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JEL Codes: J10, J61, J70.

Keywords: naturalization, immigrants, labor market, mixed marriages.



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IS NATURALIZATION A PASSPORT FOR BETTER LABOR MARKET INTEGRATION?

Evidence from a quasi-experimental setting

Yajna Govind*

June 2021 †

Abstract

Better integration is beneficial for both migrants and the host country. In this respect, granting citizenship could be an important policy to boost migrants' integration. In this paper, I estimate the causal impact of obtaining citizenship on migrants' labor market integration. I exploit a change in the law of naturalization through marriage in France in 2006. This reform amended the eligibility criteria for applicants by increasing the required number of years of marital life from 2 to 4, generating an exogenous shock and thus a quasi-experimental setting. Using administrative panel data, I first show evidence of the impact of the reform on naturalization rates. I then use a difference-in-differences model to estimate the labor market returns to naturalization. I find that, among those working, citizenship leads to an increase in annual earnings. This effect is driven by a significant increase in the number of hours worked, as well as a positive effect on hourly wages. While the gain in earnings is similar for both men and women, the effect for men is mostly driven by an increase in hours worked compared to an increase in hourly wages for women. I provide suggestive evidence that naturalization helps reduce informality, and discrimination. This paper thus provides strong evidence that naturalization acts as a catalyst for labor market integration.

JEL classification: J10, J61, J70.

Keywords: Naturalization, Immigrants, Labor market, Mixed marriages.

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1. Introduction

Obtaining the nationality of the host country is deemed as a sign of integration for foreigners. There is however a growing political debate on whether naturalization is merely a reward for integration or whether it can also boost integration¹. This debate has led to the support of opposing policies. On the one hand, supporters of the former position prescribe that the path to citizenship should be hardened to provide migrants with an incentive to integrate and thus screen the best-integrated migrants. On the other hand, if naturalization can accelerate integration, then its access should be eased, in which case, it would be a potential tool for policy-makers aiming at improving the labor market prospects of foreigners. Despite substantial interest around this question, there is so far, scarce evidence of the causal impact of naturalization on labor market integration.

This paper estimates the causal effect of naturalization on labor market outcomes and provides evidence of the mechanisms at play. Having well-integrated migrants, be it culturally, socially, or economically is a desirable condition for migrants themselves, as well as for the host country. Economic integration through labor market participation leads to lower dependence on welfare benefits and can even lead to positive net fiscal contributions (Dustmann and Frattini, 2014, d’Albis et al., 2016). Lack of integration, on the other hand, could lead to hostility and anti-immigrant feelings from the native population. There are evidence that economically integrated immigrants tend to commit less crime (Freedman et al., 2018, Mastrobuoni and Pinotti, 2015). Their integration is hence crucial for social cohesion in the host country.

The literature puts forward different factors that can boost migrants’ economic integration: better language skills (Dustmann and Fabbri, 2003; Lochmann et al., 2019), networks, or marriage to a national (Safi and Rogers, 2008; Meng and Gregory, 2005; Meng and Meurs, 2009). However, it is well-documented that migrants tend to remain at a disadvantage on the labor market when

¹As an example, an extract of an article from [France 24 \(28/08/2013\)](#) with a statement by the UMP, a center-right party in France on the Socialist Party’s move to ease citizenship (emphasis added): “(The Socialist Party) wants to increase the number of naturalisations to *facilitate the integration* of immigrants...On the contrary, we think that becoming French must be the *result of a successful journey of assimilation* into the French community.”

compared to natives (Chiswick, 1978; Baker and Benjamin, 1994; Dell’Arlinga et al., 2015). Hence, if naturalization could in itself boost foreigners’ labor market integration, then it could help in narrowing this gap.

There are different potential channels through which citizenship could boost labor market integration. First, in most countries, part of the labor market, often the public sector, tends to be conditional on nationality. This is the case in France, where an estimated 30% of the labor market falls within such a category (GED, 2000). Obtaining nationality thus provides foreigners with unrestricted access to the labor market. Additionally, citizenship can provide foreigners with a long-term stable legal stay, which can also be used as a signal for their commitment to stay in the host country. Finally, when applying for jobs, it can help reduce statistical or taste-based discrimination faced by foreigners. Altogether, citizenship can help to overcome barriers to employment, promotions, and economic opportunities.

In this paper, I estimate the causal effect of naturalization on labor market outcomes, by exploiting a national-level reform in the law of naturalization through marriage in France in 2006. As laid down in section 2, the reform amended the eligibility criteria of applicants by increasing the required number of years of marital life from 2 to 4. This provides a quasi-experimental setting whereby foreigners in two otherwise similar cohorts of marriage expecting to naturalize within the same number of years, unexpectedly face different length of waiting to be naturalized. To do so, I adopt a simple difference-in-differences approach. As a robustness check to control for general economic trends, I also adopt a triple difference approach using foreigners married to foreigners as a never-treated group. This group of foreigners are not eligible for naturalization through the channel of marriage and hence, not affected by the reform.

I use the Permanent Demographic Sample², a rich administrative French panel data, described in section 3. This data source allows me to match the marriage registry, population censuses, and employee panel data. First, based on the reported nationality at the time of marriage, I identify the two main marriage groups: i) marriages of interest: foreigners married to French (in the main

²Échantillon Démographique Permanent (EDP)

analysis), and ii) never-treated group: foreigners married to foreigners (for placebo checks and robustness analyses). By matching the marriage information to the population census data, I build a proxy for naturalization, defined as foreigners who declare being french in subsequent rounds of the census. Finally, I also follow the labor market trajectory of individuals who are salaried workers. The empirical strategy is to compare the foreigners who face a shorter compared to a longer waiting period, with a difference-in-differences approach.

I establish three main results. First, I show that, as expected, the reform led to a gap in the propensity to be naturalized between foreigners facing a shorter waiting time compared to those waiting longer, in the years following marriage. I then compare their labor market outcomes from their marriage up to 10 years after. This corresponds to the period before and after they become eligible for naturalization. I show that naturalization increases net annual earnings, through an increase in the number of hours worked and log hourly wages. I further show that these effects differ by gender. Both men and women experience an increase in earnings but it is entirely driven by an increase in the number of hours worked for men.

Finally, in section 4, I explore different potential mechanisms. An advantage of the mixed marriage context is that it allows me to rule out some of the expected channels and isolate the few remaining ones. This is the case as this group of foreigners as they already obtain those benefits prior to naturalization through their marriage, and hence already have work authorizations and networks. I show that the channel of unrestricted access to the labor market, as proxied by the probability of being employed in the public sector, does not seem to have played a role in explaining the naturalization premium. Instead, I provide suggestive evidence that naturalization is used as a signaling device for integration and language proficiency. I also show that naturalization helps reduce informality.

My paper has three main contributions. First, it estimates the causal effect of naturalization, overcoming challenges of self-selection, endogeneity, and reverse causality that have so far limited this literature. [Chiswick \(1978\)](#), at the onset of this literature, found a positive correlation between naturalization and labor market outcomes, by comparing the situation of naturalized to

non-naturalized individuals in the U.S using cross-sectional data. A more recent strand of the literature has exploited panel data to take into account time-invariant individual characteristics, and also finds a positive association between the two ([Bratsberg et al., 2002](#); [Fougère and Safi, 2009](#); [Steinhardt, 2012](#)). In France, comparing naturalized and non-naturalized migrants using panel data, [Fougère and Safi \(2009\)](#) found that obtaining French nationality is associated with a significantly higher probability of being employed.

However, these studies suffer from issues of self-selection, endogeneity, and reverse causality. Naturalization involves a double positive selection: firstly, individuals who choose to apply for the nationality are normally positively selected among the pool of all immigrants and secondly, those who end up obtaining the nationality are also positively selected among the group of applicants. Hence, comparing naturalized immigrants to non-naturalized ones leads to biased estimates. Establishing the causal impact of naturalization is furthermore complicated given that the reverse relationship might exist: well-integrated immigrants have higher chances of being naturalized. This might induce those who wish to apply for the nationality to invest more in their human capital.

Second, this paper exploits a novel and clean setting to estimate the direct causal effect of naturalization. In doing so, it comes closer to the few noticeable exceptions in this literature that provides evidence using quasi-experimental designs. This is the case of [Hainmueller et al. \(2019\)](#) which compares those who are naturalized or not by a close margin in local referendums in Swiss municipalities, showing that naturalization has a long-run positive effect on earnings in a rather conservative context³. De facto, they could be capturing both the positive effect of obtaining citizenship and the negative effect of being rejection⁴. I depart from this paper by looking at a change in the access to naturalization that allows me to compare a group of foreigners that obtain the nationality to another similar group that eventually obtains it. My analysis is thus closely

³Applicants need to have spent 12 years in Switzerland and passed a culture and language test.

⁴Critics of the direct referendum to grant citizenship in Switzerland put forward the potentially discriminatory practice. It has been declared unconstitutional and deemed to violate international laws in 2003 by the Swiss Federal Court. The resulting unwelcome feeling felt by those who are refused the nationality by members of their own locality, might have induced an adverse behavioral change on the labor market of rejected candidates, negatively affecting the control group.

related to the paper by [Gathmann and Keller \(2018\)](#) which focuses on the labor market effects of differential access to citizenship. Exploiting two reforms that altered residency requirements in Germany, they find that naturalizing earlier has a significant positive and persistent effect on the long-run economic integration of migrants. In my paper, I look at the naturalization of working-age population. I follow their labor market outcomes before and after naturalization, and I hence provide the direct and immediate effect of naturalization.

Third, this paper contributes to the literature on employment discrimination.⁵ In France, [Duguet et al. \(2010\)](#) and [Petit et al. \(2015\)](#) show through testing that the CV of a Moroccan with a French nationality receives more callbacks from employers than that with a Moroccan nationality. In this paper, I bring suggestive evidence that nationality can help reduce hiring discrimination by signaling better language proficiency and more integration. I conclude in section 6 that naturalization is a catalyst for the economic integration for foreigners and can thus be a crucial policy tool.

2. Context & Design

Like most developed countries, France has had a long history of political debate about the softening or hardening of its migration policies ([Weil, 2002](#)). Foreigners can obtain a legal stay in France through different types of visas, depending on their status and purpose of stay. These may be short-term ones (e.g. student visa, short-term work permits..) or longer-terms (e.g. 10 years residence permit). Upon satisfactory integration in France, foreigners become eligible for naturalization.

Applicants to naturalization are generally assessed based on their degree of integration in the country, by the French authorities. The two main channels through which a foreigner can apply for naturalization are through decree and through declaration⁶. The first channel, being

⁵see [Bertrand and Duflo, 2017](#) for a comprehensive review of the literature on field experiments on discrimination

⁶The bulk of applications (around 60% are through decree and 40% through declaration, of which half is through marriage.

the general process, requires significant proof of socio-economic integration. The second channel applies to individuals born in France to foreign parents, as well as to foreigners married to French nationals, which is the focus of this paper. Since both situations in themselves, constitute some level of integration, naturalization through declaration is deemed part of the natural order. While foreigners applying through decree have to extensively prove their social and professional integration in France, foreign spouses of French citizens are only required to fulfill three main criteria: a certain number of years of marital life, a valid marriage, and a sufficient knowledge of French, their marriage to a French national being an adequate proof of integration.

