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ABSTRACT

Fertility Implications of Policy Granting Legal Status Based on Offspring's Nationality

We examine the fertility impact of a change in immigration policy granting temporary legal status to undocumented immigrants based on their offspring nationality. The policy, intended to facilitate family reunification, was enacted in a 2011 Royal Decree in Spain. It recognized the ability for undocumented parents to become temporary legal residents if they had a Spanish child under the age of 18. Using data from the Spanish Labor Force Survey for the 2007 through 2016 period, along with a quasi-experimental approach that exploits the change in legal residency eligibility requirements, we show that the 2011 Royal Decree increased fertility among individuals potentially affected by the reform by approximately 32 percent.

JEL Classification: J13, J15, K37

Keywords: immigrants, legalization, fertility, Spain

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1. Introduction

This paper examines the fertility impact of an immigration policy enacted in Spain in 2011 that grants migrants legal status based on the nationality of their offspring. Immigrant women are generally mothers at an earlier age than their native-born counterparts, and they usually have more children (OECD 2015). In Europe, gross birth rates of the immigrant population were on average 16 newborns per 1000 non-citizens in 2017, compared to about 9 births per 1,000 inhabitants among the native population. In Spain, even if immigrant birth rates have been on the decline since 2008 (from almost 20 to about 16 births per 1000 immigrants), births to non-citizens still more than doubled births to Spanish nationals in 2017.[1] These differential fertility patterns are, at times, considered beneficial from the point of view of the sustainability of the Social Security system in the context of an aging population (Gonzalez *et al*., 2009). However, they can also be perceived as a threat to national identity (Davis and Deole, 2015).

At the same time, widening social and economic differences between the developed and developing world continue to stimulate migration, especially illegal migration. In the European Union, approximately 600,000 third country nationals were found to be illegally present in 2017 – 44,000 of whom were residing in Spain. This figure may, nonetheless, understate the total number of unauthorized migrants, as "only persons who are apprehended or otherwise come to the attention of national immigration authorities are recorded in these statistics" (EUROSTAT, 2019). In the case of Spain, by subtracting the number of valid residence permits from the immigrant population recorded in local population registers (Pinyol and Cebolla-Boado, 2011), we estimate a population of approximately 300,000 irregular immigrants in 2018.[2] Even if the number of irregular migrants has declined to

[1] See gross birth rates by European country and citizenship in Table A.1.
[2] Table A.2 shows estimated irregular immigrants from 2009 to 2018. See Serrano Sanguilinda *et al*. (2017) on the accuracy of Spain's population registers.

approximately half its size in 2009, immigration is still considered as one of the three most important problems in Spain by almost 15 percent of the population (CIS, 2018). Recent work even documents a clear association between the inflow of less educated immigrants and a vote shift towards nationalist political parties in Europe (Moriconi *et al.*, 2018). Hence, understanding how immigrant fertility responds to immigration policy is crucial in illuminating immigration debates.

This paper uses data from the Spanish Labor Force Survey for the 2007 through 2016 period to study the impact of a new immigration policy introduced in 2011 on migrant women's fertility. With the aim of promoting orderly migration flows and the regularization of families, the 2011 Royal Decree allowed undocumented parents to become legal residents if they had a Spanish child under the age of 18. However, although the main objective was to protect these children, the policy may have unintentionally induced eligible migrants to have children. We use a quasi-experimental approach that exploits the change in legal residency status available to eligible migrants to gauge the fertility impacts of the new policy. Specifically, we rely on a sample of women 16 to 45 years old, and proxy for their likely undocumented immigrant status. Our *treatment group* is composed of women from eligible or treated countries, and our *control group* is composed of women from non-eligible European countries, other than the EU-15 (less comparable to the treated group). Using a difference-in-differences approach, we show that the 2011 Royal Decree increased the fertility of eligible migrant women potentially affected by the reform by 10 percentage points or 32 percent. This impact is not driven by pre-exiting differential trends in childbearing among migrants in our treatment and control groups. Furthermore, it proves robust to the use of alternative control groups and model specifications, and it is seemingly the result of a fertility increase on the part of partnered women and women who were already in Spain when the Royal Decree was enacted, as opposed to single mothers or new arrivals.

To our knowledge, this is the first paper to look at the fertility impact of immigration policy granting undocumented immigrants legal status based on the nationality of their offspring. Previous literature has looked at the impact of increased migration enforcement in the United States (Amuedo-Dorantes and Arenas-Arroyo, 2018), as well as to the impact of granting birthright citizenship in Germany (Avitabile *et al*., 2013; Avitabile *et al*., 2014). However, to our knowledge, how migrant fertility might respond to the granting of legal status on the basis of the offspring's nationality has not been gauged. While the policy makes sense if the intent is to regularize the status of undocumented parents in mixed-status households with Spanish citizen children, it is crucial to understand its unintended consequences on migrant fertility.

The analysis herein also contributes to a more extended literature analyzing fertility behavior. The 2011 Royal Decree reduces the price of having children –after all, having a Spanish-born child grants legal status, which has been shown to increase future employment and earnings prospects (*e.g.* Banzak, 2016). In a Beckerian framework (Becker, 1960; Becker and Lewis, 1973; Becker and Tomes, 1976), reductions in the price/cost of having children are expected to increase fertility.[3] A number of empirical studies have shown that to be the case by gauging the impact of financial incentives of the tax system and child subsidies (Milligan, 2005; Cohen *et al*., 2013), or the fertility effect of the availability of contraceptive measures or abortion legalization (Ananat and Hungermat, 2007; Ananat *et al*., 2007).

Finally, the analysis also informs a broader literature assessing the impact of migrant regularizations. This literature includes studies focused on the impact of regularizations on employment and wages (Kossoudji *et al*., 2002; Kaushal, 2006; Devillanova *et al*., 2018), schooling (Amuedo-Dorantes and Antman, 2017), remittances (Amuedo-Dorantes and

[3] A decrease in the opportunity cost of having children brings about both a substitution and an income effect (Hotz *et al*., 1997). As assumed by Becker (1960), the empirical literature has consistently found small income effects, whether positive or negative (Hotz and Miller, 1988; Cohen *et al*., 2013).

Mazzolari, 2010), criminal behavior (Pinotti, 2017), and consumption decisions (Dustman *et al*., 2017), among many other outcomes. Our focus in on migrant fertility.

This study is organized as follows. Section 2 discusses the institutional framework, with a detailed description of the 2011 Royal Decree and how Spanish-born children with immigrant parents can acquire the Spanish nationality. Section 3 provides a theoretical framework and testable predictions. Section 4 describes the data and some descriptive statistics, and Section 5 discusses the methodology employed. Section 6 presents our key findings, along with a number of identification and robustness checks targeting the mechanisms through which the Royal Decree might have impacted migrants' fertility. Section 7 concludes the study.

2. Institutional Framework

2.1 The 2011 Royal Decree

In 2011, the Spanish government modified the requirements to qualify for legal status among non-EU nationals through the Royal Decree 557/2011. As stated in the explanatory memorandum, the aim of the reform was to promote orderly migration flows and avoid irregularity. One of its main changes was to grant outright temporary legal status to undocumented immigrants who were parents to a Spanish child.

Under the prior regime, which had been in place since 2006 (Royal Decree 2393/2004), there were three channels through which undocumented immigrants could obtain temporary legal status (Sabater and Domingo, 2012). The first one was through the so-called *labor settlement*, which required having lived in Spain for at least two years and having worked illegally for a year (it implied reporting the employer to the authorities). The second channel was through the so-called *social settlement*, which required having lived in Spain for three years, having a future one-year labor contract, and a positive report of having developed social links within the community originating from local authorities. Finally, there was the

so-called *family settlement* channel, which granted temporary legal status to non-nationals whose parents were originally Spanish. These three channels provided a *de-facto* permanent regularization mechanism, aimed at avoiding EU criticism (Baldwin-Edwards, 2014).[4] While the granted status was temporary in nature, immigrants could adjust their status to permanent after 5 years of continued legal residency in Spain (Sabater and Domingo 2012). Effectively, the 2011 Royal Decree extended its predecessor, introducing the possibility of obtaining legal status for parents of a Spanish child. Our aim is to understand how the new regulation might have impacted migrant fertility.[5]

At this point, it is worth noting that EU-nationals already enjoyed legal residence through the EU membership; therefore, they are not the group targeted by the reform.[6] Rather, the groups targeted by the reform were migrants from Morocco and Senegal in Africa; Argentina, Bolivia, Brazil, Colombia, Ecuador, Honduras and Paraguay in Latin America; and China and Pakistan in Asia. According to Sabater and Domingo (2012), who analyzed confidential data for Barcelona, between 24 percent (*labor settlement*) and 29 percent (*social settlement*) of temporary settlement permit holders lapsed back into irregularity a year later.

