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Morando, Greta

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Partner ethnicity and ethnic minority socio-economic occupation evidence from the UK

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Partner ethnicity and ethnic minority socio-economic occupation
Evidence from the UK

Greta Morando
Institute for Social and Economic Research
University of Essex

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Non-technical summary

High rates of unemployment, inactivity, and concentration in certain occupations are among the most relevant issues concerning ethnic minorities in the UK. In this context it is important to understand what role integration plays in reducing disparities in the labour market between ethnic minority and white majority populations.

We shed light on this by considering having a partner of the white majority group as a proxy indicator of integration of ethnic minorities into British society. Using data from the first wave of Understanding Society (2009/2010) we compare the socio-economic positions of ethnic minorities in co- and inter-ethnic partnerships. We implement propensity score matching techniques to account for selection bias. We hypothesise the existence of several channels, such as social networks and language fluency, through which having a partner of the white majority population can help a member of the minority population to integrate into the society, and to subsequently affect their labour market outcomes.

Raw data show that ethnic minority persons in inter-ethnic partnerships are significantly different in the distribution of their socio-economic status from ethnic minority persons in co-ethnic unions. For both men and women, the proportion of those in inter-ethnic partnerships employed as high managers, professionals and intermediates almost doubles those in co-ethnic partnerships. Another striking difference between co- and inter-ethnic partnerships, regards activity status of women: 28% of women in co-ethnic partnerships look after home or family, while this percentage halves for intermarried women (14%).

However, when accounting for self-selection without imposing parametric extrapolation, the two groups of ethnic minorities co- and inter-married are rarely comparable. When they are comparable, large part of the labour market differences is explained by their individual socio-demographic characteristics. Having a white majority group partner does not have any influence on the activity status and on the occupational position of ethnic minority men. Indeed, it increases the likelihood of being active in the labour market among non-first generation women, and the likelihood of being employed in the highest occupational positions for all women. This last outcome seems to be driven by the white minority population. However, the causality of these results should be interpreted with caution because they are sensitive to the possible existence of unobservable characteristics and they might suffer from reverse causality problem.

Partner ethnicity and ethnic minority socio-economic occupation Evidence from the UK

Greta Morando*
Institute for Social and Economic Research
University of Essex

August 2014

Abstract

What role does integration play in reducing disparities in the labour market between ethnic minority and white majority populations? We shed light on this question by comparing the socio-economic positions of ethnic minorities in co- and inter-ethnic partnerships. We implement propensity score matching techniques to account for selection bias. We find that ethnic minorities in co- and inter-ethnic unions are rarely comparable and a large part of the labour market differences is explained by their individual socio-demographic characteristics. Finally, having a white majority group partner affects the occupational position and labour market participation of only some groups of women.

Keywords: Ethnic minorities, inter-ethnic partnerships, propensity score matching, self-selection, socio-economic occupation.
JEL Classification: C14, J12, J15, J40.

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1 Introduction

On average ethnic minority groups in the UK suffer from disadvantages in the labour market when compared to the majority population. Discrimination and lack of integration into society both play an important role in generating such labour market disadvantages (Cheung and Heath 2007). Given the fact that ethnic minorities might not be strictly comparable with the white majority group (Crawfrod et al. 2010), we adopt another empirical approach. More specifically, we add to the ethnic minority labour market disadvantages literature by explicitly focusing on one proxy measure of integration - inter-ethnic unions - and analyse its role in several labour market outcomes of ethnic minorities. Having a white majority group partner could facilitate the integration of an ethnic minority person through the following channels: by acquiring language proficiency (for those whose first language is not English), by accessing social networks composed of the majority population that may be inaccessible to ethnic minorities, and by attaining an understanding of British socio-cultural norms and values. Some of these are more relevant for the first generation migrants rather than the second generation.

Hence, in this study we compare ethnic minorities with a partner of the same ethnic group and with a partner of the white majority group. We investigate how having a white majority population partner affects the economic activity and occupational selection of ethnic minorities by using data from the first wave of Understanding Society, a UK Longitudinal Household Survey (UKHLS) that started in 2009. This is possible because, for the first time, we have a large enough sample of ethnic minorities with rich information on both partners. However, it is difficult to identify the existence and role of the three channels mentioned above (language, social network, and norms and values) through which having a partner of the white majority population can help a member of the minority population to integrate into the society, especially without longitudinal data. In fact, in the UKHLS past employment histories were collected for only a quarter of the sample and the existing length of the survey (4 waves) is not long enough to get the employment history. The way we try to investigate the relevance of these channels is by seeing whether our results for the whole sample change when we analyse different subsamples of the population for whom these channels are relevant.

As partnerships are not random assignments but the result of choices made by individuals, to identify the causal effect of being in an inter-ethnic union we need to account for the self-selection into such partnerships. We first examine the association between the characteristics of the couple and the probability of being in an inter-ethnic union and, in separate multivariate analyses, the correlation of inter-ethnic partnerships with ethnic minority labour market status. Next we use propensity score matching to account for this non-random assignment and identify the causal effects. We also investigate the possible channels through which the partners ethnicity may play an important role in influencing the labour market outcomes of ethnic minorities by looking at sub-groups of the ethnic minority population.

We contribute to the literature on ethnic minority labour market disadvantages and family economics in several ways. We use up-to-date data with lots of information on both partners within the partnership. We try to depict the channels through which partner's ethnicity may have an effect of ethnic minority labour market participation and occupation. Furthermore, for the first time in this context, we make use of a semi-parametric method to investigate the comparability of ethnic minorities in co- and inter-ethnic partnerships.

We find that, after controlling for self-selection into inter-ethnic partnerships, having a white majority group partner does not affect ethnic minority labour market outcomes of ethnic minority men, and it only partly affects the labour market outcomes of some groups of women: it increases the likelihood of being active in the labour market among non-first-generation migrants, and the likelihood of being employed in the highest occupational positions for all women. This last outcome seems to be driven by the white minority population. However, these results should be interpreted with caution because they are sensitive to the possible existence of unobservable characteristics and they suffer from other limitations highlighted in the paper (mainly related to the reverse causation instance - where the choice of occupation affects the choice of the partner). Finally, this study importantly contributes to the previous literature by showing that the two groups of ethnic minorities in co- and inter-ethnic unions are very rarely comparable and their comparability varies importantly by the subgroups of ethnic minorities considered.

2 Previous literature

Labour market penalties of ethnic minority groups with respect to the white majority group are observed in different dimensions and concern different ethnic groups in various ways. Ethnic minorities have higher rates of non-employment (unemployment and inactivity) than the majority group (Blackaby, Leslie et al. 1999; Nandi and Platt 2010). When employed, members of ethnic minority groups seem to be segregated in certain occupations (Elliott and Lindley 2008; Brynin and Güveli 2012), to be over-represented in self-employment (Clark and Drinkwater 2010), to suffer from wage penalties (Clark and Drinkwater 2005; Longhi et al. 2013) and to be over-qualified (Lindley 2009). All these disadvantages are important to explain such phenomena as poverty and deprivation, which particularly affect many ethnic minority groups (Platt 2007; Nandi and Platt 2010).

The literature has found two main reasons for these disadvantages. The first one concerns discrimination. Several field experiments showed how especially visible ethnic minorities suffer from discrimination in the labour market (Wrench and Modood 2000). The other reason is (lack) of integration. This is constituted of three main components. Firstly, language is one important channel through which integration works. Lack of language proficiency or language fluency constitute an obstacle for ethnic minorities in the labour market (Lindley 2002; Shields and Price 2002; Dustmann and Fabbri 2003; Clark and Drinkwater 2008; Miranda and Zhu 2013). Secondly, there is the institutional and socio-cultutral dimension of integration. It has been found that ethnic penalties suffered by ethnic minority groups decline over generations (Clark and Lindley 2006; Cheung and Heath 2007; Dustmann et al. 2011; Moodod et al. 1997). First generation migrants may be more disadvantaged than the second generation because of their relative deficiency of language skills, their relatively poor experience in the host labour market and the fact that they tend to have foreign qualifications. On the other hand, second and further generation migrants are are born and brought up in the UK, so they are familiar and acquainted with British institutional, social, and cultural norms and values. Thirdly, segregation in residential areas and its consequent effect on social network formation and composition represent the last element constituting integration. In fact, ethnic minorities tend to live in highly concentrated areas of co-ethnic and other minority groups, and this also influences the composition of their social network, which is a very important channel for getting jobs; and the kind of jobs depends on the composition of the network. Previous studies show how physically close networks are key channels for finding a job for ethnic minorities. However, they are not always the most effective way of finding just any job, or one of high quality, and their effectiveness varies greatly among

different ethnic groups (Clark and Drinkwater 2002; Frijters et al. 2005; Battu et al. 2011; Patacchini and Zenou 2012).

Typically, studies on ethnic minority disadvantages in the labour market, compare ethnic minorities' outcomes with the outcomes of the white majority population. However, while the white majority group seems to be the most appropriate comparison group, there might be a problem of lack of similarity in the two groups in terms of their observable and unobservable characteristics, making this comparison invalid. Crawford et al. (2010) show how this is the case in the Great Britain by using and comparing different parametric and semi-parametric methods in the context of benefit claimants. Their results are sensitive to the method used and, when controlling for pre-inflow characteristics, raw penalties between the two groups (inter-married and co-married ethnic minorities) disappear. Previous results seems hence to be given by their assumptions due to the parametrisation of the methods used. A recent branch of economics and sociology has suggested another method to look at labour market disadvantages of ethnic minorities. This literature tries to approximate social integration of ethnic minorities with their partners' ethnicity (Furtado and Trejo 2012). This literature is relatively young because the phenomenon of inter-ethnic partnerships is quite new but increasing. In 1991 in the UK they made up 1.3% of all unions (Berrington 1996) and Census data of 2001 and 2011 show that this has increased to 7% and 9% of all unions, with the large majority of these partnerships involving a white majority person (CoDE 2012; ONS 2014). In defining what an inter-ethnic partnership is, some papers focus on unions among immigrants and natives, while others focus on unions between a member of an ethnic minority group and a member of the majority population. This choice is driven by the institutional national context of the country studied. Our favoured approach is the latter, as in Muttarak 2011, because in the UK a lack of integration and disadvantages in the labour market are not only peculiarities of the migrant population but also, in different degrees, of the whole ethnic minority population.

All these studies consider partners choice as an endogenous issue probably influenced by characteristics that are unobservable by researchers. Observable and unobservable traits of the individual might possibly affect both the choice of the partner and labour market outcomes. For example, an individual with certain features might be more likely to end up in an inter-ethnic partnership and at the same time, these qualities might help them to be more successful in the labour market. In this case estimates of the effect of majority partner will be overestimated or positively biased. In order to account for these problems, the studies on inter-ethnic partnerships and labour market outcomes use local marriage market ratios (by combining sex, ethnicity, and age distribution at a certain geographical level) as exclusion restrictions or instrumental variables for the likelihood of getting in an inter-ethnic partnership. All these methods (IV regression, GLS, 2SLS, Heckit, bivariate probit) are parametric and hence they rely on very strong assumptions like the fact that the instrumental variable is properly identified, and that the standard errors have a specific distribution or a jointly binary distribution between the selection and the outcome equations.

Meng and Gregory (2005) in Australia, Meng and Meurs (2009) in France and Muttarak (2011) in the UK find a positive effect of inter-ethnic partnerships on earnings and occupational mobility respectively. In the United States, Furtado and Theodoropoulos (2010) find a positive effect of inter-ethnic partnerships on immigrants' employment rates, while Kantarevic (2004) finds that there is no earnings premium for those immigrants in a relationship with a native. Among the above papers, only two explicitly consider the role that language and networks play in integration through having a partner of the majority group. Meng and Meurs (2009) find that

immigrants with a strong base in the native language and who are in a partnership with a native fair better in the labour market (in terms of earnings). This might suggest that French speaker immigrants profit better from a partnership with a native. Furtado and Theodoropoulos (2010) find that networks obtained through marriage with a native explain the higher employment rate of immigrants in this kind of partnership. Finally, Gevrek et al. (2013) find some evidence of different socio-cultural attitudes between intermarried and non-intermarried families by looking at the labour supply of their daughters in Canada. They show how daughters of inter-ethnic partnerships are less likely to be influenced by the original culture of the migrant parent in terms of their labour supply than second generation women with co-ethnic (both-migrant) parents. This evidence provides an insight in the fact that inter-ethnic partnerships have an impact on the labour supply of women through cultural adaptation to the majority culture.

To capture the effect of the partnership on ethnic minority outcomes, one should take into account the role that assortative matching plays in the selection into the partnership. The assortative matching literature starts with Beckers 'Theory of marriage' (1973) and since then, it has been mainly related to the labour market outcomes of individuals. The main idea is that being two is better than one: being in a partnership improves the utility of the individual and their partner compared to what it would have been like if both were single. The focus of the analysis is on the role of the characteristics of individuals and their combination, or matching, in the marital union formation. This last point is mainly explained by comparative advantages and specialisation. Since, for example, womens wages are on average less than their husbands' (comparative advantage), men tend to go to work while women stay at home (complete specialisation). As a result, both are better off. However, empirical literature has found that there is no clear evidence on the direction of the matching, especially for labour market traits. In fact, different papers have found that these traits are positively correlated (Smith 1979; Zimmer 1996; Lundberg and Pollak 2003; Zhang and Liu 2003). In order to explain this, Lam (1988) introduces the importance of the demand of household public goods in the matching process. He theorises that, beyond the mechanism described by Becker, there are public good economies in the household. Hence, the fact that spouses have similar demands for public goods promotes positive assortative matching on wages. This effect and its magnitude, however, must be balanced with the gain from the household division of labour. Linked to this approach, several papers emphasise the relevance of the probability that similar people tend to meet. The main explanation, driven by sociological theories, is that society is stratified and hence interactions are not random but occur inside certain strata. These strata construct and limit the people that one could meet and hence the possible partners that one could choose. These studies especially look at educational matching and the role played by some local market variables like sex and age ratios, and the average educational level of an area in providing a range of possible partners (Boulier and Rosenzweig 1984; Lewis and Oppenheimer 2000; Schwartz and Mare 2005; Shafer and Qian 2010; Furtado 2012). Here, the characteristics of individuals are considered alongside macro-level aggregate characteristics of the individuals area of residence.

Several studies in the United States (Chiswick and Houseworth 2011; Furtado and Theodoropoulos 2011; Furtado 2012) find that individuals are more likely to marry inside their ethnicity, and they choose to marry with someone of another ethnicity when there is scarce availability of possible partners with suitable characteristics in their own ethnic group. In particular, disparity in ones own education and the average education of ones own ethnic group is considered as a push factor to marry someone of another ethnicity but with a similar education. In the literature on the formation of inter-ethnic partnerships in the UK, the main finding is that different ethnicities have a different likelihood of ending up in this kind of partnership even after controlling for many

different characteristics (Platt 2009; Voas 2009; Muttarak and Heath 2010). White British and South Asian ethnic groups are generally those with the lowest rates of inter-ethnic partnerships, while Caribbean, mixed, and white ethnic groups other than British are those with the highest rate. Differences in gender within the same ethnic group have also been found to be important (e.g. Chinese women have a higher rate of intermarriage than Chinese men).

3 Theoretical and empirical framework

In this section we explain our contribution to the literature, the hypothesis that we will verify, the identification strategy and the empirical method, its strength and its drawbacks.

