Labor Market Stability and Fertility Decisions

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Abstract: This paper studies how fertility decisions respond to an improvement in job stability using variation from the large and unexpected regularization of undocumented immigrants in Spain implemented during the first half of 2005. This policy change improved substantially the labor market opportunities of affected men and women, many of which left the informality of house keeping service sectors toward more formal, stable, and higher paying jobs in larger firms (Elias et al., 2023). In this paper, we estimate the effects of the regularization on fertility rates using two alternative difference-in-differences strategies that compare fertility behavior of "eligible" and "non-eligible" candidate women to obtain the legal status, both on aggregate and at the local level. Our findings suggests that gaining work permits leads to a significant increase in women fertility. Our preferred estimates indicate that the regularization increased fertility rates among affected women by around 5 points, which is a 10 percent increase.

1 Introduction

Fertility rates declined dramatically between the mid-sixties and the end of the nineties in most of the developed countries. Since then, life-long fertility rates have remained stable below 1.8 children per women (i.e., below the replacement rate of 2.1). Figures for Spain show, if anything, a more dramatic picture: the decline was substantially larger and fertility rates stabilized at around 1.3 children per women (see Figure 1).

Figure 1: **Total fertility rates**
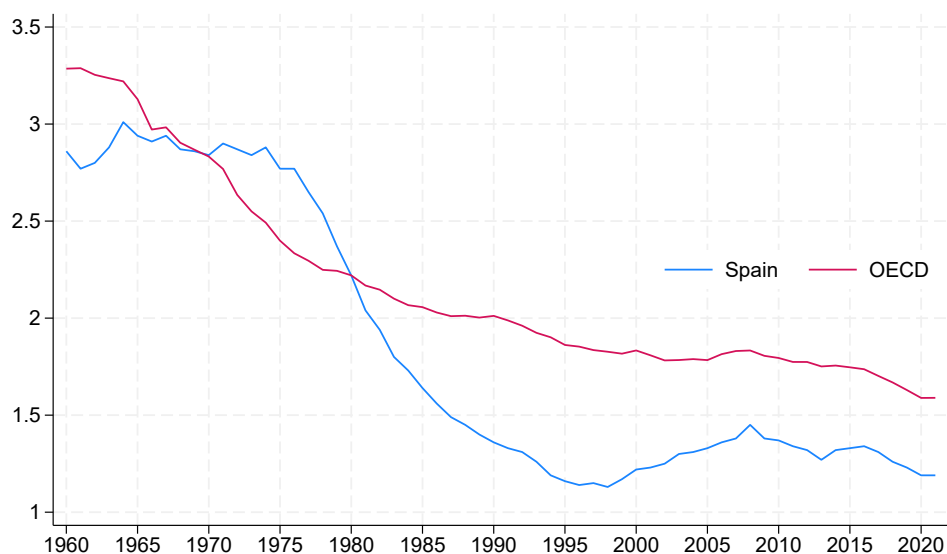
NOTE: Total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year. Source: World Development Indicators - World Bank.

Previous research has explained this decline in fertility with various alternative theories (Becker, 1981; Bongaarts, 2002). First, higher educational attainment and the increase in earnings of women have increased the involvement of females in the labor market, increasing the opportunity cost of raising children. Second, changes in the individual life style, individual self-realization, and quality of life may affect preferences for children. Moreover, changes in forms of relationships (e.g., more individuals that prefer to stay single) make it more difficult to form lasting partnerships, leading, potentially, to postpone fertility decisions. Third, societal norms, including the unequal distribution of home tasks within the family, social attitudes towards women's new roles, may have also contributed to the decline in fertility.

Finally, instability in the labor market, particularly pronounced in the case of Spain (Bentolila et al., 2012), may also account for an important fraction of the decline in fertility rates. Perhaps households wait to have kids until securing stable jobs, something that now occurs later in life (see Adsera, 2005, 2004). For instance, if we measure job instability by the proportion of temporary jobs, we observe that from the late eighties until the latest labor market reform at the end of 2022, this indicator in Spain has remained remarkably high at around 30 percent, which is more than double the EU average. Using Spanish data, De La Rica and Iza (2005) document that childless women with fixed-term contracts delay entry into motherhood relative to women with permanent contracts, and also find that the effect is stronger for women with no partner (Auer and Danzer, 2015, document similar patterns in Germany). While these patterns in the data suggest that job stability is a key factor in fertility decisions, there is still scant empirical evidence on the causal effect of job stability on fertility rates.[1]

Immigrants, and in particular immigrants lacking work permits, are, for obvious reasons, over-represented among the workers with the most unstable jobs. Over the past decades, Spain has hosted a significant number of undocumented immigrants. Recent estimates suggest that around 430,000 immigrants lacked work permits in 2019, which represents around 12.5% of all (non-EU) immigrants (Gálvez-Iniesta, 2020). Spain is not the only country with a large number of undocumented immigrants. According to the Pew Research Center, in 2017 there were as many as 10.5 million unauthorized immigrants in the US (26% of all immigrants) and around 4.5 million of undocumented immigrants in the European Union (EU27), representing 14% of the total immigrant population.