Figure 1 shows the number of applications and concessions of *family settlement* between 2006 and 2014.[7] As can be observed therein, after the 2011 Royal Decree, the number of applications and concessions increased not only on the first year of its implementation, which would be due to parents with children born before the reform, but also

[4] The Royal Decree 2393/2004 also grants the Spanish residence to those undocumented immigrants without criminal records who were living in Spain between February and May 2005 and prove being registered in a Spanish municipality before August 2004 and have a work contract (Levinson, A., 2005). Between February and May 2005, Spain regularized 575,000 immigrants (Larramona and Sanso-Navarro, 2016) in its largest regularization process ever. Northern EU criticisms towards these large-scale amnesties in Southern Europe led Spain to establish a permanent mechanism (Brick, 2011).

[5] The 2011 Royal Decree also reduced the required duration of prior unauthorized work from one year to six months to qualify for the so-called *labor settlement*. Later on, we examine if changes in the requirements for obtaining temporary legal residence through the so-called *labor settlement* affect our main results.

[6] Citizens from newest EU accession countries of Romania and Bulgaria needed an additional procedure to work as employees (not to be self-employed) until January 1st, 2014. In Table 6, we show that our results hold for the 2010-2013 period.

[7] See Table 1 for further details.

in the following years. It could be interpreted as first evidence for the hypothesis that the 2011 Royal Decree increased fertility among undocumented immigrants.

Finally, in 2012, the Spanish government restricted undocumented immigrants' free access to public health care. However, it contemplated some exceptions: (1) emergency care, (2) pregnancy and birth, and (3) health care for children. In addition, some autonomous communities decided to apply alternative reforms to ensure non-residents' access to free public health care. Therefore, this latter reform should not have impacted fertility.

2.2 Spanish Nationality: The Case of Immigrant Children Born in Spain

The Spanish Civil Code determines under which circumstances an individual can acquire the Spanish nationality. In general, there is no birthright citizenship. Children born in Spain from immigrant parents are not necessarily Spanish. Spain grants nationality based on the principle of *ius sanguinis*. That is, regardless of the place of birth, a child is Spanish if at least one of the parents is Spanish. However, in some cases, the principle of *ius soli* (birthright citizenship) can be applied. According to the Civil Code art.17, children born in Spain of immigrant parents can acquire the Spanish nationality in the following cases: (a) if at least one of the parents was born in Spain; (b) if both parents are stateless; or (c) when the parents' countries of nationality do not grant nationality to the children. This is the case of children born in Spain from parents with nationalities from the following countries (henceforth, *treated* countries): Argentina, Belarus, Brazil, Cabo Verde, Colombia, Costa Rica, Cuba, Guinea Bissau, India, Pakistan (Pakistani born outside of Pakistan), Panama, Paraguay, Peru, Portugal, Sao Tome, Principe, Uruguay, Senegal (Senegalese mother and father from another country of those included in this list), Switzerland, Palestine and Sahara (because of stateless parents), Venezuela (father or mother of Venezuela, but not both) and Morocco (Moroccan mother and stateless father or Moroccan mother and father from some

of the previous countries).[8] In addition, when immigrant children born in Spain do not fulfill any of the above requirements to be Spanish, they can be granted citizenship after one year of continued legal residence in Spain (Civil Code art. 22). Note that this requires that the parents be legal residents; otherwise, the child cannot obtain legal resident status. Therefore, this channel does not apply to children with undocumented parents.

Notwithstanding, the perceived view following the 2011 Royal Decree was that Spain grants nationality based on the principle of *ius soli*. Therefore, undocumented immigrants with nationalities other than the mentioned above could have responded to the policy, even if they did not qualify for temporary legal status.[9]

3. Theoretical Framework and Testable Predictions

We have discussed how, following the passage of the 2011 Royal Decree, undocumented immigrants who were the parents of a Spanish child could apply for temporary legal status. We assume that having legal status, even of a temporary nature, has important economic consequences: (1) it gives access to better paying jobs, and (2) it opens the door for permanent residence status and even citizenship (Bansak 2016). We hypothesize that these economic incentives may lead to an increase in fertility among eligible migrants. We can formalize this hypothesis using a standard Beckerian framework (Becker, 1960; Becker and Lewis, 1973; Becker and Tomes, 1976), in which parents obtain utility from the number of children *n* and the consumption of all other commodities *c*. We assume that all children increase parental utility, whether they are the first Spanish child (f) or not (m) (note that $n = f + m$). Parents maximize their utility $\mathrm{U} = \mathrm{U}(n, c)$ subject to a budget constraint: $I = n * p_n + c * p_c$, where *I* stands for income, p_n is the unit price of children, and p_c is the unit

[8] Children of Bolivians, Chileans an Ecuadorians born in Spain before 2009, 2008 and 2005, respectively, are Spanish. The reason is that the constitution of these countries changed so that they began to grant the nationality independently the birthplace of the child after those dates.

[9] A number of legal resolutions show that people with nationalities from countries other than the treated countries applied for their children's Spanish nationality when, in fact, the children were not eligible.

price of the composite commodity. For eligible migrants, income increases when they have a Spanish child after the enactment of the 2011 Royal Decree to: $I + \delta * I * f = f * p_n + m * p_n + c * p_c$. Therefore, the new policy lowers the unit price of having the first Spanish child, which becomes $\pi_f = p_n - \delta * I$.

In this deterministic model, if children are normal goods, the reform will increase the number of first Spanish children, unambiguously raising fertility. However, if parental time decisions are taking into account the higher potential wage of eligible migrants following the reform, income and substitution effects will be operating in opposite directions. Increased wages mean not only more income and more children through an income effect, but also increased opportunity costs for the time devoted to children through a substitution effect. As such, the net fertility impact of the reform will depend on the relative size of both effects and remains an empirical issue.[10]

4. Data and Descriptive Evidence

4.1 Data Considerations

To evaluate the impact of the 2011 Royal Decree on fertility, we use data from the 2nd quarters of the Spanish Labor Force Survey (Encuesta de Población Activa, EPA, Spanish Statistical Institute) spanning from 2007 to 2016.[11] The EPA collects data from 65,000 families (about 160,000 individuals) each trimester, and provides demographic, economic and educational attainment data for each member of the household.

Information on nationality and country of birth allows us to identify those individuals who would have been potentially affected by the 2011 Royal Decree. These individuals were nationals from the treated countries noted in Section 2.2. If they have a Spanish child and

[10] We believe that the reform entails no change in the unit price of child quality, given that these children were Spanish citizens also before the reform. See Becker and Lewis (1973) and Avitabile *et al*. (2014).
[11] The reason why we do not use pre-2007 data is that Romania and Bulgaria joined the European Union in 2007. Therefore, using data from 2007 we make sure that there are no changes in legality in our control group.

they are themselves undocumented, they could apply for legal residence through the so-called *family settlement* criterion. In principle, only undocumented immigrants would be interested. Unfortunately, since the EPA does not contain information on migrants' legal status, our treatment group –composed of individuals with nationalities from the eligible countries,[12] might contain both undocumented, as well as some legal migrants. Note, however, that the inclusion of some legal migrants in our treatment group would, in any case, result in a lower-bound estimate of the fertility impact of the reform.

It is also worth noting that, unaware of which nationalities qualified for the immigration status adjustment, undocumented immigrants from non-qualifying nationalities might have responded to the reform by having children while in Spain. For that reason, the cleanest control group is that composed of migrants who are clearly legal, as would be the case with those from EU nations other than the EU15 countries[13] –a group we exclude given their similarity to Spaniards rather than to the undocumented migrants targeted by the policy (our treatment group). Nevertheless, in our robustness checks, we experiment with alternative control and treatment groups that yield alike results. Figure 2 details how we group nationals and immigrants in our study.

In sum, our main sample is composed of immigrant women residing in Spain and who are between 16 and 45 years old. We exclude students since they would likely be legal residents –a requirement to obtain a non-compulsory education in Spain. In addition, we focus on migrants who arrived after the 2005 regularization, since most of those arriving before that date should be legal and unaffected by the 2011 Royal Decree.

[12] Note that individuals from Principe and Sao Tome are not included in the treatment group since they are not identified in the EPA. Additionally, although Portugal and Switzerland are among the treated countries, they do not belong to the treatment group because they are for sure legal and, therefore, not affected by the reform.

[13] The control group is composed of people with nationalities from the following countries: Bulgaria (2007), Cyprus (2004), Slovenia (2004), Estonia (2004), Hungary (2004), Latvia (2004), Lithuania (2004), Poland (2004), Czech Republic (2004), Slovakia (2004) and Romania (2007). Note that the year of entry in the EU is in parenthesis.

At this juncture, it is worth noting that an alternative data source to study fertility are the Spanish Vital Statistics, which offer information on parents' and children's country of birth. Unfortunately, the data only informs about women who have already become mothers; consequently, we are unable to gauge the impact of the policy on the childbearing decision of eligible women. To utilize such data, we would need to conduct the analysis at an aggregate level, after estimating fertility rates for each mother's country of origin. Furthermore, the Vital Statistics lack information on mothers' time in Spain and, as such, we would be unable to exclude from the sample those already present during the 2005 regularization.

4.2 Outcome of Interest

The EPA provides individual data on all household members and their relationship to the household head. Therefore, we have information on whether women in our sample are living with their partner, husband, parents or children, as well as on their birthplace and nationality. Using this data and exploiting information on the children's age, we can create a dummy equal to 1 if the woman has a child born in Spain in the current year.

