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The impact of Next-Generation Broadband: Marriage rates and Assortative mating

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Abstract

This work examines the effect of next-generation broadband on marriage rates among oppositeand same-sex couples in Spain. Given that the decision to sustain a relationship and enter into marriage is influenced by a broad spectrum of opportunities, high-speed broadband access can play a pivotal role in reducing search frictions, enhancing communication, and influencing cultural norms, thereby exerting a positive impact on marriage rates for both homosexual and heterosexual individuals. However, it is not clear whether the magnitude of the impact is the same for both groups. To explore this issue, we exploit plausible exogenous geographic and temporal variations in next-generation broadband coverage. We merge microdata on all Spanish marriages from 2013 to 2022 with the annual proportion of households with access to next-generation broadband via Fiber-to-the-Home (FTTH) at the municipal level. Our findings indicate that an increase in local FTTH coverage is associated with a higher crude marriage rate, controlling for municipality and time fixed effects. The response of same-sex marriages is twice as large as that of heterosexual marriages, relative to their respective average marriage rates. Empirical evidence does not support improved positive assortative mating as an explanation for the differing response observed among same-sex couples. High-speed internet access reinforces positive assortative mating by education and occupation for opposite-sex couples. Supplementary analysis, using data on public funding, shows that government support for expanding FTTH through the Next Generation Broadband Expansion Programme translates into an increase in the crude marriage rate, highlighting the appeal of areas with high-speed internet in addressing depopulation.

JEL Codes: J12, O33, L96

Keywords: Next-generation boradband, Fiber-to-the-Home, Marriage rates, Same-sex couples, Public Policies.

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1. Introduction

Next-generation broadband, particularly Fiber-to-the-Home (FTTH), represents a technological leap in digital infrastructure, offering substantial advancements over traditional broadband technologies, including faster speeds, enhanced reliability, and greater capacity (OECD, 2021). High-speed broadband access has significantly transformed the availability of online content, improved the stability of communications, and expanded opportunities for teleworking (World Broadband Association, 2023), potentially reshaping how couples meet and sustain their relationships. Although empirical evidence suggests that slower-speed internet has already led to the replacement of traditional offline social networks by the online marriage market, offering advantages such as reduced search frictions (Bellou, 2015; Murray, 2019; Hobbs et al., 2017), it is plausible to assume that the significant leap toward much faster, high-capacity internet has further strengthened this marriage market. Moreover, online platforms have become the most popular venue for meeting long-term partners among young adults (Rosenfeld et al., 2019), and nearly everyone now relies on technology to form meaningful social connections. In this context, this paper empirically examines whether the diffusion of next-generation broadband has influenced marriage rates among opposite- and same-sex couples in the scarcely explored Spanish marriage market.

From a theoretical perspective, economic models of marriage suggest that individuals search for a partner until the utility of a match exceeds the utility of remaining single, with this decision influenced by search costs, the probability of receiving offers, and the quality threshold for a match (Becker, 1973; Burdett & Coles, 1997). The Internet has already reduced search frictions by lowering search costs and expanding partner pools, improving matching (Hitsch, Hortacsu, & Ariely, 2010; Stevenson & Wolfers, 2007). Nevertheless, the technological characteristics of FTTH-such as symmetrical speeds, lower latency, and enhanced reliabilitymay amplify these effects. FTTH enables higher-quality interactions, such as real-time video communication, which can facilitate more precise assessments of potential partners. It also supports data-intensive matching algorithms, allowing for targeted partner searches that may increase the likelihood of high-quality matches (Rosenfeld, Thomas, & Hausen, 2019). These attributes could improve the matching process, potentially leading to changes in marriage dynamics, particularly in more-connected areas. What the literature omitted is whether this impact is the same for homosexual and heterosexual individuals. Beyond improving search and matching processes, FTTH may also accelerate cultural changes in the marriage market by fostering greater acceptance of diverse relationship forms and reducing stigma on same-sex couples. Additionally, the literature has shown differing behaviors between opposite- and same-sex couples in terms of positive assortative mating, with homosexual individuals being less likely to choose a partner based on complementarities (Ciscato et al., 2020; Muñoz & Sansone, 2024). Hence, while the Internet has transformed marriage markets, the effect of next-generation broadband on marriage rates needs to be assessed for both homosexual and heterosexual individuals.

The first goal of this paper is to analyze whether FTTH has affected the flows into marriage. To our knowledge, this is the first paper to examine the impact of Internet diffusion on marital decisions, focusing specifically on the case of Spain. We gather annual microdata from the Spanish Statistical Bulletin of Marriages provided by the Spanish Statistical Office (Instituto Nacional de Estadística, INE), which is particularly relevant due to its high-quality data. The bulletin compiles detailed information on all marriages taking place in Spain, including the type of marriage, date of marriage, residence of the couple, age, education, occupation, and nationality, among other variables. This data is reported at the municipality level, allowing for comparisons between rural and urban areas. Additionally, since 2005, the statistics include information on same-sex marriages. The Spanish legal context is also significant because same-sex marriage was legalized in Spain in 2005, providing a sufficient time gap before the period considered in this analysis, which spans from 2013 to 2022. The number of observations is substantial, as the annual number of marriage exceeds 170,000 on average. We merge this data with information on FTTH coverage at the municipality level provided by the Spanish Government since 2013 (Ministerio

para la Transformación Digital y de la Función Pública). Spain has made considerable efforts to reduce the digital divide in FTTH during the last decade, becoming the leader in connectivity in Europe according to the OECD (OECD, 2024). The share of fiber in total fixed broadband connections in Spain grew from 35% to 86% between 2016 and 2023 (OECD, 2024). The FTTH, lead to a notable decrease in Internet prices making it accessible for the majority of Spanish households (OECD, 2024). All datasets provide high-quality information with sufficient temporal and geographical variability to ensure reliable results, making Spanish an interesting case of study.

Our analysis contributes, first and foremost, to the growing literature focused on the socio-economic implications of high-speed broadband diffusion. Prior studies show a positive relationship between Internet use and economic and population growth (Forman et al., 2012; González-Val, 2023; Holt & Jamison, 2009; Kolko, 2012). Closely related to our paper are studies examining the relationship between broadband and marriage (Bellou, 2015; Murray, 2019; Rosenfeld & Thomas, 2012). Using data from the first and second waves of Internet diffusion, these authors find that Internet access increases partnership and marriage rates in the US, especially in large metropolitan areas and among young adults (Bellou, 2015; Murray, 2019). Their findings also provide suggestive evidence that this technology plays a greater role among individuals who face a thin market for potential partners, such as homosexuals (Bellou, 2015). It is unsurprising that this subgroup enjoyed greater benefits from the expanded pool of potential partners during the 1990s and early 2000s than heterosexuals. However, that work predates the legalization of same-sex marriage in the US, a legal change that could alter the dynamics of the marriage market. In any case, additional research is necessary to understand how Internet access has affected same-sex marriage rates. Thus, our work complements the existing literature in several important ways. First, unlike prior studies, we focus on the Spanish context and the impact of next-generation broadband. The Spanish framework allows us to exploit plausible exogenous geographic and temporal variations in next-generation broadband coverage. Second, we conduct a heterogeneous analysis of same-sex and opposite-sex couples during a period when equal marriage rights were legally recognized for both groups.