In this paper, we study how granting work permits to undocumented immigrant workers affects their fertility decisions. In particular, we exploit a large and unexpected regularization of irregular immigrants implemented by the first Zapatero government only a few months after being elected, which resulted in the regularization of almost 600,000 undocumented immigrants. As explained in more detail in Elias et al. (2023), this episode provides a unique opportunity to test the effect of immigrants' regularization on a number of outcomes of interest. The result of the 2004 presidential election was suddenly and heavily swayed in favor of the Socialist Party by the terrorist attacks carried out in commuters trains in Madrid on March 11th 2004, just three days before election day. Garcia-Montalvo (2011) shows that the mishandling of the communication during these three

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[1]A recent overview of the economics of fertility, specifically focusing on the relationship between labor market participation and fertility decisions, can be found in Doepke et al. (2023).

days likely lead to the Popular Party to lose this election. As a consequence, almost overnight, and completely unexpectedly, job stability improved substantially for a large group of workers in Spain, as docummented in Elias et al. (2023).

There are many reasons why obtaining a work permit could affect childbearing decisions of affected women. On the one hand, the regular status gives many more opportunities to immigrants, including having a more secure life without fear of being caught by the authorities, legal rights in the job, and welfare benefits, among others. On the other hand, the regular status also provides more opportunities in the labor market, generating better economic perspectives for immigrants which may translate into better conditions in general and to commit to long-term decisions like childbearing. These better economic opportunities for regularized immigrant women can, however, increase the opportunity cost of having a child, leading to postpone fertility decisions. Hence, whether granting work permits leads to higher fertility is, predominantly, an empirical question.

We use two different identification strategies, one that relies on comparisons of immigrant women from different origins, and second, one that relies on comparisons of provinces with a higher- versus lower number of immigrants gaining work permits. For the first strategy we rely on the variation generated by Zapatero's regularization policy that affected around 300,000 immigrant women from a selected set of origin countries and we compare trends in fertility rates between women from these eligible countries and a number of groups that were not affected by the policy change. More explicitly, we consider as treated, mothers without Spanish nor European Union (EU) nationality, with a non EU foreign partner, or without partner.[2] We compare the total fertility rates of this group of women to three different control groups: i) non-Spaniards couples with at least one parent with an EU nationality (except Romania and Bulgaria); ii) mothers from new accession countries (except Romania and Bulgaria)[3]; iii) natives couples with low-educated mothers. We conduct this analysis using two very detailed administrative datasets, one of birth certificates and the second of population counts for the period 2004 to 2008 (pre-period 2004-2005 and post-period 2006-2008).

Using this research design, we observe a clear break in the fertility trend of treated mothers at the beginning of 2006. This is exactly nine months after the window that the government gave to undocumented workers to regularize their status. Estimates suggest that gaining regular status

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[2]In our definition of EU nationality, we included individuals from EU-27 (excluding Spain and Romania and Bulgaria) and also individuals with other European countries (non EU) with special mobility treatments with the EU. Among these countries we include, Andorra, Island, Liechtenstein, Norway, Monaco, San Marino Switzerland, and Vatican City.

[3]This category includes new EU member countries (i.e., Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia)

leads to an increase in the yearly fertility rate of about 5 kids per one thousand women each semester, which represents about a 10% increase. As expected, the results are larger for mothers aged 25 to 34 years old, coinciding with the age at which many women have children, and smaller for older women. We also show that our results are robust to various specifications, for instance by using various control groups and for various subgroups among the treated mothers.

The second identification strategy relies on the fact that the prevalence of immigrant women from eligible countries of origin varies across provinces. Hence, at the time of the legalization some provinces experienced a large entry of immigrants into the social security while others experienced a substantially lower entry. We can then compare these trends to fertility trends at the province level from women from eligible countries of origin. This research design is similar to the comparisons across women from different origins described above, but has the additional advantage that it allows us to control for local trends that may explain some of the variation in fertility rates. The findings of this second research design are fully in line with the more aggregate comparisons. Placebo exercises that look at fertility rates of non-eligible women across provinces confirm the interpretation that our results are driven by the legalization of immigrant workers.

To the best of our knowledge, this is the first paper providing credible causal estimates of how a policy that drastically changed job stability of a large number of immigrants affected fertility decisions. Specifically, we can study how irregular immigrants who suddenly gain a work permit and a formal job in the host country change their fertility decisions. We argue that the job stability channel is the likely explanation for the change in fertility decisions because in Spain undocumented migrants were already granted access to public education and health care services irrespective of their immigration status. Access to better jobs was the main change for immigrants workers following the policy change, as documented in detail in Elias et al. (2023).

Our study is closely related to Amuedo-Dorantes et al. (2022), who analyzed a change in Spanish legislation that granted undocumented immigrants temporary residence in Spain if they had a Spanish child under 18 years old. They found that this policy change had a significant positive impact on fertility decisions, with a 32 percent increase among potentially affected immigrants. However, we believe that our study improves upon their analysis in several dimensions:

1. Importance and Salience of the Policy: In their case, the policy affected a maximum of 30,000 individuals over a four-year period (2011-2014), from non-random age groups. In contrast, the regularization policy we examine provided work permits and formal jobs to nearly 600,000 undocumented immigrants within just three months, of all ages.

2. Temporal Coincidences and Potential Confounding Factors: The policy change analyzed by Amuedo-Dorantes et al. (2022) occurred simultaneously with other policy events, which may affect their estimates. For instance, their control group primarily consisted of Romanians, who initially had the same treatment as individuals from other EU countries until work restrictions were introduced in 2012. [4] Additionally, in September 2012, access to the healthcare system was restricted for undocumented immigrants, leading to increased mortality among affected individuals (see Juanmarti Mestres et al., 2021).