The success rate among admissible files is estimated to be at around 70% for applications by decree and 90% for those through declaration. This gives an insight into the relative preference for the latter channel whenever possible. Rejections of applications of naturalization through marriage are normally rare and only occur in cases of ineligibility with respect to the main criteria or in cases of invalid marriages determined through an in-depth inquiry by the local authorities. Despite the screening measures in place, this somewhat privileged access to naturalization has led many to fear that mixed marriages could be wrongly instrumentalized to obtain the French nationality. As a result, throughout time, the French government has attempted to harden the rules to applying through the channel of marriage, mainly by increasing the number of years of marriage to a French national required to be eligible. Apart from the 1998 reform, when this condition had been relaxed, all the other reforms increased this duration, the underlying justification being that longer marriage duration requirements are more costly and will deter individuals from contracting marriages for the sole reason of obtaining the French nationality.

Similarly, the reform announced in March 2006 and acted in July 2006 changed the eligibility criteria of naturalization through marriage by increasing the number of years of marriage required to be eligible from 2 years to 4 years. Given the nature of the law, the relevant eligibility criteria for any given foreigner married to a French depended on their application date. It differently affected applicants before and after the reform in 2006 which translated into the unintended consequence of penalizing the cohort of marriage after 2004 compared to the couples married before 2004. In other words, in terms of application dates, applicants before July 2006 were required to have at

least two years of marriage to be eligible, and conversely, any application after July 2006 had to fulfill the new requirement of at least four years of marriage to be eligible. This translated into the fact that only marriages that were contracted before July 2004 could have the possibility to apply for naturalization after 2 years of marriage, while those married after July 2004 faced the hardened eligibility criteria and had to wait 4 years⁷.

The identification strategy relies on the fact that the reform was unanticipated at the time of marriage: any couple married before the announcement of the reform in March 2006 expected to wait only two years after marriage to be eligible to apply for naturalization. Hence, there is no reason for mixed married couples before and after 2004 to be any different except for their differential probability of obtaining the nationality, due to this exogenous shock. The treatment is defined as the higher propensity of being naturalized. Marriages within a window before July 2004 are thus defined as the “early-treated” group (by naturalization) and those after July 2004 as the “late-treated” group (with respect to naturalization) as in Figure 1.

Conceptually, under a full compliance setting and no administrative delay, we would expect a 0% naturalization rate among the early-treated and late-treated group up to two years after marriage. If every individual applied as soon as they were eligible, that there were no administrative delays, and no rejection in obtaining the French nationality through marriage, then there would be a 100% naturalization rate among the early-treated group as from the third year after marriage. Under similar conditions, the late-treated group would have a 0% naturalization rate up to 4 years after marriage and a 100% rate as from the fifth year after marriage (See Appendix Figure A.1).

However, in practice, this is not likely to be the case. First, the announcement of the reform in March 2006 might have led to changes in behavior and hence to changes in the composition of marriages after the announcement. This is taken care of by restricting the end date of the sample to marriages up to February 2006. Second, among the early-treated group, while everyone

⁷Only mixed marriages between January 2002- February 2006 are kept in the sample. As an example, a foreigner married to a French national in January 2004 would be eligible as soon as January 2006 while a similar foreigner married in December 2004 would only have 2 years of marriage in December 2006, not enough to be eligible under the new law.

is eligible to apply within two years of marriage, not everyone might have enough time to apply before the reform passes. This is mostly a concern for marriages closer to the July 2004 cutoff. To address this concern, the end date of the early-treated cohort is limited to February 2004. Hence the early-treated cohort are marriages which occurred between January 2002 and February 2004, and the late-treated cohort comprises of marriages between July 2004 and February 2006.

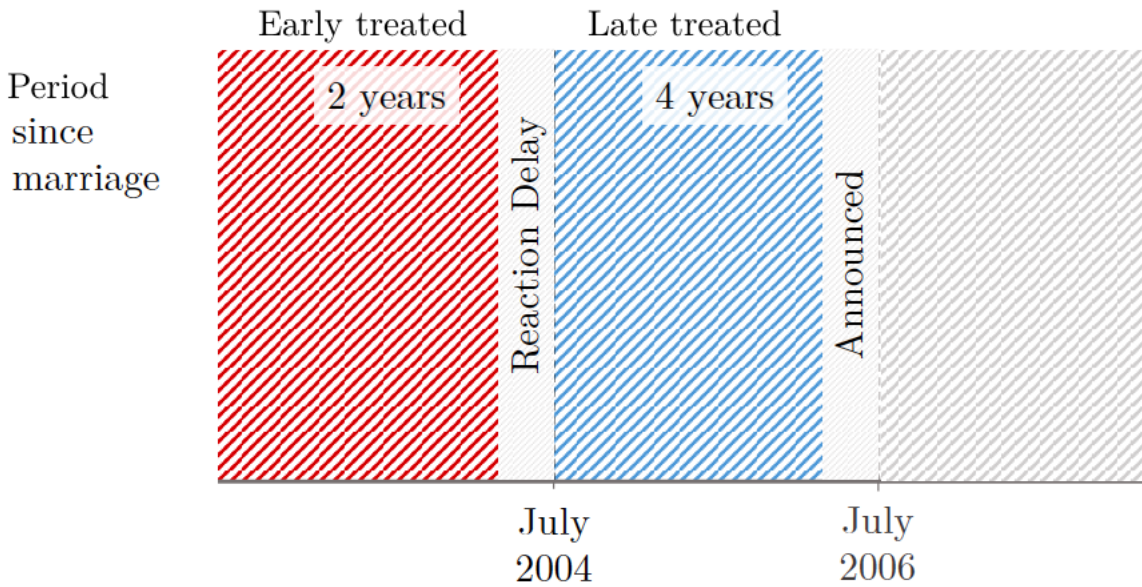


Fig. 1. Design

In addition, there might be non-compliance, making this a fuzzy design. Some marriages in the early-treated cohort might not be treated within two years of marriage due to two main reasons: if they do not apply before July 2006 (despite limiting this risk as explained above); and if they would not apply for the nationality irrespective of the eligibility criteria, known as the never-takers. Additionally, there might be foreigners treated prior to four years of marriage in the late-treated group since foreigners married to French nationals can also choose to apply for the French nationality through the general channel if they are eligible⁸, despite not having the incentives to do so. Since there is no information on naturalization in the data, only a proxy of naturalization is used as explained in Section 4. These estimates are thus intention to treat

⁸If for instance those who have been married for less than 4 years of marriage, have resided for at least 5 years on the French territory and can prove their socio-economic integration in France, then they could apply through the general channel

(ITT). There are also administrative delays between the date of application and obtaining the nationality that is estimated to be around a year on average⁹. Due to all of these reasons, the differential naturalization rate between the early and late-treated group.

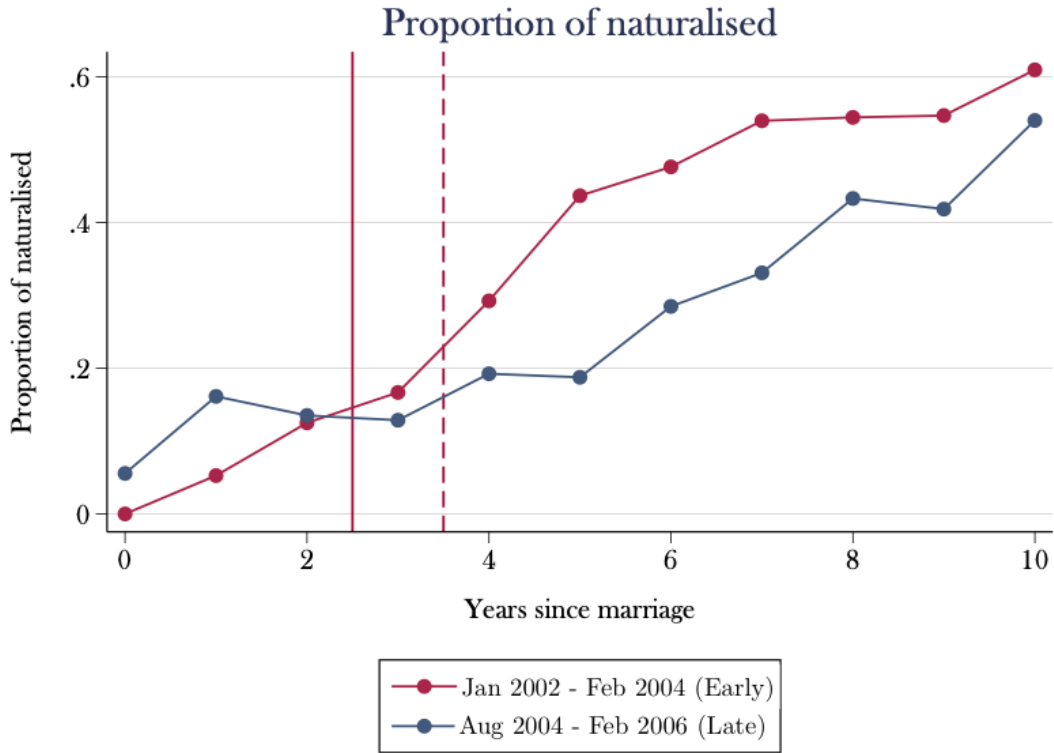


Fig. 2. Proportion of naturalized

Figure 2 shows that there is a sizeable gap in the proportion of naturalized between the early-treated and the late-treated group as from the fourth year of marriage. As expected, assuming a one-year administrative delay, there is a change in the trend of the share of naturalized in the early-treated group beyond the third year of marriage and the same change in trend occurs beyond the fifth year for the late-treated group. This is formally tested in the first-stage analysis in section 4. For placebo and robustness checks, the same analysis is performed on a similar yet never-treated group. These are foreigners married to foreigners as they are not eligible to apply for naturalization through the marriage channel, and are hence not affected by the reform. The reduced-form analysis exploits the gap in naturalization rates to estimate its effect on labor

⁹Acquisitions et pertes de la nationalité française- Rapport annuel de la sous-direction des naturalisations, 2005

market outcomes¹⁰. The reduced-form coefficients¹¹ corresponds to the effect of the ITT and the local average treatment effect (LATE) can be recovered under some assumptions, by dividing the ITT by the differential propensity of being naturalized, obtained in the first-stage.

Given that the reform only impacted the naturalization channel through marriage, in this paper, I focus on foreigners in mixed marriages. Marriages between French and foreign nationals account for 13% of all marriages in France on average. These foreigners are generally relatively more integrated compared to the overall pool of foreigners. First, upon marriage to a French national, foreigners are eligible to a special visa, renewable every two to four years, which allows them to have a legal stay and authorization to work in France. These foreigners might also be more familiar to the French institutions, labor laws, taxation, and social security systems.

When compared to the foreign-born population in the same age window, they tend to be more educated on average, have a higher probability of being employed as manual workers and relatively less in executive positions, and finally, they are more likely to be from a francophone country (see Table 7). These specificities imply that some of the mechanisms put forward by the literature on the effect of naturalization on labor market outcomes are not relevant in this case¹², allowing me to disentangle and pin down other remaining mechanisms. Hence, the main channels that are still relevant are: an unrestricted access to jobs which are conditional on the nationality; reducing discrimination; and reduced informality, which will be explored in Section 6.