The second objective of this paper is to assess whether the Internet can improve matching efficiency. Researchers have previously documented that sorting may arise in online matches due to the absence of search frictions (Hitsch et al., 2010). Thus, assortative mating might be one of the reasons why online matches are better aligned than offline ones, serving as a possible mechanism through which this technology increases marriage rates. We find suggestive evidence supporting this hypothesis, as assortative matching increases in response to the spread of FTTH among opposite-sex spouses but not among same-sex spouses. With these findings, we also contribute to the existing research that seeks to understand individual matching and marriage rates (Greenwood et al., 2014; Gutiérrez-Domènech, 2008; Lafortune & Low, 2017; Mansour & McKinnish, 2018; Schulz & Siuda, 2023) as well as research exploring differences between same-sex and opposite-sex couples (Jepsen & Jepsen, 2002; Marcén & Morales, 2022; Orth & Rosenfeld, 2018; Roisman et al., 2008).

We lastly explore the impact of the Spanish programme that subsidizes connectivity investment on marriage rates. The Next Generation Broadband Expansion Programme (Programa de extensión de la banda ancha de nueva generación, PEBA-NGA) was designed to accelerate the extension of coverage of public electronic communications networks capable of providing very high-speed broadband services to areas without coverage and to provide more broadband connectivity services in areas with a single operator. The PEBA-NGA Program has been a fundamental instrument in making Spain the country with the most extensive FTTH network in Europe, despite the challenges posed by the country's topography and geographic population dispersion. For example, by the year 2020, Fiber-to-the-Home (FTTH) coverage reached 80.4% of the Spanish population, compared to the European average of 34%. From 2013 to 2021, the programme held annual application windows for providers to propose projects through a competitive application process. Funding was a mixture of grants and repayable loans. Beneficiaries of the aid are obliged to offer wholesale access to the subsidized infrastructure for

a minimum period of seven years from the date of entry into service. A total of 798 projects from over 100 telecommunications operators were subsidized, representing investments of \notin 1.123 billion, of which \notin 621 million correspond to public subsidies, 80% of which are sourced from the European Regional Development Fund (ERDF). As a result, very high-speed broadband coverage with Fiber-to-the-Home (FTTH) networks has been provided to 6.3 million properties. This represents over 20% of existing properties and accounts for more than 50% of the FTTH coverage increase achieved during this period.

The objective of the PEBA-NGA was not to promote marriage in Spain. According to the Spanish Ministry for Digital Transformation and Public Administration, the program was a key instrument in closing the geographical digital divide, addressing the demographic challenge, and building a more inclusive society. Within the demographic challenge that Spain faces is depopulation. Depopulation does not occur uniformly across Spain, being more common in small rural areas (Collantes & Pinilla, 2011). In this framework, rising local amenities aimed at keeping and attracting young couples may be a potential solution to offset population decline. Our results suggest that public investment in FTTH accessibility may encourage couples to marry. This is observed for both same-sex and opposite-sex couples. This is a novel insight into this literature, since none of the prior works explore the impact of public investment in FTTH. This line of research can contribute to those works that seek ways to combat depopulation in Spanish municipalities (Rosario & Carolina, 2021). By focusing on this under-researched setting, the study provides novel insights into the intersection of digital infrastructure and demographic behaviors. Our results also contribute to a better understanding of the effects of public policies.

The remainder of the paper is organized as follows. Section 2 presents the data. Section 3 details the empirical strategy. Section 4 presents the results and Section 5 concludes.

2. Data

2.1 Fiber-to-the-Home coverage data

We use data on FTTH coverage at the municipality level provided by the Spanish Government.¹ It collects detailed information annually on broadband coverage provided by the various operators existing in Spain. The data includes the combined coverage provided by all operators for each technological platform, as well as the combined coverage by speed, provided by all operators and technologies, for any territorial scope. The coverage is expressed as a percentage of households covered for each territorial unit considered and technology. In our case, this territorial unit will be Spanish municipalities. Municipalities are the basic local entities of the territorial organization in Spain. As mentioned above, in our main analysis, we focus on FTTH, which is a newgeneration broadband technology that uses fibre-optic cables to transmit data. FTTH connections are known for their fast speeds and high reliability. Fiber networks in Spain began in 2008 in the most densely populated areas. However, it was not until 2013 that information on coverage at the municipal level began to be collected. In any case, the deployment in the first year considered in our analysis was small, and the growth of FTTH coverage occurred during the period analyzed. In 2013, the average coverage was just over 30% in municipalities with more than 100,000 inhabitants but much lower in the rest of the municipalities (see Table 1). After that, there was a progressive deployment of this technology.

Table 1 presents the evolution of the average FTTH coverage across municipalities in Spain from 2013 to 2022. An increase is observed in the average percentage of households with FTTH, but with considerable differences depending on the size of the municipality and over time. Municipalities with more than 100,000 inhabitants reached 80% of households with FTTH between 2014 and 2015. However, municipalities with populations between 50,000 and 100,000, which started with almost half the coverage in 2013, did not reach such high levels of coverage until 2016 and 2017. In 2020 and 2021, municipalities with populations between 10,000 and 50,000 inhabitants reached that level of coverage. The smallest municipalities, with fewer than 10,000 inhabitants, still had not reached 80% by 2022. While the majority of households in

¹ https://avancedigital.mineco.gob.es/banda-ancha/cobertura/paginas/informacion-cobertura.aspx

municipalities with more than 100,000 inhabitants already had FTTH access in 2017, the percentage of households was only 54.88% in municipalities with populations between 10,000 and 20,000 inhabitants and just 6.82% in municipalities with fewer than 10,000 inhabitants. The growth in coverage was significantly higher in small municipalities at the beginning of the series, but once coverage reached slightly above 60%, a clear slowdown was observed. To examine geographic differences, we created Figures 1.1 to 1.4. These are maps that show how the spatial distribution of the population accessing FTTH across municipalities evolved during our study period. Darker colors represent higher average FTTH coverage. By simply examining these four figures, we can observe both temporal and geographic variation in FTTH coverage from 2013 to 2022. FTTH coverage shows a geographic pattern, first with greater coverage in certain large Spanish cities, although not all of them, and later with higher coverage in southern Spain. It should be noted here that the possibilities of extending coverage also depend on the topography, so it is not only important for there to be densely populated areas for FTTH to be deployed.

2.2. Marriage statistics

In our main analysis, we use microdata from the Statistical Bulletin of Marriages provided by the Spanish Statistical Office (INE) for the period 2013–2022, which coincides temporally with the availability of the Next-generation broadband variable. Marriage Statistics collect data from the Civil Registry (Registro Civil) on all marriages celebrated in Spanish municipalities, as well as the socio-demographic characteristics of spouses. Both spouses are required to provide personal data when registering the event in the Civil Registry. In the main sample, we use data on individuals getting married during our period of study and living in the same municipality before and after marriage. Unfortunately, although it is a high-quality and extensive database, municipalities with fewer than 10,000 inhabitants are not identified, so we cannot match them with their corresponding FTTH coverage rates in our main sample. In any case, we have verified that the results hold if all municipalities with fewer than 10,000 inhabitants are assigned the average FTTH coverage rate for that type of municipality in the province to which they belong.Our main sample consists of 517,534 married couples residing in 785 different Spanish municipalities along the ten years considered here.²Around 97% of couples in our sample are opposite-sex couples and almost 3% are same-sex couples.

