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The Dynamic of the Wage Gap between Natives and Descendants of Immigrants in France

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Summary

Résumé.....	3
Abstract	4
Introduction.....	5
1. Data and descriptive evidence	9
1.1. Data and study sample	9
1.2. Identifying origin	9
1.3. Descriptive statistics on descendants of immigrants and natives	12
1.4. Focus on descendants of immigrants from Maghreb compared to natives	15
2. Empirical Strategy.....	19
2.1. Model	19
2.2. Selection of control variables	20
3. Results on descendants of immigrants from Maghreb	22
3.1. Main Results	23
3.2. Heterogeneity and robustness analysis	29
3.3. Robustness regarding selection into employment.....	31
4. Results on the descendants of immigrants, by origin	34
5. Explaining the cohort effect	37
Conclusion	40
References.....	42
Appendix A: Complementary figures and tables.....	45
Appendix B: Results about the earning gap	60

Résumé

Dynamique des écarts de salaires entre descendants d'immigrés et population sans ascendance migratoire en France

Cette étude s'intéresse à l'évolution des écarts salariaux entre descendants d'immigrés et population sans ascendance migratoire en France. La littérature empirique a jusqu'ici mis en évidence des écarts faibles ou inexistantes lorsque les différences de caractéristiques sont prises en compte, sauf dans le haut de la distribution des salaires et plus particulièrement parmi les salariés plus âgés. À l'aide des données de panel de l'Échantillon Démographique Permanent (EDP), nous tentons d'expliquer ce résultat en examinant comment les écarts salariaux entre origines migratoires évoluent avec l'âge et la génération. Les informations sur les salaires sont issues des Déclarations Annuelles de Données Sociales (DADS) faites par les employeurs et sont donc plus précises que les déclarations des salariés dans les sources habituellement mobilisées. Nos résultats indiquent que les descendants d'immigrés originaires du Maghreb et d'Afrique subsaharienne perçoivent des salaires inférieurs en moyenne à ceux des salariés sans ascendance migratoire, à caractéristiques comparables. Ces écarts de salaire inexplicables évoluent très peu avec l'âge, mais se réduisent dans le temps pour les jeunes générations. Ce résultat est robuste à diverses spécifications et pourrait être lié à la baisse des inégalités salariales observée au sein des jeunes générations en France. Notre mesure des écarts de salaire inexplicables indique une baisse pour les jeunes générations non seulement en matière d'origine migratoire mais aussi en matière de genre, ce qui pourrait traduire des changements culturels ou des évolutions globales du marché du travail.

Mots-clés : écart de salaire, descendants d'immigrés, données longitudinales

Classification JEL : J15, J31, J71

Abstract

The Dynamic of the wage gap between descendants of immigrants and natives in France

This paper examines the dynamic of the wage gap between descendants of immigrants and natives in France. While the empirical literature finds small or nonexistent wage gaps, except at the top of the wage distribution, descriptive evidence shows that the wage gaps are greater among older workers. Using a panel data based on administrative wage declarations, we attempt to explain this stylized fact by disentangling age and generation effects. We find that the descendants of immigrants from Maghreb and Sub-Saharan Africa receive lower wages compared to natives. We find nearly no variation of this unexplained gap in different age groups but rather a reduction of the gap over time for younger generations. This result is robust to various specifications. It may be related to the reduction of wage inequality among younger cohorts in France. Applying the same methodology to the gender wage gap, we also find a reduction of the unexplained gap for younger generations, suggesting that similar cultural changes or labor market developments could be involved in both cases.

Keywords: wage gap, descendants of immigrants, longitudinal data

JEL classification: J15, J31, J71

Introduction

The integration process of immigrants and their descendants is at the center of the national debate in many European countries as well as in North America. Recent theories in sociology also supported by empirical evidence argue that integration is not driven by cultural differences between natives and children of immigrants but rather by the many barriers the latter encounter in terms of access to jobs, housing, education, etc. (Safi, 2011). The integration process appears to be segmented, with certain minorities experiencing discrimination in some aspects of integration on the basis of ethnicity or racism (De Rudder et al., 2000; Brinbaum and Primon, 2013). Portes and Zhou (1993) point out that contrary to Italian immigrants in the US, “Children of nonwhite immigrants may not even have the opportunity of gaining access to middle-class white society, no matter how acculturated they become”.

This paper attempts to measure one aspect of economic integration of second-generation immigrants: the dynamic of the wage gap between natives (with native parents) and the descendants of immigrants in France.¹ We pay particular attention to the descendants of immigrants from Maghreb, as they represent a large share of the descendants of immigrants in France and of those for whom we observe wage differentials with natives. The main finding of the paper is that these wage differentials decrease over time and are smaller for younger generations. This decreasing trend over generations is also observable in the gender wage gap and may be attributable to general factors affecting the economy and society as a whole, such as greater societal awareness on discrimination issues or developments in the labor market. Notably, this finding could be related to the observed decrease of the overall wage inequality in France from one generation to the next.

The issue of the wage gap between natives and immigrants and their descendants has long attracted the attention of labor economists and has been widely examined in some Western countries. Algan et al. (2010) analyze the integration of the descendants of immigrants in Europe by comparing the labor market situation of first and second-generation immigrants.

¹ For the sake of simplification, we use the word “natives” in this paper to refer to individuals with non-immigrant parents. We use the terms “descendants of immigrants” or “second-generation immigrants” interchangeably to refer to individuals born in France with at least one immigrant parent. Detailed description and definitions are presented in the next section.

The authors focus on the three main destinations of immigrants in the European Union: Germany, France and the UK. The authors find significant wage gaps between first generation immigrants and natives in the UK, but the situation improves quite markedly for the descendants of immigrants. In Germany and France, the improvement of the wage situation of the descendants of immigrants as compared to that of immigrants is less clear.

In France, empirical evidence has shown a higher likelihood for the descendants of immigrants from Maghreb, Sub-Saharan Africa and Turkey to be unemployed or employed in precarious jobs (Meurs et al., 2006; Brinbaum and Primon, 2013; Foroni et al., 2016; Athari et al., 2019; Aeberhardt, Coudin and Rathelot, 2017). However, the literature on the wage gap between natives and descendants of immigrants in France is scarce, and existing studies tend to show little or no wage gaps when differences in observable characteristics are accounted for (Aeberhardt and Pouget, 2010; Rathelot, 2010). Recent evidence by Boutchenik and Lê (2017) and Athari et al. (2019) demonstrates the existence of wage gaps at the top of the wage distribution. These empirical studies use cross-sectional data and do not allow for an understanding of how wage differentials have evolved over time. To our knowledge, this paper is the first longitudinal study in France which documents the evolution of the wage differentials between natives and second-generation immigrants over a relatively long period (13 years). We provide insights on how the wage gap is affected by the evolution of wages over the career and the shift of wage inequality over generations. We use a data source collected by the National Institute of Statistics and Economic Studies (INSEE, France) called EDP (*Echantillon Démographique Permanent*). These data merge various datasets from the national civil-status records, population censuses and administrative data on wages.² Our sample covers wage data for the period 2002-2014. It consists of data on employees working in the private sector and public firms who were born from 1967 and aged 18 or older.

The contribution of this paper is twofold. First, we conduct a longitudinal analysis of the wage dynamics of second-generation immigrants that has not yet been done in the literature on France and second, we use a more precise measure of wages than previous studies.

² EDP also gathers income tax data and data from electoral files but these two datasets are not used in this paper. The administrative data on wages are a sample of the DADS (*Déclarations Annuelles de Données Sociales*) declared by employers.

The major contribution of this paper is based on a longitudinal analysis of the wage gap which goes beyond a simple comparison of wages in a given period. It offers the opportunity to study whether the wage trajectory over the career diverges (or converges) between natives and descendants of immigrants (age effect) and to examine whether the wage differentials observed for the younger generations are similar to what is observed for the older generations (cohort effect). Boutchenik and Lê (2017) show that unexplained wage differentials observed at the top of the wage distribution appear to concern the older employees. This result of a deeper wage gap for older employees can be attributed to either a widening of the wage gap with age or a decline of the wage gap for younger generations. The second case would give us the prospect of narrowing the global wage gap in the future as the older generations progressively exit the labor market and are replaced by younger generations. However, the empirical evidence available to date does not allow us to speculate on which effect prevails.

Most of the studies on wage inequalities between natives and immigrants (or their descendants) in France use cross-sectional data with wage responses collected from household surveys. Several studies have examined the quality of reported wages collected in household surveys by comparing these data with data from administrative records. These studies generally converge on the fact that wage data (or incomes in some cases) have fairly large measurement errors which are correlated with wages and other control variables commonly used in regressions on wages (Duncan and Hill, 1985 and Bound and Krueger, 1991 for data on the US; Biscourp et al., 2005 and Audenaert et al., 2014). Biscourp et al. (2005) show that reported wages from household surveys are often rounded and annual wage variations are unreliable. In this paper, we take advantage of using wage data from employer declarations. As we study the dynamics of the wage gap, an administrative source that allows a good measure of wage variations is of paramount importance.

The international literature gives several reasons why the wage gap should change along with an employee's age, most of the time in favor of an expansion of the gap. First of all, second-generation immigrants have lower education on average than the native population, and the increase of wages along the career is lower for less educated employees (Yaish and Gabay-Egozi, 2019). This phenomenon does not reflect differences in behavior or treatment on the labor market and should be controlled for. Second, wage dispersion increases, along with wages, over the career (Magnac et al., 2018), opening a broader range for discrimination.

Racial or gender wage gaps generally tend to be larger within the most advantaged categories of employees (Doren and Lin, 2019). We can expect the same pattern to occur with regards to age. Third, human capital accumulation on the labor market can be considered as endogenous (Thomasovic-Devey et al., 2005). Most sources of human capital accumulation (tenure, on-the-job training and experience in high-level jobs) depend as much on employers' choices as on employees'. Therefore, discrimination in access to capital accumulation should have a cumulative effect over the career. However, statistical discrimination theoretically leads to a narrowing of the gap with age. Tenure increases on average with age, and the impact of statistical discrimination on wages decreases with tenure since employers get better information about the real productivity of employees (Altonji and Pierret 2001). Kreisman and Rangel (2015) produce evidence of a steady wage gap between whites and light-skinned blacks in the United States, because light-skinned blacks have a higher return to tenure than whites. However, the global black-white wage gap widens as employees age because dark-skinned black employees tend to have a very high turnover and do not accumulate sufficient tenure over the career.

Thus, the balance between a growing and decreasing wage gap depends on the nature of the discrimination process and on labor market characteristics such as overall employment stability. This can differ over periods and across countries. Empirical evidence to date is indicative of an overall trend of a growing unexplained wage gap (Tomaskovic-Devey et al, 2005, Kreisman and Rangel, 2015, Doren and Lin, 2019), but there are no results on France. Our results show that the French case is different since the unexplained wage differentials between natives and second-generation immigrants do not increase (or decrease) with age. Rather, after controlling for observable characteristics of both individuals and their parents we find that the older cohorts of second-generation immigrants from Maghreb experience larger wage gaps (compared to younger cohorts). A simple comparison with the dynamics of the gender wage gap suggests that this decreasing wage differential observed in the youngest cohorts of the descendants of immigrants may not be due to migration-specific factors but rather to common forces that tend to reduce wage inequalities over time.

The paper is organized as follows. Section 1 presents the data and some descriptive evidence. Section 2 discusses the empirical methodology. Section 3 and 4 present the results. Section 5 concludes.

1. Data and descriptive evidence

1.1. Data and study sample

We use the Permanent Demographic Sample called the EDP (*Échantillon Démographique Permanent* in French), which is a sample of individuals collected by INSEE, the National Institute of Statistics and Economic Studies in France. This database/sample gathers several sources of information. In this paper, we use data from the national civil-status records, which contain information on birth, marriage and death, population censuses and administrative wage records that also include information on the characteristics of employees and firms. The EDP began collecting data in 1967 and the sampling is purely based on the employee date of birth. Individuals born between the 1st and the 4th of October are included in the sample. However, during the period 1982-1997, information from the civil-status records was not collected for a large share of individuals born October 2nd and 3rd. Therefore, we exclude those individuals from the study sample.

EDP's database is filled each year with new information from the different sources (civil-status, population census, wage declarations, etc.). In this paper we use the 2014 EDP data, which contains information from 1967 to 2014 and administrative wage data for the period 2002-2014. The year 2002 marks a break in the employment data. Before 2002, only employment data on the individuals born during the first four days of October in even years were collected. From 2002, all years of birth (odd and even) are covered. We exclude individuals under the age of 18. Therefore, our final sample includes employees born between 1967 and 1996.³ Employees born in 1967 were 47 years old in 2014 and those born in 1996 were 18 years old in 2014. Our sample only includes employees in the private sector and public enterprises and excludes apprentices and trainees, self-employed workers and employees in the public sector. Overall, 116,835 employees are included in the sample.

1.2. Identifying origin

We define an immigrant as: "A person born abroad with a foreign nationality", following the official definition in France. A descendant of immigrants is defined in the public statistics as:

³ The data source includes information on individuals born before 1967 through population censuses, marriage registrations or wage reports. However, those individuals are not included in the sample because their birth records were not collected (since collection began in 1967). Therefore, we cannot know whether a large share of individuals born before 1967 are natives or descendants of immigrants.

"A person born in France with at least one immigrant parent". A sharp difference between immigrants and descendants of immigrants (also called second-generation immigrants) is that the latter were born in France. In our data, the majority of descendants of immigrants (about 98%) also have French citizenship at the time they are observed on the labor market. Following the existing literature, we use the term "native" to refer to individuals who are neither immigrants, nor descendants of immigrants.

Our data contain information from the birth certificates of individuals, including the parents' country of birth and nationality at the time of the birth of the child in the sample. We identify descendants of immigrants as individuals born in France with at least one parent fulfilling the following two conditions: the parent was born abroad and had foreign nationality at the time of the birth of the child. Two limitations of the data prevent us from identifying the complete population of descendants of immigrants. First, birth certificate records do not provide information on parents' nationality at the time of their own birth. It is therefore impossible to know whether a parent born abroad with French citizenship at the time of the birth of their child is an immigrant who has acquired French citizenship or an individual who has been a French citizen since birth. Second, a significant share of birth certificates are missing one of the parents' country of birth. These two problems of identifying the parents' migratory background mean that we cannot know whether some individuals are natives or descendants of immigrants. Therefore, we use additional information from the population censuses: when individuals born in France declare having acquired French nationality or having foreign nationality, we consider them as descendants of immigrants. Still, we do not know the migratory background of individuals who were born in France and have held French citizenship since birth but for whom at least one parent's origin is missing. Such cases represent 15.8% of our sample and could be either descendants of immigrants or natives.

We identify immigrants as individuals born abroad (according to their birth certificate) with foreign nationality at birth (according to population censuses). Individuals who are born abroad with French citizenship and with no immigrant parent are considered natives. Individuals who are born abroad with French citizenship and have at least one immigrant parent represent less than 1% of the sample and are excluded from the study sample. We know that 5.1% of individuals in the study sample were born abroad but their nationality at birth is missing and we cannot determine whether they are immigrants or natives.

Despite the limits of our data, the underestimation of the population of descendants of immigrants is limited: we identify 9.5% of second-generation immigrants in our data in 2014 while this percentage is 10.8% in a comparable sample from the Labor Force Survey with no such identification problems (Table 1). However, the percentage of natives is strongly underestimated: 61.6% of the population instead of 80.2% in the reference source. In the rest of the paper, we compare the 9.5% of identified second-generation immigrants to the 61.6% identified natives. We run a robustness check identifying the 15.8% individuals with missing origin as natives with almost no impact on the results.

We use the nationality at birth of the individuals or the country of birth of the parents to define the region of origin. If the mother and father are both immigrants from different countries, we follow the existing literature and retain the father's country of origin as the origin of the individual.⁴ The structure of the descendants of immigrants by nationality in our sample is not very different from that of the Labor Force Survey, but has slightly more descendants from Maghreb and fewer descendants from Southern Europe. In this paper, we focus on second-generation immigrants from Maghreb (Algeria, Morocco and Tunisia) but we show basic results for the other well-represented regions in France usually studied in the literature: Southern Europe (Italy, Portugal and Spain), other European countries, Sub-Saharan Africa, Turkey and South East Asia (Cambodia, Laos and Vietnam).

Table 1: Distribution of the share of immigrants and descendants of immigrants in 2014

	EDP panel		Proportion in the Labor Force Survey (%)
	Proportion in our sample with missing origin (%)	Proportion in the study without missing origin (%)	
Immigrants	8.1	10.2	9.0
Descendants of Immigrants	9.5	12.0	10.8
Natives (with no immigrant parents)	61.6	77.8	80.2
Missing (Immigrants or natives)	5.1	-	-
Missing (Descendants of immigrants or natives)	15.8	-	-
Overall	100	100	100

The sample includes employees in the private sector in 2014 born between 1967 and 1996, aged between 18 and 47, excluding apprentices and interns. Individuals who were born abroad with French citizenship and with at least one immigrant parent are excluded.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, and 2014 Labor Force Survey, INSEE.

⁴ Athari et al. (2019) note that this choice has no impact on their results. Brutel (2017) calculates that the parents were born in the same country for 91% of descendants with two immigrant parents.

1.3. Descriptive statistics on descendants of immigrants and natives

We present the descriptive statistics for the year 2014 from which all individuals have reached the age of 18 and are potentially included in the sample. In 2014, descendants of immigrants from Maghreb are the largest group in our sample (42.3%) followed by the descendants of immigrants from Italy, Portugal and Spain grouped as descendants from Southern Europe (29.5%). The descendants of immigrants from Sub-Saharan Africa, other European countries, Turkey and South East Asia account for 9.1%, 5.8%, 4.2% and 3.0%, respectively (Table 2).

