The effects of Immigration on Household Services, Labor Supply and Fertility

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Abstract

There is broad evidence of a reversal in the negative correlation between fertility and labor supply for many developed countries. At the same time, immigrants seem to contribute to the household services sector, by reducing its market cost and expanding its size. This paper analyses the effect of immigration on labor supply and fertility decisions of young British women, in addition looking at the role of immigration on the market structure of household services. We use the British Quarterly Labour Force Survey (QLFS) and the British Household Panel Survey (BHPS) for the period 2003-2007 and exploit variation of immigrants in local areas (Local Authority District). Our results show that immigrants increase the labor supply of highly educated women at the intensive margin, despite not having any effect on their fertility decisions. The results are robust to the endogeneity of immigrants location and seem to be driven by the contribution of immigrants to the household production. Rising the local share of immigrants increases the size of the market for household services, and reduces their market costs, at the same time without having any effect on the market structure of childcare services.

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1 Introduction

After the mid 1980's a reversal of the negative relationship between fertility and female labor force participation has been reported across developed countries (Ahn and Mira, 2002; Rindfuss et al., 2003). Countries with a higher female labor force participation also enjoy a higher total fertility rate (TFR). These trend seems to be explained by country-specific factors, and by country-heterogeneity in the magnitude of the negative within-country correlation (Kögel, 2004). Institutional factors, labor market rigidities, and unemployment have been considered responsible for this reversal (Adserà, 2004). The availability of childcare, the flexibility in working hours, and the diffusion of part-time jobs, and maternity leave schemes may explain the reversal in the negative correlation between childbearing and female labor force participation. A recent study (Furtado and Hock, 2010) points out to an additional factor potentially responsible for the observed reduction in the negative correlation between fertility and labor supply: the role played by low skilled immigrants in the household services sector. Immigrants, by increasing the size and reducing the market cost of household services, in particular child care, reduced the negative correlation between fertility and labor supply for highly educated US women.
According to the theory the effect of a reduction in child care cost on fertility and labor supply decisions is ambiguous, depending on which mechanism prevails between substitution and income effects (Willis, 1973; Blau and Robins, 1989). If the child is a normal good, a reduction in the cost of child rearing will increase the demand for children through the standard income effect, as a consequence the labor supply would decrease. On the other hand the labor supply would increase if the substitution effect prevails, given the increased opportunity cost of child-rearing brought about by a reduction in child care costs. In addition, the quantity income elasticity of demand for children can be rather small with respect to the quality income elasticity (Becker, 1965), in particular for high earning women. Therefore women will react by increasing the quality of child care instead of having an additional child. The direction of the effect on each decision would be then an empirical open question. The evidence so far suggests that availability and reduction in market cost of child care, foster both fertility and labor supply decisions (Blau and Robins, 1989; Del Boca, 2002; Gelbach, 2002; Cascio, 2009; Rindfuss et al., 2010). Whereas the only existing evidence on the effect of lower child care costs on the correlation between fertility and labor supply (Furtado and Hock, 2010) shows that the correlation becomes less negative for high educated women. Furtado and Hock (2010) represents the first study looking at this mechanism at the aggregate level, the authors concentrate only on high educated women using cells defined by age-brackets, city and time.

The UK seems to be a particularly suitable country to analyse this question. First of all it is one of the countries experiencing, over the last two decades, a positive correlation between fertility and female labor force participation: since 1995 both TFR and employment rate have followed an upward trend. According to the Office for National Statistics (ONS), the TFR was

equal to 1.7 in 1995 and it has reached 1.96 in 2008, a value only slightly below the replacement level (2.1), whereas, over the same timespan, the labor force participation for women raised from 73% to 77% (ONS from Labour Force Survey data). Of particular interest is that the reduction in the negative correlation between labor supply and fertility seems to be driven by local areas with higher share of immigrants (Table 1), for both the extensive and the intensive margin. In addition, over the same period, the UK has witnessed a steady increase in the number of immigrants; according to 1991 Census data, immigrants represented 6.7% of the total resident population, and they have reached 11.4% in 2008. Our analysis, due to data limitation as explained below, covers the period between 2003-2007. Over this period, immigrants were 8% of the labor force in 2003 and reached 11% in 2007 (QLFS). In addition, despite being 9% of the labor force, immigrants represent 12% of those working in the household services sector, whereas only 9% of all other sectors. 16% of immigrants work in household services, as opposed to 13% of natives. Given this evidence, this paper first analyses whether the constant inflow of immigrants, by concentrating in the household services sector, affect both the size and the market cost of the latter as found for other countries (Furtado and Hock, 2010; Barone and Mocetti, 2011; Cortès and Tessada, 2011; Farrè et al., 2011). As a result increasing the availability and affordability of services which represent the market counterpart of the household production. If immigrants can be thought as substitutes for time-intensive tasks representing the household production, women - particularly the high skilled ones with the highest opportunity cost of time[1] and the highest labor market attachment - main responsible for those activities within the family, are those who can be affected the most.[2] The contribution of immigrants is valuable for natives under many respects: first, as already said, immigrants can increase the availability of household services and provide higher flexibility (opening hours) with respect to the case of services provided by natives. Immigrants can represent a better alternative to both the formal household services and childcare typically provided by natives, the services they provide can be thought as more flexible in terms of opening working hours and more convenient in terms of proximity with respect to existing services. If these services are only provided during rigid opening hours or are inconveniently located, even a high coverage is relatively ineffective in fostering employment and fertility; in this respect the service provided by immigrants can be more compatible with full-time jobs or rigid working schedule.[3] Higher availability ultimately translates into an indirect reduction in the costs of these services through a reduction in search costs, assumed to be high for high educated women. Moreover, immigrants can make these services more affordable by directly reducing their market cost, pushing down the wages of those employed in this sector. Through

[1]Cortès and Tessada (2011) set a theoretical framework showing how the women reacting more in terms of labor supply to the reduction in the cost of household services are those with higher wages.

[2]In a BHPS module each couple is interviewed about who is in charge of several family commitments within the couple. It turns out that, among working people, women are responsible for 64 percent of all cleaning activities, 72 percent of washing duties, and 58 percent of child-care activities.

[3]The higher flexibility is evident comparing the difference in weekly working hours between immigrants and natives working in the household services sector. Immigrants work 4.23 hrs per week more than natives (QLFS), also controlling for education, whereas the gap in other sectors is much lower (+1.32 hrs).

this mechanism therefore immigration can have an impact on both native female fertility and labor supply decisions, and in particular on their correlation, by easing the trade-off between the two choices (Furtado and Hock, 2010).

To our knowledge, there are no existing studies looking at the relationship between immigration and fertility decisions at the individual level. Only Furtado and Hock (2010) analyse this question by using aggregate data. The authors adopt a grouped bivariate probit estimation strategy and provide evidence that low-skilled immigration, by reducing the market cost of childcare, has a positive impact on the probability of childbearing, a negative impact on the extensive margin of the labor supply, and reduces the negative correlation between fertility and labor supply for high-skilled US women. This paper improves upon the existing literature by providing the first evidence at the individual level on the effect that immigrants have on both fertility and labor supply of young women, and exploiting the within-district variation in the share of immigrants out of the labor force. In order to identify the effect of immigrants on labor supply and fertility as well as on the market structure of household services, we use both individual fixed effects and an instrumental variable strategy based on the past local distribution of immigrants. We first analyse the effect of immigration on employment and wages in the household services sector, where the labor market is defined at the level of Local Authority Districts in Britain. Our results suggest that immigration brings about a reduction in the market cost of household services and an increase in their size. This effect is driven by domestic services such as housekeeping, personal services, and food preparation, rather than by child care services. In addition, an increase in immigration in local areas rises the labor supply of highly educated British young women at the intensive margin, without having any effect on their fertility decisions. The only exception of no effect on fertility is a (weakly significant) positive effect on the cumulative fertility of more mature women. On the other hand, despite immigration not having any effect on the probability of working for the average woman, the former rises the probability of working (and the intensive margin of the labor supply) for women with young children. Overall we interpret these effects of immigration as operating through a reduction in the negative correlation between fertility and labor supply, confirming what has been found by Furtado and Hock (2010) for the US.