3. Data & Empirical Setting

I exploit the French administrative panel data known as the *Echantillon Démographique Permanente (EDP)*. It is a panel that matches different administrative data sources for individuals born

¹⁰Extensive robustness checks show that there are no differential rates of migration out of the country due to this reform and the sample composition based on observable characteristics remains similar between early-treated and late-treated group over time.

¹¹Given the structure of the data and the sample under study, merging the three sources of data to perform a second-stage analysis is not feasible.

¹²For instance, through the spousal visa, foreigners already acquire a stable stay and employers do not face additional costs in hiring them.

on certain dates of the year, providing information on their socio-demographic characteristics. Before 2004, the EDP constituted a sample of approximately 1% of the total population and around 4% thereafter¹³. In this paper, I focus on three main data sources of the EDP which are the civil registries of marriage, the population census, and the employees' panel data (part of the Déclaration Annuelle de Données Sociales - DADS).

First, the civil registry of marriage allows me to identify the date of marriage of couples with an EDP individual, as well as other characteristics for both spouses at the time of marriage. This includes their nationality, gender, and age among others. Through this data source, I can categorize individuals into different types of marriage, namely endogamous marriages, which for the sake of this analysis is defined as marriages between two French or two foreigners, as compared to mixed marriages¹⁴. In line with the identification strategy, mixed marriages are defined as any marriage contracted between a foreign individual and a French person¹⁵, as recorded at the date of marriage. Since Europeans are less likely to be affected by this reform, they are excluded from the analysis¹⁶. Only marriages contracted between January 2002 and February 2006¹⁷ are kept in the analysis. The sample is limited to marriages contracted up to February 2006 to ensure that marriages affected by the announcement of the reform are excluded. Marriages between February 2004 and July 2004 are also excluded to minimize the number of foreigners that were eligible for the short waiting time but did not have enough time to apply before the change of the law in July 2006.

Second, I match the marriage registries to the different rounds of population censuses. As of 2004, the population census is based on a five-year rotating sample of around 14% of the population yearly. This annual structure of the population census gives information on the nationality of individuals every time they are surveyed in the census. While there is no direct information on

¹³Before 2004, the EDP included individuals born on 4 dates of the year. The sample has increased to 16 dates of the year as of 2004. This was effectively applied to the civil registries in 2004 but to the population census only as of 2008. Independently, the employer-employee data had a sample of 4% of the population until 2001 and it has increased to 8% in 2002.

¹⁴Interchangeably used with the term "intermarriage".

¹⁵Irrespective of whether the French spouse is herself/himself a naturalized citizen or is a second-generation immigrant. Further distinction and heterogeneous analyses are carried out in section 6.

¹⁶Reference to non-French in this paper is interchangeable with non-Europeans.

¹⁷Excluding marriages between February 2004 and July 2004.

naturalization (date of application, date of naturalization, or the naturalization channel), individuals report their nationality each time they are surveyed. This provides a proxy for naturalization. An individual is considered naturalized if he/she is recorded as non-French at the time of marriage and reports being French in subsequent years in the census¹⁸. Population censuses also contain extensive socio-demographic information such as country of birth, level of education, and marital status, among others. Since the interest of this analysis is to look at the labor market outcomes, only the working population is kept in the sample (aged between 20 and 65 years old).

Finally, to look at the effect of naturalization on labor market outcomes of individuals, I match the marriage registry data to the employees panel data. This data is originally derived from a panelized version of the employer-employee linked data (DADS)¹⁹. It provides extensive annual information on employed individuals, namely their salary, type of contract, type of occupation, number of hours worked among others. This data source only include declared work, and excludes self-employment. Only foreign individuals who have worked at least once before 2002, hence entered the employee panel before their date of marriage, are kept in this panel to ensure that the results are not driven by new entrants. To be able to meaningfully interpret the result, I also restrict the sample to include only foreigners who have worked during the baseline period.

The empirical strategy takes the form of a difference-in-differences approach in the static form and an event-study analysis in the dynamic form, centered around the date of marriage. In other words, each time period is expressed in terms of its distance from the date of marriage or more simply the duration since marriage (*Dur*). A reasonable event-window of up to 10 years after marriage²⁰ is included in the analysis. In the static double difference analysis, a pre and post-treatment period is defined. Given the one-year administrative delay on average, the pre-period are defined as the first three years since marriage and the post-period is set at more than 3 years since the year of marriage.

¹⁸Despite some measurement errors, this remains the best tool to measure naturalization. There is otherwise no official dataset that tracks naturalized foreign individuals, hence no information on the exact date and type of naturalization of foreign individuals.

¹⁹Déclaration Annuelle des Données Sociales

²⁰It corresponds to 11 time periods, whereby d ranges from 0 (the year of marriage) to 10 (ten years after marriage)

In the first-stage, I show evidence of the effect of the reform on the naturalization rates among the early-treated and late-treated groups. To do so, I match the marriage registry to the population census. I build an indicator of naturalization (Nat_{it}) for whether the foreign individual i at the time of their marriage, reports being French or foreigner at time t in the census. I estimate equation (1) where i is the individual, t is the calendar year, $Treat_i$ is a dummy of whether individual i is in early-treated or late-treated cohort, $Post_{it}$ is a dummy for more than two or three years of marriage, depending on the specification. The coefficient of interest, λ gives the differential rate of naturalization between early-treated and late-treated group. The specification for dynamic form is similar, whereby $Post_{it}$ is replaced by a duration dummy for each time period since marriage and these are interacted with $Treat_i$.

$$Nat_{it} = \alpha + \delta Treat_i + \beta Post_{it} + \lambda(Post_{it} * Treat_i) + \epsilon_{it} \quad (1)$$

In the second step, I estimate the reduced-form effect of naturalization on labor market outcomes²¹. To do so, I match the marriage registry data to the employee panel data. The static specification for the difference-in-differences strategy is as follows:

$$Y_{it} = \eta + \delta Post_{it} + \gamma(Post_{it} * Treat_i) + \mu_i + \epsilon_{it} \quad (2)$$

where γ is the coefficient of interest. Y are labor market outcomes such as annual earnings, number of hours worked, and hourly wage. As in the first-stage analysis, $Post$ is a dummy for being up to or more than three years since marriage and $Treat$ is a dummy for being in the early-treated or late-treated group. Individual fixed effects are also included in this analysis (μ_i). The standard errors are clustered at the individual level. In the corresponding dynamic model, duration fixed effects are included to account for any potential effects that are specific to a particular number of years of marriage²². Coefficients of interest in the dynamic form are the interaction between each duration dummy and $Treat$. In the static form, the interaction term between duration and treatment group, γ in equation (2) estimates the differences between the early-treated and late-treated

²¹Given the structure of the data and the sample under study, merging the three sources of data to perform a second-stage analysis is not feasible.

²²For instance, couples might have kids in the first few years following marriage.

group, hence the reduced-form effect of naturalization. The underlying common trend assumption holds if the early-treated and late-treated group evolve in a similar way in the pre-treatment period, especially in their labor market situations.

A potential threat to this identification strategy is the fact that foreigners married to French who fulfill the requirements are also eligible to apply through the general channel. A toughening of the criteria to apply through the marriage channel can lead some of those in the late-treated group to apply for and obtain the nationality through the general channel to circumvent the slightly longer waiting time. This would lead to a positive share of naturalized individuals in the late-treated group. As long as the early-treated group has a sizable higher share of naturalized individuals this is not a concern. However, if the late-treated individuals exercise more effort on the labor market to maximize their chances of obtaining the nationality, the reduced-form estimates may suffer from an attenuation bias due to the better labor market outcomes among the late-treated group induced by their behavioral response to the longer waiting time. In practice, since foreigners married to french already have a legal stay and an authorization to work, these behavioral responses are likely to be marginal.

Descriptive Statistics

Table 1 shows the descriptive statistics on demographic and labor market characteristics for the period under study. The main group of interest are foreigners married to french, and the never-treated group, as a point of comparison, are foreigners married to foreigners. The average age and age difference between spouses at marriage is lower on average among mixed married couples compared to the average foreign couples. There are on average more foreign men married to french women than marriages between foreign women and french men, as seen by the proportion of women in the sample of mixed marriages which is around 34%. Around 60% of the foreigners are from francophone countries and the majority comes from Algeria, Morocco, and Tunisia, which accounts for 54% of the sample of mixed marriages.

In terms of labor market characteristics, the probability of observing the foreign individual in the

Table 1: Descriptive Statistics

	Foreigner - French		Foreigner - Foreigner	
	Mean	SD	Mean	SD
<i>Demographic characteristics</i>				
Age	36.14	7.41	38.82	8.57
Age diff	5.35	5.17	6.14	5.41
Female	0.34	0.47	0.45	0.50
Francophone	0.63	0.48	0.57	0.49
Nationality of origin				
Algerian		0.18		0.22
Morrocan		0.27		0.15
Tunisian		0.09		0.03
Others		0.46		0.60
<i>Labor Market characteristics</i>				
Prob. Panel	0.72	0.45	0.68	0.47
Net annual earnings	17216.6	13111.2	16763.3	12975.7
Number of hrs worked	1334.0	675.1	1349.0	676.5
Hourly wages	12.6	6.6	12.0	6.0
Full-time	0.72	0.45	0.70	0.46
Public Empl.	0.07	0.26	0.06	0.24
Obs	4919		3403	

married couple as being employed is around 70% for both groups. Mixed couples tend to earn slightly higher annual earnings on average due to higher hourly wages, despite a lower number of hours worked on average. Around 70% of employed are in full-time employment.

The balancing test of the main covariates at baseline for the two groups as well as the difference of the differences are reported in Table 8. The average age at marriage has generally been increasing and spouses have an average age of 33 years at the time of marriage. Given this trend, the average age at marriage among the early-treated group (married before 2004) is mechanically lower than that of the late-treated group (married after 2004), especially in the group of interest (Column 1-3 of Table 8). None of the labor market characteristics are significantly different between early-treated and late-treated groups among the group of interest.

4. Results

4.1. First-Stage

This section tests whether the reform has had an effect on the naturalization rates in the early-

treated and late-treated group, by estimating equation (1). Table 2 summarizes the results of the first stage analysis for the main group of interest (foreigners married to french) and the never-treated or placebo group (foreigners married to foreigners) with a difference-in-differences approach. In the conservative approach and under the scenario of no administrative delay, the post-period is defined as after the second year of marriage, T2 (columns 1 and 3). However, as reported by the official statistics on naturalization, the average delay between the time of application and an administrative answer is a year on average. Hence, in a more plausible scenario, the post-period can also be set after T3 (columns 2 and 4). These results show that the probability of being naturalized is between 13 to 15% higher in the early-treated group compared to the late-treated group for mixed marriages, the difference being highly significant. The non-significant result for the never-treated group confirms that the gap only exist for the group of interest and it is most likely driven by the reform.

