

# COMPARATIVE ANALYSIS OF ETHNIC MINORITY OCCUPATIONAL ATTAINMENTS IN THE UK 2014-2018

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## **Abstract:**

The integration and assimilation of ethnic minority immigrants (EMIs) and their subsequent generations remains a serious unsettled issue in most of the host countries. This study conducts the labour market gender analysis to investigate specifically whether second generation of ethnic minority immigrants in the UK is gaining access to professional and managerial employment and advantaged occupational positions on par with their native counterparts.

The data used to examine the labour market achievements of EMIs is taken from Labour Force Survey (LFS) for the period 2014-2018. We apply a multivalued treatment under ignorability and report estimates of Average Treatment Effect (ATE), Average Treatment Effect on the Treated (ATET) and Potential Outcomes Means (POM) using three estimators including the Regression Adjustment (RA), Augmented Inverse Probability Weighting (AIPW) and Inverse Probability Weighting- Regression Adjustment (IPWRA). We consider two cases: the case with four categories where the first-generation natives are the base category, the second case combine all natives as a base group. Our findings suggest the following. Under Case 1, the estimated probabilities and differences across groups are consistently similar and highly significant. As expected, first generation natives have the highest probability for higher career attainment among both men and women. The findings also suggest that first generation immigrants perform better than the remaining two groups including the second-generation natives and immigrants. Furthermore, second generation immigrants have higher probability to attain higher professional career, while this is lower for managerial career. Similar conclusions are reached under Case 2. That is to say that both first – generation and second –

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generation immigrants have lower probability for higher career and managerial attainment. First – generation immigrants are found to perform better than second – generation immigrants.

**Keywords:** Ethnic immigrants, second generation, occupational attainment, employment, Average Treatment effect, Regression adjustment

## **1. Introduction**

The western countries once being popular destination for first generation of immigrants irrespective of the reasons behind their migration, are now having second and even third generation of immigrants. There are growing concerns in Western Europe about economic and social integration of those immigrants and their subsequent generations. The integration and assimilation of those immigrants and their subsequent generations remains a serious unsettled issue in most of the host countries. The consideration of second-generation and now even third generation migrants is of great interest in the literature on international migration (Alba 2005; Chiswick and Deburman 2004; Farley and Alba 2002, Portes et al. 2009; Park and Myers 2010; Reitz et al. 2011) as there is ample research evidence about the economic hardships of immigrants and their families.

International immigration in the UK has been higher since 1990s relative to previous years and despite demographic uncertainty for leaving the EU and Brexit the UK population is experiencing ethnic diversification based on past trends and this ethnic composition is projected to change substantially with a more diverse society in 2051. Furthermore, the projection of the UK's ethnic group population for 2001-2051, the ethnic minority share of the population increases from 13% (2001) to 25% in the trend projection (see Rees et al, 2012 and Lomax, Wohland, Rees and Norman, 2019). This diverse nature of the immigrants' population is a key feature of the UK labour market. But the economic assimilation and social integration in terms of professional and occupational achievements of this large influx of ethnic immigrants has also become a challenge for the policy makers in the Western European countries to reap the full-fledged benefits of young and productive members of the society (Alba, Sloan and Sperling, 2011).

The key focus here is that whether the subsequent generations of ethnic migrants are absorbed and integrated in to the mainstream labour market (Alba and Yrizar Barbosa, 2016: Alba and Nee 2003) and or assimilate only into specific segments of society due to restricted opportunities and unexplained discrimination (Portes, Fernnandez-Kelly and Haller, 2009; portes and Zhou 1993).

This research has significantly added to the substantial gap in the literature by digging deep into the professional and occupational achievements of the second generation of ethnic minority immigrants (EMIs) in comparison to not only with just their first generation and natives' first generation but also with the second generation of their native counter parts in the UK using secondary data from Labour Force Survey and also by defining different generations of both categories i.e. immigrants and natives.

Mostly studies have focussed on the labour market performance of either first or second generation of ethnic male and female migrants in the UK, US and other European countries with the new specific human capital, new environment, labour market conditions and restrictive approaches to the employment because the labour market opportunities for immigrant and their children are usually a good indicator of the long-term structural integration of ethnic minorities (Laurijssen and Glorieux, 2014). Damm and Rosholm (2005) argue that spatial dispersal policies have a significant effect on the labour market assimilation of refugees and asylum seekers. It can be argued that the choice of profession, occupational and managerial achievements and the labour market assimilation and integration are not just a matter of policies or immigrants' educational qualifications but it largely depends on the time spent in the host society and accumulation of country-specific human capital as well sufficing the economic assimilation hypothesis that assimilation takes place through overtime acquisition of country specific human capital including labour market knowledge and language proficiency

Mani, Dai and Inkson (2015) state that the level of occupational attainment is an important indicator of immigrants' economic integration in their host country. While Hermensan (2013) considers labour market opportunities and advantaged positions in the social hierarchy of their host country as a crucial long-term test of structural integration of children of ethnic minorities immigrants as these individuals have acquired linguistic fluency, educational qualifications and work experience specific to their parents' destination country. The reluctance to invest in country specific human capital may decelerate the process of assimilation (Chiswick 2000; Dustmann 2000) as first generation of migrants often feel more inclined to their own homeland culture and face difficulties in labour market assimilation and integration in society; but second-generation of migrants through better schooling, linguistic skills and more interaction

with natives get higher chances of occupational success and integration and inclusion in the society.

There is also a wide variation in the patterns of economic activity, employment and occupational attainment across generations of different ethnic minority groups of immigrants. For example, Farley and Alba (2002) using Current Population Survey for US revealed a great diversity among the second generation depending upon country of origin but in most comparison second generation exceed their first-generation parents in educational attainment, occupational achievement, and economic status. But Heath, McMohan and Roberts (2000) investigated for the UK, using Labour Force Survey that the ethnic minorities are more polarised in their qualifications than British born whites with two extremes of either with degree or no qualification at all and the LFS data also confirms that the ethnic penalties of similar magnitude do exist for both first and second generations despite the substantial equalization of educational experience.

This study has mainly focussed on the UK's labour market and assimilation of second generation of ethnic minority immigrants in comparison to first generation immigrants and its native counterparts. In this context the quarterly data from the Labour Force Survey (LFS) the largest household survey in the UK has been analysed for the years 2014-2018 to explore the role of socio-economic and demographic factors on occupational attainments of second generation of ethnic minority immigrants (EMIs).