3.1 Theoretical hypotheses and identification strategy

Linked to the importance of language proficiency we have previously discussed in the literature, our first hypothesis is that, for an ethnic minority individual, having a white majority partner influences his or her integration into society due to the attainment of English language proficiency. This implies that the lower the initial, pre-partnership English proficiency level, the greater the benefit of having a partner whose first language is English. However, it can also imply that those with pre-partnership English proficiency profit better from a partnership with a native. Hence, we take into consideration both hypotheses, and we test them by analysing two sub-samples: those whose first language is English and those for whom it is not.

Secondly in line with the findings of different degrees of penalties among generations of migrants, we also implement our model separately for 1.5 plus generations (which we define as those born in the UK and those not born in the UK but that arrived in the UK at an age smaller or equal to 14) and the latter are sometimes referred to as first generation (where we consider all immigrants that arrived in the UK at an age older than the 1.5 generation) so that we can ascertain whether pre-partnership integration has a particular relevant role in this context.

Then, we assess the social network hypothesis. People often acquire information about jobs via their social networks comprising mainly of co-ethnic members. Those in inter-ethnic partnerships may have an enlarged social network as a result of combining two (ethnic) social networks. Although we do not have a proper measure of social network, we do have information about whether the individuals are living in a non-LDA. We will use this as a crude proxy of social connections, accepting that their actual social networks are not likely to be restricted to their residential areas. These areas are too small to approximate the entire kind of network that a person has. However, they do indicate that the person is living in a zone with a high concentration of non-white, possibly co-ethnic, minority groups. Hence, when restricting the analysis to these areas, we are comparing members of ethnic minority groups who are in greater contact with the minority population. The sample of individuals living in LDA is too small to implement any analysis. However this is not relevant because we assume that in LDA both EM in co- and inter-ethnic partnerships have contacts with the white majority population. Instead we are interested in non-LDA, where we expect that a possible difference in outcomes could be driven by different ethnic composition of social connections between people in inter- and co-ethnic partnerships. This is because a person in an inter-ethnic partnership always has access to majority population networks (through their white majority partner), while for a member of a minority group living with other members of minority groups it might be less common. Network composition and its diversification is a relevant issue for labour market opportunities since it has been found that

characteristics of network members are of particular importance for labour market opportunities. For example, networks with high numbers of employed people are associated with a higher probability of employment (Blau and Robins 1990; Calvmengol and Zenou 2005; Furtado and Theodoropoulos 2010), and larger networks can increase labour market opportunities (Gang and Zimmermann 2000). When we consider non-LDA, we should remember that it has been shown that living in co-ethnic areas is associated with a higher persistence of the culture and social norms of the original ethnic group, with lower custom adoption and lower English fluency (Modood et al. 1997; Van Tubergen and Kalmijn 2005). Lower English fluency has also been found to be a determinant of ethnic penalties in the labour market (Lindley 2002; Shields and Price 2002; Dustmann and Fabbri 2003).

As robustness checks, we apply the same model also to the subgroups of all ethnic minorities excluding Irish (because it could be argued that this ethnic group is very similar in several aspects to the white majority group) and of the subgroups of only white and only non-white ethnic minorities (to discern the role of discrimination in this context).

Before implementing the propensity score matching analysis we apply several logistic regressions for three main reasons. Firstly, to model the best specification for self-selection into inter-ethnic partnerships for the propensity score matching analysis. We estimate the probability of being in an inter-ethnic partnership versus a co-ethnic one using a logistic regression where D^* is the latent or unobserved outcome, so that: $D = 1(D^* > 0)$. The first two specifications (1 and 2; results reported in Tables 1 and 2) pertain to this first objective so only include characteristics that are not likely to be influenced by union type, such as age and whether parents are of different ethnicities. In the first of these models, we include only individual characteristics; in the second model we also include characteristics of the partner (only those that are not influenced by the partnership). This last specification, (2), represents the preferred model for the propensity score.

Secondly, to see whether we can find specific differences in multivariate regression which are consistent with our interpretation of inter-ethnic partnerships as an indicator of integration of ethnic minorities in British society. In model 3, alongside the covariates of model 2, we include individual and environmental factors that may have been affected by the partnership, such as socio-economic occupation of the partner, residential area and political orientation. In this model we want to ascertain whether and in what way co- and inter-ethnic partnerships differ. More precisely, we are interested in the significance and direction of various estimated parameters in light of the association with inter-ethnic partnerships and labour market outcomes. Results are shown in Tables 1 and 2 and discussed in section 5.1 and 5.2 respectively.

Thirdly, to investigate the main channels through which partner ethnicity can influence labour market outcomes of ethnic minorities without considering self-selection in the partnership. Here, the dependent variable is being in an inter-ethnic partnership and the covariates are the same of those in model 2, in which we gradually introduce the activity status and the occupations of ethnic minority individuals and their partners (average marginal effects reported in Table 3). We then estimate the effect of inter-ethnic partnership dummy and the same covariates as in model 2 on different labour market outcomes. More specifically, we implement logistic regressions on: the probability of being employed versus unemployed and on the probability of being employees versus self-employed for men; on the probability of being active in the labour market for women; and, on the probability of being in the highest occupations compared to the lowest for both men and women separately. Finally, we also implement multinomial logit on 4 strata of occupations, again separately for men and women. We finally estimate a model

in which the dependent variable is earnings for all individuals who are employed (excluding those self-employed) as a complementary analysis to the models on occupational choices. By doing so we can establish whether there is any correlation between the fact of being in inter-ethnic partnerships and labour market outcomes, and we can investigate whether the striking differences between ethnic minority labour market outcomes in co- and inter-ethnic partnerships still persist after accounting for an important set of both partners' characteristics within the union. Results concerning these regressions are shown in tables 3, 4, 5, and 6 and discussed in section 5.3.

3.2 Implementation of PSM

In order to determine whether the ethnicity of the partner plays a role in the ethnic minority labour market outcomes, we use propensity score matching (PSM) techniques. We think there are two main reasons why propensity score matching is the best method we can implement. Firstly, there is the structure of the causal problem we are questioning, and, secondly, there is the richness and quality of our data. In our analysis the treatment is having a white majority partner versus a co-ethnic partner, and the outcome is a particular binary labour market trait of a member of an ethnic minority group. PSM allows us to control for the selection into the kind of partnership exclusively based on the observable characteristics, in this way removing all bias generated by differences in observable factors among the two groups (Imbens 2004) - as we will see in section 5, ethnic minority individuals and their partners importantly differ in several observable characteristics. This is because by conditioning on the propensity score we compare similar observations in the treated and control group with respect to their likelihood of being in an inter-ethnic partnership. We hence match observations of individuals who are very similar in their observable characteristics except for the fact that those in the treated group have a white majority partner and those in the control group have a co-ethnic partner. We now describe the framework in which we implement the propensity score matching in a more detailed way. [1]

In the empirical analysis we first model the self-selection into an inter-ethnic partnership in order to build the propensity score. An individuals choice of partner is determined by considering the matching of their characteristics. Hence, individual i chooses partner j that maximizes his or her utility:

$$U_i = f(Z_i^j, \epsilon_u), \tag{1}$$

Where Z_i^j indicates the observable characteristics of individuals i (who is a member of an ethnic minority group) and j, his/her partner (who could be someone of the same ethnic minority group or a white majority person) and ϵ_u indicates unobserved characteristics. By considering both the characteristics of the individual and of the partner we can in fact approximate assortative matching. In the specification of the propensity score we consider those features that simultaneously influence the likelihood of being in an inter-ethnic partnership and the labour market outcome variables. Importantly, these variables are not affected by the partnership itself (Caliendo and Kopeinig 2008). We assume that individuals end up in an inter-ethnic partnership when the utility of a match between individual i choosing partner j passes a certain threshold (which we normalise to zero), i.e. when:

$$D_i = I(U_i > 0) \tag{2}$$

[1] This framework is based on Ichino et al. (2008).

Our labour market outcomes of interest are all dummy variables (e.g. whether someone is in the highest occupational position). They are functions of observed (X) and unobserved variables (ϵ), and they can be conceptualised as:

$$Y_1 = g_1(X_i^j, \varepsilon_{Y1}); Y_0 = g_0(X_i^j, \varepsilon_{Y0}) \tag{3}$$

where Y_1 is the outcome of the treated group and Y_0 is the outcome of the control group. We hypothesis that X and Z correspond so that:

$$W_i^j = (Z_i^j, X_i^j) \tag{4}$$

Hence, in order to estimate the probability of being in the treatment group given the observed covariates we implement a propensity score (in this way we deal with the dimensionality problem). Instead of conditioning on W, we condition on $p(W)$, which estimates the conditional probability of being in an inter-ethnic partnership: $P(D = 1|W)$. This is estimated with a logistic regression on inter- versus co-ethnic partnership.

$$D_i = 1(D_i^* > 0) \tag{5}$$

Here, we use several variables related to demography, information on the socio-economic situation and on the ethnicity of the native family of both partners, characteristics related to ethnic minority status per se of the ethnic minority person (e.g. language, generation of migration...), and we control for the duration of the partnership itself (u). Hence, our empirical model for the propensity score is specified as below:

$$D_i^* = W_i^j \beta + u\gamma + v_i \tag{6}$$

After estimating the propensity score and matching the observations, to assess the outcomes of interest we ascertain the average treatment for treated (ATT), which is:

$$E(Y_1 - Y_0 \mid D = 1) \tag{7}$$

In this way we can see whether having a white majority partner makes a difference in the labour market outcomes for those in an inter-ethnic partnership.

3.3 Plausibility of PSM assumptions and our strategy to deal with them

Propensity score matching is a nice and intuitive method, however it relies on two important identifying assumptions. These are the weak overlap condition and the unconfoundeness for controls or conditional independence assumption (CIA). The former states that in the comparison group we always observe persons to match with persons in the treated group. In other words, ethnic minority people in co-ethnic partnerships should be similar in their observable characteristics to ethnic minority people in inter-ethnic partnerships. Unlikely the CIA, this assumption is testable and it is fulfilled in our analysis (we report the number of observations in the common support in tables 7-14). The CIA states that for those in the comparison group, once we condition on the observable variables, we do not observe any relevant differences with the treated, $Y_0 \perp D_i \mid W_i^j$. In other words, CIA states that conditional on all pre-partnership covariates, potential labour market outcomes are independent of treatment assignment (whether being in

an inter-ethnic partnership). We strongly believe that we have a rich set of pre-treatment (pre-marriage or pre-cohabiting) control variables.[2]

However, we agree that the unconfoundeness assumption is still a strong one, especially in our case where we are trying to model selection in interpersonal relationships. Hence, we try to hypothesise in which directions our results might be biased given the existence of a possible unobserved confounder or hidden bias. The observed effect of partner's ethnicity on labour market outcomes of ethnic minorities, may be possibly biased if those unobservable characteristics that make an individual more likely to get into an inter-ethnic partnership have a positive impact on their labour market outcomes. A possibility might be that an ethnic minority person is very willing to integrate into the British society, hence that person works very hard to fare in the labour market and at the same time, this attitude make him/her more prone to have a white majority partner since he/she is less emotionally attached to his/her cultural background. However, this assumption seems very strong and in a certain sense it implies that ethnic minority individuals in co-ethnic partnerships are less willing to be successful in the labour market and that having a non-traditional (white majority) partner means being less attached to his/her own culture of origin. Furthermore, Meng and Gregory (2005), Meng and Meurs (2009), and Muttarak (2011) found that some characteristics who make a person more likely to ending up in an inter-ethnic partnership are at the same time negatively correlated with achieving a better occupational position, so that selection into inter-ethnic unions contribute negatively to their occupational status. Muttarak (2011) explains this result for England and Wales by hypothesising that, while ethnic minority individuals which are inter-married enhance their social capital thanks to their partners' ethnicity, they are less ambitious or materialistic than their co-ethnic partnered counterparts. If this is true, we expect our estimates to be downward biased. However, to check the robustness of our results to the presence of possible unobservable features, we implement a sensitivity analysis and we re-estimate the ATT with a different propensity score specification (section 5.4).

Given the method that we are using, we implement several sample selections. The aim of these selections is mainly to try to mimic the situation of an experiment by comparing as similar as possible individuals. Firstly, we consider individuals that face the same marriage market. This is an important point since we have to be sure that the individuals faced the same opportunities and the same socio-cultural and institutional environment with respect to the probability of getting the treatment, which is getting in an inter-ethnic partnership (Heckman et al. 1997; Michalopoulos et al. 2004). Hence, we restrict our sample to those migrants that created their partnership after their arrival in the UK. In this way, the marriage market that our sample faces is culturally similar because it is restricted to the same country. Secondly, we deal with the timing of the start of the partnership with respect to the labour market situation that we observe the individuals to be in. It is clearly possible that individuals meet their partners in the workplace, and their labour market choices might affect the likelihood of being in an inter-ethnic partnership if, say, some occupations have a particularly high concentration of white majority workers. To reduce the instances of reverse causation (where the choice of occupation affects the choice

[2] As the literature in section 2 suggests, a partners choice is already conditioned on the fact that environmental and institutional situations matter in terms of the possible partners that can be met. From this, it results that possible partners are not randomly met, and, that the choice of the actual partner not only depends on the characteristics of the partner but also on their characteristics compared to the other possible partners met (so that the choice of j is not in absolute terms but in relative terms). Since we do not have longitudinal data that inform us of the residential movements pre- and post-partnership, we consider these environmental conditions as given. However, because we have information on both partners within each couple we do not consider that this is a relevant problem in the specification of our model as some of these factors are most likely embodied in the match of partner characteristics (e.g. positive assortative matching in education).

of partner), we restrict our sample to individuals from ethnic minority groups in partnerships which began at least one year before the person started his or her current job (or before becoming unemployed or inactive in the case where we observe a transition from in work to unemployment or inactivity status). For those who have always been unemployed or inactive we do not impose this restriction. This is possible because our survey is very rich in data concerning time. The date of the start of the partnership (which is missed in other important surveys, like the LFS) is a very useful piece of information in our study. It permits us to control for the duration of the partnership itself, to consider only those partnerships that started after migrants came in the UK and only those for which the actual job is subsequent to the partnership formation. In the last case, however, we do not know whether the previous job was in the same socio-economic classification as the current one. This is an important limitation that could undermine the validity of our results, which, hence, will be take into account when interpreting the results.

3.4 Some technical details

When applying PSM, in order to use the most appropriate weighting approach it is important to understand whether the treated population in the sample might be over- or under-represented (Frlich 2004; Smith and Todd 2005; Heckman and Todd 2009). Given the sampling strategy of our sample we consider it as a choice based-sample. In fact, in our case, the sample of ethnic minorities is non-random although the sampling method is random or a probability sampling. This is because the ethnic minority boost sample of the UKHLS has been selected by excluding sectors with low minority populations and by selecting addresses using fractions that over-sample areas with high densities of the scarcest groups (Berthoud et al. 2009). As a result, in the following analysis the population living in areas of high concentration of ethnic minority groups (non-LDA) is over-represented. Consequently, the treatment group is probably under-represented. Inter-ethnic partnerships are indeed more likely to live in LDA, which are under-represented in the sampling strategy of the minority boost sample. Following Heckman and Todd (2009), we hence use the single nearest-neighbour algorithm and match on the odds ratio of the propensity score. The single nearest-neighbour algorithm maintains the ranking of the neighbours so that the estimates from matching on the odds ratio and on the unknown correct propensity score (with true sample weight) are the same. This is given by the fact that the odds ratio is a monotonic transformation of the propensity score.