The rest of the paper is laid out as follows: Section 2 put the paper in context of the related literature, Section 3 presents the empirical strategy adopted, Section 4 describes the data. The main results are commented in Section 5, whereas some robustness checks are described in Section 6. Section 7 closes with a few conclusive remarks.

2 Background

This paper crosses two broad strands of literature: on the one hand it is very close to the literature on the impact of immigration on the host country labor market, on the other hand it is related to the literature on the impact of household services on female labor supply and fertility

decisions.

The analysis of the impact of immigration on the host country shows a strong consensus on the evidence that immigrants do not harm the native labor market either in terms of employment or in terms of wages.[4]

At the same time, and closer to this paper, there is already a broad evidence that immigrants significantly affect the native female labor supply. Different studies show that (low-skilled) immigration contributes to the household production by either increasing the availability of household services or reducing their market cost (Barone and Mocetti, 2011; Cortès and Tessada, 2011; Farrè et al., 2011; Cortès and Pan, 2013). This channel of causation has been shown to bring about a positive impact on high skilled native female labor supply mainly at the intensive margin (Barone and Mocetti, 2011; Cortès and Tessada, 2011), only Farrè et al. (2011) finds the results driven by the extensive margin.[5]

Cortès and Tessada (2011) represent the first study analysing this question with US data: according to their findings, low-skilled immigrants affect native women at the top quartile of the wage distribution, by increasing the intensive margin of their labor supply, at the same time reducing the time spent on housework and increasing the expenditures on housekeeping services. Also Barone and Mocetti (2011) confirm similar results as for the case of Italian highly educated women. In a similar vein Farrè et al. (2011) show that female immigrants increase mostly the extensive margin of the labor supply for highly-educated Spanish women, particularly they help women with higher family commitments, such as young children or co-resident elderly relatives. However, their empirical strategy is different because they work with a cross-section and exploit variation on immigration at regional level, instead of working with a panel and exploiting variation at city level as this paper does.[6]

The other strand of the literature which is particularly relevant to this paper looks at the relationship between the household services, in particular childcare, and labor supply and fertility decisions. As for the relationship between childcare availability and fertility decisions, the evidence is in favour of a positive impact of the former on the latter (Del Boca, 2002; Del Boca and Vuri, 2007; Hank and Kreyenfeld, 2003; Rindfuss et al., 2007, 2010).
Del Boca (2002) estimates two conditional logit models and find that the availability of childcare locally measured exerts a positive impact both on fertility and labor supply decisions of Italian

[4]With the only exception of Borjas (2003) and Borjas et al. (2008), the evidence is strongly in favour of a non-negative, non-significant or slightly positive effect of immigration on natives' wages and employment. See, among others, Card (2001, 2009); Ottaviano and Peri (2012); Manacorda et al. (2012). The evidence for the UK (Manacorda et al., 2012) confirms the small degree of complementarity in production between immigrants and natives. In addition, the effect of immigration differs along the native wage distribution. Natives at the bottom of the wage distribution lose from immigration, whereas those at the top gain (Dustmann et al., 2005, 2012)

[5]The only exception in favour of a negative impact on the extensive margin of the labor supply is represented by Furtado and Hock (2010).

[6]Related to this study is also (Amuedo-Dorantes and Sevilla, 2014), which looks at the effect of low skilled immigration on parental time use of US high skilled women. Low skilled immigrants, by reducing the cost of child care, reduce the time spent by high educated women on child care, in particular basic child care, whereas they foster the time devoted by mothers on more complex child care activities.

women. In a more recent paper Del Boca and Vuri (2007) find that the rationing in childcare affects negatively female employment, and also makes childcare costs have a negative impact on the former. The positive impact of childcare availability on fertility decisions has been also found by Rindfuss et al. (2007, 2010) since the increase in the availability of day care centers leads to a younger age at first birth (Rindfuss et al., 2007), and with a similar strategy they also provide evidence of a positive impact on fertility level (Rindfuss et al., 2010). To date only Hank and Kreyenfeld (2003) do not confirm the positive relationship between childcare availability and fertility decisions, since they only find that the informal childcare provided by relatives exerts a positive impact, whereas the impact of the publicly provided childcare is not significant. On the other hand, by exploiting different source of exogenous variation, many studies report the positive effect of lower child care cost on labor supply (Bailey, 2006; Baker et al., 2008; Cascio, 2009).

So far the existing literature has looked only at the impact of child-care on fertility and labor supply, rather than considering the household services sector more broadly. Nevertheless household services, through the effect of migration, have been shown affecting female labor supply. Despite the evidence in favour of a decrease in the cross-country negative correlation between fertility and labor supply, the individual correlation, though lower in magnitude, is still negative (Angrist and Evans, 1998; Francesconi, 2002; Kögel, 2004). Therefore, the intertwined nature of labor supply and fertility raises the question of whether the observed effect of immigration in fostering labor supply might have affected fertility as well, in addition to the direct effect of a change in child care services on fertility. It may be the case that, even if not through child care directly, immigration affects fertility decisions indirectly because of its impact on female labor supply.

3 Empirical strategy

The empirical analysis follows two steps. First we estimate the effect of the share of immigrants out of the labor force in local areas on the market structure of household services, by looking at the effect on both employment and average wages in each local labor market defined at the local authority district (hereafter district)-year level.[7] Second, we analyse the effect of the same share of immigrants on individual labor supply and fertility. In order to identify the impact of immigration in both steps of our analysis, we need to isolate the exogenous component of the stock of immigrants in local areas, and control for the endogeneity of the immigrants' location. Immigrants likely settle into areas characterized by favourable labor demand conditions, in turn correlated to each of the dependent variables we consider. Therefore we adopt an instrumental variable strategy predicting the current local share of immigrants by using the past local immigrants distribution (see Altonji and Card, 1991 and Card, 2001). In addition, in the second

[7]The definition of the local area will be defined in the Data section.

step of the analysis, where we estimate individual regressions, we adopt individual fixed effects. The rationale behind the instrument rests on the use of the historical country-specific settlement of immigrants in local areas as an exogenous determinant of the current local country-specific distribution. The current total country-specific stock of immigrants is then distributed into local areas according to this past distribution.

The instrument for the term representing the immigration rate in district a at time t, Im_{at} is computed according to the following formula:

$$Im_{at} = \frac{\Sigma_c \left(\frac{Im_{cat_0}}{Im_{ct_0}} \right) Im_{ct}}{Pop_{at_1}} \tag{1}$$

where Im_{cat_0} represents the stock of immigrants from country c residing in district a at time $t = t_0$. The selected past distribution is relevant to the year t_0=1991 and it is computed from the 1991 Census data.[8] Im_{ct} is the stock of immigrants from country c at time t. Pop_{at_1} is the sample labor force corresponding to the first year of the analysis (2004).

