being (GHQ), foreign-born individuals and migrant share – subgroup analysis

	Foreign-born individuals				Migrant share	
	Fixed effects		IV		IV	
	Coef.	Clustered Std. Err.	Coef.	Std. Err	Coef.	Std. Err
			Job satisfaction			
Dissatisfied	-0.110*	0.059	-0.244**	0.115	-0.177**	0.083
Satisfied	-0.010	0.019	-0.064	0.047	-0.042	0.031
Completely satisfied	0.060	0.044	-0.017	0.144	0.013	0.111
			Economic growth			
Negative GDP growth	-1.635**	0.719	-1.379	1.412	-0.519	0.523
Positive GDP growth	-0.007	0.013	-0.021	0.026	-0.014	0.017
			National identity			
Being British is extremely important	0.018	0.032	-0.199**	0.102	-0.110**	0.056
Being British is less than extremely important	-.004	.016	-0.040	0.032	-0.026	0.020

Notes: Each cell reports coefficients or standard errors of foreign-born individuals from separate subjective well-being (GHQ) regressions on specific sub-groups. Each regression controls for individual characteristics (age, age-squared, educational attainment dummies, gender, gross household income, marital status dummies, number of children, labour force status dummies), the local authority deprivation rank, annual GDP growth at national level, wave fixed effects and regional fixed effects. *statistically significant at 10% level, **significant at 5% level, *** significant at 1% level

Appendix

Table A1: Summary statistics (N=235,371)

Variable	Mean	Std. Dev.	Min	Max
Subjective well-being	24.88	5.47	0	36
Foreign born individuals	32218	42678	1000	249000
Age	48.25	17.38	19	102
Age squared	2629.88	1781.35	361	10404
Other degree	0.23	0.42	0	1
Degree	0.11	0.32	0	1
A-levels	0.20	0.40	0	1
GCSE	0.21	0.41	0	1
Other	0.11	0.31	0	1
No formal qualifications	0.14	0.35	0	1
Male	0.45	0.50	0	1
Household income	3523.78	2781.33	-20000	86703
Single	0.18	0.38	0	1
Married	0.68	0.47	0	1
Divorced	0.09	0.28	0	1
Widowed	0.06	0.24	0	1
Number of children	0.57	0.97	0	9
Self-employed	0.08	0.27	0	1
Paid employment	0.52	0.50	0	1
Unemployed	0.05	0.21	0	1
Inactive	0.36	0.48	0	1
Local-authority deprivation rank	16594.82	9259.50	1	32842
National GDP	1.71	1.74	-4.3	3.7
North West Region	0.14	0.34	0	1
Yorkshire	0.11	0.31	0	1
East Midlands	0.10	0.30	0	1
West Midlands	0.10	0.30	0	1
East of E	0.11	0.31	0	1
London	0.13	0.34	0	1
South East England	0.16	0.37	0	1
South West England	0.11	0.31	0	1

Notes: Subjective well-being (GHQ) and individual characteristics are from BHPS and UKHLS (2000-2015). The number of foreign-born individuals at local authority level over 2000-2015 is from the ONS.

Table A2: Subjective well-being (GHQ) and foreign-born individuals, full estimates

	(1) Pooled OLS	(2) Fixed Effects	(3) IV
Foreign-born individuals (00,000)	0.003	-0.009	-0.012
	(0.006)	(0.013)	(0.025)
Age	-0.155***	-0.138***	-0.119***
	(0.008)	(0.048)	(0.046)
Age-squared	0.002***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
Other higher degree	0.577***	-0.167	-0.159
	(0.081)	(0.301)	(0.247)
Degree	0.510***	0.079	0.144
	(0.090)	(0.306)	(0.262)
Higher secondary qualification (A-level)	0.448***	0.234	0.151
	(0.082)	(0.282)	(0.226)
Lower secondary qualification (GCSE)	0.444***	0.146	0.125
	(0.080)	(0.267)	(0.214)
Other	0.359***	-0.230	-0.280
	(0.090)	(0.227)	(0.193)
Male	0.892***	-1.859*[26]	-1.756*
	(0.041)	(1.059)	(0.987)
Household income (£0,000)	0.065***	0.013**	0.013**
	(0.006)	(0.006)	(0.006)
Married	0.255***	0.210**	0.185**
	(0.061)	(0.086)	(0.076)
Divorced	-0.825***	-0.416***	-0.452***
	(0.096)	(0.128)	(0.108)
Widowed	-0.568***	-0.961***	-1.087***
	(0.112)	(0.167)	(0.141)
Number of children	0.010	-0.015	-0.017
	(0.021)	(0.031)	(0.026)
Self-employed	0.072	0.055	0.088
	(0.060)	(0.066)	(0.066)
Unemployed	-2.466***	-1.630***	-1.607***
	(0.088)	(0.083)	(0.068)
Inactive	-1.327***	-0.527***	-0.520***
	(0.056)	(0.059)	(0.049)
Local authority deprivation rank	0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)
National GDP	0.009	0.007	0.009
	(0.009)	(0.009)	(0.010)
Wave fixed effects	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes
Observations	235,371	235,371	183,822

Notes: This table report full set of estimates from regressions of individual subjective well-being (GHQ) on number of foreign-born individuals. Each regression controls for wave and regional fixed effects that are not reported. *, **, and ***, denote statistical significance at 10%, 5% and 1% level, respectively. Clustered standard errors, adjusted for clustering at individual level, are reported in parenthesis.

[26] There were a small number of individual cases (111) where people changed their reported gender across waves which explains why gender did not drop out from the fixed effects and instrumental variable analysis.