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Abstract

This paper studies the impact of naturalization on the labor market outcomes of foreign-born workers in France. Using a large panel dataset of workers employed in France over 1993-2001, I find that naturalization is associated with a sharp increase in job mobility: immigrants tend to change occupations and employers, in the same year as they naturalize. Turning to wages, I find evidence that naturalization commands a wage premium, which is associated with employment mobility. For workers initially in low-skill occupations, the wage premium is conditional on occupational mobility. For those in middle- or high-skilled occupations, there is also evidence of a wage premium, mostly for foreign women; this premium is associated with moves to a different firm. These results suggest that foreign citizenship constrains workers mobility, and are consistent with the hypothesis of a mismatch of foreign workers to their jobs.

Keywords: Immigrant assimilation, labor market, job mobility, wage bargaining.
JEL Classification: J31, J61, J68, F22

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1 Introduction

Several recent studies in immigration countries have found that the acquisition of citizenship by foreigners is associated with higher employment and wages (e.g. Bratsberg et al. (2002); Fougere and Safi (2009); Steinhardt (2012) for the US, France and Germany respectively). These studies use longitudinal data, which allows to control, to some extent, for the selection of individuals into naturalization; thus suggesting that naturalization by itself (rather than individual characteristics of those who choose to naturalize), has, in these countries, a positive impact on the employment prospects of immigrants, and on their wages.

Barriers on access to some jobs, facing foreign workers, are generally cited as the plausible mechanism behind this pattern. Such barriers include legal restrictions - a number of jobs, mostly in the public sector, being open only to nationals, in the US and in European countries. In addition to this legal discrimination, foreign workers may also face discrimination by employers, for example if citizenship is interpreted as a signal for (country-specific) human capital, or for a commitment to stay longer in the country.

These various forms of discrimination may explain the observed employment impact of naturalization. They may also explain the positive wage effect in two cases: if they apply in jobs paying higher wages, for a given employee profile; or, if they have an indirect impact on wages paid in other, non-restricted positions, by lowering the probability of employment for non-citizens, and thus weakening their bargaining position in the jobs which they have access to.

Alternatively, another source of explanation for the wage impact lies in the degree of economic and legal security offered by citizenship, through the assurance of legal stay and access to safety nets. Without citizenship, obtaining and renewing a legal permit to stay may be tied to employment[1]. Consequently, foreign workers may be under more pressure to secure employment, and thus have less time for screening positions; changing jobs may also be seen as a risk, if it implies leaving a permanent contract for a short-term one or a testing period. In the presence of imperfect information on the labor market, this can create mismatch between foreign workers and the positions they occupy. In this case, the wage gap is not caused by discrimination in specific jobs, but rather by a broader form of discrimination on the labor market.

This paper contributes to clarify these mechanisms in the French case. A large, administrative dataset of employer data is used, where immigrant and native workers are followed throughout their professional life.[2] The longitudinal (annual) dimension of the data allows to control for individual

[1] This is the case in France (see below)

[2] The DADS (Déclaration annuelle des données sociales) comprises all data reported by employers in France

heterogeneity when measuring the impacts that naturalization has on the careers of immigrants - i.e. on the wages they earn and the types of jobs they hold. I put specific attention to the conjunction between these two impacts, looking at whether the naturalization wage premium is tied to a change of employer or occupation.[3]

Results show, first, that naturalization triggers a sharp increase in job mobility: the probability of changing employer, as well as occupation, increases sharply in the year of naturalization. Table 1 illustrates this point. The probabilities of changing employer, occupation, as well as location, labor contract, or entering the public sector, are computed for all individuals in the sample (including foreigners and naturalized foreign-born), depending on whether they are foreigner, naturalized, or just in the year of naturalization. All these probabilities increase sharply in the precise year of naturalization, a result which will be confirmed later when controlling for a range of individual characteristics.

Second, my results confirm the presence of a "naturalization wage premium" in the French context, but highlight the importance of accounting for heterogeneity in this relationship. For foreign men, the premium exists mostly for workers initially employed in low-skilled occupations; while among women, by contrast, there is evidence of a premium for those in middle- and high-skilled occupations.

Third, results establish a link between the wage premium and job mobility. For workers employed in low-skill occupations in particular, the premium materializes only for those changing occupation in the year of their naturalization: thus naturalization increases wages because it allows to move to a better paid type of job. This suggests a pattern of mismatch (between employee and job), prior to naturalization. The mobility effect is centered on the naturalization year, thus there is no apparent reason (such as skill) why those workers would not have been able to change before; other than the constraint that foreign citizenship exerts on mobility itself. [4] One possible explanation lies in the precarious situation of those with foreign citizenship, due to uncertainty about legal stay and safety nets; this may lead some foreigners to accept jobs not matching their qualifications, because they have not the time to search further (or because changing job is risky, if it involves a testing period during which long-term employment is not guaranteed).

The link between mobility and the wage premium also appears to hold in the case of women in

about their employees for computation of social contributions. The panel dataset used here follows over time all workers born in October of even years. In most of the empirical analysis I use data for the period 1993-2001, for reasons detailed below.

[3] As individuals born in France to foreign parents become French at 18, very few such cases are considered here (less than 0.5% observations at age under 18). This study is thus essentially about naturalizations of workers born abroad, i.e. about first-generation, not second-generation immigrants.

[4] In addition, I also conduct robustness checks to verify that the wage premium is not taking place in the years preceding naturalization.

middle- and higher-skilled occupations.[5] In this case, the effect on wages is found for those workers who change employer (while staying in the same occupation category).

This effect can also be explained by the fact that those workers accept less paying positions because they lack time or security to search for a better match. Alternatively, it could be that citizenship is lifting barriers to specific positions. Restrictions on access to specific professions and public sector jobs, passport requirements for some positions, employer preferences, are among the forms of discrimination (legal or not) that could play a role. The fact that this effect is specific to foreign women suggests that two forms of discriminations, based on gender and nationality, may be interacting here.

The analysis on wages is conducted while controlling for individual heterogeneity using an individual fixed-effects model. Thus, the wage increase is not explained by constant individual characteristics associated to the choice to naturalize. However, there remains the possibility that those who eventually naturalize have distinctive wage patterns, for example because they invest more in country-specific human or social capital, in prevision of staying long-term in the country (or to increase their chances of obtaining citizenship). I control for this in several ways. First, I check that both the mobility and the wage effects of naturalization occur at the time of naturalization, and not in the years before. Second, I use specifications allowing for individual wage growth to differ for those who eventually naturalize (or, also, for those in particular who change jobs when naturalizing). These tests confirm that the observed wage impacts are not detected in any form (level or growth) before citizenship acquisition. This establishes that naturalization is instrumental in the effects on job mobility and wages I measure, and that these effects are not driven by selection into naturalization. [6]

[5] Classification of occupation is based on the original categories *socio-professionnelles* available in the data, and is described in detail in the data section. Medium- and high-skilled occupations referred to here include intermediary office workers , technical workers, managers and executives.

[6] Note however, that the effects measured could still be specific to those applying for citizenship, or to those whose demand is accepted. I cannot estimate how much the measured effect could be extended if, for instance, naturalization was made easier.