Table 2: First Stage

Cutoff	(1) Foreigner-French		(3) Foreigner-Foreigner	
	(2) After T3	(4) After T3	(3) After T2	(4) After T3
	After T2	After T3	After T2	After T3
Treat x Post	0.13*** (0.02)	0.15*** (0.03)	-0.04 (0.04)	-0.04 (0.04)
Observations	1,804	1,804	687	687
Adj R-squared	0.04	0.06	0.02	0.02
Individual FE	Yes	Yes	Yes	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 3 shows the underlying dynamic effects whereby each point estimate is the differential rate of naturalization in the early-treated foreigners compared to the late-treated foreigners married to a french, during each year since marriage²³. T0 corresponds to the year of marriage and T10 refers to 10 years after marriage. Since the early-treated group are married before the 2004 threshold, they become eligible to apply to naturalization through marriage as soon as 2 years

²³The estimate of the rate of naturalization is conditional upon being observed in the population census. For instance, the coefficient of T4 is interpreted as a 20 percentage point higher naturalization rate among the early-treated group compared to the late-treated group conditional of being in the population census 4 years after marriage. A series of robustness checks are carried out to show that there is no differential rate of attrition and that the population composition is stable over the period.

after marriage. On the contrary, having contracted a marriage after July 2004, the foreigners in the late-treated group will only become eligible through this channel after 4 years of marriage. In addition, it takes a year on average for the French administration to process the application.

The rates of naturalization between the two groups do not seem to significantly differ in the “pre-treatment” period- from the year of marriage to two years after marriage, since none of the groups are eligible for naturalization through the channel of marriage. The difference gradually sets in as from the fourth year of marriage, likely due to the one-year administrative delay, at about 20-25 percentage points. The gap seems to close off as from 6 years of marriage, consistent with the timing at which the late-treated group is likely to witness an increasing probability of being naturalized²⁴.

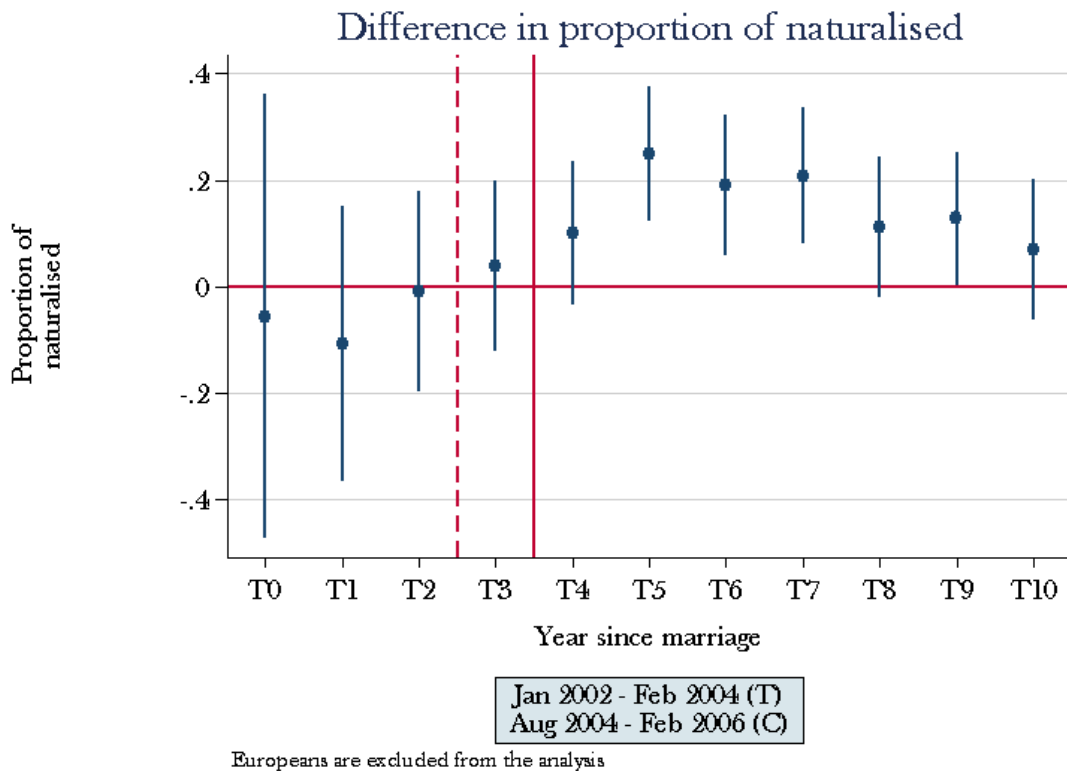


Fig. 3. Naturalization rate differences among mixed marriages

²⁴Robustness checks show that there are no differential probability of observing individuals in the early-treated and late-treated group over time and the sample composition based on observable characteristics remains similar between early-treated and late-treated group over time.

Different placebo analyses are undertaken to confirm the validity of the first stage. First, since foreigners married to foreigners are not eligible to apply to the nationality through the marriage channel, they are not impacted by the reform. Column 3 and 4 of table 2, as well as Figure 4 shows the equivalent exercise for foreign marriages. As expected, there are no significant difference in the naturalization rates between the equivalent “early-treated” and the equivalent “late-treated” groups in this never-treated group. The coefficients of the dynamic analysis are not different from zero when taken together. This supports the claim that the patterns seen in Figure 3 are driven by the reform for naturalization through marriage and it validates the use of the foreigners married to foreigners as a never-treated group in the triple-difference analysis in the robustness test section. In addition, a second set of placebo tests are presented in Appendix D, whereby the reform dates are altered and the dynamic first-stage exercise for the group of interest, foreigners married to french citizens, are presented.

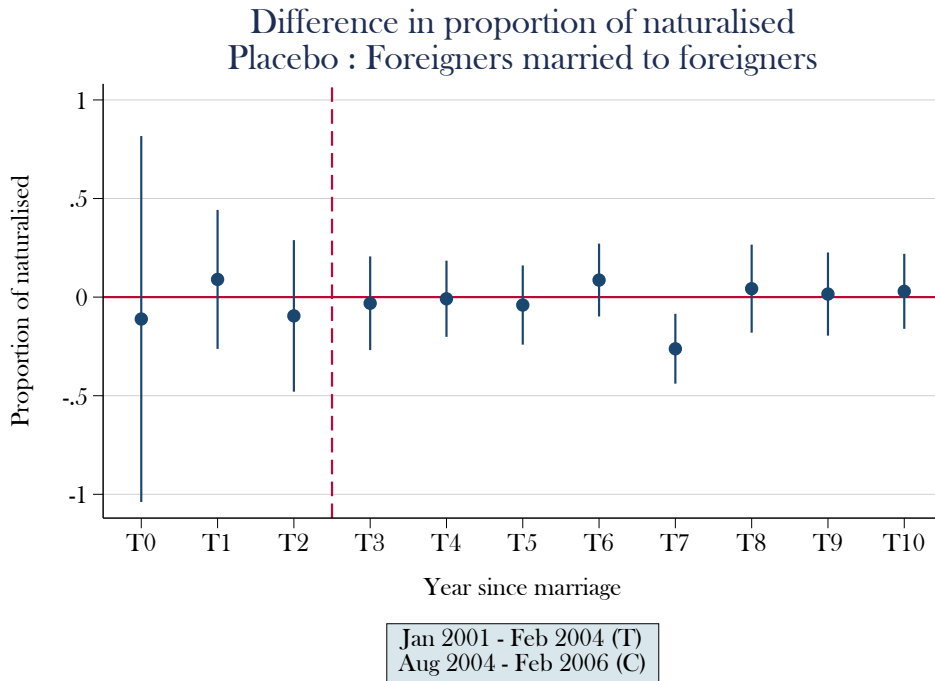


Fig. 4. Difference in naturalization rate among foreign marriages

4.2. reduced-form

Exploiting the 2006 reform shock on the naturalization propensity of two otherwise comparable

groups, I estimate the causal effect of naturalization on the labor market outcomes of foreigners. In this section, the reduced-form equation (2) is estimated and results based on the difference-in-differences approach are reported in static and dynamic forms.²⁵

The main result of the difference-in-differences analysis is presented in Table 3²⁶. Naturalization led to approximately 2300 € or a 29% increase in annual earnings. This can be decomposed into a positive effect on the number of hours worked and hourly wages. The model explains up to 65% of the variations in annual earnings. These results are similar to the triple differences analysis in magnitude, as reported in robustness test section. This suggests that accounting or not for the year effects does not significantly change the results.

Table 3: Main Results

	(1)	(2)	(3)	(4)	(5)
	Net annual earnings	Log earnings	No of hours worked	Hourly wages	Log Wages
Post x Treat	2,293.28** (1,094.35)	0.29*** (0.11)	111.92* (66.07)	0.92** (0.42)	0.07*** (0.03)
Observations	2,040	2,040	2,040	2,040	2,040
Adj R-squared	0.65	0.41	0.43	0.61	0.65
Ind. FE	Yes	Yes	Yes	Yes	Yes
Mean	17103	10.11	1407	11.83	3.108

The table present the difference-in-differences coefficient for foreigners married to french citizens before and after 2004. The pre-period consist of the first three years of marriage (T0 - T3) and the post-period is defined as time periods beyond the third year of marriage (T4 - T10). Results are conditional on working in the pre-treatment period. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Figure 5 shows the dynamic effect of naturalization on earnings. There is no significant difference between the early-treated and late-treated group up to 3 years since marriage, hence no pre-trend. The effect of naturalization kicks in as from the fourth year since marriage, as expected. The effect of naturalization on annual earnings can be decomposed into its effect on the number of hours worked and hourly wages. Figure 6 shows an increase in the number of hours worked as well as in the hourly wages.

²⁵All confidence intervals are at the 95% as standard in the literature.

²⁶The results are conditional of working in the first 3 years since marriage

The gradual decrease in the labor market effect over time is the mechanical result of the catch up of the late-treated group with the early-treated group as late-treated foreigners also obtain the French nationality as from the fifth year since marriage. This implies that there are no discernible persistent effect on annual earnings of being naturalized earlier in this context. The gap between the two group narrows down completely in terms of the number of hours worked. This does not seem to be the case in terms of the average hourly wages for which the gap remain sizeable, up to ten years after marriage, even if not significantly different as seen in Figure 6.