The key contribution of this paper is that there are no empirical studies focusing on occupational attainment of second generation of EMIs in the UK using large scale secondary data evidence from LFS. SO, we extended the existing literature in three ways. First, while the existing studies have mainly focused on earnings and occupational attainment of ethnic minorities immigrants, explaining the occupational attainments of children of ethnic minorities immigrants and British born, the second-generation females of ethnic minorities in the UK remain a research gap. Thus, our first contribution is to offer an attempt to bridge this gap. Second, we conduct an extensive empirical exercise and compare between the attainment of male and female second-generation immigrants. Finally, while most studies use first generation natives as the control group to which the outcomes of first generation and second-generation

outcomes are compared to, we propose to extend a second control group that include second generation natives (or more precisely second generation immigrants' counterparts).

This is a very useful extension since it allows checking if the differences between second generation immigrants and first generation natives – if any – is more likely due to their ethnic assignment and not to other factors such as economic conditions, occupational and career preferences of the second generation and other similar factors. This can be captured by constructing a comparison group that share similar time set up as second-generation immigrants, which is second generation natives.

In this context, our findings using multivariate treatments effects suggest that the estimated probabilities and differences across groups are consistently similar and highly significant. As expected, first generation natives have the highest probability for higher career attainment among both men and women. The findings also suggest that first generation immigrants perform better than the remaining two groups including the second-generation natives and immigrants. Furthermore, second generation immigrants have higher probability to attain higher professional career, while this is lower for managerial career. Similar conclusions are reached under Case 2 that both first – generation and second – generation immigrants have lower probability for higher career and managerial attainment but first – generation immigrants are found to perform better than second – generation immigrants.

The remainder of the paper is organised as follows. Section 2 offers a discussion of the labour market integration of the second-generation literature. Section 3 is the methodology section. The discussion of findings and empirical results is in Section 4. Section 5 concludes.

## **2. Labour Market Integration of Second Generation**

### **2.1. Theory of Human Capital of second-generation immigrants**

There has been extensive research on the earnings assimilation of immigrants from different perspectives as immigrant's integration and assimilation is of great policy concerns for many governments. In this context, Chiswick (1978) pioneered the study of immigrants' earnings assimilation, using human capital theory, following his examination of the US labour market using cross sectional regression analysis he concluded that . newly arrived migrants lack knowledge about functionality of the foreign labour market, as well as language fluency and awareness of the skills valued by employers. with time of residence in the host country; immigrants accumulate country-specific human capital narrowing the initial earning gap. Hatton (1997) also discussed differences in the assimilation of pre-1890 immigrants but his findings were that immigrants who arrived as children had similar earnings profiles to the native-born while those who arrived as adults suffered an initial earnings disadvantage but their earnings grew at a rate faster than the native-born. In this regard, different explanations have been put forward to explain these disadvantages experienced by the ethnic minorities' immigrants in the labour market.

The labour market integration of the second generation of the immigrants has been given two separate focuses in the literature; one with overall integration in the labour market and the second focussing more on important determinants of labour market success. The studies focussing on second generations are deeply rooted into the classical assimilation theory, which emphasis the following stages: moving up from peddler to plumber to professional leading to advancements in labour market and leaving behind ethnic identities [ Park and Burger (1921); Warner and sole (1945), Gorden (1964) and (Suro1998)]. However, the assessment of second generation's labour market position revealed that labour market disadvantages found in the first generation are transferred in the subsequent second generation. This is mainly due to lower levels of human capital and lower status of social gain. The labour market integration of new or subsequent generation along with education is a useful tool to measure the quality of this structural integration processes as argued by Lessard-Phillips, Fibbi and Wanner (2012). Despite the improvement in educational attainment for the second generation immigrants

relative to their parents, the British born ethnic minorities are less likely to be in employment and earn on average less than their white British born counterparts (Dustmann, Fratini and Theodoropoulos, 2010). Although the ethnic minorities in the UK are more likely to have university qualifications, they still face substantial disadvantage in the labour market on average compared their British born white counterparts (Algan et al.2010; Modood 2005). Wouter Zwysen & Simonetta Longhi (2018) summarises that university career, parental background, networks and economic opportunities within the local area may all lead to ethnic differences in labour market outcomes.

Alexander et al (2017) investigated long term economic and social effects on Great Migration children using longitudinally linked census data and their results revealed modest but statistically significant advantages in education, income, and poverty status for African American children. Most research studies typically concluded that despite taking in to account the disadvantage that second-generation immigrants have because of lower educational degrees, a part of the labour market differences remains unexplained (For example Phalet and Swyngedouw 2003; Heath et al. 2008; Lessard-Phillips et al. 2012). However empirical evidence on labour market assimilation of the second generation in Europe suggest that most ethnic groups do assimilate into middle class compared to their first-generation immigrant parents (Heath et al, 2008).

The structural approaches focus on labour market segmentation for first generation immigrants often pointing at open or concealed discrimination that nails the second generation down to similar structural positions as their parents. The theory of segmented assimilation is a good extension of classical assimilation theory where Zhou and Bankston (1998) introduced the idea of segmented assimilation arguing that some second and third generation groups prosper while others form a new urban underclass. The concept of segmented assimilation helps to describe the diverse possible outcomes for these groups. Under segmented assimilation, acculturation may not lead to socio-economic success and upward mobility is possible without detaching from their ethnic bonds (Portes 1995; Zhou 1999). The success of immigrants in the labour market means higher net economic and fiscal contribution to the host economy, which in turn



affects the attitudes of the native population towards both generations of immigrants (Algan, Dustmann, Glitz and Manning (2009).

## **2.2 Occupational Mobility of second- generation migrants and its Determinants.**

Economic and social mobility of new generation of migrant descent is mainly studied by comparing their position with that of natives or first-generation immigrants. The most notable upward mobility is experienced during professional career and can be either at the start of career or occupational status at middle age (Warren,2001, Hauser et al. 2000).

Occupation is a general term that refers to the job or profession a person adopts as a means of earning a living. The choice of occupation has a direct impact on an individual's earnings as the type of occupation may determine the level of one's earning. Thus, occupational analysis cannot be ignored in assessing labour market performance of a person. Nickell (1982) regards occupation as a portrayal of one's general well-being such as health condition, language usage, food taste, clothes, cars, and social standing. In this context, the higher is the level of occupation the higher is the level of earning. Conversely, a low-level occupation is related with poor rewards and less opportunities. Occupational analysis is also very important in other disciplines. For example, an extensive literature in sociology has investigated how educational achievements and other individual characteristics affect a person's achieved socio-economic status, for example, Blau and Duncan (1967).