Table 2: Distribution of descendants of immigrants by region of origin in 2014

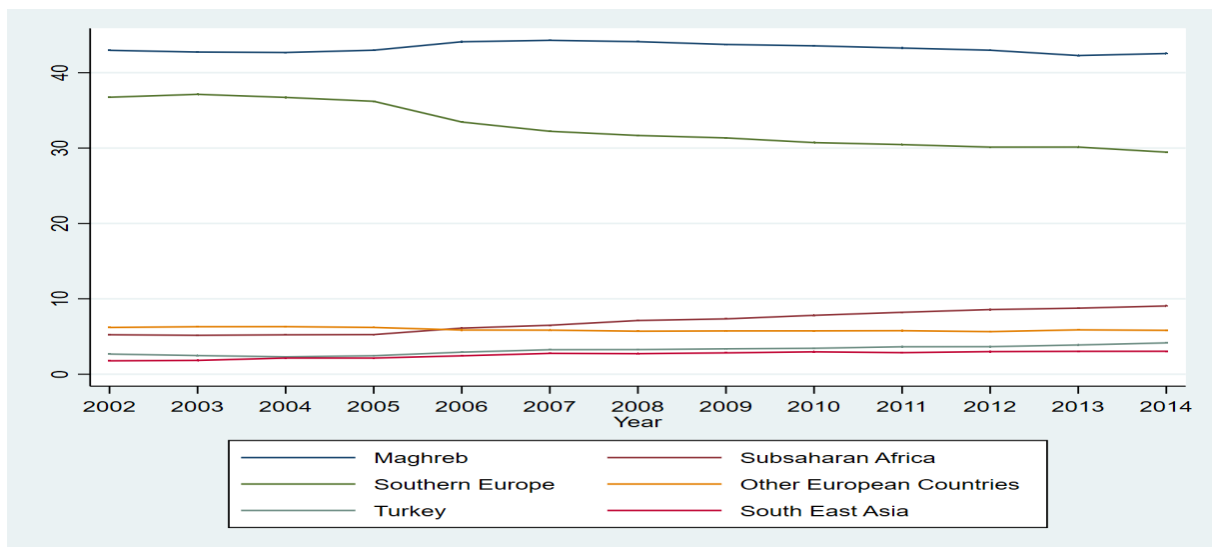
Region	Percentage of the descendants of immigrants by region of origin (%)
Maghreb	42.3
Southern Europe	29.5
Sub-Saharan Africa	9.1
Other European Countries	5.8
Turkey	4.2
South East Asia (Cambodia, Laos, Vietnam)	3.0
Other Descendants of Immigrants	4.0
Missing Countries	2.2
Overall	100

The sample includes descendants of immigrants born between 1967 and 1996, aged between 18 and 47, and employed in the private sector in 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

The share of the descendants of immigrants from Maghreb and other European countries in our sample remained stable during the study period, while the share of second-generation immigrants from Sub-Saharan Africa, Turkey and South East Asia slightly increased. The share of the descendants of immigrants from Southern Europe decreased markedly from 37% to 30% (Figure 1).

Figure 1: Evolution of the descendants of immigrants by region of origin (%)



The sample includes descendants of immigrants born between 1967 and 1996, aged between 18 and 47, and employed in the private sector between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE

The hourly wage is measured as the sum of wages earned by an employee in a given year divided by the sum of hours worked. The median hourly wage is higher for the descendants of immigrants from Southern Europe compared to other origins, but this is partly driven by the fact that they are older. Descendants from South East Asia have high wages although they are among the youngest groups. Descendants from other European countries are similar to natives in terms of wage and age. In accordance with the existing literature on France, descendants of immigrants from Maghreb, Sub-Saharan Africa and Turkey have lower wages and are also younger than natives. Descendants from South East Asia have the highest percentage of college degrees (38%) and higher-grade occupations. The difference with natives in the percentage of employees in higher grade occupations is particularly sharp (a difference of 9 percentage points). Descendants of immigrants from Turkey are less likely to hold a college degree and to be employed in a higher-grade occupation than the other descendants. Descendants from Maghreb, Southern Europe and Sub-Saharan Africa have similar proportions of college graduates and higher-grade professionals. Descendants of immigrants from all regions of origin are more likely to live in the Paris urban area compared to natives. This share is highest among descendants from Sub-Saharan Africa (73%) and South East Asia (51%) and lowest for descendants from Turkey (20%). Only 17% of natives live in the Paris urban area.

Table 3: Descriptive statistics in 2014, by region of origin

<i>(in %)</i>	Natives	Maghreb	Sub-Saharan Africa	Southern Europe	Other European countries	Turkey	South East Asia
Median hourly wage (net euros)	10.7	10.4	9.9	11.1	10.7	9.4	10.9
Median age (years)	33	31	27	36	33	27	28
Share with college degrees (1)	34.0	26.7	27.2	27.7	35.6	16.3	37.8
Share in a higher grade occupation (2)	14.9	9.0	10.8	10.9	17.5	4.3	24.0
Share living in Paris urban area	16.7	38.2	73.1	33.8	38.3	19.9	51.1

(1) The population census in France was replaced by the annual census survey in 2004. The information on the diploma is from the last year the individual was surveyed in an annual census survey, which may be 2014 or before. As young individuals in particular may earn a higher degree over time, the true share of college graduates in 2014 may be higher than the figures presented in this table.

(2) The high grade social status of “*cadres*” is defined at the sector-level by collective agreements. It covers managers, executives, employees with a high level of responsibility, and various experts.

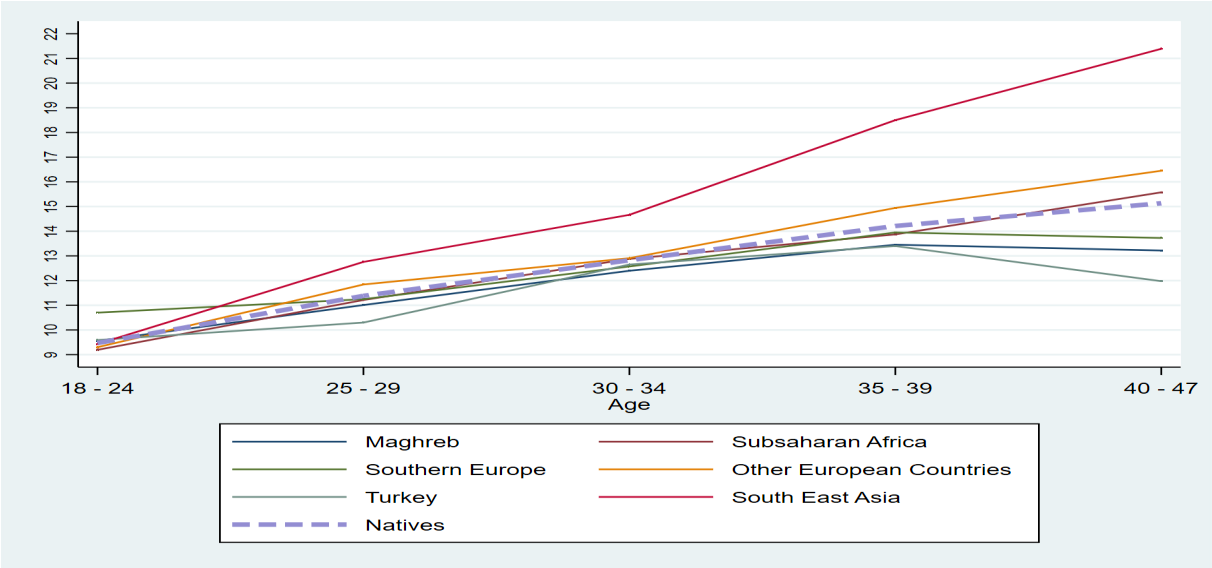
The sample includes natives and descendants of immigrants born between 1967 and 1996, aged between 18 and 47, and employed in the private sector in 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE

As expected, the average hourly wage increases with age for all the groups (Figure 2). Interestingly, wages among employees are very close at younger ages and wage differences gradually widen as employees age. At a given age and beyond age 25, the average hourly wage is much higher for second-generation immigrants from South Asia and lower for second-generation immigrants from North Africa and Turkey. On average, descendants of immigrants from other European countries have higher hourly wages compared to natives, while those from Southern Europe display lower hourly wages than natives. When age is accounted for, the average wage of descendants of immigrants from Sub-Saharan Africa is close to those of natives. Figure 2 does not account for two important aspects. First, it shows important compositional effects because the populations whose wages are compared do not have the same observable characteristics: some may be, for instance, more educated than others on average or live in larger urban areas or benefit from a better family background, etc. (See Table 3 above and Tables 7 and 8 in the Appendix for the professions of the parents.) All these factors could explain part of the wage differentials. Second, this increasing trend of wages (and wage-gaps) over age confounds age effects, cohort effects and also date effects. The aim

of the econometric part of the paper is precisely to neutralize the date effects and to disentangle the age and cohort components of the wage differentials between natives and descendants of immigrants.

Figure 2: Average hourly wage in 2014 (euros), by age and region of origin



The sample includes natives and descendants of immigrants born between 1967 and 1996, aged between 18 and 47, and employed in the private sector in 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE

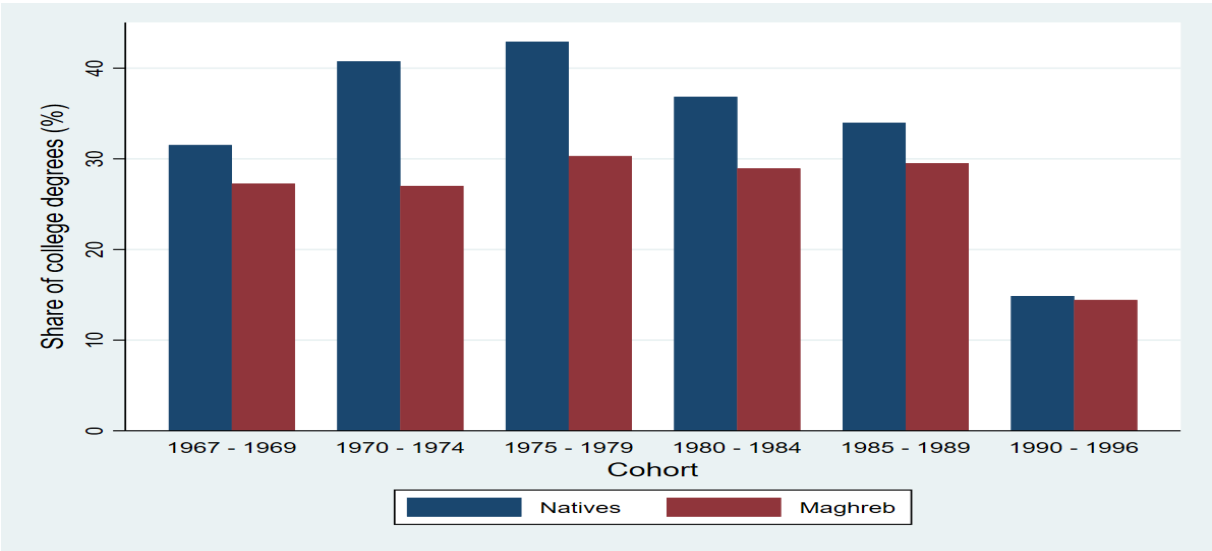
1.4. Focus on descendants of immigrants from Maghreb compared to natives

In the following descriptive analysis, we focus on the descendants of immigrants from Maghreb. Table 6 in the Appendix displays a comparison between natives and descendants of immigrants from Maghreb of the different variables used in the econometric model. Compared to natives, descendants of immigrants from Maghreb are younger, less educated and less likely to be employed in higher-grade occupations. They are more likely to work in the service sector and less likely in industry. Only a very small share of the descendants of immigrants live in rural areas, while a significant proportion live in the urban area of Paris.

The share of employees with a college degree increases markedly among natives between the 1967-1969 and 1970-1974 cohorts, while it remains constant among the descendants from Maghreb (Figure 3). Therefore, the educational gap between these two populations is particularly high for the 1970-1974 and 1975-1979 cohorts (about 13 percentage points). For the younger cohorts, the share of employees with a college degree decreases for individuals

of both origins because the share of data corresponding to employees aged 18 to 24 increases, and employees in this age group are less likely to hold a college degree. Similar observations can be made between natives and descendants from Maghreb regarding the share of employees with higher-grade occupations (Figure 4). The gap is greater for the older cohorts and smaller for the younger cohorts for which the share of higher-grade professionals is very small in both populations. Age structure is at play since the differences of education and occupation level in people between the ages of 18 to 24 are very small.

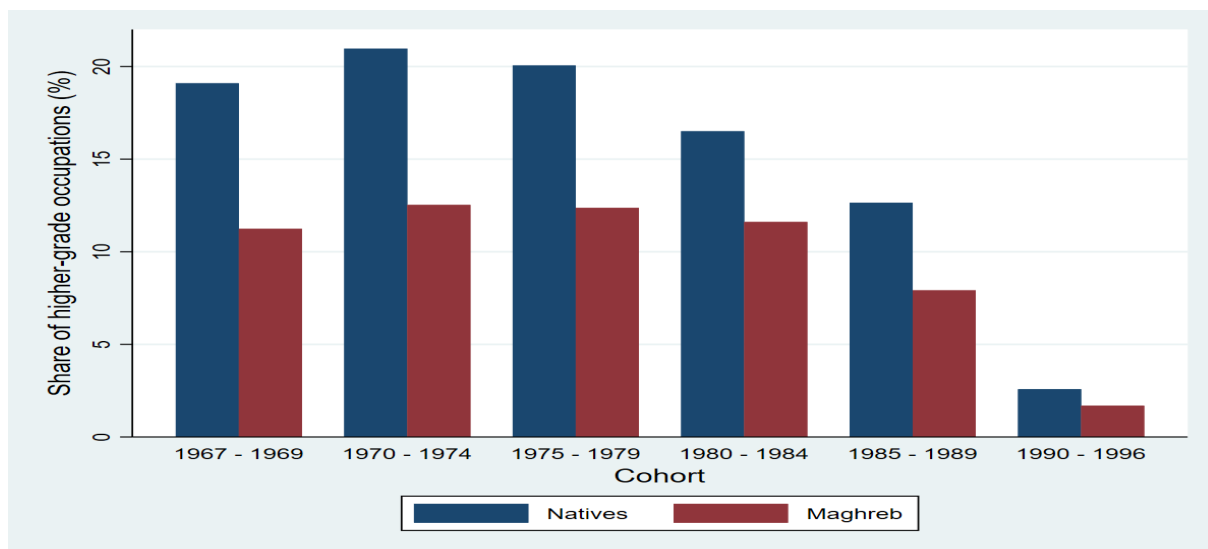
Figure 3: Employees with a college degree in cohort of natives and descendants of immigrants from Maghreb (share in %)



The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE

Figure 4: Share of higher-grade occupations in cohort of natives and descendants of immigrants from Maghreb (in %)

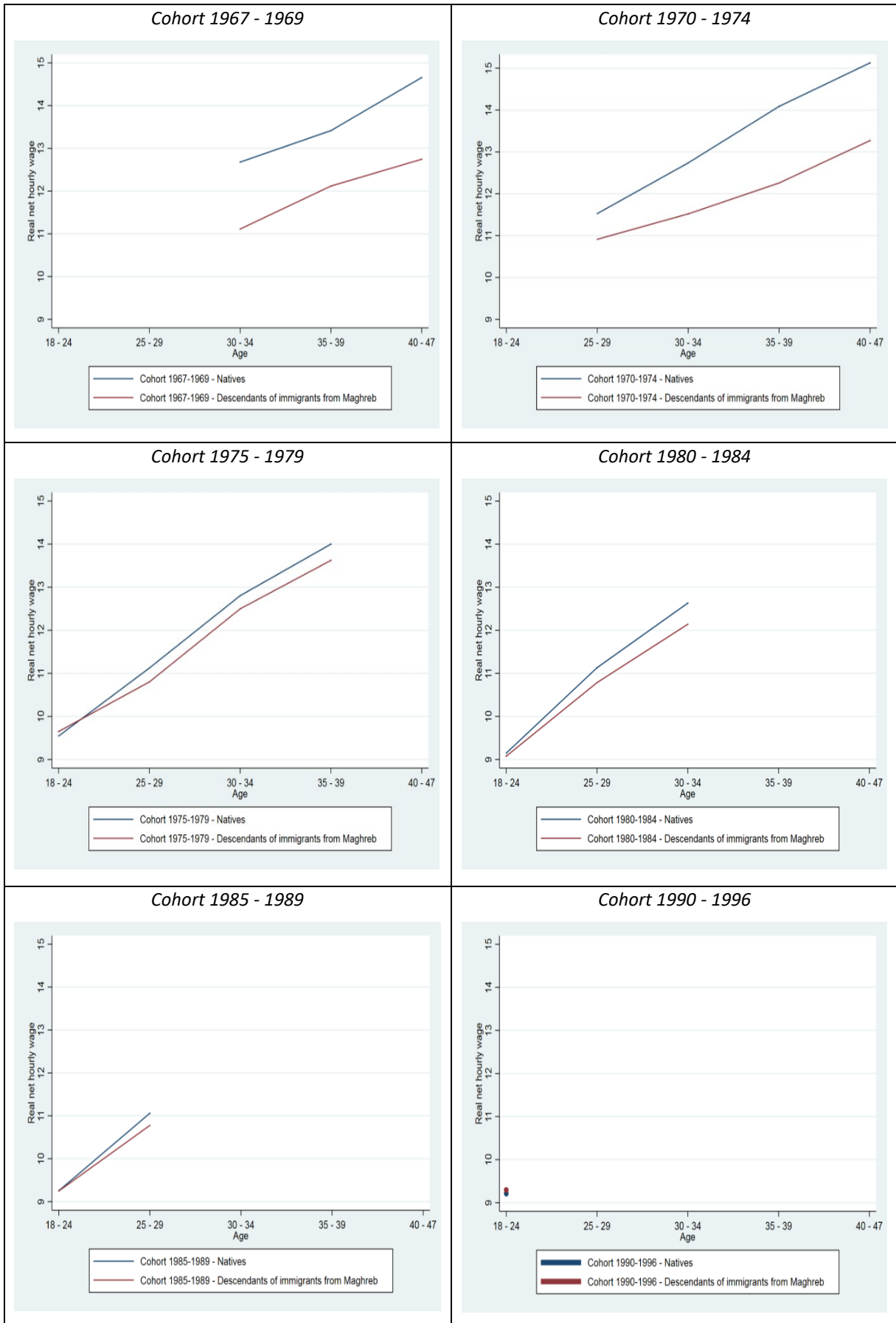


The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 5 neutralizes the age dimension and compares wage differentials between natives and descendants of immigrants from Maghreb across generations. It shows for each generation how the average hourly wage evolves along with age in the study period 2002-2014. The gap on the average real hourly wage is clearly larger for the oldest generations. At a given age, the wage gap for the 1967-1969 and 1970-1974 generations lies between 0.5 and 2 euros while the wage gaps are extremely small for the younger generations. This set of descriptive evidence provides a first glimpse of the main findings of this study: generation has more impact than age on the wage gap between natives and descendants from Maghreb.