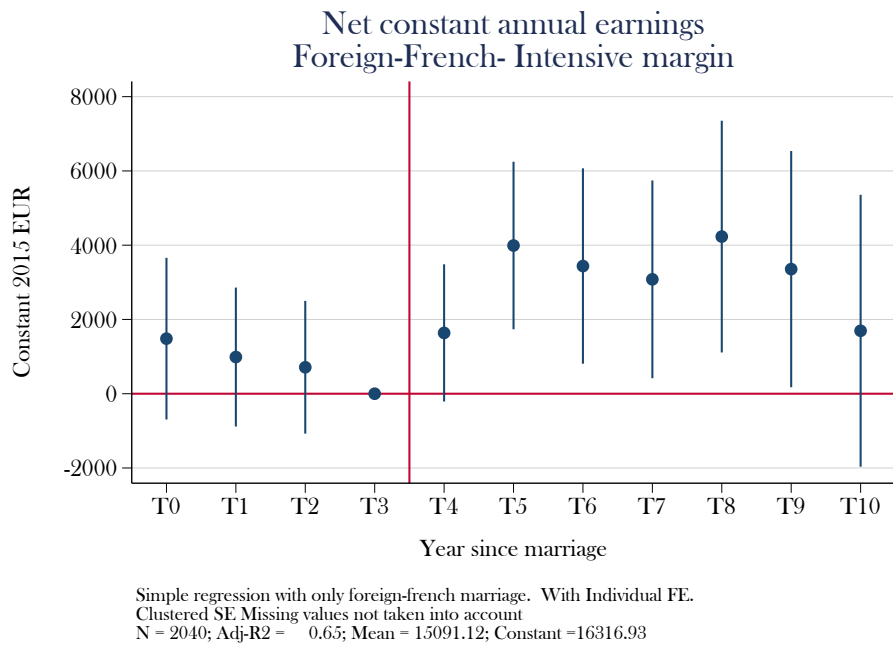
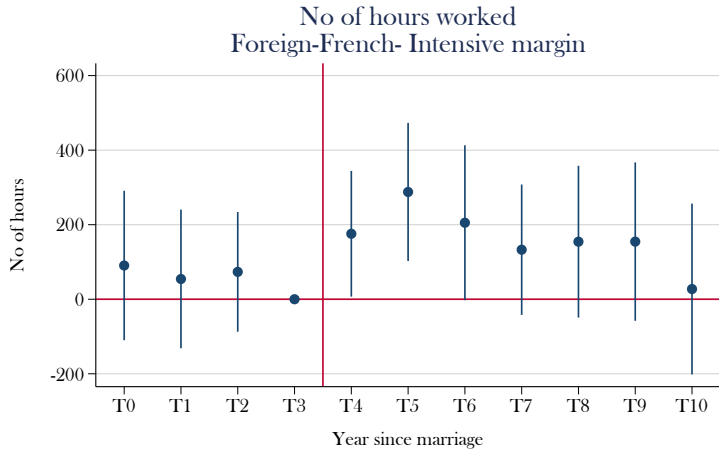
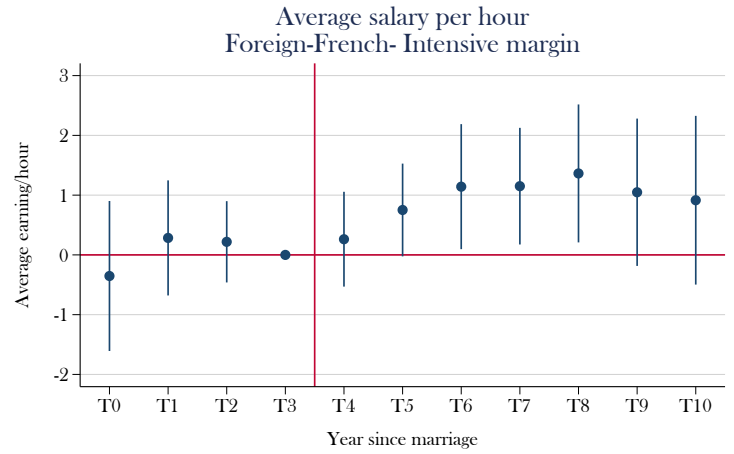


Fig. 5. Net constant annual earnings



Simple regression with only foreign-french marriage. With Individual FE.
 Clustered SE Missing values not taken into account
 N = 2040; Adj-R2 = 0.43; Mean = 1241.06; Constant = -1442.29



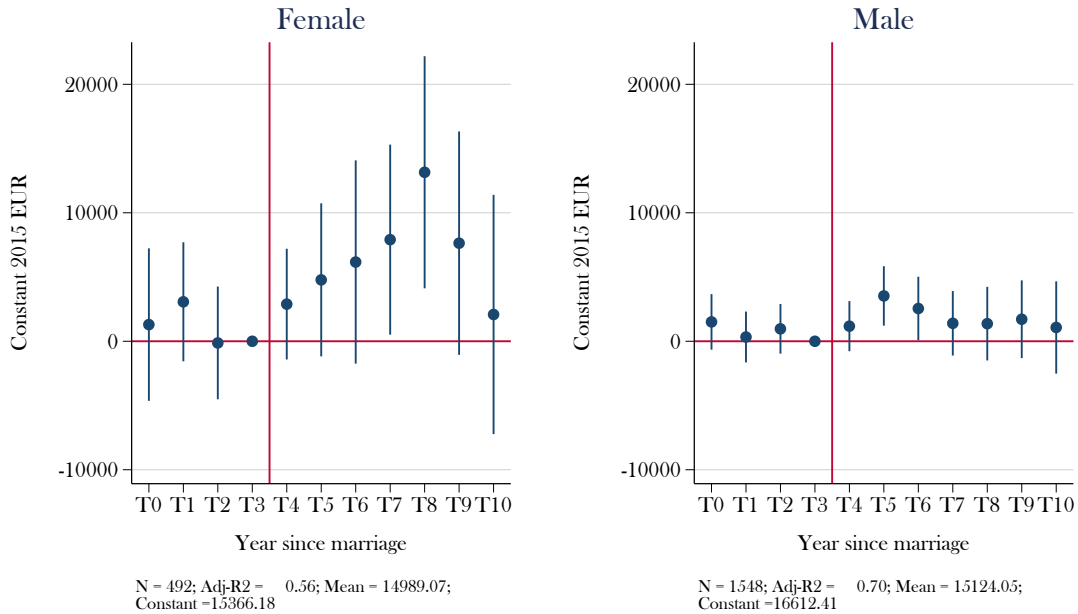
Simple regression with only foreign-french marriage. With Individual FE.
 Clustered SE Missing values not taken into account
 N = 2040; Adj-R2 = 0.63; Mean = 10.44; Constant = -11.19

Fig. 6. (a) Number of hours worked and (b) Hourly wages

Gender decomposition

These results mask underlying gender differences. Figure 7 reveals that the effects on annual earnings are much larger for women in absolute terms compared to men. When decomposed in terms of its effect on the number of hours worked (Figure E.1), and hourly wages (Figure E.2), it seems that men gain more in terms of an increase in the number of hours worked while the effect for women experience a larger increase in hourly wages.

Net constant annual earnings Foreign-French- Intensive margin



Simple regression with only foreign-french marriage. With Individual FE.
 Clustered SE. Missing values not taken into account

Fig. 7. Net annual earnings by gender

4.3. Robustness Tests

Since the main analysis is a cohort comparison design, the calendar year effects cannot be directly accounted for by including year fixed effects. To reduce any bias related to this, a similar group that is not affected by the reform is included to capture any year-specific effects using a triple-difference approach. Foreigners married to foreigners are not eligible to apply for naturalization through the marriage channel. Marriages between two foreigners are thus considered as never-treated groups since they are unaffected by the reform. To make sure that foreigners married to foreigners are similar in characteristics to those married to french, I implement a Coarsened Exact Matching (CEM) (Iacus et al., 2012) on baseline characteristics such as the age group, year, gender, sector of employment, working full-time or not and earnings²⁷.

Given the setting, there should be no differential rate of naturalization between a similarly-defined “early-treated” and “late-treated” group among the never-treated foreigner group. In

²⁷Baseline here refers to pre-treatment period $Dur = 0$ to 3.

terms of the first-stage analysis, this is the case as shown in Column 3-4 of Table 2. The reduced-form estimates of the effect of naturalization on labor market outcomes with a triple difference approach is obtained through the following specification:

$$Y_{it} = \eta_2 + \delta_2 Post_{it} + \theta(Post_{it} * Mixed_i) + \gamma_2(Post_{it} * Treat_i) + \rho(Post_{it} * Treat_i * Mixed_i) + \mu_i + \epsilon_{it} \quad (3)$$

where all variables are as described for equation (2) and; $Mixed_i$ is a dummy for whether the foreign individual is married to a french (group of interest) or to a foreigner (never-treated group). As in the specification (2), $Post_{it}$, as well as the interaction between $Post_{it}$ and treatment are included. In addition, in this specification, the interaction between the three are included. The term of interest, ρ , estimates the effect of naturalization on labor market outcomes at each duration since marriage for the early-treated group compared to the late-treated group of the group of interest compared to the never-treated group. In other words, in the triple difference approach, the estimate is net of any effect that might arise due to the calendar year. This relies on the plausible assumption that both $Mixed_i$ groups are affected in similar ways by calendar effects. As before, this model is also estimated in its dynamic form by including duration fixed effects and the corresponding interactions.

The balancing test for both the groups of interest (foreigners married to French) and the never-treated group (foreigners married to foreigners), as well as the difference of the differences at baseline is reported in 8. Columns 4 to 6 show the basic characteristics in the “early-treated” and “late-treated” group and the difference between the two for the never-treated group. It is noted that the difference of the differences in column 7 is significant for the age and the age difference. However, none of the labor market outcomes have significant differences in the baseline period. The results for the triple difference estimates are shown in table 4. While this model introduces noise and hence results in a loss in the precision of the estimates, the signs and the magnitude are very similar to the ones in table 3. This suggests that accounting for year effects does not significantly alter the results.

Table 4: Triple Differences

	(1)	(2)	(3)	(4)	(5)
	Net annual earnings	Log earnings	No of hours worked	Hourly wages	Log Wages
Post x Treat x Mixed	2,758.52 (1,907.57)	0.36** (0.17)	115.55 (114.46)	1.31* (0.72)	0.11*** (0.04)
Observations	3,238	3,238	3,238	3,238	3,238
Adj R-squared	0.67	0.40	0.41	0.66	0.69
Ind. FE	Yes	Yes	Yes	Yes	Yes
Mean	17321	10.13	1421	11.88	3.106

The table present the triple difference coefficient. The pre-period consist of the first three years of marriage (T0 - T3) and the post-period is defined as time periods beyond the third year of marriage (T4 - T10). Results are conditional on working in the pre-treatment period. Standard errors clustered at the individual level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5. Mechanisms

The literature puts forward different potential mechanisms through which naturalization could lead to better economic integration. Obtaining the nationality of the host country can provide foreigners with a stable legal stay. This can in turn lead to behavioral changes such as country-specific human capital accumulation. Naturalization can lead to better job matches and reduce skill-downgrading for foreigners. Since part of the labor market, generally the public sector, is conditional on nationality, obtaining citizenship helps by giving foreigners access to those jobs. In addition, naturalization can reduce the hiring costs of foreigners in cases where there are administrative and financial costs on employers hiring foreigners. Finally, naturalization can play a role in reducing discrimination.

The unique setting exploited in this paper allows me to rule out many of the above-mentioned channels while enabling me to better isolate the remaining ones. In fact, foreigners married to French are eligible for a spousal visa which provides them with a long-term stay and authorization to work, as well as complete access to the welfare benefits in the country. In addition to this, employers do not face any additional burden in hiring them, implying that these foreigners have relatively easier access to the labor market. However, they might still face three main constraints

due to their nationality: first, restricted access to jobs conditional on the nationality; second, reduced access to the formal sector employment; and third, they can still be subject to taste-based and statistical discrimination. In this section, I test these channels and provide suggestive evidence for whether they matter.

Unrestricted access to the labor market

In France, [Fougère and Safi \(2009\)](#) based on [GED \(2000\)](#), document that around 20% of the labor market, of which a large part of the public sector, is not accessible to non-citizens. These restrictions also exist in other countries such as the US and Canada. Since not all restricted positions can be identified in the data, I look at a broader proxy, the public sector employment. I test this channel by looking at the effect of naturalization on the probability of employment in the public sector.