The evidence in the literature strongly suggest that labour market outcomes of British ethnic minorities and immigrants are worse off compared to their British native counterparts. For

example, ethnic minorities and immigrants face higher level of unemployment (Price 2001, Blackaby et.al 1997,2002 and Bell, 1999) and are under-represented in the higher stage of occupational ladder and more concentrated on the lower stage (Carmichael and Wood, 2000, Borooah, 2001). Demireva (2011) has also established that there are significant differentials between new immigrant groups in their labour-market participation, employment and occupational attainment – which could not be explained by over time accumulation of human capital – and for migrant women inactivity was of greater concern rather than unemployment.

Immigrants occupational attainment, despite being a significant indicator of economic integration, has received less attention where only few economic studies have examined the role of occupational attainment of immigrants in explaining their economic success in terms of economic opportunities and as a pathway to higher earnings. These few existing studies, however, have recognized that the distributional properties of occupation of immigrants in a host country is central to understanding how immigrants affects economic growth and adjust to host country's labour market requirements (Green 1999; Orrenius and Zayodyn, 2007; Elliott and Lindley, 2008; Chiswick and Miller, 2009).

The understanding of career paths of migrants provides a deeper insight into assimilation process. For example, a study by Hartmann (2016) assessed differences in the success of middle-class assimilation by early employment career patterns of guest workers of Turkish origin, using German Socioeconomic Panel data set. The results indicate that large differential exist between native-born Germans and second-generation Turks and more pronounced between second generation Turk women and native German women due to complex causes including their lower education, language skills, host-country specific social capital as well as group specific penalties for marriage and child birth.

Heath and Cheung (2006) argued that overall ethnic minority groups and most notably Pakistani, Bangladeshi, Black Caribbean and Black African men experience higher unemployment rates and greater concentrations in routine and semi-routine work. Their hourly earnings are also lower in comparison with British and other whites' counterparts. Furthermore,

women from these groups also have higher unemployment rates than the comparison group but those in the work, tend to have higher average hourly earnings than those of white women. However, these differentials cannot be explained just by the age, education or foreign birth of ethnic minority groups as even the second generation, born and educated in Britain also experience significant net disadvantages in the labour market with respect to unemployment, earnings and occupational attainment (Heath and Cheung, 2006). Heath, Rowthorn and Kilpi (2008) have revealed in their survey of recent research of ten Western European countries that second generation of ethnic minorities from less-developed origins appear to be particularly disadvantaged in education, access to labour market and occupational attainment.

Among other factors, parental background is also considered as one of the important sources of ethnic differences in labour market outcome consistent within the literature on intergenerational social mobility and particularly ethnic social mobility (e.g. Li and Heath 2016; Platt 2005; Zuccotti2015). Parental socio-economic status can affect labour market outcomes of ethnic migrant children directly or indirectly through education (Zuccotti 2015). Parents from higher socio-economic background transmit soft skills to their children, which are considered valuable in the labour market. In addition, young adults often rely on their parents' social networks to find work, most of are effective with higher social- economic backgrounds (Bowel, Gintis, and Groves 2005; Holzer 1988; Kadushin 2012; Patacchini and Zenou 2012).

Lessard-Phillips, Fibbi and Wanner (2012) explored second-generation of Turks in the Swiss labour market using ethnic penalty approach and identified that second generation seems to avoid intergenerational social reproduction vis-à-vis occupational status with strong intergenerational occupational mobility at a considerable higher level than their comparison group peers, but gender gap shows that this mobility is not automatic. Tran and Lee et.al (2019) findings for American Asian concludes that despite attaining exceptional educational outcomes, the intergenerational mobility varies across different ethnic groups of second generation of immigrants and this advantage remains restricted to educational domain and is not transferred to the labour market. For example, among Asian American, the five different (Chinese, Indians, Filipinos, Vietnamese and Korean) ethnic groups of second-generation immigrants, all five second-generation Asians groups hold exceptional educational outcome

but no significant advantage of occupational attainment over whites in the US labour market except for Chinese. As the ethno racial bias and discrimination may hinder the professional attainment of second- generation Asian despite their high education attainment (Tran, Lee and Huang, 2019; Lee and Key, 2016).

### **2.3. Review of Literature on Female Ethnic Migrants.**

The data published by Statista (official population statistic used between censuses) reveals in 2019 the population of the UK was over 66 million, with 33.82 million females and 32.98 million males. The figures published by the UK government based on 2011 census reveals that 51% of the population is made up of women and girls with most ethnic groups having roughly the same male and female populations but there was larger female than male population in the Chinese, black Caribbean and other white ethnic groups, where women and girls made up 53% of the respective populations. Factually these ethnic migrant women are less economically active and integrated in the labour market than migrant men and native-born women, with female migrant countries from third world countries faring worse than from other EU countries (migrationpolicy.org). Given that language proficiency and labour market access are the main determinants of the integration process of migrants, family and childcare responsibilities of these migrant women hinders this process of integration and consequently their employment outcome is far worse than migrant men and native-born women. Therefore, migrant women's challenges and barriers make them among most disadvantaged group both as migrants and women (ec.europa.eu). Despite these facts there have been serious gap in the literature on independent research of assimilation and integration of first as well as second generation of ethnic specifically females in the UK Female migrants have been neglected in the migration literature and relatively few studies have accounted for the experiences of female migrants (e.g. Alexander, 2017; White, 2005).

The main objective of this paper is to conduct the labour market gender analysis to examine the managerial and professional attainment of both generations of immigrant and to investigate specifically whether second generation of ethnic minority immigrants in the UK is breaking

through and gaining access to professional and managerial employment and advantaged occupational positions on par with their native counterparts.

So this paper has investigated the differences and discrepancies in the labour market across ethnic groups in the UK. In this context, we identify four groups including first and second-generation natives and immigrants to explore their occupational attainments using LFS data from 2014 to 2018. The focus remains on the performance of second generation of ethnic minority males and females in the UK and study explores the leadership and managerial role achievements and differentials across different ethnic groups in the UK using Labour Force Survey 2014-2018.

