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Under the Same Roof: Educational Attainment and Adult Co-Residence With Parents

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ABSTRACT

We study the influence of higher education on the likelihood of co-residence between adults in their late 20s and their parents. We exploit a policy change that expanded the supply of higher education in Greece to compare the probability of attaining higher education and the probability of living with parents between individuals who were just, and just not exposed to the expansion. We find evidence that completing university studies reduces the probability of co-residence by 17 percentage points. We further document evidence that the impact of higher education is stronger for men.

1 | Introduction

Moving out of the parental household is a significant milestone in the transition to adulthood (Billari and Liefbroer 2010; Buchmann and Kriesi 2011; Hogan and Astone 1986). The timing of residential independence during an individual's life course is constantly evolving in response to changing socio-economic conditions, with rates of inter-generational co-residence between adults and their parents increasing in many countries (Dettling and Hsu 2018; Esteve and Reher 2021; Goldscheider and DaVanzo 1985; Ward and Spitze 2007). The average age of leaving the parental home across EU countries was 26.2 years in 2024, ranging from 31.3 years in Croatia to 21.4 years in Finland (European Commission 2025). In England and Wales, the number of adult children living with their parents increased by 14.7% between 2011 and 2021 (Office for National Statistics 2023), while a similar trend is observed in the United States of America (Merten et al. 2018). At the same time, more adults appear to be returning to their parents' home following a brief foray to independence, in a phenomenon that has been termed the 'boomerang effect' (Arundel and Lennartz 2017; Liao and Paweenawat 2022; Stone et al. 2014).

Adults' co-residence with their parents has complex social, demographic and labour force participation implications.

Co-residence protracts the transition to adulthood, offering young adults the opportunity for deeper exploration of alternative life directions during their late teens and early 20s (Arnett 2000), and supports them during job search, improving their employment outcomes and long-term career opportunities (Hao and Brinton 1997; Liao and Paweenawat 2022; Saydam and Raley 2024). On the other hand, co-residence can be negatively associated with parents' labour force participation (Tong et al. 2019). Living with one's parents can reduce the probability of forming romantic relationships and marriage (Yu and Kuo 2016), plausibly obstructing family formation and delaying later life course milestones and can be both negatively (Caputo 2019; Gil-Moltó and Hole 2024; Tosi and Grundy 2018) and positively (Aranda 2015; Courtin and Avendano 2016; Waddell and Harkness 2024; Ye and Chen 2014; Zunzunegui et al. 2001) associated with parental mental health and well-being. In this context, identifying the factors affecting the living arrangements of young adults is important for understanding demographic, social and economic trends and designing effective policy interventions for addressing ensuing challenges.

Much of the existing empirical research on the drivers of co-residence focuses on the family's role in providing a safety net against adverse macroeconomic conditions and unfavourable

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individual financial circumstances. Co-residence is an insurance mechanism against labour market risk for young adults (Kaplan 2012; Ong ViforJ et al. 2025), increases with perceived job and income insecurity (Becker et al. 2010; Fernandes et al. 2008), indebtedness (Dettling and Hsu 2018), unemployment and low wages (Matsudaira 2016) and at times of economic crisis (Arundel and Lennartz 2017; Lennartz et al. 2016; Wu and Grundy 2023). Co-residence varies with the level of social support provided by the welfare state (Albertini et al. 2019; F. Billari 2004) and is discouraged by easier access to credit and affordable rental and property markets (Acolin et al. 2024; Grevenbrock et al. 2024; Lennartz et al. 2016; Wetzstein 2017). At the same time, co-residence rates depend on cultural norms and the strength of family ties (Cepa and Kao 2019; Giuliano 2007), and local social expectations¹ influencing the sequencing of life course events (Adamopoulou and Kaya 2018; Liefbroer and Billari 2010). Prior research also points to the links between co-residence and religiosity and the prominence of individualistic values (van den Berg et al. 2021), and changes in fertility rates and life expectancy (Esteve and Reher 2021). Beyond economic and aggregate or individual cultural determinants, personal and parental characteristics and their interactions impact on residential decisions (Stone et al. 2014). Co-residence is contingent on parents' willingness and ability to provide material support (Albertini et al. 2007; Liao and Paweenawat 2022; Worth 2021) and is correlated with their educational attainment (Pilkaukas et al. 2020).

The change in patterns of co-residence since the second half of the 20th century coincided with an expansion in the supply of higher education. Did the associated marked increase in educational attainment contribute to the observed patterns of co-residence? And if so, did it serve to increase or moderate the prevalence of co-residence? Higher education can influence co-residence directly by requiring students to relocate for attending university, hastening residential independence (F. Billari 2004; Buchmann and Kriesi 2011; Ford et al. 2002). At the same time, the proliferation of higher education institutions (Valero and Van Reenen 2019), offers greater opportunity for young adults to study while remaining in their parental home during their late teens to early 20s in a period of 'emerging adulthood' (Arnett 2000). Benefiting from parental support, these individuals can graduate with less debt and more savings relative to peers (Worth 2021), allowing greater residential independence in their late 20s and early 30s. Indirectly, education can influence co-residence decisions through its impact on the timing of subsequent life course milestones, individual financial circumstances and preferences. Completing full-time studies is among the first landmarks of the transition to adulthood. Remaining in education can delay labour market participation and family formation that stimulate residential independence (Furstenberg 2010; Kneale and Joshi 2008). On the other hand, tertiary education can improve financial and career outcomes (Altonji et al. 2012; Cole et al. 2014; Crawford et al. 2016), allowing quicker participation in the property market (Silles 2023), and by encouraging mobility.