To implement a good quality matching performance we also specify several options. We restrict our analysis to the common support so that we only consider the region where the propensity score densities of inter- and of the co-ethnic groups overlap. We impose a calliper (of 0.05 and 0.10 separately for each match) to restrict the distance between treated and control observation and avoid bad (too distant) matches. Since we have a relatively high number of ethnic minority individuals in co-ethnic partnerships, we opt for the non-replacement option (each observation of the control group is considered only once) to decrease the variance of the estimator (Smith and Todd 2005). Hence, we make sure that ordering is randomly done before implementing the matching since the estimates with non replacement depend on the order in which observations get matched (Caliendo and Kopeinig 2008). Finally, we do not use bootstrap because of its invalidity with the kind of algorithm we use, as proved by Abadie and Imbens (2008). To assess the matching quality we use the standardised mean bias, the pseudo-R squared, and the p-value of the chi-square test (all reported in tables 7-14). The first one was introduced by Rosenbaum and Rubin (1985) to evaluate the distance in marginal distributions of the covariates. While before the matching this value is normally high, after the matching it is

usually seen sufficient to be below 5% for the matching to be considered of good quality - even if for matching in sub-groups of individuals it is also accepted to be up to 7% (Caliendo 2006). The pseudo-R squared is derived by the re-estimation of the propensity score on the matched sample, so that it indicates how well the regressors explain the probability of ending up in an inter-ethnic partnership. The chi-square test indicates that we have a good quality matching if before it the covariates were jointly significant in explaining the likelihood of being in the treated group and after the matching they are not.

When the overall balance is unacceptable, as indicated by the measures just discussed above, we conclude that ethnic minority people in co- and inter-ethnic partnerships that we want to compare in a particular sub-group are too different, and, so, our research question becomes irrelevant. This is because the *what if* question we want to investigate, what if an ethnic minority has a white majority partner compared to a co-ethnic one, does not make sense if the person in a co-ethnic partnership is completely different from the person in an inter-ethnic relationship on their key personal traits. The identification strategy underlying PSM requires that the two groups are comparable in their observable (and ideally unobservable) characteristics. Being able to see whether the groups we are considering for the comparison are actually comparable is one of the main advantages of the PSM technique with respect to other traditional empirical methods such as regressions. Finally, to perform the PSM we use the programme written by Leuven and Sianesi in STATA. [3]

4 Data and descriptive statistics

In this section we explain the composition of our sample, the choice and the building of the dependent and independent variables. We finally report and go through their descriptive statistics.

4.1 Sample

We use data from the first wave of Understanding Society (UKHLS), 2009/2010, because of its vast array of questions across different aspects of a person's life, including their socio-demographic characteristics, labour market activities, partnership and fertility patterns and has an ethnic minority boost sample of approximately 4,000 households. The large sample size and the ethnic minority boost sample enables us to analyse inter-ethnic partnerships. In this way, we bring up to date the inter-ethnic literature in the UK by using the most recent data. We restrict our analysis to opposite sex couples that are legally married or in cohabiting partnerships. We consider members of ethnic minority groups as being in a co-ethnic partnership when their partner belongs to the same ethnic group as their own ethnic group, and we consider them to be in an inter-ethnic partnership when their partner is of the white majority group (defined below).

The definition of ethnicity that we use here is based on a self-reported 2011 UK Census of ethnic group classification (see A1 for a description of ethnic group categories). We categorise those who report their ethnic group to be white-British/English/Scottish/Welsh/Northern Irish as white majority. We restrict our analysis to the following ethnic minority groups: Other white categories (which includes those who report their ethnic group as 'White: Irish' and 'White: Any other white background'), Caribbean, Indian, Bangladeshi, Pakistani, Chinese and African.

[3] E. Leuven and B. Sianesi. (2003). 'PSMATCH2: Stata module to perform full Mahalanobis and propensity score matching, common support graphing, and covariate imbalance testing". http://ideas.repec.org/c/boc/bocode/s432001.html. Version 4.0.6, 17th May 2012.

We are excluding ethnic minorities in a partnership with a partner of a different ethnic minority group as we are specifically interested in understanding how having a partner from the majority group influences labour market outcomes of ethnic minorities through several channels (e.g. language, social connections). Such unions between two individuals of different minority ethnic groups are a very small proportion (9%) of all inter-ethnic unions. Since we are interested in labour market outcomes (employment and occupational choice), we restrict our sample to those who replied to the question "Which of these best describes your current employment situation?" with the responses: self employed or in paid employment (full or part-time), unemployed and looking after family or home. That is, we exclude those who are retired, students, in training and long term sick or disabled. Below follows a precise description of the covariates and the outcome variables used in this study.

All these other sample selections, added to those described in section 3.3, affect the size of our sample, which is composed of 629 men and 706 women. However, small sample size should not be a problem. Pirracchio et al. (2012) show through some Monte Carlo simulations that, conditional on the right specification of the PS model, both in case of small study sample (they decrease their sample from 1,000 to 40 subjects) or low prevalence of treatment, PSM and inverse probability of treatment weighting can yield unbiased estimations of treatment effect. By trying different specification of the PS model, they also argue that the optimal one should include true cofounder and the variable related only to the outcome.

4.2 Control variables

Our control variables are relevant for both self-selection into an inter-ethnic partnership and labour market status of ethnic minorities. We initially present the covariates that are used in the propensity score. These are selected by considering the fact that we observe couples who have been in partnerships for varying lengths of time. As we do not measure all variables at the beginning of a partnership, some time-varying characteristics may be affected by the choice of partner, and so the covariates we will include in the specification of the propensity score have been chosen (or built) such that it is not possible that they are influenced (changed) by the partnership itself. These are:

- Age: Age is measured at the time of interview.
- Ethnicity: Based on the 2011 UK census ethnic group question (see section 4.1 for further details).
- Education: None, GCSE, A-Level, and university degree and other higher education.
- Migrant generation: Here we consider both whether individuals were born in the UK and the years since arrival (YSA) if born outside the UK. This last element is important for capturing the experience in the labour market. Hence, we have the following categories: ethnic minorities born in UK; ethnic minorities born outside the UK but arrived in the country at an age young or equal 14; migrants arrived in the UK after they were fourteen and staid in UK for maximum 5 years; migrants arrived in the UK after they were fourteen and staid in UK between 6 and 10 years; migrants arrived in the UK after they were fourteen and staid in UK for more than 10 years.
- Whether English is the first language: This is a 0-1 indicator variable.

- Whether the parents of the respondent were of different ethnicities: This is used to proxy an individuals perception on co-ethnic unions. It is meant to capture view and preferences on mixed partnerships.

- Parents occupation: This is based on the questions: 'Was your mother working when you were 14?' and 'What job was your mother doing at that time?' and the same for the father. We approximate the socio-economic position (using SOC-2000 coding) of parents by considering the highest position among parents. We created a dummy equal to 1 to indicate the highest job group (managers, senior officials, professional occupation, associate professional and technical occupations) and 0 otherwise. Furthermore, to account for inconsistencies in coding frames for occupations across different countries, we interact this variable with a dummy indicating whether the respondent at the age of 14 was in the UK. In fact, comparisons across different countries can be misleading since, for example, a migrant could have had a higher socio-economic status in the country of origin than in the UK.

We implement logit estimates for the likelihood of ethnic minority persons being in inter-ethnic partnerships to test whether being in a partnership with a white majority person is a proxy for the degree of integration into British society which could directly influence labour market outcomes (Section3.2). We also do this to identify the channels through which such partnerships affect occupational position of ethnic minority persons. The following are additional variables we include as covariates in those models and/or that we use in the descriptive summary. These variables may be changed because of the nature of the relationship itself, like residential area and socio-cultural characteristics. These are:

- Duration of the partnership: Measured by year, this indicates the 'strength' of the relationship and hence the potential influence that one partner has on the other person. It measures years of cohabitation, years of marriage, or years of cohabitation and marriage for those that cohabited before marrying.

- Cohabitation: This is a 0-1 indicator variable with 1 indicating whether the partnership is non-marital cohabitation and 0 if it is a marriage.

- Region of current residence: England (excluding London), London, and, Wales, Scotland and Northern Ireland.

- LDA (low density area): It is a 0-1 dummy variable indicating whether the person lives in a postal sector with an estimated share of non-whites less than 5%.

- Whether belonging to a particular religion: Not religious, Christian, Muslim and other religion. Due to high collinearity between type of religion and ethnic group, in the regressions we use a 0-1 dummy variable indicating whether the individual is religious at all.

- Political orientation: None, Labour, Conservative, and other. Here we combine different questions in the survey asking which party you would vote for tomorrow and which party you feel the closest to.

- Importance of being British: Variable measuring high importance of Britishness and derived from the question: '[...] how important is being British for you? Enter number from 0 to 10' and split in the following categories: high, not high and missing (this question was not asked to the whole sample).

- Partners activity status: whether employed in these types of jobs: larger employers, higher management/professional; lower management/professional, intermediate; small employers, own account, lower supervisory, and technical; semi-routine and routine; whether unemployed; whether looking after family/home; and other (retired, on maternity leave, full-time student, long-term sick or disabled, on a government training scheme, doing something else).

- English difficulties: Respondents for whom English is not the first language are asked a series of questions on English language difficulty including one which asks about whether they have "...any difficulty speaking English to people for day to day activities such as shopping or taking the bus". This is quite a specific question compared to whether they find it difficult to generally express themselves without a given context. By using this information, we create a variable that is divided into the following three categories: English as the first language, English is not the first language and they do not have any difficulties speaking English, and English is not the first language and they have difficulties speaking English. While it is possible that an individual has a white majority partner because she has a good level of spoken English (as it is broadly defined by the question on difficulty with speaking) we cannot exclude the possibility that the reverse may also be true, i.e. their lack of English language difficulty is due to having a white British partner. Because of the high explanatory power of this variable on the type of partnership we will not include it in the regressions. In fact, as tables A3 and A5 show, all language difficulties are reported by ethnic minorities in co-ethnic partnerships. This is a clear sign that language matters when associated with partner ethnicity.

From the descriptive tables A2-A5 we can see that characteristics of partners differ between the two kinds of partnerships in several dimensions for both men and women. Both partners in inter-ethnic partnerships are more educated and white majority partners are more likely to be employed in the highest occupations. Furthermore the large majority of ethnic minority in inter-ethnic partnerships are white Irish or Other white and they mainly live in areas with low density of non-white ethnic minorities. In fact, most of them live in England (London excluded), while the majority of co-ethnic partnerships live in London. Most of inter-ethnic partnerships are composed of individuals who were born in the UK and, in a smaller part, of individuals that were not born in the UK but that have been living in the UK for more than 10 years. So, it is not a surprise that we find that they mostly have English as the first language and when it is not the case they do not find any difficulties in speaking it. The two groups differ also in the socio-economic and cultural background. Forty-four (forty-six) percent of women (men) in inter-ethnic partnerships have a high socio-economic background, while the percentage decreases to 30% for women (27% for men) in co-ethnic partnerships. While 20% of women (21% of men) in inter-ethnic partnerships have parents from different ethnic groups, only 7% of women (6% of men) in co-ethnic partnerships share the same characteristics. After noticing all these differences in their socio-demographic characteristics, we expect to find large difference in their activity status and occupations (as we will see in the next section). The question is how much of these are explained by their differences in their observable features, and how much by the 'benefits' acquired by having a partner from the white majority population.

4.3 Labour market outcomes

We are interested in estimating the effect of having a partner belonging to the white majority population on several labour market outcomes. We construct the occupational outcome by combining the classes of national statistic socio-economic classification (NS-SEC) and the

answers given regarding their main activity status (described above in Section 4.1). The former is a widely used measure developed from the sociological classification called the Goldthorpe Schema (Erikson and Goldthorpe 2002; Goldthorpe and Jackson 2007). From this, we categorise 4 ordered occupational categories for employed persons: 1) large employers, higher management and higher professional; 2) lower management, lower professional and intermediate; 3) small employers, own account, lower supervisory and technical; and, 4) semi routine and routine. The other categories we create are: 5) unemployed; and 6) inactive (which is looking after family or home). Since all these states are not on the same decisional level, we consider different situations (outcomes). For example, we look at the probability of being an employee or being self-employed conditioning on working. Or, again, we investigate the probability of being outside the labour market (inactive) compared to being employed (employees or self-employed) or looking for a job (unemployed). This is because the rationale behind the decision is based on the will to work or not work. Furthermore, for certain specifications we exclude the self-employed population because it is quite different -especially in terms of reported earnings - from the population of employees. Finally, for inactivity, unemployment, and self-employment we consider only one gender because these issues are more relevant for one gender (as the literature on ethnic minority penalties shows and as we can also see from our data in the descriptive table).

More specifically, the outcomes we study here are related to whether the individual is employed and participate in the in labour market force at all:

- Whether ethnic minority men are employed (employees and self-employed) vs. unemployed;
- Whether ethnic minority women are active (employees, self-employed and unemployed) or inactive in the labour market.

  And, conditional on the participation in the labour force, we also study:

- Whether ethnic minority men are self-employed or employees;
- Whether ethnic minority persons that are employees are more likely to be in the highest occupational positions (large employers, management, professional or intermediate) rather than the lowest (small employers, lower supervisory, technical, and semi-routine, routine);
- Whether ethnic minority persons that are employees are more likely to be in a particular occupation (e.g. high professional).

From Figure 1, we notice that, on average, ethnic minority persons in inter-ethnic partnerships are significantly different in the distribution of their socio-economic status from ethnic minority persons in co-ethnic unions. For both ethnic minority men and women, the proportion of those in inter-ethnic partnerships employed as high managers, professionals and intermediates (62% of intermarried men and 63% of intermarried women) is almost twice that of those in co-ethnic partnerships. In particular, 48% of women and 30% of men in inter-ethnic partnerships are concentrated in the management, professional and intermediate category. Another striking difference between co- and inter-ethnic partnerships regards inactive women: 28% of women in co-ethnic partnerships look after home or family, while this percentage halves for intermarried women (14%). Since some of the outcomes include self-employed workers, it is relevant to see where those workers are mostly concentrated and whether there is any difference between inter- and co-ethnic partnerships. Seventy-two percent of self-employed men in co-ethnic partnerships and 59% of men in inter-ethnic partnerships are in the 'small employers, own account, lower supervisory and technical' category. However, there is not much difference in self-employment occurrence between intermarried and non intermarried men (20% and 21%, respectively). Also for women we do not notice any relevant difference in this regard.

5 Results

This section describes the results of the logistic regressions (5.1-5.3) and those of the PSM (5.4).

5.1 Determinants of being in an inter-ethnic union

In Model 1 (see Tables 1 and 2), for both men and women the main determinant of being in an inter-ethnic partnership is the ethnic group. More precisely, all ethnic groups, except Irish, are less likely to end up in an inter-ethnic partnership compared to 'other white'. For women, having English as a first language is an important determinant of being in an inter-ethnic partnership, while for men this element is not statistically significant. For men, being born in the UK is an important determinant, which is positively correlated with being in an inter-ethnic partnership. Having higher education is another important determinant, both in magnitude and statistical significance. Having parents from different ethnic groups is also a positive determinant of having a white majority partner.