Unfortunately, the incidence of yearly births is rather low given the survey nature of the data. As a result, we cannot model the likelihood of having a child in Spain in a given year following the policy enactment. To overcome this limitation, we examine, instead, the probability of having a child born in Spain, while accounting for the number of children. If the probability of having a (new) baby in Spain increased with the law, the probability of having at least one child should have increased as well. In addition, as a robustness check, we also model our outcome focusing on new mothers,[14] as well as experiment with other outcomes, including (1) having a child born in Spain who is less than 5 years old, and (2) having a child born in Spain in the past 2 years, to ensure the estimated impacts are consistent across fertility measures. All variables are defined in Table B in the appendix.

[14] As we shall discuss, our main finding proves robust to this alternative model specification.

4.3 Descriptive Statistics

Table 2 reports summary statistics for women in our sample, composed of 7,283 immigrant women of childbearing age (16 to 45 years old) who are not students, and who arrived in Spain after 2005. We split the sample in two groups: a *treatment group* composed of women from eligible or treated countries, and a *control group* composed of women from European countries, other than the EU-15.[15]

As can be observed in Table 2, our control variables display similar values across both groups prior to 2011; nevertheless, they significantly differ with regards to their fertility. That said, although the probability of having a child born in Spain and the average number of children born in Spain were both larger for migrants in the treated group prior to the 2011 Royal Decree, we later on show that the fertility trends exhibited by both groups prior to 2011 were not significantly different from each other. Additionally, we perform a variety of robustness checks using alternative control and treated groups.[16] The percentage of women with a child born in Spain and a child born in Spain less than 5 years old is very similar for both treatment and control groups prior to the reform since we restrict the sample to those arriving after 2005 and the period prior to the reform runs from 2007 to 2011.

Does the 2011 Royal Decree appear to have significantly changed the childbearing propensities of migrants in the treated and control groups? Figure 3 addresses that question from a purely descriptive point of view. The shares of migrant women with a child born in Spain among women in the treatment and control groups exhibited similar trends prior to the reform. However, the share jumped exclusively for women in treatment group after the 2011 Royal Decree, whereas it continued the trend already exhibited prior to the reform for women

[15] See Appendix C for further information on the number of observations per country before and after the reform. As can be observed in this table, the proportion of countries remain similar before and after the passage of the 2011 RD, suggesting that there were not significant compositional changes.
[16] Table C in Appendix shows summary statistics for these individuals.

in the control group. As such, Figure 3 is suggestive of the reform having had a fertility effect on qualifying migrants.

Table 3 reports additional evidence by quantifying any pre-existing differences in the propensity to have a child born in Spain among migrants in the treatment and control groups. It also reports preliminary difference-in-difference estimates by comparing the share of migrants with a child born in Spain in the treatment and control groups, before and after the 2011 Royal Decree. According to the estimates in Table 3, the share of migrant women with a child born in Spain in the treatment group rose by about 21 percentage points from before to after the 2011 Royal Decree –an increase statistically significant at the 1 percent level. Fertility also increased for migrant women in the control group, although by a much lower extent (11 percentage points). As a result, the Royal Decree appears to have raised fertility by 10 percentage points. Nevertheless, this estimate fails to account for a number of characteristics potentially affecting fertility. In what follows, we address this shortcoming with a thorough analysis of the 2011 Royal Decree impacts once we control for all such traits.

5. Empirical Methodology

Our objective is to estimate the fertility impact of the Royal Decree 2011, which modified the requirements for temporary residency permits. To that end, we rely on a difference-in-difference approach that compares changes in fertility across groups of eligible vs. non-eligible migrants, before and after the enactment of the Royal Decree. Individuals eligible to benefit from the reform constitute the so-called *treatment group*, whereas individuals from new accession countries to the European Union constitute the so-called *control group*. As noted earlier, the ideal control group would be migrants from those same countries who, nonetheless, already enjoy legal status.[17] Since we lack information on

[17] We considered using women from the so-called treated nations who are married to a Spanish citizen, as they would easily gain legal status. Unfortunately, we lack information on the year they got married. As such, we

migrants' legal status, we include migrants from new accession countries to the European Union, who are clearly legal residents. Nevertheless, like most migrants in the treatment group, migrants in the control group also originate from emerging economies.[18] Specifically, we estimate the following model specification:

(1) $y_{ijst} = \beta_0 + \beta_1 Post_t + \beta_2 Treat_{ij} + \beta_3 (Post_t \, x \, Treat_{ij}) + X'_{ijst}\gamma + \mu_t + \delta_s + \lambda_j + \theta_t t + \varepsilon_{ijst}$

where y_{ijst} is a dummy variable that takes value 1 if individual *i* with nationality *j* in province *s* in period *t* has at least one child born in Spain.[19] $Post_t$ is a dummy variable equal to 1 after the 2011 Royal Decree was enacted; that is, if the observation refers to waves 2012 onward. $Treat_{ij}$ indicates whether the individual is eligible to benefit from the reform –those nationals of countries included in Section 2.2 that do not grant the citizenship to native children when they are born abroad.[20] The control group are European migrants who are clearly legal, but do not form part of the more developed EU-15 countries.

To guarantee that the effect of the 2011 Royal Decree on fertility is not driven by other factors, we control for a rich set of characteristics that could be affecting the decision of having a child. The vector X'_{ijst} contains controls for the respondent's age, years in Spain, since over time immigrants tend to assimilate to natives, marital status, the number of children,[21] an indicator for whether they have a tertiary education and tenure, which could be associated with the legal status. Finally, to control for temporal changes across provinces and nationalities that could be affecting our outcome of interest, such as changes in per capita

cannot know if they were married to the Spanish citizen at the time they decided to have a child. Furthermore, it is likely a nonrandom group of women who marry a Spanish citizen.

[18] In subsequent robustness checks, we also experiment with alternative control groups.

[19] Other outcomes considered in the robustness check section are: have an underage child born in Spain, have a child born in Spain with less than 5 years old, number of children born in Spain, number of underage children born in Spain and number of children born in Spain with less than 5 years old.

[20] Note that individuals from Cabo Verde, Principe and Sao Tome are not included in the treatment group since they are not identified in the EPA. Additionally, although those nationals of Portugal and Switzerland that have a child in Spain have the option of being Spanish, they are not in the treatment group because they are legal and, therefore, not affected by the reform.

[21] The number of children refers to the number of children that the woman had before the last child born in Spain. It includes both, children born in Spain and abroad living with the mother.

income or the adoption of policies impacting fertility patterns, the model incorporates year fixed effects (μ_t), province fixed effects (δ_s), nationality fixed effects (λ_j), and either province-year fixed effects or province specific time trend ($\theta_t t$), depending on the specification.

The parameter of interest is β_3 –namely, the coefficient on the interaction term between $Post_t$ and $Treat_{ij}$. It captures the effect of the 2011 Royal Decree on migrants' fertility. Specifically, it gauges changes in fertility by those potentially affected by the reform relative to those who would not be impacted by that reform (European nationals from countries other than those in the EU15). A positive β_3 would be consistent with the hypothesis that the 2011 Royal Decree induced increased fertility. Equation (1) is estimated by OLS and standard errors are clustered at the country of nationality level.

To ensure that the difference in difference estimates are capturing causal impacts, the assumption of parallel trends must be fulfilled. Namely, trends in fertility would need to be the same for individuals in the control and treatment groups in the absence of the reform (Angrist and Pischke, 2008). This assumption cannot be fully tested. However, similarly to Amuedo and Antman (2016), we check for parallel trends before the reform to prove that the observed deviation after the reform was not pre-existent.

Additionally, we conduct a variety of robustness checks altering the control and treatment groups, as well as excluding potentially legal migrants. The latter is important since the EPA does not contain information on migrants' legal immigration status. Since we are unable to distinguish among legal and undocumented immigrants in our treated group, it is worth to keep in mind that our estimates are likely to constitute a lower bound. Finally, we look at alternative fertility outcomes to ensure the measured impacts are consistent throughout alterative fertility measures.

6. Did the 2011 Royal Decree Impact Migrant Fertility?

6.1 Main Findings

Our main goal is to assess *if* and *how* the 2011 Royal Decree, which granted undocumented parents the ability to become legal residents if they had a Spanish child, might have impacted these individuals' fertility patterns. Table 4 displays the results from estimating equation (1). To explore the sensitivity of the coefficient capturing the impact of the Royal Decree on migrants' fertility patterns, we estimate a number of specifications that progressively add more controls. The first column is a rather basic model with only year, province and nationality of origin fixed-effects. In column (2), we further control for basic demographic traits –namely, age, indicators for whether the individual is married or has a college education, job tenure and the duration of their migration spell in Spain. Finally, in column (3), we include a province-specific time trend; whereas, in column (4), we replace it with province-year fixed-effects.