Here, we focus on the role of education in determining co-residence by providing reduced-form evidence on the relationship between the attainment of higher education and the probability that adults cohabit with their parents. Establishing a

causal link between higher education and co-residence is challenging, as unobserved personal and family characteristics, including socio-economic background, attitudes and preferences for independent living, can simultaneously affect both the decision to pursue higher education and co-residence status. To address the endogeneity, we focus on the quasi-natural experiment that resulted from an expansion in higher education supply that took place in Greece, affecting cohorts graduating from high school in year 2000 onward (Kountouris 2020). We use data from the Greek Population and Housing Census conducted in 2011 when the first affected cohort were 29 years old, and exploit the variation introduced by the school enrolment age cutoff, to estimate a fuzzy regression discontinuity design (RDD) comparing the probability of co-residence, across adults that were just and just-not affected by the expansion in higher education supply. Focusing the analysis on a single country allows us to neutralize the influence of macroeconomic, institutional and cultural drivers of co-residence (Giuliano 2007). Furthermore, Greece presents an interesting case study as it has the highest housing cost overburden rate across EU countries and one of the highest average home-leaving age (European Commission 2025). We find evidence that higher educational attainment lowers the probability that adults share a dwelling with one or more of their parents: adults who acquired a higher education qualification only because they were exposed to the expansion in higher education supply are around 17.3 percentage points less likely to co-reside with their parents in their late 20s. We assess the role of sex² in the relationship between educational attainment and the probability of co-residence (Chiuri and Del Boca 2010; Stone et al. 2014), and find that the result is more pronounced for men relative to women. We explore plausible mechanisms that may drive the influence of higher education. Specifically, we examine whether the effect can be attributed to improvements in career outcomes or marriage formation. We further report some results on the relationship between educational attainment and boomerang behaviour. Overall, our results suggest that investment in higher education and broadening access to university studies can contribute to the emancipation of young adults through improving their labour market outcomes.

Prior research has focused on the association between higher education and co-residence, and its drivers. White and Lacy (1997), using data from the US, find that late home-leaving (after 21 years) is associated with higher educational attainment, while Stone et al. (2011) show a negative association between university education and co-residence with parents, for adults in their early 30s in the United Kingdom. Similarly, VanWey and Cebulko (2007) and Isengard and Szydluk (2012) find a negative relationship between higher levels of education and co-residence using data from Brazil and Europe, respectively. Pilkaukas et al. (2020) argues that higher urbanization rates combined with expansion in education supply drove younger generations in the United States away from rural places, decreasing the opportunities but also the need for co-residence. In their qualitative investigation of UK graduates' motivation for co-residence Roberts et al. (2016), find that living with parents fulfils multiple roles: it allows individuals to support their parents, it acts as a springboard for career development, a means to accumulate resources, particularly for future property purchases in an overheated property market and

serves as a place of refuge and a preferred living arrangement due to comfort and cultural practices. Another strand of research examines the mediating effect of education on the behaviours of multigenerational households. Studying the behaviour of couples co-residing with parents in China, Hu and Mu (2021) show that education is negatively correlated with the time co-residing women spend on housework, while (Cheng 2019) shows a positive correlation between women's education and decision-making power. To our knowledge, this is the first paper attempting to provide causal estimates on the relationship between the attainment of higher education and the probability of co-residence.

The next section gives some background on inter-generational co-residence, the educational system and housing market in Greece. Section 3 outlines the data and methodology, Section 4 presents the results and while Section 5 discusses the findings and concludes.

2 | Background

2.1 | Greek Education System the Expansion in Higher Education Supply

Higher education at the undergraduate level in Greece was exclusively provided by the State free of cost to the students for the period we study in this paper³ and was organized in two tiers: Higher Education Institutes (HEIs) and Technological Education Institutes (TEIs) offering 4–6 and 3.5 year programs, respectively. Admission to a HEI was rationed through university entry examinations that candidates sat after completing 9 years of compulsory schooling (6 years of primary and 3 years of lower secondary school), followed by 3 years of upper secondary school. Free provision, perceived pecuniary returns to education, along with cultural factors placing a large value on higher education, interacted to generate excess demand for university studies. According to the OECD, 54% of women and 36% of men aged 25–34 had a university degree in 2024 (OECD 2024). To bridge the gap between supply and demand and stem the flow of undergraduate students abroad, the government increased the number of places by about 20,000 between 1998 and 2000 (Kountouris 2020). The expansion in supply coincided with a reform that changed the University admission process. The first cohort that was exposed to the reforms graduated from high school in 2000.

2.2 | Inter-Generational Co-Residence and the Housing Market in Greece

Intergenerational co-residence is high in Greece due to strong family ties, limited labour market opportunities for young adults and a weak welfare support system (Christopoulou and Pantalidou 2022). In 2019, 57.8% of young adults, aged 25–34, lived at the parental household while the average home leaving age in 2024 was 30.7 years (European Commission 2025)⁴. The global financial crisis of 2008 led to a deep recession in Greece that deteriorated the labour market conditions and increased unemployment (Matsaganis and Leventi 2013). Young adults were particularly affected with the youth unemployment (<25 years old) reaching 53.1% in 2014 (Bell and

Blanchflower 2015). The parental household provided a safety net for young adults and co-residence increased (Christopoulou and Pantalidou 2022). At the same time, Greece has the highest housing cost overburden rate among EU countries with 30.3% of people aged 15–29 spending more than 40% of their disposable income on housing (Alexandri 2022). Homeownership, while higher in Greece compared to the EU average, is decreasing and social housing is very limited (Adamopoulou et al. 2025). To tackle a housing crisis aggravated by increased demand from foreign investors and short-term rentals and to support low-income young adults to live independently, the government has since 2022 announced a series of measures including low mortgage rates for first-time buyers, low-interest loans for house renovations and changes to short-term rental rules (Newsroom 2022; Radin 2024).

3 | Data and Empirical Approach

3.1 | Data

We use data from the 2011 decennial Greek Housing and Population Census that was administered by the Hellenic Statistical Authority (National Statistical Office of Greece). The census collected socio-demographic information for all the country's residents through in-person interviews by trained enumerators at each household's residence. Our data set consists of a 10% anonymized representative sample of 413,464 household and 1,056,607 individual records made publicly available through IPUMS (Minnesota Population Center 2018). The data report the month and year of birth for every household member, along with socioeconomic characteristics including the highest completed educational level. We exclude from the analysis individuals reported to be born outside of Greece, to ensure similarity in the likelihood of having immediate family in the country across adults at ages 27–31. We further restrict our focus to those individuals who regularly resided in the dwelling in which they were enumerated.