3. Changes in Spanish citizenship concessions: During the period analyzed by Amuedo-Dorantes et al. (2022), there was a significant increase (around 75 percent, from an yearly average of 84,000 to 147,000) in the number of Spanish citizenship grants due to changes in bureaucratic procedures.[5] This change in nationality cannot be detected in the Spanish Labor Force Survey, potentially affecting the interpretation of their results.

By highlighting these differences, we believe that our study offers a clearer and more robust analysis of the relationship between job stability and fertility decisions among undocumented immigrants.

In a recent paper, Amuedo-Dorantes et al. (2023) investigate the effects on fertility decisions of a large amnesty of Venezuelan workers in Colombia. They find that the work permits and the access to social services (specially health system) reduced the likelihood of having a child. They argue that this result is due to better labor market opportunities for women *and* greater access to family planning through the health care system. The policy we exploit enables us to more effectively identify "job stability" because the 2005 regularization in Spain granted both work permits and access to formal jobs to workers who benefit from the regularization. In the Spanish case, however, access to the health care system was already universal, regardless of the immigrants' status.

Our analysis also relates with Avitabile et al. (2014) who studies how a policy that changed the birthright citizenship in Germany affected fertility and health outcomes of children, Amuedo-Dorantes and Arenas-Arroyo (2021) who analyze the effects of immigration enforcement in the US on immigrant fertility, the work by Clark and Lepinteur (2022) who study a labor market reform in France, and the work by Ayllon (2019) who studies job stability and fertility during the Great Recession. More generally, our paper also contributes to a broader literature that studies the impact

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[4]See more details in the Law (accessed in May 2023).

[5]Link (accessed in May 2023).

of regularization of immigrants on different outcomes.[6]

The remainder of the paper is organized as follows. In Section 2 we describe the policy change. In Section 3 we describe our data and explain our empirical strategies. Section 4 presents the results. Section 5 concludes.

2 Background and Regularization Policy

Until the middle of the 1990s Spain was an emigration country. Since then, and until the beginning of the Great Recession in 2008, the country received the most important inflow of migrants among developed countries, transforming Spain into a country with medium-high levels of immigration. By the end of this period, more than 13 percent of its population was foreign-born, with Romania, Morocco, and Ecuador being the top countries of origin.

Concerns about the arrival of this large wave of immigrants intensified in the early 2000s. The Popular party (right-wing) in power since 1996 established tougher conditions for immigrants to settle in Spain. Like other center-right parties in Europe, this is the party that has traditionally adopted tougher regulations to limit immigration in Spain. The party won the 2000 general elections with the majority of seats and despite the large political protests against Spanish involvement in the Iraq war, most of the people in Spain expected the Popular Party to continue in power after the March 2004 elections. According to the CIS (*Centro de Investigaciones Sociológicas*), the vote forecast for the two main political parties in Spain (poll conducted in January 2004) was 42.2 percent for the Popular Party and 35.5 percent for the Socialist Party. On March 11, 2004, just three days before the election date, terrorists attacked several commuter trains in Madrid, 193 people died in what was the largest-ever terrorist attack in Spain.[7]

As is well documented by Garcia-Montalvo (2011), the government's communication strategy during the three days between the attacks and the day of the election likely caused the Popular Party to lose the general election on March 14, 2004.[8] The new socialist government implemented, a few months after it came into power, the largest legalization of undocumented immigrants ever in Spain.

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[6]Among others: i- labor market outcomes Elias et al. (2023), DiPorto et al. (2018), Devillanova et al. (2017), Amuedo-Dorantes and Bansak (2011), Amuedo-Dorantes et al. (2007) and Kaushal (2006); ii- crime Fasani (2018), Pinotti (2017), Mastrobuoni and Pinotti (2015) and Baker (2015); iii- public finances Elias et al. (2023) and Cascio and Lewis (2019) and; iv- consumption (Dustmann et al., 2017).

[7]For more detail on vote polls the weeks before the election day, see Garcia-Montalvo (2011).

[8]By comparing the voting behavior of Spanish nationals voting abroad (who voted before the attacks) with those voting the day of the election (Spanish residents) from this election and the prior ones, Garcia-Montalvo (2011) concludes that the attacks ultimately changed the outcome of the election and unexpectedly gave power to the candidate of the Socialist Party (Zapatero).

Almost 600,000 immigrants, already in Spain, gained legal status.[9] Thus, completely unexpected a few months earlier, almost one third of the Spanish immigrant population experienced a big change in their labor-market opportunities.[10] It is also important to highlight that the legalization policy did not affected Spaniards and nationals from European Union countries, who already had work permits in Spain thanks to the Schengen treaty.[11] Table 1 reports the number of immigrants that gained work permits by country of origin.

Table 1: **Applications and authorizations by country of origin**

Country	Applicants	Authorized	Legalization rate
Ecuador	140.020	127.925	91,4
Romania	118.546	100.128	84,5
Morocco	86.806	68.727	79,2
Colombia	56.760	50.417	88,8
Bolivia	47.325	39.773	84
Bulgaria	25.598	22.239	86,9
Argentina	23.896	21.519	90,1
Ukraine	22.247	19.466	87,5
Pakistan	15.782	8.602	54,5
China	13.416	8.159	60,8
Uruguay	10.650	9.653	90,6
Brazil	10.488	8.069	76,9
Senegal	10.100	7.265	71,9
Venezuela	8.051	6.722	83,5
Algeria	8.038	5.979	74,4
Russia	7.950	6.767	85,1
Paraguay	7.522	5.822	77,4
Nigeria	7.326	5.197	70,9
Mali	7.205	6.249	86,7
India	5.064	2.777	54,8
Total	691.655	578.375	83,6

NOTE: This table shows the number of applicants, the number of applicants that fulfilled the criteria for obtaining work permits, and the legalization rate for a selected number of treatment countries of origin. Source: Spanish Ministry of Social Security.