Regardless of the model specification, it is clear that the 2011 Royal Decree significantly increased migrants' propensity to have a Spanish child. Its impact only strengthened with the inclusion of further controls, rising from an 8 percentage point (25 percent) increase in the likelihood of having a Spanish child in column (1), to a 10 percentage point (32 percent) increase in that likelihood in column (4).[22] Hence, it is apparent that granting parents' residency permits based on having a Spanish child significantly altered the childbearing patterns of migrant women by a non-negligible amount.

6.2 Identification Checks

One of the main threats to identification in our difference-in-difference framework stems from the possibility that the fertility impacts being measured might be capturing pre-

[22] Results remain statistically significant when using bootstrap standard errors with resampling weights (t=5.7731, p-value=0.0200).

existing differential trends in childbearing patterns across eligible and non-eligible migrants. To assess if that is the case, Table 5 conducts a couple of identification checks. *First*, in the top panel, we re-estimate equation (1) including additional interaction terms of our treated group indicator with dummies indicative of up to four years prior to the enactment of the 2011 Royal Decree. In the absence of any pre-existing differential impacts, the coefficients for the four additional interaction terms should be non-statistically different from zero, whereas the estimated coefficient for the true policy indicator should remain statistically significant and of similar sign and magnitude to the one in Table 4. According to the estimates in the top panel of Table 5, none of the coefficients on the additional interaction terms are statistically different from zero, suggesting that the fertility patterns of migrants in our treated and controls groups were not statistically different from each other prior to the enactment of the 2011 Royal Decree. However, these migrants behave differently after the enactment of the Royal Decree. The propensity of eligible migrants to have a child born in Spain rises by 12 percentage points (37 percent) –an amount comparable in magnitude to the estimated coefficient on the last column of Table 4.

As an additional check, we experiment with restricting our sample to the period prior to the enactment of the 2011 Royal Decree and creating a time trend, which we interact with our treated group indicator. If migrants in our treatment group already exhibited a differential childbearing pattern when compared to migrants in our control group before 2011, the coefficient on the interaction term should be statistically different from zero. According to the estimates displayed in the bottom panel of Table 5, there is no evidence of that being the case.

In sum, the results in the top and bottom panels of Table 5 point to the lack of a statistically significant difference in the probability of having a Spanish child by migrants in the treatment and control groups prior to 2011. In other words, there is no evidence of

differential pre-existing trends in the childbearing patterns exhibited by the two groups being compared.

6.3 Robustness Checks

We next conduct a number of robustness checks that address some common concerns. First, we explore if the found impacts are robust to the use of alternative control groups, as well as to changes in the composition of the treated group. This is done in columns (2) through (4) of Table 6.[23] Specifically, column (2) documents how the propensity to have a Spanish child rises by 7 percentage points (21 percent) among our treated group when compared to *all* European migrants. In column (3), we further change the control group to Spanish natives. Still, we continue to find that the 2011 Royal Decree raised the likelihood of having a Spanish child by 7 percentage points (12 percent). Finally, in column (4), we experiment with altering our treatment group. Because many migrants, unaware of the limited nationalities that qualified for legal status by having a Spanish child, might have responded by having a child while in Spain, we experiment with including all foreign-born parents who are not migrants from the EU countries in the treatment group, regardless of their nationality. We continue to find that the reform raised the propensity to have a Spanish child by 9 percentage points (30 percent). In sum, the impact of the 2011 Royal Decree appears robust to alterations in the control group, as well as to the extension of the treatment group to parents from outside the EU countries that do not qualify for the regulated residency permits.

Next, we experiment with restricting our sample to new parents, as they might different incentives and responsiveness to the measure at hand. According to the estimated coefficient in column (5), these parents responded similarly to the ones included in our

[23] Table D in the appendix displays basic descriptive statistics for these three alternative control and treatment groups.

baseline specification, raising their propensity to have a Spanish child by 9 percentage points (56 percent).

In columns (6) through (8), we further try a number of robustness checks aimed at excluding potentially legal migrants from our treatment group. As noted in the Data section, the EPA does not have information on the legal immigration status of migrants. If legal migrants are included in the treatment group, the estimate from the baseline model specification might be potentially downward biased. To assess the degree to which that might be the case, we experiment with alternative specifications of the treated group. First, we exclude individuals who could possibly be legal by fulfilling one of the following criteria: (a) being married to a Spanish native, (b) having a father or mother originally born in Spain, or (c) being born in Spain and having lived in the country for 3 years before turning 18 years old. According to the estimate in column (6), migrants in this newly redefined treatment group are 11 percentage points (34 percent) more likely than migrants from European countries from outside the EU15 to have a Spanish child.

Next, we next experiment with excluding migrants who could have gained legal status through *labor settlement* namely those with more than 6 months of job tenure. The new estimated impact shows that fertility rose by 11 percentage points (29 percent) among this restricted group of eligible migrants –a group more likely to be capturing undocumented immigrants.

Finally, in column (8), we further restrict our treatment group to individuals in couples in which the other person is also a migrant from one of the countries that qualified for legal status in the 2011 Royal Decree. In this manner, we exclude individuals whose partners might have been individuals who would likely be legal and, therefore, provided alternative pathways through which migrants could have earned legal status other than through the conditions established in the 2011 Royal Decree. As can be seen from the estimate in column (8), these

migrants became 15 percentage points (51 percent) more likely to respond by having a child in Spain when compared to alike migrants from European countries from outside the EU15.

The last specification shown in column (9) of Table 6 uses the same control and treatment groups included in our baseline specification in column (1), but restricts the sample to the 2009 through 2014 period. Since their entry in the EU, migrants from Bulgaria and Romania enjoyed legal status after 2007; however, they required a special permit in order to work until 2013. If we focus on the period during which they would have lacked a work permit, even if they were legal, we continue to find evidence of a significant childbearing response to the 2011 Royal Decree. Specifically, the propensity to have a Spanish child increased by 10 percentage points (32 percent) for individuals originating from one of the countries that qualified for legal status under the new Royal Decree, when compared to migrants in the treatment group.

In sum, the estimated fertility impact in Table 4 appears quite robust to changes in the control and treatment groups based on a number of factors ranging from their national origins, likelihood of enjoying a legal immigration status, or the presence of older children in the household.

6.4 The 2011 Royal Decree Impact on Alternative Fertility Outcomes

If the 2011 Royal Decree impacted migrants' childbearing by increasing their likelihood of having a child born in Spain, we should be able to observe evidence of that impact when examining alternative fertility outcomes. To that end, Table 7 displays the estimated impacts that the 2011 Royal Decree appears to have had on a number of fertility outcomes of the treated group, when compared to their counterparts in the control group. Specifically, the new measure raised the propensity to have a Spanish child *less than 5 years old* by 9 percentage points (33 percent), and the probability of having a Spanish child *less than 3 years old* by 4 percentage points (17 percent).

Next, in columns (4) through (6), we examine the impact that the 2011 Royal Decree has had on the overall number of Spanish children that migrants in the treated group report having when compared to their counterparts in the control group. We find that the new fertility criteria established in the 2011 Royal Decree increased the number of Spanish children that qualifying migrants had by 49 percent, by 39 percent in the case of the number of Spanish children less than 5 years of age, and by 16 percent in the case of young children less than 3 years old.

In sum, the estimates in Table 7 confirm that the estimated impact in Table 4 is not unique to how we measure our childbearing outcome but, rather, it is similarly found when using alternative fertility measures.[24]

7. Heterogeneous Impacts and Mechanisms

Once the fertility impacts of the 2011 Royal Decree have been clearly established, we try to gain a better understanding about the mechanisms potentially at work. In particular, we ask ourselves three questions that unveil the type of migrant responsive to the measure at hand. *First*, we inquire about the national origins of migrants responding to the Royal Decree. Is there a particular migrant group driving the results? To that end, Figure 4 depicts how the estimated fertility impact of the 2011 Royal Decree varied as we remove one nationality at a time. It is evident from the figure that no single country origin appears to be driving the results.

Second, we ask ourselves if the estimated fertility impacts are driven by newly arrived migrants, who might have responded to the "fertility call" regulated in the Royal Decree. To that end, in column (2) of Table 8, we exclude migrants who arrived after the enactment of the 2011 Royal Decree. As can be seen therein, we continue to find evidence of a significant

[24] Table E in the appendix displays the results of estimating these models restricting our sample to individuals who did not have other children born in Spain prior to 2011. As can be seen therein, the impacts are similarly present with estimated impacts similar to those obtained in our baseline specification for this group.

increase in the likelihood of having a Spanish child of 11.4 percentage points (35 percent) following the adoption of the Royal Decree. Hence, the impact measured by our baseline (a 32 percent increase) is not driven by new arrivals.

Finally, we explore if the impact occurred among migrants in couples or among single mothers. A long-standing child development literature has spoken about the benefits of being raised in a two-parent household, as opposed to by a single mother (Lundberg *et al.* 2016). Are single mothers the ones responding to the new measure or, rather, are the new children born in Spain residing in two-parent households? According to the estimate in column (3) of Table 8, the Royal Decree did not necessarily raise the childbearing likelihood of single mothers but, rather, appears to have been driven by the response of migrants in a couple relationship.