Figure 5: Average real net hourly wage of natives and descendants from Maghreb, by age and cohort



The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE

2. Empirical Strategy

2.1. Model

We estimate the following empirical model:

$$\log(\text{Relative_Wage}_{it}) = \alpha_0 + \alpha_1 \text{Age}_{it} + \alpha_2 \text{Cohort}_i + \alpha_3 \text{Age}_{it} * \text{Cohort}_i + \text{Native}_i(\beta_0 + \beta_1 \text{Age}_{it} + \beta_2 \text{Cohort}_i) + \gamma X_{it} + u_i + \varepsilon_{it} \quad (1)$$

where:

$\log(\text{Relative_Wage}_{it})$ is the relative wage and indicates the position of the worker i relative to the average wage in year t . It is calculated as the logarithm of the net hourly wage for the worker i minus the mean of the logarithms of the net hourly wages from the year t . This allows for neutralizing the year effects, which include all factors specific to a particular year and common to all individuals (productivity trends, economic shocks etc.). This strategy of using the relative wage as dependent variable is a way to control for time effects without including year fixed effects and dealing with identification issues due to the multicollinearity between, age, cohort and year.

The average log hourly wage used to calculate the relative wage is computed from the whole sample of workers aged between 18 and 65 in a given year to avoid this term from being influenced by the changing age structure of the study sample. In fact, the age composition in the study sample changes from year to year because each year new workers reach the age of 18 and enter the sample while workers who were already in the sample become one year older.

Native_i is a dummy variable equal to 1 if the individual i is a native with native parents and 0 if he/she is a descendant of immigrants.

Age_{it} and Cohort_i , respectively, are dummies for the age group of the employee in year t and his/her cohort group defined by the year of birth. The interaction $\text{Age}_{it} * \text{Cohort}_i$ captures the fact that the age-wage profile could be different from one cohort to another.

X_{it} is a set of the individual's characteristics. The choice of which control variable to include is not obvious as some variables may be endogenous. We discuss this issue below.

u_i is an individual specific effect and ε_{it} is the idiosyncratic error term.

We use a random effects model to estimate this equation because the main variable of interest - the migration background (“native vs descendant of immigrants”) - is not time-varying. A fixed effects model would not allow for identifying the effect of this variable.⁵

Also, the random effects model is preferred to a pooled OLS in our data. Indeed, the Breusch-Pagan Lagrange multiplier test for random effects strongly rejects the null hypothesis that the variance of the individual specific effect (u_i) is zero.

Finally, equation (1) implicitly assumes that the age profile of the wage gap between natives and second-generation immigrants is similar across cohorts. To break this assumption, we need to include the triple interaction term $Native_i * Age_{it} * Cohort_i$. However, many of the coefficients of this variable could not be estimated in the model due to the collinearity of this variable with $Native_i * Age_{it}$ and $Native_i * Cohort_i$. In addition, the overall significance test of the coefficients of this triple interaction term does not reject the null hypothesis of non-significance of these coefficients. Therefore, we choose a parsimonious model which does not include this interaction term.

Unless otherwise stated, estimates include only employees who have worked more than 910 hours per year, which is the equivalent of six months of full-time work per year.⁶ This allows us to exclude employees with short working hours, which could drive our results. They are reintegrated in the robustness analysis to evaluate the magnitude of the selection bias into employment.

2.2. Selection of control variables

To measure the wage gap between natives and descendants of immigrants, it is crucial to account for the differences in observable characteristics between the two populations by including them as control variables in equation (1). The seminal work by Mincer (1974) has pointed out the paramount importance of schooling and experience in a model of wage

⁵ Being native or descendant of immigrants is fixed and does not change over time, unlike the wage, for instance, which may change from year to year. A fixed effects model is therefore not suitable in this case since such a model does not allow to estimate fixed variables.

⁶ Legislation in France sets the legal working time of full-time employees at 35 hours per week, corresponding to 1,820 hours per year.

determination. Furthermore, to measure the wage gap between descendants of immigrants and natives, it is useful to control for other individual characteristics related to wages such as gender and geographical location. However, the inclusion of endogenous variables in the regression model yields incorrect estimates of the wage gap. Endogenous variables can be viewed as factors that are caused by the variable of interest, which is the origin status. Therefore, endogenous variables reflect discrimination or difficulties faced by the descendants of immigrants in their integration process or in their access to the labor market. In some sense, almost all individual characteristics may be suspected as being endogenous, including geographical factors or even education (Neal and Johnson, 1996). Choosing the right variable to include in the regression model is therefore a tricky task. We test the sensitivity of the results by adding step by step different control variables.

For the baseline model, we follow the empirical literature by only including variables measuring characteristics prior to the entry in the labor market: gender, education (6 different degree levels), geographical location (size of the urban area and department dummies) and the profession of the two parents at the time of the birth of the individual.⁷ The latter variable is a measure of family background. The difference between the occupations of the parents of natives and descendants of immigrants may reflect the greater risk of immigrants performing poorly in the labor market due to integration barriers or discrimination. To a certain extent, this variable is endogenous.⁸ However, we include it in our model because it is measured prior to the entry in the labor market, has a high impact on wages and captures one of the sharpest differences in observable characteristics between natives and descendants of immigrants. We interact the degree level with the cohort to capture the fact that the value of diplomas decreases over time while the share of graduate salaries increases. Some variables related to the status in the labor market such as socio-professional categories and an indicator of whether the worker has a part-time or full-time job are strongly endogenous and are clearly affected by discrimination against descendants of immigrants. Indeed, existing studies have documented the greater difficulty of descendants of immigrants (particularly from Maghreb, Sub-Saharan Africa and Turkey) to get a job or a white-collar position (Meurs et al., 2006; Aeberhardt and Pouget, 2010). The difficulty of getting a job necessarily translates into lower

⁷ See the discussion by Angrist and Pischke (2008) on “bad controls”, page 47.

⁸ The parents’ education would seem to be more exogenous but we do not have this information.

chances of obtaining a full-time job. A second class of labor market variables such as the industry or size of the firm may also be endogenous. The industry is potentially an important characteristic which influences wages and should be accounted for in measuring wage gaps. Nevertheless, descendants of immigrants may be more likely to work in low-paid industries due to barriers to obtaining employment in well-paid industries. We thus add control variables step by step as follows:

- Model 1: Age, Cohort, Age*Cohort
- Model 2: + Gender, Size of urban area, Department dummies⁹, Degree level (6 categories), Degree level*Cohort
- Model 3: + Socio-professional categories of parents
- Model 4: + Industry, Firm size
- Model 5: + Indicator part-time/full-time, Socio-professional categories (4 categories), Socio-professional categories*age¹⁰
- Model 6: + Extended socio-professional categories (25 categories).

The variables of interest origin, age*origin and cohort*origin are added in all six specifications. Model 3 includes only variables measured prior to the employee's entry into the labor market and is therefore our preferred and baseline model.

3. Results on descendants of immigrants from Maghreb

The results of the econometric estimations are presented in this section. We first discuss the main results on the descendants of immigrants from Maghreb, followed by some heterogeneity analyses and robustness tests and a discussion of the selection into employment. Results on the other origins (Sub-Saharan Africa, Turkey, European countries

⁹ The department is the second largest administrative division in France after the region. France is divided into 101 departments.

¹⁰ This interaction term captures the fact that average wage differences between socio-professional categories grow with the employee's age. The estimated difference in log(wage) between natives and descendants of immigrants is 5.8% of which 4% is unexplained by the model, that is two thirds. Applying this ratio to the observed wage gap gives 5%. These results are available upon request.

and South East Asia) are then presented. Finally, we attempt to find potential explanations of our main results.

3.1. Main Results

We estimate equation (1) with a random effects model by including control variables step by step as detailed in the previous section. Results on the variables of interest are presented in Table 5, and the same table with a full set of controls is presented in the Appendix (Table 9). Our baseline specification is presented in column 3 (model 3). Other estimates presented in the robustness tests and heterogeneity analyses are based on this model.

The three variables of interest included in model 1 (with their interactions) explain 11.1% of the overall wage variations. The R^2 rises to 43.0% in model 2 and reaches 60.4% and 61.7% in model 5 and 6, respectively, with the introduction of socio-professional categories. Results in Table 5 suggest that all the effects of the migration background on wages are mainly captured by the interaction terms with the cohort, and to a lesser extent with the age group. The main effects are not significant except in model 1. In a model without interaction terms, the effects of the migration background are significant at the 1% level in all six models. In 2014, the last year of the panel, a cross-section estimate using the baseline specification reveals that all things being equal, the wages of natives are 5% higher than that of the descendants of immigrants from Maghreb.¹¹

To facilitate the interpretation of the wage gap between natives and second-generation immigrants from Maghreb, we present the average marginal effect of origin on wages by age and birth cohort in Figure 6 for the baseline model and in Figures 19 to 24 for all six models in the Appendix. The y-axis represents the relative net hourly wage gap: a positive figure means that the wage gap is in favor of natives. The x-axis represents the age group and each line displays a birth cohort. Confidence intervals are at the 95% level.

A first striking result in all the six models is that the wage gap is relatively flat according to age. Indeed, there seems to be little difference in the wage gap across age groups. According to the Wald test in the baseline model, the differences in wage gap between age groups are not significant except between the ages of 18-24 and 30-34. The small wage gap observed for the

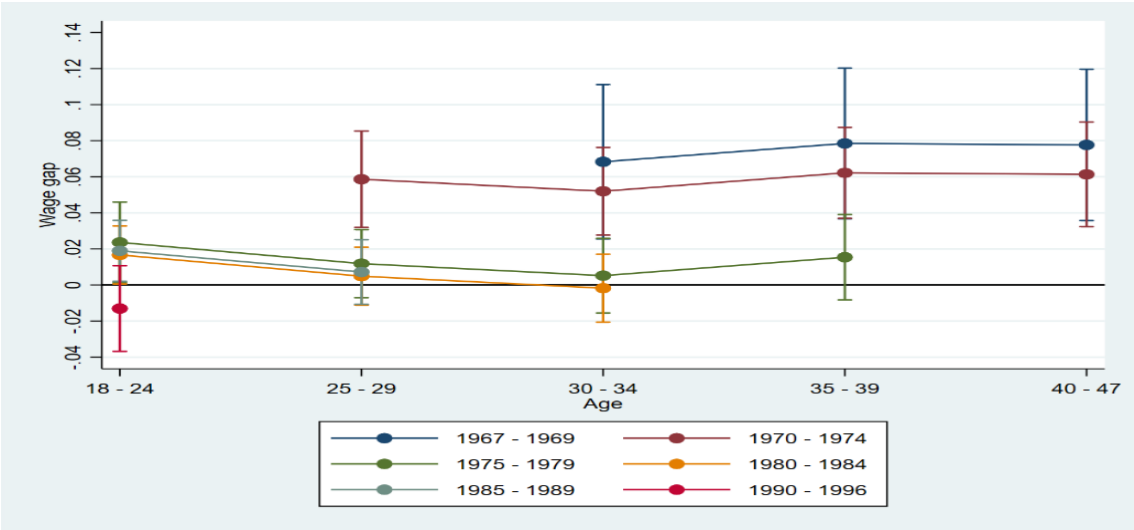
¹¹ These results are available upon request.

30-34 age group may be related to a particular selection pattern into employment. As we will see later, the decreasing wage gap at 30-34 years old is almost entirely driven by women. Indeed, this age corresponds to a time when many women have children and this may shift the decision to participate in the labor market.

A second important observation in these graphs is the sharp differences between the older and younger cohorts. The wage gap is greater for the oldest two cohorts. In the baseline model, the difference between the 1967-1969 and 1970-1974 cohorts is not significant. However, the differences are statistically significant at the 5% level between the 1970-1974 cohort and the other younger cohorts. The reduction of the gap happens mainly between the 1970-74 and 1975-79 cohorts, while the differences in observables between natives and descendants of immigrants in the data are still very large (Figures 3 and 4). Therefore, the reduction of the wage gap seems unrelated to the convergence of observable characteristics in the sample of younger cohorts.

Using 3-year cohort groups, the break in the wage gap between the older and younger cohorts appears smoother and more like a continuum tendency (see Figure 26 in the Appendix). There is an initial break between the 1970-1972 and 1973-1975 cohorts and a second break between the 1973-1975 cohorts and the other younger cohorts.

Figure 6: Estimated wage gap between natives and second-generation immigrants from Maghreb (Model 3 – Baseline specification)



The estimation sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the baseline regression (Table 5, model 3). The gap is positive when the native wage is higher than that of the descendant of immigrants. Vertical bars are the confidence intervals at the 95% level.

The wage gap between natives and descendants of immigrants of the 1970-1974 cohort in the age group 25-29 is about 6% in favor of natives.

Table 4 allows for a comparison of the impact of the different sets of control variables on the estimated wage gap. The age profile is equally flat in each specification, which is why we focus our attention on the variation of the gap for different generations solely at the ages of 30 to 34. The point estimate is presented for the four generations observed at this age during the study period. Observing these four generations is particularly interesting since the break in the wage gap occurred between the 1970-1974 and 1975-1979 generations. As expected, the estimated wage gap is greater in model 1 where no control variables are included. The point estimates are very similar between model 1 and model 2 and yet model 2 includes important variables: gender, education and geographical factors. While controlling for education contributes to sharply reducing the estimated wage gap, geographical controls (here department dummies and the size of the urban area) increase the estimated wage gap. The effects of these two variables offset each other. Indeed, descendants of immigrants from Maghreb are less educated than natives but they live in larger cities where wages are generally higher. The profession of the parents appears to be one of the most impactful variables. When introduced, the estimated wage gap drops by nearly two percentage points among the two oldest cohorts and goes from significant to non-significantly different from zero for the younger cohorts. This shows the importance of accounting for social background when analyzing wage differences between natives and descendants of immigrants. Tables 7 and 8 in the Appendix show a comparison of the socio-professional categories of the parents of natives and descendants of immigrants from Maghreb. The parents of natives were much more likely to be higher-grade professionals and less likely to be manual workers or inactive. In addition, the gap between the socio-professional categories of parents of natives and of descendants of immigrants from Maghreb does not narrow over time.

In model 4, the industry and firm size are included. Overall these two variables (industry and firm size) have little impact on the estimated wage gaps, which are very close to the point

estimates in model 3. For younger cohorts, the estimated wage gaps rise in model 4, albeit not significantly from zero. This is mainly driven by the firm size variable, which is positively related to wages. Indeed, descendants of immigrants from Maghreb are slightly more likely to work in larger companies (see Table 6 in Appendix). This may be related to the centralization of recruitment in bigger firms, which lowers discrimination in the recruitment process (Berson et al., 2018).

In model 5, the inclusion of the socio-professional categories of the employees and an indicator of part-time vs full-time work creates a one percentage point decrease of the estimated wage gap for the two oldest cohorts. As discussed in the empirical strategy section, these variables may be the result of the difficulties faced by the descendants of immigrants to fully integrate into the labor market. Their impacts are therefore difficult to interpret. In model 6, we control for a detailed socio-professional category classification with 25 groups. In model 5, the socio-professional category has only four groups: higher professional, intermediate professional, non-manual workers and manual workers. The introduction of the extensive socio-professional categories in model 6 has little impact on the point estimates.

Table 4: Estimated wage gap at age 30 - 34, by cohort group

	1967 - 1969	1970 - 1974	1975 - 1979	1980 - 1984
Model 1 : age, cohort, age*cohort	7.8*	8.7*	3.5*	1.6
Model 2 : Model 1 + gender, education, geographical factors	8.6*	7.0*	2.7*	2.5*
Model 3 : Model 2 + profession of parents	6.8*	5.2*	0.5	-0.2
Model 4 : Model 3 + industry, firm size	6.4*	5.3*	1.2	0.9
Model 5 : Model 4 + part-time/full-time, occupation	5.5*	4.1*	0.7	0.4
Model 6 : Model 5 + two digit occupation (more detailed)	5.4*	3.8*	0.7	0.5

* Indicates that the wage gap is significantly different from zero at the 5% level.

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns. Only the marginal effects for the 30-34 age group is presented in this table. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Interestingly, in all the different specifications, the estimated wage gap is clearly greater in the oldest cohorts and smaller among younger cohorts. This appears as the main finding of the

paper and suggests that the wage gap related to migration background decreases over time for younger generations. The unexplained wage gap becomes even insignificant for those of the 1975 generation and younger. However, equality of hourly wages does not imply equality of total gains: access to full-time employment still differs and leads to a remaining unexplained earning gap (see Appendix B).

Several potential mechanisms could explain the decline of the wage gap over generations and our data do not allow us to assess the contribution of each mechanism. Nevertheless, it is interesting as a heuristic approach to draw a parallel between the origin wage gap issue and the well-documented gender gap issue in order to get an idea of the possible underlying mechanisms at work. We use our baseline model on the exact same data to measure the gender wage gap among natives and find a similar result: a steady reduction of the unexplained gender wage gap over generations (Figure 35). This is a striking result and, to the best of our knowledge, new evidence in the empirical literature on France. This analogy between the gender and origin wage gap suggests that the mechanisms behind the main finding of this paper may not be specific to migration or integration issues but rather to cultural changes or other labor market developments. These issues will be discussed later in the paper. The other findings about the gender wage gap are consistent with the existing literature (Goldin, 2014; Albrecht et al., 2018; Wilner, 2016). We find an increase in the unexplained gender wage gap up to the age of 30-34. From the 30-34 to 40-47 age groups the unexplained gender wage gap is rather flat, showing a persistence of motherhood penalty.