Another essential characteristic for the interpretation of our empirical exercise is the fact that, during the entire period of analysis, the coverage of Spanish National Health System was universal. All individuals residing in Spain, natives and immigrants, irrespective of personal circumstances or administrative situation in the country, were entitled to having free full access

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[9]Real Decreto 2393/2004.

[10]For a detailed description of the background, and the policy change, see Elias et al. (2023).

[11]It is worth noting that nationals from Romania and Bulgaria that, at the moment of the policy implementation, were still not part of the European Union were also affected by the policy change. Romania and Bulgaria ranked second and sixth in terms of number of individuals that gained the legal status thanks to the legalization.

to the health care system. In particular, undocumented immigrants had access to the same health care services than Spanish natives. In order to receive these health care services the only requirement was being registered in the municipality (*Padrón Municipal*). All residents (including undocumented immigrants) similarly benefited from social assistance programs, in general, provided by municipalities, including among others, school meals for kids, soup kitchens, supervised flats or residences, psychological support, home care services, or occupational training courses and programs providing assistance to find a job.

One way to measure the aggregate importance of the policy for job stability is to look at the entry of immigrants into the social security system around the policy change. Figure 2 shows that the number of immigrants affiliated to the social security system (i.e., a measure of formal immigrant workers), increased by almost 4 percentage points with the legalization.

Figure 2: **Immigrants Affiliated to the Social Security**
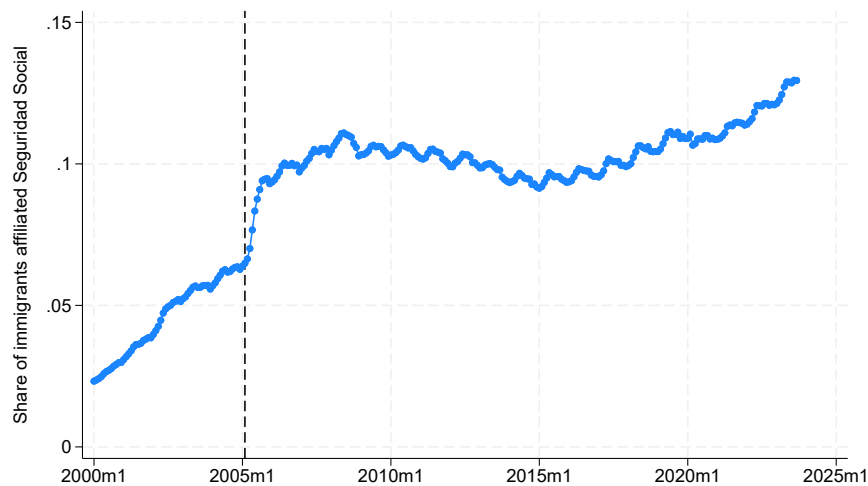
NOTE: This graph shows the fraction of immigrants affiliated in the social security system as a percentage of all affiliates for each month between 2000 and 2023. Source: Own elaboration based on Social Security data.

3 Data and methodology

3.1 Data

Our main data comes from an administrative database of birth certificates, for the period 2003-2008,[12] from the Spanish National Statistical Institute (INE). This dataset contains information on

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[12]We concluded our analysis period in 2008 to mitigate potential confounding effects resulting from the great recession and the implementation of a universal child benefit program in Spain in July 2007 (see, González and

the universe of births registered in Spain. More concretely, it provides information about the month of birth, measures of newborn health, as well as, mother and family information (e.g. nationality of parents, age, civil status, number of previous children for each mother, etc.). Additionally, we use the population register data (*Padrón Municipal*, INE) which allows us to know, every year and in every province, the number of immigrant women by nationality and age. To construct our main dependent variable, we focus on female population, by country of origin, aged between 16 and 49 years old. Combining these two datasets we are able to examine whether immigrant women originally from candidate countries adjusted their fertility in response to the legalization policy that changed the legal status of many immigrant couples from countries outside of the European Union.

Figure 3 shows the aggregate raw fertility rates of both, treated and non-treated women. Fertility rates are substantially higher among women born outside the European Union than among women from Spain and the European Union. However, both groups exhibit similar trends before the policy. These trends seem to diverge after the policy. This is observed most clearly in Panel B of Figure 3 where we normalize the fertility rate of the two groups of women to the fertility rate just before the policy change. Panel B shows that while the fertility rate among European Union born women continued to decline, that of women born outside the European Union experienced a reversal of trend.