### **3. Data and Econometric Methodology**

#### *3.1. Data*

The data used to examine the labour market achievements of EMIs is taken from Labour Force Survey (LFS) for the period 2014-2018. The LFS is the largest social survey carried out across the UK. From 1998 the LFS has been providing headline employment and unemployment figures for each month of the preceding quarter. The main purpose of the LFS is to provide internationally comparable statistics on the levels and changes in employment, unemployment and economic inactivity.<sup>3</sup>

It is a panel of nearly 60,000 households and approximately 138,000 respondents interviewed each quarter for five consecutive quarters with basic core questions along with varying non-core questions asked in each quarter. Some questions in the core are only asked at the first interview (wave1) as they relate to characteristics that do not change over time (e.g. sex, ethnicity, country of birth and nationality). It provides a wide range of data on labour market statistics including employment, wages and economic activities along with other social and demographic information. The survey consists of two parts; the first part is related to basic information on household family structure, basic housing information and other demographic details of the individuals while second part contains information on respondents' economic activity, employment, occupation, hourly earnings, education and health etc. Since 1997, a section on earnings from employment, has been asked in the respondents first and fifth interviews. The earnings data are processed along with the rest of the data each quarter but are weighted separately.

#### **1- First Generation Natives**

We have included all those UK born individuals who have categorised themselves as whites and are equal or over the age of 40. The reason for using age  $\geq 40$  is that for most men, attainment of executive rank coincides with the onset of middle age. Goldman and Harry (1973) provided evidence for increasing age as a most important predictor of rank in newer and growing sectors of the economy and their data also concluded importance of age as a criterion

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<sup>3</sup> <http://qbsoc.surrey.ac.uk/surveys/lfs/lfsintro.htm>

for the allocation of rank within the large-scale organisations. As well as leading jobsites across the globe has generally defined 50-65 for senior management positions with 10-15 years' job experiences and 35-45 as an ideal age for middle management positions (compaignlive.co.uk; Zippia.com; bayt.com; reddit.com).

**2- First Generation Immigrants:** These are the ethnic immigrants born outside the country and usually are the citizen of the country where they were born. They had lived in their country of birth and had their schooling and education in that country. These immigrants have arrived in the UK either as economic migrants under work permit schemes and Highly skilled migrant programs (HSMP) or non-economic migrants as refugees and asylum seekers.

The age limit is set similar to their counterpart natives as  $\geq 40$  for comparing the occupational attainments in the same age range.

### **3- Second Generation Natives**

All those individuals who have born in the UK and have reported their ethnicity as whites and are below the age of 39 (for the same reasons defined above) are characterised as the second-generation natives for the comparison with second generation immigrants. The average age for first leadership training is around age 30 and remains in that role for nine years as mentioned in an article published in the Harvard's Business Review (Zenger, 2012 and Levinson (1969). Furthermore, evidence from Ricklen (2019) analysis about five researches with survey of 10,000 managers between ages 20-70 mentions that the young managers are typically in their 20s and 30s while their older counterparts are in their 50s and 60s.

### **4- Second Generation Immigrants:**

Generally, there is no universal definition of first or second generation of immigrants. Webster's New World Dictionary defines first generation as a foreign-born resident relocated to gain permanent residency and citizenship in a new country while second generation is naturally born individuals, born in a country of relocation with single or both foreign born citizens.

The definition of second generation also vary across different studies and some include only those born in the destination countries with both parents born abroad while some broaden this approach to include those also who migrated before schooling age and had at least one parent born abroad (Heath et al (2008); Farley and Alba (2008)).

For our research identifying the second generation is not straight forwardly given in the UK LFS as the information on parent's country of birth is not available in the LFS. The UK LFS have information on country of birth for first-generation immigrants but no information is available on country of parental birth for the second generation. Therefore, we have used ethnicity as a proxy for being second-generation immigrants which is a standard practice in the literature (see Wang (2018); Heath et al (2008)).

This study will attempt to construct first and second-generation categories of immigrants using information from LFS on country of origin and country of birth along with the year of arrival is then matched with the other information such as age to decide on whether the ethnic immigrant is from 1<sup>st</sup> generation or second generation of migrants.

Although a number of studies have found a correlation between immigrant earnings assimilation and the time horizon in the host country and has also highlighted the link between country-specific human capital and assimilation, especially English language skills (Chiswick (1978), Carliner (1995), Duleep and Regets (1999)), not all the individuals interviewed in the LFS answer the earnings questions. Either individuals sometimes refuse to report their earnings or proxy respondents are used. Therefore, there are missing values or they are assigned imputed earnings by choosing a respondent with similar characteristics as non-respondents. Thus, earnings data have the drawback of measurement error due to missing observations and proxy earnings. Therefore, to complement earnings, an occupational analysis also becomes important, in order to compare the findings. Hence, because of measurement error and missing observations in the earnings data it seems appropriate to examine occupational attainment as an equivalent measure of success at work and integration in the labour market.

For the purpose of this paper, we define two types of outcome variables. The first outcome variable captures attainment. We use two proxies to measure occupational attainment including managerial and professional attainment. Both are binary dummy variables taking value 1 for high managerial/ professional attainment and 0 otherwise. The predicted differences and



estimated potential outcomes of these two proxies are interpreted as the likelihood to attain higher managerial/ professional career. The second outcome variable captures the differences across treatment levels in income.

### 3.2. Econometric Model and Methods

To investigate the differences across respondents, we apply the Propensity Score Matching, PSM, rooted to Rosenbaum and Rubin (1985). We use this approach to estimate the average treatment effect on the treated that is free from self-selection biases. The treatment is defined by generational and migration status. There are two levels, (i) whether the individual is a native or immigrant and (ii) whether the respondent is first generation or second generation. Therefore, we have four groups to which each individual in the sample is assigned ( $j = 0,1,2,3$ ).

Therefore, we have the case of multivalued treatments. Suppose that the treatment variables takes  $G + 1$  different values, labelled as  $\{0,1,2, \dots, G\}$  where '0' refer to the control group and  $1,2, \dots, G$  refer to different levels.