When introducing partner's characteristics (Model 2), the magnitude of the average marginal effect and its statistical significance do not change much for both men and women compared to the previous model. For men we find that their white majority partners are mainly from privileged socio-economic backgrounds. For women, they are less likely to have any qualifications at all, and their higher qualifications are A-levels, and they are less likely to have parents of different ethnic groups.

5.2 Differences in changing-over-time characteristics between co- and inter-ethnic partnerships

We introduce characteristics that may be affected by the partnership itself in Model 3 in Tables 1 and 2. The fact that the introduction of these does not importantly affect the results of the first two models indicates that the specification of the propensity score is quite good and depicts the main determinants influencing the likelihood of ending up in an inter-ethnic partnership. White majority partners of ethnic minority men and women are less likely to be religious than co-ethnic partners. Another important element positively associated with inter-ethnic partnerships is that, unsurprisingly, they live in areas with a low density of non-white population (13/18 percentage points less likely compared to co-ethnic partnerships).

5.3 Correlation of being in an inter-ethnic union and labour market outcomes

When introducing the activity status and occupational selections of ethnic minorities and their partners in Model 2 (see Table 3), the main determinants of ending up in an inter-ethnic partnership do not change much and the ethnic group still plays a predominant role. There is a positive correlation between being in an inter-ethnic partnership and being inactive for men, while, for women, having a white majority partner is negatively correlated with working as small employers, own account, lower supervisory, and technical. For men we also find that their white majority partners are less likely to work in semi-routine and routine jobs and to look after the

family or home.

From the models where we have some labour market outcomes as dependent variables (tables 4-6), we see that: for men, being in an inter-ethnic partnership is not correlated to whether they are employed. If they are employed it is correlated to whether they are self-employed rather than employees or in certain occupational positions (Table 4). Hence, once controlling for different socio-demographic characteristics of the ethnic minority person and his partner, the striking differences noticed in the raw data, especially in socio-economic occupation, disappear. For example, ethnicity, seems to be the major determinant of being self-employed. Being an immigrant and living in the UK for more than 10 years (compared to being born in the UK) and having English as the first language are the major determinants of unemployment. For ethnic minorities who work as employees, higher education, being born in the UK, having English as first language, having a partner with a high socio-economic background and with a qualification are all positive determinants of being in the highest occupational positions.

For women, partner's ethnicity does not play any role in their likelihood of being active in the labour market (Table 5). This outcome is mostly explained by their ethnicity, with Pakistani and Bangladeshi women more likely to look after the home or family by 35 and 25 percentage points, respectively. Unsurprisingly, another positive determinant of being active is having English as first language, as we already found in the ethnic minority women literature (Lindley 2002; Miranda and Zhu 2013). Interestingly, generation of migration does not play any role in influencing the activity status of women, while ethnic minorities and their partners' education are positively correlated to the activity status of women (this last element suggests positive assortative matching in education). These elements interestingly point out how the activity status of women in an inter-ethnic partnership is mostly determined by cultural and attitudinal reasons (education, language, ethnic group) rather than integration (generation of migration and year since arrival are not statistically significant).

Inter-ethnic partnership is positively correlated with being in the highest occupational positions for employed women by 11 percentage points (Table 5). Here the only ethnic minority group which shows a statistically significant coefficient is the Chinese one. Then, having English as a first language, education and coming from an high socio-economic background are the other important determinants which explain this result. Table 6 shows how the positive correlation between inter-ethnic partnerships and being employed in the highest occupational position is mainly driven by the likelihood of working as lower management, professional and intermediate compared to small employer, lower supervisory and technical (statistically significant at 5%) and compared to working in semi-routine and routine jobs (statistically significant at 10%). However, we do not find any evidence of a correlation between occupation and earnings for employees women (Table 5).

5.4 Impact of being in an inter-ethnic union on labour market outcomes

Tables 7-13 show the PSM results (where the specification of the PS is equal to Model 2 explained in section 5.1). The first column specifies the group that we are considering (e.g. the whole sample, living in non-LDA, and so on). The second reports the raw difference of the means of the outcomes in the two groups and, below and in italic, its standard error. The third column specifies the ATT and, below and in italic, its standard error. It follows the number of ethnic

minorities in co-ethnic and in inter-ethnic partnerships on common support (on CS) and out of the common support in parentheses (out CS). Finally, we specify the measures of matching balancing quality before and after matching: the mean bias (MB), the p>chi2, and the pseudo-R squared. In the last column we state the caliper which we used.

For both men and women the overlap of characteristics of the ethnic minority in the two groups is quite poor and it implies that there are lots of ethnic minority individuals in inter-ethnic partnerships outside the common support. This means that there are few comparable ethnic minority persons in inter-ethnic partnerships with ethnic minority individuals in co-ethnic partnerships. Furthermore, after implementing the matching, there are very few cases where a good balance of the characteristics of the matched individuals is achieved. For example, a MB equal or under 7 (this is the maximum of MB that is considered as acceptable in Caliendo 2006 for sub-groups of population) is achieved only in 11 cases for men and 10 cases for women. This reinforces the suggestion that the two groups are too different in their characteristics to be considered comparable. Finally, when we consider that there is a good quality matching, we find that inter-ethnic partnerships are not relevant to explain the difference in outcomes. Ethnic minorities' and their partners' characteristics explain the outcomes, not the kind of partnership itself.

The only ATT that we can consider significant is the one regarding 1.5 plus generation women (which we have defined as all those not born in the UK and arrived here at an age older than 14) in Table 11. [4] Notice that in this sub-sample there are no Pakistani and Bangladeshi women in inter-ethnic partnerships. For non-immigrant women, having a partner of the white majority population increases the probability of being active in the labour market by 25 percentage points compared to having a co-ethnic partner. Hence, after accounting for the selection into the kind of partnership, for those ethnic minorities born in the UK or not born but grown up in the UK, having a white majority partner increases their chances of being active in the labour market. These findings might be in line with the multivariate analysis previously discussed in section 5.3: women with the similar level of integration (non-immigrants) might differ in their attitude towards gender roles. To have an idea about how this result is robust to the possible existence of unobservable characteristics (or, in other words, to get an idea of how important unobservable factors should be to imply a different assignment of the treatment between individuals otherwise similar in their observable characteristics), we implement a sensitivity analysis using the method proposed by Rosenbaum (2002).[5]

[4]There are some other statistically significant ATT for both men and women but they result from using too few observations of ethnic minority in inter-ethnic partnership and so we do not include them in the discussion of the PSM results.

[5]This method is compatible with the kind of algorithm we employ, with binary outcomes, with matching without replacement, and, especially, with matching on the odds ratio. Following this method we assume that the odds of hidden bias (called gamma in tables A14) starts from 1 (the case when there is no hidden bias) and then it increases. In our case we set a maximum of 2, making it rising gradually by 0.05. The idea is that that the higher the resistance to the increase in gamma, the more robust the estimates are. The way this sensitivity analysis works is by using the Mantel and Haenszel non-parametric test statistic. The null hypothesis is no treatment effect between control and treated groups under two scenarios, one of over-estimation of treatment effect and the other one of under-estimation. This test is computed for different levels of gamma. Depending on the sign of the ATT we might be particularly interested in one of the two scenarios. For example, when our ATT is positive we may want to see how a positive unobserved selection may over-estimate the ATT estimates. In our case, it might be that those more likely to be in an inter-ethnic partnership are also more likely to be active. For the opposite, we are interested in the under-estimation scenario, which is negative selection, when the ATT of interest is negative. Hence with this method we can see how, in the worst-case scenario, the bounds of our estimates vary with hidden bias.We implement this sensitivity analysis by using 'mhbounds' on STATA (M. Caliendo and S. O. Becker. Mantel-Haenszel bounds to check sensitivity of estimated average treatment effects on the treated.

The sensitivity analysis suggests that the ATT estimates are sensitive to possible deviation from CIA. At $\gamma = 1.10$ and at $\gamma = 1.25$ the result regarding the activity status of women would not be significant at 5% and 10%-significance level, respectively. Hence, it means that non-first generation ethic minority women in inter-ethnic partnerships would be active in the labour market even if we allow the two groups to differ by up to 10% in their unobservable characteristics. With a positive selection bias, this result becomes insignificant at 5%-significance level when those with unobservable characteristics are over-represented in the inter-ethnic group, that is when the odds ratio of treatment assignment differ between the treated and the comparison group by more than 1.10. Hence, we should interpret our estimated average effect for treated with caution because it might be quite sensitive to the presence of unobservable characteristics.

5.4.1 Robustness check

In their work on the performance of PSM with small sample size, Piracchio et al. (2012) recommend in such cases, to use covariates strongly associated with outcomes in the PS, because they found that adding in the PS variables that are only related to the treatment allocation leads to a larger variance in the estimation of the treatment effect. Hence, for robustness check, we implemented the same PSM but by excluding the parents' ethnicity dummy variable for both the ethnic minority person and his/her partner. This variable is in fact the only one in the PS to be exclusively important for explaining the likelihood of ending up in an inter-ethnic partnership but that should not affect labour market outcomes. Furthermore, it is a variable particularly difficult to balance in almost all specifications and it is rarely statistically significant. In Table 14 we report the results of the statistically significant ATT which achieved a good quality matching.

Here we find again the result regarding non-immigrant women and their activity status (where there are not Bangladeshi and Pakistani women in inter-ethnic partnerships). Moreover, we find that women in inter-ethnic partnerships are more likely to be in the highest occupational positions (by 21 percentage points, where there are not Pakistani in inter-ethnic partnerships). This is true especially among white ethnic minority women (25 percentage points); and, that this is driven by the fact that white ethnic minorities are less likely to be employed as small employer, lower supervisory and technical.[6] However, it is important here to remember that we have not completely solved the reverse causality problem, so occupation might have affected partner's choice. In Table 14 we also reported the gamma bounds of the sensitivity analysis. In line with the previous sensitivity analysis, it is possible that, in the worst case scenario, a small hidden bias might bias our results. Interestingly, this is true especially for the over-estimation of the results, but not for their under-estimation (fourth row in Table 14). This might suggest that if there is an unobservable characteristic which influences both the likelihood of being in an inter-ethnic partnership and the labour market outcomes of the ethnic minority person, then this should be positively correlate to both.

6 Conclusion

In the social science literature it is well established that, when compared to the white majority group, ethnic minority groups suffer from disadvantages in the labour market under several

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[6] In all these cases just mentioned the parents' ethnicity variable in the PS of the ATT estimated in tables 11-13 was never statistically significant at 5% level for both ethnic minority individuals and their partners.

aspects (e.g. unemployment and inactivity rates, wage penalty). This is due to two main reasons: discrimination and lack of integration in the society. However, it has been shown that the comparison of outcomes between white majority population and ethnic minorities is not always possible and might even be misleading (Crawford et al. 2010). Hence, recently, the empirical economic literature has focused on the second reason of ethnic penalties in the labour market -lack of integration- and has overcame the majority-minority comparison by using inter-ethnic partnership as a proxy of ethnic minority integration. Hence, these studies compare the labour market outcome of ethnic minorities in co- and in inter-ethnic partnerships. While all previous papers use this strategy by adopting fully parametric methods in order to control for selection in observable and unobservable characteristics, we do the same by using a semi-parametric method, controlling exclusively for observable characteristics. We in fact argue that we have a rich set of information on both partners in the partnership which allows us to use propensity score matching.

When looking at raw data, ethnic minorities and their partners largely differ in their socio-demographic characteristics and in their labour market outcomes, with ethnic minorities in inter-ethnic partnerships being better off than those in co-ethnic partnerships. When we implement multivariate regressions with labour market outcomes as dependent variables, we find that most of the socio-demographic characteristics of ethnic minorities (e.g. ethnicity, education, whether English is their first language) explain the realisation of the outcome. Hence, being in an inter-ethnic partnership is not correlated at all with labour market outcomes once controlling for all other characteristics. This is always true for men and relatively true for women. In fact, for women we find that there is a positive correlation between been in an inter-ethnic partnership and being employed in the highest occupational positions. However, here a problem of reverse causality might subsist. which with our data, we were not able to completely solve (where the occupation influences partner's choice).

When we implement PSM, we find that, differently from the majority of other papers on this topic, inter-ethnic partnerships, on average, do not have any effect on labour market outcomes of ethnic minorities. This is because in the large part of cases it was impossible to estimate the average treatment of treated due to unbridgeable differences in observable characteristics of ethnic minorities in co- and inter-ethnic partnerships (as suggested by the scarce common support and the bad quality of matching). This is one of the advantages of using this method, since it does not allow to pool together and extrapolate inferences on very different groups through some parametric assumptions. However, we find some evidence of the fact that inter-ethnic partnerships have a positive effect on the likelihood of being active in the labour market among a group of women with an important level of pre-partnership integration (non-first generation migrants women). Additionally, we find that discrimination might also play an interactive role between inter-ethnic partnership and women' labour market outcomes, since the positive effect of inter-ethnic partnerships on occupational choice is found only among the white minority group women (Irish and other white), who may not be subjected to discrimination as visible minorities are. However, these results should be interpreted with caution because they are sensitive to different specifications of the propensity score, and the sensitivity analysis suggests that, in the worst case scenario, the existence of unobservable characteristics might bias (overestimates) our results even if they make the odds of being in an inter-ethic partnership of the matched individual differing by very small. For the occupational outcomes there is also the reverse causality issue.

This study highlights that more research should be undertaken on finding better ways to estimate and understand ethnic penalties in the labour market. When the empirical method chosen involves the use of a comparison between two groups, it should be firstly argued and

shown that the two groups are effectively comparable. The results of our PSM analysis suggest that the benefits from inter-ethnic partnerships exist exclusively for women. This is the case for those women who have some socio-cultural values (e.g. regarding the role of women at home and in the labour market) and for those women who are less likely to be discriminated in the labour market because of their ethnic group (and hence are more likely to reach the highest occupational positions). Hence, we point out that integration, in its broader sense, plays a different role in affecting socio-economic status of ethnic minority men and women. Furthermore, this analysis suggests the need of addressing the issue of ethnic minority labour market penalties not only by gender, but also by different socio-demographic groups (e.g. by 'visibility' of belonging to an ethnic minority group, by migrants generations and years since arrival). This is essential to inform policies for implementing targeted actions.