Figure 3: **Raw Fertility Rates**
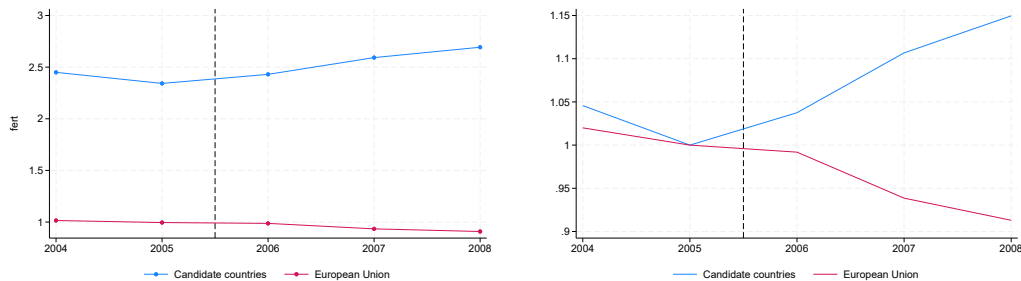
Panel A   Panel B

NOTE: Panel A shows the fertility rates of mother from candidate countries to obtain a work permit and fertility rates from European Union women (excluding Spain). The vertical line indicates the last period before the reform. The figure on Panel B normalizes the figure on the left using the last observation before the policy intervention. Source: Own elaboration based on INE data.

Trommlerová, 2023).

3.2 Empirical Strategies

Our empirical exercise implements two standard difference-in-difference strategies. First, we compare the fertility rates of women from treatment countries of origin to various groups of women from the European Union and Spain. Second, we compare births from mothers from treatment countries in Spanish provinces (administrative units similar in size to commuting zones) with high immigrant entry into the social security system versus smaller.

The first strategy, compares before and after the policy, the fertility rate of mothers from eligible and non-eligible countries of origin. More precisely, we use the following model:

$$fertility\,rate_{c,t} \;=\; \beta\,treat_c * post_t + \delta_t + \delta_c + \epsilon_{c,t} \tag{1}$$

where $fertility\,rate_{c,t}$ represents the fertility rate (births per one thousand women aged between 16 and 49 years old) for mothers originally from country c in period t, $treat_c$ is our treatment indicator –a dummy equal to one for eligible countries–, and $post_t$ is a dummy equal to one for years from 2006 onward (January 2006 is 9 months after the middle of time window for regularization). δ_t represents time fixed effects and δ_c represent country fixed effects. We also employ a dynamic difference-in-difference specification to estimate the precise timing of differential changes in fertility rates, relative to the base year 2005. With this methodology we can see whether there are systematic deviations from trend across affected and non affected countries in fertility rates up to 2005, and visualize if changes start to occur only nine months after the regularization policy.

The second empirical strategy compares births per capita across provinces and relates these to the number of immigrants entering the social security that occurred at the time of the policy change. Specifically, we estimate the following model:

$$\frac{births_{p,t}}{working\,age\,population_{p,t}} = \beta\frac{New\,affiliates\,in\,social\,security_{p,2005}}{working\,age\,population_{p,2005}} * post_t + \delta_t + \delta_p + \epsilon_{p,t} \tag{2}$$

where $births_{p,t}$ is the number of children that women from treatment countries had in province p at time t, $working\,age\,population_{p,t}$ is the number of workers in the province each year, and $New\,affiliates\,in\,social\,security_{p,2005}$ is the number of foreign-born from treatment countries' affiliates entering the social security system at the time of the policy change, i.e., the jump observed in Figure 2 but computed for each province. δ_t and δ_p are time and province fixed effects. Following

Elias et al. (2023) we allow for linear province specific time trends prior to the policy change to account for potentially different evolutions in births per capita across provinces unrelated to the policy change. This strategy is proposed among others in Goodman-Bacon (2020) and used in Miller et al. (2021), Goodman-Bacon (2021), and Dustmann et al. (2022).

Our interpretation, based on the results reported in Elias et al. (2023), is that the main change experienced by immigrants from eligible countries was a change in job opportunities. The legalization granted work permits to immigrant workers already in Spain, with a job contract for at least the subsequent 6 months. This allows Elias et al. (2023) to trace in the data work trajectories of these immigrant workers, and to document that immigrant women, many of which started as house keeping workers, transitioned into better paying jobs in larger firms. Given this, our estimates can be interpreted as a reduced form effect of work permits on fertility decisions.

4 Empirical Evidence

4.1 Aggregate Level Findings

4.1.1 Main results

We begin the discussion of our results by presenting our findings from the difference-in-differences specification according to Equation 1. The results are shown in Table 2, where we compare fertility rates between our treatment group and various potential control groups. In column 1, we consider, as control group, non-Spaniard couples with at least one parent with an EU nationality – where EU means countries that in 2004 belonged to the EU, i.e. it excludes Romania and Bulgaria, who accessed the EU after the policy change. The second column uses "new accession countries" as a control group. This control group is composed of mothers from the new EU countries in 2004, which includes Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. In column 3, we use, as control group, the set of mothers with Spanish nationality but low education levels. This may be a better control group than all Spanish mothers because immigrants who gained worked permits with the reform were disproportionately low-educated. In all these regressions, the pre-regularization period comprises the years 2004 and 2005, and the post-period includes years 2006 until 2008. All columns include time and country of origin fixed effects. The table also displays the average value of the dependent variable, measured in the second semester of 2005.