Figure 2 provides evidence supporting the possible relationship between the growth of FTTH and marriage rates in Spain. The figure on the left illustrates the evolution of both variables during the period 2013–2022. The gold line shows the average proportion of households with FTTH (during the previous year), and the black and green lines show the average marriage rate for all couples and opposite-sex couples by year, respectively. The figure on the right shows the crude marriage rate (CMR) among same-sex couples. The CMR is calculated as number of marriages per 1,000 inhabitants. The sharpest increase in all crude marriage rates can be observed from 2013 to 2016, when the diffusion of FTTH took place at the highest speed. After that, there was a moderate increase in CMRs, while the average number of households with FTTH continued to grow steadily, followed by a notable decline in 2020 due to the COVID-19 pandemic and a quick recovery after 2021. In response to the COVID-19 pandemic, the Spanish Government declared a state of emergency in March 2020, and several social distancing measures were adopted throughout that year. For that reason, we have excluded the year 2020 from our main sample.

² Note that there are some municipalities not reporting marriages in all years. In addition, estimates include nine years as we use first lag of our main explanatory variable.

3. Empirical Strategy

To provide empirical evidence on the impact of FTTH on marriage rates, we exploit the municipal and temporal variation in the FTTH coverage between 2013 and 2022 (excluding the year 2020). Specifically, we estimate the following equation:

$$CMR_{mt} = \beta_0 + \beta_1 FTTH_{mt-1} + \delta_m + \theta_t + \varepsilon_{mt} \quad (1)$$

where CMR_{mt} is the crude marriage rate in municipality *m* in year *t*. CMR is defined as the number of marriages during the year *t* divided by the average population in that year. The value is expressed per 1,000 inhabitants.³ Our main explanatory variable is $FTTH_{mt-1}$, which measures the proportion of households with FTTH coverage in municipality *m* in year *t*-1. Therefore, β_1 captures the effect of FTTH expansion on local CMRs. To control for any unobservable characteristics of the municipality that may be related to marriage decisions, we introduce municipality fixed effects, δ_m . Year fixed effects, θ_t , are added to capture time-variant unobserved characteristics.

We also extend our analysis to the study of changes in assortative mating of married couples in response to FTTH. From the Statistical Bulletin of Marriages, we are able to identify couples in which both partners have similar characteristics (homogamy couples). In order to do that, we estimate the equation:

$$Y_{imt} = \beta_0 + \beta_1 FTTH_{imt-1} + \delta_m + \theta_t + \varepsilon_{imt} \quad (2)$$

where Y_{imt} is a dummy variable that takes the value 1 when spouses of couple *I*, getting married in year t and living in municipality *m* after marriage exhibit similar characteristics (educational level, occupational status, age range, and native status), and 0 otherwise. Our key variable, $FTTH_{imt-1}$, is the first lag of the proportion of households with FTTH coverage in the municipality *m*, where couple *i* resides after marriage. The rest of variables have been previously defined. If the increase in the marriage rate is due to improvements in matching resulting from greater Internet access through FTTH, we should observe a positive impact of FTTH on assortative mating. Then, we would expect β_1 to be positive.

4. Results

4.2. Marriage rates

Table 2 shows the estimated coefficients of Equation (1). We find that FTTH positively impacts marriage rates (see column 1). The effect is significant but modest, as a 25-percentage-point increase in FTTH raises the marriage rate by 0.05 marriages per 1,000 inhabitants, representing 1% of the average crude marriage rate in the period under consideration. The remaining columns present a separate analysis of opposite- and same-sex married couples. In both cases, a positive and significant impact of FTTH coverage on the marriage rate is observed. The effect is greater in the case of same-sex couples. A 25-percentage-point increase in FTTH raises the marriage rate by 0.002 same-sex marriages per 1,000 inhabitants, representing 2% of the average crude marriage rate in the period under consideration for same-sex couples. In the case of opposite-sex couples, the impact is similar to that observed for all couples.

The main estimated coefficient is similar when we use data from the year 2020, as shown in Table A1 in the Appendix, and when we include all identifiable municipalities (see Table A2). We have also tested whether the results are maintained when we use two lags of FTTH in our analysis, as shown in Table A3. The results do not vary substantially. Additionally, we have examined what happens when we use wireless coverage data. Although the magnitude of the

³ Annual population data comes from the yearly municipality register (Padrón continuo) published by the INE.

effect appears to be smaller in this latter case, it should be noted that wireless and mobile coverage provide lower speeds than FTTH (see Table A4).

Table 3 presents the results of estimating an event study in which the event year is the year a municipality obtains FTTH coverage. These estimates reinforce our findings, providing empirical evidence in favor of the exogeneity of the event. From the event year onward, the effect is positive and statistically significant. However, as before, there are differences depending on the type of couple (opposite- or same-sex couples). For same-sex couples, a consistently positive and significant effect is observed. In contrast, for opposite-sex couples, we observe a negative and significant relationship starting six years after FTTH coverage became available in the municipality.

Since alternative modes of partnership to marriage have arisen during the last decades, it is arguable that our estimates are capturing a different pattern in family formation between opposite- and same-sex couples. To address these concerns, we use additional data from the Continuous Household Survey (ECH) provided by the Spanish Statistical Office (INE) for the period 2014–2019. The ECH provides rich data as it collects annual information on the demographic characteristics of Spanish households, including whether individuals are single or live with a partner (as married or unmarried couples). Thus, we are able to calculate aggregate living-together rates at the annual and provincial levels. By merging this data with the annual average FTTH at the provincial level, we can estimate the impact of this technology on all types of couple unions.⁴ Results are presented in Table A5 in the Appendix, and our conclusions slightly change since the impact of opposite-sex couples is not statistically significant, albeit positive.

Assortative mating may be a plausible mechanism underlying our previous results. We address this issue in the next subsection.

4.3. Assortative mating

We now evaluate whether increases in marriage rates in response to FTTH may be due to different patterns in matching. This sub-analysis is motivated by the branch of literature documenting that sorting along mate attributes is prevalent in frictionless search markets (Mansour & McKinnish, 2018). The design of online dating sites provides a frictionless market environment by allowing individuals to easily identify potential mates that conform to their preferences. Thus, dating online can increase sorting in mating. Table 4 shows the estimated coefficients of Equation (2). Our results show that FTTH diffusion is associated with a significant preference among spouses for similarity along many, but not all, of the attributes considered here. In particular, we find that FTTH has a positive impact on the probability of reporting marrying a partner with similar educational attainment and occupational status, as shown in Columns (1) and (2), respectively. These findings are consistent with the literature mentioned above, showing a preference for similar partners in the absence of search frictions. This is not observed in the case of age, where the relationship is negative. The effect on couples of different nationalities is not significant.

Then, we explore the heterogeneous behavior in mating between same- and opposite-sex couples. If a growing resemblance between spouses has contributed to rising marriage rates by increasing matching efficiency through online dating, we should find that FTTH diffusion has played a role in assortative mating for both types of couples. Our findings are consistent when using a subsample formed by opposite-sex couples (see Panel A in Table 5), but sorting among same-sex spouses only increases due to FTTH expansion in terms of occupational status (see Panel B). Overall, these findings point to assortative mating as a plausible mechanism through which FTTH has increased marriage rates in Spain, but mainly for opposite-sex couples.