The census reports the relationships among all members for each nuclear family recorded in every household. Specifically, individuals are reported as 'members of the household not belonging to a nuclear family', 'male member', 'female member', 'child of both parents' and 'child of one parent'. Our objective is to assess the influence of educational attainment on the probability that an adult shares a dwelling with their parents. Accordingly, the main outcome variable is a co-residence indicator that equals one for individuals recorded as a 'child of both parents' or 'child of one parent', and zero otherwise. Our main independent variable is binary, equalling one for individuals that have completed a higher education qualification. We also show results when distinguishing between the two tiers of higher education.

3.2 | Empirical Approach

Let the relationship between intergenerational co-residence and higher educational attainment be described by:

$$LP_i = \beta_0 + \beta_1 ED_i + \mathbf{X}_i + \epsilon_i \quad (1)$$

where LP_i is a binary variable indicating whether individual i co-resides with one or more of their parents, ED_i is a binary equal to one for individuals that have completed higher education, $\mathbf{X}_i$ is a set of controls and ϵ_i is an error term. Unobserved confounders, including ability and the strength of family links, that may determine both educational attainment and co-residence status, preclude interpreting β_1 as the effect of higher educational attainment on the probability of co-residence.

To address the endogeneity of higher education attainment, we exploit the natural experiment created by the expansion in higher education supply that took place in Greece in the late 1990s, that affected cohorts graduating from high school on year 2000 and later. Children enrolled to primary school subject to turning 5.5 years on October 1 of the enrolment year and pre-university schooling lasted 12 years. This implies that the first cohort experiencing the effects of the increase in higher education supply were born after 31 March 1982.⁵ While being born after March 1982 does not imply that individuals attained higher education, it discontinuously increases the probability that they accessed and completed university studies. This allows us to apply a fuzzy RDD (Cattaneo et al. 2020; Lee and Lemieux 2010), comparing the probability of co-residence and the probability of higher educational attainment, between cohorts that were just and just-not exposed to the expansion in higher education supply. Similar approaches have been applied to assess the influence of education on various outcomes of interest (Apfeld et al. 2023; Chen 2017; Machin et al. 2011; Oreopoulos 2006).

This approach estimates a Local Average Treatment Effect (LATE), that is the effect of higher education on the probability of co-residence for those individuals that attained higher education only because they were born just after the school enrolment cutoff:

$$\beta_1 = \frac{\lim_{R_i \downarrow 0} E[LP_i | R_i] - \lim_{R_i \uparrow 0} E[LP_i | R_i]}{\lim_{R_i \downarrow 0} E[ED_i | R_i] - \lim_{R_i \uparrow 0} E[ED_i | R_i]} \quad (2)$$

where R_i is the forcing variable recording i 's age in year-months, in deviations from April 1982. To estimate β_1 we use Two Stage Least Squares (2SLS), instrumenting ED_i with a binary variable that equals one for individuals that were born on April 1982 and later, and were therefore exposed to the expansion in higher education supply. Specifically, we estimate:

$$LP_i = \beta_0 + \beta_1 \hat{ED}_i + \beta_2 f(R_i) + \mathbf{X}_i + \epsilon_i \quad (3)$$

where the first stage equation is:

$$ED_i = \gamma_0 + \gamma_1 T_i + \gamma_2 f(R_i) + \mathbf{X}_i + u_i \quad (4)$$

We also report estimates from the reduced form equation, assessing the relationship between exposure to the expansion of higher education supply and the probability of co-residence:

$$LP_i = \beta_0 + \beta_1 T_i + \beta_2 f(R_i) + \mathbf{X}_i + \epsilon_i \quad (5)$$

In all cases, $f(R_i)$ is a linear polynomial (Gelman and Imbens 2019), in the forcing variable capturing cohort and age

effects on the probability of co-residence (Settersten 1998), and $T_i = I\{R_i \geq 0\}$ is the treatment variable indicating those born after the threshold. Finally, $\mathbf{X}_i$ includes a set of region-of-birth dummies capturing local cultural, social and economic conditions that may influence educational attainment and preferences towards co-residence with parents. $\mathbf{X}_i$ also includes a set of month-of-birth dummies to control for month of birth specific effects on attainment and the probability co-residence. We use information from individuals born within a 2-year bandwidth on either side of the school enrolment cutoff, that is, those born between May 1980 and March 1983. Those individuals were between 27 and 31 years old at the time of the census. As a robustness test, we also report estimates for every bandwidth between 12 and 48 months on each side of the threshold. We use a uniform kernel for the local linear regressions, but in robustness tests, we also report estimates when employing a triangular kernel.

Identification requires that unobserved variables determining co-residence and higher education attainment are smooth around the school enrolment cutoff (April 1982 in our case), or in other words, that individuals born just before and just after the school enrolment cutoff date do not systematically differ in any way, other than their opportunity to enter and complete university as a result of the expansion in higher education supply. This assumption would be violated if births in 1982 were non-randomly sorted around the school enrolment cutoff, to take advantage of the expanded higher education opportunities in the future. This is unlikely as parents in 1982 could not have anticipated the future expansion in higher education supply. Testing for manipulation of the running variable using the test suggested by (Cattaneo et al. 2020) does not reject the null of continuity at the April 1982 threshold. It is worth noting that with our data, we can only observe whether individuals live with their parents, and not whether they have the opportunity to live with their parents. Our approach then requires that the opportunity to live in the parental household does not change discontinuously between those that were born just before and just after April 1982.

4 | Results

4.1 | Descriptive

Table 1 reports on the characteristics of the sample. About 48% of 27–31-year-olds co-reside with their parents. Co-residence is noticeably more prevalent for men, relative to women (58% vs. 39%, respectively) consistent with prior evidence (Goldscheider and Goldscheider 1992; van den Berg et al. 2018). About 42% of the sample has completed tertiary education and 67% are in employment.

4.2 | Main

In common with the rest of the literature applying RDD, we begin by graphically illustrating the relationship between the forcing variable and the variables of interest. Figure 1a,b shows the share of individuals co-residing with their parents as a function of their month-year of birth, in deviations from the threshold, for the full sample and by sex. There is a noticeable

negative relationship between age and co-residence, reflecting the fact that younger individuals are more likely to live with their parents. The share of individuals co-residing with one or more of their parents appears to drop by about 3 percentage points at the threshold, suggesting a plausible link between the expansion in higher education supply and the probability of co-residence. Men are consistently less likely to reside with parents relative to women, reflecting cultural and social norms (Figure 1b). Figure 1c,d illustrates the first-stage relationship between higher education attainment and month-year of birth, for the full sample and by sex, respectively. There is a marked jump in the share of individuals with completed higher education at the April 1982 birth threshold of about 10 percentage

points suggesting that the expansion in higher education supply did in fact impact higher educational attainment.