Table 1: Mobility rates: changing employer, contract type, location

Status	Foreigner	Naturalization	Citizen
Changing employer			
Staying with same employer	113,632	3,668	20,707
Changing employer	27,208	2,959	4,631
P[changing](%)	19.3	44.6	18.3
Changing occupation (1-digit)			
Same occ.	128,709	5,113	22,311
Changed occ.	10,842	1,347	2,634
P[changing] (%)	7.8	20.9	10.6
*Changing location (*département*)*			
Same dept	128,280	5,206	23,258
Changed dept.	12,536	1,418	2,077
P[changing] (%)	8.9	21.4	8.2
Changing sector of employment			
Same sector	119,723	4,210	21,558
changing	21,015	2,413	3,761
P[changing](%)	14.9	36.4	14.8
Entering public sector			
No	139,981	6,476	25,138
Yes	479	127	161
P[enter](%)	0.3	1.9	0.6
Changing labor contract (2006-2008)			
Same contract	112,238	10,394	39,186
changing contract	20,478	3,461	3,386
P[changing](%)	15.43	25.0	7.9

Source: panel DADS, 1993-2001, except last panel: 2006-2008. Sample includes all foreigners and naturalized individuals, for all individuals being observed two consecutive years; changes are from one year to the next.

Early socio-economic studies of naturalization have studied the determinants, rather than the consequences, of it. Rates of naturalization were found to vary widely across origins, education and cultural backgrounds. Acquisition of the host country citizenship is a choice, which an economist would want to explain by the prospective benefits a candidate can expect from it. However, the decision is not primarily an economic one, and could instead be motivated by political factors, symbolic ones. Bernard (1936)'s findings, of higher naturalization among the high educated, suggests that it could be used as a signal of status, and of willingness to stay, rather than as an instrument for economic progress. Portes and Curtis (1987) show that naturalization rates are especially low among Mexican immigrants, and show this to be explained by the short distance from origin, and by the temporary nature of the immigrant experience for the majority of them. Diehl and Blohm (2003) find that, among Turkish immigrants in Germany, the propensity to naturalize is higher among those most assimilated (those with German friends, speaking German, Turkish immigrants). Thus, they argue that naturalization is used at the end of the assimilation process, to bring legal status in accordance with a social status already achieved.

One early study of the economic effects of naturalization was Chiswick (1978), who was interested in the process of assimilation of immigrants. He found evidence of naturalized immigrants having higher wages, but this result obtained in cross-sectional estimation does not establish causality; thus, it does not say whether naturalization is only a sign of assimilation, or as an essential component of it.

More recently, several studies have used longitudinal data to test the hypothesis of naturalization having a direct impact on labor market outcomes. Comparing cross-sectional and panel estimates has allowed to ask whether there was more than selection in the naturalization effect, as well as to infer the direction of selection. [7]

Most studies answer positively. Bratsberg et al. (2002); Steinhardt (2012) find a positive impact on wages, in the US and Germany, respectively. Bevelander and Pendakur (2012) find a positive impact on employment in Sweden. By contrast, Scott (2008) and Engdahl (2011) find little or no wage premium of naturalization in the case of Sweden, after controlling for individual heterogeneity. Bratsberg and Raaum (2011) finds no positive impact on wages, in the case of Norway, and a small negative impact for some groups. Fougere and Safi (2009) found a positive employment effect in the case of France.

Bratsberg et al. (2002) use a small sample from a longitudinal survey, the NLSY, focused

[7] Panel estimates with fixed effects allow to control for constant, unobserved individual characteristics influencing both the probability to naturalize and labor market outcomes. However, another possible source of bias lies in the fact that naturalization reflects a longer-term commitment to stay in the host country, so that those willing to naturalize may be accumulating more country-specific human capital, even before naturalization. This can result in higher wage growth for them. This is discussed in section 3.5 below.

on Youth in the US (along with CPS data used in cross-section). Steinhardt (2012) is using administrative data, similar to those used here, for Germany. Both are using the panel dimension to control for individual characteristics entering into the self-selection of candidates for naturalization. The evidence in this paper of a wage "premium" of naturalization is broadly in line with their results. However, the present paper shows the premium to be significant only for some specific occupation groups, and to be conditional on employment mobility patterns; by contrast, these two studies do not explicitly test for such heterogeneity. Therefore, the comparison raises the possibility that their estimates reflect an average of different premia across heterogeneous groups.

Bratsberg et al. (2002) also find, in cross-sectional data, that the probability of holding a public-sector job, a white-collar one, or a unionized one, is higher for naturalized immigrants. They interpret this as evidence that the wage premium results from access to those job categories, with citizenship lifting specific barriers to better-paid positions. The present paper tests this hypothesis, and confirms it only partly. It establishes the link between the wage premium and job mobility. Mobility across occupations is one of important channels; on the contrary, access to public sector does not seem to play a major role.

The next section presents some background on French naturalization laws. Section 3 discusses the data and the empirical methodology. Section 4 presents the empirical results. The last section concludes.

2 Naturalization and the labor market: the French context

Acquisitions of French citizenship averaged 125,000 per year over 1995-2001, and 133,000 since then.[8] These include naturalizations by decree (by administrative decision upon request by the foreigner), or by declaration, which applies to spouses of a French person, and to children born in France of foreign parents (*jus soli*).[9] Naturalizations by decree account for about 50% of cases over the period considered.

Conditions for eligibility to naturalization include 5 years of prior residence in France, legal status (at the time of the request), no criminal record, secured income, as well as social, professional and cultural assimilation (Art. 21 of the *Code Civil*). Note that acceptance depends on

[8] Ministry of Interior.

[9] The data do not allow to distinguish between these cases; I only observe changes in nationality as reported by an individual's employer, and refer to all such occurrences as "naturalizations", after cleaning of the data as detailed below. Note however that children born in France obtain citizenship by declaration when reaching age 18, thus most of these cases are excluded of the analysis as I use data for employed people, mostly older: people between 16 and 18 account for less than 0.5% of the estimation sample.

a discretionary decision by the administration, and can be refused even if these requirements are fulfilled. In particular, the criteria of cultural assimilation and of professional integration (*insertion professionnelle*) are to be appreciated by the prefet. For example, the nature of employment or of the labor contract do not explicitly enter the legal requirements; however, short-term or low-pay contracts can be a motive for rejection.[10]

The process of naturalization can be long. The official maximum delay is of 18 months after the request is received. However, delays to submit the request may also add some time. Hagedorn (2001) indicates that "the waiting time for the applicants amounted in 1997 to seven months for an initial meeting with a staff member and additional eight months to have the obligatory interview in which assimilation potential and personal motivation is examined." In addition, informal sources, such as associations, indicate that several applications are often necessary before obtaining a positive result.[11]

Fougere and Safi (2009) note that the average length of sojourn in France prior to naturalization is approximately 17 years, much longer than in Canada or the US. The rate of naturalized foreign-born was 75% in the 1996 Canadian census, compared to 40% in France.

As is the case in other immigration countries, a number of jobs are restricted to nationals, mostly in the public sector. [12] A report from the Haut Conseil à l'Intégration indicated in 1998 that the stock of jobs available to non-European foreigners is reduced by 23% (Haut conseil à l'Intégration, 1998). Groupe d'Etude sur les Discriminations (2000) finds a figure of 30%, showing that, in addition to public servant positions being restricted to nationals (or EU nationals), successive legislation has created restrictions in numerous private sector professions.[13] These include physicians and surgeons, pharmacists, notaries, architects, insurance officers, managers of a private research laboratory, or of a firm in the funerals, explosives, or fund escorting.[14]

However, as underlined by Haut conseil à l'Intégration (1998), the difference in labor market

[10] This is indicated by associations providing advice to immigrants, such as www.info-droits-etrangers.org/.

[11] Official figures on rates of refusal are not made public.

[12] Employment restrictions to non-citizens apply in e.g. Austria, Belgium, Canada, Germany, the US and Sweden. See Kogan, 2003; Corluy et al., 2011; DeVoretz and Pivnenko, 2005; Euwals et al., 2010; Steinhardt, 2012; Bevelander and Veenman, 2006; Scott, 2008.