⁴ The ECH information is not offered disaggregated by municipalities.

4.4. Public policies on FTTH and marriage.

Up to here, we have explored the impact of FTTH on marriage rates. In this subsection, we focus on how the FTTH deployment took place and how it has impacted marriage rates. To do so, we exploit data provided by the Spanish Government on the Next Generation Broadband Expansion Programme (Programa de extensión de la banda ancha de nueva generación, PEBA-NGA). This programme, as previously explained, was fundamental in the deployment of FTTH, accounting for more than 50% of the FTTH growth during the period considered. The objective of this programme was not to promote marriages, but by reducing the geographical digital divide, this public initiative may have contributed to addressing the demographic challenge and building a more inclusive society. This, in turn, could have impacted marriage rates.

The results are presented in Table 6. We have considered different types of measures to capture the effect of the PEBA-NGA on marriage rates, all of which are defined in Table 6. What is interesting about these estimates is that we observe that the public subsidies provided to expand FTTH have had an impact on marriage rates for both types of couples. The results suggest that public investment in FTTH may encourage couples to marry. This is particularly relevant, as it may be a key factor in attracting couples to small municipalities and, therefore, mitigating depopulation.

5. Conclusions

This work examines the effect of next-generation broadband on marriage rates among oppositeand same-sex couples in Spain. Given that the decision to sustain a relationship and enter into marriage is influenced by a broad spectrum of opportunities, high-speed broadband access can play a pivotal role in reducing search frictions, enhancing communication, and influencing cultural norms, thereby exerting a positive impact on marriage rates for both homosexual and heterosexual individuals. However, it is not clear whether the magnitude of the impact is the same for both groups. To explore this issue, we exploit plausible exogenous geographic and temporal variations in next-generation broadband coverage. We merge microdata on all Spanish marriages from 2013 to 2022 with the annual proportion of households with access to next-generation broadband via Fiber-to-the-Home (FTTH) at the municipal level.

Our findings indicate that an increase in local FTTH coverage is associated with a higher crude marriage rate, controlling for municipality and time fixed effects. The response of same-sex marriages is twice as large as that of heterosexual marriages, relative to their respective average marriage rates. Empirical evidence does not support improved positive assortative mating as an explanation for the differing response observed among same-sex couples. High-speed internet access reinforces positive assortative mating by education and occupation for opposite-sex couples. Supplementary analysis, using data on public funding, shows that government support for expanding FTTH through the Next Generation Broadband Expansion Programme translates into an increase in the crude marriage rate, highlighting the appeal of areas with high-speed internet in addressing depopulation.

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Notes: Data comes from the Spanish Government. Unit: % of households.



Figure 2: Evolution of CMR and FTTH during the period 2013-2022

Note: Data on FTTH comes from the Spanish Government and data on Crude Marriage Rates (CMR) comes from the Statistical Bulletin of Marriages (source: INE)

Year	All municipalities	Pop.>100,000	$50,001 \le \text{Pop.} \le 100,000$	$20,001 \le \text{Pop.} \le 50,000$	$10,000 \le \text{Pop.} \le 20,000$	Pop. ≤10,000
2013	0,99%	34,73%	19,90%	6,07%	3,11%	0,20%
2014	2,82%	74,47%	44,11%	24,02%	9,91%	0,64%
2015	4,91%	86,81%	72,08%	39,19%	20,99%	1,46%
2016	7,37%	91,71%	78,89%	52,97%	35,31%	2,89%
2017	12,31%	95,26%	86,21%	67,13%	54,88%	6,82%
2018	17,31%	95,94%	88,72%	76,09%	68,75%	11,33%
2019	24,85%	95,86%	86,84%	77,65%	72,47%	19,44%
2020	36,19%	95,05%	88,86%	83,91%	78,64%	31,41%
2021	52,09%	97,27%	95,44%	90,52%	86,68%	48,23%
2022	62,80%	97,88%	95,98%	91,71%	89,70%	59,84%

 Table 1: Average FTTH coverage by year and municipality size

Notes: This table present average values across municipalities. Data comes from the Spanish Government. Unit: % of households.

	(1)	(2)	(3)
D.V: CMR	All couples	Opposite-sex couples	Same-sex couples
$FTTH_{t-1}$	0.149***	0.141***	0.008**
	(0.035)	(0.035)	(0.004)
Observations	5,864	5,864	5,864
R-squared	0.625	0.620	0.424
D.V. Mean	3.64	3.56	0.09
D.V. Std. Dev.	0.82	0.81	0.08
Municipality FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 2: The effect of FTTH on the crude marriage rate across Spanish municipalities

Note: The sample consists of municipalities reporting any marriages during our period of study, 2013–2022 (excluding the year 2020). Municipalities without marriage information in some years are excluded from our sample. The dependent variable in all columns is the crude marriage rate (CMR) by year and municipality. We use the first lag of the explanatory variable, which is the proportion of households with Fiber-to-the-Home (FTTH). Robust standard errors reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

	(1)	(2)	(3)
D.V: CMR	All couples	Opposite-sex couples	Same-sex couples
7 periods before the event	-0.359	-0.397	0.038
-	(0.317)	(0.300)	(0.024)
6 periods before the event	-0.032	-0.022	-0.010
	(0.178)	(0.174)	(0.014)
5 periods before the event	-0.265***	-0.233***	-0.032***
	(0.084)	(0.084)	(0.008)
4 periods before the event	-0.109**	-0.080	-0.029***
	(0.054)	(0.054)	(0.005)
3 periods before the event	-0.014	0.006	-0.019***
	(0.046)	(0.046)	(0.005)
2 periods before the event	-0.034	-0.017	-0.018***
	(0.038)	(0.037)	(0.005)
The period of the event	0.070**	0.066**	0.004
	(0.033)	(0.033)	(0.004)
1 period after the event	0.136***	0.126***	0.010***
	(0.033)	(0.033)	(0.004)
2 periods after the event	0.141***	0.120***	0.020***
	(0.034)	(0.034)	(0.004)
3 periods after the event	0.080**	0.058*	0.022***
	(0.034)	(0.033)	(0.004)
4 periods after the event	0.092**	0.059*	0.032***
	(0.036)	(0.035)	(0.004)
5 periods after the event	-0.030	-0.060	0.030***
	(0.041)	(0.040)	(0.004)
6 periods after the event	-0.155***	-0.188***	0.033***
	(0.051)	(0.050)	(0.005)
7 periods after the event	-0.215***	-0.247***	0.032***
	(0.041)	(0.041)	(0.004)
8 periods after the event	0.163***	0.106**	0.058***
	(0.046)	(0.045)	(0.006)
Observations	5 <i>,</i> 864	5,864	5,864
R-squared	0.591	0.586	0.424
D.V. Mean	3.65	3.56	0.09
D.V. Std. Dev.	0.84	0.81	0.08
Municipality FE	Yes	Yes	Yes
Year FE	No	No	No