The validity of this strategy relies upon two main requirements: the past local distribution must be unrelated to current local pulling factors, and the total country-specific stock of immigrants should be unrelated to any area-specific pulling factors. We deal with the first issue by including district fixed effects and the local unemployment rate, that should control for potential omitted factors. In addition, in some specifications, when computing the instrument for Im_{at} we exclude the immigrants from area a from the computation of the term Im_{ct}. The results are robust to all these controls. The second requirement for the instrument validity is that past and current local distributions have to be correlated. This requirement is strongly supported by the broad empirical evidence regarding the tendency of newly-arrived immigrants to cluster in areas highly populated by immigrants from the same country to take advantage of the pre-established networks.[9] In addition, there is evidence that the composition of immigrants in the UK has changed in terms of country of origin over the period of our analysis, mainly due to the access of the A8 countries (see Jaitman and Machin, 2013). Therefore we try to assess the relevance of the instrument by running a series of regressions relating past and current shares of immigrants at local level. We construct an index measuring the presence of enclaves in the period we consider as the reference for the past and in the period of the analysis. The index denotes the fraction of immigrants from country c residing in district a, divided by the fraction of the total immigrant population living in the same district. A value of this index equal to 1 would suggest that immigrants from country c are just as likely to live in district a as the average immigrant population, values bigger than one would then suggest the presence of enclaves. Figure 1 shows this index computed for the past

[8] In Section 4, we describe in greater depth the data used for the implementation of the instrument.

[9] Cutler and Glaeser, 1997 provide evidence for the US, whereas Aslund (2005) and Damm (2009) provide two more recent examples for Sweden.

(1991) on the horizontal axis, whereas the vertical axis shows the index computed for the period of the analysis (2003-2007), each panel represents a different group of countries (West Europe, East Europe, North America, Africa, Asia, Central South America, Asia and Middle East, and Other countries.). Each point represents a district and the line represents the regression line. Two main results emerge from this figure. First of all it is clear how many countries tend to settle into enclaves since the values are mostly higher than 1. In addition there is a clear tendency for immigrants to settle in place where there was an enclave settled in the past, and this is evident from the regression coefficient which is always positive and significant. The only exception being the case of Central South America and Asia-Middle East. The results of this exercise supports then the validity of the network hypothesis: immigrants tend to cluster in small area with other immigrants from the same group and areas where an enclave settled in the past disproportionally attract future immigrants from the same country.[10]

3.1 The Impact of Immigration on the market structure of Household Services

As previously mentioned there might be two channels by which immigration can have an impact on household services; they can have an impact on their availability or on their market cost. Immigrants can enlarge the size of the household services sector at the same time providing more flexible services in terms of opening working hours compared to services provided by natives. This would allow women to accommodate the time devoted to work and the need to perform housework. Ultimately this effect would represent itself an indirect reduction in cost, assuming that more flexible services turn into lower search costs. In addition, immigration can have a direct impact on the prices of these services. Typically if immigrants push down the wages of those working in this sector, also the market cost of these services goes down since other fixed costs can be considered negligible for these occupations. We estimate separately the effect of immigrants on the size and the market cost of household services using the following two estimating equations

$$empl^{hs}_{at} = \phi Im_{at} + \mu_1 X_{at} + D_a + D_t + \eta_{at} \tag{2}$$

$$logwhs^{hs}_{at} = \alpha Im_{at} + \mu_2 X_{at} + D_a + D_t + \epsilon_{at} \tag{3}$$

$emplhs_{at}$ is the share of workers employed in occupations representing the household services out the labor force in district a at time t, whereas $lnwhs_{at}$ represents the average real hourly wages (in log)[11] of those employed in occupations representing the household services in area a at time

[10] In the empirical analysis we use all groups for the computation of the instrument. In a series of robustness checks we exclude the two groups for which this correlation is not significant, the results are invariant to this exclusion.

[11] Nominal wages are deflated by using the CPI-based deflator (base=2005).

t. $\mathbf{z_{at}}$ represents a vector of additional controls capturing omitted time varying factors: the log of median high skilled male income, the share of high skilled women, the share of households with young children (0-2 years old). These controls should account for higher demand for household services in each local labor market. D_a, and D_t are district and time fixed effects, respectively and ϵ_{at} (analogously η_{at}) is a standard zero mean error term. [12]

The coefficients of interest are: ϕ, and α respectively. If the share of immigrants in local areas reduces (indireclty through search cost or directly) the market cost of household services, we expect $\phi>0$ and $\alpha<0$.

3.2 The Impact of Immigration on Labor Supply and Fertility

In the second step of our analysis we try to detect how immigration affects fertility and labor supply decisions of British women, and estimate the following two separate regressions:

$$work_{iat} = c_i + \beta_0 X_{iat} + \beta_1 Im_{at} + \beta_2 Im_{at} xhs_{iat} + D_t + \eta_{iat} \tag{4}$$

$$birth_{iat+1} = d_i + \gamma_0 X_{iat} + \gamma_1 Im_{at} + \gamma_2 Im_{at} xhs_{iat} + D_t + \epsilon_{iat} \tag{5}$$

Equation (4) refers to the labor supply decision and equation (5) refers to the fertility decision of individual i residing in the local district a at time t. The dependent variable $work_{iat}$ denotes the labor supply. Three different measures of labor supply are used: an indicator for working/not working, and two indicators for the intensive margin, weekly hours worked (in log), and an indicator for working full-time versus part-time. c_i (and d_i) are individual fixed effects, $\mathbf{X_{iat}}$ represents a vector of individual characteristics which will be described in details in the next section, and D_t are time fixed effects. $birth_{iat+1}$ denotes the birth spell, corresponding to having a child of zero age one year after year t. Similar definitions are quite standard in the fertility - related literature, which motivates this choice in order to take into account the 9-months gestation period, and the average birth occurring in the middle of the calendar year (Del Boca, 2002; Rindfuss et al., 2007, 2010). Im_{at} denotes the share of immigrants at the district level out of the labor force, and η_{iat} (and analogously ϵ_{iat}) is a standard zero mean error term.

We try to detect whether the impact of immigration differs by female educational level, because we expect a higher impact on those with a higher level of education, (see Cortès and Tessada, 2011) who have a higher opportunity cost of time and higher labor market attachment. Therefore the interaction between immigrants and an indicator for higher education are also included in the analysis. In the baseline specification hs denotes people with a tertiary education, including also vocational education, in some specifications we exclude vocational tertiary education. Our coefficients of interest are therefore: β_1 and β_2; γ_1 and γ_2. In case immigrants

[12] Due to the fact that the dependent variables represent aggregates and averages, we allow and control for heteroskedasticity by weighting each observation with the respective cell size.