[13] Such legislation has accumulated since the late 19th century, with numerous laws targeting specific professions, motivated partly by concerns regarding national sovereignty and security (weapons trade), xenophobia, and corporatist lobbying.

In the public sector, non-EU nationals generally are denied access to *titulaire* positions (permanent contracts for public servants), but not to contract jobs (status similar to private sector employment). This also applies to public firms such as the national railroads, energy, and air flight companies.

[14] By contrast, in the US, most similar restrictions for private sector professions have been repealed, according to Yang (1994)

outcomes (in particular unemployment) between foreigners and nationals cannot be explained entirely by legal discrimination. Several studies have brought evidence of discrimination at hiring against immigrants: see e.g. Cediey and Foroni (2007).

In addition, labor market outcomes may differ for non-nationals due to differences in exit options. Even though, as acknowledged by Haut conseil à l'Intégration (1998), discrimination in access to welfare benefits have been essentially removed, some minor differences subsist. For example, access to the minimum income allocation (RMI, now RSA) is conditional, for foreigners without resident status, on having spent at least 3 years in the country (Math, 2011). [15] Haut conseil à l'Intégration (1998) also points out that delays in registering individuals or in the renewal of permits to stay may disrupt access to benefits.

Another factor is the link between employment and residency permits. Tow main types of permit exist for non-EU nationals in France. The first if the residence status which guarantees authorization to stay for ten years, and may be requested after 5 years of legal stay in the territory; the second is a temporary one-year card which needs to be renewed every year upon examination of the individual's situation. For non-students, stable employment is one of the conditions for renewal (as well as for obtention of residency card).

In accordance with citizenship opening wider employment opportunities, Fougere and Safi (2009) find higher employment probabilities for naturalized immigrants. [16]

3 Data and Methodology

The main dataset I use is the panel from the *Déclaration annuelle des données sociales* (DADS). The DADS dataset is a large administrative dataset of matched employer-employee information collected by the *Institut National de la Statistique et des Etudes Economiques* (INSEE). These data are based upon mandatory employer reports of earnings of each employee subject to French payroll taxes. Thus, they comprise all legally declared employees in French establishments. Among these, the INSEE builds a panel dataset with a randomly selected 1/12th of workers, which can be followed in time. I use this panel dataset in this paper.

[15] This duration was brought to 5 years in 2004.

[16] This is consistent with studies in other European countries, e.g. Bevelander and Veenman (2006); Bevelander and Pendakur (2012).

3.1 Definition of Immigrants

For each individual, the dataset records personal characteristics - gender, age, year of entry in the labor force - job characteristics, including occupation type, net annual earnings, and the employer, including the location, industry and size of the employing establishment. The panel covers the period 1993-2008. However, the nationality variable, allowing us to identify immigrants and naturalization events, is not recorded in the years 2002 to 2005. In order to have a continuous sample of years, I therefore restrict the analysis to the period 1993-2001. The only exception will concern the study on the effect of naturalization on changes in job contracts (short-term, long-term and temporary contracts), as this variable is only recorded after 2005.

Recorded in the data is the French or foreign nationality of each employee.[17] I focus on workers recorded as foreign at some point in the data, i.e. foreign and naturalized individuals.

Note that in France, *jus soli* implies that individuals born of foreign parents in France can acquire French nationality, by right, at 18. Thus, I consider very few such cases, as I focus on working individuals, (less than 0.5% of observations under 18). This study is thus essentially about first-generation immigrants.

One issue with this variable is that it is not always well recorded by employers, as it is an information required in the forms but not relevant for the computation of employer contributions. The presence of inconsistencies in the panel dataset – *e.g.*, people recorded as switching from foreigner to national several times – is a sign of measurement error. This is particularly an issue for the identification of naturalization events.

I address this issue by eliminating all series of the variable nationality which seem suspicious: whenever an individual is observed switching from "French" to "foreigner", I get rid of the data series for this individual. Although there may be occurrences of individuals changing nationality in this direction, I expect that a number of these cases are due either to misrecording (i.e., an individual incorrectly recorded as French, then later correctly as foreign), or to individuals having double nationalities, and being recorded alternatively as one or the other. This also eliminates all cases of multiple switching.[18]

An additional issue with this variable is that I do not observe individuals with the nationality of a European union (EU) member country. This is an issue as one expects an EU nationality to entail much less constraints on the labor market as a non-EU one.[19] My approach is the following.

[17] Note that this variable does not allow to identify immigrants in the commonly admitted definition of the term, i.e. a person *born abroad as a foreigner*.

[18] In the regressions of table 1, where the indicator variable for the naturalization year is used, observations with an ambiguity for citizenship in the year $t+1$ are also eliminated.

[19] First, EU nationals do not face any restriction to stay and work in France, and are not required to hold a permit. Second, a number of professions are open to EU country nationals.

Information on EU nationality is actually recorded in the most recent years of the data, after 2005, which I am not using for the analysis (I focus on the 1993-2001 period, offering a longer time horizon). Therefore, in the 1993-2001 data I use, I get rid of individuals observed later - after 2005 - as EU nationals.[20]

Finally, the dataset is formed of individuals who have been recorded as foreigners at some point in the data. This is because I am mainly interested in observing the impact of naturalization in time: therefore, I compare workers who naturalize with those who remain non-citizens.

3.2 Occupation variables

I consider four main categories of occupation:[21] Blue-collar low-skilled workers, i.e. manual occupations; White-collar low-skilled workers, including commercial employees, personal service workers, office employees in public and private sector. Middle-skilled professions; including intermediary office workers in private and public sectors, technical workers, foremen; and high-skilled professions, including lawyers, health, professionals, public sector managing personnel, scientists, engineers and technical managers.[22]

In some results, I will also make use of the finer classification of occupations (2-digit CSP code) provided in the data. For example, the blue-collar low-skilled category breaks down into qualified/non-qualified workers in industrial/craftmanship sector; drivers; transportation workers; and agricultural workers.

3.3 Main employment

The DADS data contains information on every (legal) employment for each worker. Many workers thus appear to have several positions in a given year, either because they changed employment during the year, or because they held several positions simultaneously. In the empirical analysis I retain only one position per worker and year, denoted the worker's main employment. This position

[20] In average, 60% of individuals present in the data over 1993-2001 are still being observed after 2005.

[21] These are based on the 1-digit classification of *catégories socio-professionnelles* defined by the INSEE and provided in the data. See http://www.insee.fr/fr/methodes/default.asp?page=nomenclatures/pcs2003/pcs2003.htm for details.

The category of managers and CEOs will not be considered. It represents less than 2% of the observations in the sample of immigrants used here.

[22] Caliendo et al. (2012) use the same dataset, and argue that this classification of occupations is hierarchical, in the sense that wage distributions are ranked, and that numbers of workers per "layer" in a firm decrease when going up. Their category "clerks" is called "white-collar low-skilled" here, "supervisors" are my middle-skilled and "senior staff" my high-skilled.

is the one with the most recorded worked days in the year; if there are several such positions, I select the one with most hours; and finally, the one with highest pay, if there still remain several candidates.[23]

3.4 Descriptive statistics

Table 2 documents the distribution of the main variables of interest and controls, for the sample of foreign-born workers. Note that low-skilled occupations represent the large majority of positions held by foreign-born workers. For comparison, the lower panel displays the distribution of occupations among native workers, (i.e. excluding foreigners and naturalized individuals), this data being used in the last section of the empirical exercise. Shares of natives employed in low-skilled blue-collar positions are much lower than among foreign-born, in particular for women.