The result reported in Column 2 in [Table 9](#) shows that there is no sizeable effect on public sector employment. [Figure E.3](#) shows the dynamic effects over the ten years after marriage and the null effect seems to hold over the whole period. This might be explained by the fact that only part of the public sector employment is conditional on nationality and this proxy might hence be too noisy to detect an effect. It can also be driven by the fact that entry in the public sector is costly²⁸, and is thus less likely at later stages in a person's career. There is a need to further analyze the employment in other jobs that are restricted to French nationals.

Informality

Foreigners tend to lack negotiating power when looking for a job and employees might take advantage of their situation to hire them informally. In France, the construction sector is one of the main sectors that is massively impacted by informal employment. I test the effect of naturalization for foreigners in the construction sector compared to those employed in other sectors. I use a triple difference specification, similar to equation (3), replacing $Mixed_i$ by a

²⁸In France, public sector jobs are obtained through national competitions.

dummy ($Construction_i$) for whether an individual is employed in the construction sector or not. The results in table 5 show that on average foreigners in the construction earned less than in other sectors. As a result of naturalization, they seem to obtain a much higher increase in their earnings, almost entirely explained by an increase in the number of hours worked.

Table 5: Construction sector

VARIABLES	(1) Net annual earnings	(2) No of hours worked	(3) Hourly wages
Post x Construction	-4,336.32** (1,872.08)	-253.37* (128.54)	-0.65 (0.65)
Post x Treat x Construction	5,179.08** (2,406.37)	422.50** (182.99)	0.02 (0.80)
Observations	2038	2038	2038
Adj R-squared	0.65	0.43	0.61
Ind. FE	Yes	Yes	Yes

Clustered standard errors at the individual-level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The pre-period consist of T0 - T3 and the post-period is defined as T4 - T10.

The heterogeneous analysis by sector, construction and others, are presented in Table 10. It shows that among workers in the construction sector, naturalization seems to have a massive effect on the number of hours worked, with no effect on hourly wages. On the contrary, in the non-construction sector, the effect is solely in terms of an increase in hourly wages and no significant effect on the number of hours worked. Given that the construction sector is heavily affected by informal work, these results might be driven by an increase in declared work following naturalization.²⁹ Apart from the gain for foreigners in terms of less precarious situations, this would also represent a fiscal gain for governments.

²⁹The employer-employee dataset only captures declared hours of work.

Reduced discrimination

The literature on discrimination in hiring has extensively shown that employers tend to discriminate against foreigners or foreign-sounding names. In France, a recent study has shown that french individuals with foreign-sounding names had a 20 - 30 % lower chance of being called back when compared with a fellow citizen with a french-sounding name. [Duguet et al. \(2010\)](#), and [Petit et al. \(2015\)](#) show that obtaining the nationality for a Moroccan-origin with a foreign-sounding name increases the call-back success rate of an application by 1.45%.

Non-citizens might be subject to statistical discrimination and taste-based discrimination if employers have a preference for their own group (French citizens). In that case, naturalization can help foreigners in reducing nationality-related taste-based discrimination. It can also potentially send a signal of higher integration and language proficiency. A proxy to test this channel is to look at the benefits of naturalization for foreigners from non-francophone compared to francophone countries. Having the French nationality, irrespective of the foreign-sounding name, could help send a signal of better language skills, and better integration in general. In this case, the benefit of obtaining the nationality would be lower for foreigners coming from francophone countries compared to those with a nationality from a non-francophone country.

To test this, I adopt a triple difference approach and estimate an equation similar to equation (3). Instead of $Mixed_i$, in this setting, I include a dummy for having the nationality of a non-francophone country. Column 1 of Table 6 shows the coefficient of the interaction terms. A foreigner from a non-francophone country tends to have lower annual earnings on average, even if not significant. Obtaining the nationality significantly increases their earnings compared to foreigners from francophone countries. This seems to be driven by a higher increase in hourly wages for those from non-francophone countries. This suggest that naturalization can help reducing discrimination through a signaling effect.

Table 6: Non-francophone

VARIABLES	(1) Net annual earnings	(2) No of hours worked	(3) Hourly wages
Post x Non-Francophone	-2314.73 (1,755.87)	-69.52 (136.89)	-1.57*** (0.54)
Post x Treat x Non-Francophone	6436.08* (1432.9)	124.69 (164.67)	3.08** (1.39)
Observations	2040	2040	2040
Adj R-squared	0.65	0.43	0.62
Ind. FE	Yes	Yes	Yes

Clustered standard errors at the individual-level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The pre-period consist of T0 - T3 and the post-period is defined as T4 - T10.

6. Conclusion

Given the known benefits of economically well-integrated migrants, efforts should be put in further integrating them into the labor market of the host country. One of the policies at the disposal of every government is the naturalization process of migrants. Due to the rising fear towards migrants, countries tend to become stricter in terms of their naturalization rules. In the same line, France has increasingly hardened the rules and thus restricting the path to naturalization. The channel of naturalization through marriage, traditionally thought to be a natural process for well-integrated citizens, has not been spared by the tightening of rules.

In this paper, I exploit such a reform in the law of naturalization through marriage in France in 2006 as an exogenous shock on mixed married couples in France. This paper is among the few in the literature to exploit a national-level reform that provides a quasi-experimental setting, thus overcoming the main issues of the existing literature: endogeneity, selection and reverse causality. Using a difference-in-differences strategy, I show that naturalization has a positive effect on annual earnings. This is explained by a positive effect on the number of hours worked, as well as hourly wages. A gender decomposition reveals that the effects on earnings are stronger for women as

compared to men. The effect is driven by an increase in the number of hours worked for men, and an increase in hourly wages for women.

Of the potential mechanisms put forward by the literature for the positive association between naturalization and labor market outcomes, unrestricted access to the local labor market, as proxied by public sector employment, does not seem to have played a role. Instead, there are suggestive evidence that naturalization helps in reducing informal employment, hence representing a gain for the foreigners as well as the host country. Naturalization also helps in reducing discrimination by signaling better language proficiency, and integration. In all, these results confirm the relevance of naturalization as a powerful tool to foster integration.