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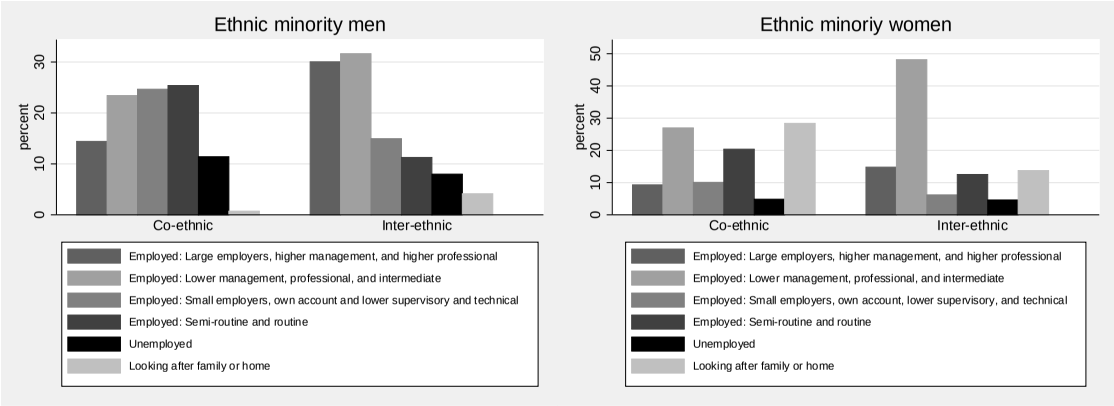

(a) Men (b) Women

Figure 1: Ethnic minority activity status and NS-SEC

Table 1: Propensity score modeling (men)

			Average Marginal Effect			
Dependent variable: Inter-ethnic partnership	**(1)**	**(1 weighted)**	**(2)**	**(2 weighted)**	**(3)**	**(3 weighted)**
(Ref: Other white)						
Irish	-0.04	-0.01	-0.03	0.01	0.14**	0.15**
Indian	-0.27***	-0.32***	-0.25***	-0.28***	-0.11*	-0.14**
Pakistani	-0.25***	-0.34***	-0.24***	-0.33***	-0.01	-0.09
Bangladeshi	-0.16**	-0.03	-0.12*	0.01	0.05	0.06
Chinese	-0.33**	-0.41**	-0.35***	-0.45***	-0.31***	-0.47***
Caribbean	-0.11*	-0.12	-0.09	-0.1	0.02	0
African	-0.17**	-0.13	-0.19***	-0.16*	-0.01	-0.01
Age	-0.03**	-0.04**	-0.05***	-0.08***	-0.04***	-0.06***
Age squared	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
(Ref: English first language)						
English not first language	-0.08*	-0.06	-0.07	-0.05	-0.05	-0.01
(Ref: Born in UK)						
Not born in UK, $\leq$ 14 y.o.	-0.07	-0.04	-0.09*	-0.08	-0.09*	-0.07
Not born in UK, $>$ 14 y.o., 0-5 YSA	-0.13	-0.29**	-0.1	-0.24**	-0.06	-0.19**
Not born in UK, $>$ 14 y.o., 6-10 YSA	-0.12*	-0.22**	-0.12*	-0.23**	-0.07	-0.19**
Not born in UK, $>$ 14 y.o., $>$10 YSA	-0.11*	-0.11	-0.11**	-0.12*	-0.08	-0.12*
(Ref: University degree)						
A level	-0.14**	-0.19***	-0.12**	-0.18**	-0.14***	-0.19***
GCSE	-0.13***	-0.22***	-0.11**	-0.20***	-0.09*	-0.15***
No qualification	-0.23***	-0.31***	-0.17***	-0.23***	-0.17***	-0.22***
(Ref: Parents with lowest occupations)						
Parents with highest occupations	-0.01	-0.06	-0.03	-0.06	-0.01	-0.05
(Ref: Parents of same ethnic group)						
Parents of different ethnic groups	0.09*	0.13*	0.09*	0.14*	0.04	0.07
Age - partner			0.03*	0.05*	0.03*	0.03**
Age squared - partner			0	-0.00*	-0.00*	-0.00**
(Ref: University degree) - partner						
A level - partner			-0.03	-0.04	0.01	0.02
GCSE - partner			0.02	0.08	0.02	0.08
No qualification - partner			-0.06	-0.1	-0.04	-0.06
(Ref: Parents with lowest occupations) - partner						
Parents with highest occupations - partner			0.10***	0.11**	0.05*	0.07*
(Ref: Parents of same ethnic group) - partner						
Parents of different ethnic groups - partner			-0.06	-0.1	-0.1	-0.13*
(Ref: Not religious)						
Religious					-0.06	-0.05
(Ref: Apolitical)						
Conservative					-0.02	-0.03
Labour					-0.02	-0.02
Another political view					-0.06	-0.05
(Ref: Britishness: none)/low						
Britishness: high					-0.02	-0.10*
Britishness: missing					-0.08	-0.11*
(Ref: Not religious) - partner						
Religious - partner					-0.16***	-0.18***
(Ref: Apolitical) - partner						
Conservative - partner					0.05	0.07
Labour - partner					0.05	0.07
Another political view - partner					0.07	0.05
(Ref: Britishness: none)/low - partner						
Britishness: high - partner					-0.06	-0.03
Britishness: missing - partner					0.03	0.04
(Ref: non-LDA)						
LDA					0.15***	0.18***
(Ref: England excluding London)						
London					-0.07*	-0.07
NI, Scotland, and Wales					-0.06	-0.05
Duration					0	-0.01**
(Ref: Marriage)						
Cohabitation					0.02	0
Ethnic minority person characteristics	X	X	X	X	X	X
Partner characteristics			X	X	X	X
Partnership characteristics					X	X
N=629						

Notes: *:p<0.05; **:p<0.01; ***:p<0.00. Robust standard errors.

Table 2: Propensity score modeling (women)

	Average Marginal Effect					
Dependent variable: Inter-ethnic partnership	**(1)**	**(1 weighted)**	**(2)**	**(2 weighted)**	**(3)**	**(3 weighted)**
(Ref: Other white)						
Irish	-0.14**	-0.12	-0.11*	-0.07	0.01	0.03
Indian	-0.42***	-0.54***	-0.40***	-0.52***	-0.20***	-0.31***
Pakistani	-0.61***	-0.65***	-0.59***	-0.65***	-0.38***	-0.47***
Bangladeshi	-0.47***	-0.37**	-0.45***	-0.41***	-0.23***	-0.28***
Chinese	-0.14*	-0.25*	-0.14*	-0.25*	-0.15*	-0.30**
Caribbean	-0.26***	-0.30***	-0.22***	-0.28***	-0.12*	-0.23***
African	-0.38***	-0.38***	-0.36***	-0.36***	-0.17***	-0.19**
Age	0.01	0.01	0	-0.01	0	-0.01
Age squared	0	0	0	0	0	0
(Ref: English first language)						
English not first language	-0.13***	-0.14**	-0.12***	-0.14**	-0.08**	-0.11**
(Ref: Born in UK)						
Not born in UK, $\leq$ 14 y.o.	0.09*	0.12	0.08	0.1	0.02	0.03
Not born in UK, $>$ 14 y.o., 0-5 YSA	-0.11	-0.17*	-0.11	-0.16*	-0.15**	-0.23***
Not born in UK, $>$ 14 y.o., 6-10 YSA	-0.03	-0.06	-0.05	-0.07	-0.09*	-0.15*
Not born in UK, $>$ 14 y.o., $>$10 YSA	-0.05	-0.04	-0.05	-0.04	-0.06	-0.05
(Ref: University degree)						
A level	-0.07*	-0.09	-0.06	-0.09	-0.04	-0.04
GCSE	-0.05	-0.06	-0.05	-0.05	-0.04	-0.05
No qualification	-0.14**	-0.16*	-0.11*	-0.11	-0.05	-0.04
(Ref: Parents with lowest occupations)						
Parents with highest occupations	0.04	0.03	0.03	0.02	0.02	0.01
(Ref: Parents of same ethnic group)						
Parents of different ethnic groups	0.03	0.04	0.03	0.04	0.01	0
Age - partner			0.01	0.03	0.01	0.01
Age squared - partner			0	0	0	0
(Ref: University degree) - partner						
A level - partner			-0.09*	-0.16*	-0.05	-0.1
GCSE - partner			0.01	0.02	0.04	0.05
No qualification - partner			-0.14**	-0.23***	-0.09*	-0.17**
(Ref: Parents with lowest occupations) - partner						
Parents with highest occupations - partner			0.01	-0.05	0.01	-0.05
(Ref: Parents of same ethnic group) - partner						
Parents of different ethnic groups - partner			-0.12*	-0.16*	-0.12**	-0.18**
(Ref: Not religious)						
Religious					-0.06	-0.03
(Ref: Apolitical)						
Conservative					0.01	-0.05
Labour					0.05	0.05
Another political view					0	-0.03
(Ref: Britishness: none)/low						
Britishness: high					0	0.03
Britishness: missing					-0.02	-0.04
(Ref: Not religious) - partner						
Religious - partner					-0.13***	-0.18***
(Ref: Apolitical) - partner						
Conservative - partner					0.07	0.13**
Labour - partner					-0.03	0
Another political view - partner					0.07	0.09
(Ref: Britishness: none)/low - partner						
Britishness: high - partner					-0.04	-0.11
Britishness: missing - partner					0.02	0
(Ref: non-LDA)						
LDA					0.13***	0.14***
(Ref: England excluding London)						
London					-0.02	-0.06
NI, Scotland, and Wales					-0.08	-0.11
Duration					-0.01*	-0.01*
(Ref: Marriage)						
Cohabitation					0	0.01
Ethnic minority person characteristics	X	X	X	X	X	X
Partner characteristics			X	X	X	X
Partnership characteristics					X	X
N=706						

Notes: *:p<0.05; **:p<0.01; ***:p<0.00. Robust standard errors.

Table 3: Correlation of inter-ethnic partnership and ethnic minorities' and partners' labour market outcomes

Dependent variable: Inter-ethnic partnership	**Men**		**Women**	
	Average marginal effect			
(Ref: Other white)				
Irish	0.01	0	-0.08	-0.08
Indian	-0.28***	-0.28***	-0.53***	-0.53***
Pakistani	-0.32***	-0.29***	-0.64***	-0.62***
Bangladeshi	-0.02	0.01	-0.41***	-0.41***
Chinese	-0.46***	-0.43***	-0.24*	-0.24**
Caribbean	-0.1	-0.11	-0.28***	-0.26***
African	-0.15	-0.13	-0.36***	-0.34***
Age	-0.08***	-0.07***	-0.01	-0.01
Age squared	0.00***	0.00***	0	0
(Ref: English first language)				
English not first language	-0.04	-0.06	-0.12*	-0.11*
(Ref: Born in UK)				
Not born in UK, $\leq$ 14 y.o.	-0.06	-0.06	0.1	0.1
Not born in UK, $>$ 14 y.o., 0-5 YSA	-0.23*	-0.20*	-0.17*	-0.16*
Not born in UK, $>$ 14 y.o., 6-10 YSA	-0.22**	-0.20**	-0.07	-0.06
Not born in UK, $>$ 14 y.o., $>$10 YSA	-0.1	-0.09	-0.03	-0.04
(Ref: University degree)				
A level	-0.15**	-0.15**	-0.08	-0.07
GCSE	-0.17**	-0.17**	-0.04	-0.05
No qualification	-0.18**	-0.17**	-0.1	-0.1
(Ref: Parents with lowest occupations)				
Parents with highest occupations	-0.06	-0.08	0.01	0.01
(Ref: Parents of same ethnic group)				
Parents of different ethnic groups	0.14**	0.14**	0.04	0.04
Age - partner	0.04*	0.04*	0.03	0.02
Age squared - partner	0	-0.00*	0	0
(Ref: University degree) - partner				
A level - partner	-0.04	-0.02	-0.18**	-0.17*
GCSE - partner	0.08	0.10*	0.03	0.05
No qualification - partner	-0.13	-0.12	-0.22**	-0.18**
(Ref: Parents with lowest occupations) - partner				
Parents with highest occupations - partner	0.10**	0.10*	-0.06	-0.06
(Ref: Parents of same ethnic group) - partner				
Parents of different ethnic groups - partner	-0.09	-0.08	-0.16*	-0.15*
(Ref: Employed: Lower management, professional, and intermediate)				
Employed: Large employers, higher management, and higher professional	0.05	0.08	-0.08	-0.08
Employed: Small employers, own account, and lower supervisory and technical	-0.05	-0.03	-0.16*	-0.15*
Employed: Semi-routine and routine	-0.01	0.01	-0.07	-0.05
Unemployed	-0.01	-0.03	0.03	0.04
Looking after family or home	0.23*	0.24*	-0.07	-0.07
(Ref: Employed: Lower management, professional, and intermediate) - partner				
Employed: Large employers, higher management, and higher professional - partner		-0.08		0
Employed: Small employers, own account, and lower supervisory and technical - partner		-0.08		-0.05
Employed: Semi-routine and routine - partner		-0.11*		-0.08
Unemployed - partner		0.11		-0.14
Looking after family or home - partner		-0.15**		-0.08
Other - partner		-0.03		-0.04
	N=629		N=706	

Notes: *:p<0.05; **:p<0.01; ***:p<0.00. Robust standard errors.

Table 4: Correlation between inter-ethnic partnership and several labour market outcomes (men)

Dependent variable	**Unemployed vs. employed**	**Self-employed vs. employees**	**Highest vs. lowest occupations**	**Earnings**
		Average marginal effect		**Coefficient**
(Ref: Other white)				
Irish	-0.04	0.18*	0.09	-0.03
Indian	-0.02	0.09	0.01	-0.03
Pakistani	-0.01	0.18*	-0.08	-0.38*
Bangladeshi	-0.01	0.26*	0.09	-0.22
Chinese	/	0.12	-0.09	-0.29
Caribbean	-0.1	0.07	-0.14	-0.06
African	-0.10*	-0.12	-0.11	-0.27**
Age	0.01	-0.02	-0.08***	-0.08
Age squared	0	0	0.00***	0
(Ref: English first language)				
English not first language	-0.08*	0.02	-0.12*	-0.18
(Ref: Born in UK)				
Not born in UK, $\leq$ 14 y.o.	0.07	0.02	-0.03	-0.12
Not born in UK, $>$ 14 y.o., 0-5 YSA	0.09	-0.22	-0.25**	-0.3
Not born in UK, $>$ 14 y.o., 6-10 YSA	0.05	0.03	-0.16*	-0.06
Not born in UK, $>$ 14 y.o., $>$10 YSA	0.11*	0.11	-0.02	-0.06
(Ref: University degree)				
A level	0.02	0.09	-0.20***	-0.22*
GCSE	-0.06	0.16*	-0.25***	-0.48***
No qualification	-0.08*	0.11	-0.56***	-0.68***
(Ref: Parents with lowest occupations)				
Parents with highest occupations	0	0.02	0.08	0.11
(Ref: Parents of same ethnic group)				
Parents of different ethnic groups	-0.02	0.03	-0.1	0.03
Age - partner	0	0.01	0.06**	0.18***
Age squared - partner	0	0	-0.00***	-0.00***
(Ref: University degree) - partner				
A level - partner	-0.06	-0.14*	-0.04	0.12
GCSE - partner	-0.09**	-0.06	-0.11	-0.03
No qualification - partner	-0.16***	-0.14	-0.23**	0.1
(Ref: Parents with lowest occupations) - partner				
Parents with highest occupations - partner	-0.02	0.10*	0.14**	0.21*
(Ref: Parents of same ethnic group) - partner				
Parents of different ethnic groups - partner	-0.05	0	0.12	0.3
(Ref: Co-ethnic partnership)				
Inter-ethnic partnership	0	-0.04	0.06	0.01
N	617	519	402	391

Notes: *:p<0.05; **:p<0.01; ***:p<0.00. Robust standard errors.