We now turn to the estimates from our fuzzy RDD. Table 2 shows estimates of the LATE of higher education on the probability of co-residence (Equation 2), along with estimates from the first stage and the reduced form equations (Equations 4 and 5, respectively), for the full sample and the samples of men and women. The reduced form effect (capturing the intent-to-treat effect) is small but statistically significant in all cases. For the full sample, individuals born just after the threshold are about 2.2 percentage points less likely to co-reside with one or more of their parents (column 1). The effect appears to vary with sex: men and women born just after the school enrolment threshold are 3.2 and 2.4 percentage points less likely to co-reside with parents, respectively, relative to those born just earlier. As anticipated by Figure 1c, the first stage effect shows a strong relationship between the expansion in higher education supply and the probability of completing a higher education degree: the probability of completing a higher education qualification increases by 12.7, 10.3 and 15.7 percentage points for the full sample, men and women, respectively.

The LATE of higher education on the probability of co-residence is negative, quantitatively and statistically significant for all samples. The probability of co-residence is lower by 17.3 percentage points for those individuals that attained higher education only because they were just exposed to the expansion in higher education supply. As anticipated by the relative sizes

TABLE 1 | Sample characteristics.

Variable	(1) All	(2) Men	(3) Women
Co-residence	0.48	0.58	0.39
Higher education	0.42	0.36	0.48
In employment	0.67	0.73	0.62
In marriage	0.29	0.18	0.39
Female	0.51		
Observations	39,251	19,060	20,191

Note: The table reports characteristics for the full sample (column 1), and the samples of men and women (columns 2 and 3, respectively). All variables are binary, and figures reported are shares.

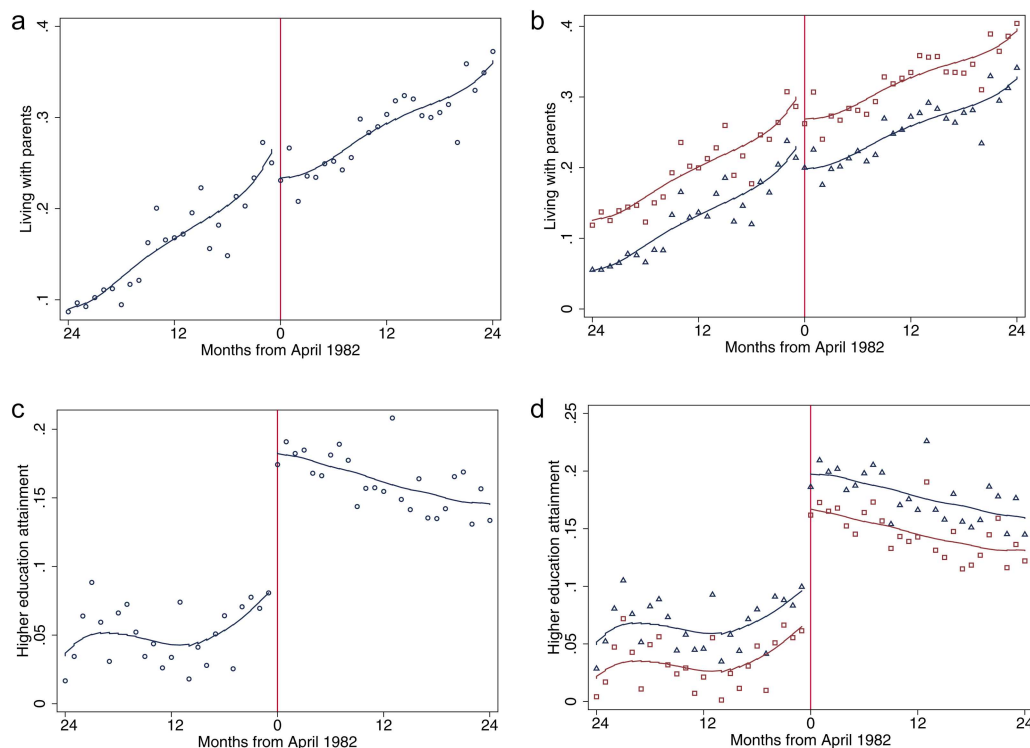


FIGURE 1 | Discontinuity in the reduced form and the first stage equations. The figure illustrates the relationships between month-year of birth and co-residence (a and b), and higher educational attainment (c and d). In (a), circles represent the average residuals from a regression of the co-residence indicator on the set of region-of-birth and month-of-birth dummies. In (c), circles are average residuals from a regression of the higher educational attainment indicator on region of birth and month of birth dummies. In (b) and (d), triangles and squares are average residuals from regressions using the samples of women and men, respectively. In all cases, lines are lowest smoothers.

TABLE 2 | Co-residence and higher education attainment.

	(1) Full sample	(2) Men	(3) Women
2SLS			
Higher Ed.	−0.173** (0.075)	−0.315** (0.140)	−0.153** (0.070)
First stage			
T	0.127*** (0.010)	0.103*** (0.011)	0.157*** (0.014)
Reduced form			
T	−0.022** (0.010)	−0.032** (0.014)	−0.024** (0.011)
Bandwidth	24	24	34
Observations	39,251	19,060	20,191

Note: The table presents estimates of the LATE of higher education attainment on the probability that a young adult lives with their parents. Higher education is binary indicating individuals that have completed a tertiary course. *T* is binary indicating individuals that were born after March 1982. The dependent variable in all cases is binary, indicating a person that lives with one or more of their parents. Standard errors clustered at the level of month-year of birth in parentheses.

** $p < 0.05$; *** $p < 0.01$.

TABLE 3 | Higher education and returning to the parental household.