In summary, the general pattern of a decreasing wage gap between natives and Maghrebi descendants of immigrants over generations is supported by a similar trend in the gender wage gap. These results bring new insights to the existing literature on France and suggest that common forces in the French labor market contribute to reducing gender and ethnic discrimination over time.

Table 5: Estimated parameters for the model of wage gap between natives and descendants of immigrants
from Maghreb

Dependent variable: Log relative hourly net wage

	Model (1)	Model (2)	Model (3) (Baseline)	Model (4)	Model (5)	Model (6)
Migration background (Ref = Descendant of immigrants)						
Native	-0.0266** (0.0110)	0.0066 (0.0120)	-0.0131 (0.0121)	-0.0003 (0.0115)	0.0009 (0.0111)	0.0006 (0.0110)
Age group (Ref = 18-24)						
25 - 29	0.0950*** (0.0068)	0.0917*** (0.0067)	0.0916*** (0.0067)	0.0899*** (0.0065)	0.0750*** (0.0061)	0.0502*** (0.0067)
30 - 34	0.162*** (0.0087)	0.158*** (0.0087)	0.159*** (0.0086)	0.154*** (0.0083)	0.119*** (0.0077)	0.0916*** (0.0082)
35 - 39	0.162*** (0.0111)	0.160*** (0.0109)	0.160*** (0.0109)	0.157*** (0.0107)	0.0971*** (0.0099)	0.0603*** (0.0104)
40 - 47	0.176*** (0.0136)	0.177*** (0.0135)	0.177*** (0.0135)	0.172*** (0.0132)	0.0989*** (0.0121)	0.0630*** (0.0128)
Migration background*Age group						
Native # 25 - 29	-0.0129* (0.0067)	-0.0112* (0.0066)	-0.0118* (0.0066)	-0.0103 (0.0064)	-0.0107* (0.0058)	-0.0094* (0.0057)
Native # 30 - 34	-0.0212** (0.0088)	-0.0177** (0.0087)	-0.0184** (0.0087)	-0.0163* (0.0084)	-0.0198*** (0.0076)	-0.0180** (0.0074)
Native # 35 - 39	-0.0125 (0.0106)	-0.00745 (0.0105)	-0.00823 (0.0105)	-0.00879 (0.0102)	-0.0146 (0.0093)	-0.0136 (0.0092)
Native # 40 - 47	-0.0125 (0.0132)	-0.0085 (0.0132)	-0.0091 (0.0132)	-0.0075 (0.0129)	-0.0144 (0.0116)	-0.0154 (0.0116)
Cohort group (Ref = 1990-1996)						
1967 - 1969	0.124*** (0.0282)	-0.0452 (0.0304)	-0.0342 (0.0302)	-0.0286 (0.0293)	0.0253 (0.0262)	0.0442* (0.0256)
1970 - 1974	0.109*** (0.0203)	-0.0753*** (0.0237)	-0.0635*** (0.0237)	-0.0545** (0.0226)	-0.00481 (0.0211)	0.0150 (0.0207)
1975 - 1979	0.130*** (0.0164)	-0.0142 (0.0212)	-0.0015 (0.0212)	0.0003 (0.0201)	0.0286 (0.0191)	0.0434** (0.0189)
1980 - 1984	0.0667*** (0.0134)	-0.0065 (0.0190)	0.0002 (0.0189)	-0.0034 (0.0180)	0.0032 (0.0173)	0.0090 (0.0171)
1985 - 1989	0.0300** (0.0134)	-0.0361* (0.0203)	-0.0258 (0.0203)	-0.0260 (0.0192)	-0.0173 (0.0186)	-0.0142 (0.0184)
Migration background*Cohort group						
Native # 1967 - 1969	0.126*** (0.0285)	0.0971*** (0.0264)	0.0998*** (0.0263)	0.0811*** (0.0256)	0.0744*** (0.0222)	0.0717*** (0.0217)

Native # 1970 - 1974	0.135*** (0.0204)	0.0815*** (0.0192)	0.0835*** (0.0191)	0.0694*** (0.0183)	0.0597*** (0.0166)	0.0555*** (0.0164)
Native # 1975 - 1979	0.0825*** (0.0166)	0.0381** (0.0165)	0.0367** (0.0165)	0.0283* (0.0157)	0.0256* (0.0146)	0.0244* (0.0144)
Native # 1980 - 1984	0.0640*** (0.0138)	0.0361** (0.0144)	0.0297** (0.0145)	0.0261* (0.0137)	0.0233* (0.0129)	0.0219* (0.0128)
Native # 1985 - 1989	0.0538*** (0.0138)	0.0388*** (0.0146)	0.0320** (0.0147)	0.0263* (0.0139)	0.0205 (0.0132)	0.0192 (0.0131)
Age group*Cohort group	Yes	Yes	Yes	Yes	Yes	Yes
Gender, education, geographical factors	No	Yes	Yes	Yes	Yes	Yes
Profession of parents	No	No	Yes	Yes	Yes	Yes
Industry, firm size	No	No	No	Yes	Yes	Yes
Part-time/full-time, occupation	No	No	No	No	Yes	Yes
Two digit occupation (more detailed)	No	No	No	No	No	Yes
Number of observations	394,446	394,446	394,446	394,446	394,446	394,446
Number of individuals	56,862	56,862	56,862	56,862	56,862	56,862
R-squared	11.11	43.01	44.04	48.14	60.37	61.71

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

3.2. Heterogeneity and robustness analysis

The unexplained wage differentials between natives and the Maghrebi descendants of immigrants are higher within the male population, especially in men from the two oldest cohorts (Figure 8). The unexplained wage differentials are much smaller for women, and non-significant in most cases (Figure 7). Female descendants earn less than their male counterparts but the gender wage gap is narrower among descendants than among natives. This result can be related to the fact that unexplained wage gaps are generally narrower among populations with lower average wages (Doren and Lin. 2019). The wage gap related to origin reaches 12% in the sample of men of the 1967-1969 cohort and 9% for men in the 1970-1974 cohort. For the younger cohorts the wage gaps are estimated around 2-3% but are non-significant in most cases. As stated previously, the smaller wage gap observed in the 30-34 age group is clearly driven by women. This is potentially explained by low female participation in the labor market due to childbearing. A temporary withdrawal from the labor market by the mothers with the

lowest potential wages leads to a higher average of observed wages at the ages of 30 to 34. Athari et al. (2019) show in particular that the labor force participation of women from Maghreb when they have children is much lower than that of native women. Therefore, the selection pattern should be stronger for the descendants of immigrants and thus artificially reduce their wage gap with natives.

In Figure 10, we test whether the wage gap is different if we exclude the descendants of immigrants with one immigrant parent and one native parent and run the estimation only in the sample of descendants with two immigrant parents. The second-generation immigrants from Maghreb with two immigrant parents represent 61% of the sample, and 23% have only one immigrant parent. The remaining 16% of the descendants of immigrants from Maghreb have one immigrant parent and one parent whose origin is missing. These individuals are also excluded from the sub sample from which Figure 10 is drawn. Results are not much different from that of the baseline regression. The estimated wage gap is slightly greater for the 1970-1974 cohort and smaller for the 1967-1969 cohort compared to the baseline model. Results for the other cohorts are quite close to what we observe in the baseline regression (Figure 10). There is very little empirical evidence on the distinction between descendants of immigrants with one or two immigrant parents in France, probably due to data issues. Meurs et al. (2006) for instance show that the unemployment rate of descendants with one immigrant parent lies between that of descendants with two immigrant parents (who have a higher unemployment rate) and that of natives. In our study, the limitation of the data in distinguishing these two types of descendants of immigrants prevents us from yielding any firm conclusions on this subject.

Figures 28 and 30 in the Appendix present the results of additional estimates to assess the robustness of our main results. As mentioned previously in the data section, we cannot know the origin of the parents of a large share of individuals in the study sample. In Figure 28, individuals with missing origins are considered as natives. Results in Figure 28 are very similar to the baseline results (reported in Figure 27). The estimated wage gaps are slightly smaller in Figure 28 because some descendants of immigrants are wrongly considered as natives. However, the main results hold and the age and cohort profile of the wage gap is nearly the same in the two graphs. In Figure 30, we exclude for each year of the panel the extreme wages (the top and bottom 1%) from the analysis to assess the impact of outliers. Again, the main

results do not change but wage gaps are smaller for older cohorts when extreme wages are excluded. This is consistent with the study by Boutchenik and Lê (2017) who find higher wage differentials at the top of the wage distribution.

3.3. Robustness regarding selection into employment

Selection into employment is a crucial issue when evaluating wage discrimination in the labor market. The age profile of the wage gap for women showed that selection bias can affect our results. Indeed, the employment rate, calculated as the share of private sector employees among the population, is higher for natives than for second-generation immigrants from Maghreb, with a differential ranging from 4 to 16 percentage points, depending on the generation and the age (Figure 11). This employment gap implies that employees are more selected among descendants of immigrants than among natives, which can create a downward bias in the measure of the wage gap. Indeed, the higher selection among the descendants of immigrants implies that the more productive of them or, more generally, the descendants of immigrants with the more unobservable characteristics positively related to wages, are employed, and then observed in our data. Therefore, the estimated wage gap would be greater if all the populations were observed in the data.

Aeberhardt et al (2010) have documented the magnitude of the selection bias in the measure of the wage gap between natives and second-generation immigrants from Maghreb. They find that the selection bias reduces the wage gap by 2.3 percentage points, which is non negligible, but only one fifth of the 13.4 gross wage gap in their data. In our more recent sample of employees aged 18 to 47, the gross wage gap is only 4% in 2014. More recently, Athari et al. (2019) document how the unexplained wage gap changes when the selection into employment is accounted for. They find no changes in the unexplained wage gap between natives and second-generation immigrants and larger wage gaps between natives and first-generation immigrants from Sub-Saharan Africa and South East Asia. Rather than the precise level of the bias, we are concerned by its evolution over generations: an increase in the bias could cause the reduction of the estimated wage gap in our model and cast doubt on our main finding.

The employment gap between natives and second-generation immigrants gives us some insight into the magnitude of the selection bias in the measure of the wage gap. The greater the employment gap, the higher the selection of descendants of immigrants compared to natives and thus the higher the associated bias. Therefore, an increase of the employment gap should translate into an increase of the bias and a decrease of the measured wage gap. In our data, we can only measure the rate in salaried employment since self-employed workers are not recorded in the wage data. The salaried employment gap happens to be rather constant with age (except for ages 18 to 24) and shows no increase over generations that could explain a decrease of the measured wage gap. On the contrary, this employment gap appears to decrease slightly between the 1967-1974 generations on the one hand, and the 1975-89 generations on the other hand (Figure 11).

Therefore, even if there is possibly a non-negligible selection bias in our measure of the wage gap, this bias should not affect the estimated wage gap profile over age and cohort, leaving aside ages 18 to 24. Importantly, it should not disprove the result of a smaller wage gap for the younger generations.

Selecting individuals to include in the sample according to their number of annual working hours offers a good opportunity to assess how the selection into employment affects our main results. Recall that the baseline specification includes employees working more than 910 hours per year, which is the equivalent of more than six months of full-time employment, and represents the number of hours worked by 73% of the whole sample. The selection bias is amplified in a regression with only the employees working full-time all-year representing 40% of the whole sample (Figure 32 in Appendix). Wage gaps are thus slightly smaller in Figure 32, but the patterns of age and cohort effects are essentially the same as the baseline model. In Figures 33 and 34 in the Appendix, employees working more than the equivalent of three months and one month per year are included in the sample. This represents 83% and 92% of the total sample, respectively. The selection bias is therefore less pronounced with greater wage gaps, as expected. Overall, the results are not very different from what we observe in the baseline model, suggesting that the selection bias is certainly at play but that it does not challenge our two main findings: the flat age profile of the wage gap and its lower level for younger generations.

Figure 7: Estimated wage gap between natives and second-generation immigrants from Maghreb – Women

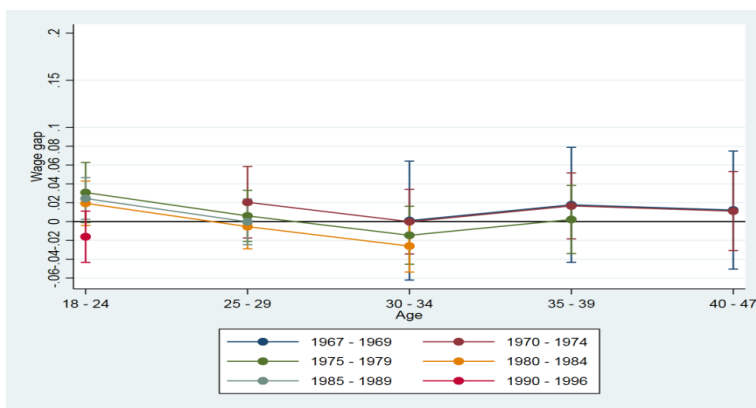


Figure 8: Estimated wage gap between natives and second-generation immigrants from Maghreb - Men

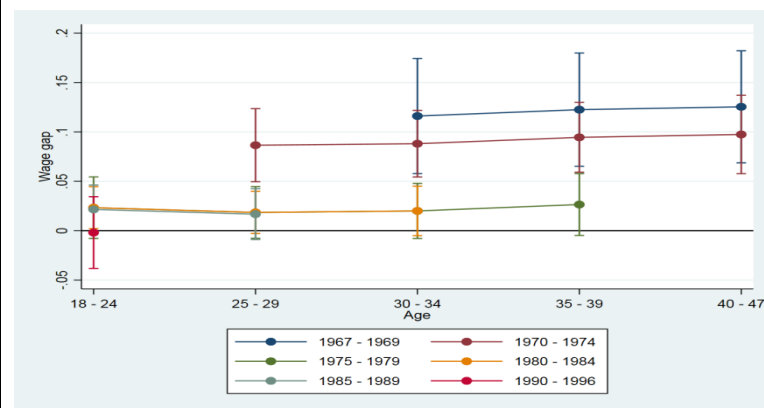


Figure 9: Estimated wage gap between natives and second-generation immigrants from Maghreb - Baseline

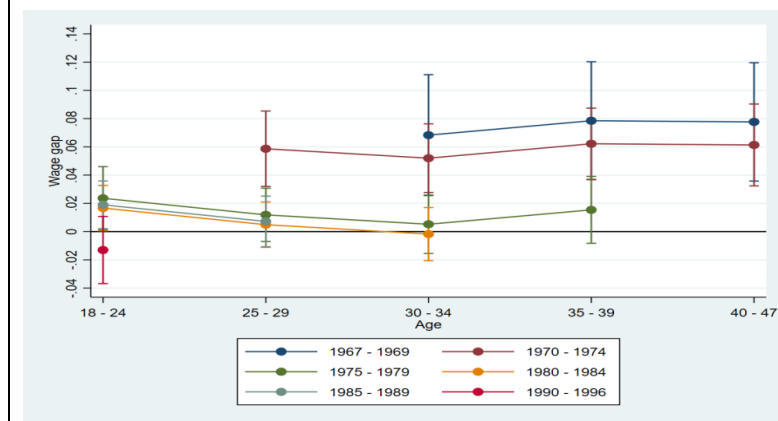
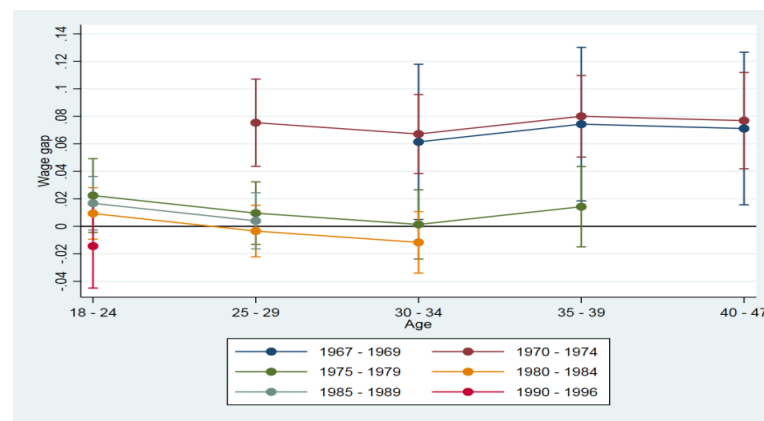


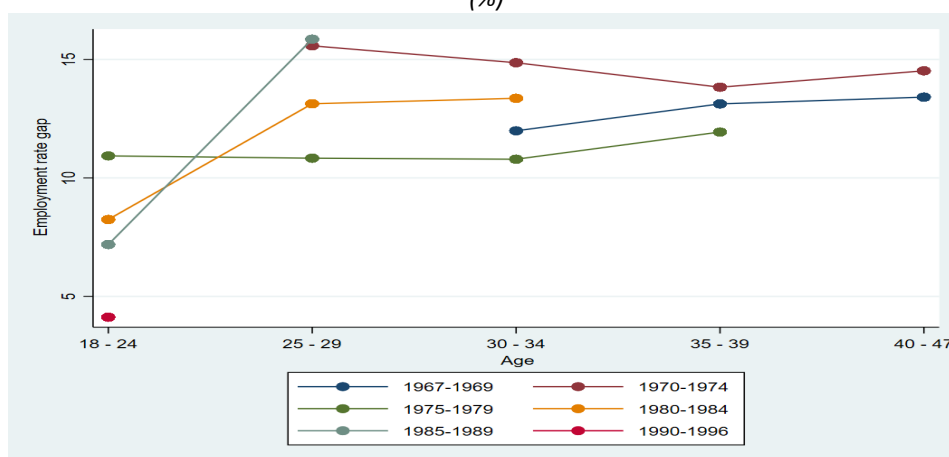
Figure 10: Estimated wage gap between natives and second-generation immigrants from Maghreb - With two immigrant parents



Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models.