bring about a reduction in the negative correlation between fertility and labor supply, we would expect that one of the following cases occur: $\beta_1 + \beta_2 > 0$ and $\gamma_1 + \gamma_2 >= 0$ (or not significant), or, alternatively, $\gamma_1 + \gamma_2 > 0$ and $\beta_1 + \beta_2 >= 0$ (or not significant). Despite the dependent variables relevant to the fertility decision and two out of the three measures of the labor supply decision are binary, we adopt a fixed effect linear model for all the specifications.[13] Despite the decisions related to fertility and labor supply being correlated, suggesting that a simultaneous equation framework should be the preferred estimation strategy, there are a number of concerns preventing the joint estimation of the system of equations.[14] First of all it is not clear the real advantage of a joint estimation with respect to a single equation estimation strategy when we work with finite samples (comparing the single equation 2SLS approach with the 3SLS strategy which allows for the correlation in the errors terms (Mikhail, 1975, Belsley, 1988) the relative advantage of the joint estimation holds true only when the cross-equation correlation is sufficiently high, especially in a two-equation system. In our case, the cross-equation correlation between labor supply and fertility, estimated as residual from equations 4 and 5, is rather low (-0.01), thus not justifying the use of a joint estimation. On top of that, 3SLS techniques that account for the panel dimension of the data (EC3SLS) are random effect estimators which assume the individual fixed effects uncorrelated to the other regressors, a strong and likely not realistic assumption. The alternative estimation strategy would be a Full Information Maximum Likelihood estimator, which has the drawback of not accounting for the endogeneity of our main variable of interest unless you rely on a control function approach by including the first stage residuals. Therefore we decide to use a single equation estimation strategy. (Mikhail (1975) demonstrates with Monte Carlo studies that 2SLS has the smaller mean square error when the between-equation correlation is ρ=.18, but 3SLS becomes the winner when ρ=.76.)[15]

[13]There is evidence that a non linear specification provides very similar estimates to a linear probability model in a cross-section setting (Angrist and Evans, 1998) and in a longitudinal setting (Alessie et al., 2004). Adopting a linear specification allows to gain in efficiency with respect to using a conditional logit model. In this latter case, we would lose more than 85 percent of the observations, because the observations whose outcome variable does not vary within-individual are dropped from the estimation sample. In addition, we would also lose in efficiency due to the fact the we should adopt a control function approach - including the two residuals from the relevant first stage regressions - in order to control for the endogeneity of the immigration's variables.

[14]Other studies using a simultaneous estimation are: Francesconi, 2002, and (Del Boca et al., 2009).

[15]As a support of the validity of this strategy, we run a series of robustness checks in order to evaluate the effect of the cross equation correlation - by controlling for fertility in the labor supply equation and viceversa. Ideally we would like to include these regressors and instrument for them, however it is difficult to find an instrument providing exogenous variation for fertility (labor supply) and not being correlated with labor supply (fertility). Such an example would be for instance an institutional change in the child care coverage. Over the period of our analysis, there was an expansion of the free childcare provision. Since April 2004, it has been mandatory for all Local Education Authority to provide free nursery places for all 3- and 4-years old children for 12.5 hours a week and for 33 weeks per year. These free nursery places can be taken up in any of the following forms: nursery schools, day nurseries, registered childminders, private nurseries (nannies became eligible since 2005).

4 Data

In order to implement the empirical analysis we make use of three different data sources: the QLFS (Quarterly Labour Force Survey), the BHPS (British Household Panel Survey), and the 1991 UK Census data. From the QLFS we compute the measure of immigration rate at district level. The QLFS is a quarterly survey conducted in UK throughout the years since 1992, in which each sampled address is called on five times at quarterly intervals, and yields about 60,000 responding households per each quarter. However, only since December 1994 the QLFS covered the whole of the UK, including also Northern Ireland. We pool together all quarters relevant to the period between 2003 and 2007.

The BHPS is an annual longitudinal survey, and it consists of a nationally representative sample of about 5,500 households recruited in 1991. All individuals living at the sampled address are interviewed each year, if the individual split-offs from the original family, he/she is followed and re-interviewed at the new address. Since 2001 the sample is representative of the UK and each year around 10,000 households are interviewed. The survey has been run for 18 years until 2008. All members of the household aged 16 or over are interviewed and the survey covers a broad range of topics, among which: household composition, education, health, employment status, income from employment. The BHPS is used in order to run the empirical analysis at the individual level, and we import from the QLFS all the information about immigration. In addition, we also use the QLFS for the aggregate regressions (2 and 3) at district-year level to evaluate the effect of immigration on the labor market structure of the household services sector.

The third data source consists in the 1991 UK Census data, used to compute the past local distribution of immigrants by macro-areas of origin (see 1).

The selection of the period between 2003 and 2007 is due primarily to data restrictions. First of all, we need to exclude the last year available from the BHPS (2008) because the definition of the birth spell requires to take the 1 years lead of the variable asking about having a child of zero age. In addition, the first year available for the QLFS with the district identifier is 2003.

The immigrants-related variables are constructed using the QLFS. Immigrants are defined as non British: those who were born outside the UK and Ireland. This choice is motivated by the fact that English and Irish people are a fairly homogeneous group, both in terms of their language and the proximity of their culture, therefore we argue that it is hardly justifiable to consider Irish people as immigrants. In order to implement the instrument immigrants are categorized according to 8 macro-areas of origin, which we consider might represent enclaves, in terms of sharing similar cultures (Figure 1 supports this assumption): Western Europe, Eastern Europe, North America and Canada, Centre-South America, Middle East, Rest of Asia, Africa, and others.

Immigrants seem to experience a substantial downgrading once in the host country (Dustmann et al., 2005), their actual skill is not valued as if it was acquired in the UK. Despite this,

immigrants are still higher educated than natives, and this holds true also among immigrants working in the household services sector. [16] 41% of immigrants has left full time education at age 21 or older, as opposed to only 18% of natives. Within the household services sector, even if the percentage of high skilled immigrants is lower than in the full sample, the gap with natives is much higher (24% versus 5%). Therefore we decide not to restrict the analysis only to low skilled immigrants because a substantial share of the immigrants sample would be excluded[17]

The measure of immigration is defined at the district (LAD) level. A Local Authority District represents one of the smallest administrative units in Great Britain, and over the period of our analysis the number of this local units was 376. In our identification strategy we exploit the within-district variation in the share of immigrants, since for 90 percent of the sample the individual fixed effects coincides with the district fixed effects. We also control for the robustness of this assumption, by additionally adding district fixed effects and the results are robust to this specification.

The final sample, after having excluded all observations with missing information about the variables included in the empirical analysis, consist in 2,830 British women with age between 20 and 44, corresponding to 11,320 person-year observations. These are women in the labor force. The definition of employment is based on having worked the week previous to the interview or having not worked but having a job that they were away from. The following regressors are also included in the empirical analysis: age, age squared, an indicator for higher education,[18] an indicator for couple, four variables denoting the number of children in the following age brackets, 0-2, 3-4, 5-15, and 16 or over, two indicators for having a co-resident father, or a co-resident mother, total household income minus total individual income (in log) and its squared value, and an indicator for the intensity of care activities towards people either inside or outside the family (set equal to one if the weekly hours are higher than 20.). Table 3 reports the summary statistics of the sample. The percentage of employed women is relatively high (79%), and, among those working, the average number of working hours per week is 32.7, whereas 65% of them work full time. Their average educational level is also high (40% of them is highly educated). Since we are considering the sample of British women, the definition of their higher education is based on the English educational system. Accordingly high skilled women are those with the highest educational qualification corresponding to the National Vocational Qualification level 4 or higher, a tertiary education.

[16] The definition of low-skill is based on the age when the respondent has left full-time education. By doing so we follow Manacorda et al. (2012) who adopt this criterion in order to identify the educational level of immigrants because the definition of the educational level based on the highest qualification attained according to the UK system is misleading. Most of the immigrants in fact tend to answer "other qualifications" when asked about their highest educational level. A likely explanation of this mis-allocation is the fact that immigrants are not able to map the education they have acquired in their home country into the English educational system.