Each respondent has been assigned one of  $G+1$  possible treatment level  $g=0,1,2$ . Furthermore, we observe for each individual the vector

$$\mathbf{z}_i = (y_i, w_i, \mathbf{x}'_i)', \quad i = 1,2, \dots, n \quad (1)$$

where  $y_i$  is the observed outcome variable,  $w_i$  is the treatment level, and  $\mathbf{x}'_i$  is  $k \times 1$  vector of explanatory variables. The indicator variables  $d_i(g) = 1(w_i = g)$ , which take the value 1 if the respondent  $i$  is in the group  $g$  and the value of zero otherwise. Note that the function  $\mathbf{1}(\cdot)$  is the indicator function, the vectors  $\mathbf{z}_i$  are independent and identically distributed draws of the vector  $\mathbf{z} = (y, w, \mathbf{x}')$  and  $d(g) = 1(w = g)$ .

We apply the classical potential outcome framework, which distinguishes between the observed outcome  $y_i$  and the  $G+1$  potential outcomes  $y_i(G)$  for each treatment level  $g=0,1,2$ . The observed response  $y_i$  can be expressed as follows:

$$y_i = \sum_{g=0}^G d_i(g)y_i \quad (2)$$

The individual-level treatment effect of treatment level  $m$  versus  $h$  is the difference of their corresponding potential outcomes:  $y_m - y_h$ . The average treatment effect is defined as the

difference in the means of the two potential outcomes:

$$\Delta_{mh} = E[y_m - y_h] = \mu_m - \mu_h \quad (3)$$

Since the data are observational, we require a set of covariates  $\mathbf{x}_i$  as conditioning to estimate (3). The set of covariates is assumed to contain all confounders associated with the treatment assignment process and potential outcomes. Conditioning on the set of covariates implies that the treatment assignment is as equally good as random assignment. This, however, requires two further assumptions: the unconfoundedness and overlap assumptions. The unconfoundedness assumption can formally be expressed as follows:

$$y_i \perp d_i(g) | \mathbf{x} \quad (4)$$

where “ $\perp$ ” denotes independence. This assumption implies that the distribution of each potential outcome  $y_i(g)$  is independent of the random treatment  $d_i(g)$  (Imbens and Wooldridge, 2009; Wooldridge, 2010). It imposes conditional random assignment for each treatment level and requires all determinants of treatment level and the outcome variable are observed. It also rules out the presence of observed characteristics that commonly affect treatment and outcomes.

The overlap condition ensures that all individuals with the same characteristics in the sample have a positive probability of being part of each of a treatment level. The overlap condition is defined formally as follows:

$$0 < P(G = g | X = x), \text{ for } g \in G \text{ and } x \text{ in the support of } X \quad (5)$$

This condition rules out the perfect predictability of participation conditional on the set of covariates  $X$ , which defines the individual characteristics of respondents under each treatment level. The combination of both assumptions (in (4) and (5)) is referred to as strong ignorability i.e. the condition of “zero bias” or “no-confounding” using an independence relationship (Rosenbaum and Rubi, 1983), under which the conditional expectation of potential outcome for treatment level,  $g$ , can be defined in terms of conditional expectation of observed outcomes of respondents receiving the treatment  $g$  as follows:

$$E[Y_{ig} | X_i] = E[Y_{ig} | d_{ig}(G_i), X_i] = E[Y_i | d_{ig}(G_i), X_i] = E[Y_i | d_i, X_i] \quad (6)$$

Following Imbens (2000), we apply the Generalised Propensity Score, GPS, to mitigate the issue of ‘high dimensionality’ and alternative approach to conditioning directly on the set of covariates,  $X$ , under the presence of multivalued treatment. The GSP is formally expressed as:

$$p_g \equiv \Pr[G_i = g|X_i = x] = E[d_{ig}(G_i)|X_i = x] \quad (7)$$

which defines the propensity score as the conditional probability of a randomly selected respondent to receive a treatment conditional on the set of pre-treatment covariates. Furthermore, average potential outcomes can be derived as:

$$E[Y_{ig}] = E\left[\frac{Y_i d_{ig}(G_i)}{p_{gi}}\right] \quad (8)$$

We use multinomial logit model to estimate GPS.

The second stage of causal inference analysis is to estimate the average treatment effects. In this context, we can estimate the average treatment effect for treatment level  $h$  relative to  $g$ , denoted  $\Delta_{gh}$ , as

$$\Delta_{gh} = N^{-1} \sum_{i=1}^N [\hat{m}_h(\mathbf{x}_i) - \hat{m}_g(\mathbf{x}_i)] \quad (9)$$

For robustness, we report estimates of Average Treatment Effect (ATE), Average Treatment Effect on the Treated (ATET) and Potential Outcomes Means (POM) using three estimators including the Regression Adjustment (RA), Augmented Inverse Probability Weighting (AIPW) and Inverse Probability Weighting- Regression Adjustment (IPWRA)<sup>4</sup>.

## 4. Empirical Results

### 4.1. Descriptive Statistics

Our empirical exercise has been carried out on two definitions of treatment levels. The first is based on three levels including: (i) natives, (ii) first generation immigrants and (iii) second generation immigrants. The second is an extension of the first definition of treatment levels. Under the second definition of treatment levels, we also distinguish between first generation

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<sup>4</sup> Readers are referred to Cattaneo (2010) and Linden et al (2016) for detailed discussion on these estimators.

and second generation of natives. This implies we have four treatment levels: (i) first generation natives, (ii) first generation immigrants, (3) second generation natives and (iv) second generation immigrants.

Table 1 reports the count of respondents in each treatment level covering also gender. First generation natives are the largest group with around 51% of the overall sample, 51% of female respondents and 52% of male respondents.

**Table 1:** Respondents Distribution by Gender and Generation

Treatment Levels	ALL		Female		Male	
	Freq.	(%)	Freq.	(%)	Freq.	(%)
1 <sup>st</sup> Gen Natives	415202	51.17	200094	50.57	215108	51.74
2 <sup>nd</sup> Gen Natives	266965	32.90	133342	33.70	133623	32.14
1 <sup>st</sup> Gen Immigrants	83010	10.23	41998	10.61	41012	9.86
2 <sup>nd</sup> Gen Immigrants	46319	5.71	20280	5.12	26039	6.26
Total	811496	100.00	395714	100.00	415782	100.00

We also examine the extent to which the generation and immigration status and occupation attainment may affect the distributional properties compared to the full sample. Table 2 reports the count (and relative frequencies) of respondents by their treatment and occupation levels. The composition of each treatment level under each occupation attainment level is similar to the distribution and composition of the treatment levels reported in Table 1. For instance, first generation natives are still the prominent group with 64.1% and 50.9% of whom are considered managers and professional with high attainments over the whole sample, respectively. In contrast, second generation immigrants are the least represented group with high attainment of managerial and professional attainment. Similarly, when we consider the distribution by gender, high attainment managers and professionals are mostly first-generation natives respondents, followed by first generation immigrants, second generation natives and finally second generation immigrants. This shows that when accounting for occupation attainment, the distributional properties are the same as those of the overall sample as reported in Table 1.