Table 2 shows that, irrespective of the control group considered, the regularization led to an

Table 2: Effects of the Regularization on Fertility

Dep. Var.:	Fertility Rate (× 1000)		
	(1)	(2)	(3)
Post*treated	4.917*	8.427***	5.797**
	(2.603)	(2.431)	(2.330)
Control group	Foreign EU	New accession	Natives l-s
Time fixed effects	yes	yes	yes
Country fixed effects	yes	yes	yes
R-squared	0.967	0.964	0.946
Observations	871	693	683
DV mean		46.205	

NOTE: The dependent variable mean refers to fertility rate of women from eligible countries with at least one child born in Spain in the second semester of 2005. The data is collapsed at bi-annual level. Standard errors cluster at the nationality of the mother are reported. * significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level. All specifications are weighted using the female population of each nationality.

increase in fertility rates of women from candidate countries. We estimate that granting work permits led to an increase of around 5 to 8.5 points. Our preferred specification, where we use all mothers from EU countries as control, suggests that the regularization increases fertility rates by almost 5 points, which represents a 10.6 percent increase. Therefore, our findings suggest that improvements in labor market prospects seem to have a positive and significant impact on fertility decisions.

Figure 4 shows the same estimates of Table 2 using a dynamic difference-in-differences approach. As can be seen, after the policy, the fertility rates of treated mothers increased relative to the fertility rates of mothers from non-eligible countries. These graphs confirm the results reported in Table 2, and they show visually that the impact of the amnesty happens only nine months after its implementation. It is also important for our identification to check if there are any differential trends prior to the policy change. All three panels of Figure 4 show that, on top of the salient break in the trend after the regularization, there are no systematic differential pre-policy trends in any of our three specifications.

4.1.2 Heterogeneity

Our data allows us to investigate if there are heterogeneous effects across different groups of individuals. First, we analyze if there are any differences by the age of the mother. Second, if there are heterogeneities between new mothers and those who have the second or a subsequent

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Figure 4: **Dynamic difference-in-differences estimates with alternative controls**

Panel A   **Panel B**   **Panel C**
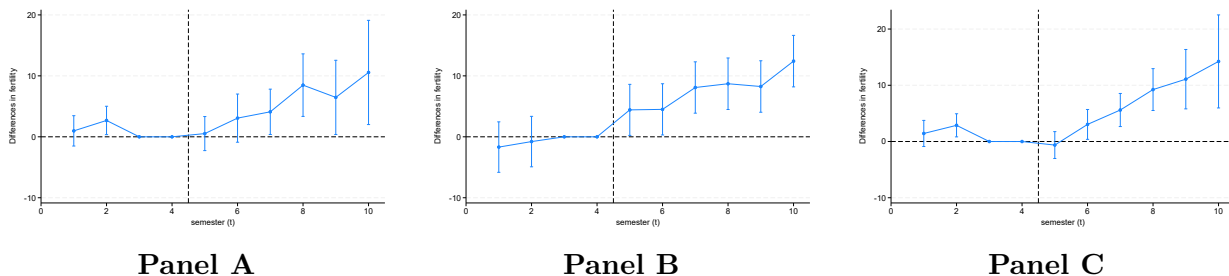
NOTE: In all panels, we consider as treated all birth where both parents are nationals from "candidate" countries to gain the work permit. In Panel A, the control group consists of mothers with origins from a new EU accession country, excluding Romania and Bulgaria who are treated. Panel B displays the estimates using as a control group couples where both parents are natives with the mother low-skilled. The data is collapsed at bi-annual level.

birth. Finally, we explore differences by the region of origin of the mothers.

Table 3 shows that our findings are primarily driven by mothers aged between 25 and 34 years old, as shown in Panel A. This specific group experienced a substantial increase in fertility rates relative to the control group. For this group the increase in fertility was almost 18 percent. On the other hand, the effect on fertility rates among young mothers, aged between 16 and 25 years old, is smaller and less precisely estimated. This observation may be interpreted as suggesting that the opportunity cost of having a child is higher for this age group. In other words, factors such as educational progress or professional career development may play a more significant role in their decision-making process regarding childbearing (see Kuka et al., 2019).

In addition, and consistent with the previous result, our findings are also driven by mothers on the margin of having a second child (Panel B). Finally, we show that our results are mainly a result of immigrants from African countries and, to a lesser extent, from Asia (Panel C). It is not surprising that immigrants from Latin American countries show a relatively smaller response in terms of fertility rates to the policy. This can be attributed to the advantages they have in Spain due to the cultural proximity between Latin American and Spanish cultures. The familiarity with the host country's institutional functioning allows these immigrants to have a better understanding and a quicker assimilation process (see, Izquierdo et al., 2009, for empirical evidence on the faster labor market assimilation among Latin-American immigrants in Spain). As a result, the impact of the policy on their fertility decisions may be less pronounced compared to immigrants from other regions, where cultural and institutional differences might play a more significant role.

Table 3: Heterogeneous Effects of the Regularization on Fertility

	(1)	(2)	(3)
	Specifications with control Foreign EU		
Panel A: Age groups			
	between 16 and 24 y.o.	between 25 and 34 y.o.	between 35 and 49 y.o.
Post*treated	4.621	10.202***	2.283***
	(4.965)	(2.470)	(0.843)
R-squared	0.948	0.960	0.955
Observations	836	998	820
DV mean	63.693	57.485	17.359
Panel B: Number of previous kids			
	No kids	One kid	Two or more kids
Post*treated	1.645	2.449**	0.859***
	(1.487)	(0.988)	(0.306)
R-squared	0.965	0.928	0.966
Observations	829	771	687
DV mean	25.644	13.033	7.752
Panel C: Regions of origin			
	Latin-America	Africa	Asia
Post*treated	2.550	17.372***	5.585**
	(1.999)	(2.102)	(2.208)
R-squared	0.936	0.974	0.977
Observations	377	472	338
DV mean	31.803	99.241	73.889
Time fixed effects	yes	yes	yes
Country fixed effects	yes	yes	yes

NOTE: The dependent variable mean refers to fertility rate of women from eligible countries with at least one child born in Spain before January of 2006 (9 months after the implementation of the regularization). Panel A and C fertility rate is calculated using the specific age population, in Panel B fertility rates are calculated using female population between 16 and 49 years old. The control group consists of mothers with origins in a EU-15 country, except Spain. The data is collapsed at bi-annual level. Standard errors cluster at the nationality of the mother are reported. * significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level. All specifications are weighted using the female population of each nationality.