	(1) Full sample	(2) Men	(3) Women
2SLS			
Higher Ed.	0.021 (0.051)	0.057 (0.136)	−0.013 (0.043)
First stage			
T	0.132*** (0.012)	0.101*** (0.018)	0.159*** (0.014)
Reduced form			
T	0.003 (0.007)	0.006 (0.014)	−0.002 (0.007)
Bandwidth	24	24	34
Observations	22,565	9242	13,323

Note: The table presents estimates of the LATE of higher education attainment on the probability that an adult boomerangs at their parents' home. Higher education is binary indicating individuals that have completed a tertiary course. *T* is binary indicating individuals that were born after March 1982. The dependent variable in all cases is binary, indicating individuals currently co-residing with parents. Standard errors clustered at the level of month-year of birth in parentheses.

*** $p < 0.01$.

of the reduced form and first stage effects, the magnitude of the effect for men is twice the size of that for women. Higher education lowers the probability men co-reside with their parents by 0.3, while the corresponding effect for women is 0.15.

4.3 | Boomerang?

The boomerang phenomenon refers to adults that returned to the parental home after a period of residential independence (South and Lei 2015; Stone et al. 2014). Assessing the influence

of higher education attainment on the probability of returning in the context of our study, requires restricting the analysis on individuals that have at some point left their parental home (i.e., excluding individuals that have never left). Our data do not report the detailed history of individuals' housing arrangements, and as a result we cannot exclude never-leavers from our analysis. We can however use information on individuals' municipality of residence at the census date and in the recent past, to address an adjacent question that can provide some intuition on the education-boomerang behaviour relationship. Specifically, we have information on household members' municipality of residence at the time of the census, 1 year before the census (in 2010) and 5 years before the census (in 2006). We use this information to identify individuals who both resided in the same municipality as their parents in 2006 and 2010, and co-resided with their parents in 2011. We exclude these subjects and repeat the analysis, to estimate the influence of higher education on the probability individuals who resided in a different location to their parents in the recent past, have since returned to the parental home. Estimates in Table 3 do not suggest a relationship between higher education attainment and the probability an adult boomerangs to their parents' home, neither for the full sample, nor for the male and female samples. In all cases, the reduced form effect is quantitatively small and statistically insignificant, implying an insignificant LATE.

4.4 | Mechanisms

4.4.1 | Labour Market Outcomes

Having established the impact of higher education attainment on the probability of co-residence, we now explore some of its possible drivers. Education can improve short and long term employment opportunities and labour market outcomes, and increase income, allowing greater flexibility in living arrangements and enabling residential independence (Le Blanc and Wolff 2006; Silles 2023). To evaluate whether the drop in the probability of co-residence can be attributed to this mechanism, we assess the effect of higher education attainment on labour market outcomes. We begin by estimating the LATE of higher education on the probability of employment, using a fuzzy RDD to compare the probability of being in employment, between individuals that were born just before and just after April 1982. Estimates reported in the first column of Table 4 do not suggest that higher education attainment improved the probability of employment. The LATE of higher education for the full sample is small and statistically insignificant. It is also worth noting that although insignificant, the estimated relationships for the male and female samples carry opposite signs: higher educational attainment appears to increase the probability of being in employment for men and decrease it for women.

While higher education attainment does not appear to increase the probability of being in employment for just-treated subjects relative to the just-not-treated, it may improve career outcomes for those that are employed. Higher education qualifications are often required for middle and higher management roles and are prerequisites for professional accreditation. These occupations can be perceived to be more prestigious, be better remunerated

TABLE 4 | Mechanisms.

	Full sample			Men			Women		
	(1) Empl.	(2) Occup.	(3) Marr.	(4) Empl.	(5) Occup.	(6) Marr.	(7) Empl.	(8) Occup.	(9) Marr.
2SLS									
Higher Ed.	−0.010 (0.068)	0.268*** (0.062)	−0.078 (0.065)	0.127 (0.131)	0.215*** (0.069)	0.015 (0.093)	−0.119 (0.079)	0.347*** (0.082)	−0.062 (0.084)
First stage									
T	0.127*** (0.010)	0.139*** (0.011)	0.127*** (0.010)	0.103*** (0.011)	0.121*** (0.011)	0.103*** (0.011)	0.157*** (0.014)	0.168*** (0.016)	0.157*** (0.014)
Reduced form									
T	−0.001 (0.009)	0.037*** (0.010)	−0.010 (0.008)	0.013 (0.013)	0.037*** (0.010)	0.001 (0.010)	−0.019 (0.012)	0.058*** (0.017)	−0.010 (0.013)
Bandwidth	24	24	24	24	24	24	24	24	24
Observations	39,251	30,913	39,251	19,060	15,883	19,060	20,191	15,030	20,191

Note: Higher Ed. is binary indicating individuals that have completed a tertiary course. *T* is binary indicating individuals that were born after March 1982. The dependent variables are binary, indicating an individual in employment (columns 1, 4, 7), an individual in a management position (columns 2, 5, 8) and an individual who is currently married (columns 3, 6, 9). Standard errors clustered at the running variable level.

*** $p < 0.01$.

and provide better long term career progression opportunities compared to others (Ganzeboom et al. 1992), allowing for greater financial independence that in turn allows for independent living. We assess this mechanism by testing whether higher education attainment leads to better occupational outcomes. To this end, we use information from the census that organizes primary occupation in nine categories⁶ according to the International Standard Classification of Occupations, and create a binary ‘Occupation’ variable indicating employed individuals categorized as ‘Legislators, senior officials and managers’, ‘Professionals’ and ‘Technicians and associate professionals’. Table 4 shows estimates from a fuzzy RDD estimating the impact of higher education attainment on probability an individual's occupation falls into one of these categories. Estimates suggest that higher education increases the probability of being in a relatively more prestigious occupation by about 27 percentage points (column 2). We further find that the effect is higher for women (about 35 percentage points) than men (about 21 percentage points) (columns 5 and 8, respectively).

4.5 | Marriage Formation

Partnership, marriage and family formation are important life course milestones that may trigger residential independence (Stone et al. 2011). Attending higher education increases opportunities for socialization, and interactions that may lead to partnership formation. At the same time, higher education can drive assortative mating plausibly reinforcing the positive effects from occupational outcomes. In Table 4, we report the effect of higher education attainment on the probability of being in a marriage, comparing between individuals born just before and just after the April 1982 threshold. There is no evidence that higher educational attainment impacts on the probability of marriage for any of the samples, suggesting that marriage is unlikely to be a mechanism driving the relationship between co-residence and higher education.