Furthermore, we test whether treatment levels and occupational attainment are dependent. We perform the Pearson and LR  $\chi^2$  dependency tests appropriate for nominal variables. The null hypothesis being tested states that the treatment level (generation and immigration status) is

independent of occupational attainment. In other words, there is no association between the treatment levels and occupation attainment. The tests are implemented over the whole sample, female and male respondents. The null hypothesis is, however, strongly rejected in all cases. This implies that the treatment levels and occupational attainment are dependent. Therefore, it is likely that the occupational success may be determined by the ethnic and generational background of labour market participants. We explore this further using causal effects models in the following section.

**Table 2:** Distribution of Respondents across Generation and Occupation

Treatment Levels	ALL				Female				Male	
	Managerial		Professional		Managerial		Professional		Managerial	
	Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)
1 <sup>st</sup> Gen Natives	54808	64.1	82136	50.94	19157	62.72	41193	49.26	35651	64.87
2 <sup>nd</sup> Gen Natives	18884	22.09	50274	31.18	7297	23.89	27994	33.47	11587	21.08
1 <sup>st</sup> Gen Immigrants	7670	8.97	17736	11	2989	9.79	9294	11.11	4681	8.52
2 <sup>nd</sup> Gen Immigrants	4141	4.84	11082	6.87	1101	3.6	5146	6.15	3040	5.53
Total	85503	100	161228	100	30544	100	83627	100	54959	100
Pearson $\chi^2$	4.0e+03***				1.7e+03***				1.9e+03**	
LR $\chi^2$	4.0e+03***				1.8e+03***				2.0e+03**	

Pearson and LR  $\chi^2$  statistics test the null of independence between generation groups and occupation. The alternative states dependent to rejection of the null hypothesis at 1% level of significance.

#### 4.2. Potential Outcome Model Estimates

We estimate potential outcomes models expressed in equation (2) and report the ATE, ATET and POM using three estimators including RA, AIPW and IPWRA. We employ two outcome variables, managerial and professional attainments. Both outcome variables are binary. In other words, the estimated potential outcomes can be interpreted as probabilities or the likelihood of a randomly selected respondent to achieve high managerial or professional attainments.

For robustness purposes, we adopt two settings. The first setting is based on the standard approach in the literature, which allows for three treatment levels: natives, first generation immigrants and second-generation immigrants. This setting assumes implicitly that assimilation benchmark is defined by occupation attainments of the natives regardless of which generation they belong to. We extend this setting to introduce second-generation natives as a fourth treatment level. Thus, we examine whether assimilation hypothesis holds with respect to immigration status and not due to generational differences. In this context, the first

generation may have better opportunities compared to even their counterpart of the second generation.

#### *4.2.1 Three Levels of Treatment*

Tables 3 panels A-C report the average treatment effects, the average treatment effects on the treated and potential outcomes using RA, AIPW and IPWRA respectively. We consider three outcome variables: all attainment, managerial attainment and professional attainment. These are reported for the full sample, male and female respondents. According to our findings, the potential outcome estimates are generally found to be higher for native respondents, followed by first generation immigrants; while the second generation immigrants are the least likely to attain success at the higher managerial and professional level. Similarly, the estimated differences based on ATE and ATET suggest that natives have higher chances to achieve higher occupational attainments than immigrants, both first and second generation do. Furthermore, the evidence suggest that male respondents have higher chances to achieve success at the managerial and professional levels compared to female respondents. This finding is also valid for all treatment levels.

**Table 2A: Higher Managerial and Professional Attainment (Three Categories)**

	ALL			Managerial			Professional		
	Full Sample	Men	Women	Full Sample	Men	Women	Full Sample	Men	Women
Regression Adjustments									
ATE									
Native	0.161***	0.206***	0.117***	0.372***	0.216***	0.149***	0.475***	0.226***	0.203***
1st Immig vs Natives	-0.022***	-0.036***	-0.009***	-0.038***	-0.036***	-0.016***	0.066***	-0.019***	-0.011***
2nd Immigs vs Natives	-0.042***	-0.065***	-0.024***	-0.161***	-0.069***	-0.046***	0.024***	-0.052***	-0.016***
ATET									
Native	0.202***	0.258***	0.151***	0.403***	0.267***	0.179***	0.478***	0.273***	0.243***
1st Immig vs Natives	-0.032***	-0.051***	-0.016***	-0.042***	-0.052***	-0.020***	0.083***	-0.025***	-0.014***
2nd Immigs vs Natives	-0.035***	-0.063***	-0.019***	-0.149***	-0.065***	-0.038***	0.067***	-0.040***	0.004
POM									
Native	0.161***	0.206***	0.117***	0.372***	0.216***	0.149***	0.475***	0.226***	0.203***
1st Immigs	0.139***	0.170***	0.107***	0.334***	0.180***	0.133***	0.541***	0.207***	0.192***
2nd Immigs	0.120***	0.140***	0.092***	0.210***	0.147***	0.103***	0.499***	0.174***	0.187***

*Notes:* ATE refer to average treatment effect, ATET refers to average treatment effects on the treated, POM refers to potential outcomes means. The outcome variable is binary takes value 1 if an individual is high career achiever and zero otherwise. Reported values are probabilities. The outcome is modelled using logit including the covariates: quadratic in age, tenure, age left full time education, number of dependent children, usual working hours, marital status and education level. \*\*\* denotes 1% level of significance