[23] I also eliminate observations with less than 50 or more than 2500 hours worked per year. The maximum of 2500 hours is a correction applied by INSEE.

Table 2: Descriptive statistics

Foreign-born	Men		Women	
	Mean	SD	Mean	SD
Age	40.9	11.2	39.1	11.3
Experience	11.8	8.2	8.9	7.7
Tenure	4.9	6.7	3.7	5.2
Occupation categories	Men		Women	
	N	%	N	%
High-skilled	13,831	9.5	5,512	7.5
Medium-skilled	15,229	10.4	9,128	12.5
Low-skilled white-collar	20,680	14.1	30,662	41.8
Low-skilled blue-collar	93,856	64.2	27,558	37.6
CEOs	2,629	1.8	447	0.6
Total	146,225	100	73,307	100
Natives	Men		Women	
	N	%	N	%
High-skilled	281,838	12.5	138,051	7.2
Medium-skilled	467,086	20.7	449,412	23.4
Low-skilled white-collar	365,136	16.2	1,039,525	54
Low-skilled blue-collar	1,106,908	49.1	288,065	14.9
CEOs	32,913	1.5	8,846	0.5
Total	2,253,881	100	1,923,899	100

Sample includes data for 1993-2001. Main employment observations. Foreign-born denotes workers recorded at least once as foreign in the data. Note: observations for CEOs are not used in the empirical analysis.

3.5 The Empirical Methodology

Naturalization and mobility I first investigate the link between naturalization and mobility - i.e., the propensity to change occupation, employer, location, or sector. Table 1 suggests that such a link exists. I test whether this link still holds when controlling for worker characteristics, by fitting the following logit model by maximum likelihood :

$$P[mobility_{it}] = F(\alpha.Foreign_{it} + \gamma.Nat_{it} + \beta.X_{it} + \delta_t), \quad (1)$$

where $F(z) = \frac{e^z}{1+e^z}$ is the cumulative logistic distribution. $P[mobility_{it}]$ is the probability that individual i changes occupation, employer, location... between year t and $t+1$.[24] $Foreign_{it}$ is an indicator of foreign citizenship, and Nat_{it} equals 1 in the year of naturalization. Thus the model estimates whether the propensity to change is different in the year an individual acquires French citizenship, relative to the mobility level of naturalized workers. X_{it} denotes a set of controls, which will include age and age squared, and indicator variables for the region (of work), occupational category, and sector of employment. δ_t denotes year fixed-effects, to control for the time shocks to employment mobility. In addition, I also include variables $Nat_{i,t-1}$ and $Nat_{i,t+1}$ as regressors in order to test whether the effect is also observed one year before/after naturalization.

Naturalization and wages To capture the effect of citizenship acquisition on annual wages, I use a baseline wage equation of the type:

$$\ln w_{it} = \alpha.CTZ_{it} + \beta.X_{it} + \delta_t + \delta_i + \xi_{it}\,, \quad (2)$$

with w_{it} the hourly wage of worker i in her main employed position in year t. CTZ_{it} is a binary indicator of French citizenship.[25] Thus, coefficient α measures the average difference between post- and pre-naturalization log wages for a given worker, controlling for individual characteristics and the variables in X_{it}. X_{it} is a vector of controls, which include experience (number of years since first entry in the labor force in France), tenure (number of years spent in the same firm), and their squares. δ_t denote year fixed effects. δ_i is the individual time-invariant component of the error term, and ξ_{it} an idiosyncratic disturbance.

[24] The alternative is no change between t and $t+1$: individuals whose occupation, employer or location is missing in $t+1$ are removed from the estimation sample.

[25] Data cleaning procedures, detailed in section 3, imply that a change in CTZ_{it} can occur at most one time per individual, and always from 0 to 1.

Identification of α in this equation relies on the assumption that the acquisition of French citizenship is correlated with constant individual characteristics, but not with time-varying, individual unobserved determinants of wages. This may not be true if, for example, naturalized workers have a different pattern of human capital accumulation. One would then expect to measure a different time trend for wages of naturalized workers, even before naturalization takes place. This concern will be addressed in the robustness checks section, in particular by adding to the above model interactions between experience and indicator variables for workers who eventually naturalize.

Results show that the wage effects of naturalization vary across occupation groups. For this reason, the model will be estimated separately by occupation, grouping workers by their initial occupation in the data.[26]

Next, I will decompose the impact of naturalization, by distinguishing cases where citizenship acquisition is accompanied by mobility, i.e. a change of occupation and/or of employer. This is done with the following specification:

$$\ln w_{it} = \alpha^{mob}.CTZ_{it}.D_i^{mob} + \alpha^{nomob}.CTZ_{it}.D_i^{nomob} + \beta.X_{it} + \delta_t + \delta_i + \xi_{it}\,, \tag{3}$$

where D_i^{mob} and D_i^{nomob} are indicator variables of value 1 if individual i naturalized and changed occupation in the same year (D_i^{mob}), or naturalized but without occupational change (D_i^{nomob}).

One has $CTZ_{it}.D_i^{mob} + CTZ_{it}.D_i^{nomob} = CTZ_{it}$ for all individuals i in the sample.

4 Empirical Results

4.1 The Impact of Naturalization on Mobility

First, I document the fact that naturalization coincides, for many individuals, with mobility along several dimensions: the probability of moving to a different employer and type of job (occupation), as well as changing contract type, and location, is much higher in the year of naturalization, than at any other time.

In table 3, I use the specification shown in equation 1 to test for the link between naturalization and mobility, which was suggested in table 1. Results confirm that the mobility of immigrant workers is higher in the year of naturalization. For example, the odds of changing occupation are multiplied by 2.9 for foreign men in the year of naturalization.

[26] Alternatively one may estimate a model with all workers and interaction terms to allow for different impacts. The method here is preferred as it allows for the impact of control variables, e.g. experience and tenure, to also vary across occupations.

The probability to move to a different firm, occupation, or sector, increases in the same year that naturalization occurs; the effects on year earlier or later are much smaller or non significant. This is consistent with naturalization facilitating mobility, rather than the other way around. If, for example, employment changes were decided to increase one's chance of obtaining citizenship, then we should expect to find most of the mobility effect appear on the "Naturalization $t-1$" variable.

More generally, one could think that citizenship acquisition is a decision which is part of a broader change undertaken by an individual, possibly involving a change of job, location, etc. But if this were solely the result of an individual decision, then there would be no reason to wait for the naturalization to occur before these other changes. One would then expect to find job mobility preceding naturalization, especially given the delay between the first demand and obtention of the nationality, which in France is often of two years or more. Instead, these results suggest that obtaining the nationality is what makes professional mobility possible.

The effect is not due to a correlation with age, which the model controls for. Nor is it explained by the fact that those naturalizing have particular types of occupation, location, or sector employment, which would be associated with higher mobility: including indicator variables for year, region, sector and occupation in these regressions rules out this possibility.

Next, I look at this mobility effect across occupation groups. As we have just seen that occupation changes, in particular, were higher when naturalizing, a natural question is whether this effect concerns foreign workers in all occupation groups, and in which direction these changes occurs.

In table 4, I split the sample into groups by occupation, i.e. the initial occupation of each foreign worker in the sample, and estimates the probability of moving to a different occupation. The naturalization effect on mobility is detected in all groups (except for women in high-skill occupations). However, one notes that this effect is stronger in the low-skilled than the high-skilled occupations. For instance, the odds of changing occupation are multiplied by more than 3 in the year of naturalization, for foreign men in low-skilled blue-collar jobs; for those in high-skilled positions, the factor is less than 2.