4.6 | Additional Results

4.6.1 | Property Market Participation

As suggested earlier, pecuniary returns to education can facilitate greater access to the property market, enabling residential independence (Lennartz et al. 2016). To provide some insight on whether this channel can explain our results, we focus on individuals that did not co-reside with parents at the time of the census, and estimate the effect of higher education attainment on the probabilities they (i) own, and (ii) rent the property they currently reside in. Columns 1 and 2 of Table 5 show the corresponding estimates. There is no evidence that higher education attainment increases homeownership, and in fact the likelihood a tertiary education graduate resides in a household-owned property is about 20 percentage points lower compared to those without higher education. Nevertheless, the probability of living in a rental property increases by 17 percentage points (column 2).

This finding can be due to at least two complementary mechanisms. First, the negative impact on the probability of homeownership may be attributed to the opportunity costs of higher education. While studying, individuals are more likely to stay out of the labour market, reducing their wealth accumulation in their early adult years and consequently their opportunity to afford a property. Nevertheless, the improvement in labour market outcomes implied by higher education attainment allows graduates to afford rent.

Second, higher education attainment increases employment opportunities, with the potential to lead to greater mobility in search of career progression. Individuals with higher education may then strategically choose to rent, in order to avoid homeownership lock-in⁷ (Engelhardt 2003). This is particularly pertinent in the Greek case where the property market during the period we study was illiquid due to structural (fragmented ownership), cultural (homeownership within families as a

TABLE 5 | Property market participation, parental employment, by tier of higher education and urbanization.

	(1) Own home	(2) Rent home	(3) Parents in employment	(4) Live with parents	(5) Live with parents	(6) Major urban	(7) Not major urban
2SLS							
Higher Ed.	−0.201** (0.092)	0.171** (0.087)	−0.044 (0.085)			−0.235 (0.172)	−0.162* (0.085)
University				−0.287*** (0.107)			
HTE					−0.088 (0.088)		
First stage							
	0.138*** (0.013)	0.138*** (0.013)	0.117*** (0.014)	0.092*** (0.011)	0.118*** (0.008)	0.131*** (0.021)	0.127*** (0.011)
Reduced form							
	−0.028** (0.014)	0.024* (0.012)	−0.005 (0.010)	−0.026*** (0.010)	−0.010 (0.010)	−0.031 (0.023)	−0.020* (0.011)
Bandwidth	24	24	24	24	24	24	24
Observations	20,320	20,320	18,931	32,095	29,760	5979	33,272

Note: Higher education is binary indicating individuals that have completed a tertiary course. University and HTE are binary, equal to one for individuals that have completed University and Higher Technical Education, respectively. *T* is binary indicating individuals that were born after March 1982. In columns 1 and 2, the sample contains individuals not co-residing with parents. The dependent variables in columns 1 and 2 are binary indicating individuals that live in households owning and renting their residence, respectively. In column 3, the sample comprises individuals currently co-residing with parents. The dependent variable is binary, equal to one if at least one parent is in employment. In columns 4, 5, 6 and 7, the dependent variable is binary, indicating co-residing individuals. In column 6, the sample comprises individuals residing in the Athens and Thessaloniki metropolitan areas. In column 7, the sample comprises individuals residing away from the major metropolitan areas. Standard errors clustered at the running variable level.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

social security mechanism), financial (limited access to credit and uncertainty due to the financial crisis) and legal or regulatory (administrative procedures and bureaucracy) barriers (Chatzitsolis and Vlamis 2014; Siatitsa et al. 2025). These constraints served to reduce housing supply and large housing developments. Uncertainty, inability to borrow and high mortgage rates, could have exacerbated graduates' willingness to strategically choose renting over owning. To partially assess this mechanism, we construct two binary mobility variables, each equal to 1 for respondents who reside in the same municipality as they did 1 year and 5 years prior to the census. Table A1 shows estimates from a RDD estimating the LATE of higher education on the probability of residential mobility. Higher education appears to increase short-term residential mobility by 13 and 8 percentage points, respectively, suggesting that mobility is a plausible alternative mechanism underlying the increased probability of renting.

4.7 | Parental Employment

Does co-residence with parents influence parental labour supply? To address this question, we further explore whether the higher education attainment of co-residing children influence their parents' employment status. To gain some intuition on this, we use information from individuals co-residing with their parents at the time of the census and estimate the relationship between their higher education attainment and the probability at least one of co-resident parents being in employment. Estimates in the third column of Table 5 do not suggest a

relationship between higher education and parents' employment status.

4.8 | The Role of Higher Education Tier

As suggested earlier, higher education comprised two tiers: Universities offered 4–6 year courses and Higher Technological Institutes that offered 3.5 year courses primarily focusing on vocational education. University courses were in relatively higher demand, perceived to be prestigious and to offer greater returns relative to technical education. We test whether the main result varies depending on the tier of higher education completed. Columns 4 and 5 of Table 5 report the corresponding estimates. Estimates suggest that our main result is driven by university education: Attending university appears to decrease the probability of co-residence by 29 percentage points, while the corresponding result for higher technical studies is statistically insignificant.

4.9 | Urban Versus Rural Areas

We further explore whether the impact of higher education on the probability of co-residence with parents varies with the degree of urbanization at the region of residence. Large urban centres tend to offer more employment opportunities, especially for graduates, drawing them away from rural areas. At the same time, the higher housing cost burden may encourage co-residence relative to rural areas. As a result, the impact of higher education may be more pronounced for people

TABLE 6 | Robustness.

	(1) Full sample	(2) Men	(3) Women
Quadratic	−0.223** (0.112)	−0.422* (0.237)	−0.206** (0.089)
Donut	−0.168** (0.080)	−0.280** (0.141)	−0.178** (0.073)
Triangular	−0.173** (0.075)	−0.319** (0.150)	−0.162** (0.063)
Robust se	−0.173** (0.087)	−0.315** (0.158)	−0.153 (0.097)
Bandwidth	24	24	24
Observations	39,251	19,060	20,191

Note: Each cell shows estimates of the LATE of higher education on the probability an individual cohabits with their parents from a separate 2SLS regression. Columns 1, 2 and 3 use the full sample, the sample of men and the sample of women, respectively. The first row uses a quadratic local polynomial. Models in the second row exclude individuals born 1 month before and after the April 1982 cut-off. The third row uses a triangular kernel for the local linear regressions. The fourth row uses robust standard errors.