4.1.3 Robustness Checks

One concern regarding our difference-in-difference strategy is the potential existence of differential pretrends between treatment and control groups. Although we examined pretrends in the event study type graphs in Figure 4, we also perform a placebo test to address this issue. In the placebo test, we artificially shift our entire study period one year ahead. This means interacting the treatment group dummy with a post-period covering the years 2005 to 2007, taking the years 2003 and 2004 as the pre-period. With this strategy we are considering as a treatment period months where, due to the fact that it takes at least nine months to conceive a kid, fertility rates should not have shifted significantly. Column one of Table 4 indicates that the point estimates of the parameter of interest are significantly smaller compared to the estimates in our baseline specification and not statistically different from zero.

Table 4: Robustness to the Effects of the Regularization on Fertility

	(1)	(2)
	Specification with control Foreign EU	
	pre: 2003-04 $ post: 2005-07	Excluding Rom. & Bul.
Post*treated	0.296	5.719*
	(3.378)	(2.995)
R-squared	0.958	0.968
Observations	871	851
DV mean	54.644	47.361
Time FE	Y	Y
Country FE	Y	Y

NOTE: The dependent variable mean refers to fertility rate of women from eligible countries with at least one child born in Spain before January of 2006 (9 months after the implementation oStandard errors cluster at the nationality of the mother are reported. * significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level. All specifications are weighted using the female population of each nationality.

Another important concern is the possibility that our findings regarding childbearing decisions are driven by a specific origin group of mothers. Specifically, we are concerned about immigrants originally from Romania and Bulgaria, who constituted 21% of the legalized immigrant population. These two countries held the status of "candidate" states for EU membership from June 2004, and they officially entered the EU in January 2007, however at the time of the policy changed they were still not members of the EU, and hence, its citizens were eligible to the regularization process. If our fertility results are driven by these two countries, then they may be an artifact of the EU accession process rather than a consequence of the 2005 amnesty.

To examine the possible influence of this policy on our estimates, known as the "second phase of EU enlargement", and the importance of "expectations of membership", we replicated our baseline estimates but excluding births from mothers originating from Romania and Bulgaria. Column 2 of Table 4 shows that our baseline result does not change significantly, supporting our main finding that an improvement in job stability positively impacts on fertility decisions. Moreover, the estimates excluding births from mothers of Romanian and Bulgarian origin are a bit higher than those in our baseline specification (columns one of Table 2). This might suggest that couples from these two countries may have reacted in advance to the 2005 regularization policy (possibly in 2004 or earlier) due to their anticipated future EU membership.

4.2 Province Level Findings

4.2.1 Main Results

In this section, we estimate the effect of the policy reform on fertility at the local level. Intuitively, the regressions relate the increase in social security affiliates to the increase in births from mothers from the treated countries of origin observed at the province level. Hence, the estimates tell how many more births we observe in a province per newly legalized immigrant worker.

The results are shown in Table 5. We show three different specifications. The first specification is a simple difference in difference which allows for differential linear trends across provinces fitted using pre-policy data, as explained in more detail in section 3.2 and in Elias et al. (2023). The estimates suggest that, for each immigrant entering the social security system in early 2005, we observe 0.015 births in the next two years. The estimate is very similar if we add time and province fixed effects, and if we control for the province level unemployment rate (in Column 3), a usual determinant of fertility decisions (Aparicio et al., 2020).

As before, Figure 5 checks that indeed we see a differential change to linear trends that is greater in provinces with higher numbers of immigrants entering the social security system. The graph is clear in this respect. The number of births starts to increase 9 months after the period in which immigrant workers gained work permits, as indicated by the vertical line.

4.2.2 Heterogeneity

As we also discussed with the country of origin comparisons, we would expect the policy to affect, especially, mothers at childbearing ages. The policy might have also affected differentially mothers

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Table 5: Effects of the Reform on Province level Births

Dep. Var.:	Births per person		
	(1)	(2)	(3)
Increase in Affiliates	0.015***	0.016***	0.017***
to Social Security	(0.005)	(0.005)	(0.006)
Observations	600	600	600
R-squared	0.207	0.644	0.646
Linear province specific time trends	yes	yes	yes
Fixed effects	no	yes	yes
Additional controls	no	no	yes

NOTE: This table estimates the effect of the entry of immigrant workers into the social security system on the number of births per person across provinces. The data covers 50 provinces during 12 semesters. Standard errors clustered at province level. * significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level. indicate significance at ten, five and one per cent.