 Table 3: Event study

Note: The event period is defined as the year in which the first lag of FTTH exceeds 0. Robust standard errors reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

	(1)	(2)	(3)	(4)
D.V:	Same educational level couple	Same occupational category couple	Same group of age couple	Inter- marriage
$FTTH_{t-1}$	0.019***	0.051***	-0.014***	0.002
	(0.003)	(0.003)	(0.004)	(0.003)
Observations	627,440	627,440	627,440	627,440
R-squared	0.271	0.372	0.009	0.0194
D.V. Mean	0.52	0.43	0.50	0.08
D.V. Std. Dev.	0.50	0.50	0.50	0.27
For all				
Post-marriage municipality FE	Yes	Yes	Yes	Yes
Pre-marriage municipality FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 4: The effect of FTTH on assortative mating

Note: The sample in all columns is couples getting married in year t in municipality m We limit the sample to couples reporting information on education, profession, age, and immigrant status for both partners. Our period of study is 2013–2022 (excluding the year 2020). We use the first lag of the explanatory variable. The dependent variable in column 1 is a dummy variable that takes the value of 1 if both spouses have completed the same educational level, and 0 otherwise. The dependent variable in column 2 is a dummy variable that takes the value of 1 if both spouses have the value of 1 if both spouses belong to the same age group, and 0 otherwise. The dependent variable in column 3 is a dummy variable that takes the value of 1 if one spouse is native and the other non-native, and 0 otherwise. The explanatory variable capturing internet access is the proportion of households with FTTH in the municipality of residence before marriage. For spouses living in different municipalities. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

	(1)	(2)	(3)	(4)
D.V:	Same educational level couple	Same occupational status couple	Same group of age couple	Inter- marriage
Panel A: Opposite-sex married	couples			
$FTTH_{t-1}$	0.019***	0.050***	-0.013***	0.002
Observations R-squared	(0.003) 609,479 0.269	(0.003) 609,479 0.373	(0.003) 609,479 0.0093	(0.020) 609,479 0.0190
D.V. Mean	0.52	0.43	0.50	0.08
D.V. Std. Dev.	0.50	0.50	0.50	0.27
Panel B: Same-sex married cou	ples			
$FTTH_{t-1}$	-0.0006	0.040**	-0.005	-0.013
Observations R-squared D.V. Mean D.V. Std. Dev.	(0.020) 17,961 0.392 0.56 0.50	$(0.020) \\ 17,961 \\ 0.409 \\ 0.54 \\ 0.50$	(0.024) 17,961 0.113 0.39 0.50	(0.016) 17,961 0.115 0.12 0.33
For all				
Post-marriage municipality FE	Yes	Yes	Yes	Yes
Pre-marriage municipality FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 5: The effect of FTTH on assortative mating: differences between opposite- and same-sex couples

Note: The sample in all columns is couples getting married in year t in municipality m We limit the sample to couples reporting information on education, profession, age, and immigrant status for both partners. Our period of study is 2013–2022 (excluding the year 2020). We use the first lag of the explanatory variable. The dependent variable in column 1 is a dummy variable that takes the value of 1 if both spouses have completed the same educational level, and 0 otherwise. The dependent variable in column 2 is a dummy variable that takes the value of 1 if both spouses have the value of 1 if both spouses belong to the same age group, and 0 otherwise. The dependent variable in column 3 is a dummy variable that takes the value of 1 if one spouse is native and the other non-native, and 0 otherwise. The explanatory variable capturing internet access is the proportion of households with FTTH in the municipality of residence before marriage. For spouses living in different municipalities. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