In conclusion, by allowing migrants from certain origins to gain legal status when having a child born in Spain, the 2011 Royal Decree effectively raised the childbearing propensity of migrants from qualifying nationalities. This impact is not driven by migrants from a particular national origin, by new arrivals or by single mothers.[25] Rather, it appears to have been a unanimous response by all migrants; does not appear to have generated a "call effect" resulting in new migrants coming to the country to have their children born in Spain; and does not seem to have dangerously raised the number of children born in singly-headed households –a trait more likely to be associated to life in poverty.[26]

[25] We also investigated if the 2011 reform had any impact on the age at which mothers had their Spanish children. A reduction on mothers' average age when giving birth to those children would imply that women were moving forward their childbearing, as opposed to overall raising their completed fertility. We performed two different analyses with coincident results (see Table F in the Appendix). First, we explored if the reform had a differential impact on the childbearing of women above and below 30 years of age. We did not observe any significant differences between the two. Second, we gauged the impact of the reform on mothers' childbearing age, and also failed to find an impact. The findings thus suggest that the policy did not significantly altered migrants' childbearing cycle.

[26] Table G displays the estimated impacts when we restrict our sample to migrants in a relationship in which the other partner is also from a country that qualifies for the acquisition of legal status based on having a child less than 18 years of age born in Spain. The effects, using this more restricted sample of migrants less likely to be legal, continue to be significant and of similar magnitude to the impact found in the baseline specification (column (1) of that table).

8. Summary and Conclusions

We study the fertility implications of the 2011 Royal Decree granting temporary legal status to undocumented parents of a Spanish born child. We rely on a difference in difference approach that compares fertility of migrant women from eligible nationalities, to that of alike, but non-eligible, migrant women, before and after the reform. We find that the 2011 Royal Decree significantly raised migrant women's likelihood of having a child born in Spain by 32 percent. The impact is not driven by pre-existing differential fertility trends and appears robust to the use of alternative control groups, to changes in the treatment group, and to the presence of children in the household prior to 2011.

We also study the mechanisms though which the 2011 Royal Decree increased migrant fertility. We find that the effect is not driven by women of a particular nationality. Furthermore, it is not driven by recent migrant women having more children but, rather, by the response of migrant women who were already living in Spain prior to the reform. Finally, the response has not been concentrated among single mothers but, instead, among married women.

We believe these findings are of interest as they underscore the importance given to legal status by undocumented migrants, who respond by having more children, supposedly to qualify for a residency permit. That is, policies granting legal status, even if it is temporary in nature, can generate a significant response on the part of undocumented immigrants –a point to keep in mind by policy-makers to redirect that response to areas in which it might prove positive for the country, as would be the case when countries have below replace rate fertility rates.

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Table 1: Applications and Concessions of *Family Settlement* (2006-2014)

Year	Applications	Concessions
2006	1,199	585
2007	2,823	1,917
2008	1,745	920
2009	1,183	767
2010	1,123	484
2011	12,754	5,728
2012	10,859	11,961
2013	8,518	7,367
2014	7,915	6,447
2006-2010	8,073	4,673
2011-2014	40,046	31,503
Total	**48,119**	**36,176**

Source: Cerezo (2016) and authors' own tabulations.

Table 2: Descriptive Statistics

Variables	Treatment Group		Control Group	
	Pre-RD	Post-RD	Pre-RD	Post-RD
Panel A: Outcomes				
Child Born in Spain	0.24	0.46	0.15	0.29
	(0.43)	(0.50)	(0.36)	(0.45)
Child Born in Spain <5	0.23	0.39	0.14	0.23
	(0.42)	(0.49)	(0.35)	(0.42)
Child Born in Spain <3	0.21	0.28	0.12	0.16
	(0.41)	(0.45)	(0.33)	(0.37)
N. children born in Spain	0.27	0.68	0.16	0.36
	(0.52)	(0.87)	(0.40)	(0.62)
N. children born in Spain <5	0.25	0.48	0.15	0.26
	(0.50)	(0.67)	(0.38)	(0.51)
N. children born in Spain <3	0.22	0.29	0.13	0.17
	(0.45)	(0.50)	(0.35)	(0.40)
Panel B: Controls				
Age	30.45	32.08	29.76	31.56
	(7.14)	(6.85)	(7.70)	(7.00)
Job Tenure	7.46	12.60	8.97	16.22
	(13.98)	(24.92)	(15.88)	(25.88)
Married	0.61	0.65	0.53	0.55
	(0.49)	(0.48)	(0.50)	(0.50)
University Education	0.18	0.19	0.16	0.22
	(0.39)	(0.39)	(0.37)	(0.41)
Number of Children	0.35	0.53	0.21	0.27
	(0.75)	(0.86)	(0.55)	(0.56)
Years in Spain	2.08	5.49	2.18	5.83
	(1.45)	(2.42)	(1.50)	(2.41)
Observations	1,893	2,936	1,076	1,378

Source: EPA 2007-2016 and authors' own tabulations.

Table 3: Difference-in-Differences in the Probability of Having a Child Born in Spain

	Treatment Group			Control Group			DD
	Pre	**Post**	**DT**	**Pre**	**Post**	**DC**	**(DT-DC)**
Child Born in Spain	0.248 (0.432)	0.458 (0.498)	0.211*** (0.018)	0.160 (0.367)	0.271 (0.444)	0.110** (0.016)	0.101*** (0.023)
N	1,893	2,936	4,829	1,893	1,378	2,454	7,283

Notes: The sample is women who are between 16 and 45 years old. The sample is restricted to non-students who arrived in Spain after the 2005 normalization. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. Standard deviations are set in italics, and standard errors are set in bold. All regressions include a constant term. The number of observations is listed on the second row. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: The Impact of the 2011 Royal Decree on Fertility

Key Regressors	(1) Baseline	(2) With Demographic Traits	(3) With Demographic Traits + Province Time Trend	(4) With Demographic Traits + Province-Year FE
Post * Treated	**0.081*** (0.022)**	**0.079*** (0.020)**	**0.092*** (0.018)**	**0.102*** (0.017)**
Year FE	Y	Y	Y	Y
Province FE	Y	Y	Y	Y
Nationality FE	Y	Y	Y	Y
Other Controls	N	Y	Y	Y
Province-Year FE or Trend	N	N	Province-Trend	Y
Dep.Var. Mean			0.323	
Observations	7,283	7,283	7,283	7,283
R-squared	0.165	0.280	0.286	0.327

Notes: The sample is women who are between 16 and 45 years old. The sample is restricted to non-students who arrived in Spain after the 2005 normalization. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. All model specifications include a constant term. Specification (1) includes year, country and nationality fixed effect. Specification (2) adds age, marital status, university education, number of children, work length and years since arrived in Spain. Specification (3) adds province-year time trend. Finally, specification (4) includes province-year fixed effect. Standard errors are clustered at the country of nationality level. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Identification Check: Testing for Parallel Pre-trends

Key Regressors	**Using Placebos for Up to 5 Years Earlier**
Post x Treated	**0.118*** **
	(0.023)
Placebo 2010 x Treated	-0.027
	(0.025)
Placebo 2009 x Treated	-0.018
	(0.036)
Placebo 2008 x Treated	0.048
	(0.057)
Placebo 2007 x Treated	0.005
	(0.029)
Observations	7,283
R-squared	0.327
Key Regressors	**Using a Trend**
Treated x Trend	**0.003**
	(0.009)
Observations	2,969
R-squared	0.290
Year FE	Y
Province FE	Y
Nationality FE	Y
Other Controls	Y
Province-Year FE	Y

Notes: The sample is women who are between 16 and 45 years old. The sample is restricted to non-students who arrived in Spain after the 2005 normalization. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. The model specification includes a constant term, year, country fixed effect, province-year fixed effect, age, gender, marital status, an indicator for university education, number of children, work length and years since arrived in Spain. Standard errors are clustered at the country of nationality level. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Impacts of the 2011 Royal Decree on Fertility – Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Model Specification	**Baseline**	**Control Group: European**	**Control Group: Spanish**	**Treatment Group: Treated and Non-treated Nationalities**	**Excluding Women with a Child Born in Spain Between 1994 and 2011**	**Excluding Potentially Legal Migrants from Treatment Group**	**Excluding Mothers with Tenures > 6 Months**	**Couples**	**2009-2014**
Key Regressors									
Post * Treated	0.102***	0.066**	0.069***	0.092***	0.086**	0.107***	0.113***	0.146***	0.100***
	(0.017)	(0.028)	(0.014)	(0.017)	(0.035)	(0.019)	(0.018)	(0.043)	(0.019)
Observations	7,283	7,982	215,619	10,611	5,402	6,426	4,887	1,777	4,600
R-squared	0.327	0.314	0.490	0.314	0.220	0.343	0.360	0.387	0.306
Dep. Var mean	0.323	0.315	0.578	0.312	0.153	0.318	0.389	0.289	0.315
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Nationality FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Other Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Province-Year FE or Trend	Y	Y	Y	Y	Y	Y	Y	Y	Y