[17] Among the more recent migrants, the share of high skilled working in the domestic sector is even higher (33%).

[18] Higher education corresponds to the ISCED code equal or higher than 5, including higher vocational, college or higher education.

From Table 4 we can see the variation in labor supply over time by education and birth spell, where birth spell denotes if the woman has a child of zero age. The probability of working increases for women regardless of their employment condition, in particular it increases for women with a recently born child, regardless of their education. Whereas working hours are constant for all women with the exception of high skilled women with a new born baby experiencing an increase. The same rising trend applies to the probability of working full time for high skilled women with a new born child, whereas, if anything, the rest experiences a decline. Overall this evidence is in line with the reduction in the negative correlation between fertility and labor supply, as shown in Table 1. As for the trend in fertility rate, the average number of children per woman has remained constant over the period 2003-2007, even controlling for education and employment status. The probability of giving birth has slightly decreased for the low skilled and remained constant for the high skilled.[19]

This first descriptive evidence suggests a reduction in the negative correlation between labor supply and fertility, in particular for high educated women over the period 2003-2007. In addition, from Table 1 it emerges that this trend is driven by areas highly populated by immigrants. Of course this evidence may be driven by spurious correlation linked to labor market conditions and other unobserved pulling factors for immigrants, therefore, in order to isolate the causal effect brought about by immigration we need to rely on the results of the empirical analysis.

5 Main results

In this section we try first to analyse the effect brought about by immigrants in the market structure of the household services sector. The household services sector consists in the following occupations according to the 2000 Standard Occupational Classification (SOC): housekeeping occupations, food preparation (bar staff, waiters/waitress, backers, and butchers), childcare occupations, gardeners, and other personal services occupations. From Table 2 it is evident how immigrants are concentrated in this sector representing the first category where they work (16.45% of them). Disaggregating further the household services sector by occupations, it emerges that 48% of immigrants works in food-preparation-related occupations, 28% in housekeeping activities, and a smaller share (17%) works in childcare and related occupations.

Starting from the results of the regressions 2 and 3, Table 6 reports the OLS and 2SLS estimates (the top panel refers to equation 2, whereas the bottom panel refers to equation 3. The first four columns represent regressions run on all occupations of the household services sector. Columns (5) and (6) consider only all household services excluding childcare. Column (7)-(8) consider only the child care sector, and columns (9) and (10) consider all other low skilled occupations. Starting from the results on employment, according to the first four columns (Top panel), it is clear how a rising immigrants as a share of the local labor force has a positive impact on the

[19] Tables not shown but available upon request.

size of the household services sector. A rise in the share of immigrants by one percentage point rises employment in this sector by 0.4 percent point corresponding to a 33 percentage points rise of the mean value of the dependent variable. This effect is consistent for both OLS and 2SLS estimates, even if higher for the 2SLS estimates. The first two columns report the simple correlation, whereas the third and fourth columns include all controls. In addition, the first stage statistics suggests that the instrument is not weak (Table 5). Once we break down the household services into child care versus all other occupations, it is evident that these results are not driven by the child care sector. Despite the sign being positive, the effect of immigration on the size of the household services is much lower in magnitude for the child care sector and not significant. The last two columns report the results for all low skilled occupations (mainly construction, and manufacturing). By doing so we try to analyse whether the results are driven by general demand driven effects common to all low-skilled occupations. This does not seem to be the case, since the effect on low skilled occupation is much lower and not significant. Table 6 (bottom panel) reports the corresponding results for the wage equation (3). Despite the effect of immigrants being always negative, it is never significant, with the only exception for the domestic services sectors (columns 5 and 6). Rising the local share of immigrants out of the labor force by one percentage point reduces the wage of those employed in the domestic sector by 1.7 percent. In addition, the effect of immigration is driven by services such as food preparation, housekeeping and cleaning, whereas there is no effect on the child care sector. These results are in contrast with what has been found in the US, where low-skilled immigrants reduce the market cost of child care services (Cortès and Tessada, 2011; Furtado and Hock, 2010; Amuedo-Dorantes and Sevilla, 2014). One interpretation could be that child care services demand higher quality than other household services. Parents can be more demanding in terms of child care and immigrants can be considered as less substitutes for child care provided by natives, especially if they don't speak well English.[20]The results in columns (9)-(10) report no effect of immigration on the average wages of other low-skilled occupation, thus supporting the interpretation that the effect of immigration is not simply driven by a general shift in the labor demand, but it is specific to the domestic services. The difference between the OLS and 2SLS estimates suggests that OLS suffer from measurement errors, because the OLS estimates turn out to be downward biased for the employment equation, whereas they are upward biased for the wage equation. If the biased was due to omitted pulling demand factors, attracting immigrants and at the same rising wages and employment, we would have found the OLS estimates upward biased for both.

In describing the results of regressions 4 and 5, we focus on the 2SLS estimation, which is the preferred one. Given that the main regressor has variation at the aggregate district level, we use a double clustering, with the two clusters defined both at the district and individual level, allowing for any kind of correlation between individuals belonging to the same district, in addition to any serial correlation within individual.

[20]Unfortunately the dataset does not contain information on language proficiency.

We start from commenting the results relevant to the impact of immigration on the three different measures of labor supply (equation 4, Table 7).[21] Both OLS and 2SLS estimates report no effect of immigrants on the probability of working for British women, regardless of their education. On the contrary, a higher share of immigrants at the local level exerts a positive effect on both the weekly working hours and the probability of switching from a part time to a full time job for working women. An increase of 1 percentage point in the share of immigrants at local level brings about an increase in weekly working hours of high skilled women by 0.74%. This translates in a 25 minutes increase per week. On the other hand, the corresponding increase in the probability of switching to a full time job is 0.8 percentage point. These results are broadly in line with other studies (Barone and Mocetti, 2011; Cortès and Tessada, 2011), with the only exception of Farrè et al., 2011 who find instead a positive effect on the labor supply of highly educated women in Spain, but mostly at the extensive margin. The results are robust to controlling for district fixed effects, in such a case the effects are higher, because the negative effect on the low skilled women disappears, whereas the effect on the high skilled women is stable across specifications.

Moving to the results on fertility (Table 8), immigration does not have any impact on the decision to giving birth. Regardless of the definition of fertility, either as an indicator for having a child of zero age the subsequent year (columns 1-3), or distinguishing between the parity of the fertility spell (columns 4-6). In Table 9 we reports the results on cumulated fertility, considering the sample of more mature women (30 aged and older) and as a dependent variable the total number of children augmented by the indicator of having a child of zero age the subsequent year. In this specification there is a small positive effect of immigration for high educated women (corresponding to a 2 percentage points rise in the dependent variable), however it is not statistically significant. Restricting the sample further to working women, first those working less than 50 hours, then those working longer than 50 hours, and with no parents co-residing with them, we can observe a rising trend in the effect of immigration on cumulated fertility of high skilled women. These results would suggest that immigration helps easing the trade-off between childrearing and labor supply for high educated women, however the estimates are very imprecise and never significant.