* $p < 0.01$; ** $p < 0.05$.

living outside the large urban centres. In Table 5, we perform the analysis separately for people living in the two largest urban centres (Athens and Thessaloniki) in the country (column 6) and people living elsewhere (column 7). Estimates suggest that higher education attainment decreases the probability of co-residence by 16.2 percentage points for those residing in households away from the main urban centres.

4.10 | Robustness

Table 6 shows estimates from some robustness tests assessing the stability of the results to perturbations in our assumptions. Repeating the analysis assuming a quadratic relationship between the forcing variable and the probabilities of co-residing and attaining higher education, leads to quantitatively and qualitatively similar estimates to the ones derived when assuming a linear relationship. Attaining higher education decreases the probability of co-residence by 0.22 for the full sample, by 0.42 for men and by 0.2 for women.

Our baseline analysis uses a uniform kernel, assigning equal weight on all observations irrespective of their distance from the threshold. Repeating the analysis when using a triangular kernel that assigns more weight to those observations that are closer to the threshold does not change results.

To test the sensitivity of the results on the choice of the bandwidth used for the analysis, Figure 2 shows estimates of the LATE of higher education for each sample and each bandwidth between 12 and 48 months on either side of the threshold. Estimates are stable across samples for most bandwidths, turning statistically insignificant for bandwidths over 30 months.

Finally, we estimate the LATE of higher education for 28 placebo expansions in higher education, each hypothetically occurring between 1974 and 1998, first affecting cohorts born

between April 1957 and 1980, respectively. Figure 3 shows the estimated placebo effects along with 95% and 90% confidence intervals. Only two of the placebo effects are significant at conventional levels.

5 | Discussion and Conclusion

The timing of major life events is ever-changing, responding to economic stimuli and evolving social conditions, expectations and norms (Albertini et al. 2018; Marini 1984). The timing of the move away from the parental household and into residential independence, an important step in the transition to adulthood, has been inexorably shifting later in the life course (European Commission 2025). The extension in the period of co-residence with parents can have an important knock-on effect on the timing of later life milestones, delaying financial independence and family formation, producing complex demographic, planning, economic and social challenges. Exploring the mechanisms impacting the timing of residential transitions is important for understanding the resulting challenges and designing interventions to address them.

Since the middle of the 20th century, access to tertiary studies and higher educational attainment has been increasing worldwide. In many states, this growth has coincided with an increase in the duration of co-residence between adults and their parents. In this paper, we study the relationship between higher education and co-residence. To overcome the complexity introduced by unobserved confounders simultaneously affecting both educational attainment and co-residence, we use the natural experiment created by a change in educational policy that took place in Greece, which increased the supply of higher education. Using census data and applying an RDD, we find evidence that completing tertiary education decreases the probability of co-residence between adults in their late 20s and their parents by approximately 17 percentage points. Our findings further suggest that the impact of education is more pronounced for men relative to women, and that the result can be plausibly attributed to the improvement in occupational outcomes. We do not find evidence that higher education is related to an interpretation of boomerang behaviour or that it is related to parents' employment status. The mechanisms we explore imply that the relationship between higher education attainment and co-residence is driven by the associated increase in human capital. It is worth noting, though, that higher education attainment can influence co-residence through alternative experiential or psychological mechanisms. For instance, consider the case of individuals who moved away from the parental household to pursue their studies. It is plausible that these individuals, accustomed to these arrangements, are more inclined to continue living away from the parental household. In this case, the experience of moving away from the parental household to pursue tertiary studies might affect the probability of future co-residence independently of human capital accumulation.

While we do not find evidence to suggest that higher education attainment is related to boomerang behaviour, it is worth noting that our analysis is designed to capture the extensive margin of the relationship. This does not mean that education is irrelevant

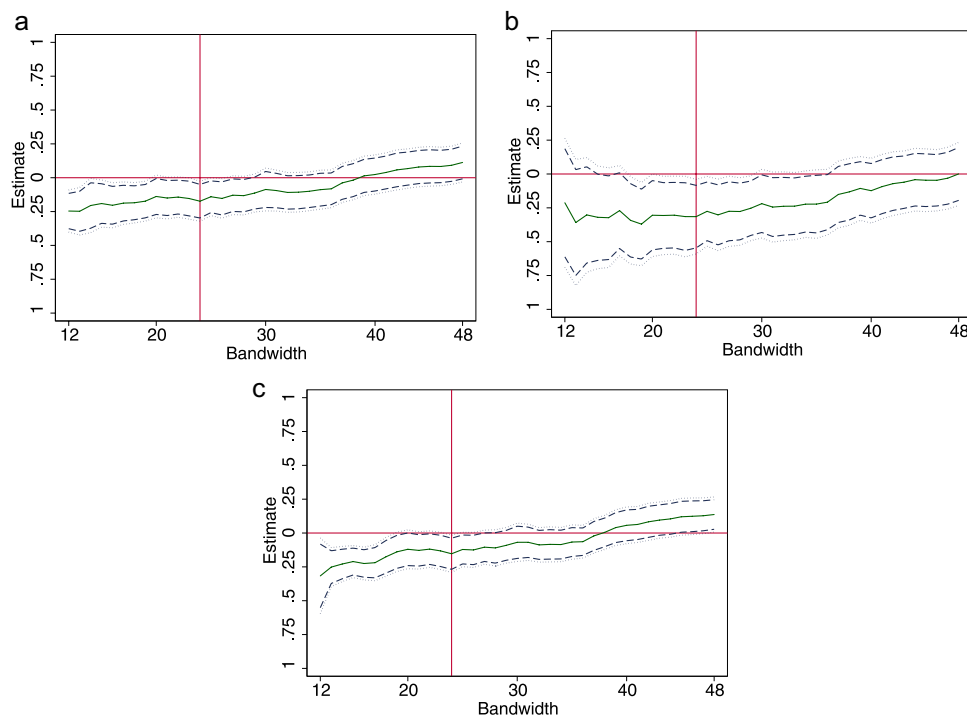


FIGURE 2 | Sensitivity to bandwidth choice. The green line represents the LATE of higher education on the probability of co-residence with parents. (a) full sample, (2) men, (c) women. Dashed and dotted are 90% and 95% confidence intervals, respectively. The red line represents the baseline estimate as reported in Table 2.