Notes: The sample is women who are between 16 and 45 years old. The sample is restricted to non-students who arrived in Spain after the 2005 normalization. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. The model specification includes a constant term, year, country fixed effect, province-year fixed effect, age, gender, marital status, an indicator for university education, number of children, work length and years since arrived in Spain. Standard errors are clustered at the country of nationality level. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Impacts of the 2011 Royal Decree on Fertility – Different outcomes

Model Specification	(1) Baseline	(2) Child Born in Spain <5 Years Old	(3) Child Born in Spain <3 Years Old	(4) No. of Children Born in Spain	(5) No. of Children Born in Spain <5 Years Old	(6) No. of Children Born in Spain <3 Years Old
Post * Treated	0.102***	0.093***	0.037***	0.213***	0.128***	0.037**
	(0.017)	(0.019)	(0.013)	(0.070)	(0.038)	(0.014)
Observations	7,283	7,283	7,283	7,283	7,283	7,283
R-squared	0.327	0.312	0.248	0.449	0.357	0.264
Dep. Var mean	0.323	0.279	0.214	0.437	0.332	0.228
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Nationality FE	Y	Y	Y	Y	Y	Y
Other Controls	Y	Y	Y	Y	Y	Y
Province-Year FE or Trend	Y	Y	Y	Y	Y	Y

Notes: The sample is women who are between 16 and 45 years old. The sample is restricted to non-students who arrived in Spain after the 2005 normalization. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. The model specification includes a constant term, year, country fixed effect, province-year fixed effect, age, gender, marital status, an indicator for university education, number of children, work length and years since arrived in Spain. Standard errors are clustered at the country of nationality level. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

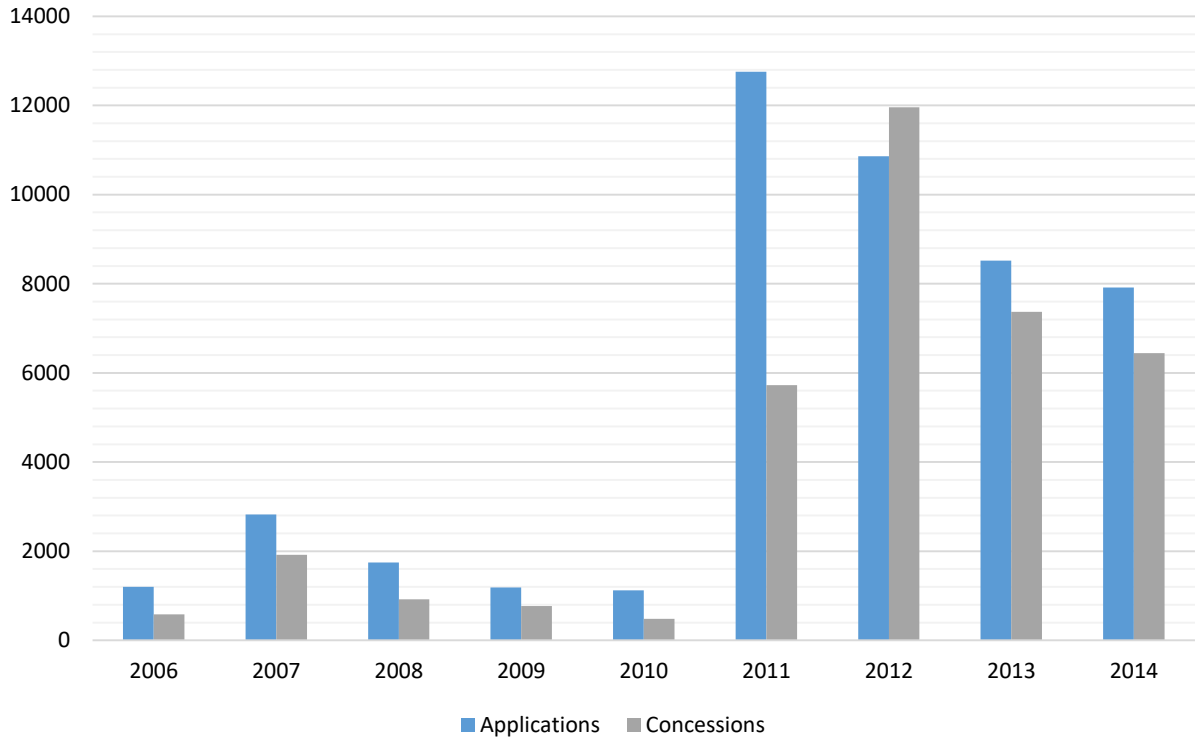
Table 8: Mechanisms

Model Specification	**(1)**	**(2)**	**(3)**
	Baseline	**Excluding Post-2011 Arrivals**	**Single mothers**
Post x Treated	0.102***	0.114***	0.037
	(0.017)	(0.020)	(0.028)
Observations	7,283	6,796	1,799
R-squared	0.327	0.334	0.363
Dep.Var Mean	0.323	0.328	0.105
Year FE	Y	Y	Y
Province FE	Y	Y	Y
Nationality FE	Y	Y	Y
Other Controls	Y	Y	Y
Province-Year FE or Trend	Y	Y	Y

Notes: The sample is women who are between 16 and 45 years old. The sample is restricted to non-students who arrived in Spain after the 2005 normalization. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. The model specification includes a constant term, year, country fixed effect, province-year fixed effect, age, gender, marital status, an indicator for university education, number of children, work length and years since arrived in Spain. Standard errors are clustered at the country of nationality level. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

FIGURES

Figure 1: Applications and Concessions of *Family Settlement* (2006-2014)



Source: Cerezo (2016).