D.V: CMR All couples Opposite-sex couples Same-sex couples Panel A: Dummy variable capturing municipalities receiving aid PEBA – NGA _{t-1} 0.003*** 0.007*** 0.006** Post of the second sec		(1)	(2)	(3)
Panel A: Dummy variable capturing municipalities receiving aid PEBA - NGA _{t-1} 0.103*** 0.097*** 0.006** 0.025 0.024) 0.003) Observations 5,864 5,864 5,864 R-squared 0.625 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Std. Dev 0.50 0.50 0.50 Panel B: Total aid (million euros) 0.0066) 0.0006) PEBA - NGA _{t-1} Mean 0.34*** 0.032*** 0.002*** 0.022*** 0.0060 0.0006) 0.0006) 0.0006) 0.0006) 0.0010 Observations 5.864 5.864 5.864 5.864 5.864 R-squared 0.626 0.621 0.424 0.02*** D.V. Mean 3.64 3.56 0.08 PEBA - NGA_{t-1} 0.03*** 0.002*** D.V. Mean 3.64 5.864 5.864 5.864	D.V: CMR	All couples	Opposite-sex couples	Same-sex couples
$PEBA - NGA_{t-1}$ 0.103^{***} 0.097^{***} 0.003 Observations 5,864 5,864 5,864 5,864 R-squared 0.625 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 $PEBA - NGA_{t-1}$ Mean 0.47 0.47 0.47 $PEBA - NGA_{t-1}$ Std. Dev 0.50 0.50 0.50 Panel B: Total aid (million euros) 0.0066) (0.001) Observations 5.864 5.864 5.864 5.864 5.864 5.864 Nean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA_{t-1} Mean 0.85 0.85 0.85 PEBA NGA_{t-1} 0.002*** D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev 1.57 1.57 1.57 PEBA - NGA_{t-1} 0.035*** 0.033*** 0.002*** 0.002*** D.V. Mean <t< td=""><td>Panel A: Dummy variable capturin</td><td>ng municipalitie</td><td>es receiving aid</td><td></td></t<>	Panel A: Dummy variable capturin	ng municipalitie	es receiving aid	
	$PEBA - NGA_{t-1}$	0.103***	0.097***	0.006**
$\begin{array}{llllllllllllllllllllllllllllllllllll$		(0.025)	(0.024)	(0.003)
R-squared 0.625 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.81 0.08 PEBA - NGA _{t-1} Mean 0.47 0.47 0.47 PEBA - NGA _{t-1} Std. Dev 0.50 0.50 0.50 Panel B: Total aid (million euros) PEBA - NGA _{t-1} 0.034*** 0.032*** 0.002*** Observations 5.864 5.864 5.864 5.864 5.864 R-squared 0.626 0.621 0.424 0.424 D.V. Mean 3.64 3.56 0.09 0.02*** Observations 5.864 5.864 5.864 5.864 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Std. Dev 1.57 1.57 Panel C: Loan aid (million euros) PEBA - NGA _{t-1} Std. Dev 1.57 1.57 1.57 Panel C: Loan aid (million euros) PEBA - NGA _{t-1} Mean 0.82 0.81 0.08 Dv.V Std. Dev. 0.82 0.81 0.08 9 9	Observations	5,864	5,864	5,864
D.V. Mean 3.64 3.56 0.09 D.V. Sid. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.47 0.47 0.47 PEBA - NGA _{t-1} Std. Dev 0.50 0.50 0.50 Panel B: Total aid (million euros) 0.002*** 0.002*** PEBA - NGA _{t-1} 0.034*** 0.032*** 0.002*** Observations 5.864 5.864 5.864 5.864 R-squared 0.626 0.621 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.008 PEBA - NGA _{t-1} N.035*** 0.002*** PEBA - NGA _{t-1} Mean 0.85 0.85 0.85 0.85 0.85 PEBA - NGA _{t-1} Std. Dev 1.57 1.57 1.57 1.57 Panel C: Loan aid (million euros) 0.002*** 0.001) 0.001) Observations 5.864 5.864 5.864 S.864 5.864 S.864 PANGA _{t-1} Mean 0.89	R-squared	0.625	0.620	0.424
D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.47 0.47 0.47 PEBA - NGA _{t-1} Std. Dev 0.50 0.50 0.50 Panel B: Total aid (million euros) 0.002*** 0.002*** Observations 5.864 5.864 5.864 5.864 5.864 R-squared 0.626 0.621 0.424 0.424 D.V. Mean 3.64 3.56 0.09 0.002*** D.V. Mean 0.85 0.85 0.85 PEBA - NGA _{t-1} Std. Dev 1.57 1.57 1.57 Panel C: Loan aid (million euros) 0.002*** PBBA - NGA _{t-1} Std. Dev 1.57 1.57 1.57 Panel C: Loan aid (million euros) 0.002*** 0.002*** PEBA - NGA _{t-1} Mean 0.82 0.81 0.008 0.82 PEBA - NGA _{t-1} Mean 0.82 0.81 0.008 <tr< td=""><td>D.V. Mean</td><td>3.64</td><td>3.56</td><td>0.09</td></tr<>	D.V. Mean	3.64	3.56	0.09
PEBA - NGA_{t-1} Mean 0.47 0.47 0.47 PEBA - NGA_{t-1} Std. Dev 0.50 0.50 0.50 Panel B: Total aid (million euros) PEBA - NGA_{t-1} 0.034*** 0.002*** 0.0006 Observations 5.864 5.864 5.864 5.864 5.864 5.864 R-squared 0.626 0.621 0.424 0.03 0.03 PEBA - NGA_{t-1} 0.03 0.08 D.V. Mean 3.64 3.56 0.09 0.08 0.08 0.08 PEBA - NGA_{t-1} 0.03 PEBA - NGA_{t-1} 0.035*** 0.033*** 0.002*** PEBA - NGA_{t-1} 0.035*** 0.033*** 0.002*** 0.002*** Observations 5.864 5.864 5.864 5.864 5.864 R-squared 0.626 0.620 0.424 0.001 Observations 5.864 5.864 5.864 5.864 7.864 NV Mean 3.64 3.56 0.09 0.89 PEBA - NGA_{t-1} 0.163*** 0.155*** 0.008* D.V. Mean 3.64 3.56 0.09 0.89 <td>D.V. Std. Dev.</td> <td>0.82</td> <td>0.81</td> <td>0.08</td>	D.V. Std. Dev.	0.82	0.81	0.08
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Panel B: Total aid (million euros) PEBA – NGA _{t-1} 0.032*** 0.002*** 0.0006) (0.006) (0.001) Observations 5,864 5,864 R-squared 0.626 0.621 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA – NGA _{t-1} Mean 0.85 0.85 0.85 PEBA – NGA _{t-1} Std. Dev 1.57 1.57 1.57 Panel C: Loan aid (million euros) PEBA – NGA _{t-1} 0.035*** 0.003*** 0.002*** Observations 5.864 5.864 5.864 5.864 R-squared 0.626 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA – NGA _{t-1} 0.163*** 0.155*** 0.008* D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA – NGA _{t-1}	$PEBA - NGA_{t-1}$ Std. Dev	0.50	0.50	0.50
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	• -	(0.006)	(0.006)	(0.001)
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	R-squared	0.626	0.621	0.424
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	D.V. Std. Dev.	0.82	0.81	0.08
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$PEBA - NGA_{t-1}$ Mean	0.85	0.85	0.85
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$PEBA - NGA_{t-1}$ Std. Dev	1.57	1.57	1.57
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Panel C: Loan aid (million euros)			
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Observations 5,864 5,864 5,864 5,864 R-squared 0.626 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA – NGA _{t-1} Mean 0.89 0.89 0.89 PEBA – NGA _{t-1} Std. Dev 1.45 1.45 1.45 PEBA – NGA _{t-1} Std. Dev 1.45 1.45 PEBA – NGA _{t-1} Std. Dev 1.63*** 0.155*** 0.008* Observations 5,864 5,864 5,864 5,864 R-squared 0.625 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA – NGA _{t-1} Mean 0.14 0.14 0.14 PEBA – NGA _{t-1} Std. Dev 0.24 0.24 0.24 PEBA – NGA _{t-1} Std. Dev 0.235*** 0.233*** 0.012** Observations 5.864 5.864 5.864 R-squared 0.62	t I	(0.007)	(0.007)	(0.001)
R-squared 0.626 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.89 0.89 0.89 PEBA - NGA _{t-1} Std. Dev 1.45 1.45 1.45 Panel D: Grant aid (million euros) $PEBA - NGA_{t-1}$ 0.163^{***} 0.155^{***} 0.008^* 0.041) (0.041) (0.041) (0.004) 0.004 Observations $5,864$ $5,864$ $5,864$ $5,864$ R-squared 0.625 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA_{t-1} Mean 0.14 0.14 0.14 PEBA - NGA_{t-1} Std. Dev 0.24 0.24 0.24 Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project $PEBA - NGA_{t-1}$ 0.235^{***} 0.223^{***} 0.012^{**} Observations 5.864 5.864 5.864 5.864 5.864 <td>Observations</td> <td>5.864</td> <td>5.864</td> <td>5.864</td>	Observations	5.864	5.864	5.864
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	R-squared	0.626	0.620	0.424
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	D.V. Mean	3.64	3.56	0.09