**Table 2B: Higher Managerial and Professional Attainment (Three Categories)**

	ALL			Managerial			Professional		
	Full Sample	Men	Women	Full Sample	Men	Women	Full Sample	Men	Women
Inverse Probability Weighting									
ATE									
Native	0.161***	0.206***	0.117***	0.372***	0.216***	0.149***	0.475***	0.226***	0.203***
1st Immig vs Natives	-0.022***	-0.036***	-0.009***	-0.038***	-0.036***	-0.016***	0.066***	-0.019***	-0.011***
2nd Immigs vs Natives	-0.042***	-0.065***	-0.024***	-0.161***	-0.069***	-0.046***	0.024***	-0.052***	-0.016***
<i>N</i>	838,072	428,673	409,399	87,708	460,062	465,718	167,580	515,835	489,817
POM									
Native	0.161***	0.206***	0.117***	0.372***	0.216***	0.149***	0.475***	0.226***	0.203***
1st Immigs	0.139***	0.170***	0.107***	0.334***	0.180***	0.133***	0.541***	0.207***	0.192***
2nd Immigs	0.120***	0.140***	0.092***	0.210***	0.147***	0.103***	0.499***	0.174***	0.187***
<i>N</i>	838,072	428,673	409,399	87,708	460,062	465,718	167,580	515,835	489,817

*Notes:* ATE refer to average treatment effect, ATET refers to average treatment effects on the treated, POM refers to potential outcomes means. The outcome variable is binary takes value 1 if an individual is high career achiever and zero otherwise. Reported values are probabilities. The outcome is modelled using logit including the covariates: quadratic in age, tenure, age left full time education, number of dependent children, usual working hours, marital status and education level. \*\*\* denotes 1% level of significance



**Table 2C: Higher Managerial and Professional Attainment (Three Categories)**

	ALL			Managerial			Professional		
	Full Sample	Men	Women	Full Sample	Men	Women	Full Sample	Men	Women
Inverse Probability Weighting Regression Adjustments									
ATE									
Native	0.161***	0.206***	0.117***	0.372***	0.216***	0.149***	0.475***	0.226***	0.203***
1st Immig vs Natives	-0.022***	-0.036***	-0.009***	-0.038***	-0.036***	-0.016***	0.066***	-0.019***	-0.011***
2nd Immigs vs Natives	-0.042***	-0.065***	-0.024***	-0.161***	-0.069***	-0.046***	0.024***	-0.052***	-0.016***
<i>N</i>	838,072	428,673	409,399	87,708	460,062	465,718	167,580	515,835	489,817
ATET									
Native	0.202***	0.258***	0.151***	0.403***	0.267***	0.179***	0.478***	0.273***	0.243***
1st Immig vs Natives	-0.032***	-0.051***	-0.016***	-0.042***	-0.052***	-0.020***	0.083***	-0.025***	-0.014***
2nd Immigs vs Natives	-0.035***	-0.063***	-0.019***	-0.149***	-0.065***	-0.038***	0.067***	-0.040***	0.004
<i>N</i>	838,072	428,673	409,399	87,708	460,062	465,718	167,580	515,835	489,817
POM									
Native	0.161***	0.206***	0.117***	0.372***	0.216***	0.149***	0.475***	0.226***	0.203***
1st Immigs	0.139***	0.170***	0.107***	0.334***	0.180***	0.133***	0.541***	0.207***	0.192***
2nd Immigs	0.120***	0.140***	0.092***	0.210***	0.147***	0.103***	0.499***	0.174***	0.187***
<i>N</i>	838,072	428,673	409,399	87,708	460,062	465,718	167,580	515,835	489,817

*Notes:* ATE refer to average treatment effect, ATET refers to average treatment effects on the treated, POM refers to potential outcomes means. The outcome variable is binary takes value 1 if an individual is high career achiever and zero otherwise. Reported values are probabilities. The outcome is modelled using logit including the covariates: quadratic in age, tenure, age left full time education, number of dependent children, usual working hours, marital status and education level. \*\*\* denotes 1% level of significance

Tables 4A – 4C report the estimated effects and potential outcomes for four treatment levels. In general, our findings are consistent with the case of three treatment level in the sense that first generation natives are better off. The estimated potential outcomes, however, suggest that the likelihood to achieve managerial and/ or professional attainment is higher for immigrants – both first and second generation – than second generation natives. In this context, the findings also suggest that first generation immigrants perform better than the remaining two groups including the second-generation natives and immigrants. Furthermore, second generation immigrants have higher probability to attain higher professional career, while this is lower for managerial career.

**Table 4A: Higher Managerial and Professional Attainment (Four Categories)**

	ALL			Managerial			Professional		
	Full Sample	Men	Women	Full Sample	Men	Women	Full Sample	Men	Women
<i>ATE</i>									
1st Native	0.187***	0.239***	0.123***	0.385***	0.248***	0.165***	0.514***	0.256***	0.240***
2nd Natives vs 1st Natives	-0.069***	-0.100***	-0.035***	-0.153***	-0.103***	-0.056***	0.112***	-0.090***	-0.063***
1st Immigs vs 1st Natives	-0.048***	-0.069***	-0.017***	-0.050***	-0.068***	-0.031***	0.026***	-0.050***	-0.048***
2nd Immigs vs 1st Natives	-0.069***	-0.100***	-0.032***	-0.175***	-0.102***	-0.063***	-0.017**	-0.084***	-0.054***
<i>N</i>	808,925								
<i>ATET</i>									
1st Native	0.195***	0.236***	0.128***	0.362***	0.243***	0.165***	0.557***	0.261***	0.276***
2nd Natives vs 1st Natives	-0.066***	-0.083***	-0.023***	-0.046***	-0.082***	-0.044***	-0.107***	-0.078***	-0.099***
1st Immigs vs 1st Natives	-0.091***	-0.106***	-0.019**	-0.148***	-0.105***	-0.052***	-0.007	-0.079***	-0.085***
2nd Immigs vs 1st Natives	-0.075***	-0.122***	-0.035***	-0.094***	-0.120***	-0.061***	-0.018	-0.098***	-0.117***
<i>N</i>									
<i>POM</i>									
1st Native	0.187***	0.239***	0.123***	0.385***	0.248***	0.165***	0.514***	0.256***	0.240***
2nd Natives	0.118***	0.139***	0.089***	0.232***	0.145***	0.109***	0.626***	0.166***	0.177***
1st Immigs	0.139***	0.170***	0.107***	0.335***	0.180***	0.133***	0.541***	0.206***	0.192***
2nd Immigs	0.119***	0.139***	0.091***	0.210***	0.146***	0.102***	0.497***	0.172***	0.186***
<i>N</i>									

*Notes:* ATE refer to average treatment effect, ATET refers to average treatment effects on the treated, POM refers to potential outcomes means. The outcome variable is binary takes value 1 if an individual is high career achiever and zero otherwise. Reported values are probabilities. The outcome is modelled using logit including the covariates: quadratic in age, tenure, age left full time education, number of dependent children, usual working hours, marital status and education level. Estimator: Regression Adjustment. Treatment Model: multinomial logit. \*\*\* denotes 1% level of significance. *N* refers to the sample size.