Figure 5: Effects of the Reform on Province level Births by Semester
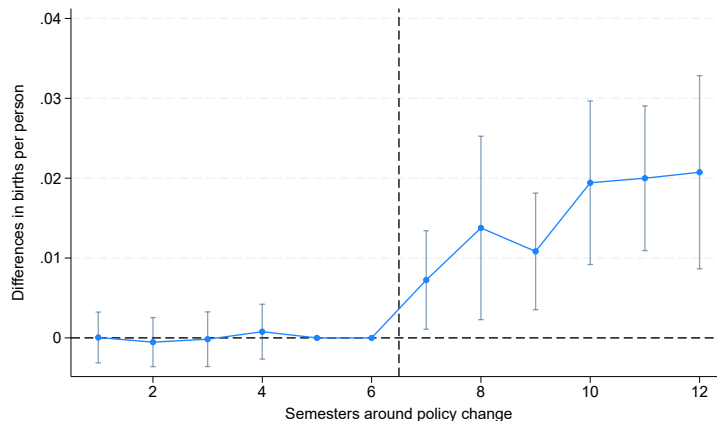
NOTE: This graph shows the effect of the entry of immigrants into the social security system on births per capita across provinces. The data is collapsed at bi-annual level.

on the margin to having one or more kids. We investigate this heterogeneity here. We do not attempt to investigate heterogeneity by country of origin using this empirical research design because when breaking the data by country of origin at the province level we end up with too many zeros.

Table 6 shows the results. Panel A shows that most of the effect is concentrated in mothers aged 25 to 34, a result that is fully in line with the aggregate comparisons shown in Table 3. When we split mothers as a function of the number of kids that they have, we see as before that the estimate is similar for mother with no kids or with one kid, while substantially smaller for mothers

with two or more kids. Hence, this table shows the same patterns that we already observed in Table 3 using a different identification strategy.

Table 6: Effects of the Reform on Province level Births, heterogeneity

Panel A: heterogeneity by age of the mother			
Dep. Var.:	Births per person		
	16 to 24 y.o.	25 to 34 y.o.	34 to 49 y.o.
	(1)	(2)	(3)
Increase in Affiliates	0.003	0.014***	0.000
to Social Security	(0.005)	(0.003)	(0.001)
Observations	600	599	595
R-squared	0.485	0.642	0.471
Panel B: heterogeneity by number of kids			
Dep. Var.:	Births per person		
	No kids	One kid	Two or more
	(1)	(2)	(3)
Increase in Affiliates	0.007	0.007**	0.004
to Social Security	(0.005)	(0.002)	(0.003)
Observations	600	600	597
R-squared	0.508	0.651	0.532
Linear province specific time trends	yes	yes	yes
Fixed effects	yes	yes	yes
Additional controls	yes	yes	yes

NOTE: This table estimates the effect of the entry of immigrant workers into the social security system on the number of births per person across provinces. The data covers 50 provinces during 12 semesters. Standard errors clustered at province level. * significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level.

4.2.3 Placebo

We can use the cross country of origin comparisons made in Section 4.1 to think about three placebo groups to examine using the cross province comparison design: EU nationals, low-skill natives, and new EU accession countries. Specifically we can check whether there is a jump in the number of births from mothers from these different groups of countries across provinces that coincides with the policy change. Figure 6 shows no detectable change around the policy for these three groups of mothers, reassuring us, once more, that what we capture in our main regressions is the effect of the policy change on fertility decisions of immigrants who gained work permits.

Figure 6: Placebo groups
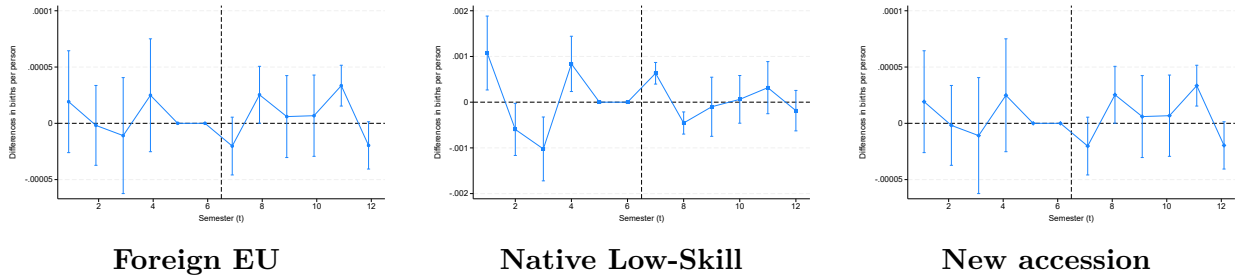
| **Foreign EU** | **Native Low-Skill** | **New accession** |

NOTE: This graph shows the effect of the entry of immigrants into the social security system on births per capita across provinces for three placebo groups. The data is collapsed at bi-annual level.

5   Conclusion

In this paper, we analyze how job stability influences childbearing decisions. Specifically, we examine the effects of an unexpected regularization policy that granted work permits to nearly 600,000 undocumented immigrants, half of whom were women. This policy was directly aimed to provide increased stability in the labor market. In this paper we estimate how this policy affected overall fertility rates.

We find that, nine months after the policy change, fertility rates of mothers from eligible countries increased relative to non-affected mothers. Our preferred specification suggests that eligible mothers had an increase in fertility rates of approximately 5 points. This increase represents a 10 percent rise compared to pre-reform levels. We also show that the effect was particularly pronounced among mothers between 25 and 34 years old and of African origin. Our estimates imply around 2,800 more births per year (≈ 0.7 percent of pre regularization yearly births).

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