Figure 2: Classification of Individuals in the Sample

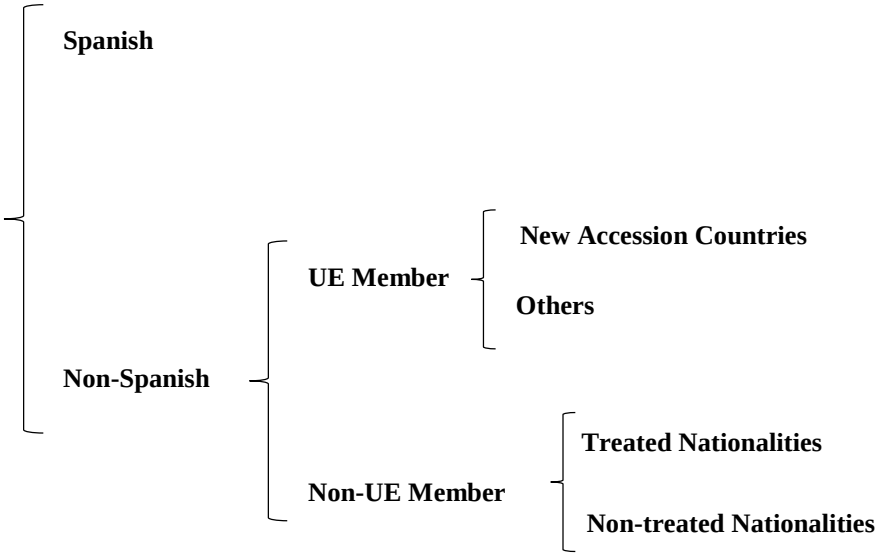


Figure 3: Percentage of Individuals with a Child Born in Spain

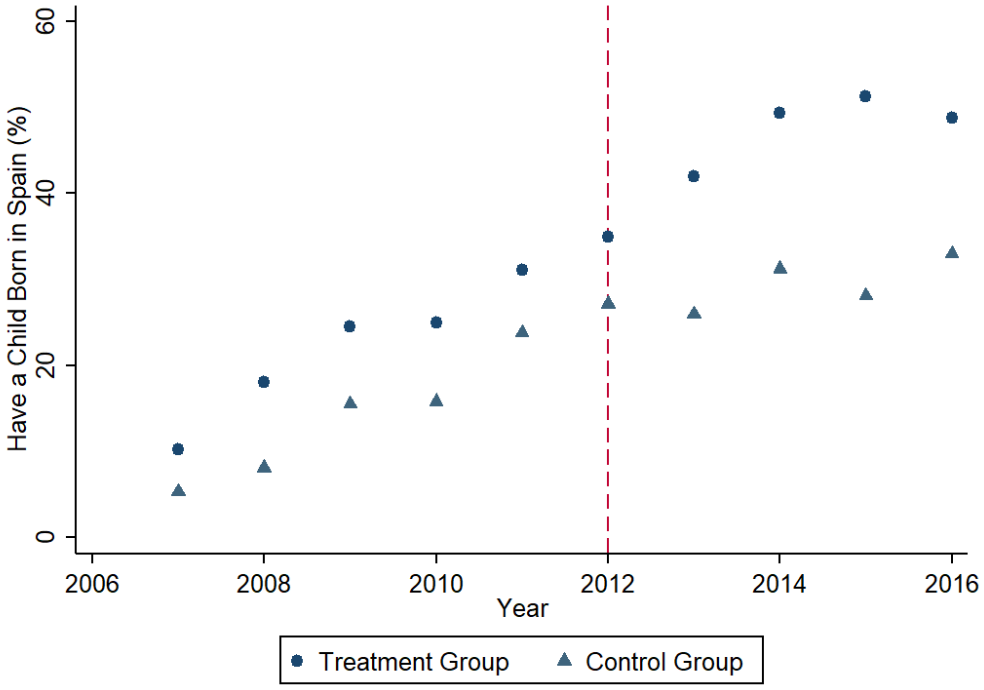
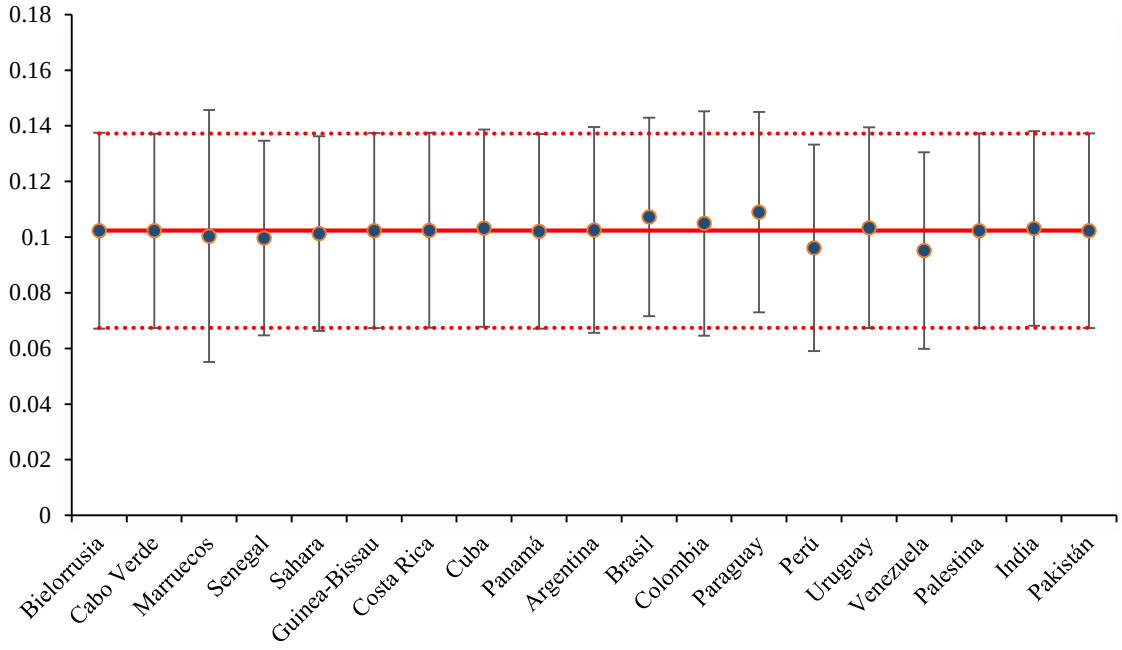


Figure 4: Impacts of the 2011 Royal Decree on Fertility When We Remove One Nationality at a Time



APPENDIX

Table A.1. Gross Birth Rates by Citizenship

	Nationals										Non-nationals									
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Belgium	10.69	10.50	10.51	10.25	10.09	9.85	9.70	9.33	9.20	8.91	22.68	23.07	22.72	22.76	22.71	21.35	22.08	20.98	21.18	21.40
Bulgaria	10.36	10.84	10.18	9.62	9.46	9.18	9.39	9.23	9.19	9.11	19.52	22.81	21.87	19.07	14.42	10.09	8.79	8.90	6.11	6.75
Czech Republic	11.62	11.43	11.28	10.48	10.19	10.01	10.29	10.34	10.54	10.62	6.54	7.31	7.28	7.00	13.60	13.60	13.47	13.69	12.84	13.97
Denmark	11.26	10.78	10.78	9.95	9.70	9.24	9.28	9.42	9.83	9.69	20.52	20.37	20.78	19.66	19.18	18.79	19.32	18.83	20.07	19.92
Germany	7.58	7.41	7.62	7.44	7.56	7.62	7.93	8.02	8.29	8.22	16.07	15.66	18.58	17.72	17.27	16.80	17.06	16.76	19.46	18.50
Estonia	12.62	12.54	12.89	11.90	11.26	10.87	10.92	11.22	11.37	11.16	8.51	7.70	7.14	7.05	7.25	3.41	3.38	4.05	6.78	6.43
Ireland						12.90	12.62	12.21	11.65	11.25						29.24	27.90	26.50	25.89	24.11
Greece	9.47	9.39	9.15	8.60	8.39	8.04	7.97	8.00	8.05	7.68	23.70	23.94	23.09	20.62	17.51	15.43	14.81	14.94	15.71	15.16
Spain	10.07	9.55	9.34	9.13	8.81	8.28	8.36	8.20	7.94	7.53	19.88	18.78	18.61	17.35	17.03	16.69	16.84	16.69	16.83	16.31
France						11.23	11.11	10.74	10.42	10.19						28.30	29.70	29.54	29.08	28.97
Croatia					9.65	9.30	9.29	8.89	8.99	8.87					18.38	16.62	17.39	14.54	12.95	11.54
Italy	8.72	8.49	8.34	8.06	7.82	7.44	7.27	7.04	6.85	6.62	26.98	26.67	25.60	24.80	23.16	20.07	19.40	18.75	18.47	17.83
Cyprus	10.05	10.31	10.19	9.70	10.23	9.74	9.68	9.58	9.77	9.15	18.51	17.11	17.63	17.06	18.22	16.08	17.41	17.40	18.03	17.95
Latvia	12.53	11.49	10.56	10.11	10.90	11.32	12.07	12.31	12.38	11.89	5.46	5.02	4.29	4.32	4.00	4.49	4.59	4.49	4.52	3.86
Lithuania	9.88	10.20	10.01	10.03	10.21	10.11	10.33	10.81	10.65	10.14	12.23	13.65	14.36	16.31	16.15	16.59	18.42	21.95	23.26	17.08
Luxembourg	8.89	9.40	7.32	7.26	7.51	7.58	7.60	7.65	7.42	7.81	14.55	13.69	16.96	15.18	15.80	15.37	14.47	13.97	13.29	12.87
Hungary	9.81	9.54	8.99	8.75	9.03	9.08	9.47	9.42	9.77	9.70	13.83	13.90	11.81	16.43	14.70	7.66	7.93	6.35	7.11	8.10
Malta	9.36	9.43	9.18	9.39	9.15	8.87	8.85	8.91	8.93	8.34	19.18	16.04	13.79	12.76	10.08	16.51	16.82	15.55	15.63	13.55
Netherlands	10.61	10.52	10.45	10.14	9.86	9.58	9.73	9.42	9.44	9.22	23.42	27.98	27.05	26.36	25.66	20.83	21.46	20.31	20.20	19.66
Austria	8.05	7.83	8.04	7.94	7.99	7.95	8.07	8.19	8.31	8.26	20.50	20.37	20.66	19.95	19.48	18.99	18.96	18.47	19.39	18.91
Poland						9.62	9.83	9.70	10.04	10.55						10.61	8.37	11.61	15.28	16.98
Portugal	9.32	8.81	8.95	8.59	8.05	7.52	7.53	7.87	8.01	7.89	23.25	22.79	24.22	22.90	21.01	18.45	18.22	18.43	19.32	19.72
Romania				9.80	10.08	9.49	9.95	10.16	10.14	10.30				0.42	0.68	0.50	21.84	19.83	15.38	18.36
Slovenia	10.59	10.52	10.73	10.44	10.37	9.88	9.87	9.51	9.40	9.35	14.57	14.35	14.93	16.14	16.87	17.63	17.80	18.88	17.52	16.92
Slovakia		11.42	11.25	11.04	10.39	10.22	10.25	10.28	10.61	10.67		0.33	0.45	82.33	0.77	1.20	1.42	7.15	8.62	8.97
Finland	10.87	10.96	10.98	10.73	10.56	10.24	10.01	9.64	9.11	8.65	22.17	22.05	22.43	21.40	21.32	20.85	20.71	20.29	19.49	18.65
Sweden	10.96	11.09	11.31	10.81	10.85	10.76	10.76	10.58	10.62	10.22	24.18	24.04	25.07	24.36	24.51	24.29	23.59	23.42	22.67	22.50
United Kingdom						10.89	10.77	10.66	10.57	10.24						26.35	25.10	24.83	23.60	22.41
Iceland	14.52	14.85	14.56	13.27	13.23	12.58	12.69	11.79	11.35	11.35	22.60	29.12	27.38	25.19	26.02	22.47	20.75	19.63	17.67	14.33
Liechtenstein	7.35	9.29	7.00	8.38	7.88	7.11	7.67	5.96	8.12	6.51	14.87	15.40	13.33	15.73	13.29	13.10	14.47	13.86	13.68	13.45
Norway	11.61	11.62	11.30	10.85	10.71	10.21	10.10	9.93	9.83	9.29	27.24	27.66	26.89	25.69	23.96	23.95	23.20	23.00	22.51	22.18
Switzerland	8.12	8.21	8.29	8.21	8.24	8.18	8.28	8.32	8.28	8.18	16.42	16.33	16.67	16.60	16.57	16.29	16.64	16.59	16.75	16.52

Source: EUROSTAT Fertility and Population Statistics (2019)