Finally, in table 5, I look at employer mobility across occupation groups. The pattern found here is the opposite: mobility is significantly higher at naturalization, for all groups of workers (except women in low-skilled blue-collar occupations); but the effect tends to increase when moving up the skill level of jobs. The employer mobility effect is larger for workers initially in middle- and high-skilled occupation groups, than for those in low-skilled ones.

Taken together, these results suggest that the incidence of foreign citizenship on employment

is present across occupation classes. Results on occupational mobility are consistent with skill mismatch, by some foreign workers are constrained to take jobs below their qualification. But workers in higher-skill jobs also seem to face some type of mismatch, as naturalization creates an opportunity to move to different jobs.

Whether these two types of mobility are associated with a wage increase is the question we turn to in the next section.

Table 3: Naturalization and mobility

	(1)	(2)	(3)	(4)
	Probability of changing			
	employer	occupation	location	sector
Panel A: Men				
Naturalization	2.60	2.89	2.56	2.68
	(0.00)	(0.00)	(0.00)	(0.00)
Naturalization: T-1	1.39	1.80	1.36	1.42
	(0.00)	(0.00)	(0.00)	(0.00)
Naturalization: T+1	1.14	0.99	1.29	1.13
	(0.05)	(0.87)	(0.01)	(0.14)
Foreign	1.42	0.70	1.30	1.09
	(0.00)	(0.00)	(0.00)	(0.10)
Baseline odds	.18	.05	.07	.08
Observations	64093	63808	64090	61672
Pseudo R^2	0.059	0.061	0.078	0.057
Panel B: Women				
Naturalization	2.71	2.44	2.33	2.77
	(0.00)	(0.00)	(0.00)	(0.00)
Naturalization: T-1	1.12	1.27	1.08	1.26
	(0.13)	(0.01)	(0.46)	(0.01)
Naturalization: T+1	1.35	1.01	1.46	1.23
	(0.00)	(0.96)	(0.00)	(0.04)
Foreign	1.50	1.03	1.60	1.17
	(0.00)	(0.64)	(0.00)	(0.01)
Baseline odds	0.21	0.09	0.09	0.10
Observations	28666	28447	28636	27639
Pseudo R^2	0.052	0.036	0.066	0.051
Fixed effects	Year,region			

Exponentiated coefficients. Standard errors in parentheses

^{c} p<0.1, ^{b} p<0.05, ^{a} p<0.01

Logit model on probability of mobility between year t and t+1, table displays odds ratios. Sample: DADS data, foreign-born workers, 1993-2001. Baseline odds are computed as the median predicted value ($\hat{p}/(1-\hat{p})$) among foreign, non naturalizing workers. Model includes age, age squared as controls. Observations with missing information on employment in the following year are dropped from the sample. Naturalization equals 1 in t for a worker who is foreign in t and French in t+1. 1-digit occupation has four categories: High-skilled, middle-skilled, low-skilled white/blue-collar. Location: *région* of employment. Sector: NES classification. See section 3 for details on occupational categories.

Table 4: Occupational mobility

	(1)	(2)	(3)	(4)
	Probability of changing occupation			
Occupation	LS blue collar	LS white collar	Med-skill	High-Skill
		Men		
Naturalization	3.13	2.27	2.21	1.86
	(0.00)	(0.00)	(0.00)	(0.00)
Naturalization: T-1	1.89	1.50	1.53	0.95
	(0.00)	(0.01)	(0.01)	(0.84)
Naturalization: T+1	0.96	1.25	0.92	0.97
	(0.78)	(0.23)	(0.64)	(0.92)
Foreign	0.59	1.23	1.01	1.05
	(0.00)	(0.08)	(0.95)	(0.77)
Baseline odds	0.03	0.16	0.12	0.08
Observations	44157	7889	6277	5389
Pseudo R^2	0.070	0.041	0.035	0.026
Fixed effects		Year,region		
		Women		
Naturalization	3.50	2.03	2.10	1.41
	(0.00)	(0.00)	(0.00)	(0.29)
Naturalization: T-1	1.71	1.06	1.17	0.53
	(0.00)	(0.69)	(0.49)	(0.24)
Naturalization: T+1	0.87	1.10	1.00	0.74
	(0.55)	(0.54)	(1.00)	(0.55)
Foreign	0.92	1.22	1.06	1.12
	(0.52)	(0.03)	(0.72)	(0.65)
Baseline odds	0.06	0.11	0.16	0.09
Observations	11537	12101	3102	1672
Pseudo R^2	0.065	0.030	0.034	0.045
Fixed effects		Year,region		

Exponentiated coefficients. p-values in parentheses

Logit model on probability of changing occupation (1-digit *csp* category) between year t and t+1, table displays odds ratios. Sample: DADS, foreign-born workers, 1993-2001. Baseline odds are computed as the median predicted value ($\hat{p}/(1-\hat{p})$) among foreign, non naturalizing workers. Model includes age, age squared as controls. Sample in each column includes all foreign workers first observed in a given occupation, e.g. low-skilled blue-collar for column 1. Workers are classified by first observed occupation category. Variable definitions as in table 3.

Table 5: Employer mobility

	(1)	(2)	(3)	(4)
	Probability of changing employer			
Occupation	LS blue collar	LS white collar	Med-skill	High-Skill
		Men		
Naturalization	1.60	1.41	2.61	2.03
	(0.00)	(0.02)	(0.00)	(0.00)
Naturalization: T-1	1.06	1.18	1.44	1.80
	(0.51)	(0.42)	(0.10)	(0.01)
Naturalization: T+1	1.32	0.69	1.04	0.73
	(0.02)	(0.15)	(0.85)	(0.23)
Foreign	1.58	1.14	0.81	0.68
	(0.00)	(0.33)	(0.13)	(0.01)
Baseline odds	0.10	0.10	0.06	0.08
Observations	44357	7958	6247	5455
Pseudo R^2	0.021	0.024	0.027	0.033
		Women		
Naturalization	1.19	1.84	1.70	3.21
	(0.13)	(0.00)	(0.01)	(0.00)
Naturalization: T-1	0.81	0.85	1.41	1.51
	(0.23)	(0.32)	(0.22)	(0.37)
Naturalization: T+1	1.32	1.37	1.44	1.01
	(0.21)	(0.05)	(0.22)	(0.98)
Foreign	2.22	1.20	1.18	0.59
	(0.00)	(0.08)	(0.43)	(0.04)
Observations	11624	12197	3065	1640
Pseudo R^2	0.025	0.034	0.049	0.060
Baseline odds	0.16	0.08	0.08	0.08
Fixed effects		Year,region		

Exponentiated coefficients. p-values in parentheses

Logit model on probability of changing occupation (1-digit *csp* category) between year t and t+1, table displays odds ratios. Sample: foreign-born workers, 1993-2001. Baseline odds are computed as the median predicted value ($\hat{p}/(1-\hat{p})$) among foreign, non naturalizing workers. Model includes age, age squared as controls. Sample in each column includes all foreign workers first observed in a given occupation, e.g. low-skilled blue-collar for column 1. Workers are classified by first observed occupation category. Variable definitions as in table 3.

4.2 The Impact of Naturalization on Wages

I now look at the relationship between citizenship and wages. I ask whether a wage gain from naturalization appears in France, as is the case in several countries studied in previous studies. I also want to ask whether this potential wage gain is linked to the mobility patterns - changes of occupation, of firm - identified in the previous section. To this purpose, I use panel regressions with individual fixed-effects, on the sample of foreign-born workers in France; the model used is the one described in equation 2.

Results in line 1 of tables 6 and 7 show that the overall effect of naturalizations (citizenship) on wages is limited: the only significant impact is found for women initially in middle-skilled occupations.