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Appendix A. Design

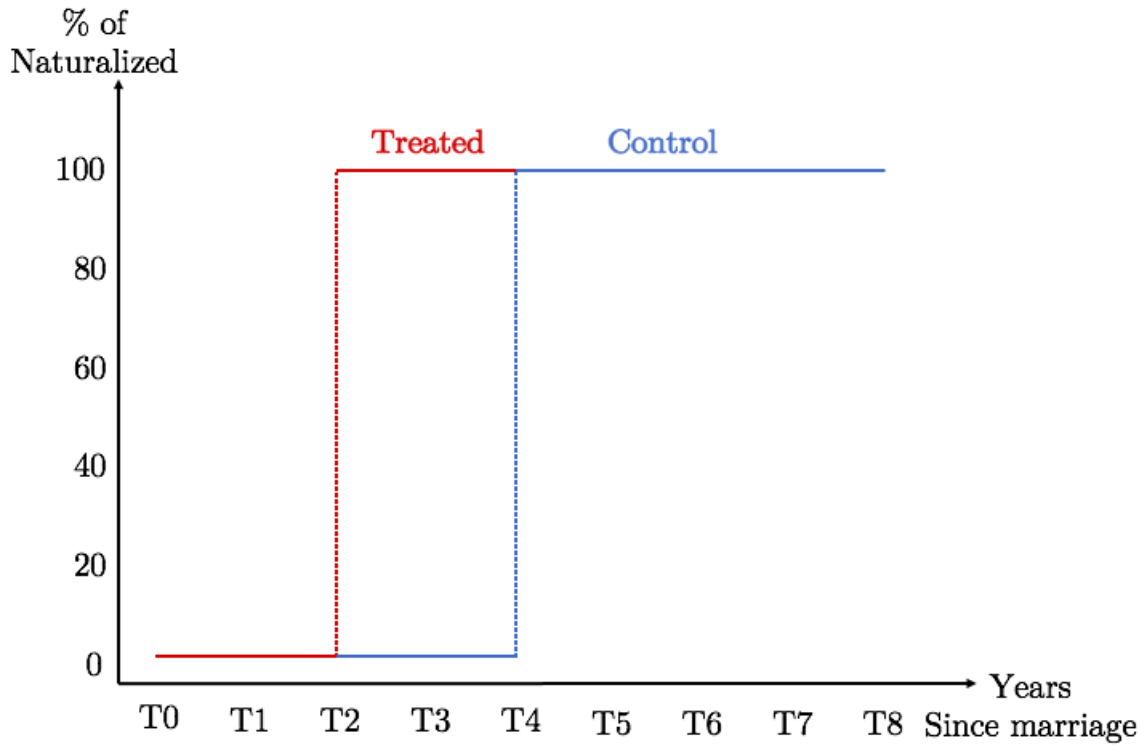


Fig. A.1. Under full compliance and no delay

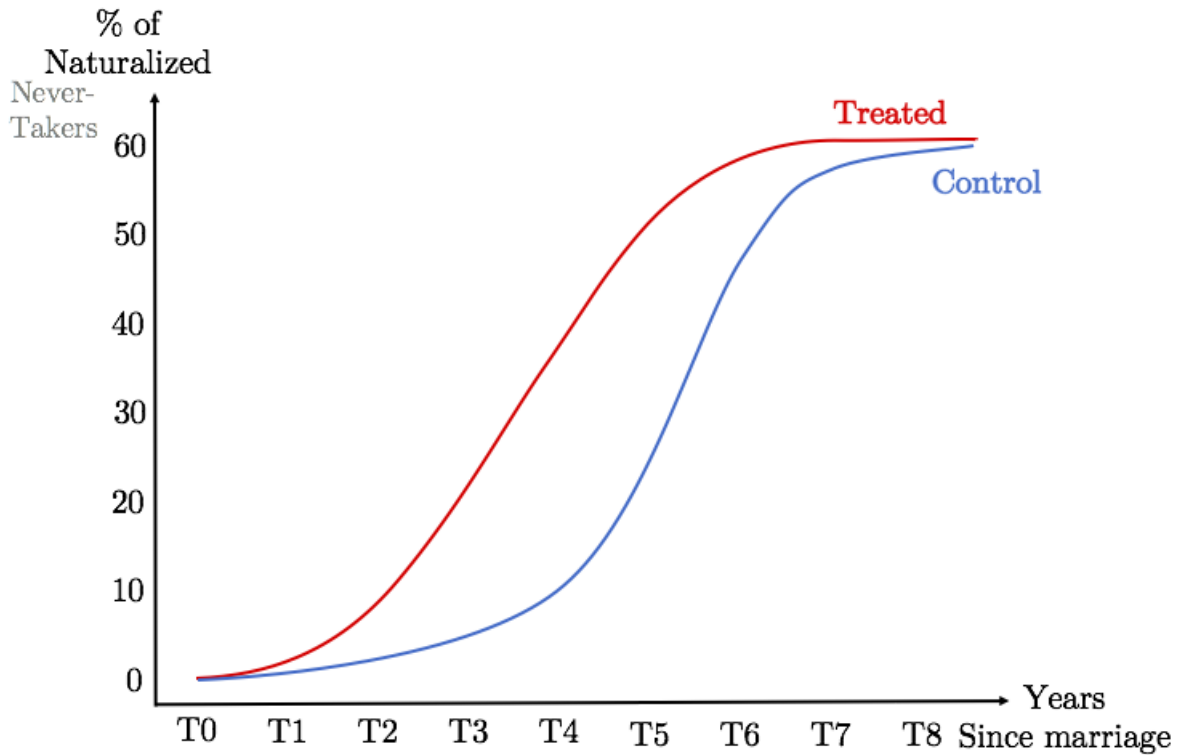
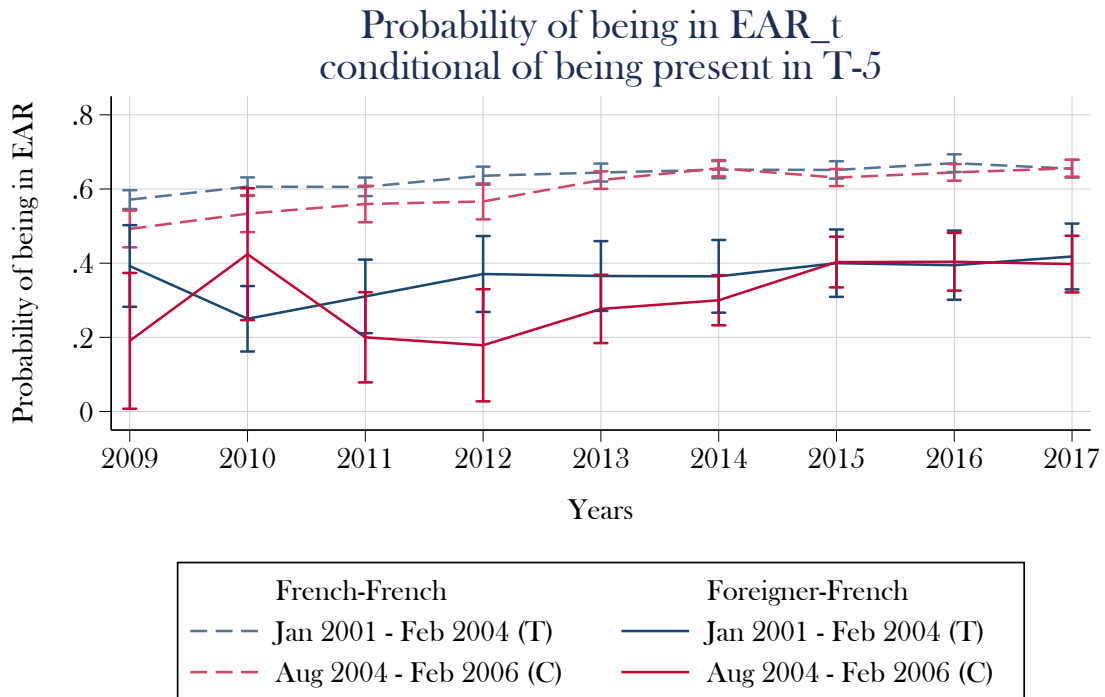
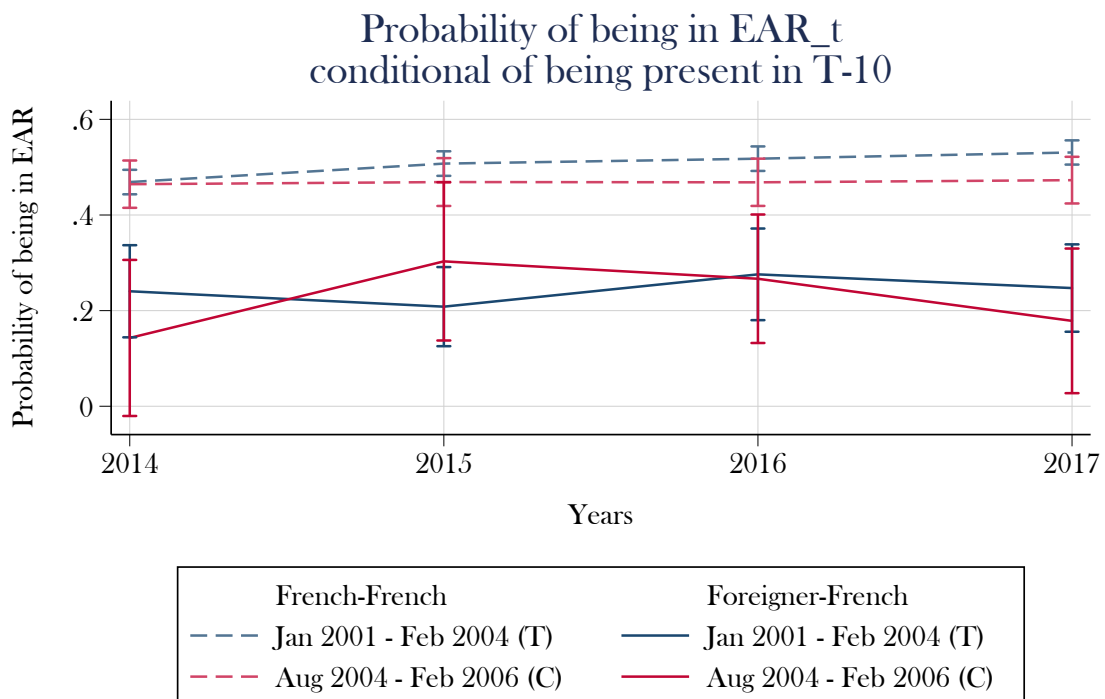


Fig. A.2. With delay and defiance

Appendix B. Sample Composition



E.g Probability of being observed in 2009 for Fr-Fr marriage in treated and control group is around 50% conditional of being in the 2004 census. The same for For-Fr marriage is around 20% in the treated group and 38% in the control group. The differences are not statistically sig.



E.g Probability of being observed in 2014 for Fr-Fr marriage in treated and control group is around 40% conditional of being in the 2004 census. The same for For-Fr marriage is around 20% in the treated group and the control group. The differences are not statistically sig.

Fig. B.1. Sample Composition

Figure B.1 suggest that there is no differential attrition rate between the early-treated and late-treated group. The upper (lower) panel shows that the probability of being in the population census 5 (10) years after being observed in a given year t is similar for the early-treated and late-treated group. The following figures show the average number of years in France and the level of education over the years, showing that there are no major changes within the period of interest.

Appendix C. Descriptive Statistics

Table 7: Sample selection

	Foreigners to French	All foreign-born	Difference
Age at Arrival	24.11 (10.19)	17.19 (11.60)	6.92*** (0.18)
Undergraduate or above	0.41 (0.49)	0.36 (0.48)	0.05*** (0.01)
Manual worker	0.28 (0.45)	0.22 (0.41)	0.06*** (0.01)
Employees	0.28 (0.45)	0.29 (0.45)	-0.01* (0.01)
Intermediate Professions	0.19 (0.39)	0.21 (0.41)	-0.02*** (0.01)
Executives	0.17 (0.38)	0.19 (0.39)	-0.02** (0.01)
Origin from Maghreb	0.42 (0.49)	0.39 (0.49)	0.03*** (0.01)
Francophone	0.61 (0.49)	0.56 (0.50)	0.05*** (0.01)
Observations	7,385	10,226	18,061

Table 8: Balancing Test

	Foreigner-French			Foreigner-Foreigner			(7) Diff of Diffs
	(1) Early-Treated	(2) Late-treated	(3) Diff	(4) Early-Treated	(5) Late-treated	(6) Diff	
Age	31.30 (6.14)	33.14 (7.71)	-1.84*** (0.41)	34.80 (8.21)	34.52 (7.67)	0.28 (0.54)	-2.13*** (0.66)
Age Diff.	5.66 (5.26)	5.27 (5.15)	0.38 (0.30)	6.95 (6.07)	5.52 (4.79)	1.43*** (0.36)	-1.05** (0.47)
% of women	0.33 (0.47)	0.33 (0.47)	0.00 (0.03)	0.48 (0.50)	0.44 (0.50)	0.04 (0.03)	-0.04 (0.04)
Prob(Panel)	0.75 (0.43)	0.73 (0.44)	0.02 (0.02)	0.77 (0.42)	0.69 (0.46)	0.08*** (0.03)	-0.05 (0.04)
Full-time	0.65 (0.48)	0.69 (0.46)	-0.04 (0.03)	0.63 (0.48)	0.68 (0.47)	-0.05 (0.04)	0.01 (0.05)
No of hours	1140.5 (690.6)	1178.6 (688.9)	-38.1 (45.2)	1205.2 (665.6)	1278.5 (725.0)	-73.3 (55.7)	35.3 (71.5)
Annual earnings	12264.5 (10310.7)	13337.2 (10008.5)	-1072.7 (664)	13459.0 (10445.2)	14470 (11329.1)	-1011 (872.2)	-61.8 (1079.9)
Observations	531	768	1,299	342	588	930	2,229

Appendix D. Placebo Analysis

Figure D.1 shows the differential naturalization rate between early-treated and late-treated groups when changing the reform timing to random dates. The top left panel corresponds to the actual date of the reform, July 2006 and is exactly the same as Figure 3. The top-right panel of Figure D.1 shows the differential rates under the assumption that the reform occurred in July 2008. In the bottom left and right panels, the reform date is assumed to be in July 2010 and 2012 respectively³⁰. There seems to be no significant differential naturalization rates under the three placebo scenarios.



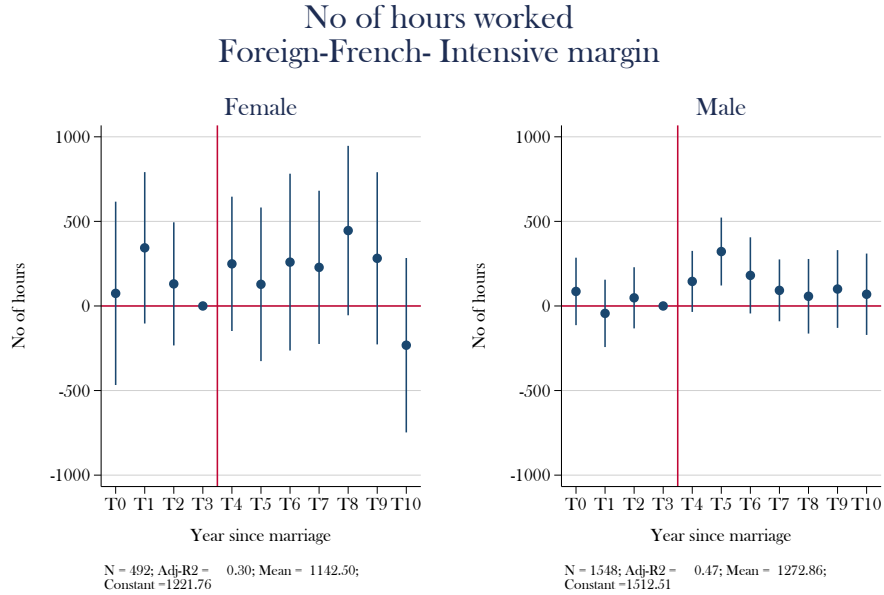
Excluding Europeans

Fig. D.1. Placebo: Difference in naturalization rate with different reform dates

³⁰Choosing a more recent reform date restricts the number of periods after marriage that can be observed in the data, given that the latest year for which population census data is available is 2016.