Another way to look at whether immigration eases the trade-off between child-rearing and labor supply is to analyse the effect on labor supply for women with high demand for childcare. Table 10 reports the results for the effects of immigration on labor supply selecting women without young children, women with young children (0-2 aged), and women with young children but without parents co-residing in the same household. Assuming that the presence of parents represents a form of child care support. The interaction term for high skilled here select the women

[21] As for the impact of the other regressors (not shown but available upon request.), as expected having children exerts a negative effect on the labor supply decision, a signal of the role incompatibility between labor force participation and fertility. This is true in particular for the intensive margin. The highest negative effect on hours worked comes from having children in the age bracket between 0 and 2. This effect is much lower and not significant for the men sample, suggesting that the burden of childcare is lower for them.

with tertiary education, excluding vocational education, in order to identify the sample with the highest opportunity cost of time. Columns (1)-(3) report the probability of working, columns (4)-(6) report the working hours, and columns (7)-(9) the probability of working full time. Immigrants do not affect the probability of working for women with no young children, whereas they rise the former for those with young children and even more if without parents co-residing with them. Despite this effect being only weakly significant, it is also confirmed by the results on the intensive margin of the labor supply. The drastic reduction in the sample size brings about an increase in the standard errors, however the trend in the coefficients support the idea of the role of immigration in easing the trade-off between childrearing and labor supply for high educated women.[22]

6 Robustness

Having established the above evidence, we try to check how these effects hold to a series of robustness checks. First, we try to control for potential omitted factors that might drive our results. We consider the sample of men as a control group. If the mechanism driving our results is driven by the contribution of immigrants to household production, we expect men to be, if anything, much less affected in labor supply, given their lower contribution to the household production with respect to women. In addition, omitted demand conditions could be correlated to both the presence of immigrants in a local area and the labor supply decision. In such a case the effect that we find would be due to complementary effects in production, the supply shift brought about by immigration would shift the labor demand curve, and we should find similar positive effect on wages. The results on the sample of men (columns 1-3, Table 11) are reassuringly in contrast to the presence of complementarity effects. There is no effect on men throughout all measures of labor supply. Given that the elasticity of labor supply is very small for men, often not different from zero and lower than the one for women (Blundell and MaCurdy, 1999), we might also fail to detect any reaction on labor supply of men because their labor supply function is extremely rigid, despite immigrants inducing a complementarity effect through a rise in the labor demand function. In such a case, the results on wages would unveil if this complementarity effects is at work, in particular for men, who have been found to be imperfect substitutes for immigrants in production (Manacorda et al., 2012). However, our results (columns 4-5, Table 11) confirm that there is no effects on wages for either gender, thus complementarity effects are not driving our findings. As an additional robustness check, we run a falsification exercise selecting only older women still in the labor force, between 45 and 65 age. Again, if the mechanism driving the increase in labor supply without any reduction in fertility represents a reduction in the negative correlation between fertility and labor supply, we should not find the same results on older women, as in fact Table 12 shows. An additional concern would

[22]The results considering the standard definition of high education used in the rest of the analysis are consistent, though lower in magnitude.

be due to the endogenous moving of women. Women willing to work longer hours can move to areas characterized by higher job opportunities and favourable demand conditions. At the same time these areas can also attract immigrants moving towards thriving labor markets. In such a case we would observe a spurious positive correlation between immigration and labor supply. in order to control for such a mechanism we replicate the analysis excluding people self-reporting they ever moved in one of the years considered because of job opportunities/job-related reasons. The results are almost unchanged (Table 13). Our estimates provide per each regression, the total effect of immigration on labor supply and fertility, without taking into account the correlation in the cross-equation error terms, given the extremely low conditional correlation found. However, the results are unaffected by the correlation in the cross-equation error terms (in Table 14 we additionally control for the fertility spell in the labor supply equations (columns 1-4), and for labor supply in the regressions on fertility, see columns 5-6).

7 Conclusion

The impact of immigration on the host country's labor market has been largely investigated. Immigrants can be thought as substitutes for time intensive tasks of the household production such as housekeeping, food preparation, and care activities. If immigrants replace natives in household production we expect them to have an impact on labor supply and fertility decisions of women, in particular women in their reproductive age. Given the reversal in the negative relationship between fertility and labor force participation observed in many developed countries, this paper tries to investigate which role immigration plays in explaining this pattern, in addition to the role attributed to institutional factors, such as flexibility of working time, availability of part time jobs, and parental leaves, and child care opportunities.

Despite other studies have already provided robust evidence that immigrants foster female native labor supply, in particular for the high-skilled component of the labor force, the evidence on the impact on fertility is largely unexplored, in particular at the individual level.

This paper represents the first study looking at the role played by immigration on individual decisions of fertility and labor supply for young native women, controlling for unobserved individual heterogeneity, and endogeneity of immigrants location. Analysing the case of Britain, our results first find that immigration affects the market structure of household services, in particular domestic services such as housekeeping, and food preparation, by increasing their size and reducing their market cost. Whereas no effect has been found on the child care sector, suggesting that immigrants are not considered as perfect substitutes for natives in providing child care as in providing other domestic services. In addition, we confirm previous findings about the positive impact of immigration on the labor supply of highly educated women. Immigrants rise the working hours of highly educated young women and the probability of shifting from a part time to a full time job. These results are robust to potential omitted factors which can be linked to

the production side of the economy, such as complementarity effects.

We argue that the effect on labor supply might be due to the contribution of immigrants to household services, given the effects that immigration has on the market structure of these services. Therefore the channel through which immigrants affect women labor supply is likely due to their contribution to household production. However, despite fostering the labor supply, immigrants do not seem to reduce fertility of native women, thus suggesting that they probably contribute to conciliate childcare and work-related activities, confirming the results found by Furtado and Hock (2010). The additional evidence of a higher positive effect on the probability of working of women with young children suggests this interpretation.

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Table 1: Correlation between Fertility and Labor Supply

	High Share Imm	**Low Share Imm**	**Total**
	Panel A. Work-Birth Spell		
2003	-0.16	-0.09	-0.12
2007	-0.06	-0.08	-0.07
	Panel B. Weekly Working Hours-Birth Spell		
2003	-0.14	-0.04	-0.09
2007	-0.07	-0.10	-0.08

Source: BHPS. 2003-2007. Each entry represents the correlation coefficient between an indicator for working and a fertility spell (Panel A), and weekly working hours and fertility spell (Panel B). Sample: British women, 20-44 year old.

Table 2: Distribution of Immigrants by Occupation (%)

Household Service	16.45
Professional	16.34
Manager	14.75
Associate Professional	14.58
Administrative	9.31
Process, Plants and Machine Operatives	7.98
Elementary Occupations	7.15
Sales and Costumer Services	6.53
Skilled Trades	5.04
Other Personal Service	1.89

Source: QLFS. 2003-2007

Table 3: Summary statistics

Variable	Mean	Std. Dev.	N
Work	0.788	0.409	11,320
Weekly hours	32.705	12.424	8,801
Full time	0.646	0.478	8,846
Share Immigrants	0.07	0.077	11,320
High edu-College+	0.399	0.49	11,320
Age	33.113	6.993	11,320
Care (more than 20hrs)	0.025	0.157	11,320
Numb Children 0-2	0.14	0.369	11,320
Numb Children 3-4	0.14	0.364	11,320
Numb Children 5-15	0.747	0.942	11,320
Numb Children 16-18	0.056	0.244	11,320
Couple	0.736	0.441	11,320
Father in Household	0.069	0.254	11,320
Mother in Household	0.101	0.301	11,320