In the lower parts of the tables, I then decompose the citizenship variable according to the mobility pattern at the time of naturalization, using the model of equation (3). This allows to measure different effects of citizenship depending on the mobility behavior in the year of naturalization. I distinguish up to three cases: occupation change, same occupation but employer change, and same occupation and employer.

This reveals the presence of wage gains conditional on some specific mobility patterns. Namely, there is a significant "citizenship premium", of about 8%, for men in low-skill white-collar occupations, when naturalization coincides with occupational mobility. Note that this effect does not hold when including occupation fixed-effects, indicating that the wage increase is entirely explained by average pay differences between occupation classes. In addition, there is indication of a wage gain for men in high-skill occupations, of about 4%, under the condition of no occupation, and no employer mobility at the time of naturalization.

In the case of women, the decomposition also reveals the presence of a wage premium conditional on some mobility patterns. Women in middle-skilled occupations benefit from a naturalization premium when they move to a different employing firm at the time of naturalization. The gain is substantial (about 14%). A similar effect is found for women in high-skill occupations, of even larger amplitude. Note that such large effects are obtained by focusing on individuals most likely to obtain a pay rise, which thus yields larger coefficients than in overall estimates without decomposition.

These results reveal the extent of heterogeneity in the wage effects of citizenship, and the need to account for this heterogeneity in measuring them. Differences across occupation groups appear to be important in the citizenship effect on wages, yet they are not taken into account in previous studies. Neither is the link between the impact on mobility and wages accounted for. The results here suggest that this may partly explain the small effects measured in some cases (e.g. Scott

(2008); Engdahl (2011)): if the impacts on wages and on employment mobility are tied together, then measuring the wage effect alone may fail to detect a significant effect.

These results suggest several potential mechanisms. The pattern for low-skilled occupations is consistent with a mismatch between some foreign workers and their employment: the immediate mobility response, in the naturalization year, suggests that foreign citizenship is what prevented those workers from moving up to higher-qualified occupations before. This upward mobility is associated with a wage gain, which is largely explained by the average wage levels of their initial and final occupations (so that including occupation fixed-effects makes the coefficient non significant).

The gains found for women in higher-skilled occupations suggests a second, distinct mechanism by which foreign citizenship constrains mobility and wages. One possibility is that this pattern could be due to barriers specific to some jobs - e.g., some of the public or private sector activities restricted to nationals (see section 2). Other forms of discrimination may be at work.

Table 6: Naturalization and wages (Men, 1993-2001)

	log hourly wage			
Occupation group	LSB	LSW	MS	HS
Citizenship	-0.00	0.01	0.01	0.03
	(0.65)	(0.47)	(0.76)	(0.19)
R^2	0.095	0.167	0.127	0.122
Ctz. x	0.02	0.08	-0.01	-0.10
occ. mobility	(0.46)	(0.01)	(0.90)	(0.18)
Ctz. x	-0.00	-0.01	0.01	0.05
no occ. mobility	(0.76)	(0.61)	(0.61)	(0.02)
R^2	0.096	0.169	0.127	0.124
Ctz. x	0.02	0.08	-0.01	-0.10
occ. mobility	(0.47)	(0.01)	(0.91)	(0.18)
Ctz. x	-0.02	-0.03	0.06	0.04
employer mobility	(0.34)	(0.43)	(0.25)	(0.33)
Ctz. x	0.00	-0.00	-0.00	0.05
no employer mobility	(0.60)	(0.89)	(0.79)	(0.02)
R^2	0.096	0.169	0.128	0.124
			occ. fixed-effects	
Ctz. x	-0.02	0.03	-0.02	-0.05
occ. mobility	(0.46)	(0.33)	(0.64)	(0.45)
Ctz. x	-0.02	-0.02	0.06	0.02
employer mobility	(0.36)	(0.47)	(0.20)	(0.61)
Ctz. x	0.00	-0.00	-0.00	0.04
no employer mobility	(0.75)	(0.90)	(0.98)	(0.05)
R^2	0.104	0.214	0.149	0.142
Observations	63725	12860	8881	8824

p-values in parentheses. Standard errors clustered at individual (worker) level.

Panel regressions with individual fixed-effects. Samples include all foreign and naturalized foreign-born workers, by first observed occupation group. "Citizenship" equals 1 when a worker has French citizenship. *Occ. mobility* equals 1 for individuals changing occupation in the same year as naturalization. *Employer mobility* equals 1 for individuals changing employer (firm) in the same year as naturalization, without changing occupation. Model includes year fixed-effects, experience, tenure and their squares. HS= High-skilled occupations, MS: middle-skilled, LSW/B: low-skilled white/blue-collar occupations. See text for definitions of occupational categories.

Table 7: Naturalization and wages (Women, 1993-2001)

	log hourly wage			
Occupation group	LSB	LSW	MS	HS
Citizenship	0.01	0.01	0.06	0.03
	(0.61)	(0.44)	(0.05)	(0.52)
R^2	0.087	0.126	0.112	0.094
Ctz. x	0.01	0.05	0.01	-0.33
occ. mobility	(0.86)	(0.11)	(0.89)	(0.10)
Ctz. x	0.01	0.01	0.08	0.09
no occ. mobility	(0.41)	(0.60)	(0.02)	(0.04)
R^2	0.087	0.126	0.113	0.102
Ctz. x	0.01	0.05	0.01	-0.33
occ. mobility	(0.87)	(0.11)	(0.89)	(0.10)
Ctz. x	-0.03	0.02	0.16	0.28
employer mobility	(0.35)	(0.35)	(0.05)	(0.01)
Ctz. x	0.03	0.00	0.06	0.02
no employer mobility	(0.05)	(0.84)	(0.13)	(0.58)
R^2	0.087	0.126	0.113	0.107
			occ. fixed-effects	
Ctz. x	-0.02	0.02	0.04	-0.23
occ. mobility	(0.62)	(0.48)	(0.58)	(0.18)
Ctz. x	-0.03	0.02	0.15	0.25
employer mobility	(0.34)	(0.35)	(0.06)	(0.01)
Ctz. x	0.03	0.00	0.06	0.00
no employer mobility	(0.06)	(0.95)	(0.11)	(0.96)
R^2	0.097	0.139	0.131	0.129
Observations	18834	19459	4686	3022

p-values in parentheses. Standard errors clustered at individual (worker) level.

Panel regressions with individual fixed-effects. Samples include all foreign and naturalized foreign-born workers, by first observed occupation group. "Citizenship" equals 1 when a worker has French citizenship. *Occ. mobility* equals 1 for individuals changing occupation in the same year as naturalization. *Employer mobility* equals 1 for individuals changing employer (firm) in the same year as naturalization, without changing occupation. Model includes year fixed-effects, experience, tenure and their squares. HS= High-skilled occupations, MS: middle-skilled, LSW/B: low-skilled white/blue-collar occupations. See text for definitions of occupational categories.

Robustness checks First, I test whether the measured effect on wages actually follows naturalization, or precedes it. One would expect to find an anticipated effect, if for example, a decision to settle permanently in the country and to "assimilate" leads to wage growth and, eventually, to naturalization. Results on mobility, in the previous section, have already given an indication on this, by showing that the increase in the propensity to change employment as mostly taking place in the year of naturalization and not earlier. Since we found that the wage premium was tied to mobility, it seems likely that the wage effect should not precede naturalization either.

In table 8, I use the same model as before, testing whether a worker's hourly wage is higher after s/he has naturalized; this variable *Citizenship* is interacted with an indicator for occupational mobility (change in 1-digit occupation class) at the time of naturalization. In addition, I include a variable *Citizenship (t-3)* which switches to one 3 years before naturalization. This variable is similarly interacted with the same indicator of occupational mobility at the time of naturalization.