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	D.V. Std. Dev.	0.82	0.81	0.08
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$PEBA - NGA_{t-1}$ Mean	0.89	0.89	0.89
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	$PEBA - NGA_{t-1}$ Std. Dev	1.45	1.45	1.45
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Panel D: Grant aid (million euros)			
(0.041) (0.041) (0.004) Observations 5,864 5,864 5,864 R-squared 0.625 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA – NGA _{t-1} Mean 0.14 0.14 0.14 PEBA – NGA _{t-1} Std. Dev 0.24 0.24 0.24 Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project PEBA – NGA _{t-1} 0.235*** 0.223*** 0.012** (0.042) (0.041) (0.005) 0 0 0 0 Observations 5,864 5,864 5,864 5,864 5,864 0.424 D.V. Mean 3.64 3.56 0.09 0.424 0.424 0.424 D.V. Mean 3.64 3.56 0.09 0.82 0.81 0.08 PEBA – NGA _{t-1} Mean 0.24 0.24 0.24 0.24 D.V. Mean 3.64 3.56 0.09 0.82 0.81 0.08 PEBA – NGA _{t-1} Mean 0.24 0.24 <td< td=""><td>$PEBA - NGA_{t-1}$</td><td>0.163***</td><td>0.155***</td><td>0.008*</td></td<>	$PEBA - NGA_{t-1}$	0.163***	0.155***	0.008*
Observations 5,864 5,864 5,864 5,864 R-squared 0.625 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA – NGA _{t-1} Mean 0.14 0.14 0.14 PEBA – NGA _{t-1} Std. Dev 0.24 0.24 0.24 Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project PEBA – NGA _{t-1} 0.235*** 0.223*** 0.012** (0.042) (0.041) (0.005) 0bservations 5,864 5,864 5,864 R-squared 0.626 0.621 0.424 0.424 0.744 0.744 D.V. Mean 3.64 3.56 0.09 0.744 0.744 0.744 D.V. Mean 3.64 3.56 0.09 0.744 0.744 0.744 D.V. Mean 3.64 3.56 0.09 0.744 0.24 0.24 D.V. Mean 3.64 3.56 0.08 0.28 0.28 0.28 0.28 PEBA – NGA _{t-1} Mean 0.24 0.24	ι-1	(0.041)	(0.041)	(0.004)
R-squared 0.625 0.620 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.14 0.14 0.14 PEBA - NGA _{t-1} Std. Dev 0.24 0.24 0.24 Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project PEBA - NGA _{t-1} 0.235*** 0.223*** 0.012** (0.042) (0.041) (0.005) Observations 5,864 5,864 5,864 R-squared 0.626 0.621 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.24 0.24 0.24 D.V. Std. Dev. 0.28 0.28 0.28 PEBA - NGA _{t-1} Mean 0.24 0.24 0.24 PEBA - NGA _{t-1} Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes	Observations	5.864	5.864	5.864
D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.14 0.14 0.14 PEBA - NGA _{t-1} Std. Dev 0.24 0.24 0.24 Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project PEBA - NGA _{t-1} 0.235*** 0.223*** 0.012** Observations 5,864 5,864 5,864 5,864 5,864 R-squared 0.626 0.621 0.424 0.24 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.24 0.24 0.24 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.24 0.24 0.24 PEBA - NGA _{t-1} Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes	R-squared	0.625	0.620	0.424
D.V. Std. Dev. 0.82 0.81 0.08 $PEBA - NGA_{t-1}$ Mean 0.14 0.14 0.14 $PEBA - NGA_{t-1}$ Std. Dev 0.24 0.24 0.24 Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project PEBA - NGA_{t-1} 0.235*** 0.223*** 0.012** 0bservations 5,864 5,864 5,864 5,864 5,864 R-squared 0.626 0.621 0.424 0.424 D.V. Mean 3.64 3.56 0.09 0.08 PEBA - NGA_{t-1} Mean 0.24 0.24 0.24 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA_{t-1} Mean 0.24 0.24 0.24 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA_{t-1} Mean 0.24 0.24 0.24 PEBA - NGA_{t-1} Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes	D.V. Mean	3.64	3.56	0.09
PEBA - NGA _{t-1} Mean 0.14 0.14 0.14 PEBA - NGA _{t-1} Std. Dev 0.24 0.24 0.24 Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project PEBA - NGA _{t-1} 0.235*** 0.223*** 0.012** PEBA - NGA _{t-1} 0.235*** 0.223*** 0.012** Observations 5,864 5,864 5,864 R-squared 0.626 0.621 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.24 0.24 0.24 PEBA - NGA _{t-1} Mean 0.24 0.23 0.82 0.81 0.08 PEBA - NGA _{t-1} Mean 0.24 0.24 0.24 0.24 PEBA - NGA _{t-1} Std. Dev 0.28 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes Yes	D.V. Std. Dev.	0.82	0.81	0.08
PEBA - NGA _{t-1} Std. Dev 0.24 0.24 0.24 Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project PEBA - NGA _{t-1} 0.235*** 0.223*** 0.012** PEBA - NGA _{t-1} 0.235*** 0.223*** 0.012** 0.005) 0.005) Observations 5,864 5,864 5,864 5,864 0.09 0.424 O.V. Mean 3.64 3.56 0.09 0.08 0.24 0.24 D.V. Mean 3.64 3.56 0.09 0.08 0.08 0.08 0.08 0.24 0.24 D.V. Std. Dev. 0.82 0.81 0.08 0.24 0.24 0.24 PEBA - NGA _{t-1} Mean 0.24 0.24 0.24 0.24 0.24 0.24 PEBA - NGA _{t-1} Std. Dev 0.28 0.28 0.28 0.28 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes Yes Yes	$PEBA - NGA_{t-1}$ Mean	0.14	0.14	0.14
Panel E: Proportion of aid from the total amount of the budgeted expenditure on the project $PEBA - NGA_{t-1}$ 0.235^{***} 0.223^{***} 0.012^{**} (0.042) (0.041) (0.005) Observations $5,864$ $5,864$ $5,864$ R-squared 0.626 0.621 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 $PEBA - NGA_{t-1}$ Mean 0.24 0.24 0.24 $PEBA - NGA_{t-1}$ Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes	$PEBA - NGA_{t-1}$ Std. Dev	0.24	0.24	0.24
$PEBA - NGA_{t-1}$ 0.235^{***} 0.223^{***} 0.012^{**} Observations $5,864$ $5,864$ $5,864$ R-squared 0.626 0.621 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 $PEBA - NGA_{t-1}$ Mean 0.24 0.24 0.24 $PEBA - NGA_{t-1}$ Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes	Panel E: Proportion of aid from th	e total amount	of the budgeted expendit	ure on the project
(0.042) (0.041) (0.005) Observations5,8645,8645,864R-squared0.6260.6210.424D.V. Mean3.643.560.09D.V. Std. Dev.0.820.810.08 $PEBA - NGA_{t-1}$ Mean0.240.240.24 $PEBA - NGA_{t-1}$ Std. Dev0.280.280.28For allMunicipality FEYesYesYesYear FEYesYesYes	$PEBA - NGA_{t-1}$	0.235***	0.223***	0.012**
Observations $5,864$ $5,864$ $5,864$ R-squared 0.626 0.621 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 $PEBA - NGA_{t-1}$ Mean 0.24 0.24 0.24 $PEBA - NGA_{t-1}$ Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes		(0.042)	(0.041)	(0.005)
R-squared 0.626 0.621 0.424 D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 $PEBA - NGA_{t-1}$ Mean 0.24 0.24 0.24 $PEBA - NGA_{t-1}$ Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes	Observations	5 864	5 864	5 864
D.V. Mean 3.64 3.56 0.09 D.V. Std. Dev. 0.82 0.81 0.08 $PEBA - NGA_{t-1}$ Mean 0.24 0.24 0.24 $PEBA - NGA_{t-1}$ Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes Year FE Yes Yes Yes	R-squared	0.626	0.621	0.424
D.V. Std. Dev. 0.82 0.81 0.08 $PEBA - NGA_{t-1}$ Mean 0.24 0.24 0.24 $PEBA - NGA_{t-1}$ Std. Dev 0.28 0.28 0.28 For all Municipality FE Yes Yes Yes Year FE Yes Yes Yes Yes	D.V. Mean	3.64	3.56	0.09
$PEBA - NGA_{t-1}$ Mean0.240.240.24 $PEBA - NGA_{t-1}$ Std. Dev0.280.280.28For allYesYesYear FEYesYesYesYear FEYesYesYes	D.V. Std. Dev.	0.82	0.81	0.08
$PEBA - NGA_{t-1}$ Std. Dev 0.28 0.28 0.28 For all Municipality FEYesYesYesYear FEYesYesYes	$PEBA - NGA_{t-1}$ Mean	0.24	0.24	0.24
For allYesYesMunicipality FEYesYesYear FEYesYesYesYesYes	$PEBA - NGA_{t-1}$ Std. Dev	0.28	0.28	0.28
NormalMunicipality FEYesYesYesYear FEYesYesYes	For all			
Year FE Yes Yes Yes	Municipality FF	Ves	Vec	Ves
	Year FE	Ves	Ves	Ves