Table A.2. Estimates of Undocumented Immigrants in Spain

Year	(1) Non-EU Registered Migrants	(2) Valid Non-EU Residence Permits	(3) Undocumented Migrants: (1)-(2)	(4) Irregularity Rate: (3)/(1)
2018	2,945,005	2,654,292	290,713	0.10
2017	2,794,818	2,578,428	216,390	0.08
2016	2,773,989	2,498,396	275,593	0.10
2015	2,782,534	2,521,670	260,864	0.09
2014	2,966,584	2,552,599	413,985	0.14
2013	3,186,867	2,652,141	534,726	0.17
2012	3,292,641	2,746,732	545,909	0.17
2011	3,356,129	2,738,485	617,644	0.18
2010	3,397,562	2,629,136	768,426	0.23
2009	3,375,445	2,715,428	660,017	0.20

Source: EUROSTAT Fertility and Population Statistics (2019)

Table B: Definitions of Key Variables

Age	Individual Age (in years)
Job Tenure	Work Length (in months)
Married	Dummy Variable 1- Be married 0- Otherwise
University	Dummy Variable 1- Have University Education 0- Otherwise
Number of Children	Number of children born in Spain or abroad
Years in Spain	Number of Years of Residence in Spain
Child Born in Spain	Dummy variable 1- Have a Child Born in Spain 0- Otherwise
Child Born in Spain<5	Dummy variable 1- Have a Child Born in Spain with less than 5 years old 0- Otherwise
Number of Children born in Spain	Number of Children
Number of Children born in Spain <5	Number of Children with less than 5 years old

Table C: Sample Sizes by Country

	Pre- RD		Post- RD	
	N	**Share**	**N**	**Share**
Control Group				
Bulgaria	111	10.32%	133	9.65%
Cyprus	0	0.00%	2	0.15%
Slovenia	4	0.37%	2	0.15%
Estonia	2	0.19%	1	0.07%
Hungary	8	0.74%	14	1.02%
Latvia	1	0.09%	2	0.15%
Lithuania	3	0.28%	15	1.09%
Poland	45	4.18%	99	7.18%
Czech Republic	4	0.37%	12	0.87%
Slovakia	4	0.37%	13	0.94%
Romania	894	83.09%	1.085	78.73%
Treatment Group				
Bielorrusia	4	0.2%	14	0.5%
Cabo Verde	0	0.0%	6	0.2%
Marruecos	579	30.4%	1.145	38.72%
Senegal	26	1.4%	45	1.5%
Sahara Occidental	6	0.3%	6	0.2%
Guinea-Bissau	8	0.4%	1	0.0%
Costa Rica	1	0.1%	3	0.1%
Cuba	84	4.4%	136	4.6%
Panamá	2	0.1%	5	0.2%
Argentina	134	7.0%	145	4.9%
Brasil	190	10.0%	212	7.2%
Colombia	315	16.6%	427	14.4%
Paraguay	197	10.4%	279	9.4%
Perú	200	10.5%	250	8.5%
Uruguay	56	2.9%	52	1.8%
Venezuela	82	4.3%	159	5.4%
Palestina	0	0.0%	1	0.0%
India	19	1.0%	70	2.4%
Pakistan	0	0.0%	1	0.0%

Source: EPA 2007-2016 and authors' own tabulations.

Table D: Descriptive Statistics

Variables	EU Nationalities		Spanish		Non-Treated Nationalities	
	Pre-RD	**Post-RD**	**Pre-RD**	**Post-RD**	**Pre-RD**	**Post-RD**
Panel A: Outcomes						
Child Born in Spain	0.15 0.35	0.29 0.45	0.58 0.49	0.59 0.49	0.18 0.38	0.36 0.48
Child Born in Spain <5	0.14 0.35	0.27 0.44	0.31 0.46	0.32 0.47	0.17 0.38	0.32 0.47
Child Born in Spain <3	0.12 (0.33)	0.17 (0.37)	0.15 (0.36)	0.15 (0.36)	0.20 (0.46)	0.32 (0.56)
N. children born in Spain	0.16 0.39	0.37 0.63	0.99 0.99	0.99 0.98	0.21 0.48	0.47 0.72
N. children born in Spain <5	0.15 0.38	0.33 0.60	0.39 0.64	0.41 0.65	0.20 0.47	0.41 0.65
N. children born in Spain <3	0.13 (0.35)	0.18 (0.41)	0.16 (0.40)	016 (0.40)	0.16 (0.40)	0.19 (0.42)
Panel B: Controls						
Age	30.30 7.63	31.94 6.96	34.51 7.22	35.28 7.01	30.23 7.10	32.32 6.95
Job Tenure	9.36 16.08	17.92 27.66	52.14 71.92	55.67 73.08	11.05 17.26	18.48 28.58
Married	0.52 0.50	0.52 0.50	0.58 0.50	0.50 0.50	0.47 0.50	0.50 0.50
University Education	0.23 0.42	0.30 0.46	0.38 0.49	0.45 0.50	0.25 0.43	0.23 0.42
Number of Children	0.24 (0.58)	0.28 (0.58)	0.42 (0.63)	0.41 (0.63)	0.23 (0.64)	0.41 (0.77)
Years in Spain	2.16 1.51	5.57 2.53	34.51 7.22	35.28 7.01	2.22 1.45	5.47 2.54
Observations	1,330	1,823	112,531	98,259	1,275	2,053

Source: EPA 2007-2016 and authors' own tabulations.

Table E: Impacts of the 2011 Royal Decree on Fertility Using Alternative Outcomes for Women without Children Between 1994-2011

Model Specification	(1) Baseline	(2) Child Born in Spain <5 Years Old	(3) Child Born in Spain <3 Years Old	(4) No. of Children Born in Spain	(5) No. of Children Born in Spain <5 Years Old	(6) No. of Children Born in Spain <3 Years Old
Key Regressors						
Post * Treated	0.086**	0.088**	0.077**	0.098**	0.100**	0.083**
	(0.035)	(0.035)	(0.032)	(0.045)	(0.045)	(0.038)
Observations	5,402	5,402	5,402	5,402	5,402	5,402
R-squared	0.220	0.224	0.213	0.228	0.232	0.215
Dep. Var mean	0.087	0.086	0.077	0.098	0.097	0.082
Year FE	Y	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y	Y
Nationality FE	Y	Y	Y	Y	Y	Y
Other Controls	Y	Y	Y	Y	Y	Y
Province-Year FE or Trend	Y	Y	Y	Y	Y	Y

Notes: The sample is women who are between 16 and 45 years old. The sample is restricted to non-students who arrived in Spain after the 2005 normalization. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. The model specification includes a constant term, year, country fixed effect, province-year fixed effect, age, gender, marital status, an indicator for university education, work length and years since arrived in Spain. Standard errors are clustered at the country of nationality level. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table F: Impacts of the 2011 Royal Decree on Fertility and Mothers' Age at Child's Birth

Model Specification	**(1)**	**(2)**
Dependent Variable	**Cumulative Fertility**	**Mother's Age**
Post x Treated	0.109***	-0.023
	(0.017)	(0.521)
Older than 30	-0.049*	-
	(0.024)	-
Post x Treated x Older than 30	-0.022	-
	(0.040)	-
Observations	7,283	2,329
R-squared	0.328	0.377
Dep.Var Mean	0.323	28.4
Year FE	Y	Y
Province FE	Y	Y
Nationality FE	Y	Y
Other Controls	Y	Y
Province-Year FE or Trend	Y	Y

Notes: In column 1, our sample are women 16 to 45 years old. In column 2, the sample is composed of mothers of a child born in Spain, also between 16 and 45 years of age. In both columns, the sample is restricted to non-students who arrived in Spain after the 2005 normalization who are between 16 and 45 years old. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. The model specification includes a constant term, year, country fixed effect, province-year fixed effect, marital status, an indicator for university education, work length and years since arrived in Spain. Standard errors are clustered at the country of nationality level. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table G: Impacts of the 2011 Royal Decree on Fertility using Data from Couples

Model Specification	**(1)**	**(2)**	**(3)**
	Baseline	**Removing Mothers with a Child Born in Spain Prior to 2011**	**Removing Potentially Legal Migrants**
Post x Treated	0.146***	0.078*	0.127***
	(0.043)	(0.037)	(0.044)
Observations	1,777	1,387	1,750
R-squared	0.387	0.390	0.390
Dep. Var Mean	0.289	0.160	0.285
Year FE	Y	Y	Y
Province FE	Y	Y	Y
Nationality FE	Y	Y	Y
Other Controls	Y	Y	Y
Province-Year FE or Trend	Y	Y	Y

Notes: The sample is women who are between 16 and 45 years old. The sample is restricted to non-students who arrived in Spain after the 2005 normalization. The control group is composed of individuals from European nationalities excluding UE-15. The treated group is composed of individuals from treated nationalities who are potentially affected by the reform. The model specification includes a constant term, year, country fixed effect, province-year fixed effect, age, gender, marital status, an indicator for university education, work length and years since arrived in Spain. Standard errors are clustered at the country of nationality level. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1