Table 5: Correlation between inter-ethnic partnership and several labour market outcomes (women)

Dependent variable	**Active vs. inactive**	**Highest vs. lowest occupations**	**Earnings**
	Average marginal effect		**Coefficient**
(Ref: Other white)			
Irish	-0.01	0.18	0.11
Indian	-0.11*	0.12	-0.07
Pakistani	-0.35***	0.06	-0.22
Bangladeshi	-0.25***	-0.02	-0.39
Chinese	0.18	0.30**	0.1
Caribbean	-0.11	0.09	0.06
African	-0.1	-0.02	0.02
Age	0.01	0.05	0.09*
Age squared	0	0	-0.00**
(Ref: English first language)			
English not first language	-0.10*	-0.13**	-0.08
(Ref: Born in UK)			
Not born in UK, $\leq$ 14 y.o.	0.01	0.11	-0.07
Not born in UK, $>$ 14 y.o., 0-5 YSA	-0.05	-0.12	-0.13
Not born in UK, $>$ 14 y.o., 6-10 YSA	-0.07	-0.01	-0.1
Not born in UK, $>$ 14 y.o., $>$10 YSA	-0.05	-0.07	-0.03
(Ref: University degree)			
A level	-0.13*	-0.08	-0.30**
GCSE	-0.07	-0.30***	-0.64***
No qualification	-0.21***	-0.25***	-0.74***
(Ref: Parents with lowest occupations)			
Parents with highest occupations	0.01	0.14**	0.05
(Ref: Parents of same ethnic group)			
Parents of different ethnic groups	-0.09	0	0.09
Age - partner	0.01	-0.02	-0.04
Age squared - partner	0	0	0
(Ref: University degree) - partner			
A level - partner	0.11*	0.03	0.08
GCSE - partner	0.05	-0.08	-0.15
No qualification - partner	0.13*	-0.16*	-0.08
(Ref: Parents with lowest occupations) - partner			
Parents with highest occupations - partner	0.04	0.06	0.11
(Ref: Parents of same ethnic group) - partner			
Parents of different ethnic groups - partner	-0.06	0.01	-0.02
(Ref: Co-ethnic partnership)			
Inter-ethnic partnership	0.01	0.11*	0.02
N	706	412	408

Notes: *:p<0.05; **:p<0.01; ***:p<0.00. Robust standard errors.

Table 6: Mutinomial logit on occupations

	Men	**Women**
	Inter-ethnic partnership dummy coefficient	
(Ref: Employed: Lower management, professional, and intermediate)		
Large employers, higher management, and higher professional	0.16	-0.63
Small employers, lower supervisory and technical	(-1.3)	**-1.85**
Semi-routine and routine	0.13	(-.73)
N	402	412

Notes: bold:p<0.05; ():p<0.10. Robust standard errors. Covariates are the same of Model 2.

Table 7: PSM results: employed vs. unemployed (men)

	Raw	ATT	On CS, (out CS)	MB	p>chi2	R2	Caliper
All	0.055	0.054	499, 74 (44)	28.8, 13	0.000, 0.927	0.339, 0.080	0.05
	0.036	*0.056*					
	0.055	0.060	499, 84 (34)	28.8, 7.2	0.000, 1.000	0.339, 0.035	0.1
	0.036	*0.053*					
Non-LDA	0.029	-0.057	472, 53 (23)	28.9, 6.4	0.000, 0.999	0.309, 0.061	0.05
	0.045	*0.068*					
	0.029	-0.053	472, 57 (19)	28.9, 6.8	0.000, 1.000	0.309, 0.046	0.1
	0.045	*0.064*					
English 1st language	0.040	0.018	213, 55 (37)	23.0, 11.1	0.000, 0.888	0.280, 0.106	0.05
	0.040	*0.058*					
	0.040	0.016	213, 62 (30)	23.0, 6.9	0.000, 0.996	0.280, 0.056	0.1
	0.040	*0.051*					
English not 1st language	0.024	**-0.231**	286, 13 (13)	28.1 , 20.0	0.000, 0.126	0.330, 0.900	0.05
	0.078	*0.122*					
	0.024	-0.214	286, 14 (12)	28.1, 16.4	0.000, 0.066	0.330, 0.909	0.1
	0.078	*0.114*					
Non-1.5 generation	0.059	-0.059	174 , 17 (24)	31.8 , 16.3	0.000, 0.214	0.374, 0.498	0.05
	0.057	*0.100*					
	0.059	-0.045	174, 22 (19)	31.8 , 15.3	0.000, 0.584	0.374, 0.284	0.1
	0.057	*0.077*					
1.5 plus generation	0.049	0.000	292, 23 (19)	27.8, 9.6	0.000, 0.976	0.379, 0.167	0.05
	0.061	*0.102*					
	0.049	0.038	292, 26 (16)	27.8, 7.0	0.000 , 0.981	0.379 , 0.149	0.1
	0.061	*0.107*					
Excluding Irish	0.059	0.020	467 , 51 (33)	27.1, 10.4	0.000, 0.992	0.348, 0.107	0.05
	0.042	*0.057*					
	0.059	0.000	467, 59 (25)	27.1 , 8.7	0.000, 0.962	0.348, 0.082	0.1
	0.042	*0.056*					
White	0.018	-0.136	85, 22 (48)	39.8, 18.7	0.000, 0.782	0.393, 0.236	0.05
	0.051	*0.096*					
	0.018	-0.074	85, 27 (43)	39.8, 14.6	0.000, 0.573	0.393, 0.235	0.1
	0.051	*0.087*					
Non-white	0.060	0.026	414, 38 (10)	20.8, 6.8	0.000, 0.985	0.301, 0.110	0.05
	0.056	*0.067*					
	0.060	0.026	414, 38 (10)	20.8, 5.7	0.000, 0.993	0.301, 0.099	0.1
	0.056	*0.067*					

Notes:
- Bold: p<0.05.
- Raw: raw difference of the means of the outcomes in the two groups. Standard errors in italic.
- ATT: Average Treatment of Treated. Standard errors in italic.
- On CS, (out CS): number of observations on the common support before and after matching. Observations off the common support in parentheses.
- MB: mean bias before and after matching.
- p>chi2: before and after matching.
- R2: pseudo-R2 before and after matching.
- Caliper: for each specification we use two different calipers (.05 or .1).

Table 8: PSM results: self-employed vs. employees (men)

	Raw	ATT	On CS, (out CS)	MB	p>chi2	R2	Caliper
All	0.008	0.200	418, 60 (41)	27.9, 8.3	0.000, 0.974	0.346, 0.084	0.05
	0.048	*0.033*					
	0.008	0.000	418, 71 (30)	27.9, 7.0	0.000, 0.990	0.346, 0.062	0.1
	0.048	*0.071*					
Non-LDA	0.008	0.033	418, 60 (41)	27.9, 8.3	0.000, 0.974	0.346, 0.084	0.05
	0.048	*0.076*					
	0.008	0.000	418, 71 (30)	27.9, 7.0	0.000, 0.990	0.346, 0.062	0.1
	0.048	*0.071*					
English 1st language	0.071	-0.060	186, 50 (30)	23.1, 10.5	0.000, 0.910	0.287, 0.112	0.05
	0.056	*0.093*					
	0.071	-0.057	186, 53 (27)	23.1, 8.2	0.000, 0.897	0.287, 0.108	0.1
	0.056	*0.089*					
English not 1st language	-0.124	-0.077	232, 13 (8)	25.6, 20.2	0.005, 0.162	0.260, 0.612	0.05
	0.100	*0.129*					
	-0.124	-0.188	232, 16 (5)	25.6, 11.8	0.005, 0.944	0.260, 0.171	0.1
	0.100	*0.128*					
Non-1.5 generation	0.010	-0.154	150, 13 (24)	32.2, 15.7	0.000, 0.185	0.390, 0.648	0.05
	0.075	*0.169*					
	0.010	0.390	150, 20 (17)	32.2, 13.7	0.000, 0.951	0.390, 0.197	0.1
	0.075	*0.140*					
1.5 plus generation	-0.022	0.174	241, 23 (11)	26.0, 16.5	0.000, 0.594	0.356, 0.281	0.05
	0.080	*0.098*					
	-0.022	0.120	241, 25 (9)	26.0, 12.2	0.000, 0.695	0.356, 0.238	0.1
	0.080	*0.099*					
Excluding Irish	-0.045	-0.070	392, 43 (29)	25.4, 5.9	0.000, 1.000	0.352, 0.046	0.05
	0.054	*0.096*					
	-0.045	-0.135	392, 52 (20)	25.4, 8.5	0.000, 1.000	0.352, 0.051	0.1
	0.054	*0.084*					
White	0.033	0.067	75, 15 (45)	38.9, 16.8	0.000, 0.002	0.424, 1.000	0.05
	0.072	*0.159*					
	0.033	0.053	75, 19 (41)	38.9, 10.2	0.000, 0.826	0.424, 0.267	0.1
	0.072	*0.141*					
Non-white	0.020	0.115	343, 26 (15)	22.2, 15.1	0.000, 0.875	0.353, 0.212	0.05
	0.072	*0.106*					
	0.020	0.094	343, 32 (9)	21.2, 12.1	0.000, 0.998	0.353, 0.089	0.1
	0.072	*0.095*					

Notes:
- Bold: p<0.05.
- Raw: raw difference of the means of the outcomes in the two groups. Standard errors in italic.
- ATT: Average Treatment of Treated. Standard errors in italic.
- On CS, (out CS): number of observations on the common support before and after matching. Observations off the common support in parentheses.
- MB: mean bias before and after matching.
- p>chi2: before and after matching.
- R2: pseudo-R2 before and after matching.
- Caliper: for each specification we use two different calipers (.05 or .1).

Table 9: PSM results: highest vs. lowest occupations (men)

	Raw	ATT	On CS, (out CS)	MB	p>chi2	R2	Caliper
All	**0.295**	0.022	321, 45 (36)	29.9, 8.5	0.000, 1.000	0.435, 0.062	0.05
	0.060	*0.098*					
	0.295	0.064	321, 47 (34)	29.9, 7.1	0.000, 0.999	0.435, 0.071	0.1
	0.060	*0.092*					
Non-LDA	**0.257**	0.000	301, 27 (21)	31.3, 11.5	0.000, 0.677	0.440, 0.290	0.05
	0.077	*0.131*					
	0.257	0.000	301, 31 (17)	31.3, 10.3	0.000, 0.973	0.440, 0.157	0.1
	0.077	*0.121*					
English 1st language	0.184	0.000	148, 25 (37)	25.7, 12.7	0.000, 0.879	0.405, 0.232	0.05
	0.072	*0.139*					
	0.184	0.031	148, 32 (30)	25.7, 11.0	0.000, 0.841	0.405, 0.190	0.1
	0.072	*0.116*					
English not 1st language	**0.408**	0.273	173, 11 (8)	26.1, 23.5	0.000, 0.035	0.387, 0.875	0.05
	0.116	*0.211*					
	0.408	0.231	173, 13 (6)	26.1, 20.9	0.000, 0.006	0.387, 0.909	0.1
	0.116	*0.188*					
Non-1.5 generation	**0.242**	0.364	120, 11 (19)	34.6, 20.7	0.000, 0.016	0.412, 1.000	0.05
	0.098	*0.207*					
	0.242	**0.357**	120, 14 (16)	34.6, 9.5	0.000, 0.536	0.412, 0.382	0.1
	0.098	*0.178*					
1.5 plus generation	**0.366**	0.333	181, 12 (17)	27.4, 37.3	0.000, 0.060	0.446, 0.855	0.05
	0.097	*0.198*					
	0.366	0.250	181, 16 (13)	27.4, 23.0	0.000, 0.255	0.446, 0.469	0.1
	0.097	*0.175*					
Excluding Irish	**0.296**	0.065	301, 31 (31)	29.0, 13.9	0.000, 0.971	0.455, 0.129	0.05
	0.068	*0.120*					
	0.296	0.132	301, 38 (24)	29.0, 8.3	0.000, 0.993	0.455, 0.085	0.1
	0.068	*0.108*					
White	**0.329**	**0.444**	60, 9 (40)	37.6, 29.8	0.000, 0.126	0.485, 1.000	0.05
	0.089	*0.176*					
	0.329	0.333	60, 12 (37)	37.6, 19.2	0.000, 0.010	0.485, 1.000	0.1
	0.089	*0.170*					
Non-white	**0.247**	0.158	261, 19 (13)	23.1, 26.3	0.000, 0.003	0.410, 1.000	0.05
	0.093	*0.149*					
	0.247	0.182	261, 22 (10)	23.1, 21.3	0.000, 0.410	0.410, 0.394	0.1
	0.093	*0.141*					

Notes:
- Bold: p<0.05.
- Raw: raw difference of the means of the outcomes in the two groups. Standard errors in italic.
- ATT: Average Treatment of Treated. Standard errors in italic.
- On CS, (out CS): number of observations on the common support before and after matching. Observations off the common support in parentheses.
- MB: mean bias before and after matching.
- p>chi2: before and after matching.
- R2: pseudo-R2 before and after matching.
- Caliper: for each specification we use two different calipers (.05 or .1).

Table 10: PSM results: single occupation (men)