Table 0. The chect of TEDA-110A on CMA	Table 6:	The	effect	of I	PEBA	-NGA	on	CMR
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Note: The sample consists of municipalities reporting any marriages during our period of study, 2013–2022 (excluding the year 2020). Municipalities without marriage information in some years are excluded from our sample. The dependent variable in all columns is the crude marriage rate (CMR) by year and municipality. We use the first lag of the explanatory variable, which is the proportion of households with Fiber-to-the-Home (FTTH). Robust standard errors reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Appendix

	(1)	(2)	(3)
D.V: CMR	All couples	Opposite-sex couples	Same-sex couples
$FTTH_{t-1}$	0.132***	0.125***	0.008**
	(0.034)	(0.034)	(0.004)
Observations	6,597	6,597	6,597
R-squared	0.714	0.711	0.412
D.V. Mean	3.46	3.37	0.08
D.V. Std. Dev.	0.96	0.94	0.08
Municipality FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table A1: The effect of FTTH on crude marriage rates across Spanish municipalitiesincluding the year 2020

Note: The sample consists of municipalities reporting any marriages during our period of study, 2013–2022. Municipalities without marriage information in some years are excluded from our sample. The dependent variable in all columns is the crude marriage rate (CMR) by year and municipality. We use the first lag of the explanatory variable, which is the proportion of households with Fiber-to-the-Home (FTTH. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

	(1)	(2)	(3)
<i>D.V</i> : CMR	All couples	Opposite-sex couples	Same-sex couples
$FTTH_{t-1}$	0.197***	0.188***	0.009**
	(0.042)	(0.042)	(0.004)
Observations	6,280	6,280	6,280
R-squared	0.666	0.661	0.439
D.V. Mean	3.50	3.42	0.08
D.V. Std. Dev.	1.08	1.05	0.08
Municipality FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

 Table A2: The effect of FTTH on crude marriage rates across Spanish municipalities including municipalities with any marriage in some years

Note: The sample consists of municipalities reporting any marriages during our period of study, 2013–2022 (excluding the year 2020). The dependent variable in all columns is the crude marriage rate (CMR) by year and municipality. We use the first lag of the explanatory variable, which is the proportion of households with Fiber-to-the-Home (FTTH). Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

	(1)	(2)	(3)
D.V: CMR	All couples	Opposite-sex couples	Same-sex couples
$(FTTH_{t-1}+FTTH_{t-2})/2$	0.230***	0.220***	0.010*
	(0.044)	(0.044)	(0.005)
Observations	5,283	5,283	5,283
R-squared	0.639	0.634	0.431
D.V. Mean	3.66	3.57	0.09
D.V. Std. Dev.	0.82	0.80	0.08
$(FTTH_{t-1} + FTTH_{t-2})/2$ Mean	0.56	0.56	0.56
$(FTTH_{t-1} + FTTH_{t-2})/2$ Std. Dev.	0.39	0.39	0.39
Municipality FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

 Table A3: The effect of FTTH on the crude marriage rate across Spanish municipalities by redefining our Internet measure

Note: The sample consists of municipalities reporting any marriages during our period of study, 2013–2022 (excluding the year 2020). Municipalities without marriage information in some years are excluded from our sample. The dependent variable in all columns is the crude marriage rate (CMR) by year and municipality. We use the average of the first and second lag of the proportion of households with FTTH as our main explanatory variable. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

	(1)	(2)	(3)
D.V: CMR	All couples	Opposite- sex couples	Same-sex couples
Wireless Coverage $_{t-1}$	0.135***	0.128***	0.007**
	(0.028)	(0.028)	(0.003)
Observations	5,864	5,864	5,864
R-squared	0.626	0.620	0.424
D.V. Mean	3.64	3.56	0.09
D.V. Std. Dev.	0.82	0.81	0.08
Wireless Coverage _{t-1} Mean	0.41	0.41	0.41
Wireless Coverage $_{t-1}$ Std. Dev.	0.37	0.37	0.37
Municipality FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table A4: The effect of wireless coverage on crude marriage rates across Spanish municipalities

Note: The sample consists of municipalities reporting any marriages during our period of study, 2013–2022 (excluding the year 2020). Municipalities without marriage information in some years are excluded from our sample. The dependent variable in all columns is the crude marriage rate (CMR) by year and municipality. We use the first lag of the explanatory variable, which is the proportion of households with Fiber-to-the-Home (FTTH). Robust standard errors reported in parentheses. We use the first lag of the explanatory variable, which is the first lag of the explanatory variable, which is the proportion of households with Fiber-to-the-Home (FTTH). Robust standard errors reported in parentheses. We use the first lag of the explanatory variable, which is the proportion of households accessing wireless coverage at speeds of 2 and 30 Mbps during 2013-2020 and the proportion of households with fixed wireless access for the years 2021 and 2022. Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

	(1)	(2)	(3)		
Panel A: Micro an	nalysis				
D.V: Civil partnership	All couples	Opposite-sex couples	Same-sex couples		
$FTTH_{t-1}$	0.006** (0.003)	0.003 (0.003)	0.003*** (0.000)		
Observations	1,616,469	1,616,469	1,616,469		
R-squared	0.004	0.004	0.000		
D.V. Mean	0.06	0.06	0.001		
D.V. Std. Dev.	0.23	0.23	0.037		
Panel B: Macro analysis					
<i>D.V:</i> Civil partnership variation rate	All couples	Opposite-sex couples	Same-sex couples		
$FTTH_{t-1}$	0.151	0.114	1.940***		
Observations R-squared D.V. Mean D.V. Std. Dev.	(0.117) 312 0.503 -0.04 0.18	(0.119) 312 0.502 -0.04 0.18	$(0.623) \\ 312 \\ 0.499 \\ 0.03 \\ 0.75$		
Province FE Year FE	Yes Yes	Yes Yes	Yes Yes		

 Table A5: The effect of FTTH on living-together (as a married or unmarried couple) rates across Spanish provinces

Note: Data comes from the Continuous Household Survey (ECH) provided by the Spanish Statistical Office (INE) for the period 2014–2019. Panel A presents the estimated coefficients of our regressions at the individual level. Panel B presents the estimated coefficients of regressions at the provincial level. The dependent variable in Panel A is a dummy variable that takes the value of 1 if the individual reports having an opposite- or same-sex civil partner in column (1), an opposite-sex civil partner in column (2), and a same-sex partner in column (3), and 0 otherwise. The dependent variable in column (1) of Panel B is the variation rate, with respect to the first year in our sample, of the annual civil partnership rate at the provincial level. This is calculated as the total number of civil partnerships (both opposite- and same-sex couples) in year t and province i, divided by the average population in that year and province. The value is expressed per 1,000 inhabitants. The civil partnership rates in columns (2) and (3) are calculated considering only opposite- and same-sex couples, respectively. We use the first lag of the explanatory variable, which is the proportion of households with Fibre-To-The-Home (FTTH).Robust standard errors are reported in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.