**Table 4B: Higher Managerial and Professional Attainment (Four Categories)**

	ALL			Managerial			Professional		
	Full Sample	Men	Women	Full Sample	Men	Women	Full Sample	Men	Women
Inverse Probability Weighting									
ATE									
1st Native	0.187***	0.239***	0.123***	0.385***	0.248***	0.165***	0.514***	0.256***	0.240***
2nd Natives vs 1st Natives	-0.069***	-0.100***	-0.035***	-0.153***	-0.103***	-0.056***	0.112***	-0.090***	-0.063***
1st Immigs vs 1st Natives	-0.048***	-0.069***	-0.017***	-0.050***	-0.068***	-0.031***	0.026***	-0.050***	-0.048***
2nd Immigs vs 1st Natives	-0.069***	-0.100***	-0.032***	-0.175***	-0.102***	-0.063***	-0.017**	-0.084***	-0.054***
POM									
1st Native	0.187***	0.239***	0.123***	0.385***	0.248***	0.165***	0.514***	0.256***	0.240***
2nd Natives	0.118***	0.139***	0.089***	0.232***	0.145***	0.109***	0.626***	0.166***	0.177***
1st Immigs	0.139***	0.170***	0.107***	0.335***	0.180***	0.133***	0.541***	0.206***	0.192***
2nd Immigs	0.119***	0.139***	0.091***	0.210***	0.146***	0.102***	0.497***	0.172***	0.186***

*Notes:* ATE refer to average treatment effect, ATET refers to average treatment effects on the treated, POM refers to potential outcomes means. The outcome variable is binary takes value 1 if an individual is high career achiever and zero otherwise. Reported values are probabilities. The outcome is modelled using logit including the covariates: quadratic in age, tenure, age left full time education, number of dependent children, usual working hours, marital status and education level. \*\*\* denotes 1% level of significance

**Table 4C: Higher Managerial and Professional Attainment (Four Categories)**

	ALL			Managerial			Professional		
	Full Sample	Men	Women	Full Sample	Men	Women	Full Sample	Men	Women
Inverse Probability Weighting Regression Adjustments									
<b>ATE</b>									
1st Native	0.187***	0.239***	0.123***	0.385***	0.248***	0.165***	0.514***	0.256***	0.240***
2nd Natives vs 1st Natives	-0.069***	-0.100***	-0.035***	-0.153***	-0.103***	-0.056***	0.112***	-0.090***	-0.063***
1st Immigs vs 1st Natives	-0.048***	-0.069***	-0.017***	-0.050***	-0.068***	-0.031***	0.026***	-0.050***	-0.048***
2nd Immigs vs 1st Natives	-0.069***	-0.100***	-0.032***	-0.175***	-0.102***	-0.063***	-0.017**	-0.084***	-0.054***
<b>ATET</b>									
1st Native	0.195***	0.236***	0.128***	0.362***	0.243***	0.165***	0.557***	0.261***	0.276***
2nd Natives vs 1st Natives	-0.066***	-0.083***	-0.023***	-0.046***	-0.082***	-0.044***	-0.107***	-0.078***	-0.099***
1st Immigs vs 1st Natives	-0.091***	-0.122***	-0.035***	-0.094***	-0.120***	-0.061***	-0.098***	-0.079***	-0.117***
2nd Immigs vs 1st Natives	-0.075***	-0.106***	-0.019**	-0.148***	-0.105***	-0.052***	-0.079***	-0.098***	-0.085***
<b>POM</b>									
1st Native	0.187***	0.239***	0.123***	0.385***	0.248***	0.165***	0.514***	0.256***	0.240***
2nd Natives	0.118***	0.139***	0.089***	0.232***	0.145***	0.109***	0.626***	0.166***	0.177***
1st Immigs	0.139***	0.170***	0.107***	0.335***	0.180***	0.133***	0.541***	0.206***	0.192***
2nd Immigs	0.119***	0.139***	0.091***	0.210***	0.146***	0.102***	0.497***	0.172***	0.186***

*Notes:* ATE refer to average treatment effect, ATET refers to average treatment effects on the treated, POM refers to potential outcomes means. The outcome variable is binary takes value 1 if an individual is high career achiever and zero otherwise. Reported values are probabilities. The outcome is modelled using logit including the covariates: quadratic in age, tenure, age left full time education, number of dependent children, usual working hours, marital status and education level. \*\*\* denotes 1% level of significance

## 5. Concluding Remarks

The integration and assimilation of ethnic minority immigrants and their subsequent generations remains a serious unsettled issue in most of the host countries. In this study, we aimed to re-examine the issue of assimilation. We conduct a comparative analysis of occupational and managerial outcomes across gender to investigate specifically whether second generation of ethnic minority immigrants in the UK is gaining access to professional and managerial employment and advantaged occupational positions on par with their native counterparts.

The data used to examine the labour market achievements of EMIs is taken from Labour Force Survey (LFS) for the period 2014-2018. We apply a multivalued treatment under ignorability and report estimates of Average Treatment Effect (ATE), Average Treatment Effect on the Treated (ATET) and Potential Outcomes Means (POM) using three estimators including the Regression Adjustment (RA), Augmented Inverse Probability Weighting (AIPW) and Inverse Probability Weighting- Regression Adjustment (IPWRA).

We consider two cases: the case with four categories where the first-generation natives are the base category, the second case combine all natives as a base group. Our findings suggest the following. Under Case 1, the estimated probabilities and differences across groups are consistently similar and highly significant. As expected, first generation natives have the highest probability for higher career attainment among both men and women. The findings also suggest that first generation immigrants perform better than the remaining two groups including the second-generation natives and immigrants. Furthermore, second generation immigrants have higher probability to attain higher professional career, while this is lower for managerial career. Similar conclusions are reached under Case 2. That is to say that both first – generation and second – generation immigrants have lower probability for higher career and managerial attainment. First – generation immigrants are found to perform better than second – generation immigrants.

In short, the evidence we reached are twofold: first, there is evidence that immigrants have lower career prospects than natives. `Second, first generation natives are better off than their second-generation counterparts. In other words, there is also generational differences.