Source: BHPS, 2003-2007

Table 4: Labor Supply by Fertility and Education

	Low Skilled		High Skilled	
	W/o Birth	With Birth	W/o Birth	With Birth
	Probability of Working			
2003	0.75	0.46	0.87	0.74
2004	0.75	0.45	0.90	0.74
2005	0.74	0.61	0.88	0.74
2006	0.73	0.52	0.87	0.75
2007	0.75	0.62	0.89	0.81
	Week Work hours			
2003	31.40	26.25	34.78	28.64
2004	32.03	24.82	33.82	30.60
2005	31.56	27.75	35.19	26.06
2006	31.67	27.52	34.72	28.82
2007	31.99	26.54	34.43	31.67
	Full Time			
2003	0.60	0.50	0.71	0.50
2004	0.63	0.36	0.67	0.61
2005	0.62	0.47	0.73	0.39
2006	0.62	0.41	0.71	0.47
2007	0.64	0.41	0.69	0.62

Source: BHPS, 2003-2007

Table 5: First Stage

	(1)	(2)	(3)	(4)	(5)	(6)
IV	0.35***	0.34***	0.34***	0.35***	0.34***	0.34***
	(0.10)	(0.10)	(0.10)	(0.12)	(0.12)	(0.12)
N	1,706	1,706	1,706	1,706	1,706	1,706
Cluster-LAD					yes	yes
FE		yes	yes	yes	yes	yes
Unempl Rate				yes		yes
First stage regressors			yes	yes	yes	yes

Robust standard errors in parenthesis, significance: *p<.1, ** p<.05, *** p<.01. FE: district and time fixed effects. First Stage Regressors (average values): indicator for high education, age, (log) household income (- individual income), 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for intensity of care duties.

Table 6: Immigration and Household Services

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
	Base				**Hous Serv**		**Child Care**		**Low Skilled Occ**	
	Employment									
Share Im	0.06**	0.29**	0.06**	0.38**	0.07***	0.27**	-0.02	0.11	0.00	0.18
	(0.03)	(0.14)	(0.03)	(0.15)	(0.03)	(0.11)	(0.01)	(0.09)	(0.03)	(0.17)
Mean Dep.var.	0.12				0.10		0.02		0.20	
F-stats		10.47		11.17		11.17		11.17		11.17
N	1,706	1,706	1,706	1,706	1,706	1,706	1,706	1,706	1,706	1,706
	Hourly wages (log)									
Share Im	-0.09	-1.05	-0.08	-1.15	0.06	-1.75**	-0.32	0.93	-0.09	0.26
	(0.13)	(0.76)	(0.13)	(0.76)	(0.15)	(0.89)	(0.27)	(1.68)	(0.10)	(0.54)
Mean Dep.var.	1.83				1.80		1.89		1.96	
F-stats		13.16		13.87		13.87		9.34		19.89
N	1,705	1,705	1,705	1,705	1,704	1,704	1,575	1,575	1,706	1,706
Controls			yes	yes	yes	yes	yes	yes	yes	yes
Mean Share Imm	0.08									

Robust standard errors in parenthesis, significance: * p<.1, ** p<.05, *** p<.01. Common controls: district and time fixed effects. Additional controls: (log) median high skilled male income, share of high skilled women, share of families with children 0-2 aged. All regressions are weighted using the cell size of the dependent variable.

Table 7: Effect of Immigration on Labor Supply

	(1)	(2)	(3)	(4)	(5)	(6)
	Work/not Work		**Week Hours (log)**		**Full time**	
			OLS			
Share Im	0.07	0.07	-0.37*	-0.09	-0.01	0.20
	(0.16)	(0.18)	(0.21)	(0.24)	(0.18)	(0.24)
Share Imxhs	0.13	0.22	1.00***	0.77**	0.63***	0.33
	(0.21)	(0.26)	(0.27)	(0.35)	(0.22)	(0.31)
			2SLS			
Share Im	0.19	0.65	-0.80**	1.17	-0.30	0.64
	(0.30)	(1.33)	(0.38)	(2.61)	(0.33)	(1.85)
Share Imxhs	-0.08	0.19	1.54***	1.48***	1.08***	1.24**
	(0.33)	(0.41)	(0.40)	(0.47)	(0.34)	(0.50)
Mean Share Imm		0.08				
Mean Dep. varxhs		0.87		34.36		0.69
LAD-FE		yes		yes		yes
N	11,320	11,320	8,624	8,624	8,679	8,679

Standard errors in parentheses clustered at individual and district level. Additional controls: (log) household income (- individual income), high education, age (and its sq.), 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for the intensity of care duties, unemployment rate, time fixed effects. * p<0.10, ** p<0.05, *** p<0.01

Table 8: Effect of Immigration on Fertility

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	**2SLS**		**2SLS**		
		Birth$_{t+1}$		**1st Child**	**2nd Child**	**3rd Child**
Share Im	-0.09	-0.11	0.55	-0.11	0.01	-0.01
	(0.12)	(0.17)	(0.95)	(0.13)	(0.06)	(0.05)
Share Imxhs	0.01	-0.09	-0.09	-0.03	-0.10	0.04
	(0.14)	(0.18)	(0.20)	(0.15)	(0.07)	(0.05)
Mean Share Imm		0.08				
Mean Dep. varxhs		0.07		0.03	0.03	0.01
N	11,320	11,320	11,320	11,320	11,320	11,320

Standard errors in parentheses clustered at individual and district level. Additional controls: (log) household income (- individual income), high education, age (and its sq.), 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for the intensity of care duties, unemployment rate, time fixed effects. * p<0.10, ** p<0.05, *** p<0.01

Table 9: Effect of Immigration on Cumulative Fertility

	(1)	(2)	(3)	(4)
Dep. var: Birth$_{t+1}$ + n. Children	**Women 30+**	**Working Women 30+**		
		<50hrs	**>=50hrs**	**>=50hrs w/o Parents**
Share Im	-1.44*	-0.41	-2.56	-2.84
	(0.84)	(0.54)	(4.80)	(4.80)
Share Imxhs	1.69*	1.01	2.17	2.61
	(0.99)	(0.81)	(4.98)	(4.99)
N	7,023	5,047	219	215

Standard errors clustered at individual and district level. Additional controls: (log) household income (- individual income), high education, age (and its sq.), 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for the intensity of care duties, unemployment rate, time fixed effects.

Table 10: Effect of Immigration on Labour Supply by Presence of Young Children

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Work/not Work			**Week Hours (log)**			**Full time**		
Share Im	0.12	-2.26**	-2.40**	-0.28	-1.82	-2.78**	0.21	-2.13	-3.71*
	(0.25)	(1.08)	(1.10)	(0.44)	(1.43)	(1.31)	(0.33)	(2.06)	(2.18)
Share Imxhs	-0.00	3.45*	3.58*	1.12**	7.92*	8.19	0.42	8.99	9.21
	(0.34)	(1.81)	(1.85)	(0.49)	(4.75)	(4.98)	(0.38)	(7.54)	(7.95)
0-2 Age Child	no	yes	yes	no	yes	yes	no	yes	yes
Co-Resident Par			no			no			no
N	9,646	1,221	1,159	7,626	672	641	7,664	688	658

Standard errors clustered at individual and district level. Additional controls: (log) household income (- individual income), high education (no vocational training), age (and its sq.), 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for the intensity of care duties, unemployment rate, time fixed effects.