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE

Figure 11: Gap in salaried employment rate between natives and second-generation immigrants from Maghreb (%)



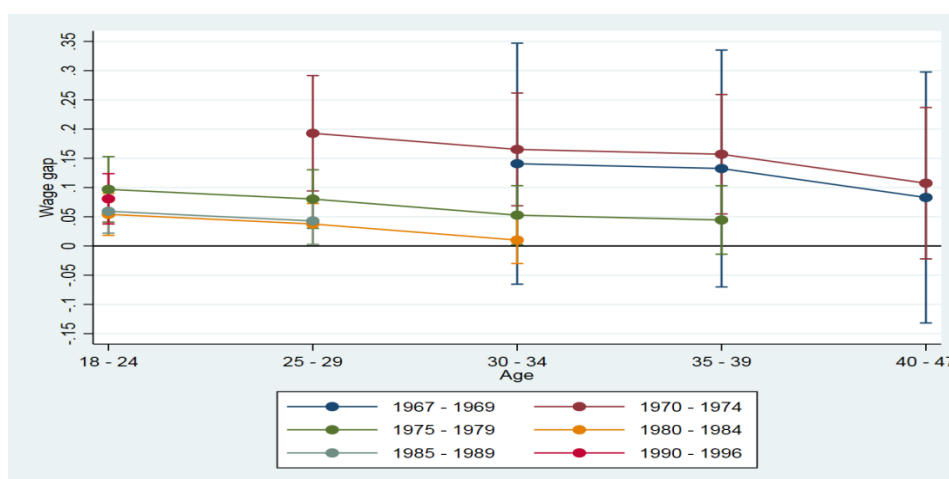
The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

4. Results on the descendants of immigrants, by origin

In this section we present the results of the wage gap in hourly wages estimated from the baseline model for the descendants of immigrants of other regions of origin, namely Sub-Saharan Africa, Southern Europe, other European countries, South East Asia and Turkey. Employees originating in Sub-Saharan Africa are the only ones (along with those originating in Maghreb) who show a steady and significant unfavorable wage gap compared to natives.

Figure 12: Estimated wage gap between natives and second-generation immigrants from Sub-Saharan Africa



Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression model. The sample includes natives and descendants of immigrants from Sub-Saharan Africa born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

The estimated wage gaps between the descendants of immigrants from Sub-Saharan Africa and natives are very high. On average, in 2014, wages of the descendants of immigrants from Sub-Saharan Africa are 9% lower than those of natives. We observe a reduction of the wage gap for younger cohorts, which is quite similar to what we observe for the Maghrebi descendants of immigrants (Figure 12). The estimated wage gaps are between 8% and 20%, depending on age, for the 1967-1969 and 1970-1974 cohorts. Notice that only 82 observations of descendants of immigrants from Sub-Saharan Africa are observed in our sample for the oldest 1967-1969 cohort, making the estimated wage gaps for this cohort very imprecise and not significant. For the younger cohorts, the estimated wage gaps are significantly different from zero for employees below 30 years old and are estimated between 4% and 10%. For employees over 30 years old, the point estimates are imprecise and not significant. Overall, the pattern in terms of wage gap is similar to that of the descendants from Maghreb, with a gap narrowing for younger generations. However, and although confidence intervals lead us to be cautious, wage gaps are greater for younger workers and the age profile of the gap appears to decline slightly.

Descendants of immigrants from Southern Europe are better paid than natives, after controlling for observable characteristics but with big differences across generations (Figure 13). The result is reversed for the descendants of immigrants from Southern Europe of the 1985-1989 cohort who are paid less than natives. We observe similar results for the descendants of immigrants from other European countries (Figure 14). However, the estimated wage gaps for this population are mostly insignificant. Younger workers aged between 18 and 24 from other European countries are paid less than natives. The wage gaps in this age group are significant for the 1980-1984 and 1985-1989 cohorts. Results for the descendants of immigrants from South East Asia display an age effect (Figure 15). Descendants from South East Asia are better paid than natives, as shown in the descriptive evidence. However, wage gaps are closer for younger employees and increase with age in favor of the descendants from South East Asia. Like the descendants of immigrants from Sub-Saharan Africa, those from Turkey are very poorly represented in the 1967-1969 and 1970-1974 cohorts, making the estimated wage gaps very imprecise for these two cohorts (Figure 16). Overall, we do not detect unexplained wage gaps between natives and descendants of immigrants from Turkey.

Figure 13: Estimated wage gap between natives and second-generation immigrants from Southern Europe

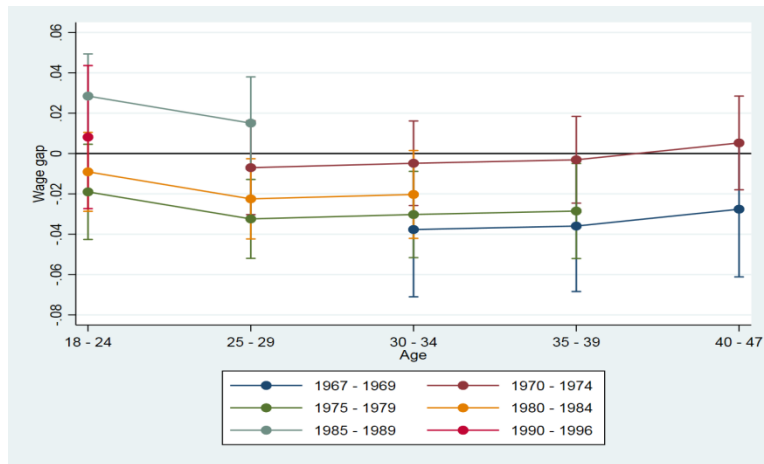


Figure 14: Estimated wage gap between natives and second-generation immigrants from other European countries

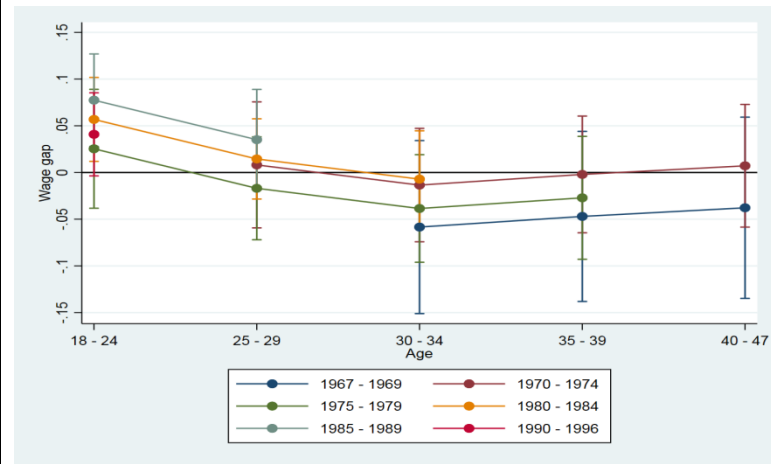


Figure 15: Estimated wage gap between natives and second-generation immigrants from South East Asia

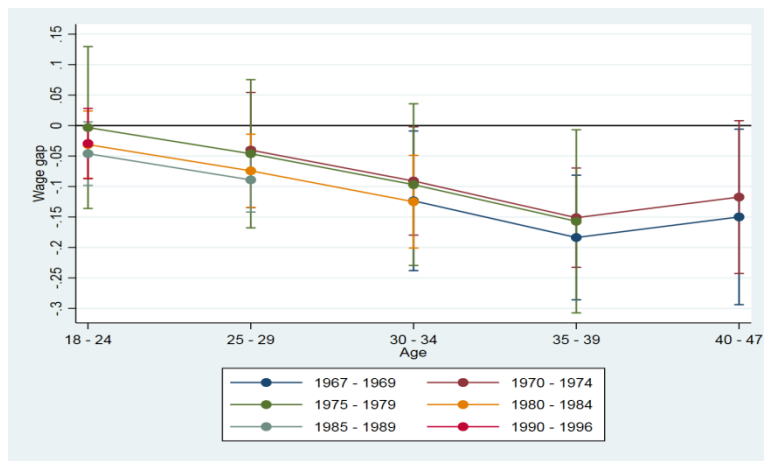
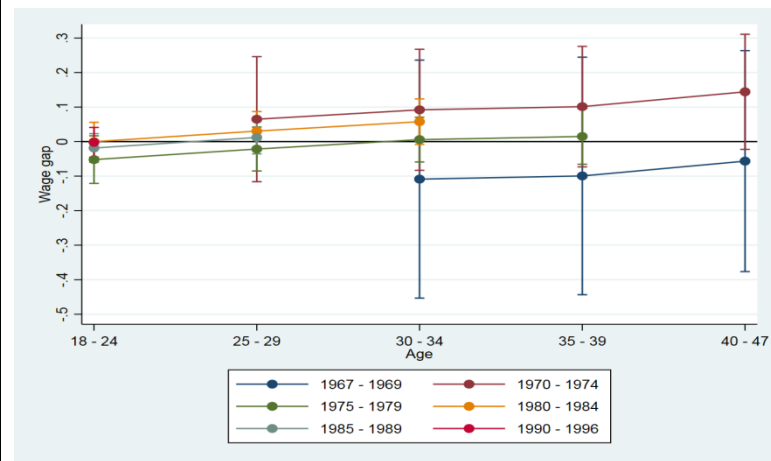


Figure 16: Estimated wage gap between natives and second-generation immigrants from Turkey



Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models. The sample includes natives and descendants of immigrants born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

5. Explaining the cohort effect

The similar trend of a steady reduction of the gender wage gap over cohorts discussed earlier in the paper suggests that common mechanisms may explain the decreasing trend of the wage gap related to gender or to migration background. As discussed by Fernandez (2013), cultural changes may play an important role in the reduction of the gender wage gap. Indeed, over time, societies in general seem to be more concerned about discrimination according to gender but also according to migration background. Wrench (2016) states that in the European context, there is a growing interest in diversity management, which is a set of strategies aimed at recognizing cultural differences and better integrating excluded minorities into the labor market.

Alongside the effects of cultural changes, we document some labor market dynamics, notably the rise of the minimum wage and a changing wage structure over generations to explain this reduction of the wage gap.

The growth of the minimum wage seems to play a key role in France in reducing wage inequality. Indeed, the minimum wage contributes to compressing wages at the bottom of the distribution and leaves little room for employers to discriminate against lower-paid workers. Over our study period, the minimum wage increased very significantly between 2002 and 2006 and increased only slightly between 2007 and 2014.¹² This differential growth in the minimum wage has directly impacted overall wage inequality. Wage inequality in France, as measured by decile ratios of the real net hourly wage, decreased markedly between 2002 and 2006 and remained constant between 2007 and 2014 (Figure 17). The wage gap between natives and descendants of immigrants from Africa could be linked to overall wage inequality since descendants have lower wages than natives. As regards our data, between 2002 and 2006, a period of high wage inequality, only employees from older generations are observed in mid-career, where wage differentials are higher.¹³ Therefore, the large increase in the minimum wage is a possible channel to the decreasing origin wage gap over generations. However, the

¹² The gross hourly minimum wage increased by 4.4% annually on average between 2002 and 2006, and only by 1.3% per year between 2007 and 2014. The large increase in the minimum wage occurred during the period when a reform called the “Loi Aubry” aimed at reducing the weekly working time from 39 to 35 hours. The minimum hourly wage was thus increased so that workers did not receive a lower monthly salary because of this reform.

¹³ For example, in 2002, employees born after 1984 are not observed because they are too young (under 18) and employees born after 1977 are under 25.

main findings of the paper are not entirely driven by the specific period 2002-2006 with the sharp rise in the minimum wage. Results on a regression limited to the period 2007-2014 are in line with the main findings: no age effect and a decreasing wage gap over generations (see Figure 36 in the Appendix).

Alongside the effect of the minimum wage, the changing wage structure across generations may play a role in explaining the cohort effect on the wage gap. In Figure 18, the decile ratio P50/P10 is calculated for individuals in the sample (aged between 18 and 47) for each age-cohort group. Interestingly, the wage inequality over cohort follows a similar trend to that of the origin wage gap. At a given age below 35, wage inequality is smaller for younger cohorts, even in the period after 2006.¹⁴ Therefore, our main finding of a cohort effect in the wage gap between natives and descendants of immigrants from Maghreb may be potentially explained by this decreasing overall wage inequality across cohorts. The decreasing wage inequality is more robust to different decile ratios at the top (P90/P50) or at the bottom (P20/P10) of the wage distribution (see Figures 37 and 38 in the Appendix).

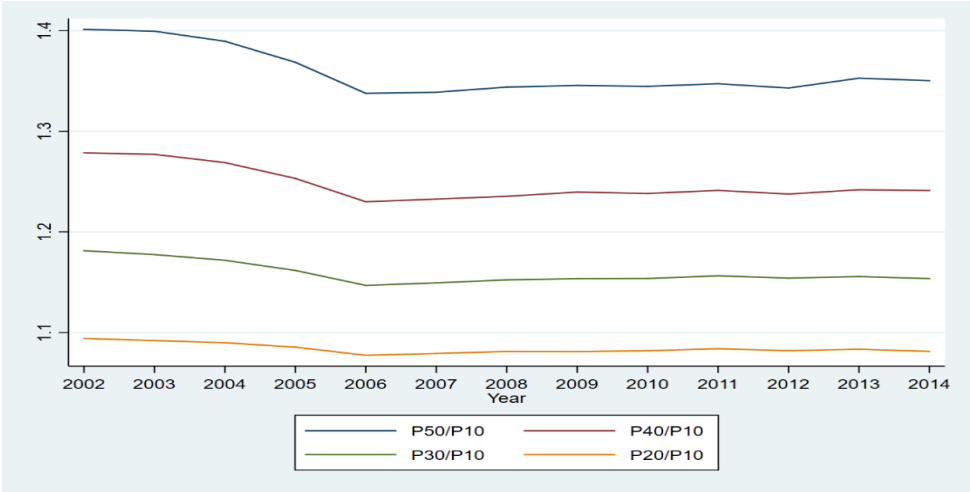
At first sight, the gradual decrease in wage inequality over cohorts may appear inconsistent with the flat overall wage inequality over the period 2007-2014: if wage inequality is narrowing among younger generations, overall wage inequality should decrease over time as younger generations replace older ones. However, as shown by Flamand et al. (2018), wage growth over the career is faster for younger cohorts in France. Therefore, wage differences linked to age increase over time and compensate for the reduction of wage differences among generations. The sharpening of the age slope for younger generations is confirmed by Figure 5: while the entry wage is higher for older cohorts, wages are generally higher for younger cohorts in mid-career (beyond 35 years old, see Figure 5 in the descriptive statistics section).

It would be interesting to explore whether wage inequalities of the younger generations would exceed those of the older generations beyond the age of 50 and whether the cohort effect of the wage gap between natives and descendants of immigrants would be affected. We leave this question for future research.

¹⁴ For instance, the observation of a decreasing wage inequality across cohorts remains for the 1975-1979 and 1980-1984 generations at 30-34 and the 1980-1984 and 1985-1989 generations at ages 25-29 who are observed after 2006.

In summary, the decreasing wage gap between natives and descendants of immigrants from Maghreb could be associated with a marked rise of the minimum wage accompanied by a subsequent decline in wage inequality during the period 2002-2006. Older generations were then observed in a period of relatively high wage inequality, which may partially translate into a greater wage gap between natives and descendants of immigrants and an even larger gender wage gap. A quick glance at the composition of wage inequality in France suggests that overall wage inequalities are lower for the younger generations compared to the older ones, holding age constant. This observation could also constitute a channel for explaining the reduction in the wage gap over generations. The aim of this discussion is to provide some possible explanations and not to carry out any empirical demonstration which could be the subject of future research.

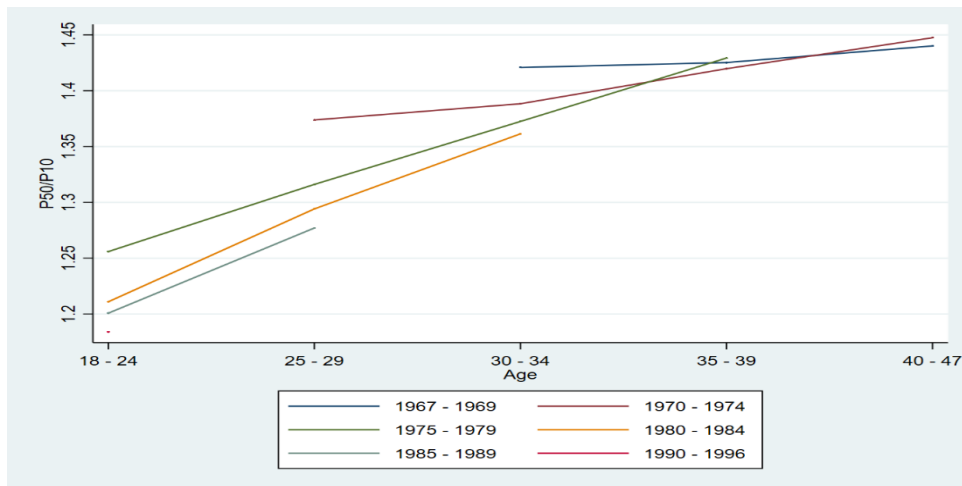
Figure 17: Evolution of wage inequality between 2002-2014 in the total population (aged 18-65)



Note: The decile ratios are computed from a larger sample of individuals aged between 18 and 65 at each year. This gives a broad picture of the wage inequalities' trends in France.