The previous results are mostly unaffected. As before, a significant wage premium is found for men in the low-skilled white-collar group, associated with occupational mobility; and for women in the middle- and high-skilled groups, associated with no change of occupation. There is no sign of these effects starting before naturalization. [27]

This is further confirmed when one excludes all observations after naturalization has occurred (keeping only workers when still foreign), which is done in the columns 5 to 8 of the table: there is no sign of a significant wage hike preceding naturalization.

Second, the issue of selection is addressed more broadly. In general one may suspect that individuals who naturalize at some point have faster wage growth, for instance because they accumulate more country-specific human capital, even before naturalization occurs. I test for this in tables 9 and 10, where 3 models of increasing flexibility are estimated. I first add to the model interaction terms of experience (and its square) with individual indicators for those individuals who naturalize at some point (equal to constant 1 also before naturalization). Second, I add the possibility that those who *change occupation* in the year of naturalization, have faster wage growth; this is done by adding the interaction of experience with an indicator for individuals who changed occupation in the year of naturalization [28]. Finally, I allow for wage growth to differ also after naturalization (adding a term experience x post-naturalization x indicator for naturalization with occupational change).

[27] Similar tests for an effect 4, 2, 1 year before naturalization have been conducted and confirm the results shown here. They are available upon request.

[28] Thus, the dummy *naturalized*, equal to constant 1 for individuals who ever naturalize, is equal to the sum of the two indicators *naturalized with mobility* and *naturalized without mobility*. The case without mobility is the omitted category here.

Results confirm the robustness of the previous findings and clarify the patterns. For men in low-skilled white-collar occupations, the last panel indicates that the wage premium is entirely driven by faster wage growth *after* naturalization. Allowing for faster wage growth (along the career) for those naturalizing does not affect the coefficient previously found (first panel), but adding the mobility distinction does[29] (second panel).

Thus, for this category of workers, it appears that naturalization has a positive effect on wages mainly through occupation mobility, which delivers a gain in wages through faster wage growth.

For women in middle-skilled occupations, by contrast, results in the third panel indicate that the premium previously found is essentially immediate, as it is captured by the *citizenship* variable more than by post-naturalization effects on wage growth. This effect is robust to the alternative specifications tested.[30]

Overall, these tests confirm that the previous results on naturalization wage premia, are not attributable to the selection of naturalization candidates, nor on patterns of assimilation or investment which could start before naturalization takes place.

[29] This seems to be due to the experience term capturing part of the post-naturalization wage growth acceleration.

[30] The specific effect found for women suggests that the effects of foreign citizenship may be compounded by other factors, e.g. gender-based discrimination, or professional choices within couples; so as to make this effect apparent for women but not for men in similar occupations. Lack of information on e.g. family background in the data prevents us from testing this.

Table 8: Naturalization and wages: t vs. $t-3$

	log hourly wage							
Occupation	LSB	LSW	MS	HS	LSB	LSW	MS	HS
					before naturalization only			
				Men				
Citizenship x	0.01	0.09	0.01	-0.08				
occ. mobility	(0.60)	(0.01)	(0.86)	(0.28)				
Ctz. x	-0.00	-0.01	0.00	0.05				
no occ. mobility	(0.84)	(0.41)	(0.85)	(0.03)				
Citizenship (t-3) x	0.02	-0.05	-0.09	-0.09	0.01	-0.01	-0.07	-0.08
occ. mobility	(0.40)	(0.09)	(0.06)	(0.31)	(0.62)	(0.73)	(0.10)	(0.34)
Ctz. (t-3)	-0.00	0.03	0.04	0.02	-0.01	0.02	0.03	0.04
no occ. mobility	(0.77)	(0.24)	(0.27)	(0.31)	(0.63)	(0.38)	(0.39)	(0.09)
Observations	63725	12860	8881	8824	57458	10915	6839	7405
R^2	0.096	0.169	0.128	0.124	0.087	0.148	0.108	0.113
				Women				
Citizenship x	0.01	0.05	0.01	-0.33				
occ. mobility	(0.88)	(0.09)	(0.91)	(0.10)				
Ctz. x	0.01	0.01	0.09	0.09				
no occ. mobility	(0.47)	(0.63)	(0.01)	(0.04)				
Ctz. (t-3) x	0.01	-0.03	-0.03	-0.02	0.01	-0.02	-0.03	-0.04
occ. mobility	(0.82)	(0.41)	(0.53)	(0.62)	(0.85)	(0.64)	(0.44)	(0.23)
Ctz (t-3)	0.01	-0.00	-0.07	0.02	-0.00	0.00	-0.02	0.04
no occ. mobility	(0.57)	(0.98)	(0.06)	(0.64)	(0.93)	(0.99)	(0.50)	(0.44)
Observations	18834	19459	4686	3022	16718	15484	3614	2556
R^2	0.087	0.126	0.114	0.102	0.082	0.100	0.099	0.076

p-values in parentheses. Standard errors clustered at individual (worker) level.

Panel regressions with individual fixed-effects. Samples include all foreign and naturalized foreign-born workers, by first observed occupation group. "Citizenship" equals 1 when a worker has French citizenship, "Citizenship (t-3)" equals 1 starting three years before a worker acquires citizenship. Columns 5-8: post-naturalization observations excluded.

Table 9: Naturalization and wages: selection and wage dynamics - Men

	log hourly wage			
Occupation	LSB	LSW	MS	HS
Ctz. x occ. mobility	0.00	0.08	-0.01	-0.12
	(0.93)	(0.01)	(0.90)	(0.12)
Ctz. x empl. mobility	-0.03	-0.02	0.06	0.03
	(0.09)	(0.52)	(0.25)	(0.55)
Ctz. x no empl. mobility	-0.00	-0.00	-0.01	0.03
	(0.69)	(0.96)	(0.81)	(0.20)
(Expce.	0.02	-0.01	0.01	-0.00
x naturalized)	(0.00)	(0.47)	(0.38)	(0.86)
Ctz. x occ. mobility	-0.02	0.05	0.03	-0.10
	(0.53)	(0.15)	(0.60)	(0.27)
Ctz. x no occ. mobility	-0.01	0.01	-0.01	0.03
	(0.45)	(0.72)	(0.83)	(0.24)
(Expce.	0.02	-0.01	0.01	-0.00
x naturalized)	(0.00)	(0.17)	(0.38)	(0.69)
(Expce.	0.01	0.02	-0.00	0.02
x nat'd w/ mobility)	(0.61)	(0.13)	(0.89)	(0.54)
Ctz. x	-0.07	0.02	0.03	-0.11
occ. mobility	(0.10)	(0.60)	(0.58)	(0.31)
Ctz.	-0.01	0.00	-0.01	0.03
no mobility	(0.47)	(0.90)	(0.79)	(0.29)
(Expce. x	0.00	-0.01	0.00	0.01
naturalized)	(0.23)	(0.33)	(0.83)	(0.41)
(Expce. x	0.00	-0.00	-0.01	-0.01
nat'd w/ mobility)	(0.75)	(0.98)	(0.24)	(0.52)
Post-nat expce.	0.03	0.03	0.00	0.01
x mobility	(0.01)	(0.02)	(0.92)	(0.67)
Post-nat expce.	-0.00	0.00	0.00	0.00
x no mobility	(0.68)	(0.68)	(0.67)	(0.71)
Observations	63725	12860	8881	8824

p-values in parentheses. Standard errors clustered at individual (worker) level.