Table 11: Effect of Immigration on Production

	(1)	(2)	(3)	(4)	(5)
	Males			**Females**	**Males**
	Work	**Week Hours (log)**	**Full Time**	**Hourly Wages**	
Share Im	-0.13	0.23	-0.10	0.05	-0.18
	(0.36)	(0.31)	(0.30)	(0.33)	(0.41)
Share Imxhs	0.14	-0.06	0.13	0.60	0.53
	(0.29)	(0.39)	(0.35)	(0.37)	(0.42)
N	10,315	8,888	8,982	8,105	7,704

Standard errors clustered at individual and district level. Additional controls for labor supply regressions: (log) household income (- individual income), high education, age (and its sq.), 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for the intensity of care duties, unemployment rate, time fixed effects. Additional controls for wage regressions: high education, age (and its sq.), industry, and time fixed effects.

Table 12: Falsification Exercise: Older Women (45-65 Age)

	(1)	(2)	(3)	(4)
Dep. var.	**Work/No Work**	**Week Hrs (log)**	**Full time**	**Birth**$_{t+1}$
Share Im	0.50	0.68	0.62	-0.09
	(0.45)	(0.54)	(0.52)	(0.08)
Share Imxhs	1.04	1.55	1.65	0.21
	(0.66)	(1.19)	(1.66)	(0.21)
N	9,039	5,196	5,237	9,039

Standard errors clustered at individual and district level. Additional controls: (log) household income (- individual income), high education, age (and its sq.), indicator for children (4 age brackets), couple, 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for the intensity of care duties, unemployment rate, time fixed effects.

Table 13: Endogenous Moving

	(1)	(2)	(3)	(4)
Dep. var.	**Work/No Work**	**Week Hrs (log)**	**Full time**	**Birth$_{t+1}$**
		Full Sample		
Share Im	0.19	-0.80**	-0.30	-0.11
	(0.30)	(0.38)	(0.33)	(0.17)
Share Imxhs	-0.08	1.54***	1.08***	-0.09
	(0.33)	(0.40)	(0.34)	(0.18)
N	11,320	8,624	8,679	11,320
	Exclude Movers for Employment/Job Opportunities			
Share Imm	0.05	-0.79**	-0.27	-0.05
	(0.24)	(0.35)	(0.26)	(0.20)
Share Immxhs	0.19	1.60***	1.09***	-0.04
	(0.31)	(0.39)	(0.31)	(0.20)
N	10,513	7,979	8,028	10,513

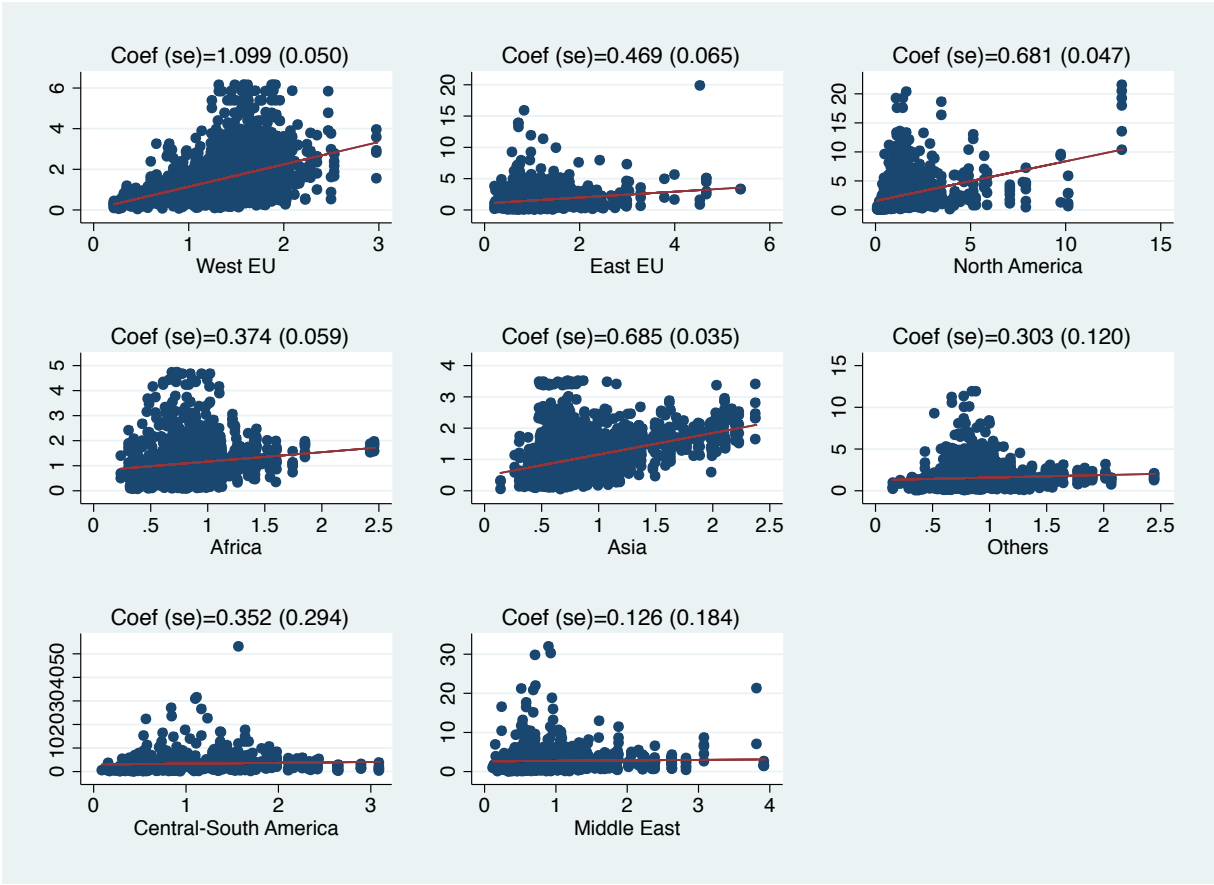
Standard errors clustered at individual and district level. Additional controls: (log) household income (- individual income), high education, age (and its sq.), 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for the intensity of care duties, unemployment rate, time fixed effects.

Table 14: Control for cross-equation Correlation between Fertility and Labor Supply

	(1)	(2)	(3)	(4)	(5)	(6)
	Work		**Week hours**		**Birth$_{t+1}$**	
Share Im	0.19	0.18	-0.80**	-0.80**	-0.11	-0.13
	(0.30)	(0.30)	(0.38)	(0.38)	(0.17)	(0.17)
ShareImxhs	-0.08	-0.08	1.54***	1.54***	-0.09	-0.07
	(0.33)	(0.33)	(0.40)	(0.40)	(0.18)	(0.17)
Birth$_{t+1}$		-0.01		-0.01		
		(0.01)		(0.02)		
Work$_{t-1}$						-0.01
						(0.01)
N	11,320	11,320	8,624	8,624	11,320	8,624

Standard errors clustered at individual and district level. Additional controls: (log) household income (- individual income), high education, age (and its sq.), occupation (only for week hours), 4 indicators for number of children (4 age brackets), couple, co-resident father, co-resident mother, indicator for the intensity of care duties, unemployment rate, time fixed effects.

Figure 1: Enclaves



Source: 1991 UK Census and QLFS (2003-2007). Each point represents the aggregation index as described in the text, computed at the district level. The horizontal axis represents values of the aggregation index computed from Census data for 1991, the vertical axis represents values of the aggregation index computed using the QLFS for the period 2003-2007. The line represents the regression coefficient from regressing y-values on x-values.