The sample includes all employees in the private sector between 2002 and 2014, and aged between 18 and 65, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 18: Decile ratio P50/P10 of the real net hourly wage in the study sample, by age and cohort



The sample includes all employees in the private sector working more than 910 hours per year between 2002 and 2014, born between 1967 and 1996, and aged between 18 and 47, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Conclusion

In this paper we attempt to contribute to a better understanding of the economic integration of second-generation immigrants in France by exploring the dynamics of the wage gap between natives and the descendants of immigrants. Contrary to earlier studies on France (Aeberhardt and Pouget, 2010; Rathelot, 2010), our paper shows the existence of an unexplained wage gap between natives and descendants of immigrants from Maghreb and Sub-Saharan Africa, even when controlling for a large set of observable characteristics. Our findings are in line with the recent studies by Boutchenik and Lê (2017) and Athari et al. (2019) which show a significant wage gap at the top of the wage distribution between natives and the descendants of immigrants from Maghreb. In 2014, the unexplained wage gap is about 5% on average for the descendants of immigrants from Maghreb and 9% for the descendants from Sub-Saharan Africa. The panel structure of the data and the large sample of the second-generation immigrants from Maghreb in all cohort groups offer a unique opportunity to examine how the unexplained wage gap evolves over the career (age effect) and over generations (cohort effects). Our findings suggest that the age effect is weak or non-existent; but wage differentials are significantly different across cohorts. The second-generation immigrants from the older cohorts are the most penalized. This result is robust to different specifications and sensitivity analyses.

Even though the unexplained wage gap estimated in this paper may contain the impact of discrimination, we cannot rule out the fact that it may also include the effect of unobservable factors influencing wages. Furthermore, we do not account for the selection into employment in our econometric framework. However, the lack of increase in the employment gap for younger cohorts and the robustness of our results to various selections of the sample suggest that the reduction of the wage gap for younger cohorts is not driven by a particular pattern of selection into employment.

Several mechanisms could explain this decreasing wage gap over generations between natives and second-generation immigrants from Maghreb. A simple analogy with the trend of the gender wage gap estimated in our sample suggests that a combination of factors may contribute to reducing the general pattern of wage gap over generations in France. This could be related, for example, to changing attitudes about discrimination or to general evolutions of the labor market. Interestingly, the minimum wage increased strongly at the beginning of our period of analysis and the overall inequality of wages within cohorts decreased over generations. A deeper analysis of the link between discrimination and overall inequality would help provide insight into the phenomena at play in France, which we leave to further research.

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Appendix A: Complementary figures and tables

Table 6: Descriptive statistics on employee characteristics in 2014, by origin group *

Variables	Descendants		Variables	Descendants	
	of immigrants from Maghreb	Natives		of immigrants from Maghreb	Natives
Average age (years)	31.6	33.3	Full-time/Part-time job		
Age group			Part-time	32.1	25.2
18 - 24	21.2	18.7	Full-time	67.9	74.8
25 - 29	20.9	17.8	Overall	100	100
30 - 34	21.8	18.2	Sector		
35 - 39	18.7	16.7	Industry	8.8	16.5
40 - 47	17.4	28.6	Construction	4.4	7.0
Overall	100	100	Trade	17.2	19.1
Cohort group			Services	69.6	57.4
1967 - 1969	5.5	10.8	Overall	100	100
1970 - 1974	11.9	17.8	Firm size		
1975 - 1979	18.7	16.7	0 - 9	18.6	20.8
1980 - 1984	21.8	18.2	10 - 19	7.9	8.9
1985 - 1989	20.9	17.8	20 - 49	11.2	12.2
1990 - 1996	21.2	18.7	50 - 249	15.1	17.6
Overall	100	100	250 - 499	7.8	7.6
Female	45.0	44.7	500 - 999	7.7	6.9
Degree level			1,000 or more	31.8	26.1
No diploma	13.7	7.8	Overall	100	100
CEP - BEPC	9.9	9.0	Size of the urban area (# Inhabitants)		
CAP - BEP	17.9	21.9	Rural	2.5	16.0
High School			Less than 15 000	2.1	4.9
Degree (Bac)	19.6	23.3	15 000 - 20 000	0.6	1.5
Undergraduate			20 000 - 25 000	0.7	0.9
Degree	15.1	19.7	25 000 - 35 000	0.8	2.1
Graduate Degree	7.1	12.2			

Missing	16.7	6.1	35 000 - 50 000	1.1	2.3
Overall	100	100	50 000 - 100 000	4.4	6.4
			100 000 - 200 000	5.9	8.7
Socio-professional category			200 000 - 500 000	10.6	16.0
Higher grade	9.0	14.9	500 000 –		
Intermediate grade	16.3	19.8	10 000 000	33.2	24.7
Non-Manual Employees	40.6	34.9	Paris urban area	38.2	16.7
Workers	34.2	30.4	Overall	100	100
Overall	100	100			

* All figures represent proportion in percentages except those of “average age” which refer to a number of years.

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector in 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Table 7: Socio-professional categories of the father, by birth cohort (%)

Panel 1: Natives

	1967-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1996
Farmers	6.7	4.5	4.1	2.6	3.2	2.9
Artisans - Merchants	4.4	4.1	3.9	4.8	5.2	5.2
Higher grade professionals	5.5	6.0	7.2	8.1	9.1	7.9
Intermediate grade professionals	11.6	14.3	16.0	14.8	17.2	19.8
Non-manual employees	15.1	15.7	17.6	18.2	18.5	18.1
Manual workers	53.6	52.0	48.7	46.0	44.6	42.9
Not in the labor force	1.0	1.3	1.0	2.8	1.8	2.1
Missing	2.2	2.1	1.7	2.7	0.5	1.1
Overall	100	100	100	100	100	100

Panel 2: Descendants of immigrants from Maghreb

	1967-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1996
Farmers	0.6	0.3	0.2	1.2	0.0	0.2
Artisans - Merchants	2.4	1.6	3.5	3.0	4.8	5.2
Higher grade professionals	0.6	1.6	0.9	1.2	2.2	2.8
Intermediate grade professionals	3.0	4.1	3.3	3.1	3.1	6.3
Non-manual employees	11.2	6.3	7.5	8.0	8.5	9.1
Manual workers	75.7	79.3	77.9	75.9	69.1	57.9
Not in the labor force	1.2	1.6	2.6	3.4	8.1	11.8
Missing	5.3	5.2	4.2	4.2	4.2	6.8
Overall	100	100	100	100	100	100

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector in 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Table 8: Socio-professional categories of the mother, by birth cohort (%)

Panel 1: Natives

	1967-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1996
Farmers	2.5	1.3	1.0	0.7	0.9	0.6
Artisans - Merchants	1.0	1.1	0.7	1.1	1.4	1.4
Higher grade professionals	0.9	1.4	2.0	2.9	3.5	3.4
Intermediate grade professionals	5.0	7.3	9.8	11.2	13.8	16.4
Non-manual employees	20.4	24.0	31.0	30.9	36.5	38.9
Manual workers	9.1	12.2	13.2	13.5	8.0	7.9
Not in the labor force	57.6	49.9	39.8	37.6	35.1	30.3
Missing	3.5	2.8	2.5	2.1	0.8	1.1
Overall	100	100	100	100	100	100

Panel 2: Descendants of immigrants from Maghreb

	1967-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1996
Farmers	0.0	0.0	0.2	0.0	0.0	0.0
Artisans - Merchants	0.0	0.3	0.5	0.3	0.8	0.8
Higher grade professionals	0.0	0.5	0.7	0.6	0.8	0.5
Intermediate grade professionals	1.8	1.1	2.1	2.2	2.2	2.6
Non-manual employees	4.1	6.3	7.8	5.4	9.8	19.2
Manual workers	4.7	6.5	4.9	5.1	4.7	5.1
Not in the labor force	81.1	78.2	79.1	83.0	80.0	69.7
Missing	8.3	7.1	4.7	3.4	1.9	2.2
Overall	100	100	100	100	100	100

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector in 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Table 9: Wage gap between natives and descendants of immigrants from Maghreb

Dependent variable: Log relative hourly wage

	Model (1)	Model (2)	Model (3) (Baseline)	Model (4)	Model (5)	Model (6)
Migration background (Ref = Descendant of immigrants)						
Native	-0.0266** (0.0110)	0.0066 (0.0120)	-0.0131 (0.0121)	-0.0003 (0.0115)	0.0009 (0.0111)	0.0006 (0.0110)
Age group (Ref = 18-24)						
25 - 29	0.0950*** (0.0068)	0.0917*** (0.0067)	0.0916*** (0.0067)	0.0899*** (0.0065)	0.0750*** (0.0061)	0.0502*** (0.0067)
30 - 34	0.162*** (0.0087)	0.158*** (0.0087)	0.159*** (0.0086)	0.154*** (0.0083)	0.119*** (0.0077)	0.0916*** (0.0082)
35 - 39	0.162*** (0.0111)	0.160*** (0.0109)	0.160*** (0.0109)	0.157*** (0.0107)	0.0971*** (0.0099)	0.0603*** (0.0104)
40 - 47	0.176*** (0.0136)	0.177*** (0.0135)	0.177*** (0.0135)	0.172*** (0.0132)	0.0989*** (0.0121)	0.0630*** (0.0128)
Migration background*Age group						
Native # 25 - 29	-0.0129* (0.0067)	-0.0112* (0.0066)	-0.0118* (0.0066)	-0.0103 (0.0064)	-0.0107* (0.0058)	-0.0094* (0.0057)
Native # 30 - 34	-0.0212** (0.0088)	-0.0177** (0.0087)	-0.0184** (0.0087)	-0.0163* (0.0084)	-0.0198*** (0.0076)	-0.0180** (0.0074)
Native # 35 - 39	-0.0125 (0.0106)	-0.00745 (0.0105)	-0.00823 (0.0105)	-0.00879 (0.0102)	-0.0146 (0.0093)	-0.0136 (0.0092)
Native # 40 - 47	-0.0125 (0.0132)	-0.0085 (0.0132)	-0.0091 (0.0132)	-0.0075 (0.0129)	-0.0144 (0.0116)	-0.0154 (0.0116)
Cohort group (Ref = 1990-1996)						
1967 - 1969	0.124*** (0.0282)	-0.0452 (0.0304)	-0.0342 (0.0302)	-0.0286 (0.0293)	0.0253 (0.0262)	0.0442* (0.0256)
1970 - 1974	0.109*** (0.0203)	-0.0753*** (0.0237)	-0.0635*** (0.0237)	-0.0545** (0.0226)	-0.00481 (0.0211)	0.0150 (0.0207)
1975 - 1979	0.130*** (0.0164)	-0.0142 (0.0212)	-0.0015 (0.0212)	0.0003 (0.0201)	0.0286 (0.0191)	0.0434** (0.0189)
1980 - 1984	0.0667*** (0.0134)	-0.0065 (0.0190)	0.0002 (0.0189)	-0.0034 (0.0180)	0.0032 (0.0173)	0.0090 (0.0171)
1985 - 1989	0.0300** (0.0134)	-0.0361* (0.0203)	-0.0258 (0.0203)	-0.0260 (0.0192)	-0.0173 (0.0186)	-0.0142 (0.0184)

Migration background* Cohort group

Native # 1967 - 1969	0.126*** (0.0285)	0.0971*** (0.0264)	0.0998*** (0.0263)	0.0811*** (0.0256)	0.0744*** (0.0222)	0.0717*** (0.0217)
Native # 1970 - 1974	0.135*** (0.0204)	0.0815*** (0.0192)	0.0835*** (0.0191)	0.0694*** (0.0183)	0.0597*** (0.0166)	0.0555*** (0.0164)
Native # 1975 - 1979	0.0825*** (0.0166)	0.0381** (0.0165)	0.0367** (0.0165)	0.0283* (0.0157)	0.0256* (0.0146)	0.0244* (0.0144)
Native # 1980 - 1984	0.0640*** (0.0138)	0.0361** (0.0144)	0.0297** (0.0145)	0.0261* (0.0137)	0.0233* (0.0129)	0.0219* (0.0128)
Native # 1985 - 1989	0.0538*** (0.0138)	0.0388*** (0.0146)	0.0320** (0.0147)	0.0263* (0.0139)	0.0205 (0.0132)	0.0192 (0.0131)

Gender (Ref = Male)

Female		-0.144*** (0.0021)	-0.142*** (0.0021)	-0.123*** (0.0021)	-0.110*** (0.0019)	-0.112*** (0.0019)
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Degree level (Ref = no diploma)

Cep – BEPC¹		0.0345** (0.0140)	0.0276** (0.0140)	0.0196 (0.0135)	0.0177 (0.0135)	0.0145 (0.0134)
Cap – BEP²		0.0102 (0.0132)	0.0157 (0.0132)	0.0147 (0.0127)	0.0134 (0.0128)	0.0133 (0.0126)
High school degree (bac)		0.0448*** (0.0134)	0.0380*** (0.0134)	0.0282** (0.0129)	0.0260** (0.0130)	0.0228* (0.0129)
Undergraduate degree		0.0868*** (0.0149)	0.0756*** (0.0150)	0.0536*** (0.0144)	0.0500*** (0.0143)	0.0510*** (0.0141)
Graduate degree		0.131*** (0.0268)	0.108*** (0.0268)	0.0774*** (0.0263)	0.0577** (0.0247)	0.0627** (0.0246)

Size of the urban area (Ref = rural area)

Less than 15 000 inhabitants		0.0054* (0.0030)	0.0051* (0.0030)	0.0042 (0.0029)	0.0033 (0.0027)	0.0036 (0.0026)
15 000 - 20 000		-0.0101* (0.0055)	-0.0103* (0.0055)	-0.0083 (0.0053)	-0.0115** (0.0047)	-0.0087* (0.0046)
20 000 - 25 000		-0.0044 (0.0069)	-0.0045 (0.0069)	-0.0062 (0.0066)	-0.0054 (0.0059)	-0.0048 (0.0058)
25 000 - 35 000		-0.0086* (0.0050)	-0.0091* (0.0049)	-0.0085* (0.0048)	-0.0101** (0.0042)	-0.0092** (0.0041)

35 000 - 50 000	0.0060 (0.0050)	0.0058 (0.0050)	0.0044 (0.0048)	0.0047 (0.0042)	0.0060 (0.0042)
50 000 - 100 000	0.0048 (0.0036)	0.0040 (0.0036)	0.0028 (0.0035)	0.0018 (0.0031)	0.0019 (0.0030)
100 000 - 200 000	0.0030 (0.0033)	0.0022 (0.0033)	0.0005 (0.0032)	0.0015 (0.0028)	0.0015 (0.0027)
200 000 - 500 000	0.0055* (0.0030)	0.0042 (0.0030)	0.0023 (0.0029)	0.0018 (0.0026)	0.0022 (0.0025)
500 000 - 10 000 000	0.0121*** (0.0034)	0.00957*** (0.0034)	0.00827** (0.0033)	0.00536* (0.0029)	0.00533* (0.0028)
Paris urban area	0.0376*** (0.0085)	0.0347*** (0.0084)	0.0348*** (0.0082)	0.0335*** (0.0074)	0.0358*** (0.0073)
Socio-professional category of the father (Ref=Farmers)					
Artisans - Merchant		0.0232*** (0.0079)	0.0238*** (0.0076)	0.0189*** (0.0065)	0.0174*** (0.0063)
Higher grade professionals		0.105*** (0.0085)	0.0988*** (0.0082)	0.0657*** (0.0069)	0.0631*** (0.0067)
Intermediate grade professionals		0.0282*** (0.0068)	0.0255*** (0.0065)	0.0163*** (0.0055)	0.0149*** (0.0054)
Non-manual employees		-0.0035 (0.0065)	-0.0089 (0.0062)	-0.0091* (0.0052)	-0.0100* (0.0051)
Manual workers		-0.0157*** (0.0061)	-0.0200*** (0.0058)	-0.0143*** (0.0049)	-0.0145*** (0.0048)
Not in the labor force		0.0047 (0.0102)	0.0027 (0.0097)	-0.0027 (0.0082)	-0.0019 (0.0080)
Socio-professional category of the mother (Ref=Farmers)					
Artisans - Merchant		0.0109 (0.0142)	0.0167 (0.0137)	0.0090 (0.0118)	0.0103 (0.0115)
Higher grade professionals		0.0918*** (0.0146)	0.0885*** (0.0140)	0.0559*** (0.0120)	0.0567*** (0.0118)
Intermediate grade professionals		0.0347*** (0.0109)	0.0364*** (0.0104)	0.0198** (0.0090)	0.0203** (0.0088)

Non-manual employees		0.0177*	0.0189*	0.0120	0.0126	
		(0.0103)	(0.0099)	(0.0086)	(0.0083)	
Manual workers		0.0014	0.0015	0.0009	0.0018	
		(0.0104)	(0.0100)	(0.0087)	(0.0084)	
Not in the labor force		0.0003	0.0017	-0.0004	0.0016	
		(0.0102)	(0.0098)	(0.0084)	(0.0082)	
Firm size (Ref = 0-9 employees)						
10 - 19			0.0200***	0.0205***	0.0198***	
			(0.0019)	(0.0018)	(0.0018)	
20 - 49			0.0355***	0.0351***	0.0338***	
			(0.0021)	(0.0019)	(0.0019)	
50 - 249			0.0504***	0.0470***	0.0457***	
			(0.0021)	(0.0019)	(0.0019)	
250 - 499			0.0629***	0.0559***	0.0539***	
			(0.0026)	(0.0023)	(0.0023)	
500 - 999			0.0676***	0.0615***	0.0598***	
			(0.0027)	(0.0025)	(0.0024)	
1000 or more			0.0842***	0.0752***	0.0745***	
			(0.0022)	(0.0020)	(0.0019)	
Socio-professional categories (Ref = manual workers)						
Higher grade professionals				0.111***		
				(0.0087)		
Intermediate grade professionals				0.0376***		
				(0.0034)		
Non-manual employees				0.0018		
				(0.0025)		
Full-time/Part-time job (Ref=Full-time)						
Part-time				0.0230***	0.0241***	
				(0.0013)	(0.0013)	
Constant	-0.267***	-0.255***	-0.245***	-0.289***	-0.295***	-0.286***
	(0.0107)	(0.0187)	(0.0207)	(0.0203)	(0.0189)	(0.0188)
Age group*Cohort group	Yes	Yes	Yes	Yes	Yes	Yes
Department dummies	No	Yes	Yes	Yes	Yes	Yes

Degree level*Cohort group	No	Yes	Yes	Yes	Yes	Yes
Industry dummies (A38)	No	No	No	Yes	Yes	Yes
Aggregated socio-professional categories*Age group	No	No	No	No	Yes	No
Extensive socio-professional categories	No	No	No	No	No	Yes
Extensive socio-professional categories *Age group	No	No	No	No	No	Yes
Number of observations	394,446	394,446	394,446	394,446	394,446	394,446
Number of individuals	56,862	56,862	56,862	56,862	56,862	56,862
R-squared	11.11	43.01	44.04	48.14	60.37	61.71

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Standard errors in parentheses are clustered at the individual level.