	Occup. 1		Occup. 2		Occup. 3		Occup. 4						
	Raw	**ATT**	**Raw**	**ATT, s.e.**	**Raw**	**ATT, s.e.**	**Raw**	**ATT, s.e.**	**On CS, (out CS)**	**MB**	**p¿chi2**	**R2**	**Caliper**
All	**0.208**	0.000	0.087	0.022	**-0.106**	-0.044	**-0.189**	0.022	321, 45 (36)	29.9, 8.5	0.000, 1.000	0.435, 0.062	0.05
	0.048	*0.094*	*0.059*	*0.106*	*0.042*	*0.053*	*0.058*	*0.090*					
	0.208	0.021	0.087	0.043	**-0.106**	-0.043	**-0.189**	-0.021	321, 47 (34)	29.9, 7.1	0.000, 0.999	0.435, 0.071	0.1
	0.048	*0.094*	*0.059*	*0.104*	*0.042*	*0.051*	*0.058*	*0.084*					
Non-LDA	**0.225**	0.000	0.032	0.000	-0.097	-0.074	**-0.160**	0.074	301, 27 (21)	31.3 , 11.5	0.000, 0.677	0.440, 0.290	0.05
	0.059	*0.127*	*0.073*	*0.134*	*0.055*	*0.072*	*0.074*	*0.121*					
	0.225	0.032	0.032	-0.032	-0.097	-0.097	**-0.160**	0.097	301, 31 (17)	31.3, 10.3	0.000, 0.973	0.440, 0.157	0.1
	0.059	*0.119*	*0.073*	*0.125*	*0.055*	*0.069*	*0.074*	*0.110*					
English 1st language	**0.170**	0.040	0.014	-0.040	-0.044	-0.120	**-0.140**	0.120	148, 25 (37)	25.7, 12.7	0.000, 0.879	0.405, 0.232	0.05
	0.062	*0.119*	*0.075*	*0.142*	*0.045*	*0.085*	*0.067*	*0.125*					
	0.170	0.000	0.014	0.031	-0.044	0.045	**-0.140**	0.063	148, 32 (30)	25.7, 11.0	0.000, 0.841	0.405, 0.190	0.1
	0.062	*0.110*	*0.075*	*0.126*	*0.045*	*0.078*	*0.067*	*0.099*					
English not 1st language	**0.288**	0.182	0.120	0.091	**-0.197**	-0.182	-0.211	-0.091	173, 11 (8)	26.1, 23.5	0.000, 0.035	0.387, 0.875	0.05
	0.087	*0.195*	*0.106*	*0.207*	*0.092*	*0.122*	*0.118*	*0.207*					
	0.288	0.154	0.120	0.077	**-0.197**	-0.154	-0.211	-0.077	173, 13 (6)	26.1, 20.9	0.000, 0.006	0.387, 0.909	0.1
	0.087	*0.186*	*0.106*	*0.194*	*0.092*	*0.104*	*0.118*	*0.180*					
Non-1.5 generation	**0.292**	0.273	-0.050	0.091	-0.100	**-0.273**	-0.142	-0.091	120, 11 (19)	34.6, 20.7	0.000, 0.016	0.412, 1.000	0.05
	0.084	*0.199*	*0.099*	*0.186*	*0.065*	*0.141*	*0.092*	*0.207*					
	0.292	0.286	-0.050	0.071	-0.100	-0.214	-0.142	-0.143	120, 14 (16)	34.6, 9.5	0.000, 0.536	0.412, 0.382	0.1
	0.084	*0.179*	*0.099*	*0.169*	*0.065*	*0.114*	*0.092*	*0.175*					
1.5 plus generation	**0.143**	0.083	**0.223**	0.250	**-0.148**	**-0.250**	**-0.219**	-0.083	181, 12 (17)	27.4, 37.3	0.000, 0.060	0.446, 0.855	0.05
	0.072	*0.172*	*0.090*	*0.199*	*0.073*	*0.131*	*0.097*	*0.193*					
	0.143	0.125	**0.223**	0.125	**-0.148**	-0.188	**-0.219**	-0.063	181, 16 (13)	27.4, 23.0	0.000, 0.255	0.446, 0.469	0.1
	0.072	*0.141*	*0.090*	*0.175*	*0.073*	*0.101*	*0.097*	*0.173*					
Excluding Irish	**0.189**	0.032	0.107	0.032	**-0.108**	-0.065	**-0.189**	0.000	301, 31 (31)	29.0, 13.9	0.000, 0.971	0.455, 0.129	0.05
	0.053	*0.110*	*0.066*	*0.128*	*0.048*	*0.076*	*0.066*	*0.108*					
	0.189	0.053	0.107	0.079	**-0.108**	-0.105	**-0.189**	-0.026	301, 38 (24)	29.0, 8.3	0.000, 0.993	0.455, 0.085	0.1
	0.053	*0.099*	*0.066*	*0.115*	*0.048*	*0.070*	*0.066*	*0.097*					
White	**0.291**	0.111	0.038	0.333	**-0.109**	-0.111	**-0.220**	**-0.333**	60, 9 (40)	37.6, 29.8	0.000, 0.126	0.485, 1.000	0.05
	0.079	*0.242*	*0.094*	*0.229*	*0.058*	*0.111*	*0.085*	*0.167*					
	0.291	0.250	0.038	0.083	**-0.109**	-0.167	**-0.220**	-0.167	60, 12 (37)	37.6, 19.2	0.000, 0.010	0.485, 1.000	0.1
	0.079	*0.206*	*0.094*	*0.193*	*0.058*	*0.112*	*0.085*	*0.155*					
Non-white	0.124	0.105	0.123	0.053	-0.095	-0.105	-0.153	-0.053	261, 19 (13)	23.1, 26.3	0.000, 0.003	0.410, 1.000	0.05
	0.070	*0.146*	*0.088*	*0.166*	*0.066*	*0.101*	*0.089*	*0.129*					
	0.124	0.091	0.123	0.091	-0.095	-0.091	-0.153	-0.091	261, 22 (10)	23.1, 21.3	0.000, 0.410	0.410, 0.394	0.1
	0.070	*0.129*	*0.088*	*0.153*	*0.066*	*0.105*	*0.089*	*0.118*					

Notes:
- Occup. 1: Large employers, higher management, and higher professional;
  Occup. 2: Lower management, professional, and intermediate;
  Occup. 3: Small employers, lower supervisory, and technical;
  Occup. 4: Semi-routine and routine.
- Bold: p<0.05.
- Raw: raw difference of the means of the outcomes in the two groups. Standard errors in italic.
- ATT: Average Treatment of Treated. Standard errors in italic.
- On CS, (out CS): number of observations on the common support before and after matching. Observations off the common support in parentheses.
- MB: mean bias before and after matching.
- p>chi2: before and after matching.
- R2: pseudo-R2 before and after matching.
- Caliper: for each specification we use two different calipers (.05 or .1).

Table 11: PSM results: active vs. inactive (women)

	Raw	ATT	On CS, (out CS)	MB	p>chi2	R2	Caliper
All	**0.217**	0.032	522 , 95 (89)	26.9, 5.5	0.000, 1.000	0.425, 0.026	0.05
	0.039	*0.054*					
	0.217	0.019	522, 103 (81)	26.9, 7.2	0.000, 0.997	0.425, 0.034	0.1
	0.039	*0.053*					
Non-LDA	**0.226**	0.089	490, 90 (21)	25.4, 6.5	0.000, 1.000	0.298, 0.018	0.05
	0.049	*0.061*					
	0.226	0.084	490, 95 (16)	25.4, 5.6	0.000, 1.000	0.298, 0.016	0.1
	0.049	*0.058*					
English 1st language	0.059	-0.061	208, 66 (67)	21.4, 8.2	0.000, 0.996	0.297, 0.052	0.05
	0.043	*0.060*					
	0.059	-0.059	208, 68 (65)	21.4, 6.4	0.000, 1.000	0.297, 0.038	0.1
	0.043	*0.058*					
English not 1st language	**0.314**	0.139	314, 36 (15)	26.2, 9.8	0.000, 0.924	0.244, 0.244	0.05
	0.073	*0.107*					
	0.314	0.184	314, 38 (13)	26.2, 9.2	0.000, 0.953	0.244, 0.097	0.1
	0.073	*0.098*					
Non-1.5 generation	**0.177**	-0.038	194, 26 (35)	34.5, 19.2	0.000, 0.564	0.424, 0.249	0.05
	0.065	*0.115*					
	0.177	-0.067	194, 30 (31)	34.5, 15.1	0.000, 0.515	0.424, 0.221	0.1
	0.065	*0.105*					
1.5 plus generation	**0.246**	**0.184**	292, 49 (36)	28.1, 7.8	0.000, 1.000	0.366, 0.043	0.05
	0.058	*0.089*					
	0.246	0.160	292, 50 (35)	28.1, 8.6	0.000, 0.999	0.366, 0.052	0.1
	0.058	*0.089*					
Excluding Irish	**0.232**	-0.058	487, 69 (73)	27.9 , 7.5	0.000, 0.999	0.466, 0.044	0.05
	0.044	*0.063*					
	0.232	-0.100	487, 70 (72)	27.9, 7.7	0.000, 0.986	0.466, 0.059	0.1
	0.044	*0.065*					
White	0.046	0.043	88, 46 (87)	26.3, 11.2	0.000, 0.920	0.205, 0.089	0.05
	0.050	*0.071*					
	0.046	0.098	88, 51 (82)	26.3, 7.6	0.000, 0.970	0.205, 0.070	0.1
	0.050	*0.066*					
Non-white	**0.224**	-0.036	434, 28 (23)	26.9, 12.9	0.000, 0.706	0.389, 0.244	0.05
	0.071	*0.108*					
	0.224	0.1	434, 33 (18)	26.9, 14.0	0.000, 0.755	0.389, 0.197	0.1
	0.071	*0.096*					

Notes:
- Bold: p<0.05.
- Raw: raw difference of the means of the outcomes in the two groups. Standard errors in italic.
- ATT: Average Treatment of Treated. Standard errors in italic.
- On CS, (out CS): number of observations on the common support before and after matching. Observations off the common support in parentheses.
- MB: mean bias before and after matching.
- p>chi2: before and after matching.
- R2: pseudo-R2 before and after matching.
- Caliper: for each specification we use two different calipers (.05 or .1).

Table 12: PSM results: highest vs. lowest occupations (women)

	Raw	ATT	On CS, (out CS)	MB	p>chi2	R2	Caliper
All	**0.211**	0.071	282, 84 (46)	21.4, 8.0	0.000, 0.992	0.279, 0.048	0.05
	0.049	*0.070*					
	0.211	0.091	282, 88 (42)	21.4, 5.5	0.000, 1.000	0.279, 0.028	0.1
	0.049	*0.068*					
Non-LDA	**0.294**	0.135	259, 52 (26)	25.8, 10.6	0.000, 0.908	0.287, 0.108	0.05
	0.059	*0.075*					
	0.294	0.105	259, 57 (21)	25.8, 8.1	0.000, 0.940	0.287, 0.091	0.1
	0.059	*0.076*					
English 1st language	**0.211**	-0.016	283, 64 (34)	19.7, 5.9	0.000, 1.000	0.243, 0.025	0.05
	0.054	*0.063*					
	0.211	-0.045	283, 67 (31)	19.7, 7.5	0.000, 0.999	0.243, 0.041	0.1
	0.054	*0.063*					
English not 1st language	**0.212**	0.240	132, 25 (11)	20.4, 16.0	0.069, 0.997	0.158, 0.081	0.05
	0.093	*0.137*					
	0.212	0.154	132, 26 (10)	20.4, 13.8	0.069, 0.982	0.158. 0.108	0.1
	0.093	*0.138*					
Non-1.5 generation	**0.152**	-0.083	114, 12 (29)	31.1, 29.7	0.000, 0.024	0.473, 1.000	0.05
	0.079	*0.172*					
	0.152	-0.063	114, 16 (25)	31.1, 20.0	0.000, 0.306	0.473, 0.468	0.1
	0.079	*0.164*					
1.5 plus generation	**0.269**	0.238	142, 21 (39)	24.2, 30.2	0.000, 0.000	0.407, 1.000	0.05
	0.074	*0.151*					
	0.269	0.240	142, 25 (35)	24.2, 17.0	0.000, 0.276	0.407, 0.358	0.1
	0.074	*0.137*					
Excluding Irish	**0.198**	0.017	255, 58 (42)	23.3, 10.1	0.000, 0.985	0.312, 0.072	0.05
	0.056	*0.083*					
	0.198	0.030	255, 67 (33)	23.3, 6.5	0.000, 1.000	0.312, 0.033	0.1
	0.056	*0.076*					
White	**0.248**	0.188	60, 32 (64)	21.5, 12.1	0.005, 0.877	0.194, 0.147	0.05
	0.074	*0.121*					
	0.248	0.189	60, 37 (59)	21.5, 10.0	0.005, 0.991	0.194, 0.079	0.1
	0.074	*0.111*					
Non-white	**0.249**	-0.125	222, 16 (18)	25.2, 18.6	0.000, 0.002	0.345, 1.000	0.05
	0.088	0.119					
	0.249	0	222, 18 (16)	25.2, 10.4	0.000, 0.001	0.345, 1.000	0.1
	0.088	*0.128*					

Notes:
- Bold: p<0.05.
- Raw: raw difference of the means of the outcomes in the two groups. Standard errors in italic.
- ATT: Average Treatment of Treated. Standard errors in italic.
- On CS, (out CS): number of observations on the common support before and after matching. Observations off the common support in parentheses.
- MB: mean bias before and after matching.
- p>chi2: before and after matching.
- R2: pseudo-R2 before and after matching.
- Caliper: for each specification we use two different calipers (.05 or .1).

Table 13: PSM results: single occupation (women)

	Occup. 1		Occup. 2		Occup. 3		Occup. 4						
	Raw	**ATT, s.e.**	**Raw**	**ATT, s.e.**	**Raw**	**ATT**	**Raw**	**ATT, s.e.**	**On CS, (out CS)**	**MB**	**p¿chi2**	**R2**	**Caliper**
All	0.057	0.000	**0.154**	0.071	-0.018	-0.071	**-0.193**	0.000	282, 84 (46)	21.4, 8.0	0.000, 0.992	0.279, 0.048	0.05
	0.037	*0.059*	*0.053*	*0.077*	*0.023*	*0.040*	*0.047*	*0.064*					
	0.057	0.034	**0.154**	0.057	-0.018	-0.057	**-0.193**	-0.034	282, 88 (42)	21.4 , 5.5	0.000, 1.000	0.279, 0.028	0.1
	0.037	*0.059*	*0.053*	*0.076*	*0.023*	*0.039*	*0.047*	*0.062*					
Non-LDA	**0.138**	0.077	**0.156**	0.058	**-0.030**	-0.019	**-0.264**	-0.115	259, 52 (26)	25.8, 10.6	0.000. 0.908	0.287, 0.108	0.05
	0.047	0.083	*0.064*	0.097	*0.024*	0.033	*0.058*	0.071					
	0.138	0.105	**0.156**	0.000	**-0.030**	-0.018	**-0.264**	-0.088	259, 57 (21)	25.8, 8.1	0.000, 0.940	0.287, 0.091	0.1
	0.047	*0.079*	*0.064*	*0.094*	*0.024*	*0.030*	*0.058*	*0.073*					
English 1st language	0.000	-0.106	**0.145**	0.043	-0.032	0.000	**-0.112**	0.064	150, 47 (47)	20.0, 11.1	0.000, 0.799	0.219, 0.139	0.05
	0.048	*0.076*	*0.064*	*0.099*	*0.026*	*0.030*	*0.052*	*0.076*					
	0.000	-0.017	**0.145**	0.034	-0.032	-0.052	**-0.112**	0.034	150, 58 (36)	20.0, 8.8	0.000, 0.980	0.219, 0.075	0.1
	0.048	*0.072*	*0.064*	*0.091*	*0.026*	*0.038*	*0.052*	*0.068*					
English not 1st language	**0.159**	0.080	0.053	0.160	0.023	0.080	**-0.235**	**-0.320**	132, 25 (11)	20.4, 16.0	0.069, 0.997	0.158, 0.081	0.05
	0.061	*0.115*	*0.091*	*0.140*	*0.047*	*0.077*	*0.092*	*0.126*					
	0.159	0.077	0.053	0.077	0.023	0.077	**-0.235**	-0.231	132, 26 (10)	20.4 , 13.8	0.069, 0.982	0.158, 0.108	0.1
	0.061	*0.111*	*0.091*	*0.137*	*0.047*	*0.075*	*0.092*	*0.131*					
Non-1.5 generation	-0.027	0.083	**0.179**	-0.167	-0.002	-0.083	-0.150	0.167	114, 12 (29)	31.1, 29.7	0.000, 0.024	0.473, 1.000	0.05
	0.064	*0.083*	*0.089*	*0.181*	*0.029*	*0.083*	*0.076*	*0.155*					
	-0.027	1.000	**0.179**	-0.063	-0.002	-0.063	-0.150	0.125	114, 16 (25)	31.1, 20.0	0.000, 0.306	0.473, 0.468	0.1
	0.064	*0.088*	*0.089*	*0.173*	*0.029*	*0.106*	*0.076*	*0.141*					
1.5 plus generation	**0.130**	0.095	0.139	0.143	-0.013	-0.190	**-0.256**	-0.048	142, 21 (39)	24.2, 30.2	0.000, 0.000	0.407, 1.000	0.05
	0.056	*0.123*	*0.076*	*0.154*	*0.037*	*0.106*	*0.071*	*0.139*					
	0.130	0.120	0.139	0.120	-0.013	-0.160	**-0.256**	-0.080	142, 25 (35)	24.2, 10.0	0.000, 0.276	0.407, 0.358	0.1
	0.056	*0.110*	*0.076*	*0.141*	*0.037*	*0.091*	*0.071*	*0.129*					
Excluding Irish	**0.097**	0.052	0.101	-0.034	-0.007	0.000	**-0.191**	-0.017	255, 58 (42)	23.3, 10.1	0.000, 0.985	0.312, 0.072	0.05
	0.043	*0.077*	*0.059*	*0.094*	*0.025*	*0.041*	*0.054*	*0.077*					
	0.097	0.312	0.101	0.030	-0.007	0.000	**-0.191**	-0.030	255, 67 (33)	23.3, 6.5	0.000, 1.000	0.312, 0.033	0.1
	0.043	*0.067*	*0.059*	*0.086*	*0.025*	*0.036*	*0.054*	*0.071*					
White	0.044	-0.031	**0.204**	0.219	-0.075	-0.031	**-0.173**	-0.156	60, 32 (64)	21.5, 12.1	0.005, 0.877	0.194, 0.147	0.05
	0.061	*0.096*	*0.081*	*0.123*	*0.042*	*0.079*	*0.070*	*0.110*					
	0.044	-0.027	**0.204**	0.216	-0.075	-0.081	**-0.173**	-0.108	60, 37 (59)	21.5, 10.0	0.005, 0.991	0.194, 0.079	0.1
	0.061	*0.084*	*0.081*	*0.115*	*0.042*	*0.058*	*0.070*	*0.107*					
Non-white	0.080	0.063	0.170	-0.188	-0.011	0.063	**-0.238**	0.063	222, 16 (18)	25.2, 18.6	0.000, 0.002	0.345, 1.000	0.05
	0.063	*0.132*	*0.092*	*0.161*	*0.036*	*0.063*	*0.085*	*0.106*					
	0.080	0.167	0.170	-0.17	-0.011	0	**-0.238**	0.079	222, 18 (16)	25.2, 20.4	0.000, 0.001	0.345, 1.000	0.1
	0.063	*0.133*	*0.092*	*0.162*	*0.036*	*0.079*	*0.085*	*0.108*					

Notes:
- Occup. 1: Large employers, higher management, and higher professional;
  Occup. 2: Lower management, professional, and intermediate;
  Occup. 3: Small employers, lower supervisory, and technical;
  Occup. 4: Semi-routine and routine.
- Bold: p<0.05.
- Raw: raw difference of the means of the outcomes in the two groups. Standard errors in italic.
- ATT: Average Treatment of Treated. Standard errors in italic.
- On CS, (out CS): number of observations on the common support before and after matching. Observations off the common support in parentheses.
- MB: mean bias before and after matching.
- p>chi2: before and after matching.
- R2: pseudo-R2 before and after matching.
- Caliper: for each specification we use two different calipers (.05 or .1).