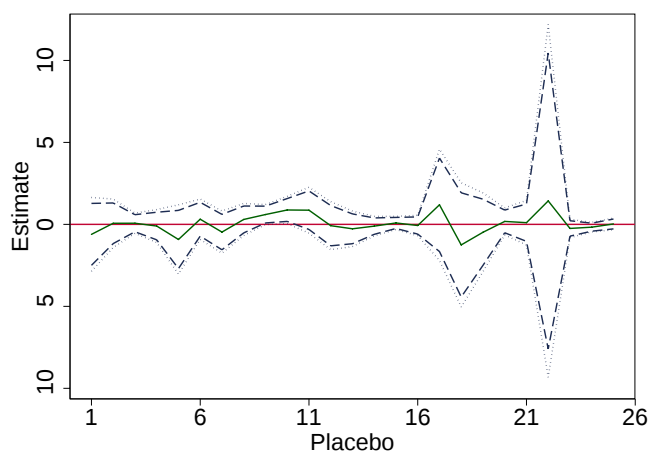


FIGURE 3 | Placebo tests. The green line represents the LATE of higher education on the probability of co-residence with parents for each of 25 placebo expansions taking place in the years 1974–1998 (affecting first the cohorts born in April 1957 and 1980, respectively). Dashed and dotted are 90% and 95% confidence intervals, respectively.

for the consequences of such moves. Post-return outcomes for boomerangers can be characterized by substantial heterogeneity (Choi 2023). Returning to the parental home may function as a form of insurance for lower-income individuals, through improving their access to location-specific social capital and support networks. On the other hand, it may be negatively related to the employment opportunities of middle- and higher-income individuals. Furthermore, boomerang moves can perpetuate spatial inequalities when returning to areas with weaker labour markets (Chan et al. 2026). This is particularly relevant in the Greek context, where regional disparities in employment opportunities are significant.

To our knowledge, our analysis is the first attempt to recover some causal evidence on the relationship between higher educational attainment and co-residence practices. Our results, however, agree with studies uncovering a negative association between educational attainment and co-residence (Isengard and Szydluk 2012; Stone et al. 2011; VanWey and Cebulko 2007).

Many states are faced with complex multi-pronged demographic, housing and employment crises (Wetzstein 2017). Developed economies in particular are facing housing crises and increasing youth unemployment, all the while population growth is decreasing and educational attainment increases. To tackle these challenges, governments are devising policies aiming to improve social well-being. For example, the ‘help to buy scheme’ in the United Kingdom is aimed at supporting first-time buyers. Similarly, Greece and Spain have recently introduced new rules to regulate the short-term housing rental market in response to the housing crisis. To devise effective policy responses, governments need to understand the factors that affect residential decisions and the implications of residential choices for the individual, the economy and society. In this paper, we find that higher education may influence these decisions. It is therefore important for policymakers to ensure equal opportunities to attain higher education for students from different socio-demographic backgrounds, along with policies aiming to increase housing affordability. This is particularly pertinent for economies where property markets are increasingly becoming inaccessible due to limited access to credit, short-term rentals and restrictive home-building regulations (Wetzstein 2017). Future research should further investigate the mechanism that may explain the relationship between higher education and the decision to leave the parental household.

As with any observational study, ours should be accompanied with a series of caveats. The analysis we present here takes advantage of a specific natural experiment that took place within the institutional, social and cultural context prevailing in a specific location at a certain point in time. As such, we cannot claim that results can be generalized across different contexts or institutional frameworks. For example, the strength of the results may vary across countries facing different economic conditions, cultural backgrounds and social acceptance of co-residence (Settersten 1998; Tosi 2017).

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The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data used in this study are publicly available from IPUMS at <https://international.ipums.org/international/>. The estimation code is available from the authors at a reasonable request.

Endnotes

¹ It is worth noting that (Marini 1984) cautions against interpreting the sequencing of transitions to adulthood as outcomes of social norms.

² The census did not collect data on gender.

³ The country only recently allowed non-state universities to be established and operate (Law 5094/2024).

⁴ In comparison, the corresponding average for the EU was 26.2 years in 2024 (European Commission 2025).

⁵ Individuals born on 31 March 1982, turned 5.5 on 30 September 1987, enrolled in primary school in 1987, went through 12 years of schooling, graduated from high school and sat the university entry examination in 1999. On the other hand, those born on 1 April 1982, turned 5.5 on 1 October 1987, missed the 1987 primary school enrolment cutoff by a day, and enrolled in primary school in September 1988. They sat the university entry exams in 2000 and were the first cohort to be exposed to the treatment.

⁶ The categories are: Legislators, senior officials and managers; Professionals; Technicians and associate professionals; Clerks; Service workers and shop and market sales; Skilled agricultural and fishery workers; Crafts and related trades workers; Plant and machine operators and assemblers; Elementary occupations.

⁷ We thank an anonymous referee for raising this point.

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Appendix

TABLE A1 | Higher education attainment and mobility.

	Full sample		Men		Women	
	(1)	(2)	(3)	(4)	(5)	(6)
2SLS						
Higher Ed.	0.132*** (0.040)	0.087* (0.052)	0.208** (0.084)	−0.010 (0.115)	0.084* (0.050)	0.168*** (0.059)
First stage						
T	0.127*** (0.010)	0.127*** (0.010)	0.103*** (0.011)	0.103*** (0.011)	0.157*** (0.014)	0.157*** (0.014)
Reduced form						
T	0.017*** (0.005)	0.011* (0.007)	0.021** (0.008)	−0.001 (0.012)	0.013* (0.008)	0.026*** (0.009)
Bandwidth	24	24	24	24	24	24
Observations	39,251	39,251	19,060	19,060	20,191	20,191

Note: Higher education is binary indicating individuals that have completed a tertiary course. *T* is binary indicating individuals that were born after March 1982. In columns 1, 3 and 5, the dependent variable is binary, equal to 1 for individuals that reside in a different municipality to the one they resided 1 year ago. In columns 2, 4 and 6, the dependent variable is binary, equal to 1 for individuals that reside in a different municipality to the one they resided 5 years ago. Standard errors clustered at the running variable level.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.