* p<0.1. ** p<0.05. *** p<0.01

¹ Middle school degree

² Vocational training (after middle school)

Figure 19: Estimated wage gap between natives and second-generation immigrants from Maghreb (Model 1: no controls)

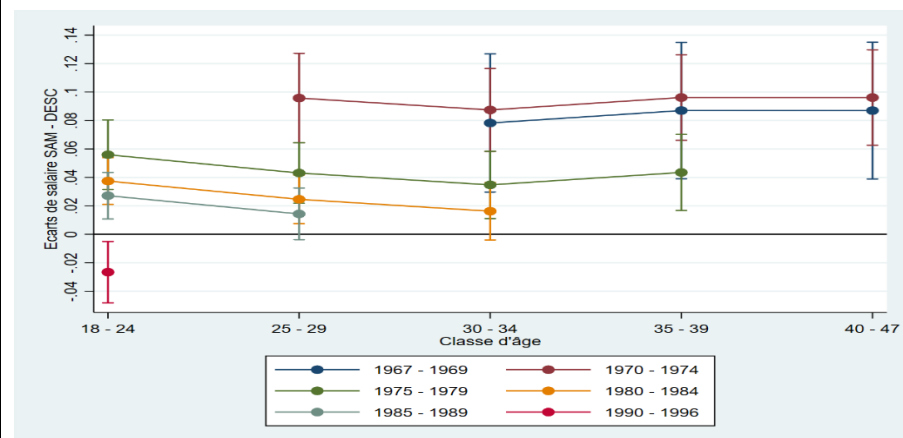


Figure 20: Estimated wage gap between natives and second-generation immigrants from Maghreb (Model 2: + gender, degree, degree*cohort, geographical factors)

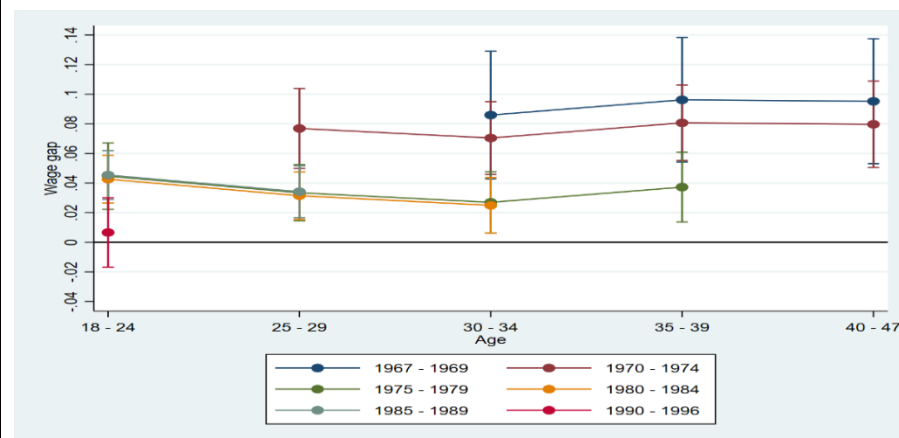


Figure 21: Estimated wage gap between natives and second-generation immigrants from Maghreb (Model 3 - Baseline: + parents' occupations)

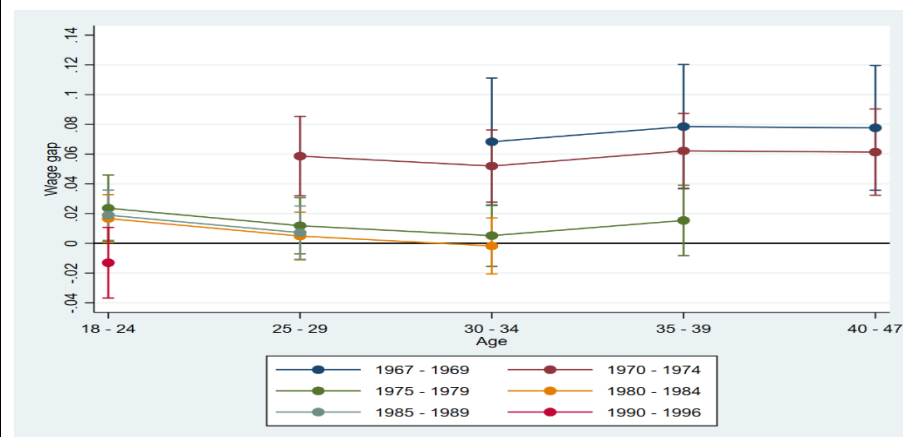


Figure 22: Estimated wage gap between natives and second-generation immigrants from Maghreb (Model 4: + industry dummies, firm size)

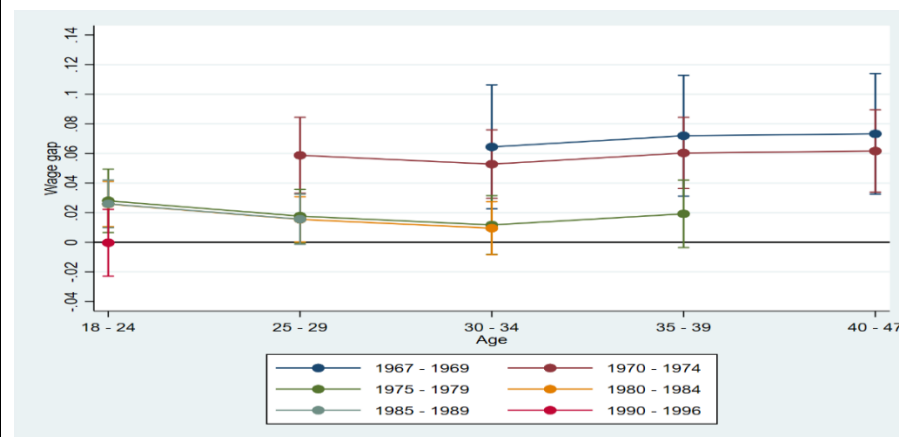


Figure 23: Estimated wage gap between natives and second-generation immigrants from Maghreb (Model 5: + occupation, occupation*age, dummy part-time/full-time)

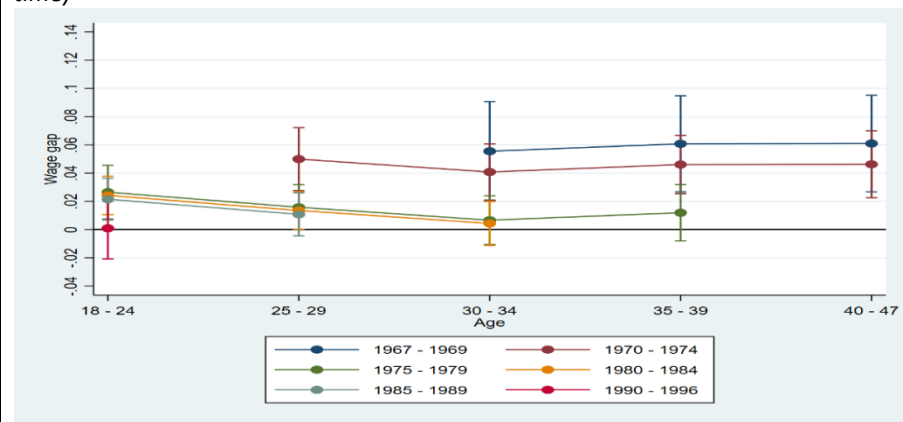


Figure 24: Estimated wage gap between natives and second-generation immigrants from Maghreb (Model 6: + extensive occupation categories)

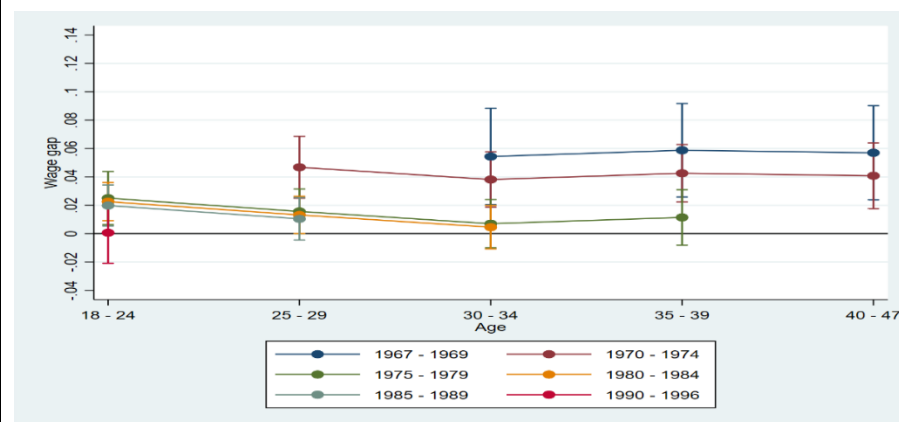


Figure 25: Estimated wage gap between natives and second-generation immigrants from Maghreb - Baseline model

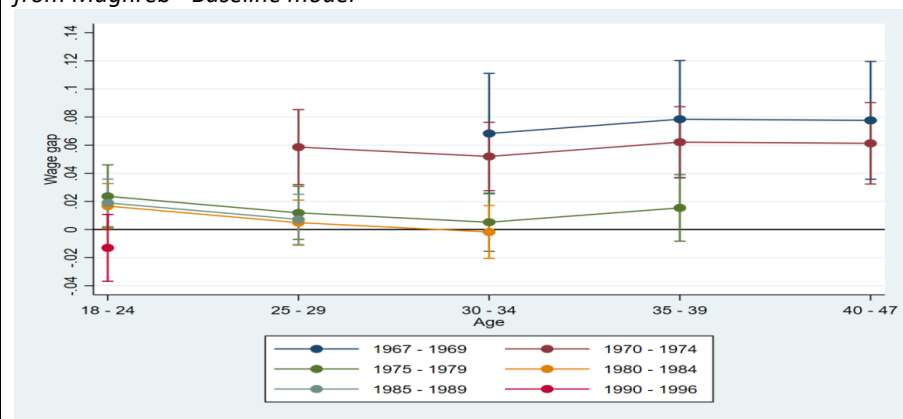
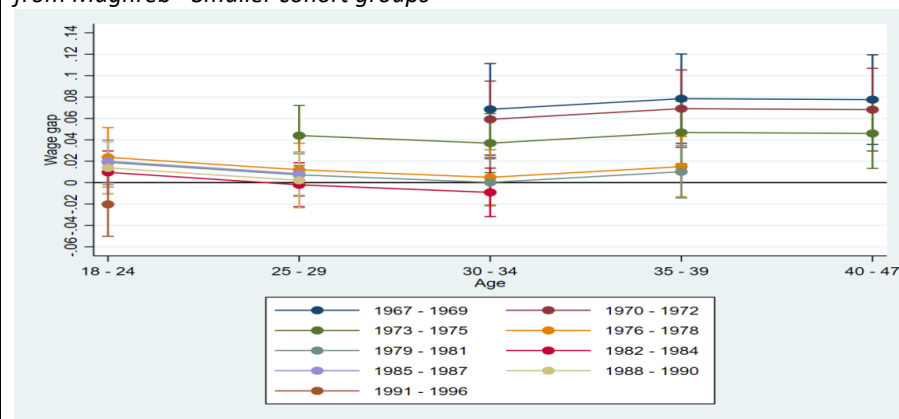


Figure 26: Estimated wage gap between natives and second-generation immigrants from Maghreb - Smaller cohort groups



Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models. The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE

Figure 27: Estimated wage gap between natives and second-generation immigrants from Maghreb – Baseline model

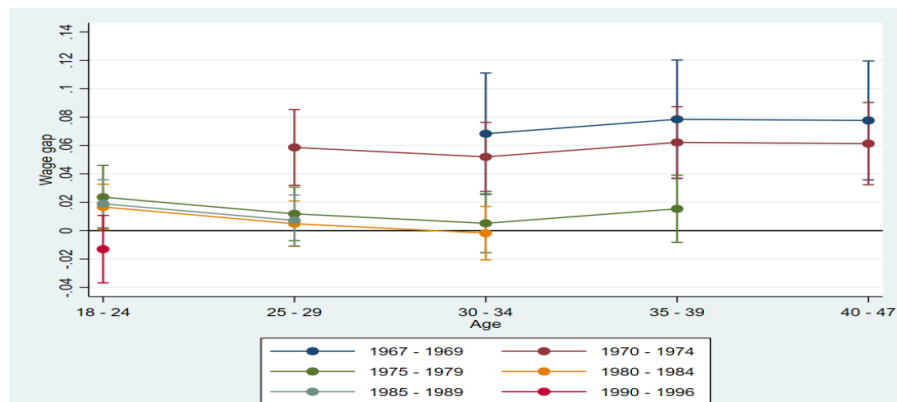


Figure 28: Estimated wage gap between natives and second-generation immigrants from Maghreb - Including missing values

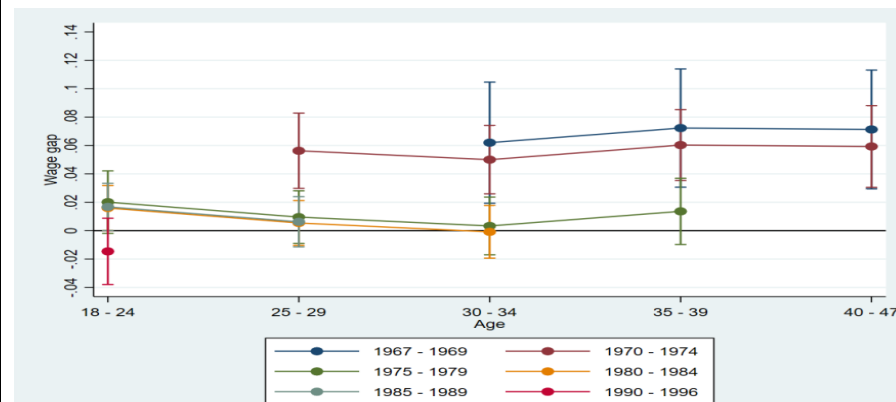


Figure 29: Estimated wage gap between natives and second-generation immigrants from Maghreb – Baseline model

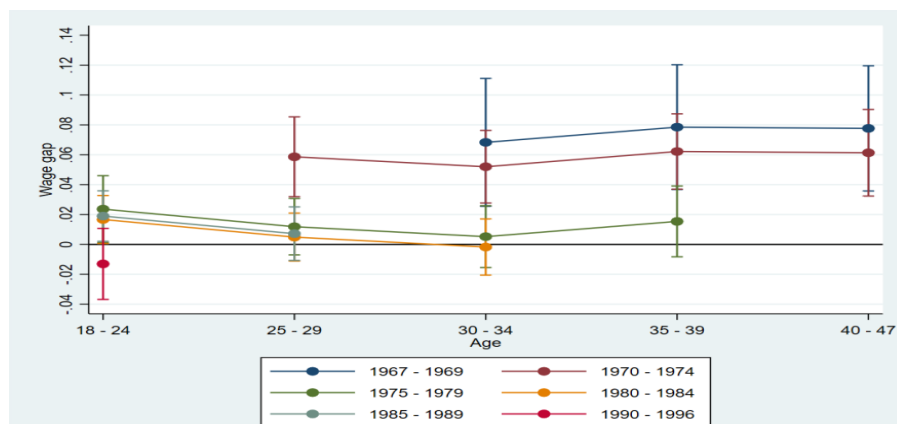
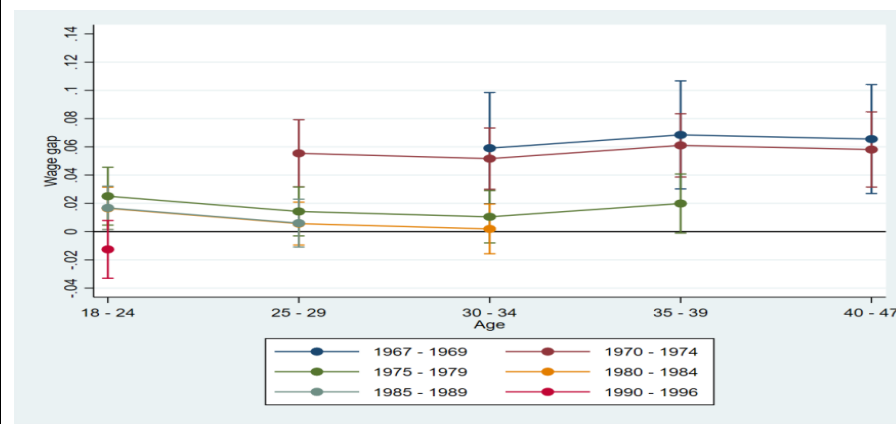


Figure 30: Estimated wage gap between natives and second-generation immigrants from Maghreb - Excluding extreme wages



Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models. The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 31: Estimated wage gap between natives and second-generation immigrants from Maghreb – Baseline (equivalent of at least 6 months of full-time work)

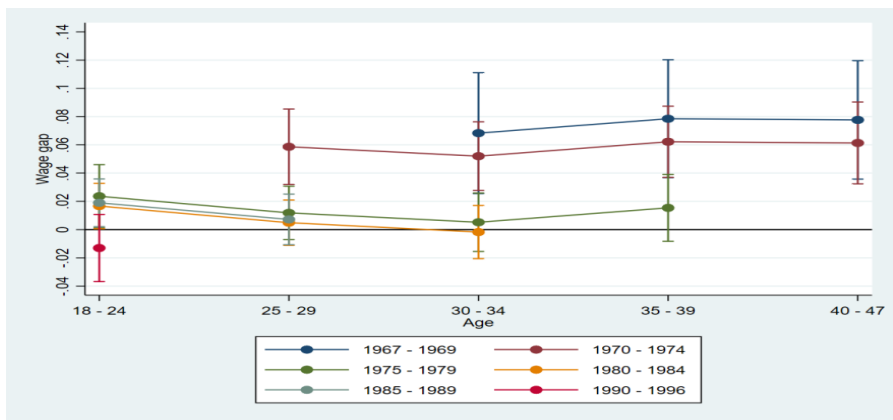


Figure 32: Estimated wage gap between natives and second-generation immigrants from Maghreb – Full-year and full-time work