Table 14: Robustness checks

Group	Raw	ATT, s.e.	On CS, (out CS)	MB	p>chi2	R2	Caliper	Gamma bounds, 5% stat. sign.	Gamma bounds, 10% stat. sign.
Non Non-1.5 generations women	**0.246**	**0.182**	292, 55 (30)	29.6, 7.6	0.000, 0.999	0.353, 0.040	0.1	1.00-1.15	1.00-1.35
	0.058	*0.082*							
All women	**0.211**	**0.159**	282, 88 (44)	21.4, 5.4	0.000, 1.000	0.278, 0.027	0.1	1.00-1.15	1.00-1.30
	0.049	*0.070*							
White women	**0.248**	**0.214**	60, 42 (54)	21.3, 7.1	0.005, 0.994	0.178, 0.055	0.1	1.00-1.10	1.00-1.30
	0.074	*0.102*							
White women	**-0.075**	**-0.119**	60, 42 (54)	21.3, 7.1	0.005, 0.994	0.178, 0.055	0.1	1.00-2.00	1.00-2.00
	0.042	*0.060*							

Notes:
- Bold: p<0.05.
- Raw: raw difference of the means of the outcomes in the two groups. Standard errors in italic.
- ATT: Average Treatment of Treated. Standard errors in italic.
- On CS, (out CS): number of observations on the common support before and after matching. Observations off the common support in parentheses.
- MB: mean bias before and after matching.
- p>chi2: before and after matching.
- R2: pseudo-R2 before and after matching.
- Caliper: for each specification we use two different calipers (.05 or .1).
- Gamma bounds: odds of hidden bias bounds within which the ATT estimates are statistically significant at 5% and 10% levels in the sensitivity analysis.

A Appendix

Table A1: Response options for the ethnic group question in UKHLS (wave 1)

White	British/English/Scottish/Welsh/Northern Irish.
	Irish;
	Gypsy or Irish Traveller;
	Another white background.
Mixed	White and Black Caribbean;
	White and Black African;
	White and Asian;
	Any other mixed background.
Asian or Asian British	Indian;
	Pakistani;
	Bangladeshi;
	Chinese;
	Any other Asian background.
Black/African/Caribbean/Black British	Caribbean;
	African;
	Any other Black background.
Other Ethnic group	Arab;
	Any other ethnic group.

Table A2: Men in co-ethnic partnership

Variable	Mean	Std. Dev.
ETHNIC MINORITY PERSON CHARACTERISTICS		
Age	40.607	9.408
Irish	0.065	0.248
Other white	0.105	0.307
Indian	0.294	0.456
Pakistani	0.165	0.371
Bangladeshi	0.123	0.329
Chinese	0.032	0.175
Caribbean	0.081	0.274
African/Black	0.135	0.342
English is not the first language	0.573	0.495
English is not the first language and has difficulties	0.095	0.294
English is not the first language and has not difficulties	0.478	0.5
Born in UK	0.246	0.431
Not born in UK, arrived $\leq$ 14 y.o.	0.167	0.373
Not born in UK, arrived $>$ 14 y.o., YSA 0-5	0.097	0.297
Not born in UK, arrived $>$ 14 y.o., YSA 6-10	0.145	0.352
Not born in UK, arrived $>$ 14 y.o., YSA $>$ 10	0.345	0.476
University degree and higher	0.425	0.495
A level	0.163	0.369
GCSE	0.232	0.423
No qualification	0.181	0.385
Parents of highest occupations	0.306	0.461
Parents of different ethnic groups	0.058	0.233
Religious	0.863	0.344
Apolitical	0.258	0.438
Conservative	0.147	0.354
Labour	0.466	0.499
Other party	0.129	0.335
Importance of feeling British: high	0.24	0.428
Importance of feeling British: nonexistent,/medium/low	0.379	0.486
Importance of feeling British: missing	0.381	0.486
PARTNER CHARACTERISTICS		
Age	37.597	9.527
University degree and higher	0.435	0.496
A level	0.145	0.352
GCSE	0.234	0.424
No qualification	0.187	0.39
Parents of highest occupations	0.272	0.445
Parents of different ethnic groups	0.067	0.251
Religious	0.891	0.312
Apolitical	0.325	0.469
Conservative	0.113	0.317
Labour	0.421	0.494
Other party	0.141	0.348
Importance of feeling British: high	0.232	0.423
Importance of feeling British: nonexistent,/medium/low	0.385	0.487
Importance of feeling British: missing	0.383	0.487
Employed: Large employers, higher management, and higher professional	0.085	0.28
Employed:Lower management, professional, and intermediate	0.262	0.44
Employed:Small employers, own account, lower supervisory and technical	0.065	0.248
Employed:Semi-routine and routine	0.181	0.385
Unemployed	0.032	0.175
Looking after family or home	0.327	0.47
Other activity	0.048	0.213
PARTNERSHIP CHARACTERISTICS		
LDA	0.054	0.225
England, London excluded	0.464	0.499
Norther Ireland, Scotland, Wales	0.073	0.261
London	0.462	0.499
Duration	13.652	9.602
Cohabitation	0.097	0.297
N	504	

Table A3: Men in inter-ethnic partnership

Variable	Mean	Std. Dev.
ETHNIC MINORITY PERSON CHARACTERISTICS		
Age	43.808	12.274
Irish	0.288	0.455
Other white	0.296	0.458
Indian	0.088	0.284
Pakistani	0.064	0.246
Bangladeshi	0.056	0.231
Chinese	0.008	0.089
Caribbean	0.136	0.344
African/Black	0.064	0.246
English is not the first language	0.224	0.419
English is not the first language and has difficulties	0	0
English is not the first language and has not difficulties	0.224	0.419
Born in UK	0.52	0.502
Not born in UK, arrived $\leq$ 14 y.o.	0.112	0.317
Not born in UK, arrived $>$ 14 y.o., YSA 0-5	0.064	0.246
Not born in UK, arrived $>$ 14 y.o., YSA 6-10	0.096	0.296
Not born in UK, arrived $>$ 14 y.o., YSA $>$ 10	0.208	0.408
University degree and higher	0.64	0.482
A level	0.112	0.317
GCSE	0.168	0.375
No qualification	0.08	0.272
Parents of highest occupations	0.328	0.471
Parents of different ethnic groups	0.208	0.408
Religious	0.560	0.498
Apolitical	0.248	0.434
Conservative	0.16	0.368
Labour	0.336	0.474
Other party	0.256	0.438
Importance of feeling British: high	0.264	0.443
Importance of feeling British: nonexistent,/medium/low	0.208	0.408
Importance of feeling British: missing	0.528	0.501
PARTNER CHARACTERISTICS		
Age	42.464	11.726
University degree and higher	0.584	0.495
A level	0.096	0.296
GCSE	0.24	0.429
No qualification	0.08	0.272
Parents of highest occupations	0.456	0.5
Parents of different ethnic groups	0.064	0.246
Religious	0.560	0.498
Apolitical	0.232	0.424
Conservative	0.152	0.36
Labour	0.344	0.477
Other party	0.272	0.447
Importance of feeling British: high	0.216	0.413
Importance of feeling British: nonexistent,/medium/low	0.192	0.395
Importance of feeling British: missing	0.592	0.493
Employed: Large employers, higher management, and higher professional	0.144	0.353
Employed:Lower management, professional, and intermediate	0.424	0.496
Employed:Small employers, own account, lower supervisory and technical	0.04	0.197
Employed:Semi-routine and routine	0.088	0.284
Unemployed	0.056	0.231
Looking after family or home	0.128	0.335
Other activity	0.12	0.326
PARTNERSHIP CHARACTERISTICS		
LDA	0.352	0.48
England, London excluded	0.224	0.419
Norther Ireland, Scotland, Wales	0.168	0.375
London	0.608	0.49
Duration	15.74	11.491
Cohabitation	0.192	0.395
N	125	

Table A4: Women in co-ethnic partnership

Variable	Mean	Std. Dev.
ETHNIC MINORITY PERSON CHARACTERISTICS		
Age	38.404	10.366
Irish	0.067	0.25
Other white	0.102	0.302
Indian	0.33	0.47
Pakistani	0.167	0.373
Bangladeshi	0.119	0.324
Chinese	0.019	0.137
Caribbean	0.075	0.263
African/Black	0.123	0.328
English is not the first language	0.602	0.49
English is not the first language and has difficulties	0.117	0.322
English is not the first language and has not difficulties	0.485	0.5
Born in UK	0.28	0.449
Not born in UK, arrived $\leq$ 14 y.o.	0.153	0.361
Not born in UK, arrived $>$ 14 y.o., YSA 0-5	0.123	0.328
Not born in UK, arrived $>$ 14 y.o., YSA 6-10	0.148	0.355
Not born in UK, arrived $>$ 14 y.o., YSA $>$ 10	0.297	0.457
University degree and higher	0.416	0.493
A level	0.148	0.355
GCSE	0.243	0.429
No qualification	0.193	0.395
Parents of highest occupations	0.278	0.448
Parents of different ethnic groups	0.073	0.26
Religious	0.902	0.297
Apolitical	0.333	0.472
Conservative	0.119	0.324
Labour	0.414	0.493
Other party	0.134	0.341
Importance of feeling British: high	0.22	0.415
Importance of feeling British: inexistent,/medium/low	0.379	0.486
Importance of feeling British: misisng	0.4	0.49
PARTNER CHARACTERISTICS		
Age	42.169	10.963
University degree and higher	0.421	0.494
A level	0.155	0.362
GCSE	0.234	0.424
Any qualifiaction	0.19	0.392
Parents of highest occupations	0.299	0.458
Parents of different ethnic groups	0.061	0.24
Religious	0.877	0.328
Apolitical	0.249	0.433
Conservative	0.14	0.347
Labour	0.473	0.5
Other party	0.138	0.345
Importance of feeling British: high	0.238	0.426
Importance of feeling British: nonexistent,/medium/low	0.374	0.484
Importance of feeling British: missing	0.389	0.488
Employed: Large employers, higher management, and higher professional	0.144	0.351
Employed:Lower management, professional, and intermediate	0.213	0.41
Employed:Small employers, own account, lower supervisory and technical	0.211	0.408
Employed:Semi-routine and routine	0.207	0.405
Unemployed	0.111	0.315
Looking after family or home	0.008	0.087
Other activity	0.107	0.31
PARTNERSHIP CHARACTERISTICS		
LDA	0.061	0.24
England, London excluded	0.46	0.499
Norther Ireland, Scotland, Wales	0.08	0.272
London	0.46	0.499
Duration	15.052	10.495
Cohabitation	0.1	0.3
N	522	

Table A5: Women in inter-ethnic partnership

Variable	Mean	Std. Dev.
ETHNIC MINORITY PERSON CHARACTERISTICS		
Age	41.201	10.775
Irish	0.228	0.421
Other white	0.495	0.501
Indian	0.071	0.257
Pakistani	0.005	0.074
Bangladeshi	0.011	0.104
Chinese	0.038	0.192
Caribbean	0.12	0.325
African/Black	0.033	0.178
English is not the first language	0.277	0.449
English is not the first language and has difficulties	0	0
English is not the first language and has not difficulties	0.277	0.449
Born in UK	0.348	0.478
Not born in UK, arrived $\leq$ 14 y.o.	0.147	0.355
Not born in UK, arrived $>$ 14 y.o., YSA 0-5	0.082	0.274
Not born in UK, arrived $>$ 14 y.o., YSA 6-10	0.152	0.36
Not born in UK, arrived $>$ 14 y.o., YSA $>$ 10	0.272	0.446
University degree and higher	0.679	0.468
A level	0.087	0.283
GCSE	0.174	0.38
No qualification	0.06	0.238
Parents of highest occupations	0.462	0.5
Parents of different ethnic groups	0.196	0.398
Religious	0.582	0.495
Apolitical	0.277	0.449
Conservative	0.147	0.355
Labour	0.342	0.476
Other party	0.234	0.424
Importance of feeling British: high	0.201	0.402
Importance of feeling British: nonexistent,/medium/low	0.136	0.344
Importance of feeling British: missing	0.663	0.474
PARTNER CHARACTERISTICS		
Age	43.864	11.174
University degree and higher	0.576	0.496
A level	0.098	0.298
GCSE	0.266	0.443
No qualification	0.06	0.238
Parents of highest occupations	0.44	0.498
Parents of different ethnic groups	0.06	0.238
Religious	0.342	0.476
Apolitical	0.168	0.375
Conservative	0.266	0.443
Labour	0.255	0.437
Other party	0.31	0.464
Importance of feeling British: high	0.228	0.421
Importance of feeling British: nonexistent,/medium/low	0.147	0.355
Importance of feeling British: missing	0.625	0.485
Employed: Large employers, higher management, and higher professional	0.234	0.424
Employed:Lower management, professional, and intermediate	0.353	0.479
Employed:Small employers, own account, lower supervisory and technical	0.174	0.38
Employed:Semi-routine and routine	0.098	0.298
Unemployed	0.043	0.204
Looking after family or home	0.005	0.074
Other activity	0.092	0.29
PARTNERSHIP CHARACTERISTICS		
LDA	0.397	0.491
England, London excluded	0.212	0.41
Norther Ireland, Scotland, Wales	0.141	0.349
London	0.647	0.479
Duration	14.473	10.707
Cohabitation	0.234	0.424
N	184	