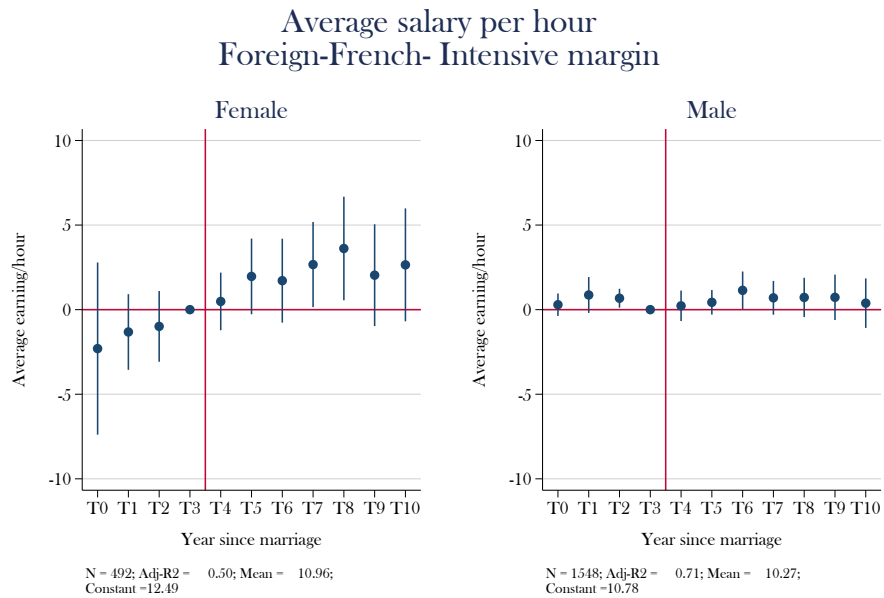
Appendix E. Heterogeneity Analysis & Mechanisms

E.1. Decomposition by Gender



Simple regression with only foreign-french marriage. With Individual FE.
Clustered SE. Missing values not taken into account

Fig. E.1. Number of hours worked by gender



Simple regression with only foreign-french marriage. With Individual FE.
Clustered SE. Missing values not taken into account

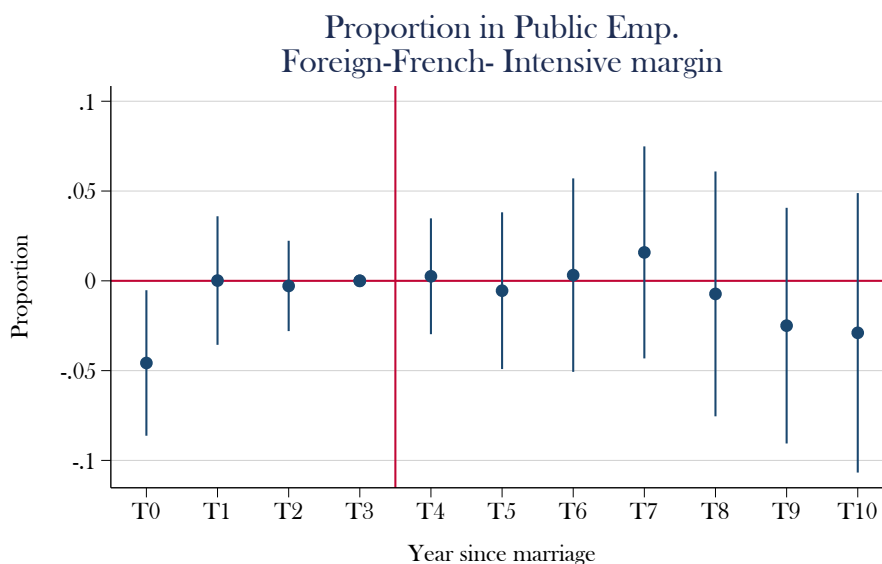
Fig. E.2. Hourly wages by gender

E.2. Labor market access

Table 9: Diff-in-Differences

	(1)	(2)
	Full-time emp.	Public sector emp.
Post x Treat	0.05 (0.07)	0.03 (0.03)
Observations	3,238	3,238
Adj R-squared	0.34	0.59
Ind. FE	Yes	Yes
Mean	0.740	0.0386

The table present the difference-in-differences coefficient. The pre-period consist of the first three years of marriage (T0 - T3) and the post-period is defined as time periods beyond the third year of marriage (T4 - T10). Results are conditional on working in the pre-treatment period. Standard errors clustered at the individual level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.



Simple regression with only foreign-french marriage. With Individual FE.
 Clustered SE. Missing values not taken into account
 N = 2237; Adj-R2 = 0.62; Mean = 0.04; Constant = .04

Fig. E.3. Public sector employment

E.2. Informal sector

Table 10: Construction sector

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Construction			Non-Construction		
	Net annual earnings	No of hours worked	Hourly wages	Net annual earnings	No of hours worked	Hourly wages
Post x Construction	7,140.29*** (2,220.83)	496.13*** (141.67)	1.03 (0.84)	1,607.99 (1,187.22)	49.82 (69.17)	0.94** (0.47)
Observations	220	220	220	1813	1813	1813
Adj R-squared	0.63	0.51	0.56	0.65	0.44	0.62
Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes

Clustered standard errors at the individual-level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The pre-period consist of T0 - T3 and the post-period is defined as T4 - T10.

Appendix F. Divorce

In this section, I explore the effect of the 2006 reform on divorce. There are different factors that might come into play when analyzing the effect on divorce rates. First, the reform aimed at fighting against fraudulent marriage,³¹ and by definition, these are more likely to end in divorce once the nationality is obtained. This would result in an increase the divorce rate due to a higher separation rate among the treated group after obtaining the nationality.

Additionally, the effect of the reform on the late-treated group couples' incentive to remain or separate can be two-fold. First, the additional “burden” of a longer waiting period might induce the couples in the late-treated group to divorce more. However, as explained in section 2, given that the naturalization process through the marriage channel remains the relatively easiest channel despite the longer waiting period, these couples might instead have the incentive to stay longer in the couple. This would lead to a reduction in divorces among the late-treated group and a net positive effect of naturalization on divorce rates. Finally, better labor market outcomes due to naturalization might in themselves lead to higher divorce rates. In all, one expects to find a positive effect on divorce, not necessarily attributed to fraudulent marriages.

In order to understand the general effect of naturalization on the divorce rate, equation 2 and 2b are estimated with Y as a dummy for whether individual i is divorced or not at time t . Figure F.1 shows the dynamic results of a difference-in-differences analysis on the probability of being divorced. This result tend to confirm the positive effect of the reform on divorce rates.

Accounting for year trends in this case is more complex than in the main analysis since divorce is a joint decision in the couple. Hence, it is not clear whether the relevant never-treated group should be french married to french citizens or instead, foreigners married to foreigners. Figure F.2 shows the dynamic results for the triple difference estimation for both never-treated group. The left panel shows the results when compared to french married to french couples and the right panel shows the equivalent when the never-treated group are foreigners married to foreigners. These

³¹These are considered as marriages for the sole purpose of obtaining the nationality

suggest that the result on divorces are sensitive to the choice of the comparison group. Taken together, it is unclear if the reform had a positive effect on divorce rates.

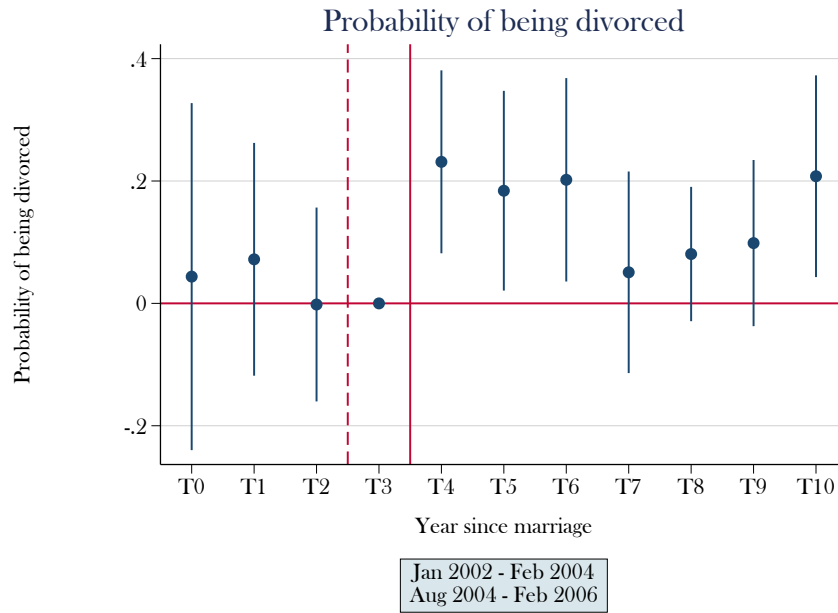


Fig. F.1. Difference in divorce rates

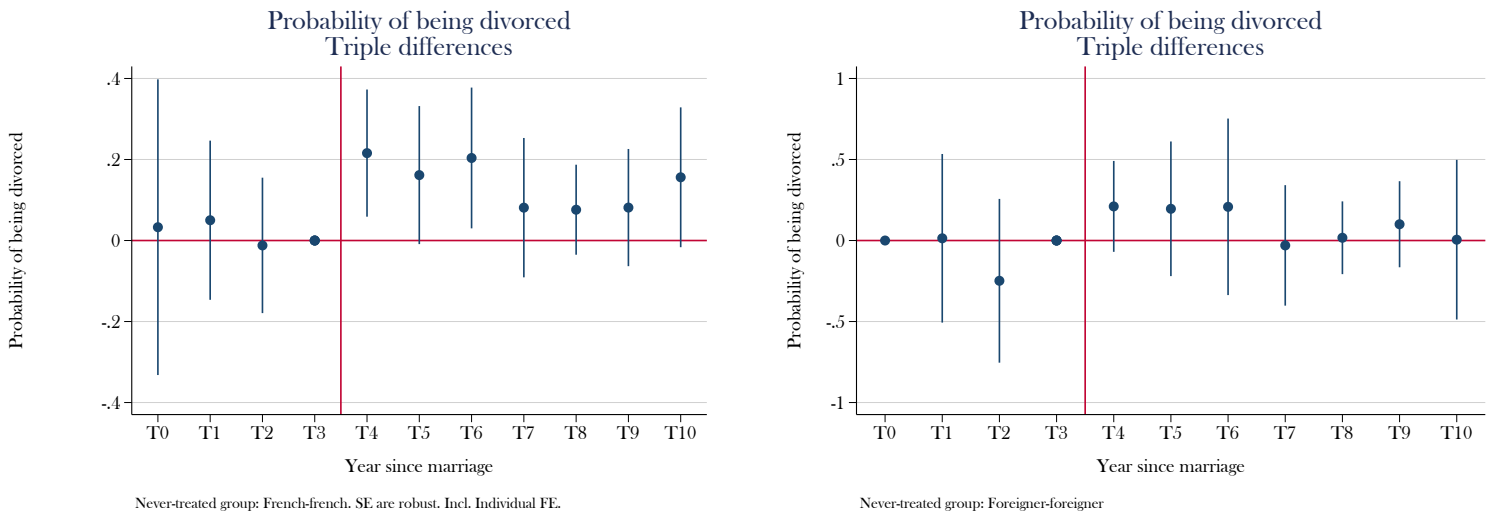


Fig. F.2. Divorce: Never treated group as (a) French married to French, (b) Foreigners married to foreigners