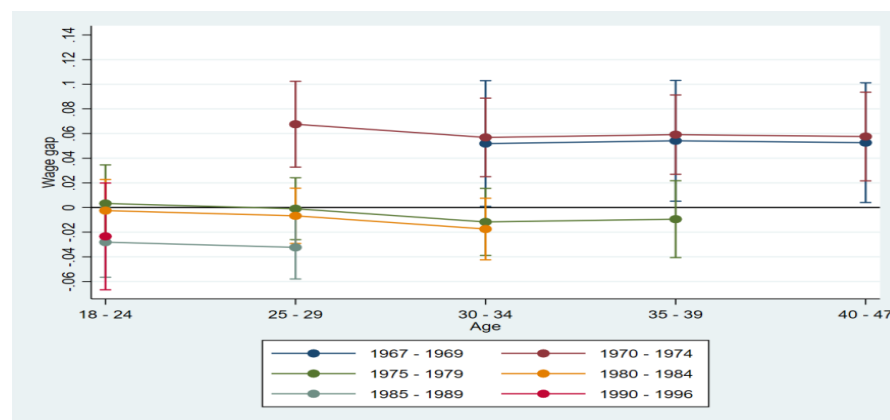


Figure 33: Estimated wage gap between natives and second-generation immigrants from Maghreb – Equivalent of at least 3 months of full-time work

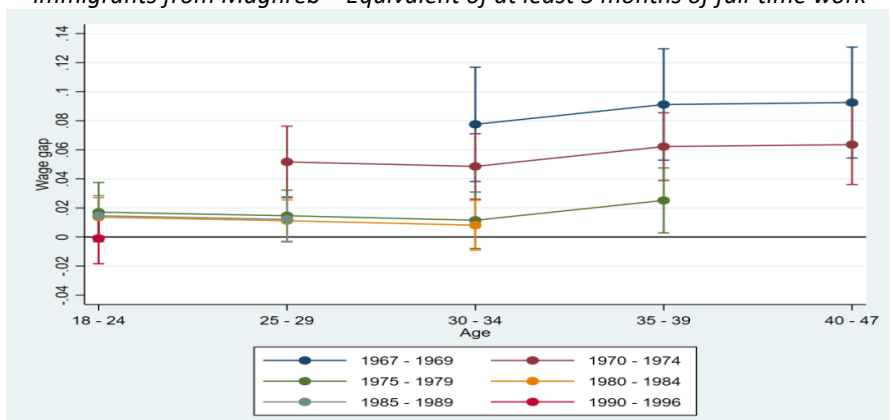
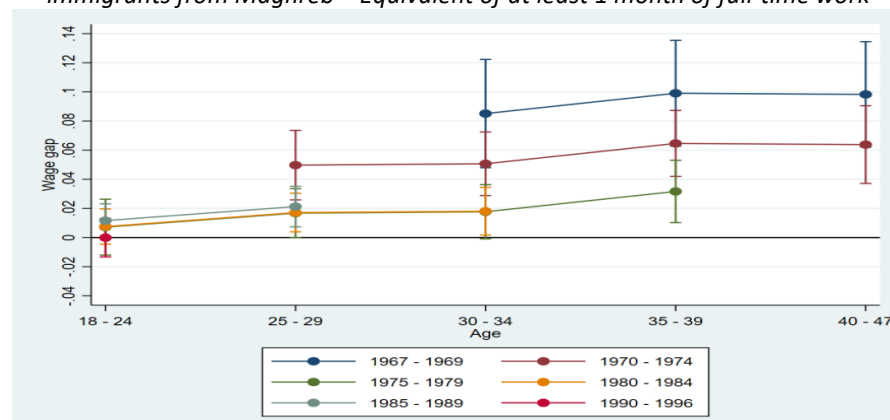
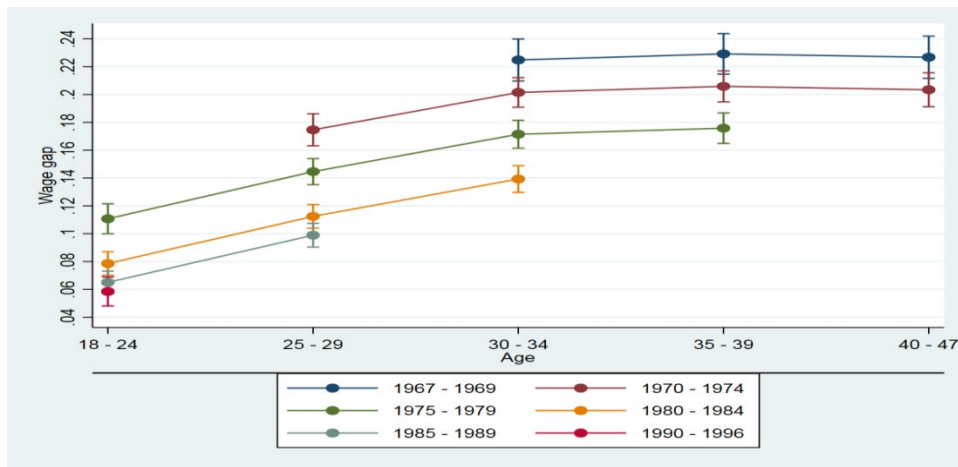


Figure 34: Estimated wage gap between natives and second-generation immigrants from Maghreb – Equivalent of at least 1 month of full-time work



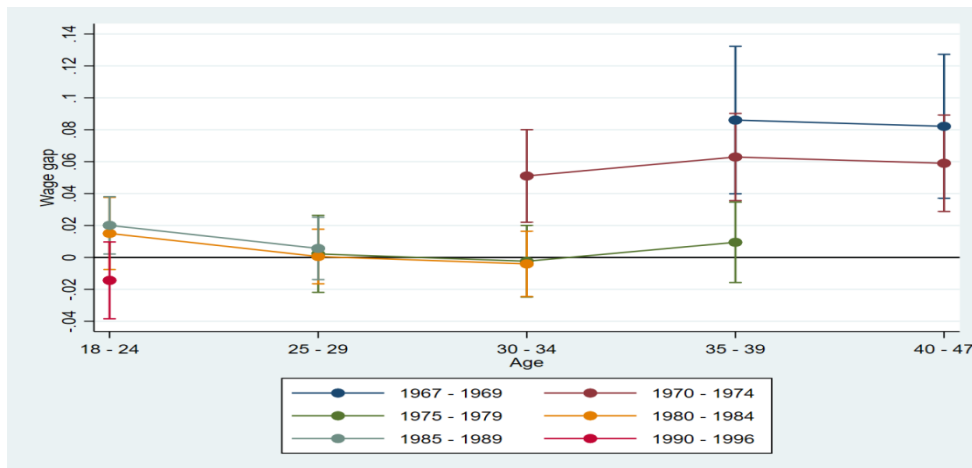
Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models. The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 35: Estimated wage gap between men and women among natives



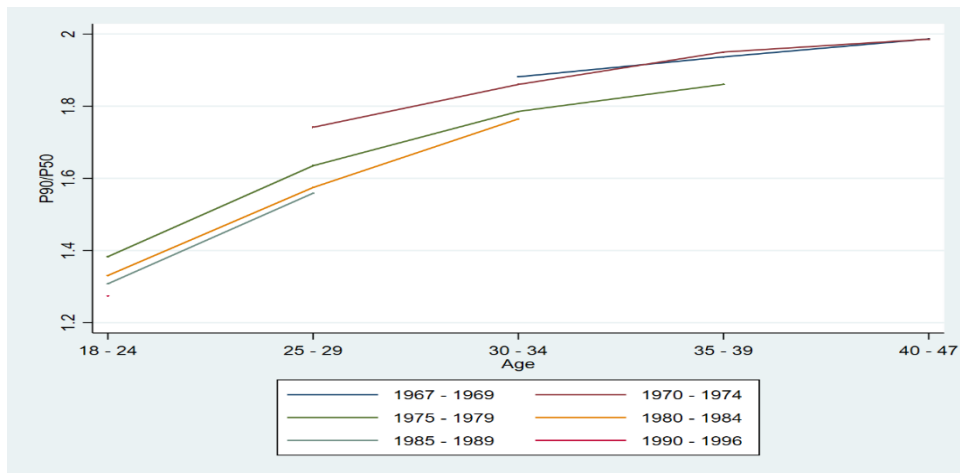
Note: The estimated wage gap in the y-axis is the marginal effects of gender from a regression model. The sample includes natives born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 36: Estimated wage gap between natives and second-generation immigrants from Maghreb - Period 2007-2014



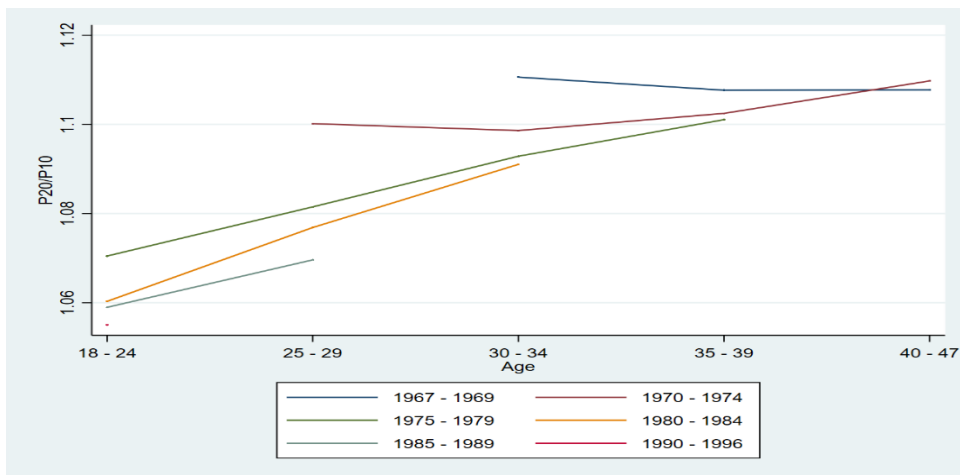
Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models. The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2007 and 2014, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 37: Decile ratio P90/P50 of the real net hourly wage in the study sample, by age and cohort



The sample includes all employees in the private sector working more than 910 hours per year between 2002 and 2014, born between 1967 and 1996, and aged between 18 and 47, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 38: Decile ratio P20/P10 of the real net hourly wage in the study sample, by age and cohort



The sample includes all employees in the private sector working more than 910 hours per year between 2002 and 2014, born between 1967 and 1996, and aged between 18 and 47, excluding apprentices and interns. Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

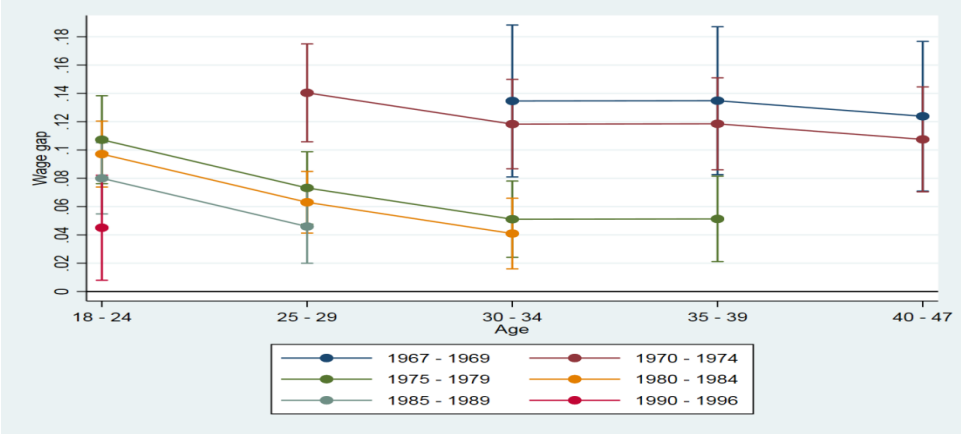
Appendix B: Results about the earning gap

This study focuses on the wage differential between natives and descendants of immigrants, which is an indicator of equality of treatment once employed. Equality of access to employment is obviously also an issue, since testing experiments have found evidence of discrimination in recruitment processes (Duguet et al., 2010, Foroni et al., 2016). However, the measure of employment discrimination on the whole population may be even more difficult than the measure of wage discrimination: it is easy to assume that most people would accept a raise in their hourly wage but it is less easy to assume that most of them would like to work more. Therefore, the difference in working time can come from both cultural differences in labor supply behavior (such as a lower activity rate for mothers) and from a difference of access to employment (or full-time employment). In this Appendix we present the results on total annual earnings as opposed to hourly wage, for our main interest population of second-generation immigrants from Maghreb. Indeed, this indicator cumulates differences in salary and differences in working time. Leaving aside the problems of non-measurement of some control variables and the potential endogeneity of some of our explanatories, the differences of treatment on the labor market should be somewhere in-between these new results (annual earnings gap) and the previous ones (hourly wage gap).

As one would expect, the differences in earnings are much larger than the differences in hourly wage. The earning gap is estimated between 11% and 14% for the two oldest generations and between 4% and 10% for the younger generations (Figure 39). These results display an age effect, which is particularly marked among the youngest workers aged 18 to 34. Natives have higher earnings at 18 to 24 years old, but this gap is decreasing with age. This age effect has to be driven by differences in hours worked since we have found no age effect in the hourly wage gap. This suggests that young natives work many more hours annually than the corresponding descendants of immigrants from Maghreb. This age effect is stronger among women and is likely mitigated by the selection into employment. In accordance with the main results of the paper, the earning gap is clearly smaller for younger cohorts (Figure 39). For instance, at the ages 30-34, the gap is about 14% for the cohort 1967-1969 and only 4% for the cohort 1980-1984, a difference of 10 percentage points. However, the unexplained gap in earning remains significant, even for the youngest generation.

The results, by gender, are presented in Figures 40 and 41. The gap in earnings is much greater among men and reaches 20% for the 1967-1969 cohort and 16% for the 1970-1974 cohort. The gap exceeds 6% for other cohorts. Among women, the estimated gap in earnings is much smaller and its measurement is more imprecise. The differences are only significant at younger ages.

Figure 39: Estimated gap in total annual wage between natives and second-generation immigrants from Maghreb

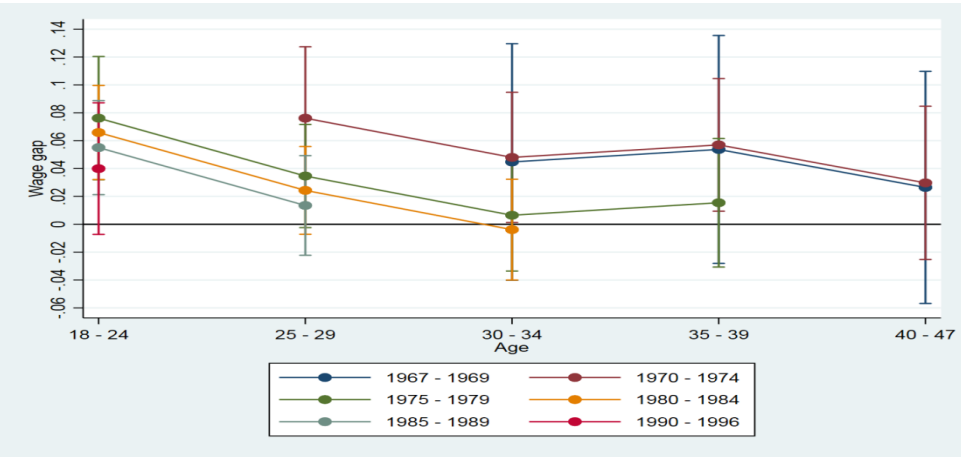


Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models.

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 40: Estimated gap in total annual wage between natives and second-generation immigrants from Maghreb - Women

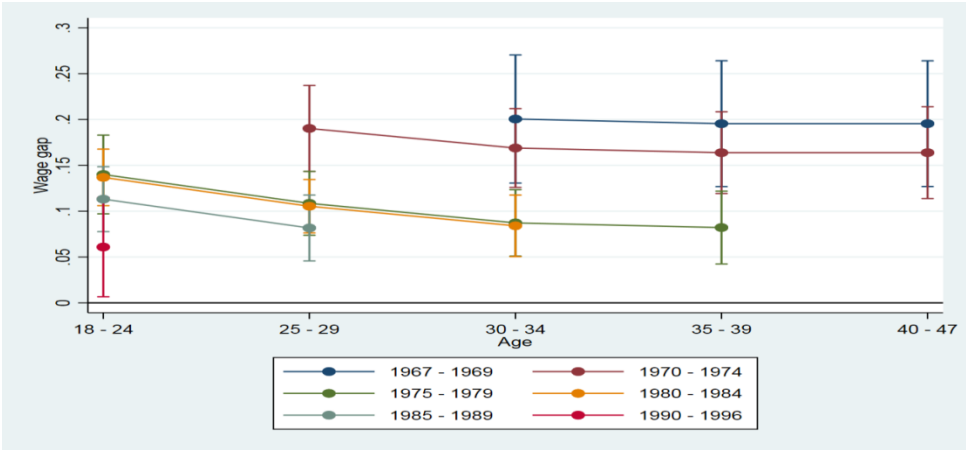


Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models.

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

Figure 41: Estimated gap in total annual wage between natives and second-generation immigrants from Maghreb - Men



Note: The estimated wage gap in the y-axis is the marginal effects of the migration background from the regression models.

The sample includes natives and descendants of immigrants from Maghreb born between 1967 and 1996, aged between 18 and 47, and employed in the private sector more than 910 hours per year between 2002 and 2014, excluding apprentices and interns.

Source: 2014 EDP panel restricted to individuals born October 1st and 4th, INSEE.