Model as in table 6, adding interaction terms of experience, experience^2 with dummy indicators. Expce x naturalized: experience * dummy for individuals acquiring citizenship at some point. (Expce x nat'd w/ mobility): experience * dummy for individuals who naturalize with a change of occupation in the naturalization year. Model also includes interactions of experience^2 with *naturalized*, *nat'd w/ mobility*. (Post-nat experience x mobility): years since naturalization * dummy for occupational change in the naturalization year.

Table 10: Naturalization and wages: selection wand wage dynamics - Women

	log hourly wage			
Occupation	LSB	LSW	MS	HS
Ctz. x mobility	0.02	0.04	0.02	-0.34
	(0.63)	(0.18)	(0.75)	(0.08)
Ctz. x	-0.01	0.01	0.17	0.27
empl. mob	(0.65)	(0.55)	(0.04)	(0.01)
Ctz. x	0.04	-0.00	0.07	0.00
no empl. mob.	(0.00)	(0.74)	(0.10)	(0.98)
Expce x	-0.01	0.01	-0.01	-0.00
naturalized	(0.15)	(0.34)	(0.71)	(0.97)
Ctz. x	0.05	0.02	-0.05	-0.25
occ. mobility	(0.30)	(0.55)	(0.60)	(0.17)
Ctz. x	0.02	0.00	0.12	0.05
no occ. mobility	(0.28)	(0.87)	(0.00)	(0.28)
Expce. x	-0.00	0.00	-0.01	0.02
naturalized	(0.44)	(0.59)	(0.66)	(0.34)
Expce. x	-0.01	0.01	0.00	-0.10
mobility nat'd	(0.20)	(0.25)	(0.93)	(0.04)
Ctz. x	0.05	0.01	-0.06	-0.20
occ. mobility	(0.34)	(0.83)	(0.53)	(0.33)
Ctz. x	0.02	0.00	0.12	0.05
no occ. mobility	(0.15)	(0.93)	(0.00)	(0.29)
Expce. x	-0.00	0.00	-0.02	0.01
nat'd	(0.93)	(0.67)	(0.02)	(0.40)
Expce. x	-0.02	-0.01	0.02	-0.01
mobility x nat'd	(0.03)	(0.60)	(0.34)	(0.55)
Post-nat expce x	0.00	0.02	0.03	-0.05
mobility	(0.70)	(0.10)	(0.35)	(0.17)
Post-nat expce x	-0.01	0.00	0.01	0.00
no mobility	(0.30)	(0.77)	(0.26)	(0.79)
Observations	18834	19459	4686	3022

p-values in parentheses. Standard errors clustered at individual (worker) level.
See table 9 for description of variables.

4.3 Comparing the wages of foreign-born and native workers

I now turn to specifications including natives. Do the wage gains from naturalization, found in the previous section, reflect a catching-up of foreign wages to natives'? Does naturalization partly or fully close the foreign-native wage gap? This is the question here.

I use the following specification:

$$\ln w_{it} = \sum_o \alpha_o Foreign_{it}.D^o_{it} + \sum_o \beta_o Nat_{it}.D^o_{it} + \sum_o \gamma_o D^o_{it} + \lambda.X_{it} + \epsilon_{it} \quad (4)$$

where D^o_{it} are indicator variables for the four categories of occupation: High-skilled, Medium-skilled, and Low-skilled blue/white-collar. $Foreign_{it}$ indicates a foreign-born worker, and Nat_{it} a naturalized worker (for whom $Foreign$ is still one). X_{it} are controls, including age, experience, tenure, and their squares.

Coefficient α_o measures the wage gap between foreign and native workers, in occupation o. The wage level of naturalized workers, relative to natives, is given by $\alpha_o + \beta_o$. Note that I cannot use fixed-effects to control for individual heterogeneity anymore (as such heterogeneity would encompass nationality). Thus, these measurements are influenced by selection, e.g. differences in human capital, between foreigners and citizens.

Results are displayed in table 11.[31] Wages of foreign (non naturalized) workers are significantly lower than those of natives, in most categories of work. Note that this can be attributable both to selection effects - e.g. lower levels of human capital of foreign workers - and/or to various forms of discrimination.

Interestingly, naturalization is associated to little wage gains in Low-skilled occupations. This is consistent with previous results in panel regressions, which indicated that the naturalization premium, in these occupations, was obtained only by those workers who moved to different types of work.

By contrast, larger gains are associated to citizenship in Middle-skilled and High-skilled occupations. This is most striking for women in middle- and High-skilled positions. These results are consistent with those in the previous section, but may also be reflecting, to some extent, a selection on talent in higher-skill positions.

[31] Note that the samples here contain only workers who are still present in the dataset after 2005. This allows to exclude individuals observed with a EU nationality (this variable being available only after 2005).

Table 11: Wages: foreign-born vs. natives (1993-2001)

	log hourly wage			
	Men		Women	
Foreign-born x HS	-0.046^a	-0.033^a	0.003	-0.065^a
	(0.006)	(0.005)	(0.008)	(0.008)
Naturalized x HS	0.071^a	0.055^a	0.142^a	0.149^a
	(0.011)	(0.010)	(0.016)	(0.015)
Foreign-born x MS	-0.069^a	-0.054^a	-0.007	-0.048^a
	(0.005)	(0.005)	(0.006)	(0.006)
Naturalized x MS	0.040^a	0.022^b	0.023^b	0.019^c
	(0.010)	(0.009)	(0.011)	(0.011)
Foreign-born x LSW	-0.133^a	-0.094^a	-0.023^a	-0.040^a
	(0.004)	(0.004)	(0.003)	(0.003)
Naturalized x LSW	0.033^a	0.002	0.011	-0.007
	(0.010)	(0.010)	(0.007)	(0.007)
Foreign-born x LSB	-0.024^a	-0.066^a	-0.018^a	-0.032^a
	(0.002)	(0.002)	(0.003)	(0.004)
Naturalized x LSB	-0.005	0.014^b	-0.003	0.008
	(0.006)	(0.006)	(0.011)	(0.011)
Fixed effects	Occupation, year			
Firm f.e.		yes		yes
Observations	2206449	2206449	1848775	1848775
R^2	0.449	0.342	0.310	0.218

Standard errors in parentheses

^{c} p<0.1, ^{b} p<0.05, ^{a} p<0.01

HS: high-skilled, MS: low-skilled, LSW/B: low-skilled blue/white-collar. See text for definition of occupational categories.

5 Conclusion

This paper has studied the impact of naturalizations on the labor market outcomes of immigrants in France. I use of a large, representative longitudinal database of employees in France over 1993-2008, constructed from social security records, to study the impact of citizenship acquisitions on job characteristics and on wages. The longitudinal dimension allows to disentangle causal impacts of citizenship from selection effects. I find that naturalizations are associated to a large increase in mobility: the probabilities to change occupations ; employing firm; contract type, and location, all increase sharply in the year of the naturalization. The precise timing of events rule out alternative explanations based on human capital accumulation. In addition, I find, consistently with previous studies, a substantial wage increase upon naturalization. The magnitude and conditions of this wage increase vary across job types. Among men initially employed in low-skill occupations, there is a wage increase conditional on occupational mobility. The premium is of the order of 8% in permanent terms, and is driven by faster wage growth (of about 3% per year) after naturalization.

In addition, there is evidence of a premium for women in middle- and high-skilled occupations. This effect is larger (about 0.13%), immediate, and most pronounced for workers changing employer at the time of naturalization. These effects are not explained by selection patterns, nor by differences in wage trajectories before naturalization. Overall, there results confirm that foreign citizenship acts as a barrier to mobility on the labor market. They establish the link between such barriers and the wage premium associated with naturalization. Several mechanisms could be at work to create a mismatch between foreign workers and their job.

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